

MASTER

Innovative performance

NPD aligned with sales and the market

Schaars, P.M.W.

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Innovative performance: NPD aligned with Sales and the market

In partial fulfillment of the requirements for the degree of

**Master of Science
In Innovation Management**

By:	P.M.W. Schaars
Student Identity number:	0722039
Program:	Innovation Management
Course:	Master Thesis (1JM96)
Supervisors:	Dr. F.M. van Eijnatten, TU/e, HPM Dr. ir. W. van der Borgh, TU/e, ITEM
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I. Preface

This master thesis is the result of my graduation project, which forms the final phase of my study Innovation Management at the Eindhoven University of Technology. It was a very interesting phase of my life, where I had the chance to develop myself in many different ways.

I would like to take this opportunity to express my gratitude to everyone who supported me during the process. First of all, I would like to thank my mentor and first supervisor Dr. F.M. van Eijnatten. He was very engaged in the process, expressed in the time he always made for me when questions arose. Furthermore, he provided much interesting literature to me, which gave me valuable insights. I would also like to thank Dr. Ir. W. van der Borgh, my second supervisor at the TU/e. He gave me structural feedback and provided me with additional insights of literature of Sales and New Product Development.

I conducted the research at an electro technical installing company. I am very grateful that I got the opportunity to perform my graduation project at this company. Not only was everyone very open and truly interested towards my research, I also felt really welcomed by my colleagues. Besides the hard work, there was also time for fun. Therefore, I always enjoyed going to work. Furthermore, I got the opportunity to meet many colleagues of other departments and other graduate students and trainees, which enriched the time in the company.

Therefore, I would also like to thank my supervisors at the company. Thanks to my first supervisor Claire de Haan, for supporting me during the project, but also for the opportunities to join inspiring meetings of the department outside the direct scope of the project. Secondly, Joost van Gemeren, which was not only my supervisor, but also the coordinator of the two-monthly meetings for graduate students and trainees. Those meetings and workshops gave me the opportunity to develop myself personally.

Furthermore, I would like to thank my family for the support. Special gratitude goes to my parents, who provided continuous support to me in everything I do. I would also thank all my friends for the support, but even more for all the fun activities, dinners and good conversations which provided some welcome distraction during my graduation project. Finally, I thank my roommates for the interest they showed, the little chats in the kitchen and the cups of tea they provided when I was working in the evening.

II. Management summary

Introduction. This master thesis report is executed following the regulative circle of van Strien (1997). In line with the design focused character of the thesis, the phases Challenge definition, Diagnosis and Design are presented in this report.

The project is conducted at a Dutch electro technical installing company. The company is endeavored to be more innovative and customer focused. In line with this mission, the company is creating innovation lines, which should result in innovative and customer focused concepts to implement in the market and create revenue with. A hypothesis is made that collaboration between Sales and I&D (which coordinates the innovation lines) can be beneficial to achieving the innovative and customer focused performance. Therefore, the managerial challenge is defined:

How to become more innovative and customer focused with the use of collaboration between Sales and Innovation and Development?

In order to create a design which can answer this question, the diagnosis phase will focus on conducting a gap analysis. In this way it can be presented what the difference is between the current processes and the desired processes to accomplish an innovative and customer focus result.

Theoretical background. A theoretical background is presented, to give more insights of the topics of interest. Related to the customer focused performance, it is important to have a strategy which is aligned with the market. A theory of Emery and Trist (1965) is provided to determine the type of market in which the company is in, and align the strategy which is needed for that type. Secondly, a decision should be made on how to serve your customer. Therefore, Porter (1980) presented a generic strategies framework. This framework states different strategies such as: differentiation, overall cost leadership and a focus strategy.

The processes are central in this thesis; therefore, the general sales process is described, followed by a description of a new product development process. With the use of literature of among others Ernst et al. (2010) it is described how those two processes can be complementary to each other, and how incorporating Sales in the NPD process can enhance the overall NPD performance.

Methodology. The methodology is divided in two sections, related to the regulative cycle of Van Strien (1997). In the diagnosis phase the research method is based on data, documents and interviews. The three sources are used for triangulation. In the design phase the conducted research focuses on best practices, literature, and experts.

Diagnosis. With the use of data, documents, internal and external interviews a description of the current and desired processes and innovative performance can be given. Based on these

descriptions a gap analysis was conducted. It showed that there exists a gap between the current and desired customer focused and innovative performance of the company. This gap can be divided into six different factors: strategy, tasks, competences, culture, and structure. The gaps are presented in Figure 1.

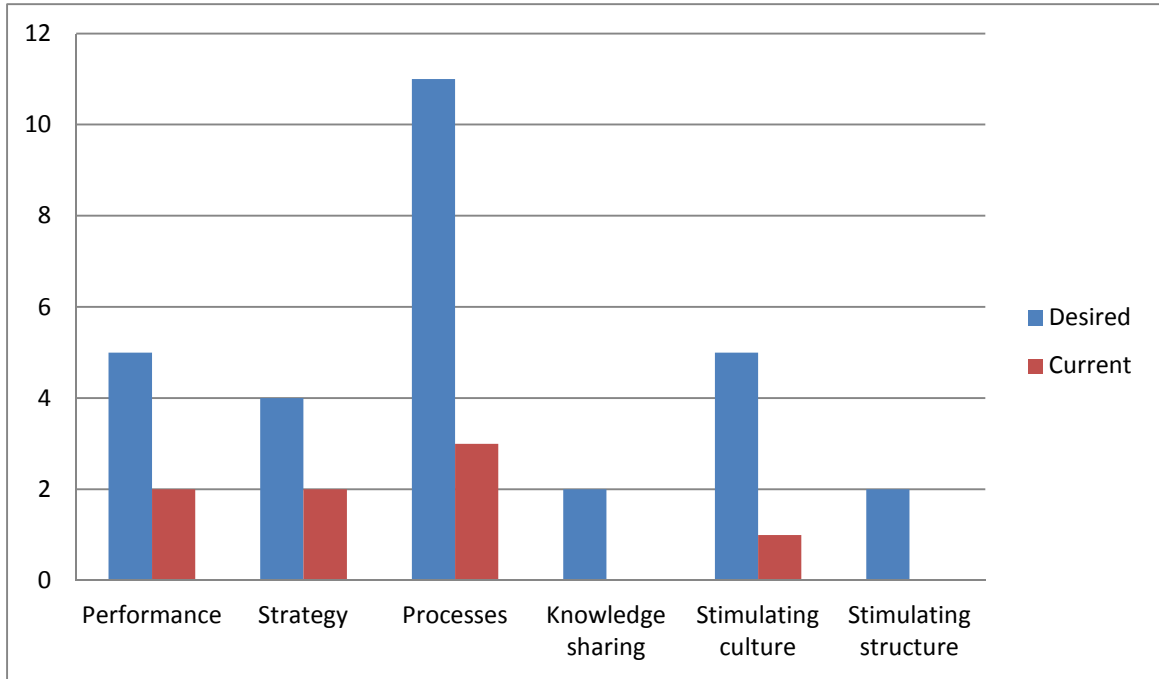


Figure 1. Graphical representation of the gaps

Design. The design strives to determine a feasible improvement direction which mitigates the gap determined. As a result of the focus of the research, the compatibility with the design requirements and the ranking of the improvement directions, the design will include strategy, process and knowledge sharing. The design recommends a structured NPD process consisting of a concept development, product development, and implementation stage (see Figure 2). The process should be coordinated by I&D, who is also responsible for detecting new techniques of the market. In the concept development stage, Sales is expected to give insights for customers' and market's needs as input for idea generation and specific customer requirement to enhance the quality of screening. I&D should perform a structured screening process based on an evaluation matrix. In the product development stage, the product is developed and tested. Sales could provide support by checking the ideas in the market and by selecting and accessing customers for executing pilots. Finally, in the implementation stage it is important that I&D promotes the final product by emphasizing the added value for the customer. Afterwards, Sales should implement the product in the market. The insights gathered after implementation of the product, should be shared with I&D as well. During the process, the knowledge should be shared, both via formal and more informal channels. Therefore, formal shared meetings in the beginning of the weekly sales meeting are recommended for the general information sharing. The specific project information should be shared during the 3x3 sessions, coordinated by I&D. Furthermore,

recommendations are made for informal and virtual knowledge sharing. Only focusing on this process is not enough to reach customer focused innovations. The market is complex and dynamic, which requires a specific strategy to retrieve and process market information effectively. Therefore, active adaptive planning and future desired scenarios need to be used. It is recommended to perform a search conference to enable all employees to use these methods. Furthermore, a competence need analysis should be executed, and customized training should be held to enhance the competences needed.

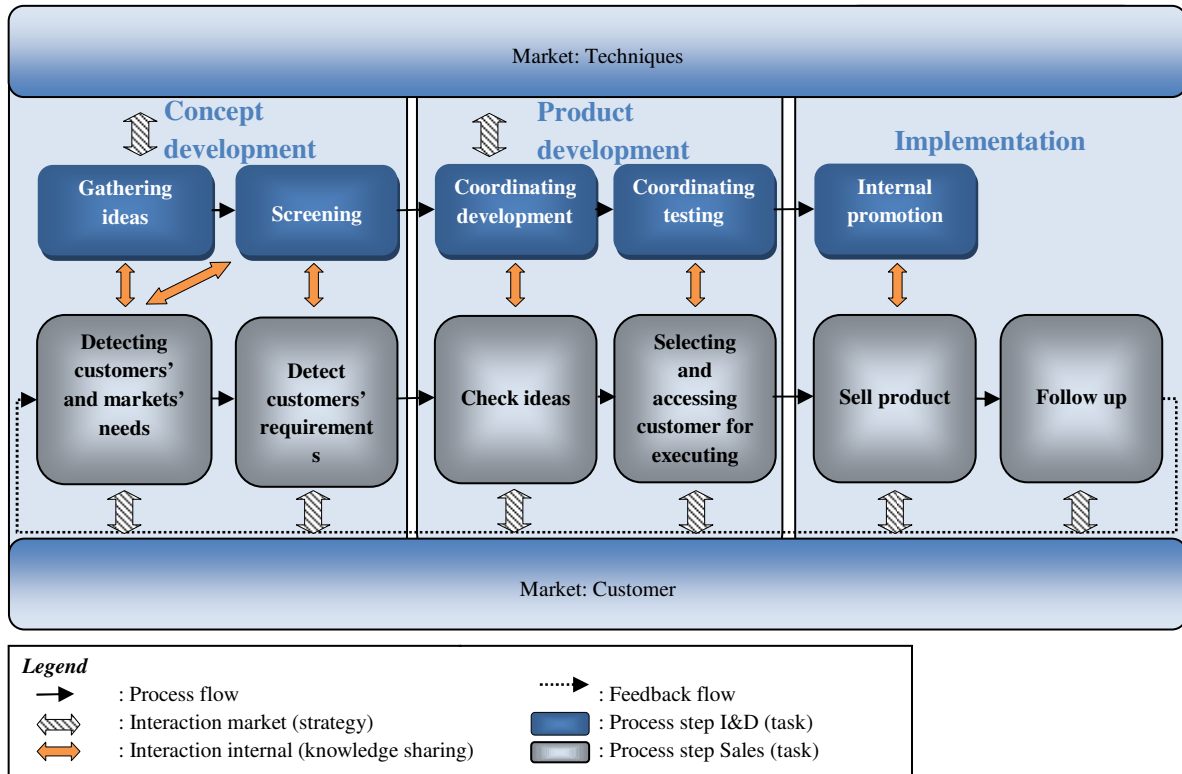


Figure 2. Proposed design of NPD process

Conclusion. The research shows the importance of alignment of the internal processes with the interaction with the market. Furthermore, with the recommendations for a structured process guided by a strategy aligned with the market the company can reach a higher level of innovativeness and customer focus. To facilitate this process, formal and informal knowledge sharing should be enhanced, as presented in the design. However, the culture and the structure of the company can form barriers for the execution of the project. Even though the research and design include decisions which could lower these barriers, it has to be concluded that the structure and culture of the company should be changed in order to let the design be truly successful.

III. Abstract

The research provides insights in how a company can enhance its innovative and customer focused performance, focusing on innovation and sales processes. The company¹ in which the research is conducted is operating in the electro technical installation market. Innovations are based on creating concepts to offer to the customer. A gap analysis shows that the desired level of innovative and customer focused performance is not yet achieved. The gap consists of differences in desired and current strategy, processes, knowledge sharing, culture, and structure. The design presented to mitigate the gap shows that the processes of Sales and I&D should not only be adjusted to each other, but also to the market. In order to create a beneficial new product development process, a structured process consisting of the stages concept development, product development and implementation should be developed. During these stages, Sales can provide insights in the needs of customers, to ensure the product developed is customer focused. Specific changes in the knowledge sharing environment are needed, in order to enhance formal and informal knowledge sharing. Furthermore, the process will only succeed if this market information is retrieved and translated in an effective way. Therefore, an external focus is also needed to interact effectively with the market. The strategy proposed is strongly depending on the human factor. Therefore, training of the employees of I&D and Sales is recommended.

1: For the sake of confidentiality the real name of the company is not used in this thesis report. Appendices contain confidential information, and are not publicly available.

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List of abbreviations

Abbreviation	Meaning	Dutch term (used in the company)
AM	Account Manager	
BG	Business Group	
BGD	Business Group Director	
BT	Building Technology	
CRM	Customer Relation Management	
DE	Design Engineering	
EMVI	Most Economically Advantaguous Tender	Economisch Meest Voordelige Inschrijving
HR	Human relations	
I&D	Innovation and Development	Innovatie en Ontwikkeling
IC	Innovation Coordinator	Innovatie Coördinator
IND	Industry	
Infra	Infrastructure	
LO	Learning Organization	
M&BD	Marketing and Business Development	
M&O	Marine and Offshore	
TM	Manager Technique	
OL	Organizational Learning	
PID	Project Initiation Document	
SC	Search Conference	
SD	Sales Director	
SE	Sales employee	
SM	Sales Manager	
TC	Tender Coordinator	
TCC	Tender Competence Centre	
TD	Technique Director	
TM	Tender Manager	

1. Introduction

Outline

- Orientation and structure of the report
- Company description
- Context and management challenge
- Goals of the research
 - Diagnostic goals
 - Design goals
 - Research relevance

1. Introduction

In this chapter the focus and structure of the report is presented. First, the general content and orientation are given. Next, the company in which the research is conducted is described. More in-depth information about the departments of study and the managerial challenge are provided afterwards. Based on the managerial challenge the goals of the research are presented, and finally the relevance of the research is given.

1.1 ORIENTATION AND STRUCTURE OF THE REPORT

This master thesis report is design oriented. As Van Eijnatten (2005) explained, one of the main characteristics of a design oriented approach is the use of the regulative cycle. Therefore, the report structure is in compliance with the steps of the *regulative cycle*, given by (1997). According to this cycle, there are five phases, which are presented in Figure 3. However, this thesis project is a typical *design focused* problem solving project. A design focused problem solving project is a project that focuses solely on the design of the solution, the change process of the design and the necessary analyses. Van Aken, Berends and Van der Bij (2007, p. 22) define a design as: "... a model of an entity to be realized, as an instruction for the next step in the creation process." This definition emphasizes that the design is not an end state, but an input for the next step. This is in line with the first three phases of the regulative cycle of Van Strien (indicated with the dark blue circles in Figure 3). In addition to the design focused method, the master thesis project is also *theory based*. Concluding, the aim of the master thesis project is to provide the company a well reasoned design that can be used as an input for implementing changes to overcome the predefined problems or challenges.

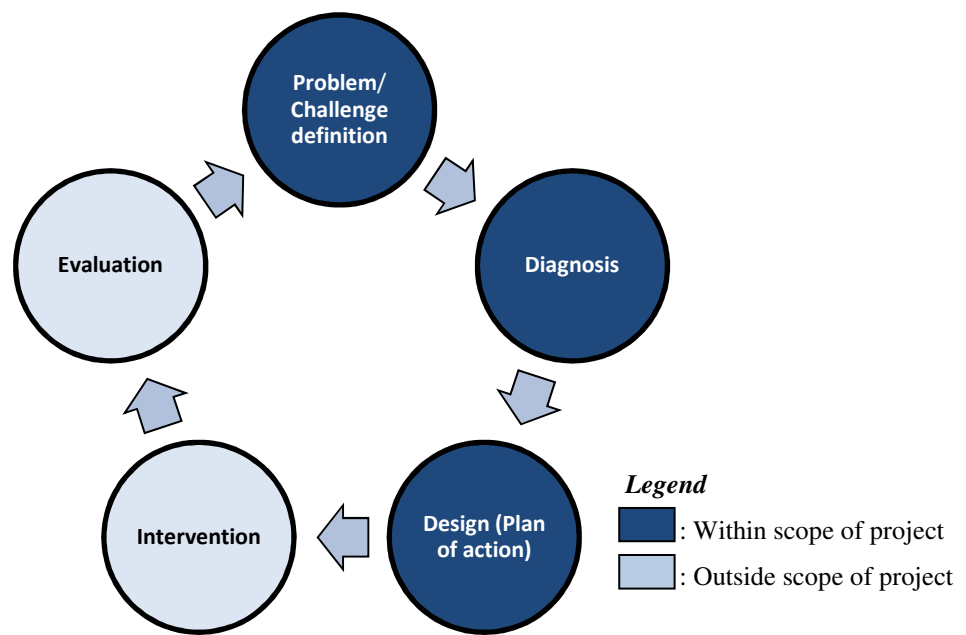


Figure 3. Regulative cycle (Based on Van Strien, 1997)

Following the regulative cycle, in this chapter the managerial challenge is presented. With the use of the defined managerial challenge, the goals of the research and the theoretical and practical relevance of the project are discussed.

As previously mentioned, this project is theory based. Consequently, the second chapter gives a theoretical background of the topics of interest, which forms guidance through the research project. In the third chapter the methodology of both the diagnosis and the design phase is discussed. In the fourth chapter the results of those phases are presented. In chapter five a conclusion of the research is given. Based on these conclusions, in the sixth chapter recommendations for the company are provided. Also a discussion of potential limitations of the research is presented and suggestions for future research are given. Finally, a reflection of the process of the research is given.

1.2 COMPANY DESCRIPTION

The company is a Dutch company founded in 1876, which operates in the installation branch. The mission of the company is to provide customers intelligent electrical engineering solutions, to help them improve their performance. The company is part of a holding, which is a property, construction and engineering concern. The company is responsible for complete electrical installations. The offices in the Netherlands are diffused over sixteen cities, of which the head office is located in Rotterdam. In addition to the multiple branches located in the Netherlands, one branch is located in Poland and one is in the Netherlands Antilles. Overall, more than 2.300 people are employed. The company operates in four separate markets; Industry (IND), Building Technology (BT), Marine & Offshore (M&O), and Infrastructure (INFRA) (see Figure 4). Together with Design Engineering those markets form the five Business Groups (BG's), which are the bases of the matrix structure of the organization. In contrast to the other BG's, Design Engineering is focusing on all the four markets, specifically in the early phases of the customers' process, such as design of solutions and consultancy role. Per Business Group there is a Sales department, a Technique department, a Financial control department and a projects/maintenance competence centre. Sales is placed vertically in the matrix in Figure 4. The Sales department of BT will be researched in the current study, indicated with a red circle in Figure 4. Furthermore, some supporting departments are presented (Human Resource Management; Marketing & Business Development; Quality, Health, Safety & Environment; Internal ICT; and, Facilities). Innovation and Development (I&D) is the second focus area of the research, also presented with a red circle in Figure 4. It is a relatively new department, which has emerged from the department Technique Development. Initially, Technique Development was only focusing on internal processes. Since 2013, the department broadened its view and a new focus area of external innovation emerged. In January 2015 the department officially changed to the new format with the new name: Innovation and Development.

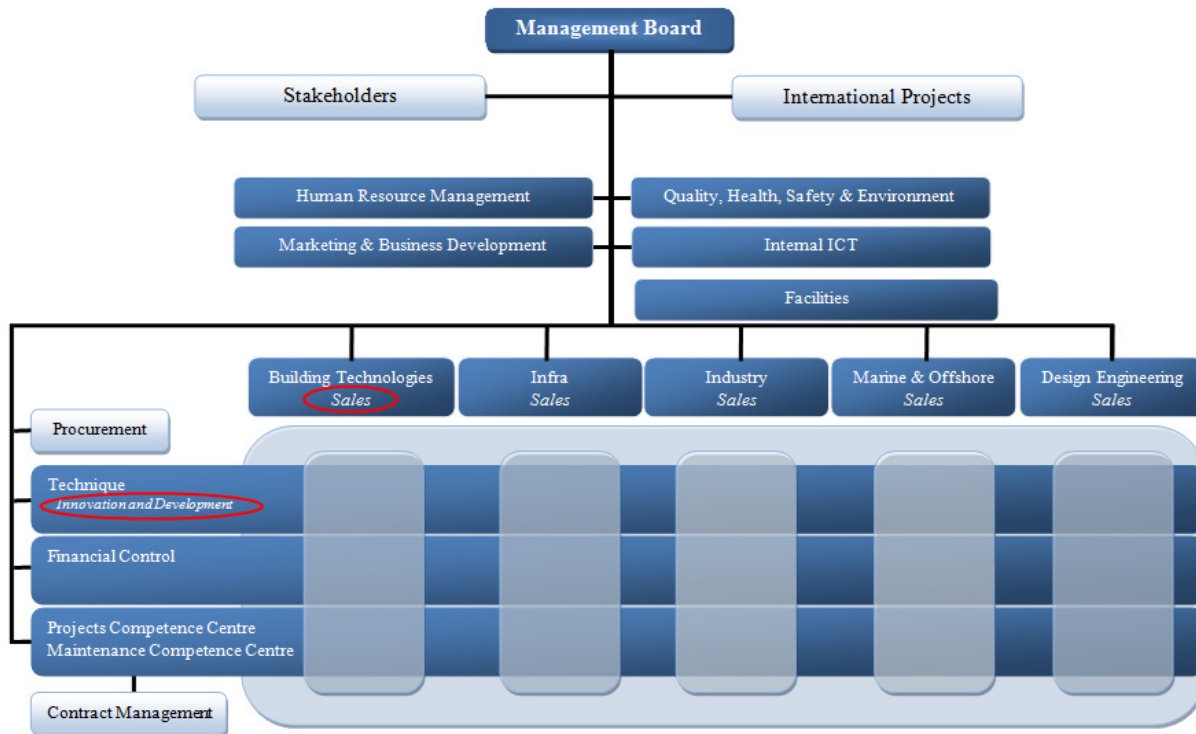


Figure 4. Organizational chart of the company

Sales BT is split into five Sales departments; existing of one sales department per each of the four areas of the company, and one Tender Competence Centre (TCC). The special and large projects of all over the country are executed by the TCC. The other projects are executed by the sales departments related to the specific area.

As mentioned, this report is focusing on the department Innovation and Development and the Sales department of BT, both indicated with a red circle (Figure 4). This is further elaborated in the next section.

1.3 CONTEXT AND MANAGERIAL CHALLENGE

The company is endeavored to fulfill its mission with the use of a flexible, innovative and integral approach. In line with the mission and approach, an innovation line is created. The innovation lines will be coordinated by the new department I&D. At the moment of the study the innovation line is still under construction. This innovation line will be divided in different teams with each a specific theme. The themes are overarching the four BG's of the company, based on the idea to provide new products which could be beneficial to all BG's. The five themes are: Sustainability, Information management, Smart comfort, Refitting, and Mobility.

The strategy of the company should fit in standards of the holding. The holding is also focusing on the future and stimulates innovation. The holding stated four requirements of innovative ideas: (1) they should be renewing; (2) they should provide a social improvement; (3) they should be

environmentally friendly; and, (4) they should have market potential. Those requirements should be considered during the new product development process. Furthermore, in the strategy plan of the company it is formulated that with each action that is undertaken, the impact for the customer and their performance should be taken into account. This complements the holding requirement of the necessity of market potential for a new product. Therefore, the question arises whether collaboration with Sales could support the customer focus of the innovation lines.

The innovative and customer focused performance goal of the company can be measured from two viewing points. Firstly, it could be approached from the market view. *Are the products and services offered by Sales aligned with the wishes of the market?* The second approach is a strategic point of view. *Are the products and services offered by Sales aligned with the innovative strategy of the company?*

It is hypothesized by the manager of I&D and the manager of Human Relations that Sales could support the Innovation lines with improving the alignment with the market. This could be explained with the use of the behavioral view. Here the company is seen as a system that operates in an environment. The environment can be seen as the whole market. The company interacts with the environment through input and output. The input refers to the information that is retrieved from the environment, and the output refers to the information given about products to parties in the market. The information about products should be aligned with the information desired by market. This means that not only the products should fulfill the wishes of the market; also the information about the product in order to sell it should be aligned.

In addition, the company should deliver the output that is aligned with its mission and vision. In order to deliver the desired output, the system should learn from its environment. The information from the environment, such as the desires of the customers, but also the new techniques, the actions of competitors and new legislations should be extracted and used in the process to create a product or service that is desired in the environment. Sales has close contact with the customers and the market, and therefore plays a pivotal role in the input and output to the market. Together with multiple supporting departments, Sales is also operating in the processes within the systems' boundary. Therefore, they do not only offer the products, but also could extract the wishes of the customers. This knowledge about the input and output could potentially enhance the process and performance of the innovation teams, which have the goal to create new products that are embraced by the market. Potentially, this leads to innovative products by which Sales is enabled to offer the customers highly valuable products.

The company consists of multiple Sales departments, each of them having a specific structure and way of working. Regarding the duration of the thesis project, it is not feasible to conduct a solid research incorporating all the Sales departments. Therefore, it is chosen to select the Sales department of one of the BG's. To ensure a grounded decision, introductory meetings were planned with the heads of the sales department of each Business Group. Secondly, as Van Aken, Berends and Van der Bij (2007) stated, a managerial problem/challenge is not necessarily equal

to the initial problem. Problem analysis could reveal that this problem is a perception problem, or is only a symptom of an underlying problem. Therefore, the introductory meetings were additionally used for problem analysis (see Appendix A). In combination with pragmatic grounds, it was chosen to research the Sales department of BT. This choice was made based on criteria which include the willingness to cooperate, the ease meetings were planned, the type and size of the markets, and the number of innovations in the past (see Appendix B). Therefore, Sales BT as group of interest together with the department of I&D were selected, as visualized in Figure 4. During the meeting, questions about the department, the specific market and innovation were asked. Within the formulation of the thesis assignment it was stated that it was desired for the company to be more innovative and customer focused. The introductory meetings revealed that indeed up till now only few customer focused innovations were implemented in the market. The focus is not yet on external innovation. This results in a technique department which mainly focuses on process innovations, and Sales, which has no clear idea about which external innovation could fit to the company. At this moment, no procedures for innovations are set. In the past innovative project emerge during the regular processes and should be executed as extra activities, which resulted in a low output. There is not yet an innovation focus present and collaborations between different departments are scarce. Since the innovation lines are under construction and the performance of Sales is not problematic at this moment, the focus of the research is a managerial challenge instead of a problem. At the moment that the innovation teams will be introduced, there might be opportunities for changes in Sales to enhance the innovative performance, which results in a future desired state. Therefore, the current process and performance of Sales will be studied and a desired future state will be defined. With the use of a gap analysis it could be determined whether and how the processes of Sales could or should be adjusted, to meet the future requirements.

Concluding, the initial managerial challenge statement of the thesis assignment is supported by the preliminary findings. Therefore, the main managerial challenge is formulated as follows:

How to become more innovative and customer focused with the use of collaboration between Sales and Innovation and Development?

1.4 GOALS OF THE RESEARCH

1.4.1 DIAGNOSTIC GOALS

The main goal of the diagnosis phase is to analyze and identify the nature of the managerial challenge. The primary question of this phase is:

1. What is the gap between the current (AS-IS) and desired (TO-BE) performance of the company, especially focusing on Sales and I&D?

Figure 5 gives a visual representation of the research content. In order to answer the primary question, elements of the research content should be studied separately. The numbers between brackets are referring to sub questions. Those sub questions are discussed below.

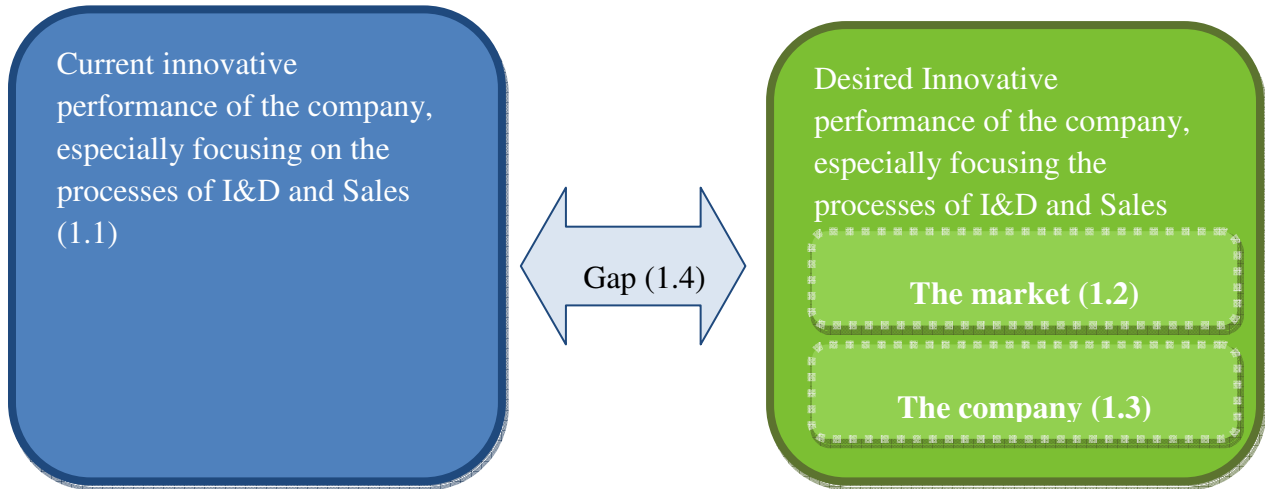


Figure 5. Schematic overview of the research

In order to define the gap, first the current situation and the desired situations by both the market as by the company should be defined. The first three sub questions focuses on those three situations. The first question is about the current situation:

1.1 What is the current situation of Sales and I&D in terms of innovative and customer focused performance and in terms of processes?

In order to define the two gaps, the current situation should be compared with the two desired states. Therefore, a diagnosis into the desired states should be done. The first desired state is based on the desires of the market. Therefore, the diagnosis question with the set of aligned sub-questions is:

1.2 Which innovative performance is desired by the market and which processes of Sales and I&D are required to serve this market properly?

1.3 What is the innovative strategy of the company and which processes of Sales and I&D are required to perform accordingly?

The final question of this stage is related to the gaps and refers back to the main question:

1.4 What is the gap between the current and desired situation in terms of innovative and customer focused performance and processes?

With the use of analysis into these two focus areas, the current performance and the markets' desired performance, and the strategic future desired performance can be sketched and compared. In this way the gap analysis can be made and the managerial challenge to overcome the gap, with identified potential strengths and weaknesses, can be determined.

1.4.2 DESIGN GOALS

The goal of the design phase is to find a way to mitigate the gap identified in the diagnosis phase. Therefore, the question to be answered in this phase is:

1. How could the gap between the AS-IS and TO-BE situations be mitigated?

With the use of the gap analysis and additional data, solution directions will be created to decrease the gap. The solution directions are academically underpinned and will provide insight in how Sales actions can be adjusted so that the new innovation teams can benefit from their support.

1.1 Which requirements does the company have regarding the improvements?

1.2 Which potential directions for improvements could be formulated with the use of best practices, literature and experts' views?

1.3 What are feasible improvements for Sales and the Innovation Lines?

1.4.3 RESEARCH RELEVANCE

Practical relevance. The company is creating innovation teams. With the emergence of these new teams, the function of Sales may require change to support the new teams. This study will provide insights in the role which Sales can play to assist the innovation teams and vice versa in order to follow an integral, flexible and innovative approach. This implies both developing products that are in line with the demands of the market, as to perform actions in line with the innovative strategy of the company. The design will provide an overview of changes that should be made within the company to stimulate innovation and the actions and competences of Sales and I&D to work in line with the innovative strategy.

Theoretical relevance. Current literature does focus on the increasing role which Sales could play in new product development processes. It emphasizes that the involvement of Sales in the early stages of new product development could be of high importance. However, literature is scarce with respect to both the way Sales could successfully interact with the market in different types of environment, as on the way Sales could avail the market knowledge to enhance the NPD processes. This study will add value to the current literature, by providing a link between both the gap that could exist between Sales performance and the market's demand, as the gap between Sales processes and an innovative company's strategy by which involvement of Sales in NPD processes is demanded.

2. Theoretical background

Outline

- Strategy
 - Organizational environment
- Sales Process
 - Sales: General process steps
 - Sales: Responsibilities and functions
- New Product Development Process
 - NPD: General process steps
 - NPD: Responsibilities and functions

2. Theoretical Background

The research question of this study focuses on how companies can be more innovative and customer focused through collaboration between Sales and departments focused on New Product Development (NPD). This section provides insights from literature, which are essential for answering the research question. First, insights about the strategy are given. It is important to have a strategy that is in line with the type of market of the company. Furthermore, theoretical background about the Sales and NPD processes are discussed.

2.1 STRATEGY

In order to determine a strategy for a company, it is pivotal to know in which market it is operating. In this chapter the theory of causal texture (Emery & Trist, 1965) and the generic strategies framework of Porter (1980) are discussed.

2.1.1 ORGANIZATIONAL ENVIRONMENT

The theory makes a distinction of five types of organizational environments (markets) in which a company could operate. The distinction is based on three characteristics, which are further explained in this section, followed by a description of the environments. Because this research focuses on a market in which competition is present, only the strategies in which this is incorporated are relevant to discuss. Finally, strategies related to those environments are discussed.

CHARACTERISTICS OF ORGANIZATIONAL ENVIRONMENT

Literature points out that the organizational environment (market) can be defined based on *goals and noxiants*, *predictability*, and *complexity*. Goals and noxiants can be seen as the opportunities and risks that exist in the market. Predictability stands for the ease that the future can be prospected with the use of current and/or historical information. Complexity of markets has been analyzed in terms of variables such as the number of players, the indeterminacy of their behavior, the significance of non-trivial feedback, and their openness to new entrants and other external sources of change (Johnson, Jefferies & Hui, 2003).

Figure 6 shows the complexity in a certain market. Each box represents a company, each arrow defines interdependencies between the companies. This results that a change in company 'A', could lead to changes in company 'B', company 'C', and eventually a change in company X. This illustrates how difficult it could be to determine the origin of the change.

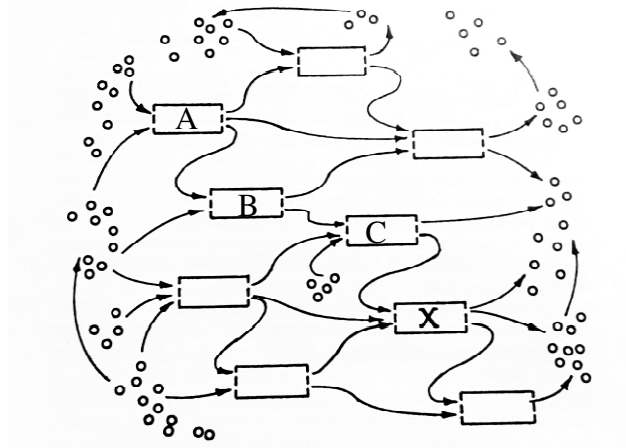


Figure 6. Complexity of organizational environments (Terreberry, 1968, p. 607)

FIVE TYPES OF ORGANIZATIONAL ENVIRONMENTS

The theory of causal textures (Emery & Trist, 1965) describes four types of organizational environments (markets), namely (1) placid, randomized environment; (2) placid, clustered environment; (3) disturbed-reactive environment; and (4) the turbulent field. Babüroglu (1988) proposed a fifth environment: (5) the vortical environment. Only the third, fourth and fifth type of organizational environments are discussed in this section.

Disturbed-reactive environment. According to Emery and Trist (1965) a random distribution of goals and noxiants exists in a market in which multiple players seek for the same goals. As a result a company not only needs to consider the organizational environment, but also has to consider what is known about itself by the other companies. Therefore, it can be concluded that in this environment a competitive challenge arises (Emery & Trist, 1965).

Turbulent field. In this organizational environment dynamics increased, which results in the highest uncertainty relative to the previous organizational environments. In contrast to the disturbed-reactive environment, changes can emerge in the environment itself. The distribution of goals and noxiants is dynamic. In this distribution the ground is in motion, which makes it harder to predict the opportunities and corresponding risks. According to Emery and Trist (1965) three elements contribute to the emergence of the dynamic field. The first is the growth of systems and linked sets of systems. Companies desire to grow in order to be able to have impact on the market, which is the case in the disturbed-reactive environment. Secondly, the growth of interdependencies between the economics and the society contribute to the emergence of the dynamic field. The third element is a continuously present change gradient which could be due to the increasing importance of research and development (Emery & Trist, 1965). Concluding, in the turbulent field, an individual company is not able to adapt to the environment through own actions only (Emery & Trist, 1965).

Vortical environment. The fifth environment is called the *vortical environment* (Babüroglu, 1988) and is basically equal to the turbulent field. However, the company decides to close itself off from the environment.

COMPANY'S STRATEGY OF INTERACTING WITH ENVIRONMENT

In the disturbed-reactive environment, a company should take the probable actions of the competition into account, and decide which actions they should execute to outperform this competition (Emery & Trist, 1965). This requires operational planning such as optimizing. By optimizing, which is done by experts who use existing knowledge to determine potential solutions and base choices on expected effectiveness (Emery & Emery, 1978). In the Type IV environment, the environment itself is changing. Therefore, purposes cannot be assumed fixed anymore, and ideals should be strived for. The rising importance of striving for ideals, stresses the importance of planning based on the intrinsic values of the choices (Emery & Emery, 1978). To conclude, instead of solely focusing on why rational decision-making, human factors become important too. "Active, adaptive planning assumes the possibility of discontinuities" (Emery, 1993, p. 234), which requires the company should use a different method of thinking. The use of desirable future scenarios is proposed. This method refers to cognitive searching that search for means to accomplish ends should be used, the focus is now on searching for ends (Emery & Emery, 1978).

The general strategy focus can be determined by the use of Porter's generic strategies framework, shown in Figure 7. Porter (1980) stated that a company can achieve competitive advantage by (1) differentiation; (2) overall cost leadership; or (3) focus. The strategy depends on strategic considerations.

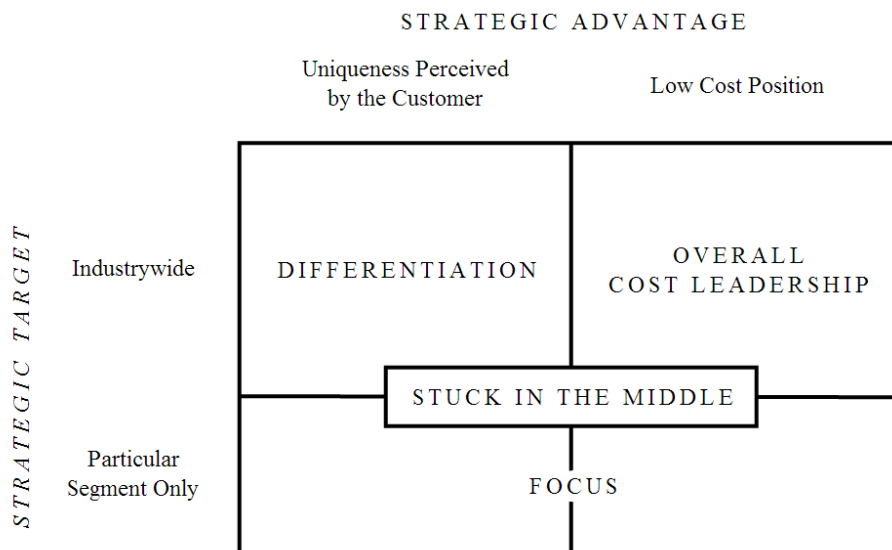


Figure 7. Porter's generic strategies framework (1980)

2.2 SALES PROCESS

The research focuses on the way the sales processes can be designed, in such way they contribute to NPD. Therefore, it is important to have insights in how a general sales process is designed. This section addresses the steps and the responsibilities of a sales department.

2.2.1 SALES: GENERAL PROCESS STEPS

Moncrief and Marshall (2005) stated that the sales process has changed over the years. The traditional sales process consists of seven sequential steps: (1) prospecting; (2) pre-approach; (3) approach; (4) presentation; (5) overcoming objectives; (6) close; and (7) follow-up. It was stated that these steps lack customer orientation. According to Moncrief and Marshall (2005), transformative factors such as technology, the expanding role of selling within organizations, team-based approaches and increased buyer knowledge lead to a different sales process. The evolved steps, which are not necessarily sequential anymore, are: (1) customer retention and deletion; (2) database and knowledge management; (3) nurturing the relationship; (4) marketing the product; (5) problem solving; (6) adding value/satisfying needs; and (7) customer relationship maintenance. Figure 8 shows that the customer stands central in the new process and the seven steps are not sequential. According to Moncrief and Marshall (2005) the main reason for changes in step 1 is the 80/20 rule, which means that 80 percent of the business is generated from 20 percent of the customers. Therefore, customer retention becomes more important than gaining as many new customers as possible. Customer Relationship Management systems become more important. Labels of A, B and C are given to the customers, representing the money the company could generate from them. Customers labeled as 'A- accounts' have the highest chance for a large positive impact on profits, while customers of a 'C-account' could even cost the organization money. Therefore, strategic choices of the time spent on specific customers should be made. The second step is changed from the pre-approach to database and knowledge management. This is mainly due to the change in technology. More information is available by the internet and new systems allow Sales employees to store and find information more easily. Nurturing the relationship instead of plainly approaching the customer, has changed because of the focus of long-term relationships which could enhance the overall business performance. Fourthly, because of the change of technology, the function of giving presentations has changed in marketing the product. Customers have access to much information, by which presentations become less essential. Therefore, Sales employees have to add value and mostly conduct more marketing functions, which includes market segmentation and product development. The last three steps have evolved based on the focus on the customers. Moncrief and Marshall (2005) described the difference between overcoming objectives and problem solving as follows: "The goal is not necessarily an immediate sale, but rather the enhancement of the relationship based on win-win solutions" (Moncrief & Marshall, 2005, p. 20). According to them, the focus on win- win solutions is also the basis of adding value and satisfying customers instead of closing a deal. The aim is to strive for mutual success. Finally, Moncrief and Marshall

(2005) explained that the final step has changed from follow up, which implies sending a letter to thank the customer, to customer relationship management, which implies providing continual service after closing the deal. Figure 8 gives an overview of all the steps in the selling process.

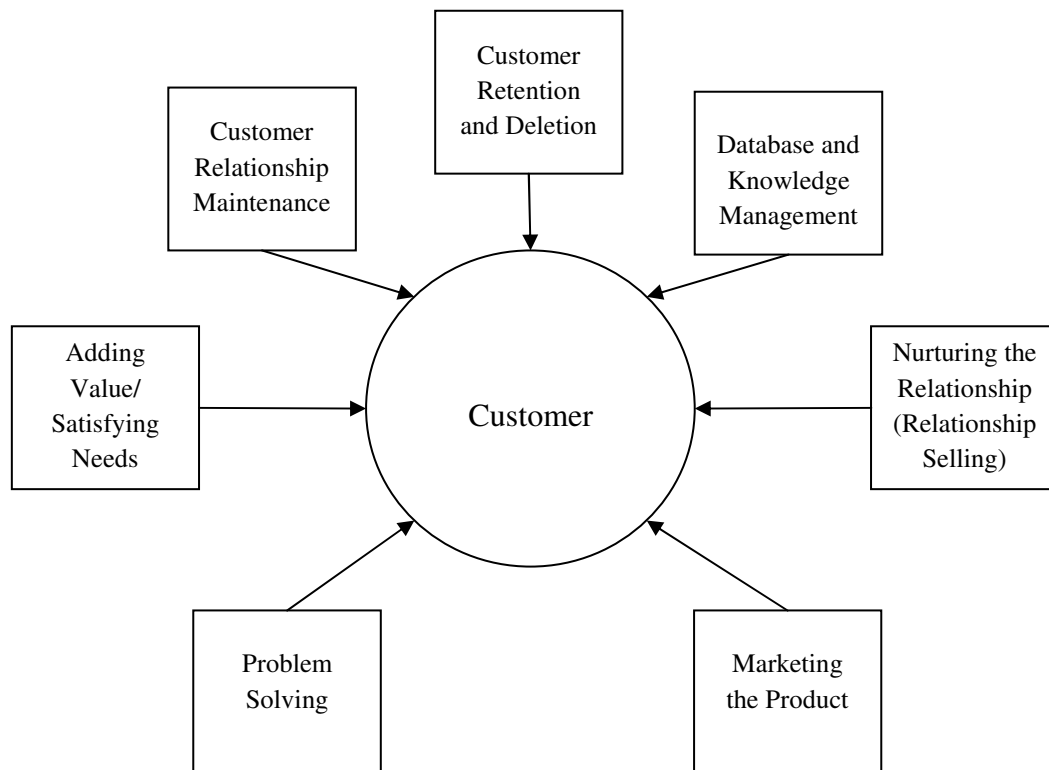


Figure 8. Evolved selling process by Moncrief and Marshall (2005, p. 19)

2.2.2 SALES: RESPONSIBILITIES AND FUNCTIONS

Because in this study the performance of Sales in relation to the new innovation teams will be examined, it is a necessity to have a solid impression of the responsibilities of Sales. The responsibilities are necessary to effectively and efficiently conduct all the steps of the sales process. Jobber and Lancaster (2006) stated that the primary responsibility of a salesperson is to successfully complete a deal, which is supported by responsibilities as prospecting, database and knowledge management, self-management, handling complaints, providing service, and implementing sales and marketing strategies. Berhman and Perreault (1982) identified seven items that could represent the responsibilities of Sales. These are: achieving quantity and quality sales objectives; controlling unnecessary company expenses; developing and maintaining customer goodwill; providing information to the company and following company policy; developing and using technical knowledge; giving high quality sales presentations; and, working

well with other personnel in the firm. Those responsibilities sometimes overlap or can be linked to each other. This is shown in Table 1.

Table 1. Categorized responsibilities (Schaars, 2015)

Key word	Jobber & Lancaster (2006)	Berhman & Perreault (1982)
Overarching goals	- Successfully complete a deal - Prospecting	- Achieving quantity and quality sales objectives
Costs		- Controlling unnecessary company expenses
Customer	- Handling complaints - Providing service	- Developing and maintaining customer goodwill - Giving high quality sales presentations
Strategy	- Implementing sales and marketing strategies	
Knowledge	- Database and knowledge management	- Providing information to the company and following company policy - Developing and using technical knowledge
Attitude in the firm	- Self- management	- Working well with other personnel in the firm

It is important that this performance can be measured, in order to analyze whether responsibilities should be executed in a different way. The performance of Sales can be measured both quantitatively as qualitatively. In this section both methods are discussed.

Quantitative measures. According to Jobber and Lancaster (2006) quantitative measures usually exist of input and output measures. Input measures are behavioral measures and are of diagnostic nature, while output measures relate directly to the performance of sales and profit. The input and output criteria can be combined into hybrid ratios, which help to answer performance questions. The input, output, hybrid ratios and performance questions given by Jobber and Lancaster (2006) are summarized in Table 2.

Table 2. Quantitative measurers of Jobber and Lancaster (2006, p.492 - 498) summarized by researcher

Input	Output	Hybrid ratios	Performance questions
<ul style="list-style-type: none"> - Sales revenue achieved - Profits generated - Percentage gross profit margin - Sales per potential account - Sales per active account - Sales revenue as percentage of sales potential - Number of orders - Sales to new customers - Number of new customers 	<ul style="list-style-type: none"> - Number of calls made - Calls per potential account - Calls per active account - Number of quotations - Number of calls on prospects 	<ul style="list-style-type: none"> - Strike rate - Sales revenue per call ratio - Order per call - Average order value - Prospecting success ratio - Average profit contribution 	<ul style="list-style-type: none"> - Is the salesperson achieving a satisfactory level of sales? - Is Sales success reflected in profit achievement? - Is the salesperson devoting sufficient time to prospecting? - Is time spent prospecting being rewarded by orders? - Does the salesperson appear to be making a satisfactory number of calls per week? - Is s/he making enough repeat calls on different customer categories? - Is s/he making too many calls on low potential customers? - Are calls being reflected in Sales? - Is the number of quotations being made reflected in order taken? - How are sales being achieved – a large number of small orders or a few large orders? - Are the profits generated per order sufficient to justify calling upon the account?

Qualitative measures. Besides quantitative, qualitative measures could be used. According to Berhman and Perreault (1982) it could be either a self-report or an evaluation by managers. Jobber and Lancaster (2006) indicated that there usually five dimensions that are evaluated: sales skills; customer relationships; self-organization; product knowledge; and cooperation and attitude. Those are strongly related to the responsibilities of Sales. Berhman and Perreault (1982) identified seven dimensions, which are similar to the responsibilities: Sales presentation, providing information; technical knowledge; sales objectives; controlling expenses; teamwork; and customer relations. This qualitative measures could also be quantified when statements of the dimensions are formulated, which should be ranked in the evaluation. Berhman and Perreault (1982) provided statements of each dimension which could be used in the evaluation. Related to the dimensions, a factor analysis could be done.

2.3 NEW PRODUCT DEVELOPMENT PROCESS

The second process which is central to this research is the NPD process. In this section the general steps are addressed. Furthermore, it is discussed which departments could have impact on the NPD performance, especially focused on Sales and R&D (I&D). It is discussed which responsibility each department has. Finally, some barriers for collaboration between Sales and R&D (I&D) are addressed.

2.3.1 NPD: GENERAL PROCESS STEPS

Ernst, Hoyer, and Rübsaamen (2010) define three stages in the NPD process: concept development; product development; and implementation. Other authors define more stages in the process, following the fuzzy-front-end theory or the stage-gate model. In this report the stages defined by Ernst et al. (2010) are followed. The stages of the other models can be placed in the three overarching stages of Ernst et al. (2010).

Concept development stage. The concept development stage is related to the *Fuzzy-Front-End*. Kim and Wilemon (2002, p. 270) defined this phase as: “The period between when an opportunity is first considered and when an idea is judged ready for development.” Furthermore, the stages idea-generation, screening, concept development and testing, and business analysis can be placed in the concept development stage. A large number of ideas are needed to achieve one single successful product implemented in the market. Furthermore, Verhage and Van Weele (1981) explained that the costs in the early stages of the stage-gate process are relatively low compared to the following stages and the impact of decisions can be large. As they state: “Many new ideas increase the probability of success, and a good screening procedure may reduce new product expense” (p. 75). Screening is thus extremely important to reduce cost of product that attends to fail. On the other hand, screening can also help to prevent companies to falsely identify promising products as potential failures. Verhage and Van Weele (1981) found that using systematic screening following specific evaluation criteria can help with that. After the screening, the concept should be further developed and tested by customers. Besides the customer view, it is also important that the products’ feasibility on technical and economical factors is researched (Cooper, 2002). Therefore, a business analysis should be conducted.

Product development stage. The product development stage covers the stages *product development and market testing* of the stage-gate model. Within this stage a prototype of the product will be made, and the details of the product are defined. Also a validation or market testing takes place. According to Cooper (1990), the validation consists of five steps. In the first step, the product quality and performance is checked internally. Next, the product can be tested in the field, to see whether the product has the required performance under the conditions of the market. By this step the customers’ opinion is also gauged. After those short tests, pilots will be produced and executed. By pilot testing potential bugs can be discovered and eliminated and the costs can be defined more specifically. Fourth, a pretest of the market could be executed in order to gauge the reaction of the customer, and to gain insight on the effectiveness of the launch plan and the expected revenues. Finally, Cooper (1990) stated that a revised financial plan should be made. Based on the outcomes of the validation steps, the company can decide whether the product should be placed in the market.

Implementation stage. The final stage is the implementation stage, also called commercialization. Cooper (1990) stated that in this stage the marketing launch plan and the operations plan should be implemented. Ernst et al. (2010) described four essential activities in

the implementation stage. The first activity is the introduction of the new product in the market. Secondly, the customers could be provided with product trainings. Furthermore, after sales support is incorporated in this stage. Besides the focus on customers, focus on strategy should also be present. It is essential to monitor the competitor's reactions and strategies following the introduction of the product.

2.3.2 NPD: RESPONSIBILITIES AND FUNCTIONS

Song and Parry (1997) found that cross-functional teams within NPD are one of the key drivers for success. The departments represented in those teams besides R&D are Marketing, Sales and also Manufacturing could be added. R&D (I&D) is the department that is responsible for the NPD process. However, Ernst et al. (2010) found that cooperation with Marketing and Sales can play a pivotal role in a successful NPD project, as is indicated in Figure 9. In contrary to Song and Parry (1997), Ernst et al. (2010) do not put specific emphasize on the department manufacturing. This report focuses on R&D (I&D) and Sales departments, therefore the functions, roles, and processes of Marketing are only mentioned briefly.

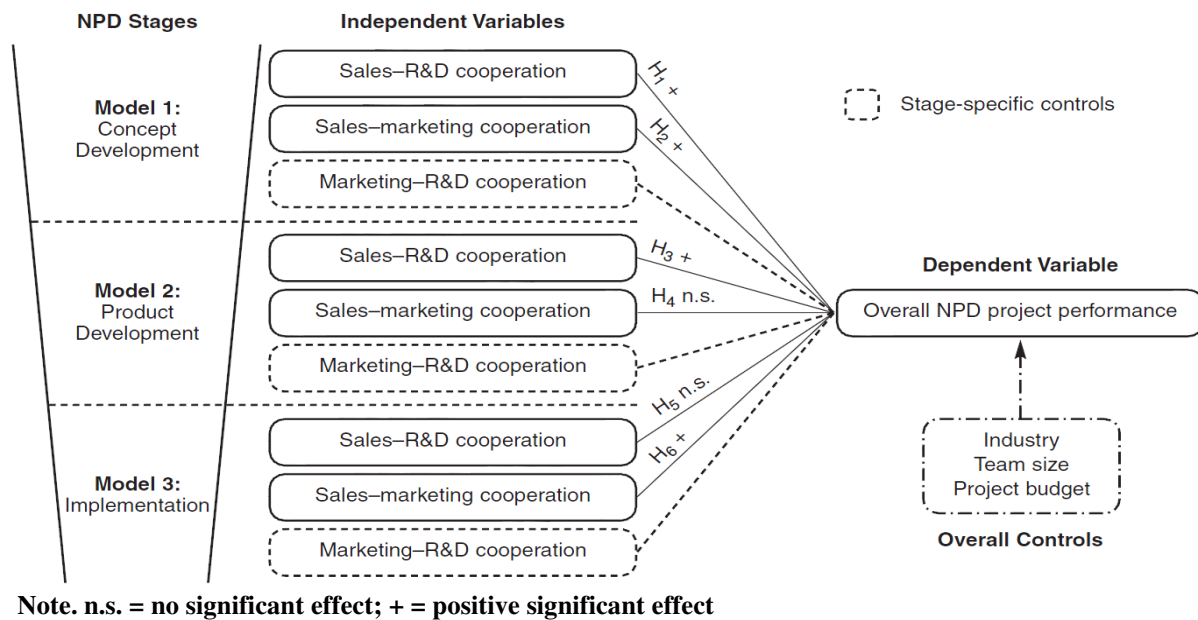


Figure 9. Effects of cooperation during NPD process (Ernst et al., 2010, p. 83)

Concept development stage. The concept development stage focuses on gathering and evaluating new ideas. Verhage and Van Weele (1981) described a set of guidelines of Ellington (1964) for this concept development stage, which could be followed by the R&D (I&D) department:

“- Set a *definite goal*: the search for ideas is facilitated tremendously if the organization has a clearly stated objective to be reached.

- Develop a *systematic procedure* to solicit ideas: don't allow the timing of idea inputs to the firm to be random.
- Use as *many sources* as possible, but if you run into a good one—stick to it!” (p. 75).

Even though R&D (I&D) is responsible for the performance of this stage, collaboration between Sales and R&D (I&D) is extremely important. Traditionally, the focus of sales is on the backend of the NPD process. According to Webster (1965) this focus changes to the frontend. According to Ernst et al. (2010) in this stage customer information is critical for success, and Sales could channel this information into the NPD process. Chonko, Tanner, and Smith (1991) also emphasized that sales people are the most logical source to obtain information about the customers, because they spent significant time with customers and are already interacting with customers about problems and requirements. Sales has two major roles, which are compatible with the stages idea generation and concept development and testing of the stage-gate process. First of all, they provide new ideas to the NPD process, by which the chance of detecting profitable new concepts increases (Ernst et al., 2010). Secondly, Sales has access to feedback from customers. This increases the chance that products that will continue in the process are in line with the needs of the customers. Summarizing, Ernst et al. (2010, p. 83) stated: “To ensure that the features of the product are aligned with customer requirements and that customers actually perceive the unique selling proposition in relation to competing products, sales needs to share its insights on customer requirements with R&D before the NPD project enters the development stage.” Besides the customer insights, R&D should manage to get insights of economical, financial and technical factors. According to Cooper (1990) this stage should be closed with a complete report about the feasibility of the concept.

Product development stage. During this stage the actual product is developed. According to Ernst et al. (2010) this is the main task of R&D (I&D). As shown in Figure 9, also cooperation between Sales and R&D (I&D) is positively related to the overall success. The specific information about the customers which is essential to the product development should be provided by Sales. Furthermore, Sales could provide support to R&D (I&D) for selecting and accessing customers, which could participate in pilots or tests of the prototype (Ernst et al., 2010).

Implementation stage. During the implementation stage, the role of Sales is crucial. Sales is responsible for selling the product. Rackham (1998) stated that a common mistake of Sales is to be product focused instead of customer focused. The research points out that statements about the product do have a positive effect at the first contact with the customer, but at the second contact the effects are almost zero. At the third and fifth contact moments, statements about the product are even negatively related to the impact on customers. Besides the customer focused tasks, Ernst et al. (2010) further stated that Sales is typically involved in monitoring competitors’ reactions. R&D (I&D) has a significant smaller role in this stage. Nonetheless, they could add value to the process by giving product trainings to the customers. This could be done directly to the customers, or R&D (I&D) could provide Sales with the most important information. Figure 9

shows that there is no significant relation between Sales and R&D. Ernst et al. (2010) explained that the tasks are relatively separated, and no direct contact is needed.

2.3.3 BARRIERS TO OVERCOME

In the latter sections, the importance of Sales in the NPD process has been highlighted. However, involving the Sales comes with some challenges. The first factor, remarked by Gordon, Schoenbachler, Kaminski, & Brouchous (1997), is that in many cases the speed of communication is too low in NPD. When the time to market is short, it is important that valuable information is shared in a short amount of time. Besides that, they remarked that the communication is often unstructured. Furthermore, Figure 9 shows a positive effect of the collaboration between Sales and Marketing on the success of the overall NPD process. According to Malshe and Biemans (2014) the marketing department can be seen as an intermediary that connects Sales to the NPD process. They also state that the role of Sales during the first two stages is only indirectly through Marketing. Despite the proved positive influence of Marketing and Sales on NPD, Melton and Hartline (2012) argued that the use of front-line employees, cross functional teams, and learning orientation are all of great importance for Sales' performance. According to Melton and Hartline (2012) those factors should be carefully aligned with the characteristics of the project, to be truly successful.

3. Method

Outline

- Introduction
- Method: Diagnosis
 - Methods of data collection
 - Methods of data analysis
- Method: Design
 - Methods of data collection
 - Methods of data analysis
 - Methods of design

3. Method

3.1 INTRODUCTION

As mentioned, this project focuses on diagnosing the gaps, and creating a design to bridge the gap. This is in line with the first three phases of Van Strien's cycle (Figure 3). The problem definition phase starts with a managerial problem defined by members of the company. In this study a managerial challenge instead of a problem is defined. The difference is that in the current situation, there is no indication that there is something wrong. However, it is assumed there is a desired state, which is even better than the current one. As stated in Section 1.3, introductory meetings were held during an orientation phase. The diagnosis phase will determine the gap between the current and desired customer focused and innovative performance. The managerial challenge is to minimize the gap found. A solution to minimize the gap will be developed in the design phase.

3.2 METHOD: DIAGNOSIS

In this section the method of data collection and data analysis of the diagnosis phase is discussed.

3.2.1 METHODS OF DATA COLLECTION

In summary, the diagnosis stage gathers data about:

- (1) The current plan of actions and performance of Sales
- (2) The ideal performance of the company from the markets' point of view
- (3) The ideal performance from a strategic point of view given by the management

The data will be gathered by three methods: use of documentation, use of company data and interviews. The method of data collection of each point is described in this section. As discussed, with respect to the scope of the master thesis and the time available, it is chosen to conduct the research only among the Business Group BT.

Table 3 shows for each stage the information that will be gathered per type of data source. More information about the interviews is given afterwards.

Table 3. Overview of methodology of diagnosis

Type of source	(1) Current	(2) Desired by market	(3) Desired according strategy																
Quantitative data collection	The numbers of new products offered to the customers																		
	The number of improved products offered to the customers																		
	The number of successes/ failures of the ideas																		
	The process time of innovations																		
Documents	Current strategy	Complaints or reactions of customers	Strategy plan for next years for the company																
	The current Sales process	Type of market	Mission and vision of the company																
	The functions and roles of Sales	Type of customers	Strategy plan for next years for Sales																
	The performance goals of Sales																		
	The current performance of Sales																		
	SWOT analysis of the company and Sales																		
Interviews	<table border="1"> <thead> <tr> <th>Focus of interview</th> <th>Respondents</th> </tr> </thead> <tbody> <tr> <td>- Current vision - Roles and functions within Sales - Performance (goals) of Sales - Innovative character</td> <td>SM (1)/ SM TCC (1): <i>Coordination of Sales process and acquisition phase</i></td> </tr> <tr> <td>- Current process - Perception of view of customers - Innovative character</td> <td>TC (2): <i>Tender phase</i> AM (9): <i>Acquisition phase</i></td> </tr> </tbody> </table>	Focus of interview	Respondents	- Current vision - Roles and functions within Sales - Performance (goals) of Sales - Innovative character	SM (1)/ SM TCC (1): <i>Coordination of Sales process and acquisition phase</i>	- Current process - Perception of view of customers - Innovative character	TC (2): <i>Tender phase</i> AM (9): <i>Acquisition phase</i>	<table border="1"> <thead> <tr> <th>Focus of interview</th> <th>Respondents</th> </tr> </thead> <tbody> <tr> <td>- Need for innovation - Type of market</td> <td>- BGD (1) - TD (1) - TM (1) - SD (1) - SM (2) - TC (2) - AM (9)</td> </tr> <tr> <td>- Service - Desired level of engagement in thinking process during process - Desired type of solutions - Desired level of innovation</td> <td>- Customer (2)</td> </tr> </tbody> </table>	Focus of interview	Respondents	- Need for innovation - Type of market	- BGD (1) - TD (1) - TM (1) - SD (1) - SM (2) - TC (2) - AM (9)	- Service - Desired level of engagement in thinking process during process - Desired type of solutions - Desired level of innovation	- Customer (2)	<table border="1"> <thead> <tr> <th>Focus of interview</th> <th>Respondents</th> </tr> </thead> <tbody> <tr> <td>- Mission and vision - Strategy - Desired performance of I&D and Sales - Desired processes</td> <td>- BGD (1) - TD (1) - TM (1) - SD (1) - SM (2)</td> </tr> </tbody> </table>	Focus of interview	Respondents	- Mission and vision - Strategy - Desired performance of I&D and Sales - Desired processes	- BGD (1) - TD (1) - TM (1) - SD (1) - SM (2)
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- Service - Desired level of engagement in thinking process during process - Desired type of solutions - Desired level of innovation	- Customer (2)																		
Focus of interview	Respondents																		
- Mission and vision - Strategy - Desired performance of I&D and Sales - Desired processes	- BGD (1) - TD (1) - TM (1) - SD (1) - SM (2)																		

Data: Table 3 shows the quantitative data that will be gathered for diagnosis of the current state. With the use of this quantitative data the current performance of Sales and the company can be shown. No quantitative data is gathered for the situation desired by the market and the situation desired according to the strategy.

Documents: As shown in Table 3, for diagnosing the *current situation* documents such as organizational charts, function descriptions and process flow charts are gathered. Furthermore, a strategy plan will be searched, in order to determine the current strategy. Finally, the current performance of the company will be researched. Therefore, SWOT- analyses, profit and loss schemes and feedback reports about the performance will be searched. For the *situation desired by the market* it is searched whether documents about complaints and feedback of the customers are present. In addition, documents describing the variety of customers and the main aspects of the market are searched. Finally, for the *situation desired by the company*, documents about the overall strategy, the mission and the vision of both the company in general and the strategy of Sales department will be gathered.

Interviews: In total 17 interviews will be conducted: 15 interviews are held with employees of the company, and 2 interviews with customers. Regarding the limited duration of the project, it is not possible to research all departments. It was estimated that researching two departments was the maximum achievement in this thesis project. Therefore, it is chosen to interview the functions of two complete departments. By selecting the employees who work directly together, communication and relations between different members of the departments can be taken into account. The TCC is accountable for larger and a different type of projects than the Sales of the areas. To detect potential differences between the types of departments, the interviews will be held with the TCC and one of the area Sales departments. The latter will be chosen on pragmatic grounds. The area with the Sales manager that is fulfilling his function the longest amount of time and is in this function during the period of this study will be chosen. Each area consists of a Sales manager (SM), at least two account managers (AM), and one Tender Coordinator (TC). Initially, it was understood that this structure was equal for the TCC. However, during the orientation phase it became clear that within the TCC no function of AM was present. Therefore, only a SM and a TC of the TCC were selected. Furthermore, it became clear that the AM's fulfill a pivotal role in the contacts with the customers. Therefore, it was chosen to do short interviews containing five leading questions with all AM's of the business group BT, for defining the Sales process in the current situation.

Table 3 shows the functions of the respondents and the topics of the interviews. The interviews are used to determine all three situations. The purpose of the interviews for the *current situation* is to define the current processes and determine the level of innovativeness and customer focus. For the *ideal situation desired by the market*, both internal and external interviews will be held. Both the desires of the customers, and the desires of the processes demanded to receive the desired performance in the current market will be researched. Therefore, internal interviews are held to define the market. Finally, to define *the ideal state of the company*, interviews about the

strategy will be held. It is chosen to interview managers at strategic level. The managers are creating the strategies and therefore they could provide a clear picture of the ideals of the company. All interviews will be semi- structured. By the leading questions, data can be compared during the analysis. Furthermore, it leaves room for the respondents to add important factors which are not known by the researcher. Table 3 gives an overview of the respondents and the specific topics that will be discussed during the interviews. An elaboration on that and the procedure of selecting the customers are discussed below, for each situation.

During the interviews notes are made as specific as possible. With approval of the respondents, the interviews are recorded. However, this will not be obliged in order to keep an open environment. Therefore, most interviews cannot be written literally. The notes will be used in case no recordings are available.

Current situation

- *Sales Manager (2): semi-structured interviews* will be held with two SM's. The selection of the managers is contingent on the selection of the two departments. To recall, it was estimated that interviewing more than two departments is not achievable in the time set for this research. The purpose of the interviews is to define the current situation of Sales, from a tactical point of view. Furthermore, some *structured questions* will be asked about the environment the company is in.

- *Account manager*(1), Account managers (9) and Tender Coordinator (2):* Of each department, one *tender coordinator* is randomly chosen. Some departments consist of only one person. Consequently, this person was chosen. With one of the AM's a more extended interview is held, because he is the leading person in one of the innovative processes. This could give insights in the way of working in current projects. This AM is referred to as AM* *Account managers short interviews*; all AM's of Sales BT will be approached by a phone call to answer some short semi-structured questions about the current process, their perception of the view of customers, and their opinions about the innovation lines.

- *Customer BT (2):* Two customers will be questioned. In collaboration with the department M&BD two customers will be selected: one customer who has strong established connections with the company and one who is a relatively new customer. This diversity in character of the relationship with the company might broaden the insights in different customer's experiences in the collaboration with the company. The purpose is to create a description of the current (innovative) performance of the company from a customers' point of view.

The ideal performance of the company from the markets point of view

- *Business Group Director (1), Technique Director (1), Technique Manager (1), Sales Director (1), Sales Manager (2), Account Manager (9), and Tender Coordinator (2):* all the respondents will be asked how they see the market, based on factors related to the theory of Emery & Trist

(1965). Those factors will relate to the variety of customers, the level of competition, the complexity of the market, the speed of change, and the factors influencing the market.

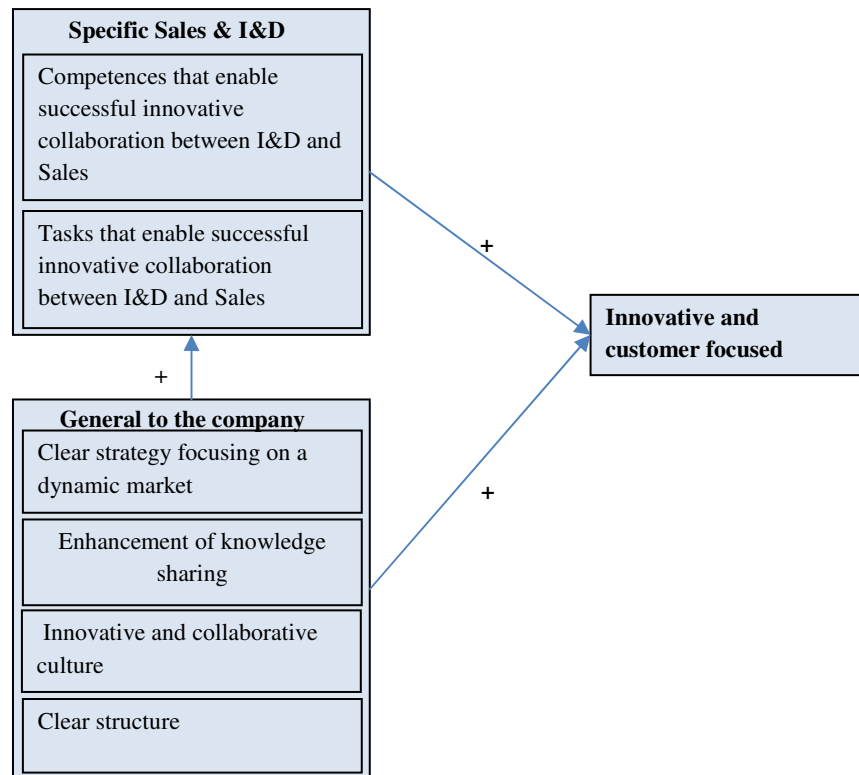
- *Customer BT(2)*: Only two customers will be questioned. The selection is equal to the selection of the customers in the current situation. The customers will be asked semi-structured questions, in order to define the desired actions to the customers from their point of view.

The ideal state from a strategic point of view given by the management

- *Business Group Director (1), Technique Director (1), Technique Manager (1), Sales Director (1), Sales Manager (2)*: *semi-structured interviews* will be held to define the strategy of innovation and the assumptions and ideas behind the strategy. It also focuses on the new innovation teams that will be created in line with this strategy. The purpose of the interviews is to define the ideal state from a strategic point of view.

3.2.2 METHODS OF DATA ANALYSIS

The primary method of analysis used in the diagnosis phase of this study is a gap analysis. In general a gap analysis is an analysis method which reveals the difference between the current state and desired state in terms of performance and processes. Zack (1998) describes a strategic gap analysis as the analysis of the gap between what the company is doing and what the company must do. Another way to describe the gap, is the difference between the outcome generated by acting as the company does, and acting as it must do. Based on the definition of the gap analysis, three analyses are performed. First, the current situation is analyzed, followed by the desired situation. Both analyses focus mainly on strategy, performance and processes, in line with the goals of the research. However, the introductory meetings reveal that culture, structure, and communication might have a large influence on the performance and the way of executing processes (see Figure 10). Therefore, those factors are also incorporated.



Note. + stands for assumed relationship by researcher

Figure 10. Assumed factors influencing performance (Created by the researcher)

Data: The quantitative data will be used to analyze the current performance of the company, in terms of innovative successes. Besides the number of successful innovations per year, also a ratio of successes and failures will be calculated. It will also be analyzed whether the duration of the projects are correlated with the successes of the company. Finally, these numbers can be compared with targets if present in the company.

Documents: The documents are analyzed with the focus on strategy, innovativeness and customer focus. A summary on the research topic will be made, to compare the results with the results of the other sources. Furthermore, the documents related to the description of the market are used to define a desired strategy related to interaction with the market. The theory of Emery and Trist (1965) will be used to define the type of market and the type of strategy needed.

Interviews: The written interviews are analyzed based on open coding. This method is suitable for this research because of the capacity of comparison and the lack of knowledge of the processes in the company and the reasons causing the gap.

Open coding will be performed by fragmenting the data and label the fragments. For each situation, the labels and fragments of the interviews are compared, and if possible, labels are combined to new labels. The labels are placed in a table, and for each respondent it is ranked

whether fragments were present in the interview related to this label. A consensus of 50 percent is used, to select the labeled data which will be used in the diagnosis. This results in an overview of factors which are present in the current situation, and in the future situation. Those factors can be compared, to execute the gap analysis.

Triangulation. The use of three data sources will enhance the reliability of the analysis. The separate analyses will be compared. When the different data sources are in agreement, this implies a higher reliability. However, the desired state does not contain any company data. Therefore, the desired state will be defined on the basis of documents and internal interviews only.

3.3 METHOD: DESIGN

During the diagnosis phase, it should be clarified what the gap is between the current and the desired state. The elements of the processes of the current and the desired state are compared. The elements that differ or are lacking in the current situation, should be incorporated in the design. In the design phase directions for improvements which could mitigate the gap are explored and a plan for redesign will be created. First, a description of the data collection methods is given followed by a description of the data analysis methods, and the design methods.

3.3.1 METHODS OF DATA COLLECTION

The data collected in this phase will be mainly focused on (1) literature; (2) best practices; and (3) experts.

Literature: Literature can provide insights in certain solutions. Although each situation is unique, it could provide a solid basis for a creative process. Not only explanatory literature and earlier case studies could provide potential solution ideas. From the literature, all the potential solutions will be summarized.

Best practices: Also *best practices* can give new ideas to the design. Those best practices could be found internally. The group Design Engineering (DE) fulfills a special role in the company. Instead of focusing on the traditional sales process, DE is fulfilling more a consultant's role and is strongly focused on which innovative ideas could be valuable for the customer. Therefore, DE will function as a group which can provide insights in the desired performance and corresponding set of actions.

Experts: Finally, *experts* on the nature of certain bottlenecks could be of importance. During the process of data collection it is important to keep in contact with the stakeholders; being the managers and the Sales employees. On the one hand, this could give new ideas, because those people are responsible for the process. On certain issues, they could prospect if ideas would be valuable based on earlier situations. Also, involving them has major consequences for the success of the eventual implementation. As Van Aken, Berends and Van der Bij (2007) pointed

out, resistance based on lack of understanding; differences in opinion; lack of trust; low willingness to change; and, conflicts of interest could negatively influence the result of the design. By involving the stakeholders in the process, this resistance will decrease, which increase the chance on success of the design. Therefore, a focus group meeting will be used consisting of: BGD (1), SD (1), TD (1), TM (1), SM (2), and TCC (1). During the focus group meeting ideas for improvement directions will be gathered. This will be used as input for designing the directions. Secondly, a meeting will be held when the improvement directions are formulated by the researcher. The focus group will rank the improvement directions from most to least important.

Table 4 gives an overview of the type of sources from which the data is collected, the specific source and the goal of the data collection.

Table 4. Data collection design phase

Type of source	Specific source	Goal
Literature	Scientific literature, papers and books	Identify different types of solutions
Best Practices	Sales force of Design Engineering	Identify elements in the work method that could be beneficial for Sales of BT
Experts	Management Team (BGD, SD, TD, TM, SM, SM, and TCC)	Receiving input for which solutions could be appropriate for the organization

3.3.2 METHODS OF DATA ANALYSIS

The collected data consist of multiple design alternatives. The method of the lowest common denominator will be used, because the goal of this stage is exploratory. This results in a presentation of all solutions that could be found in the data gathered. Those solutions will be presented in a scheme, together with all the requirements of the solution. Those requirements are defined with the use of the managers who defined the managerial challenge of the research. In each box a value of 0 till 2 is given to represent the extent to which the solution is fulfilling the requirement. Furthermore, a session with a focus group will be planned to rank the improvement directions from most to least important. With the use of the weighted average method, a general ranking is made. The most important factors receive highest weights, the least important receive the lowest weight. The formula that is used to calculate the positions is:

$$\frac{W1X1 + W2X2 + \dots + WnXn}{\text{Number of respondents}}$$

Wn: weight of position *n*

Xn: Number of reactions for position *n*

For example: there are three improvement directions which are ranked by three respondents. The ranking scores are as follows: ranking 1 = 3; ranking 2= 2; ranking 3=1. The calculation is showed in Figure 11.

Improvement direction	Respondent 1	Respondent 2	Respondent 3	Score
A	1	2	2	$= \frac{3 + (2 \times 2)}{2}$
B	2	3	3	$= \frac{3 + (1 \times 2)}{2}$
C	3	1	1	$= \frac{1 + (3 \times 2)}{2}$

Figure 11. Example calculation ranking

The focus group will be equal to the experts defined in the previous section. The purpose of the focus group is twofold: extending the knowledge, and creating support. The managers are daily working with Sales and strategies, therefore they have more insights on which requirements and factors are useful to the company. Furthermore, implementing changes in strategy could cause friction. By involving the stakeholders in the process, resistance to the new strategy could be mitigated. Finally, the outcome of the ranking based on the requirements is compared with the ranking of the focus group.

3.3.3 METHODS OF PROPOSED DESIGN

The data analysis provides insights of the best improvement directions. With the use of those directions a participative design process will be started. The design process is an iterative process and could be created in three ways, depended on the result of the ranking during the analyzing phase. If a formulated potential solution clearly turns out to be the best and is highly valued with all requirements, this solution can be copied. If multiple solutions are present, which each score high on different requirements, several solutions can be combined. However, when none of the potential solutions score high enough on several requirements, a solution can be created from scratch by the researcher.

4. Results

Outline

- Results: Diagnosis
 - Results data collection
 - Results data analysis
- Results: Design
 - Results data collection
 - Results data analysis
 - Results proposed design

4. Results

4.1 RESULTS: DIAGNOSIS

4.1.1 RESULTS DATA COLLECTION

In the method section it was explained that the necessary data could be divided into three categories: (1) the current plan of actions of Sales and the innovative performance; (2) the ideal performance of the company from the markets' point of view; and (3) the ideal performance from a strategic point of view given by the management. In this section it is explained which data of each category was found.

Data collection. Of the data described in the methodology, only the numbers of new product offered to the customers were found. An excel file of all the innovations were give. However, improvements of current products were not included. Also, the level of success was not stated. The current turnover was presented of some of the innovations. However, no information is known about the level of turnover which represents a successful project. Furthermore, the processes are not stored. Information about process times is not available in the company. In the methodology section it was stated that only quantitative data about the current situation would be gathered. However, during the research, informal conversations with the department M&BD revealed that recently a survey was held among the customers of the company. The survey included statements about the current performance of the company and the level of desired innovativeness and customer focus. The quantitative data about the customers of BT were received for this research. An overview of the quantitative data found which was required by the methodology is given in Table 5. It is also indicated when quantitative data was found which was not stated in the methodology.

Table 5. Result data collection – Quantitative data

Topics	Documents	Additional	Reference
The numbers of new products offered to the customers	Excel with new propositions		Appendix K
The number of improved products offered to the customers	Not found		
The number of successes/ failures of the ideas	Not found		
The process time of innovations	Not found		
Customer perception of the performance of the company and their desired performance in terms of customer focus and innovativeness	<i>Not defined in the Method</i>	Results survey for current and desired situation	Appendix G

Documents. The Strategic plan was received from the Manager Technique. In the strategic plan first of all the overall mission, vision, and strategy of the company are expressed. Besides the overall strategy, also the strategy per BG is given. In addition a description of the current market (*desired by market*) and future expected changes of the market are given per BG. Also, a brief SWOT analysis is given in the strategic plan. Besides the Strategic Plan, a Sales Year Plan was received from the SD. The Sales Year plan is a PowerPoint file. In this PowerPoint the structure and functions of Sales, the current process and the current focus is stated (*current situation*). In relation to the situation *desired by the market* it gives an overview of the variety of customers. It also expresses the strategy for the department, related to the situation *desired by company*. The Sales process is also partially defined in the HPM, a manual for project management. This document was created during the research. Even though the manual is not officially launched in the company, it was provided as a document in this the research. As stated, the functions and roles of Sales were shortly stated in the Sales Plan. In addition to that, the official function descriptions are gathered from the department Human Relations (HR). The performance goals of the department Sales are not expressed explicitly. However, some general goals are presented in the Sales Plan, and the focus expressed in the function description can be used. In addition to the documents which have been stated in the methodology, a CRM manual, a PowerPoint about the labour flow of BT, an appraisal document and a PowerPoint of the SalesApp were gathered. During the interviews it became clear that CRM plays a pivotal role in the Sales process. The manual was received, which states the functioning of CRM, but also gives insights in the Sales process as mentioned. During one of the interviews it was mentioned that there had been many in- and outflow of labour. Therefore, a document was requested by the department HR (see Appendix L). Table 6 shows an overview of the data collected.

Table 6. Results data collection- Documents

Topics	Documents	Additional	Reference
Current strategy	- Strategic Plan - Sales Plan		
Current Sales process	- Sales Plan - HPM - CRM manual		Appendix J
Function and roles of Sales	- Sales Plan - Function descriptions	General appraisal form	
Performance goals of Sales	- Sales Plan - Function descriptions		
Current performance of Sales	- Sales Plan (only in terms of revenue)	General performance: - Financial annual report	Appendix C
SWOT analysis	- Strategic Plan		
Complaints or reactions of customers	<i>Not found</i>		
Type of market	- Strategic plan - Sales year plan		
Type of customer	- Strategic plan - Sales year plan		
Strategy plan for next years for the company	- Strategic plan - Financial annual Report		
Mission and vision of the company	- Strategic plan - Financial annual Report - Company's website		
Strategy plan for next years for Sales	- Sales Year plan		
Insights in the CRM system	<i>Not defined in the Method</i>	CRM manual	Appendix I
In/ outflow of labor	<i>Not defined in the Method</i>	PowerPoint	Appendix L

Interviews. All required interviews were actually held with an exception of one interview with a customer. Unfortunately, only one interview could be planned. It was not possible to find a customer in time for an interview. The underlying reason for this was the risk that the relationship with the customers would be damaged. The project executed at this customer, is often used as a reference project in the company. Furthermore, some adjustments of the design of the interviews were made. Firstly, the function of TC in the specific area was not employed at the moment of planning the interviews. Therefore, a TC of another area was asked to participate in the research. This TC was asked because of his previous employment in the area researched. At the time of employment in that area, the same SM was employed as currently is. Secondly, the interview about the current market was conducted among all the required respondents. However, two of the AM had to leave early from the interview. Therefore, the market was not discussed thoroughly. The data is therefore not representative, and is left out for analysis.

4.1.2 RESULTS DATA ANALYSIS

In this section the results of the diagnosis phase are presented in three parts. The first part focuses on the description of the current situation. In the second part the desired situation is described. Finally, in the third part the two situations are compared and a gap analysis is made.

CURRENT SITUATION OF THE COMPANY

As mentioned, in this section the current situation is described with the use of the company data, interviews and documents. The current situation is described by different elements: the environment, the strategy, the (innovative) performance, processes, knowledge sharing, culture, and structure.

INNOVATIVE PERFORMANCE

All sources indicate that the overall performance could be enhanced. The overall performance can be measured in the revenue. The annual report indicates that the overall net profit has decreased the last years. The Sales year plan point out that also the revenues of Sales BT are lower than the estimated values (see Appendix C). This is supported by the internal interviews, in which the management indicates that the overall performance is lower than expected (see Appendix E). A reason for these numbers could be the economical crisis. Nonetheless the performance indicated by the profit, the interviews do indicate that the company has gained a trustworthy and high quality image. Also from the customer point of view, there is room for improvement. The customers were asked to give a mark on 0- 10 to rate the chance they should recommend the company to others. The results show that the scores could be increased (see Appendix G). This might imply that the customers are not valuing the performance high enough to recommend the company to others. The interview with one of the customers does show positive feelings towards the overall performance. Even though there were some points of criticism, the customer was very satisfied with the overall process and result of the project. As mentioned, the project is used as a reference project. Therefore, it could be questioned whether this project is representative for the overall performance. The overall tendency is that performance could be enhanced.

Even though the overall performance might imply a lack of innovativeness and customer focus, the specific performance on those elements should be analyzed too. It is concluded that the customer focus is not yet fully achieved. The respondents stated that that the company relies too heavily on what is known within the company, and on the current capabilities and products, instead of the needs and desires of the market (see Appendix E). Relating to that, doubts remain about the effectiveness and power of the AM of retrieving the true desires from the customers. One of the respondents mentioned that it might be because of the focus of gathering many new accounts. Therefore, new measurements are implemented, to control the effectiveness of each AM. The CRM is used to indicate how many accounts are gathered and which percentage leads

to new business. This measurement is implemented during the research, whereby the period of implementation is too short to extract meaningful data at this moment. In addition, no measurements or appraisals are available about specific performance indicators. Also, no specifics on innovations are incorporated in ‘company competences’ of the general appraisal forms (see Appendix H). Furthermore, no general sales trainings are given in the company. The feeling of improvement possibilities regarding customer focus is supported by the outcome of the customer’s survey. Even though the customer survey points out that the level of engaging in the customer process is sufficient, it also reveals that there is still room for improvement. The specific scores are presented in Appendix G. The interview with the customer pointed out that the company was surely engaged in the thinking process. However, the company did not provide new insights of which the customer hadn’t already thought of. An example is that other propositions of the company had not been spoken of, while the customer seemed interested when the proposition was mentioned at the interview.

Finally, the innovative performance of the company is not secured at this moment. The internal interviews indicate that even though the willingness for innovation is present, this is not translated into a solid innovative performance (see Appendix E). The innovative output is low and the duration of the innovative projects which are executed are relatively long. One of the respondents also mentioned that the propositions that are implemented in the market, have not gained enormous revenues yet (see Appendix E). The document found about the current innovations in the entire company support this view. It reveals that in total in the whole company four new concepts were placed in the market, up till now. However, the accuracy could be questioned, considering the fact that during the interviews one concept that was repeatedly mentioned in the internal interviews, was not included in the document. Nevertheless, it does indicate that there are not many new concepts, yet. Of those concepts, it is not sure whether they are or will be profitable. Finally, one of the respondents mentioned, that there could have been more innovations, which simply were not recognized as such.

Table 7. Overview - Current performance of the company

Factor	Interview internal	Interview external	Customers’ survey	Documents
Overall performance	Results were lower than expected	Very satisfied	Room for improvement based on the score of willingness to recommend the company	Overall positive results, however lower than estimated
Customer focus	Concerns about the customer focus	Satisfied	Room for improvement	X
Innovativeness	Few successful innovations	Low	Room for improvement	X

Strategy of the company. The Strategic plan 2015 -2017 of the company states that the company's vision focuses on the growing demand for intelligent electro technique. People have an increasing desire for improvement of life by smart technical solutions. Therefore, as long as there is electricity, there is a need for specialists in this area. The mission that accompanies this vision is to enhance customers' performance by delivering intelligent electro technique. More elaborately, it states that the translation between technique and functionality should focus on achieving efficiency, safety, continuity and a better profit. In order to achieve this, the company has a *flexible, innovative and integral* approach. Finally, also corporate social responsibility is included in a more elaborate version of the mission. However, this mission and vision appeared not to be well-known within the company. The results of the internal interviews show that only a small majority can explicitly tell this vision and mission (see Appendices E). Furthermore, it was noticed by the researcher that multiple respondents tried to avoid answering questions about the strategy, mission and vision of the company. The strategy which is formulated to fulfill the mission is mainly based on the method of Design to Operate, which focuses on the impact solutions have on the customer and their performance goals. Related to the integral approach, the company broadens its activities by fulfilling more steps of the customers' process in order to accomplish activities with higher added value. The integral approach leads to customized services with one, two or all of the following phases: design, build, and maintain. The business group DE is primarily responsible for the design part, the other BG's focus on build and maintain, if needed complemented with design. Furthermore, the company will engage in partnerships in order to offer customers an integral solution that incorporates the knowledge of mechanical and construction elements. The Strategic Plan emphasizes that different competences are required for the new approach. Therefore, the competences should be enhanced. It is also mentioned in the strategic plan that the markets' crisis has impact on the company's turnover. Therefore, it is stated that within all processes the focus should be on critical decisions on choosing projects, focus on financial requirements, and on business agility.

The general strategy given in the Strategic Plan, seems to imply a *differentiation strategy* suggested by Porter (1980). On company level the company strategic target are various market segments, and within the BT segment also different target markets are defined. This implies that the target is industry wide. In the company brochure of the company it is stated that the company focus is on ambitious customers in the four market segments. Focusing on the BBT segment, the corporate brochure indicates that the focus is on the high- end market. This implies that the company focuses on the uniqueness to the customer instead of a low cost position.

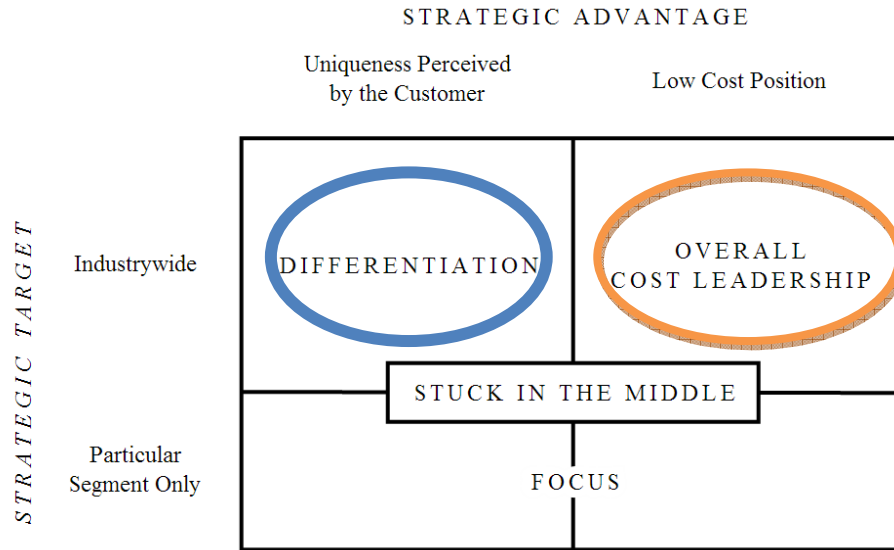


Figure 12. Strategy of the company using Porter's generic framework (1980)

Based on the statement in the Strategic Plan, which indicates that BT will develop and commercialize propositions together with M&BD, the strategy seems to be in line with the overall innovation and customer focus. However, some contradictions could also be extracted, given the fact that the pivotal focus of BT is price reduction, which implies an *overall cost leadership strategy* (indicated with orange circle in Figure 12). Furthermore, the interviews do not support the strong focus on the development of the propositions.

Also I&D seems to endeavor different ideals than disseminated in the Strategic Plan. The strategic plan makes you suspect that innovation is a key value in the organization. However, I&D states that innovation is not a primary goal and the organization is not a frontrunner on innovation. The focus is on incremental changes. Most probably, I&D is referring to the fact that the innovations are only supporting the core business. However, it does seem to weaken the ideals of the strategic plan of the organization. Table 8 gives an overview of the current strategy, based on: general strategy, strategy of BT, the mission and specifics of the strategy.

Table 8. Overview - Current strategy

Factor	Interview management	Documents
General Strategy	- Differentiation	- Implying a differentiation strategy
Strategy BT	X	- Implying a overall cost leadership strategy
Mission	- No consensus	- Being flexible, integral and innovative
Strategy specifics	- No consensus	- Design to operate - Stretches its position - Focus on critical decisions on choosing projects, focus on financial requirements, and on business agility

The processes can be divided into the current general processes of Sales, and the innovative processes present in the company. Both are discussed in this section.

GENERAL SALES PROCESS

Structure. The structure of the department of Sales BT is presented in Figure 13. The department is led by the Sales Director (SD). Furthermore, the department is divided in four geographical areas and one Tender Competence Centre (TCC), which executes the larger projects all over the country. Each area has one Sales Manager (SM), one or more Account Managers (AM) and one Tender Coordinator (TC). The TCC is led by a SM, who only has the responsibility over one TC. Each Monday morning there is a Sales meeting with the SD and all the SMs of the areas and the TCC. All the potential projects are discussed. When a project is expected to exceed 2 million, the TCC is going to proceed with this project. In other cases, the areas execute the projects.

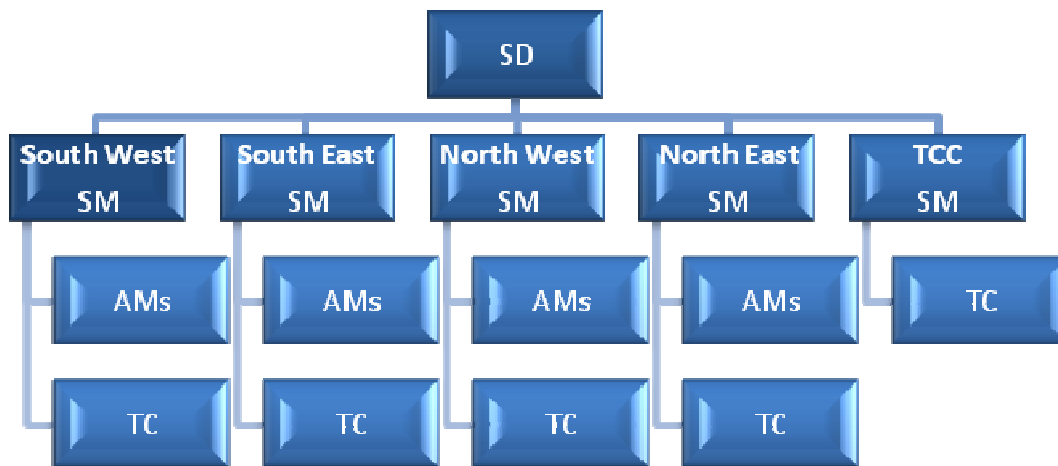


Figure 13. Structure of Sales BT

The description of all the functions presented in the structure of Sales BT, is given in Table 9. The description is based on the function profiles and internal interviews. The results of both data sources were equal, except from the description of AM. All the respondents mentioned the tasks of creating business for the company, through liaising of both existing and potential customers. However, the task of composing and executing the Sales year plan is not mentioned explicitly, at all. This might be due to the fact that composing the Sales plan is not part of the daily business. Furthermore, the function description does put emphasize on developments by indicating the SD adds value to innovation in collaboration with Technique and M&BD. This is not explicitly mentioned by the internal interviews.

Table 9. Functions of Sales BT

Function	Function description
Sales Director	<ul style="list-style-type: none"> - Design strategy for the sales force of the BG - Targets for the specific sales force are set in approval of the BG director - Coordinating Sales Force of the BG - Acquiring new assignments in existing and new strategic areas to secure the continuity and growth of the company, nationally and internationally - <i>Adds value to innovation and technological development in collaboration with Technique and M&BD (see Appendix D)</i>
Sales Manager	<ul style="list-style-type: none"> - Responsible for creating and executing sales plans - Coordinating the sales force in his/hers area - Acquiring new assignments in existing and primary new strategic areas - <i>Is up to speed about the developments at the customers and determine whether the company can react on these developments</i>
Account Manager	<ul style="list-style-type: none"> - The tasks of creating business for the company, through liaising of both existing and potential customers - Contribution to composing and executing of the sales year plans, within the targets set
Tender Coordinator	<ul style="list-style-type: none"> - Responsible for the coordination of the Tender Phase
Tender Manager	<ul style="list-style-type: none"> - Responsible for tenders of large or complex projects (more than 2 á 3 million euro) - Coordinating the tender phase and determine the strategy for the tender bid

Proces. The overall process that is defined consists of five phases: Sales, Tender, Design, Realization and Exploitation (see Figure 14). Not all phases have to be necessarily executed. The Sales department has key responsibilities in the phases Sales and Tender. The actions that are performed in those phases are presented in more detail in this section.



Figure 14. Overall process

With the use of internal interviews and documents as the Sales Plan, CRM manual and the Handbook of Project Management (HPM), the Sales processes are described. Remarkable is that in the HPM the process descriptions starts at the Tender phase and the first Sales phase is not included. The Sales plan also contains a scheme about the Sales processes. The phases are equally described as in the CRM, only the fifth phase is called ‘assignment’ instead of ‘oral agreement’. Furthermore, some additional information about the decision making and documents that should be made is given. The schemes used are presented Appendix I and Appendix J.

It is chosen to model only the simplest version of the process, in order to secure the readability of the model. In reality some steps could be added. Those steps include a preselection. Large

projects typically involve a preselection. In those cases, first a decision is made whether or not to bid for the preselections. If the preselection is won, the process goes further by a bid/no bid decision for the normal selection. Furthermore, the steps during the realization and maintenance phase are not represented in the flowchart, because they are outside the scope of this thesis project. The process flow is presented in Figure 15.

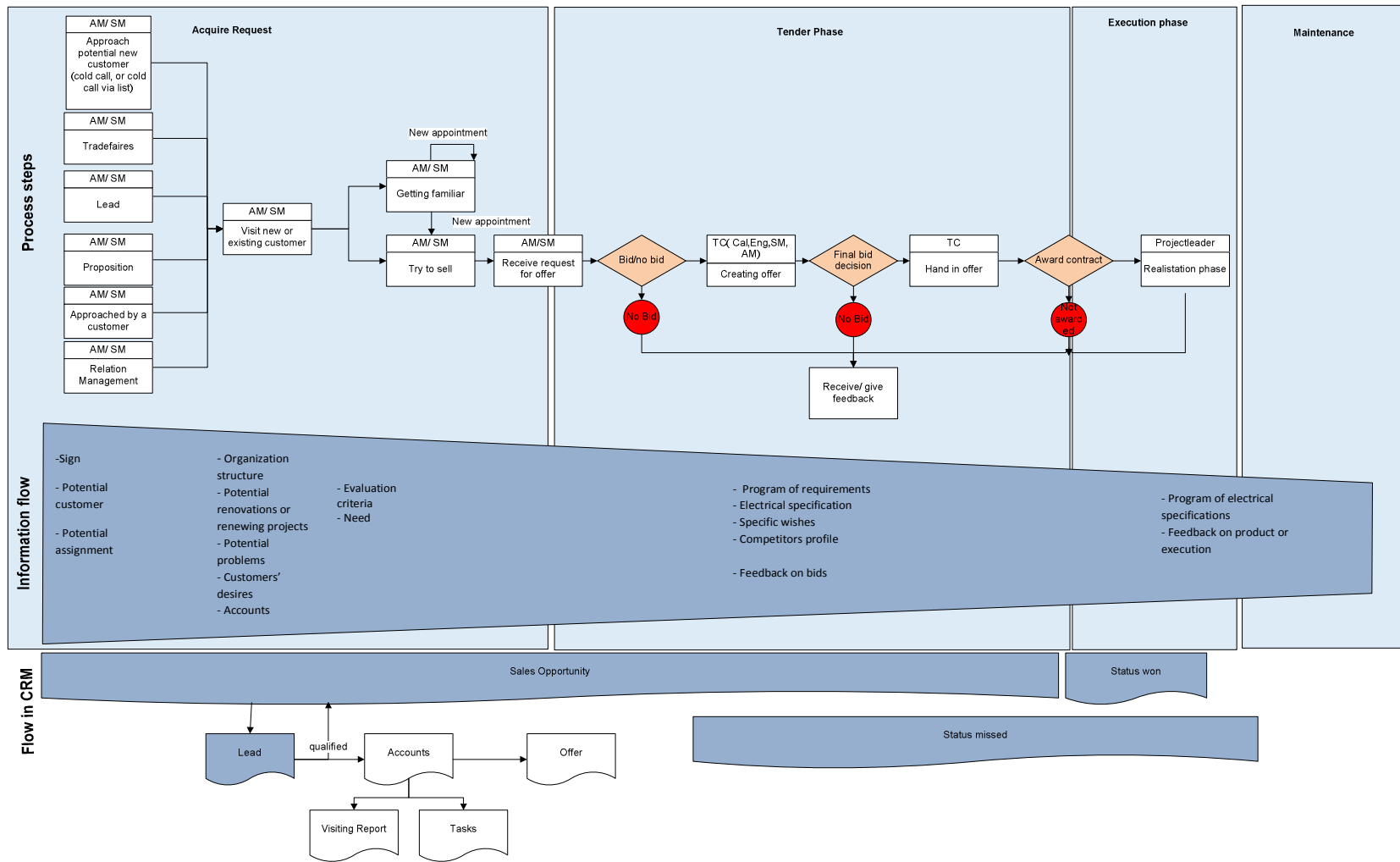


Figure 15. Process flow Sales

The Sales process starts with *the initiation phase*. The goal of this phase is to acquire a request for quotation. The AM together with the SM are responsible for achieving these requests, as stated in the function description. New customers can be acquired by multiple methods. The first type of approaching is by cold canvassing. This means that the AM (or SM) approaches a new customer without any previous contacts. In some specific cases, a marketing list is bought. In this list a summation of companies which have showed some interest in a concept is given as a start for the cold canvassing. A call is made to the potential customer to ask whether the company could help them, or an appointment could be made to have an introductory talk. Even though 100% of the AM's state they use cold canvassing, some doubts are expressed about the effectiveness. One of the AM's estimated that the calls lead to an appointment in 30% of the cases, and another AM stated that approximately 5% to 10% of the calls is effective. A third AM stated that cold calling was not often used by him, because the chances of success (Appendix E). However, it is stated that propositions could be used to trigger the customers. It was explained that customers are engulfed with calls of competitors; calling with a specific message is more effective. One of the Sales employees stated: "Even though the proposition is not what the customer needs, it gives the opportunity to start a conversation, which could lead to other kind of business". Other ways to be able to make appointments with new customers is by visiting trade fairs, or simply by approaching customers because you have a lead (Appendix F). A lead is a premature sales opportunity, about which not enough information is available. Leads can be identified by tips AM's receive from colleagues, news channels (media) which indicate chances, or networks to which AM are linked. It has to be emphasized that colleagues only give tips sporadically. Leads could be known by colleagues who mention them, persons from a personal network, suppliers, existing customers or simply by keep track of the news. Finally, customers could also approach the company by themselves, for example by mailing.

Existing customers are primary approached for relationship management. A couple times per year account managers visit customers to hear if they are satisfied and whether opportunities for new assignments are present. However, when new propositions emerge, of course also the existing customers, who could potentially benefit from the proposition, are approached. Finally, equally to new customers, existing customers could also approach the company by themselves.

The respondents state that during conversations with new and/or existing customers, the first step is to get a good view of the customers' organization. Therefore, they try to acquire information about the structure and goals of the organization and for example information about contact persons in the decision making unit. The second main topic is about the future changes or developments that the organization has planned. Each change can form a chance for the company to do business.

After the conversations with the AM's or SM's a company could request for quotation. After this the *tender phase* starts and a decision has to be made whether to do a bid. This decision is based on whether the type of project fits with the company's strategy, the risks are acceptable, and the resources are available. The decision is made by the SM, together with the AM and the TC. The

TCC has a controlling function. In case of large projects, the bidding decision is made by the TCC, and/or the SD, the BGD, or even the top management. Each company should write a detailed plan. In this plan the company expresses the price, but also the potential risks, solutions to decrease those risks, planning, the level of durability, level of quality and so forth and so on. During this process, the TC has the opportunity to ask questions about requirements to the customer, and vice versa. It depends on the type of contract and the type of tender, whether this is a formal or informal step. In some type of contracts, the company is involved in an early stage and is also responsible for the entire design. The internal interviews point out that this creates more opportunities for creativity. In those processes also brainstorm sessions with the customer and other parties such as building constructors are held. With the use of all the information and the planning, the cost price is calculated by the TC. In consultation with the BGD the final choice for the market price is made. After the delivery of those detailed files and prices the customer start a procedure to choose one of the companies that will perform the project. In case of government or semi- government agencies, this selection procedure is done according to the EMVI- standards. EMVI is a Dutch abbreviation which refers to most economically advantageous tender. Each application will be separately assessed on quality and on price. The points an application receives on quality criteria are forming fictive price reductions. The application with the lowest total price, receives the tender. Private companies are not restricted to this EMVI- procedure, but most companies do take this into account. After winning the project, the company should make a final decision whether to accept the project, and then proceeds in the *realization phase*. The TC has to transfer the project properly to the project manager. After this phase the project is either finished, or in case of a maintenance contract the contract starts, resulting in the *exploitation phase*. The latter two phases are outside the scope of Sales.

Information flow. During the Sales process, an information flow is stored. The company uses CRM software to store this information. In the CRM a list of accounts is present. Accounts are (potential) customers, but also accounts are made of companies that could influence sales opportunities. When the process starts with a lead, this lead is created in the CRM. When a lead is followed, it can transform into a sales opportunity. More information is gathered of the structure of the organization, there is information about potential renovations, future projects or potential problems. An AM also tries to receive information about specific needs of customers, evaluation criteria used by customers, and general customers' desires. If such a sales opportunity has emerged from a lead, the lead is qualified in CRM, which lead to the creation of a sales opportunity. This sales opportunity is related to a (new or existing) account. In the account the general information of the organization is stored. Information about the meetings and a summary of those conversations are attached to the sales opportunity. Also specific actions could be linked to the sales opportunity. However, besides a sales opportunity through a lead, a sales opportunity can also emerge without a lead. Customers can approach the company directly, and a first contact could result in a sales opportunity, immediately.

When the process evolves, an offer could be requested. Offers are also attached to the sales opportunity. During the whole process the status of the sales opportunity is open. At the moment a decision is made not to make a bid, or the assignment is not awarded to the company, the status should be changed in *missed*. To the status, information about the reason of missing the assignment is attached. This also includes information (if present) about why the assignment is not awarded. At the moment an assignment is awarded, the status change from *open* to *won*.

INNOVATION PROCESSES

Besides the description of the general Sales process, it is key to know how the current innovation processes are performed. Currently, the innovation lines of the department I&D are still under construction. Therefore, the current situation is seen as the company without the implementation of these lines and the department I&D only focuses on internal innovations. Therefore, when Sales detects a chance for innovation, they can't account it to another department. Internal interviews indicate that Sales sometimes does use the ideas and start a product development process by themselves. There is no procedure for these projects, and the project is additional to the regular activities. As a result of the lack of time available for such projects, the projects do not receive priority. In combination with the lack of support and resources, the projects are timely (see Appendix E). It is also questioned whether the projects are truly successful. A summary of this current situation related to the innovation process is given in Table 10.

Table 10. Overview - Current innovation process

Factor	Internal interviews	Documents
Process	- Unstructured and timely - No process yet	- No procedures about NPD can be found - None of the past NPD processes are stored
Resources	No time, budget or specialism available	- Function descriptions of Sales employees does not incorporate NPD processes.
Support and focus	No place to share the ideas and delegate the process execution I&D does not coordinate external focused innovations yet	X

GENERAL CHARACTERISTICS

Besides the performance and the processes which are directly related to the research question, there are some other factors that may be indirectly related. Therefore, in this section the market of the company, knowledge sharing, the current culture and structure of the company are discussed.

THE MARKET

With the use of the Strategic plan, Radar 2020 and internal interviews (see Appendix E), it can be defined which factors are present in the market. It is stated that a high number of competitors are present in the market. The SWOT analysis of the company also indicates that there is a threat of competitors with low cost prices. By comparing it with the literature of Emery and Trist (1965) the type of market can be determined. Table 11 shows the presence of all the factors: change in the market; competition; connections with other parties; and, related to economic, political and social factors. The three data sources used are consistent about the description of these factors.

Table 11. Current market situation

Factors	Description
Change in market	The market's demand, the technology and the amount and type of competition is changing.
Competition	High number of competitors and increasing variety.
Connections with other parties	Increasing number of relationships between parties in the entire value chain and knowledge institutions
Related to economic, political and social factors	Market is strongly related to the economic fluctuations, legislations, and social factors

Based on the presence of the factors of it can be concluded that the market is complex and fairly unpredictable. The market itself is also changing, by the changes in technology, the strong relation with the economy and the impact that social factors have. Based on the theory of Emery & Trist (1965) (see Section 2.1.1) it can be concluded that the company is operating in a turbulent field. This means that the market influences the company, internal changes are present, the actions of the company could have consequences for the market, and finally also the market could change by itself, through external factors.

KNOWLEDGE SHARING

Internal interviews show that the main perception is that the knowledge sharing is weak. Interviews with Sales reveal three main points of concern. Firstly, it is stated that the knowledge is not shared between other Sales areas, other departments and BG's. Respondents indicate that the knowledge sharing which does take place, is mainly based on personal social ties or by running in to someone coincidentally. One of the respondents stated that he has a good relationship with two other colleagues outside his team in other areas and departments. With those colleagues he does share do's and don'ts, while that doesn't happen with others. Furthermore, the respondents indicate that working at other offices in the country leads sometimes to knowledge sharing, because you meet other colleagues. One of the respondents mentioned that in- and outflow of labour could influence the knowledge sharing also. Company documents indeed show

that frequent shifts have taken place (see Appendix L). Therefore, knowledge might be lost or difficulties with finding the right person could occur. The management has the same perception, and also mentions those two problems. From the management it becomes clear that not only a lack of information sharing between other departments and BG's exist, it also occurs that they do not even know the structure and function of other departments. Finally, Sales also emphasizes that the knowledge is strongly dependent on individuals or departments. They refer to situations in which the unavailability of specific persons can lead to a lack of information, and information that can be blocked when one person forgets to share it with the rest of the department. This perception is absent in the interviews with the management. It might be a problem that especially at lower layers in the company exists, because it is about specific project information. Nonetheless, a team is creating a sales software tool which can be used on tablets. It is thought to provide each AM with a tablet. This tablet will give access to reference projects, presentations, current propositions (related to contact information of responsible persons) and will keep track of the number of times presentations have been used. Furthermore, new presentations can be made easily. This will give AM the opportunity to show the customer solid information immediately. This proposition is still under construction, and is initiated by Sales BT. Conversations with the BG IND are held, to investigate whether this could be valuable for them too. The first page of the PowerPoint of the proposition of the tablet is given in Appendix M. Furthermore, performing the research some difficulties regarding knowledge sharing became clear. Firstly, finding the right person sometimes was a timely process and also the reach ability of the colleagues was low. Besides the personal contact, also the knowledge sharing via digital infrastructure shows some concerns. Accurate information about the general structure of the company, structure and roles of departments, current goals and procedures was not easily found or not available via the intranet. Finally, observing the company, the interior of the company's offices seem to form a barrier for knowledge sharing. The offices are not very open and there are no places to meet each other for short breaks. Informal gatherings do happen at birthdays. The person whose birthday it is, invites colleagues from his/her own floor to come to his/her desk at a specific time to celebrate and eat a piece of pie. At these moments everyone gathers and have informal conversations, which also include sharing the projects currently working on. Also once a month TEC-tutorials are organized. The tutorials are presented by employees in four different areas, after working hours. Each employee can subscribe him/herself to the tutorial. The tutorials are short interactive lectures about a topic or general information about a project which can be valuable to colleagues. Table 12 shows an overview of the current situation regarding knowledge sharing with the use of three factors: level of knowledge sharing; knowledge sharing over boundaries of departments; and, stimulating knowledge environment.

Table 12. Overview- Current knowledge sharing

Factor	Interviews Sales	Interview Management		Observations
Level of knowledge sharing	Weak	Weak		Weak
Knowledge sharing over boundaries of departments	<ul style="list-style-type: none"> - Not up to speed of the other colleagues/ departments/ BG's - Knowledge sharing by accident or own social tires 	<ul style="list-style-type: none"> - Not up to speed of the other colleagues/ departments/ BG's - Knowledge sharing by accident or own social tires 	<ul style="list-style-type: none"> - TEC-tutorials - Sales Tec-tutorials - Sales days 	<ul style="list-style-type: none"> - Informal gatherings at birthdays
Stimulating knowledge sharing environment	<i>No consensus</i>	<i>No consensus</i>		<ul style="list-style-type: none"> - No clear digital infrastructure - No clear insights in departments on the intranet - No stimulating office interior

GENERAL FACTORS

CULTURE

The current culture is strongly depended on separate departments/ groups. The respondents of the internal interviews mention that each department has its own goals and own budget (see Appendix E). The focus on the individual department is so strong, that even the knowledge about the structure and function of other departments sometimes lacks. This could hinder the collaboration between departments. This can also be seen as one of the root causes of the lack of knowledge sharing (see appendix E). Besides the interviews with the management, also multiple informal conversations with employees, within and outside the departments of focus, indicate the lack of collaboration between departments.

Furthermore, there is not a strong innovation culture. Interviews point out that there is a lack of innovative focus among the employees. This is slightly remarkable, because each respondent has declared to have a positive view towards innovation (see Appendix E). This could imply that the respondents were answering in a social desirable way. Another explanation could be that the individuals do not feel stimulated to perform innovative behavior. This might be due to a lack of emphasis or resources made available for innovation. The fact that the vision of innovation is not dispersed among all the employees, might underpin this reasoning. Also the innovation lines are not widely announced and known in the company. No consensus on cultural factors is present in the interviews with the Sales employees.

Table 13. Overview - Current culture

Factor	Interviews Sales	Interview Management	Observations
Individual culture	<i>No consensus</i>	- No shared mission everyone strive to achieve together. - No urge to share information with each other	
Internally focused	<i>No consensus</i>	- Focus is on the company and internal processes.	
No culture of innovation		- No focus on innovation	
Employees states to be open to innovation	Everyone	Everyone	

STRUCTURE

The final general factor is the structure of the company. The company has multiple locations and follows a matrix structure. Furthermore, each department has its own budget. The structure is seen as a barrier for knowledge sharing, collaboration and innovation. The researcher also observed that the physical distance between the employees sometimes hinders communication. Table 14 shows the overview of the current structure perceived by the management and the observations during the research.

Table 14. Overview - Current structure

Factor	Interview Management	Observations
Structure	Structure of the company negatively influence innovation, knowledge sharing an collaboration	The different locations form a barrier for knowledge sharing
Structure of allocation of budget	The allocation of budget and rewardings are not supportive for reaching innovations and shared goals.	

CONCLUSION: CURRENT SITUATION

With the use of the analyses above, the first sub-question of the diagnosis phase can be answered. The question:

What is the current situation of Sales and I&D in terms of innovativeness and in terms of processes?

Summarizing, the innovativeness and customer focus is not fully present in all layers of the company. This implies that there is no innovative culture present. Furthermore, it is emphasized that the culture is strongly based on separate departments without much collaboration with others. The cause of this culture might have its foundation in the company's structure. The process of Sales focuses on attracting new customers, maintaining relationships with existing customers and

gaining assignments. In relation to innovation, Sales aims to sell propositions. Those propositions are also used to come in contact with customers. In addition, Sales does perform steps regarding the creation of innovations. However, there is a lack of focus and resources to bring to achieve real successful innovation and customer orientation. For Sales it is not clear which departments could help them innovating. They require support and a coordinating role from outside the department. This results in only a few innovative concepts which are released in the market. Those projects had a long through put time and the success of the projects had not yet been shown. At this moment the department I&D is only focusing on internal innovations. However, at this moment innovation lines are constructed by I&D. The intended that the innovation lines form a coordinating department for external innovations.

DESIRED PERFORMANCE FOR THE COMPANY

The desired situation of the company is described in this section. The desired performance is based on the perception of both the company and the market. In line with the description of the current situation, the following elements are discussed: strategy; (innovative) performance, NPD structure and process; knowledge sharing; culture; and, structure.

STRATEGY

The strategy presented in the current situation is the plan which is also required for the future, by the company. However, it is required that a strong strategy related to innovation is both present and known in the company. A clear mission and vision in which innovation is expressed should be known in all layers of the company. In the interviews it was mentioned that the company needs to have a USP. By developing innovations you could create a higher added value than competitors. Respondents mentioned that having an USP is extremely important because of the relatively high cost prices the company has. This is in line with the SWOT- analysis which was found in the Strategic Plan. Finally, the theory of Emery and Trist (1965) could imply that the market requires a specific interaction strategy to manage the turbulent field. This is discussed in Section 4.2.3.

(INNOVATIVE) PERFORMANCE

The respondents mention that the company should be innovative. In their perception, the customers are open to innovations. Innovations refer to combining techniques and creating concepts by which business can be generated. Specific numbers related to innovativeness are given by the department I&D. I&D is developing innovation lines. Each innovation line has a specific innovation theme, which is further explained in the next section. It is stated that (for all BG's) 2 pilots for each theme should be implemented per year, which should result in 1 proposition each year. In total (over all five themes) the company should execute 10 pilots and implement 5 propositions each year. Specific or minimum revenues that the proposition should generate are not formulated. However, it is stated in the documentation that the innovations

should be accountable for 10% of the total revenue. Besides innovation, the respondents emphasize the customer focus the company should have. The company also communicates to the customer to be customer focused. The website of the company states that everything they do, they ask themselves how it could add value to the customers. Together, this could result in a unique selling point (USP) for the company, which is required by the customer according the respondents. The customer focus and innovativeness are supported by the customer survey. The results of the survey indicate that customers highly value the importance of innovations and engagement in the designing and executing process. Also the AM's perceive the desire for innovation at customers; however, they also stated that most customers are a bit anxious of new products which have not been proved yet. The customers are not willing to take high risks in the current situation, which implies that the benefits of the innovation should overrule the risks. Finally, this is also in line with the strategy of the company, which states that the company needs to be innovative and should follow the method of Design to Operate.

NPD STRUCTURE AND PROCESS

In this section first the process of the innovation lines, which are designed by the department I&D is presented. Next, specific process requirements formulated based on interviews are formulated.

At the moment of this research, the actual I&D is not fully implemented. However, the structure and process of how the department should look like in the near future is already defined.

Structure. The department I&D is a relatively new department, which only exist for a year. Previously, the department was called Technique Development and focused mainly on the development of internal processes. By creating a new department name, a new light is shed on development. Instead of the previous focus on internal processes, now the department will also focus on external developments. This research focuses only on the external development of the department.

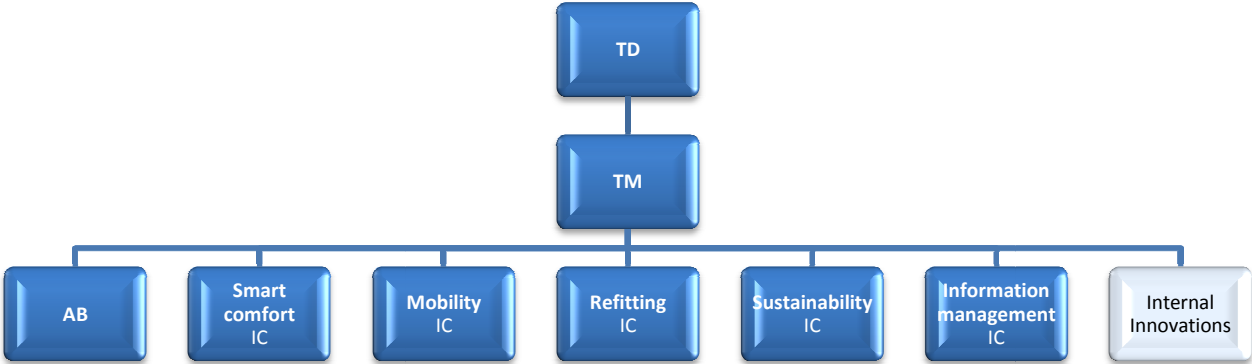
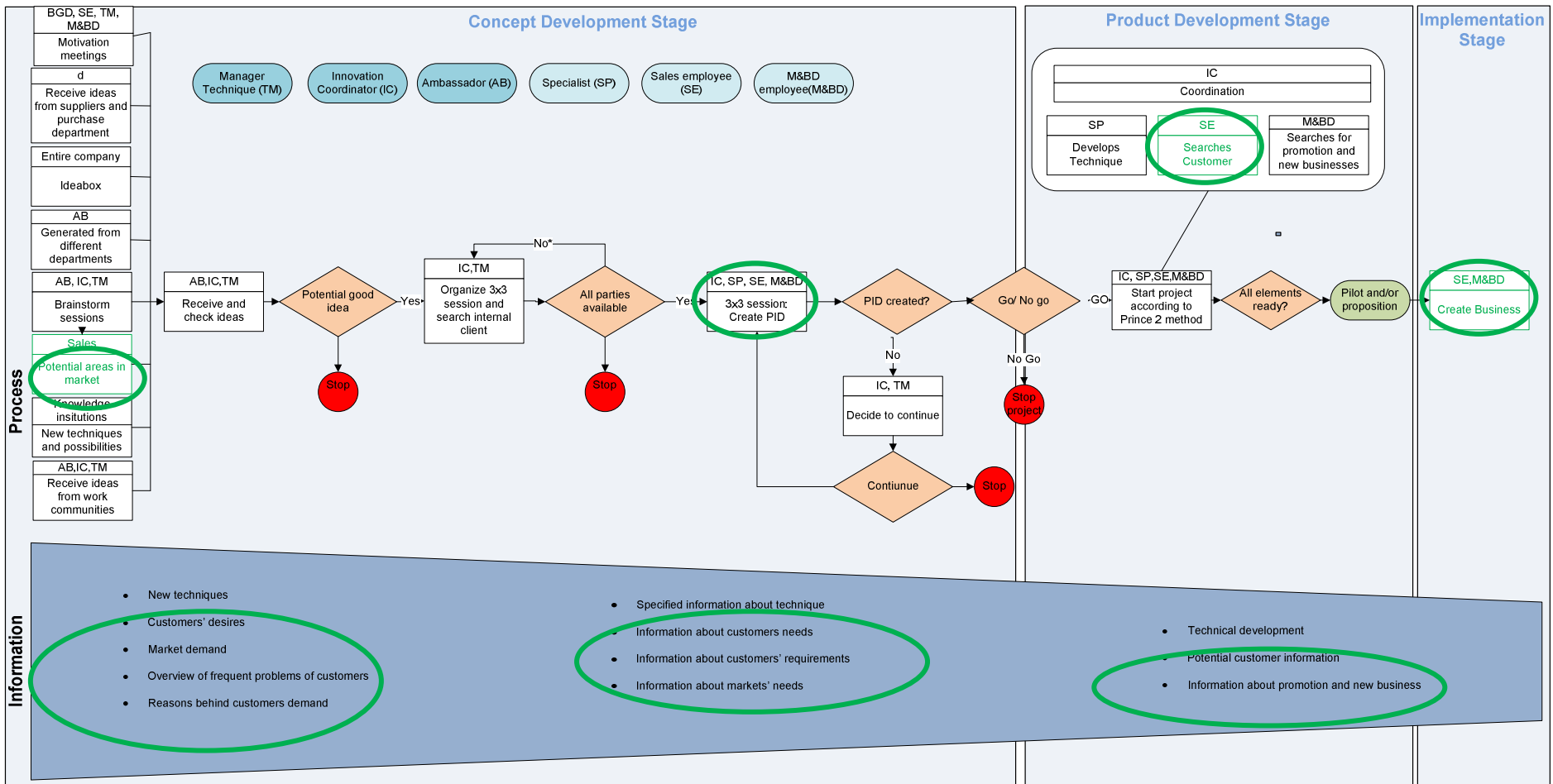


Figure 16. Structure I&D

During the research of the external part of the department was created in parallel. The goal of the department is to follow the strategic plan, by creating innovations with the market and for customers, for both the short and long term. I&D aim to be a central coordinating party for the innovations for all BG's. Further goals stated by I&D are to be understandable and inspiring, to use what is already available in the organization, and to make use of pilots that are of use for multiple business groups, or are profitable for the brand of the company. Because the department should support the each BG, it is decided to choose to choose a set up that is overarching all the BG's. I&D formulated five themes, which are applicable to all BG's. The themes are: *smart comfort; mobility; refitting; sustainability; and, information management* (see Figure 16). Each theme forms one innovation line in which innovative concepts related to the specific theme are created. Each theme has an own innovation coordinator (IC), who is responsible for the coordination of the entire processes of the theme. Furthermore, ambassadors are employed within I&D. Ambassadors should actively search for new ideas within the company, and be the central person with which other employees can share their ideas. It could occur that one person fulfills both the role of an ambassadors and an IC. As soon a potential concept idea is chosen, a project team is created. This project team consists of an employee of M&BD, a specialist from the department Technique, and employee of SE. The project team is led by the IC. See Table 15 for more detailed descriptions of these functions.

Table 15. Function descriptions of Innovation and Development

Function	Function description
Innovation Coordinator (IC)	Coordinates the innovations of his theme and has the overview of the innovations within the theme. In the process he/she monitors the progress, is responsible for the Go/ No go moments, and keeps track of potential funding.
Ambassadors (AB)	Are contact persons for the different BG's. Gather knowledge, ideas and innovations over different departments
M&BD employee (M&BD)	Searches for new markets, deliver new ideas, control with strategic plan and searches for potential promotions
Specialist (SP)	Responsible for the technique of the innovation
Sales employee (SE)	Responsible for relation/connection with customer



* : if the IC and the TM believe in the idea, the TM tries to help to convince different parties to create the team

○ : indicates that the Sales force could provide valuable input

Figure 17. Process flow I&D

Process. The process is defined with the use of a PowerPoint from I&D and internal interviews. Referring to the literature, the three stages (concept development, product development, and implementation) can also be seen in the process defined for the innovation lines. The concept development stage starts with finding new ideas. Those ideas can come from in- and outside the company. The interviews with the management point out that the AB is responsible for actively searching for new ideas inside the company. Although theoretically all departments can generate inputs for innovations, in this thesis report the emphasis is put on Sales. Sales is an important department for input generation in the concept development stage of the NPD process. Additionally, the concept development stage requires certain background information about the market and customers, such as: customer desires, market's demand, overview of frequent problems that are faced by customers and reasons behind the customer demand. Sales could provide these insights.

At the moment an idea enters I&D, the idea is checked and it is decided whether the idea has enough potential to proceed. This is done by AB, IC, and/or the TM. The check is based on the following criteria:

- It makes something easier
- It enhances something
- It has a positive impact on the world
- You can make profit out of it
- It is useful for everybody

If there is chosen to proceed, the IC (together with TM if needed) searches for an internal client, a specialist, a Sales employee and a member of the M&BD department to participate in the project team. The internal client can be a department which believes in the idea and is willing to participate and finance the process. If the IC does not succeed in gathering all the parties, the TM could potentially support the IC with the search. If it is not possible after all, the process stops, otherwise 3x3 sessions are organized. In those sessions the idea has to become more concrete. If the Project Initiation Document (PID) is finished in those three sessions, a decision is made to whether to proceed to the product development stage. If the PID is not yet complete, it can be decided to stop, or continue working. During the product development stage the method Prince 2 is used. The specifics of this method will not be discussed; however, the main aspects are shortly noted. Within the project team, it is the responsibility of the specialist to develop techniques. Secondly, the employee from Sales is expected to search customers who are willing to perform a pilot or are interested in the new product, while M&BD searches for promotion and new business. During these processes, the IC coordinates this whole process and keeps track of the quality, time, and budget aspects. If all the tasks are fulfilled, the pilot or proposition is implemented. Then the implementation stage starts, in which Sales has to try to create business with the product.

With the use of the internal interviews some more specified requirements are defined, focusing on the collaboration and tasks of Sales and I&D. It can be stated that Sales could give input for new ideas, based on the knowledge of the needs of the market they should have. I&D will be responsible for the coordination of the process. The process should be clearly

structured. Finally, the respondents state that Sales could sell the propositions which are designed during the NPD process. In order to fulfill these steps, both Sales and I&D should perform several tasks. First of all, Sales should gather the right type of information about the following topics: organization of the customers' company, planned future developments, needs behind the demand, and an overview of the needs. Added by the TM, frequent problems perceived by the customers are also very important. The internal interviews put mainly focus on the AM. Furthermore, it is desired that I&D enlarges the visibility of their department in the company. More specifically on the process, I&D should be up to speed with the new techniques in the market. Furthermore, it is stated by the respondents that new types of financing offered to the customer should be included in the design of the new concepts. It is desired that I&D focuses on those financing possibilities. An overview of the desired tasks related to collaboration and individual tasks for Sales and I&D is given in Table 16.

Table 16. Overview - Desired tasks/competences for NPD process

Tasks/ competences	Sales	I&D
Collaboration tasks	Give input for new ideas	Coordinates the process
	Facilitate customer focus	
	Sell the product	
Individual tasks	Organization of the customers' company	Enlarge visibility of the department
	Planned future developments	Gather information about new techniques
	Identify needs behind the customers' demand	
	Create an overview of the needs and frequent problems perceived by customer	

GENERAL CHARACTERISTICS

KNOWLEDGE SHARING

A solid knowledge sharing should be present in the ideal situation. Knowledge should be timely and accurately shared. The focus is on knowledge by which Sales and I&D can provide benefits from each other. However, knowledge sharing between the departments of Sales BT might be necessary to create information which is valuable to innovation processes. In order to ensure knowledge sharing, the internal interviews point out that the communication lines should be clear. Respondents indicate that one should know who is responsible for specific tasks. Furthermore, remarks are made about clear overviews of responsibilities and corresponding mailing lists to easily contact a colleague of interest. Most respondents indicate that personal contact is essential in an ideal situation. Databases are seen as a supportive tool, not as the main source of knowledge sharing. Even though the personal contact is preferred, negative remarks are made on the amount of meetings. Therefore, multiple respondents indicate that the sharing of knowledge could take place during current meetings of Sales, where I&D can join. Within the informal conversations also the importance of face- to- face contacts and the sharing of information over the departments have been emphasized.

CULTURE/ STRUCTURE

The culture of the company should be an innovative, customer focused and collaborative culture. Each employee should feel the urge to innovate, and should be personally motivated to search for new ideas which could positively impact the company's performance. Instead of focusing on the company and the internal affairs, the focus should be on the external environment. Customer focus should be incorporated in the culture. The structure of the company should enhance knowledge sharing and collaboration in the company. It should stimulate the employees to all strive to fulfill the same mission.

CONCLUSION: DESIRED PERFORMANCE

In conclusion two questions can be answered:

- *Which innovative performance is desired by the market and which processes of Sales and I&D are required to serve this market properly?*

- *What is the innovative strategy of the company and which processes of Sales and I&D are required to perform accordingly?*

Both the company and the market desires an innovative and customer focused performance. In the market point of view, the customer focus is strongly referring to the engagement of the company in the design of solutions. The company mainly refers to the production of new concepts which are desired by the market. The strategy is to serve the market following a differentiation strategy. The strategy can be fulfilled by a flexible, integral and innovative approach. The method Design to Operate will be used. On an operational level this requires NPD processes in which Sales and I&D are collaborating and benefit from each other.

In terms of innovation, Sales could benefit from the innovation lines. First, new propositions can lead to customer contact, which can result in new assignments. Secondly, more customer focused products which genuinely solve customer problems and the chance to create new concepts if solutions don't exist, can create offers and can help to win projects. Vice versa, I&D can benefit from the insights of the market that Sales possesses, or should possess in the ideal situation. During the concept development stage Sales can deliver ideas. In the second stage Sales can check whether the product is conform the wishes of the customers. Finally, Sales plays a pivotal role in the selling of the new product.

As mentioned, a distinction can be made between factors which are specific for Sales and I&D and factors which are general to the company (see Figure 10 in Section 3.2.2). Related to the specific factors, Sales needs to perform some additional tasks. It is required to gather information about: organization of the customers' company; future developments planned; needs behind the demand, an overview of the needs; and, frequent problems perceived by the customers. For I&D it is desired to enlarge the visibility; be up to speed of the new techniques of the market; and, focus on financing possibilities. It is necessary that Sales has the right competences to retrieve the right information from the customers and I&D has competences of a technical nature.

Finally, it is stated that to be successful, a foundation of general factors in the company is needed. Knowledge should be shared properly and the culture and structure should enhance collaboration and innovations.

GAP ANALYSIS

This section is focused on the comparison of the current and desired situations, based on: customer focused and innovative performance; strategy; processes; knowledge sharing; culture; and structure. The desired innovative performance is based on market insights and the company's vision. Other analyses are based on company's vision, only.

CUSTOMER FOCUSED AND INNOVATIVE PERFORMANCE

With the use of the analysis of the current performance of the company and the desired performance by the market, a market gap analysis is made. The results of the different sources are combined, which results in three topics of interest, presented in Table 17.

Table 17. Customer focused and innovative performance – Desired versus present situation

Topic	Desired	Present
Produce concepts	Yes	Yes
Produce 5 propositions per year	Yes	No
Create solid business with innovations	Yes	No
Customer focused is present	Yes	Yes
Customer focus is optimal	Yes	No

In line with the market desires, the company wants to be customer focused and innovative. However, the diagnosis of the current situation points out that innovation does not play a key role in the company and the innovative results are marginal. Also the customer focus is questioned. This is supported by the markets view. The customer survey pointed out that customers do desire companies with an innovative character, which are be engaged in solution designs. However, the customer survey also showed that the level of innovativeness and engagement in the customers' process can be improved.

Concluding, both the market and the company desire an innovative and customer focused performance. Even though a certain level of both exists in the company, it is not at the desired level at the moment.

STRATEGY

Table 18 shows an overview of the desired strategy related to the present strategy, by indicating whether the strategy is known in the company; innovation is present in the strategy; and whether ideals are formulated to be strived for.

Table 18. Strategy - Desired versus present situation

Topic	Desired	Present
Strategy known in company	Yes	No
Innovation	Yes	Yes
Customer focus	Yes	Yes
Ideals formulated.	Yes	No

The importance for an innovative approach in the current market is emphasized in the document Radar 2020, the interview with the customer, the small customer survey and indirectly by the theory of Emery and Trist. Emery and Trist (1965) claim that in the turbulent field, ends should be searched for instead of purposes. This is an innovative approach in which new ways are searched in order to fulfill demand that could arise in the future by the changes in the market. The interviews with the employees show that even though the majority of the employees are positive towards innovation, it is not yet incorporated in their current way of working. This is reflected in the performance perceived by the customers. The interview shows that the innovations of the company were already known in the market and the small survey show that there is room for improvement regarding innovation. Finally, both the customers and the Radar 2020 report highly value the importance that the company engages in the process of solution design. However, the customer survey reveals that improvements could be made (see Appendix G). Therefore, it is stated in Table 18 that the customer focus is not yet fully present.

Concluding, even though some factors are present in the strategy to a certain amount, it is not always translated into the activities of the company and not everyone is up to speed with respect to strategy.

PROCESS: TASKS AND COMPETENCES

The processes which are required to achieve the desired ideal performance are not present in the current situation. A structured NPD process is desired to achieve the innovative performance. In the current situation no formal NPD process focused on external innovations exists. However, the innovation lines which focus on NPD were created and will be implemented in the near future. They will provide structure which is needed. In order to succeed, it is important that they gain visibility. At this point, Sales is not up to speed with respect to the presence of the innovation lines. This is very important, because collaboration with Sales is needed. The current Sales process is not designed to retrieve all the information which is needed in the NPD process. Sales is expected to determine the needs behind the demands of the customers. Currently, concerns about the effectiveness on these points are expressed. Furthermore, customer relations of trust are required to execute pilots and

implement innovations. It is stated that these relations are already gained. Finally, it is desired that I&D focuses on new techniques and offering financing modes. Concerns are expressed about these points. Table 19 summarizes all the topics and shows whether the topics are present in the current situation and/ or desired for the future situation.

Table 19. Process - Desired versus present situation

Topic	Desired	Present
Structured NPD process	Yes	No (not yet)
Knowledge sharing	Yes	No
Focus on techniques in market	Yes	No
I&D is visible in company	Yes	No
Focus on providing different financing ways	Yes	No
Sales focus on the organization of the customers' company	Yes	Yes
Sales focus on planned future developments in companies	Yes	Yes
Sales identifies needs behind the customer demand	Yes	No
Sales creates an overview of the needs and frequent problems perceived by customer.	Yes	No
Sales creates trustworthy relationships	Yes	Yes
Sales possesses the competences to detect needs	Yes	No

GENERAL COMPANY CHARACTERISTICS

KNOWLEDGE SHARING

As the process already reveals, knowledge sharing is important for NPD. It is important that information will be shared between Sales and I&D. In addition, knowledge sharing is needed between areas of Sales and potentially other BG's to create an overview of the needs of the market. However, in the company knowledge is hardly shared between different areas, departments, and BG's. This is remarkable, since the function description does state the importance of the collaboration. The knowledge that is shared, is shared on basis of personal relationships or running into a colleague. Not many structured meetings are present to share knowledge between departments. Table 20 gives a summary of the presence topics in the present and desired situation.

Table 20. Knowledge sharing - Desired versus present situation

Topic	Desired	Present
Knowledge is shared over the boundaries of groups	Yes	No
Knowledge is shared in a structured way	Yes	No

CULTURE

It is stated that the current culture is not as innovative and customer focused as it is desired. There is no mission on innovation, which each employee is aware of and tries to strive for. The culture is rather individual, while in the desired situation a collaborative culture is

desired. It is stated that a collaborative culture which enhances knowledge sharing, also will enhance the customer focus and innovative character. As mentioned, it is remarkable that each of the employees interviewed, states to be very open to innovation. A summary is given in Table 21.

Table 21. Culture - Desired versus present situation

Topic	Desired	Present
Employees are open to innovation	Yes	Yes
Innovative focus	Yes	No
External focus	Yes	No
Urge to fulfill shared mission	Yes	No
Knowledge sharing culture	Yes	No

STRUCTURE

Also the structure could play a pivotal role in enhancing knowledge sharing and collaboration. The current structure seems to lead to a contrary result. Furthermore, the budget allocation and the way of rewarding seem to be counterproductive for knowledge sharing, collaboration and innovation, as shown in Table 22.

Table 22. Structure - Desired versus present

Topic	Desired	Present
Organizational structure enhances knowledge sharing and collaboration	Yes	No
Structure of allocating budgets is enhancing knowledge sharing, collaboration and innovation	Yes	No

CONCLUSION GAP ANALYSIS

Recalling, the main question to be answered in the diagnosis phase is:

What is the gap between the current and desired situation?

It can be concluded that there is a gap between the current and desired customer focused and innovative performance. Even though the gap cannot be quantified, it can be described how the gap is build up from a variety of six factors: performance; strategy; processes; knowledge sharing; culture; and, structure. Figure 18 shows the desired and current level of those factors. Concluding, the innovative and customer focused performance which is desired by both the company and the customers is not achieved at this moment. Although propositions are designed in the past, and customers do value the customer focus as sufficient, the company has not reached the level of innovative and customer focus performance as it desires.

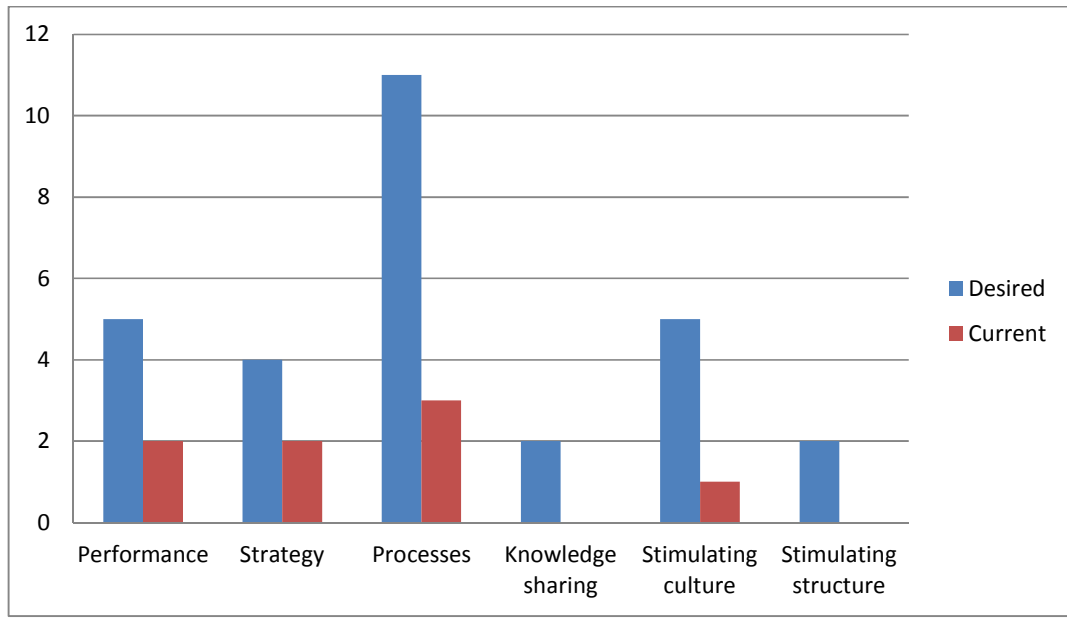


Figure 18. Graphical representation of the gap analysis

The first specific gap which could be related to the gap related to performance is *strategy*. The strategy is not yet aligned with the market, and is not known and lived at all the layers of the company. The second specific gap presented in Figure 18 is *processes*. The current processes of Sales and I&D do not result in the desired level of innovativeness and customer focus. There is a lack of a structured NPD process. In order to start such process, certain tasks additional to the current performed tasks have to be fulfilled. Sales is required to gather valuable information from the market, and communicate this to I&D. Furthermore, it is Sales' task to facilitate the contact with customers to execute pilots. Finally, Sales is responsible for selling the propositions. Although the latter task is already performed with the existing propositions, Sales is not retrieving information about the needs in the market. As a result of the absence of the NPD process, facilitating customers contact to I&D is not performed yet either. I&D is required to focus on external innovations, gather information about techniques in the market, focus on providing varying financial modes, and coordinate the NPD process. Currently, I&D focuses on the development of internal processes. These tasks also require additional competence. Third, a lack *knowledge sharing* is exists. Results showed that the departments Sales and I&D are not aware of the function of each other, and do not share information, which is required in the desired state. Interviews pointed out that the *culture* of the company is also related to the innovative and customer focused performance. The company's culture is desired to be stimulating for innovation. Although employees state to be open for innovation, the interviews indicated that the culture is not focused yet on innovation, the market, and knowledge sharing. Finally, a gap exists between the desired and current *structure*. The company's size, the matrix structure, and the allocation of budgets seem to hinder the knowledge sharing and collaboration in the company. This is not in line with the desired structure, which should support knowledge sharing and collaboration to come to new innovative concepts.

4.2 RESULTS: DESIGN

4.2.1 RESULTS DATA COLLECTION

Best practices: Interviews were held with the SM and the AM of DE. The interviews focused on the innovative character of the department, and the aspects of the process which are complementary to this performance. The most important elements according to those employees are compared with the analysis of the diagnosis, in order to define the difference in process.

Literature: Based on the gap analysis literature is searched. Literature about the strategy to align the processes with the environment, to screen the concepts, to reach customer focused implementation, the influence of the complexity on Sales employees, and the enhancement of knowledge sharing were found.

Experts: It was stated in the method that a focus group of BGD (1), TD (1), TM (1), SD (1), and SM (2) would be used in a participative design for both gathering improvement directions as on analyzing and choosing the solution direction. Unfortunately, as a result of the busy schedules of the members of the focus group and the low priority for innovation in the company, it was not possible to plan the sessions. Only one session was planned with the BGD (1), TM (1), and SM (2). One of the SM's was a new to this research. He participated instead of the SM who participated in the earlier interviews. During the focus group meeting first the results of the diagnosis were presented, followed by a broad description of the potential improvement directions. During this interactive presentation, the attendees were asked to rank the improvement as is described in the method.

4.2.2 RESULTS DATA ANALYSIS

BEST PRACTICES

Sales of the BG DE is focused on the front of the total customer process. DE is a young BG, less than 1 year old. However, it already has booked some successes. Because of the innovative and cooperative approach of the department, interviews were held with the SM and AM of the department. The difference between DE and other BG's lies in the moment of involvement in the process of the customer. Typically, contracts are of the Design and Building format. Mostly, this implies they are involved in projects where the total process is executed in a different order. The design phase is previous to the tender phase. Therefore, they have the possibility to advice and help designing customers early in the entire process.



Figure 19. Overall process conform new type of contracts

The company receives much freedom and is expected to work cooperative with the customer. The major elements that are present in the internal process of DE and not in BT are:

- Very strong focus on building trust, it is the basis each step in the process.
- Specific focus on innovation.
- Targets set on innovative performance of the employee.

LITERATURE

One of the sources for improvement directions is academic literature. With the insights of the gap analysis presented in Section 4.1.2, theories about factors that could be enhanced in the organization are sought. Specific theories about the strategic fit, tasks during the concept development stage, procedures during the implementation stage, and the communication within organization are discussed in this section.

CONCEPT DEVELOPMENT STAGE: SCREENING IDEAS

In the theoretical background systematic screening is mentioned as a very important step within the concept development stage. However, during the diagnosis phase it becomes clear that the screening is not yet very systematically designed.

Verhage and Van Weele (1981) present a method to organize the screening more systematically. They recommend creating an evaluation matrix in order to screen the ideas sufficiently. First the company should define evaluation criteria. “The evaluation factors to be used in the product evaluation matrix are those variables that the company feels are important for the successful introduction of a new product” (Verhage & Van Weele, 1981, p.82). The criteria could included business, social, or environmental factors. After setting the criteria, an analyst should add relative weights to each factor. Then the matrix framework is finished (see Appendix O for an example). For each product the matrix should be filled in. The factors have to be scored. A score of 0.0; 0.1; 0.2; ...; 1.0 can be given; 0.0 referring to very low score, and 1.0 to a high score. Of each factor the ranks are multiplied with the weight. The relative ranking of the factors are summed. This value implies the expected success of the product, by which it can be compared to the other products. Naturally, the products with the highest scores are further developed and the product with low scores will be eliminated. Verhage and Van Weele (1981) state that a score of 0.76 is commonly indicated as a good product.

IMPLEMENTATION STAGE: CUSTOMER FOCUS

Another point of concern within the company is the customer focus. Literature points out that it is common for companies to focus too much on the product during the sales of new products. Rackham (1998) claimed that this might result from the enthusiastic and state of the art presentations about the technological specifications that are given internally. He states that it is likely that Sales is impressed by the presentations and adopt the behavior. In order to prevent the focus on product specification during sales presentations, the internal process

should be adjusted. Instead of communicating the technological capacities, the focus during the internal launch should already be on the problem solving capacities of the product. After the presentation Sales should identify and target customers and plan the questions to be asked for a future call. Those questions should be mainly focus on problem and needs. In order to enhance the performance, role plays could be executed before the actual calls to the most important customers for the product happen.

KNOWLEDGE SHARING

The results point out that knowledge sharing within the company and with external partners could be enhanced. The theory of Ba and the SECI- model provide insights in creating an information sharing environment and steps which enhance communication and knowledge sharing. A short summary of those two theories are presented in this section. For a more elaborate description of the theories a reference is made to the literature review of Schaars (2014). Furthermore, it is discussed whether the physical structure of an office can have effect on knowledge sharing.

Theory of Ba and SECI- model. This theory of Ba presents a fairly abstract environment. According to Nonaka and Konno (1998, p.40) Ba can be seen as: “a shared space that serves as foundation for knowledge creation”. Four types of Ba can be distinguished. The first Ba is the originating Ba, which is about the individuals sharing feelings, emotions, experiences and mental models. According to Nonaka and Konno (1998) from this Ba care, love, trust and commitment emerge. Physical and face-to- face contact are key in this Ba. In the Interacting Ba, “individuals share mental model of others, but also reflect and analyze their own” (Nonaka & Konno, 1998, p. 47). The third Ba is the Cyber Ba. It is a virtual world where new and existing knowledge are combined. The last Ba is the exercising Ba, which enables the conversion of explicit to tacit knowledge. The interaction between tacit and explicit knowledge results in knowledge creation. Explicit knowledge can be expressed in words and numbers. This kind of knowledge can be exchanged, easily. The second type of knowledge is Tacit Knowledge. This kind of knowledge is very personal, and therefore hard to communicate. These Ba’s are facilitating the knowledge sharing process of SECI-model of Nonaka and Konno (1998). In this model individual knowledge is transformed in organizational knowledge by socialization, externalization, internalization and combination. For more background information a reference is made to the literature review of Schaars (2014).

Besides these abstract environments, physical environments can play a role in the knowledge sharing process. Stryker and Santoro (2012) found that in places with low-visibility, face-to-face communication could be improved by an open and low- walled workspace. However, they also found that workplaces which have high visibility in the company, for example because of walls of glass or a central place in the organization, no significant improvement can be found by the implementation of an open office design.

The company has to deal with both external as internal complexity. First, related to the external complexity, the gap analysis reveals that the current strategies' fit with the market could be enhanced on certain points. The current market can be described as a turbulent field, which is discussed in the section about the environment in the theory background.

In order to learn from the market, puzzle-solving learning could be used. According to Vasconcelos and Ramirez (2011) in a situation of puzzle-solving people are aware that they do not know something. Emery and Emery (1978) also explained that it is comparable with making a puzzle. It is known that a piece of the puzzle is missing, but only at the moment the piece is found you know where you were looking for. Within puzzle-solving also the possibilities outside the scope of the accepted conceptual probabilities should be considered (Emery, 1999), which requires more creativity from the learners.

The input gathered by the learning process, should be translated into a planning. In a turbulent market it is appropriate to use active adaptive planning. As Emery (1993,) stated: "Active, adaptive planning assumes the possibility of discontinuities" (p.234). With the use of the present knowledge, end-state should be searched (Emery & Emery, 1978). This method can be referred to as: desirable future scenarios. According to Emery (2000), the Search Conference (SC) can be used to create such scenarios by active adaptive planning. Rich and Martin (1999) describe the SC as method to develop strategic planning capacity by bringing diverse stakeholders together. The SC generally consists of three sessions. Those sessions are focusing on the external environment (market), the internal environment (company), and the integration of the external and internal environment. Emery (1993) emphasizes that the SC's success is strongly dependent on the preparation and planning of the SC, as well as on the actual implementation. For a more elaborate description of the SC a reference could be made to the literature research (Schaars, 2014).

Secondly, internal complexity increases in the company. As mentioned, to mitigate the gap between the current situation and an innovative and customer focused situation, it is expected that Sales perform additional tasks and use other competences. By adding more tasks and responsibilities, the complexity for Sales increases. Research shows that internal and external complexity are directly and indirectly negatively related to job satisfaction and sales performance (Schmitz & Ganesan, 2014). According to Schmitz and Ganesan (2014), personal resources such as self-efficacy could help the salespeople to handle complex situations, because high self-efficacy results in higher motivation to overcome hurdles. However, it must be added that high self- efficacy in consistent role stress could suffer from burnouts in the long run. Knight, Mich and Manion (2014) stated that Sales self-efficacy can be educated. They did research into Sales education and found that role playing in combination with experiential learning had a positive effect on a sales persons' performance.

CHOICE OF IMPROVEMENT DIRECTION

In this section the choice of improvement directions is discussed. The improvement directions are first ranked with the use of a focus group. Next, a ranking of the improvement directions is made, based on the alignment with the design requirements. Those two rankings are used to calculate an overall ranking, which forms the input for the decision of the improvement directions used in the design, presented in Section 4.2.3.

IMPROVEMENT DIRECTIONS

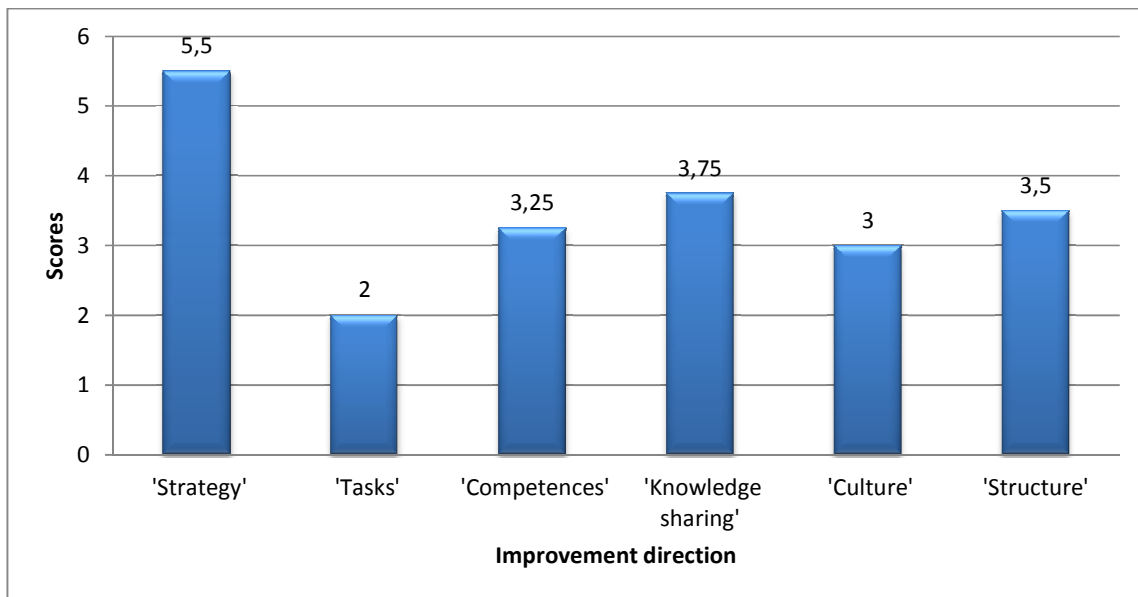
Based on the gap analysis six major improvement directions could be defined. The directions are only defined in a broad manner. The improvement directions which will be chosen will be designed in more detail, based on the best practices, literature and previous diagnoses. Those directions are presented in Table 23.

Table 23. Improvement directions

Improvement direction	Description
Strategy	- Strategy enhanced in such way it is more compatible to the changing market
Tasks	- Sales tasks focus more on the needs of customers and the overview of needs in the markets instead of the demands - I&D focus on promoting innovation and the department, gathering information about new techniques and focus on new financing ways - I&D coordinates the innovation process and actively gathers ideas internally - Sales will cooperate in innovation sessions with I&D - Solid knowledge sharing is performed
Competences	- Need-analysis is conducted and competence level will be enhanced
Knowledge sharing	- Improved communication and collaboration between members of teams, between geographical areas, between business groups and between different departments
Culture	- Culture which stimulates collaboration and innovation
Structure	- Structure which enables fast communication and solid collaboration

RANKING BASED ON FOCUS GROUP

Figure 20 shows the average score of each improvement direction. These scores are calculated with the ranking of each member of the focus group (see Appendix P).



Note. Highest score indicate highest ranking place.

Figure 20. (Reversed) Scores of ranking focus group

Resulting from weighted ranking scores per improvement direction, the improvement directions are ordered from most important to least important as follows: (1) 'Strategy', (2) 'Knowledge sharing', (3) 'Structure', (4) "Competences", (5) 'Culture', and (6) 'Tasks'. As Figure 20 shows, the improvement directions 'Knowledge sharing', 'Structure', 'Competences', and 'Culture' are relatively close to each other. In contrary, the difference in importance between 1 and the rest is relatively high. The most important reason that has been mentioned is that the strategy is the foundation of the success of the other factors. During the discussion, specifically budget was mentioned as an important factor. The budget influenced the participant's choices for ranking Strategy and Structure as important elements. However, there was not a uniform specific suggestion for improvement regarding budget. The reasoning for the high ranking of communication is closely related to structure. The lack of knowledge sharing is seen as a major bottleneck in the process to a successful, innovative and customer focused performance. Although culture is placed on a fifth place, the discussion point out that there is a relation between the culture and communication and structure. The fourth ranking place is for the competences of the employees of I&D and Sales. The reasoning is very short, only when the right set of competences is present, the current and potentially new tasks can be fulfilled successfully. Finally, tasks of I&D and Sales is ranked on the sixth place. Nonetheless the low ranking, it can be concluded from the discussions that the focus on tasks of I&D and Sales is seen as useful. However, the other directions are the fundamentals for success of the latter two directions. Without the right internal environment which supports innovation and collaboration, changes of tasks could not be implemented successfully. In addition to the ranking, it was asked whether the participants think other elements should be incorporated in a final design. Besides the explicit focus which is needed on budget, it was also mentioned by one of the participants that the external focus is essential for the design. The other participants supported this point. Remarks about the present internal focus, lack of linkage with the market and earlier failures because of the focus on techniques were mentioned.

Summarizing, an improvement suggestion should create a solid foundation in order to achieve a beneficial collaboration between Sales and I&D. This basis of strategy, culture, knowledge sharing and structure forms the breeding ground of a successful implementation of new tasks and competences.

RANKING BASED ON DESIGN SPECIFICATIONS

In this section, the improvement directions are scored based on the alignment with the design requirements. The design requirements consist of the categories: functional requirements; user requirements; boundary restrictions; and design restrictions (Van Aken et al., 2007). For each category requirements are defined with the managers who formulated the assignment (presented in Appendix Q). The alignment is scored by the researcher and presented in Table 24. Most important scores of each improvement direction are briefly discussed.

Table 24. Improvement directions scored to the alignment of the design requirements

Design requirements		Direction 1 <i>Strategy</i>	Direction 2 <i>Tasks</i>	Direction 3 <i>Competences</i>	Direction 4 <i>Knowledge sharing</i>	Direction 5 <i>Culture</i>	Direction 6 <i>Structure</i>
Function	Enhancement of performance	2	2	1	1	1	0
	Costs: benefits exceed costs	1	2	1	1	1	1
User	Competences are available	0	1	2	1	1	1
	User- friendly	2	1	2	2	1	2
Boundary	Compliance with legal requirements	2	2	2	2	2	2
	Compliance with current culture	0	0	0	0	2	0
	Compliance with vision/mission	2	2	2	2	2	1
Design	Duration: result in 6-12 months	1	2	1	2	0	1
Median based on design requirement		1,5	2	1,5	1,5	1	1

Note. Scoring requirements: 0 = zero alignment; 1= moderate alignment; 2= full alignment.

Improvement direction ‘Strategy’. The alignment with the design requirements shows that the improvement direction ‘Strategy’ fits well with the functional requirement related to performance. Costs are mainly related to the time invested in formulating and implementing the strategy. However, the formulation of the strategy already consists some main elements of the desired strategy. Therefore, a moderate alignment to both ‘costs’ and ‘duration’ is assigned. ‘Strategy’ is not aligned with the current culture, which is not focused on

innovations according the diagnosis (see Section 4.1.2). Based on the interviews in the diagnosis, it is also assumed that there is no alignment with the current available competences.

Improvement direction ‘Tasks’. The improvement direction ‘Tasks’ is directly related to the enhancement of the innovative and customer focused performance. The tasks which will be created in the improvement direction are designed to fit the vision and mission of the company and can be easily implemented in the company. Therefore, it is assumed there is a full alignment with the requirements based on costs and duration. However, certain additional competences will be needed in order to successfully perform the tasks. The tasks are not in line with the current culture, because the tasks do focus on innovation, knowledge sharing and interaction with the market.

Improvement direction ‘Competences’. ‘Competences’ are mainly indirectly related to the enhancement of the performance, through tasks. However, improving interaction with the market can immediately lead to a higher performance on customer focus. Therefore, a moderate alignment to the functional requirement based on performance is assigned. However, the direction competences which is related to tasks, will lead to higher costs. Even though training could be expensive, there is a budget available for personal development. The direction competences could be partly budgeted with this available money.

Improvement direction ‘Knowledge sharing’. Knowledge can be expensive when it involves changes in ICT infrastructure and changes in the office interior. However, because of the potential resistance for databases, the databases will only be designed in a very simple way with the potential for expansion in the future. Therefore, the initial investment will be low.

Improvement direction ‘Culture’. This improvement direction is the only direction that has full alignment with the culture. This is because it is aimed to change the culture in such way it will enhance the innovative and customer focused performance of the company. However, changing a company’s culture might take longer than a year.

Improvement direction ‘Structure’. Implementing a new structure will not lead to a more innovative and customer focused performance. However, according the diagnosis phase (see Section 4.1.2) a good structure will enable knowledge sharing and might lead to a more collaborative culture. Via knowledge sharing and culture, it might indirectly lead to a better performance

Based on the median of the alignment of the improvement directions with the design requirements, it can be concluded that ‘Tasks’ are ranked in first place. ‘Strategy’, ‘Competences’, and ‘Knowledge sharing’ follow, with all a median of 1,5. Therefore, all these directions are placed second. Finally, both ‘Culture’ and ‘Structure’ have a median level of alignment of 1, which receives both a fifth place.

OVERALL RANKING AND CHOICE OF IMPROVEMENT DIRECTIONS

An overall ranking of the six improvement directions can be calculated based on the two rankings presented above, (see Table 25). Calculation based on weighted rankings (see Appendix P) result in the following overall ranking: (1) ‘Strategy’; (2) ‘Knowledge sharing’; (3) ‘Competences’; (4) ‘Tasks’; (5) ‘Culture’; and (6) ‘Structure’.

Table 25. Overall ranking of improvement directions

Ranking	Direction 1 <i>Strategy</i>	Direction 2 <i>Tasks</i>	Direction 3 <i>Competences</i>	Direction 4 <i>Knowledge sharing</i>	Direction 5 <i>Culture</i>	Direction 6 <i>Structure</i>
Based on design requirements	2	1	2	2	5	5
Based on focus group	1	6	4	2	5	3
Weighted Ranking	1	4	3	2	5	6

Note. Ranking scores: 1= most important ... 6= least important.

The improvement directions ranked on the first four places are incorporated in the design: (1) ‘Strategy’; (2) ‘Knowledge sharing’; (3) ‘Competences’; and ‘Tasks’. Although ‘Tasks’ is the least important according the ranking based on the focus group, it is decided to also incorporate ‘Tasks’. In the alignment with the design requirements, this improvement direction has the highest score. Although the ranking of the focus group implies otherwise, the discussion during the focus group meeting indicated that the improvement direction ‘Tasks’ is very important. However, the low ranking is based on the assumptions the other gaps should be mitigated before the improvement direction ‘Tasks’ could be implemented successfully. In Table 26 the relations between the improvement directions are given. This implies that ‘Tasks’ is the only improvement direction which is strongly related to each of the improvement directions which are most important according to the ranking. Therefore, it is chosen to create a design based on ‘Tasks’, complemented by ‘Strategy’, ‘Knowledge sharing’, and ‘Competences’.

‘Culture’ and ‘Structure’ are not incorporated in the design, because their low ranking and the low feasibility regarding the duration of the implementation. Nevertheless, based on the focus group meeting; the scores regarding compliance with the requirement related to culture; and the relation between ‘Tasks’ and ‘Culture’ and ‘Structure’, it can be concluded that a solid culture and structure are necessary for a successful implementation. Therefore, the proposed design is created with under the condition that a stimulating culture and structure is present.

Table 26. Relations between improvement directions

	Direction 1 <i>Strategy</i>	Direction 2 <i>Tasks</i>	Direction 3 <i>Competences</i>	Direction 4 <i>Knowledge sharing</i>	Direction 5 <i>Culture</i>	Direction 6 <i>Structure</i>
Direction 1 <i>Strategy</i>	-					
Direction 2 <i>Tasks</i>	2	-				
Direction 3 <i>Competences</i>	1	2	-			
Direction 4 <i>Knowledge sharing</i>	1	2	1	-		
Direction 5 <i>Culture</i>	1	1	1	2	-	
Direction 6 <i>Structure</i>	0	1	0	2	2	-

Note. Scores relations: 0= not related, 1= moderately related, 2= highly related.

4.2.3 RESULTS PROPOSED DESIGN

In this section a design is proposed to enhance the customer focus and innovative performance of the company. The gap analysis showed that the gap between the current and desired performance consists of six varying gaps: strategy, tasks, competences, knowledge sharing, culture, and structure. Based on the focus group meeting and the test of the design requirements it is chosen to focus on mitigating the gap based on: strategy; tasks; competences; and knowledge sharing.

It is chosen to design a NPD process, which is mainly described by the improvement direction: ‘Tasks’. This improvement direction shows the best fit with the design requirements. However, the process exists of more elements than only ‘Tasks’ (see Section 4.1.2). It is required that there is interaction between departments to relate the activities of Sales and I&D. This can be done by mitigating the gap of knowledge sharing. Furthermore, accurate information should be retrieved from the market. Therefore, proper interaction with the market is needed, which can be achieved by a strategy which is aligned with the type of market. Finally, to successfully conduct the process, the gap between the current and desired competences should be mitigated. Although the gaps related to structure and culture are also inherent to the success of the proposed NPD process, this is beyond the scope of this thesis project.

Concluding, in this section first a NPD process in which I&D collaborative works with Sales is presented. In order to successfully implement the proposed process design, three elements needs to be aligned with the NPD process:

1. Interaction between I&D and Sales (knowledge sharing)
2. The interaction with the market (strategy)
3. Competences of the employees

Those elements are addressed in the presented sequence.

NPD PROCESS (TASKS)

In the diagnosis of current study, a process flow of the NPD process created by the department I&D is presented (see Figure 17 in Section 4.2.2). This process flow is used as starting point of the design. Furthermore, the structure presented in the literature of Section 4.2.2 is used as input for the proposed design.

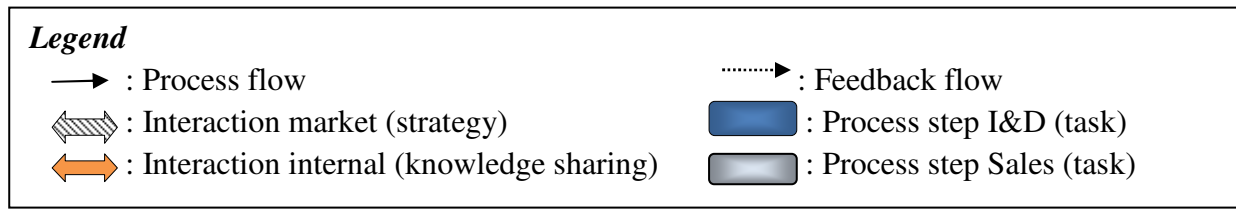
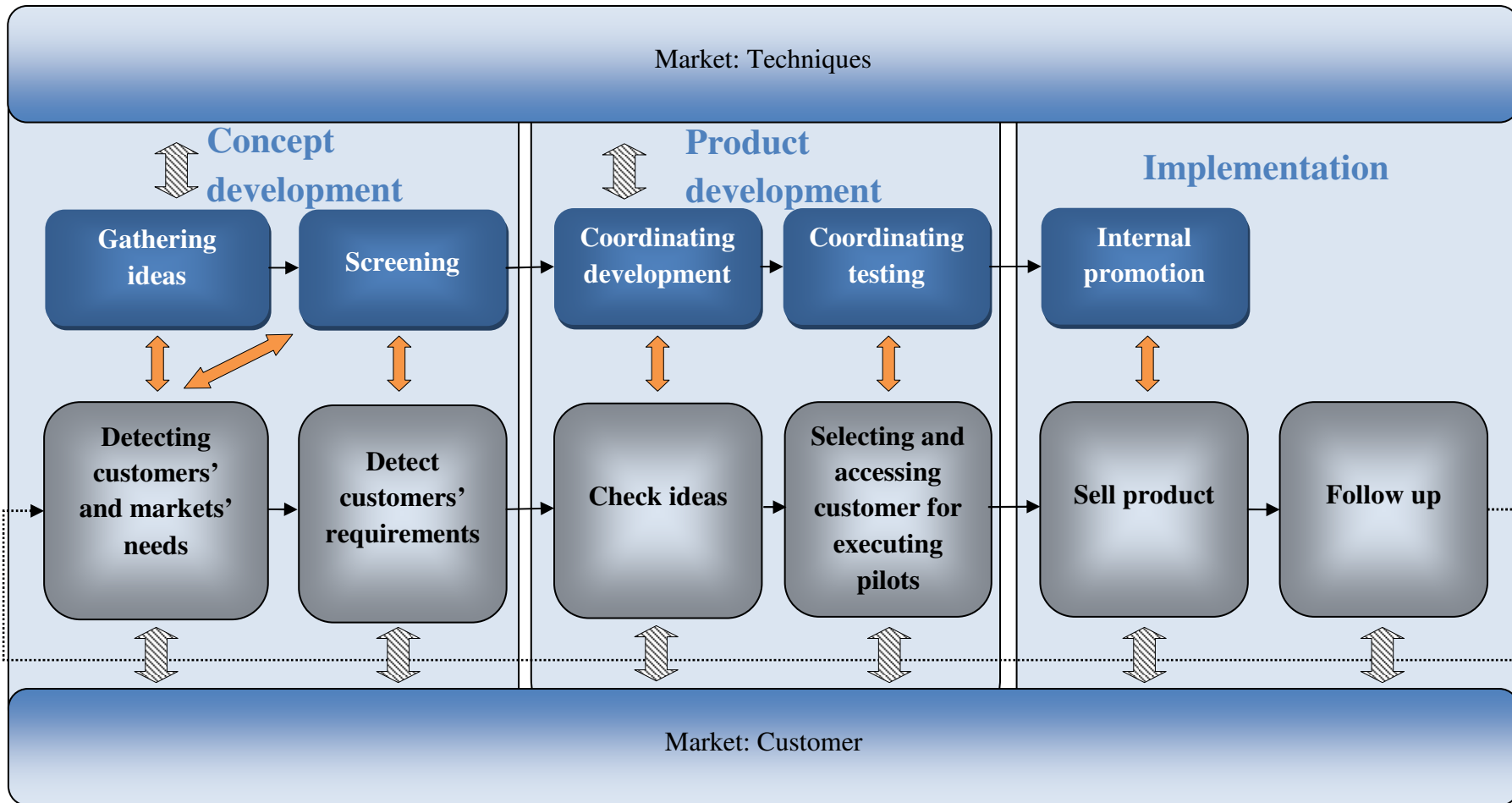


Figure 21. Proposed design: NPD process flow

Table 27. Overview proposed design: Interventions NPD process

Stages		Process		Interaction market	Interaction internal	Competences
Concept Development	I&D	Gathering ideas	Screening: Evaluation matrix (Verhage & Van Weele, 1980)	- Detect new techniques	- AB is contact person - Weekly Sales meetings	- Able to detect needs and changes in market
	Sales	Detecting customers' and markets' needs: - Needs behind the demand of specific customer - Overview of demand and needs in the market	Detecting customers' requirements: - Feedback - Overview of general requirements which come to the surface during the normal Sales process	Detect needs: - AM's visits customers - TC's can ask questions during Tender phase	- Transparency about departments through internal webpage - Use of tablets	- Knowledge of the market - Creativity - Passion
Product development	I&D	Coordinating development	Coordinating testing	- Detect new techniques and financial modes	- 3x3 session - Weekly Sales meeting	
	Sales	Check ideas: - Asks feedback from customer	Selecting and accessing customer for executing pilots	- Ensure customer focused products by checking and testing the developed products		- Create and remain trustworthy relationships with customers
Implementation	I&D	Internal promotion: - Present product to Sales			- TEC – tutorial - Sales days - Weekly Sales meeting	- Customer focused - Communication skills
	Sales	Sell product	Follow up: - Check customer satisfaction	- Sell product: provide accurate information about product - Use of tablets		- Self-efficacy
General				- Product differentiation strategy (all layers of the company) - Puzzle-solving learning - Active adaptive planning - Organize SC once a year	- Open office design - Informal events - Informal gatherings	- Competences needs-analysis - Customized trainings - Role playing - Innovation goal in general appraisal

Concept development stage. The NPD process starts with the concept development stage. In accordance with the process described in the diagnosis phase, I&D gathers ideas from multiple sources, including from Sales (see ‘gathering ideas’ in Figure 21). In addition, the diagnosis pointed out that it is desired that I&D detects new techniques in the market. Afterwards, they can check with the specialist whether it can be useful for the company. Sales is expected to create a clear picture of the customers’ and markets’ needs, which can be communicated to I&D (see Figure 21). Creating the information about the needs can be achieved by the interaction with the customers in the market. Information that is already gathered relates to the specific customer demand and certain customers’ requirements. However, in order to focus on innovativeness, the following information should be retrieved from the market:

- Needs behind the demand of specific customers
- Overview of demand in the market
- Overview of the needs in the market.

The second task of I&D in the concept development stage is to screen the concept idea. The theoretical background emphasizes the importance of go/no go decisions to ensure resources are spent on promising ideas (see Section 2.3). The diagnosis showed that the NPD process proposed by I&D focuses on creating a PID, and a Go/No Go decision is made based on broad defined criteria. The theoretical background (see Section 2.3) emphasizes the importance of go/no go decisions to ensure resources are spent on promising ideas. Therefore, it is proposed to screen the ideas more structurally. This can be done with the use of an evaluation matrix (see Appendix O) is proposed, following the procedure of Verhage and Van Weele (1981). On the vertical axis of the matrix, criteria the product should be met are summed. The criteria selected in the current process definition are rather general. More specific and measurable criteria are recommended. The criteria should be based on business, social and economical factors and should indicate values which are important for the company. In addition, the criteria for evaluation should also be aligned with the criteria for innovation set by the holding. Each criterion receives a weight, representing the relative importance of the criterion. One point can be divided over the criteria, by which the sum of the weights is always 1. On the horizontal axis a rating scale of 0.0 to 1.0 is placed. A rating of 0.0 implies the product does not fulfill this criterion at all or very poorly, while a rating of 1.0 indicates the product scores very well on this criterion. In order to screen the product, each criterion is rated. The rating can be executed with the knowledge acquired in the creation of the PID can be used as input the rating process. Afterwards, the rating score of each can be multiplied with the weight of the criterion. This results in a relative weight. The sum of the relative weight represents the overall expected success of the product. The company should set a minimum value for products which will be produced further. Recall: Verhage and Van Weele (1981) state that a score of 0.76 is commonly indicated as a good product. A template of an evaluation matrix is given in Table 28, and an example of an evaluation matrix in use is given in Appendix O.

Table 28 Template of evaluation matrix (created by researcher, based on Verhage & Van Weele, 1981)

Criteria	Weights	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Relative weights
A													Weight A x Rating score of A
B													Weight B x Rating score of B
C													Weight C x Rating score of C
D													Weight D x Rating score of D
SUM	= 1												>0.76

All ideas should be screened based on the evaluation matrix. This prevents execution of promising ideas and escalation of commitment of less promising ideas. As a result of the company's culture which is not very innovative and the pressure of the economical situation, it could be extremely important to have a quantitative underpinning for proceeding with a project. This might show the importance for proceeding, and give trust to the higher management that the project will be valuable, and solid decisions have been made.

As both stated in the theoretical background (see Section 2.2) and indicated by the stakeholders, Sales can provide valuable insights of the market for the screening process. Sales has close contact with customers, which gives them the opportunity to retrieve feedback about the concept ideas. Nevertheless, stakeholders stressed that this is only feasible when a solid relationship based on trust exists. The interviews regarding the current performance of the company indicated that such relations are present. Therefore, Sales can show the concept ideas to the customers to retrieve customers' opinions, providing that customers with solid relationships are selected. Furthermore, Sales could have a good overview of the customers' requirements. First, this could be asked when showing the concept idea. On the other hand, those requirements could also emerge from the current Sales process. During the visits of AM's and SM's those topics could be addressed. In addition, TC's receive documents of customers' assignments in which the specific requirements are stated. Additionally, in certain contracts they can ask questions about the requirements to the customers. In spite of the focus on specific assignments instead of the requirements of the new concept, TC's might notice a tendency for requirements which customers generally formulate.

Product development stage. In the theoretical background (see Section 2.3) it is showed that during the product development stage, the basis responsibility for R&D is the development of the product. However, the department I&D is not exactly the same as an R&D department. I&D does not develop the product itself, it gives coordination to the process. The actual technological developments are done by specialists. I&D controls the process and write the plans. The company has chosen to use the prince 2 method to accomplish this. Furthermore, the gap analysis showed that there is a need for offering new types of financial modes to the customers

(see 4.1.2). It is recommended that I&D will be responsible for incorporating financial modes in their design. In the focus group meeting it was discussed that the financial modes could either be presented in a separate proposition, or it could be taken into account in each concept that is placed into the market. Either way, I&D should coordinate this process during this stage. Sales could provide feedback from the customers regarding the ideas which can be used in the development of the product. As mentioned, this is most appropriate to approach customers with a well established relationship for these purposes.

The second tasks of I&D in the product development stage is the coordination of testing the products. It is Sales tasks to search for customers who are potentially interested in the new product and have a solid relationship with the company. Sales should also facilitate the contact with the customers. This is both in line with the process proposed by the company, as the collaboration proposed by the literature in the Theoretical background (see Section 2.2 and Section 4.1.2.)

Implementation stage. The *implementation stage* receives special attention. Rackham (1998) stressed that companies are easily seduced to focus too much on the product in the selling process (see Section 2.2.2). The desired state explicitly asks for a customer focused approach. Therefore, it is important to ensure the focus is not on the technical aspects of the product. This all starts with the internal presentation of the product. Instead of communicating the technological capacities, the focus during the internal launch should already be on the problem solving capacities of the product. After the instructions of the product, Sales can approach customers in order to sell the product. This is already part of the current general Sales process, as defined in the Sales process flow presented in the diagnosis (see Figure 15 in Section 4.1.2). In this case, the selling process starts with the proposition, which will be used as a trigger to come in contact with new customers, or customers with a well established relationship. Furthermore, it is recommended to execute the step Follow up. This is part of the general Sales process as presented in Section 2.2; however, it was not explicitly mentioned as a step in the current Sales process of the company. By follow up; feedback of the product can be gathered. This feedback might be used as input for improvements for the specific product, insights for new products, or reference projects which can be used to convince new customers (see Feedback flow in Figure 21). Then the sales process will be executed further as presented in Figure 15.

INTERACTION MARKET (STRATEGY)

Figure 21 shows that both I&D and Sales should interact with the market. The interaction is needed to create a product which is both innovative as customer focused, which is desired by the market and the company. However, during the focus group meeting it was mentioned that the company focuses mainly internal processes. To ensure the external focus, first a clear strategy should be formulated. The diagnosis of this study revealed that not all employees turn out to be aware of the mission and the vision on the basis of the strategy. Furthermore, the currently used strategy contains seeming contradictions (see Section 4.1.2). Therefore, the design proposes one

clear competitive strategy, and lower level strategies which are aligned with this competitive strategy. Diverse stakeholders, both of I&D and of Sales, indicated that the size of the company results in relative high overhead costs, which makes it hard to compete on price with smaller companies. This is in line with the results of the documents, at which the SWOT- analysis showed that the cost price of the products of the company are relatively high. Therefore, a competitive strategy based on costs is not suitable. Also a strategy based on focus is not applicable. The company serves multiple markets, which can be beneficial due to the strong dependence of the fluctuations in the markets. A differentiation strategy seems more suitable for the company. As Johnson, Whittington and Scholes (2011) stated: “Differentiation involves uniqueness along some dimension that is sufficiently valued by customers to allow a price premium” (p. 203). Innovation can play a pivotal role in a differentiation strategy. By providing innovative products of high quality, which are aligned with the true desires of the customer, the company can have unique added value in comparison to competition. This is also in line with the desires of the management, who indicated that having such USP is desired for the company. By this strategy the threat of competitors with lower prices decreases, because customers are served differently. Based on the diagnosis (see Section 4.1.2), it is assumed that the market desires a customer focused and innovative approach. The diagnosis (see Section 4.1.2) indicated that customers desire companies to be engaged in finding solutions to their problems. It was also revealed that customers do think innovations of the company are of high importance. As mentioned, the company already has a main focus on high quality. Besides, the current overall strategy also puts emphasis on an innovative approach. At the moment indeed innovative products are implemented in the market, which are in line with the markets needs, the premium price is justified and customers are attracted based on uniqueness of the products. Nevertheless, it is important to emphasize the pivotal role of the customer focused and innovativeness approach, as part of the competitive strategy of the company. Furthermore, it is necessary that this message is incorporated in the strategies of lower levels, such as the strategies of BG’s.

This competitive strategy stresses the importance and focus of the NPD process. This strategy gives focus to the type of product the NPD process should generate, and implement in the market. However, to accomplish the creation of such products, interaction with the market is needed during each stage of the NPD process (see hatched arrows in Figure 21). The type of interaction is shortly discussed per stage.

Concept development stage. In the concept development stage, I&D is expected to gather information from the market about techniques. New techniques can be detected by interacting with suppliers, knowledge institutes, looking at competitors and by partnering. Sales is required to interact with the market to detect the customers’ and markets’ needs and requirements. AM’s and can do this by the visits they have during a general Sales process. TC’s also have contact with customers in the Tender phase. This is already more focused on the requirements of customers.

Product development stage. I&D is also expected to interact with the market in the product development stage. Interviews pointed out that I&D should both focus on new techniques and financial modes. In this stage, I&D should interact with the market to detect the possibilities regarding these topics, which can be included in the development of the product. Sales is responsible for the interaction with the market, regarding the checking and testing of the concepts.

Implementation stage. In the final stage, the interaction with the market is primarily done by Sales. Sales should sell the product, and therefore should know which information to give to the customer in order to convince them to sell the product.

General interaction strategy. In order to successfully complete these former interactions in line with the differentiation strategy, requires a strategy related to market interaction. Therefore, the theory of Emery and Trist (1965) is used to determine a strategy for the Innovation Lines and Sales. Naturally, this strategy is in line with the competitive strategy, namely differentiation approach. It is recommended to use *puzzle solving learning* and *active adaptive planning*. With the use of puzzle solving learning and active adaptive planning, the company should be able to continuously scan the market, detect changes and act accordingly. Related to the innovation lines, this means that new products can be developed which are in line with the desires of the market.

In the current strategy, the company is focusing on specific targets. The aim is to fulfill the demand expressed by the customers. This implies searching for customers' demand (done by SM's and AM's) and trying to fulfill this demand (done by TM). However, in the current market changes can occur which cannot be fully estimated. This is a result from the complex and dynamic character the market has (see Section 4.1.2). In order to create products which are relevant at the moment of implementation in the market, the company needs to make use of *puzzle- solving learning*. As discussed in Section 4.2.2 it is not known yet which specific information is needed, until the information is found. For I&D this implies that they should interact with the market and search for trends in the technique. However, they do not know which types of techniques they are searching for. Sales is searching for changes in the need of the market. They do not know which specific changes they are looking for. Each small change, could lead to a large opportunity because of the complexity of the market. For example, the interviews pointed out that changes in regulations, can have major implications for the needs of customers. Therefore, when a customer mentions that they heard regulations might be going to change, they should recognize this information as a 'piece of the puzzle'. With the pieces of the puzzle, and the knowledge that not all pieces are complete, a new product needs to be designed which will be beneficial in the future. Therefore, active adaptive planning can be used. This is suggested for this turbulent environment by the literature presented in Section 4.2.2. With the use of the information gathered from the puzzle-solving learning desirable future scenarios should be created. For example, when it is known that environmental legislations will become stricter, this could imply that new products will be needed which are environmental friendly. However, this can result in many different needs for products. Different scenarios should be made. In order to

accomplish the creating of these scenarios, human resources are needed. This can be done by the use of the SC. This will enhance a proactive approach in which puzzle solving learning and active adaptive planning can play a flourishing role. As stated in the literature of Section 4.2.2, the SC will provide a practical plan to the company and incorporates the ideals of individuals. This will lead to a commitment of both Sales and I&D to execute the plan which arises from the SC. As stated by Emery (1993) selection of participants is extremely important for the success of the SC. In this case it is suggested to incorporate at least: management board, SD, TD, BGD, TM, all SM's, all AM's, and all IC's. Except from the management board, those participants are directly involved in the process, and could have access to valuable information which may serve as 'pieces of the puzzle'. The board possesses a broad overview of all the information available in the company. Besides, it can be imagined that parties outside the scope of this study can add value to the SC. This could include employees of the M&BD, realization, or purchase. When the company decides to do the SC with more parties, the community reference system proposed by Emery (1993) is advised as selection procedure. The participating employees defined above, defined are chosen as starting point of the community reference system. Each employee can nominate people who may participate. Those people can also nominate others. With the use of iterations, a pattern of names which can contribute to the SC should emerge, according to Emery (1993).

The SC should be led by a conference manager, which coordinates the process. According to Cabana, Emery, and Emery (1995) a skilled conference manager is required to ensure outside the box thinking. Typically, the SC duration is three days. In these three days a process is performed consisting of three stages: (1) learning about the market; (2) learning about the company; and, (3) learning how to integrate the market and the company with specific action plans (Cabana et al., 1995). At the end of the SC each participant should have an action plan to achieve the ideals which were formulated during the search. Self- management is essential to both Sales and I&D in order to be continuously adapting to the market. This will be the basis of applying puzzle solving and active adaptive planning.

It is recommended to perform a SC each year, when the strategy of the company is being formulated. In this way, the overall strategy and the innovation strategy can be aligned. For example, Cabana et al. (1995) indicate that the principles resulting from the SC can be used in formulating a mission statement. Furthermore, a yearly SC makes sure that each employee is motivated and aware of how they should interact with the market and which ideals have to be strived.

INTERACTION INTERNAL (KNOWLEDGE SHARING)

In the theoretical background of this thesis report, it is stated that the collaboration between R&D (I&D) and Sales has impact on the innovative performance. It could be retrieved from this section that knowledge sharing is central in these collaborations. Also the internal interviews and the focus group meeting stressed the importance of this factor (see Sections 4.1.2 and 4.2.2).

Therefore, knowledge sharing is central in the all stages of the proposed NPD process, as shown in Figure 21. The gap analysis showed that the current knowledge a sharing between the departments I&D and Sales is marginal. Interviews indicated that this might be due by the lack of a structured communication. In this section a proposed structure of specific knowledge sharing structure is discussed per stage. Secondly, some improvement directions the knowledge sharing related to the general NPD process are provided.

Concept development stage. As indicated by Ernst et al. (2010), Sales can channel ideas into the NPD process. Structured knowledge sharing is important, as Gordon et al. (1997) indicated that unstructured knowledge sharing can intervene with the positive relation between collaboration and NPD success (see Section 2.3.3 barriers to effective collaboration). Currently, there are some barriers in the company which hinder the knowledge sharing (See Section 4.1.2). The knowledge about other department is marginal. In addition, it is mentioned in the interviews that it could be difficult to find the right person to contact. Therefore, information sharing between Sales and I&D should be done by clear communication lines. Certain employees should be made responsible for the gathering of the information. By doing so, each employee knows who to contact if there is new information that has to be shared. This will be done with the use of AB, which form central contact person for a BG. This is proposed by I&D, as shown in Figure 17. Several stakeholders of Sales indicated that such structure will be beneficial. However, one of the stakeholders of Sales, stated that he was concerned that information will be scattered when each Sales person will go immediately to I&D. Nevertheless, it is chosen to retain this structure, because Gordon et al. (1997) remark that speed of knowledge is often to low in NPD (see 2.3.3). By using the AB, the communication lines are short and less time is lost in the communication process. However, to ensure the knowledge will reach each Sales person, weekly meetings with I&D and the SM's will be planned. The SM's can communicate the knowledge further to the rest of Sales. Those meetings should be seen as general update sessions in which both parties share their main findings, progress or irregularities regarding innovation. Ideas can be solicit and the needs of customers and potential success for ideas can be discussed. This is also in line with literature in Section 2.3 in which it is explained that the timing of inputs should structured. However, these meetings are not alone important to this stage, it can be valuable to all three stages of the NPD process. Additionally, the meetings show mutual commitment to reach a good innovative performance and emphasize the importance of innovation. Because several respondents indicate that too many meetings already exist, the meeting could be incorporated in the current meetings. Sales has a three- hour meeting each Monday with all the SM's. The first 15 minutes, a member of I&D might join the meeting. By scheduling this at the beginning of the meeting, the shared meeting can start on time. Moreover, Sales can further discuss the session during their own meeting afterwards. It is proposed that once in the three weeks the MT is present. The other weeks, each week one of the IC is present. After 8 weeks each IC has joined the meeting once.

Furthermore, it is very important for good communication and collaboration that the aim and the structure of the organization are clear. To increase transparency, the information about these topics should be easy accessible for all the employees. Therefore, a direction for improvement could be to enhance the internal webpage by adding an overview of the mission, vision, strategy and structure of the organization and the underlying departments. The page should start with displaying the vision and the mission, both phrased in only one clear sentence. After that, a short description of the strategy should be given. This summary should give insights in *how* the mission of the company should be fulfilled. A link to the strategic plan should be added. Everyone should have access to the strategic plan (potentially with non-accessible confidential parts). After those three topics, the structure of the company may be presented in an organizational chart. The organizational chart gives a quick overview of how the organization is structured, and which departments and functions are directly related. By clicking on the departments, a redirection to the departments' webpage will take place. Each department will have an own page. Similar to the company page, this starts with the aim of the department. The aim will be expressed in a one-sentence description and a summary of the operational plan. A link to an operational plan is provided. Naturally, this does imply that each department should have an operational plan with insights about the process description, the past performance, and SMART formulated goals and targets. Furthermore, each department should have an own mailing list, to which a link to outlook is provided on the webpage. Finally, the department's webpage should give access to more detailed information, such as news topics and former successes or projects. Referring back to the company page, a link to an overview of all news facts about successes should be added and a link to a holding page on which also vision, mission, a summary of the strategy and an organizational chart is presented.

Finally, the tablets mentioned in section knowledge sharing of Section 4.1.2, could be useful devices to store and share information. The current idea of the use of tablets can be used and additional functions might be added to the software. Sales indicated that they are not always aware of what other colleagues do. Furthermore, Sales employees explicitly focusing on specific markets can lead to missing chances in the market. With the use of a tablet, the Sales person has easy access to the propositions which exist in the market and can see who is responsible the specific proposition. The customer can be linked to the responsible person for that specific proposition, which increases the chance of selling. Additionally, it would be helpful if needs can be stored. By this, needs that occur frequently are easily recognized. By giving I&D access to this list, they can actively keep track of the detected needs in the market. Furthermore, the team is already developing a function by which insights can be given of the amount of times certain presentations are shown to customers. These insights can also imply certain needs, which can be valuable to the concept development stage. An overview of the design is given in Table 27.

As discussed, screening is done based on the PID created. The NPD process developed by I&D subscribe 3x3 sessions, which will be retained. In those sessions one Sales employee, one M&BD employee and one specialist will participate.

Product development stage. As indicated, one Sales person will be part of a project team of a specific concept development process. This person will participate in the 3x3 sessions, but is also involved in the product development stage. Therefore, he/she has direct contact with the IC to share the knowledge found by the interaction with the customer.

However, the weekly 15 minute meeting can provide a broader opinion of the customers and new potential customers for pilots might be detected.

Implementation stage. The research of Ernst et al. (2010) does not show a significant relation between cooperation of Sales and R&D (I&D) and the overall NPD project performance. However, as stated in processes, I&D could add value to the customer focus of the selling process of Sales. Internal promotion focusing on the problem solving capabilities of the product could be provided. As indicated in the diagnosis (see Section 4.1.2), a few times a year TEC-tutorials focused on Sales are organized. Furthermore, once a year a Sales day is scheduled, by which the entire Sales department and sometimes customers are present. Stakeholders of Sales indicate that it could be useful to present about the new propositions in those meetings. Besides those meetings, the general 15 minutes meetings will be used in the implementation stage.

General to the NPD process. The proposed forms of interaction between the departments I&D and Sales are focused on formal and structured knowledge sharing. This structured knowledge sharing is related the Interacting Ba presented in Section 4.2.2. This Ba facilitates the externalizing of knowledge in the SECI- model (Nonaka & Konno, 1998). However, the SECI-model also stressed the importance of informal knowledge sharing, related to the Originating Ba. The Originating Ba creates a place where individuals share feelings, emotions, experiences and mental models. As a result, care, love, trust and commitment could emerge according to Nonaka and Konno (1998). Therefore, the enhancement of informal contact between individuals and teams is important. In the current situations, contact is only present when employees meet someone unintentionally or it is someone of their personal network. To enlarge the internal personal networks and increase the moments people meet informally, three improvements are selected. Following the theory of Ba, physical and face-to- face contact are pivotal in the process of informal knowledge sharing.

- The interviews pointed out that the company has a culture of separate departments. The comments of respondents indicated that the physical design of the offices might be related to that. It varies over the offices of the company, but most have relatively small offices separated by walls. None of the departments have high visibility. With the use of the research of Stryker and Santoro (2012), it is proposed to have high a more *open office design*. This could have positive effects on the information sharing. One of the Sales departments recently moved to a slightly more open workspace. One of the employees mentioned this was a large improvement. Also the researcher observed a higher level of knowledge sharing. Colleagues have more personal informal contact and can easily ask questions related to work. This enhances the efficiency as a result of direct knowledge sharing and decreases the chance that work will be executed double.

Besides that, the chance that a person coincidentally obtains important information about a project will increase.

- *Informal events* could enhance the relations between the employees. This could be events with the entire company, events with the BG's, and events with the separate departments. By varying the events on those levels, the relationships and knowledge sharing on these levels will also be enhanced.

- By creating nice breaking areas, with small kitchens, you enable *informal gatherings* between the employees. It should be a place at which the employee feels comfortable. This increases the times employees meet unintentionally, and will form the basis of developing personal connections. In addition, weekly informal gathering moments could be organized. By providing some small snacks at those kitchens each week at a fixed time, employees will have a nice break and meet each other.

COMPETENCES OF THE EMPLOYEES

The last part of the proposed improvement directions are the competences of the employees. The proposed improvement direction so far, lead to additional tasks for I&D and Sales compared to the current situation; requires a different way of thinking due to the strategy proposed to enhance the interaction with the market; and, requires proper knowledge sharing of the desired internal interaction. Each element involves specific competences or characteristics of the employees. The competences are discussed per stage of the NPD process.

Concept development stage. Both Sales and I&D are expected to interact with the market and retrieve certain information. Although this is important in all stages, it is especially related to the concept development stage. In this stage the information from the market needs to be translated into new product ideas. In order to fulfill these tasks in the turbulent market of the company, puzzle-solving learning and active adaptive planning is proposed. As mentioned above, the SC can be used to set ideals and to create a plan which facilitates the puzzle- solving and active adaptive planning. However, according to Purser and Cabana (1997) knowledge, passion and creativity of people are required in order successfully conduct a SC. Therefore, it is needed that both Sales and I&D have a clear perception and knowledge of the market and are enthusiastic and motivated to share their ideals for the company. In the interviews concerns about the competences of the AM are expressed. The concerns were specifically related to the ability to retrieve the true needs of customer instead of the expressed demand. Finally, creativity is needed, which can be stimulated, but is also depended on the nature of the person.

Product development stage. In the product development stage the customer is most closely involved in the NPD process. Ideas are specifically checked with the customers and pilots are performed. The results of best practices emphasize the importance of trust in the relationships with customers, during cooperative design. Although the company seems to already have

trustworthy relationships with many customers, the importance maintain trust during the NPD processes stresses the focus of creating and maintaining relationships based on trust. Especially, because respondents remark that customers are open for innovations, however, sometimes also anxious for new products which have no references yet (see 'desired performance for the company' in Section 4.1.2).

Implementation stage. In the implementation stage, I&D is required to promote the new product (concept) to Sales. This has to be done based on the capabilities of the product which are beneficial to the customers, instead of the technical aspects of the product. This requires I&D to be customer focused and using strong communicative skills. Secondly, Sales is responsible for selling the product. This is part of the general Sales process (see Figure 15 in Section 4.1.2). Fu et al. (2010) found that Sales self-efficacy is positively related to the performance of selling new products. Self-efficacy is not only directly beneficial to Sales performance. Schmitz and Ganesan (2014) indicated that personal resources such as self-efficacy could be helpful for the Salespeople to handle complex situations. This is extremely important, given the complex market and the complex internal structure of the company. Furthermore, adding more tasks in order to enhance the innovative and customer focused performance, increases the job complexity. The focus of Sales is expected to be broadened, because their main goal of maintaining existing customers and gaining new customers is extended with searching for innovative opportunities. This will increase job complexity, because also the competences of the Sales employees need to be enhanced in order to fulfill the new tasks. Therefore, it is concluded that self-efficacy is extremely important.

Development of competences. Concluding, several additional competences are needed in the desired situation. Therefore, a solid need- analysis should be held in the company. By analyzing which specific competences are needed and which are present, customized training can be created. It is recommended to include role playing in the trainings. Knight et al. (2014) found that role playing in combination with experiential learning during education for future Sales people could increase self-efficacy, which was stressed to be important to this company. Because in the case of the company, the sales people are already employed in the field and could learn from the field, role plays could be a beneficial addition.

By the use of customized trainings, Sales and I&D can enhance the competences needed to support the NPD process. Furthermore, the analysis could reveal competences which can be incorporated in the function description and the appraisals of the employees. Measuring and enhancing the skills lead to a better output, but also put emphasize on the importance of innovation. Therefore, it is also recommended to incorporate an innovation goal in the general appraisal form of all the employees of the company. Namely, best practices indicate that targets on innovation which are related to the performance of the employee could enhance the innovative performance. Even though some of the function descriptions already possess these goals, it should be present at all layers. By making it a general performance goal, the emphasis on achieving the goal will be stronger.

Summarizing, a structured NPD process is proposed. The NPD process is based on the NPD process designed by I&D; however, additions are made to create more specific tasks. Sales activities are linked to the NPD process. It has to be mentioned that the tasks of Sales in the concept development stage and in the implementation stage are strongly related with the current Sales process. Therefore, by stressing focus on innovations; gaining insight in true customers' desires; and gaining insights in the overall markets' desire, inputs for the NPD can be retrieved from the general Sales process. Only during the product development stage, Sales should perform tasks outside the scope of the general Sales process. Furthermore, an interaction strategy is proposed to interact properly with the market; a design for structure knowledge sharing is discussed to share enhance internal interaction; and focus is placed on enhancing competences in order to execute the additional required tasks.

5. Conclusion & Recommendations

Outline

- Conclusions
- Recommendations

5. Conclusion and recommendations

5.1 CONCLUSIONS

In this section the conclusions of the research are presented.

First of all, the conclusions of the diagnosis phase are discussed. In this phase, three sub-questions needed to be answered. The first sub-questions related to the current situation of the innovative performance. Recalling the first sub-question:

1.1 What is the current situation of Sales and I&D in terms of innovative and customer focused performance and in terms and processes?

The customers of the market seemed to think the customer focused and innovative approach is sufficient. However, the analysis did show improvements could be made. Internal diagnosis showed that the innovative and customer focused performance is moderately present in the current situation. The general processes of Sales are presented in a process flow. Furthermore, the diagnosis revealed that the currently the focus of the company is on the daily processes. Sales does perform some tasks of the NPD process. However, those tasks are additional to the general process; therefore, the NPD does not receive priority. The process is unstructured and the required resources and expertise are not present. In the diagnosis phase the Innovation Lines of I&D are not implemented yet. Therefore, the current focus of I&D is on internal processes.

The second and third sub- questions related to the desired performance of both the market and the company.

1.2 Which innovative performance is desired by the market and which processes of Sales and I&D are required to serve this market properly?

1.3 What is the innovative strategy of the company and which processes of Sales and I&D are required to perform accordingly?

Both questions were answered. The diagnosis indicated that the customers do desire innovative products and a company which is engaged in thinking with the customer. Furthermore, the market was defined as a turbulent. This requires processes which are adapted to a market in which changes frequently occur and cannot be predicted easily. Also the company's strategy showed the need for an innovative and customer focused performance. The company is creating an NPD process, the Innovation Lines, which will be coordinated by I&D. The Innovation Lines are desired to produce innovative products which are aligned with the needs of the market. Collaboration between Sales and I&D is desired by the company, to ensure the alignment of the products with the market.

Based on the answers of the first three sub-questions the fourth question regarding the gap between the current and desired situation can be answered. The sub-question was formulated as follows:

1.4 What is the gap between the current and desired situation in terms of innovative and customer focused performance and processes?

The diagnosis showed that a gap between the current innovative and customer focused performance exist. This gap consists of five factors: strategy, processes, knowledge sharing, culture and structure. Of each gap certain criteria are defined by the company and the market. A comparison is made between the number of criteria present in the current and the desired situation. However, the diagnosis cannot give an answer on the specific size of the gap between the current and desired situation.

With more insights of the managerial challenge regarding the desire to be more innovative and customer focused with the use of collaboration between Sales and I&D, a Design was created in the design phase. However, three sub-questions needed to be answered in this phase. Recalling the first sub-question of the design:

1.1 Which requirements does the company have regarding the improvements?

The answer of this question is formulated with the use of the categories: functional requirements, user requirements, boundary conditions, and design restrictions. Unfortunately, the requirements are only formulated with the use of the insights of the managers who formulated the managerial challenge. No further insights of employees of the company are used.

The second design sub-question that was formulated is as follows:

1.2 Which potential directions for improvements could be formulated with the use of best practices, literature and experts' views?

With the use of books, scientific papers, and the department DE as best practice, six improvement directions are formulated. The experts' view was not utilized in order to answer the question. The improvement directions are based on: tasks, competences, knowledge sharing, strategy, culture, and structure. These improvement directions have been ranked based on a focus group meeting and the alignment with the design requirements. Considering this ranking, it was chosen to create a design based on strategy, tasks/ competences (processes) and knowledge sharing. However, the results showed that concerns about the feasibility of the design can be expressed related to the factors culture and structure. Hereby, the final design sub-question is answered, which was formulated as follows:

1.3 What are feasible improvements for Sales and the Innovation Lines?

The main question of the design phase was:

How could the gap between the as-is and to-be situations be mitigated?

The formulated gap can be mitigated by the design presented in this report, based on strategy, processes and knowledge sharing. However, the level by which the gap will decrease is a point of concern, regarding the structure and the culture of the company.

Finally, the main research question should be answered. Recalling the question:

How to become more innovative and customer focused with the use of collaboration between Sales and Innovation and Development?

With the use of the design it can be concluded that the company can increase the innovative and customer focused performance by a structured NPD process in which both Sales and I&D play a role. I&D is responsible for the coordination of the process, while Sales provides insights in the market's needs and facilitates the collaborations with the customers. In order to use valuable information of the market and translate it in products which are desired by the market, a solid strategy is needed. Furthermore, knowledge sharing between the departments Sales and I&D could be increased by formal and informal contact moments. All together, this will enhance the innovative and customer focus. However, the culture and structure of the company could form a barrier to the desired level of the performance.

5.2 RECOMMENDATIONS

It is proposed to the company to follow a clear strategy which focuses on the quality of the product. This also implies that the products should be innovative and customer focused. In order to create such products, it is recommended to define the NPD process in more detail, focusing on critical decisions and ideals that will be strived for. Within this structured process, it is required to have solid collaboration between Sales and I&D in order to achieve the customer focused concepts (products). Sales could provide I&D with information of the needs of the market in order to create new concept ideas and to check whether potential concepts are desired by the market. Furthermore, Sales can facilitate the contact moments with customers, to test products. On the other hand, I&D can provide new concepts, which gives Sales the opportunity to come in contact with customers and gain new assignments. Therefore, knowledge sharing is pivotal in the NPD process. It is proposed to organize structured meetings where knowledge valuable for NPD can be shared. Both meetings of a general character, as meetings about specific NPD project could be scheduled. It is proposed to schedule general meetings in the first fifteen minutes of the weekly Sales meetings (Video Conference can be used). The meetings for specific projects are organized in project teams who participate in 3x3 sessions. Besides these formal meetings, also informal knowledge sharing could be enhanced. It is proposed to enhance informal knowledge sharing by an open office environment, informal events and informal gatherings. Finally, technology can be used to enhance knowledge sharing. The internal webpage could be adjusted,

such that the transparency in functions and roles of departments increases. This will enhance the ease of contacting the right person for the right information. Besides, the use of tablets is proposed, to gather, store, and utilize insights of the market and concepts. However, it is required that valuable knowledge is extracted from the market in order to serve as valuable information for the NPD process. Therefore, a strategy to interact with the market is needed. It is important to continuously detect changes and trends in the market and act accordingly. As a result of the dynamics and complexity of the market, no specific purposes can be defined and no clear estimations of the future can be made. In the current market, ideals should be strived for. Therefore, all the information that is known could be a valuable part in the creation of multiple potential future scenarios and the creation of new products which match these scenarios. This requires Sales and I&D to behave in a different way. The SC can help to set ideals and actions plans which can facilitate the process of gathering and translating knowledge about the market in products which are desired by the market. However, specific competences and characteristics are required to perform a successful SC and NPD process. Therefore, it is recommended to create solid competence need- analysis and provide customized trainings to the employees. Finally, the increase in the variety of tasks for Sales, increases job complexity and potentially decrease the Sales performance. Therefore, it is recommended to use a management style which focuses on decreasing complexity and supporting Sales in the complex process.

Besides the recommendations based on the design presented in this report, it is also recommended to the company to take the culture and structure of the company into account. As the results showed, those factors can play a pivotal role in the success of the NPD process. Furthermore, incorporating more departments to the NPD process could be valuable. This is further elaborated on in the limitation section (Section 6.1.2) and the suggestions for further research (Section 6.1.3).

6. Discussion and Reflection

Outline

- Discussion
 - Relevance of the research
 - Limitations of the research
 - Suggestions for further research
- Reflection

6. Discussion / Reflection

6.1 DISCUSSION

6.1.1 RELEVANCE OF THE RESEARCH

The research adds value to the current literature by considering both the internal environment as the external environment (market) of a company in designing innovation processes. Furthermore, it adds value to the company, by providing insights in the alignment of their innovative strategy with the current market, and with the internal processes related to innovation and customer focus. The research indicates which strategy will enhance customer focused and innovative performance and the collaboration between Sales and I&D is discussed per stage of the NPD process. Implications are given for the structure of the process, knowledge sharing and achieving competences regarding the proposed strategy. Those suggestions can be used with the implementation of the innovation lines of I&D.

6.1.2 LIMITATIONS OF THE RESEARCH

Besides the relevance of the research, also limitations of the research have to be addressed. Firstly, the innovation lines are being developed to create value across the barriers of the BG's. However, this research solely focuses on Sales of one BG. As a result of the scope of the project it was not possible to research all the departments. Because of the varying structures of the departments and the differences in markets, no generalizations could be made. This is a limitation of the research.

A second limitation is the qualitative focus of the research. No scores could be linked to the presence of factors in the current and desired situations. Therefore, the size of the gap could not be determined. It would have been valuable for the company to have more quantitative insights.

Thirdly, all the functions present in the structure of Sales are researched, while only the management functions of I&D were researched. At the moment of research, the department was created and not yet all functions were fulfilled. Therefore, only the management could be interviewed. However, it would have been valuable when both departments could have been researched with equal focus.

6.1.3 SUGGESTIONS FOR FUTURE RESEARCH

Based on the limitations of the research, implications for future research are formulated. It would be interesting to produce results on a more quantitative way. This research can be used to

develop a survey. By conducting this survey to all sales employees of a company, a more general insight could be given. This could give more insight in the size of the gap of the specific factors.

Secondly, it would be interesting for future research to investigate the effect of other departments on the innovative and customer focused performance. As current literature already reveals, M&BD is influencing the NPD directly and indirectly through an impact on Sales. Furthermore, also employees that are operating in the realization and/ or maintenance phase could add value to the NPD process. Those employees have close contacts with customers, spend a significant time in the organizations of customers and are frequently confronted with problems of the customers.

Finally, the company could benefit from research into the structure and culture of the company. This research indicates that the culture and structure of the company have a negative impact on knowledge sharing, collaboration and innovation. It would be valuable to research how the current culture and structure could be adapted, in order to enhance the NPD process.

6.2 REFLECTION

The thesis project was longer than planned. This was caused by both the availability of information in the company and the focus of the report.

Firstly, a slow start had its origin in the knowledge I had about the structure of departments. As a result, multiple introductory meetings had to be planned. These introductory meetings gave me insights in the structure and the size of the departments. The size of all Sales departments together, would have been too large to retrieve valuable results in the time planned for the thesis project. Therefore, I decided in approval of my supervisors to scope down the project and to choose one BG as group of interest of the research, namely, BT. Furthermore, these meetings made me realize that the BG DE had a different approach than the other BG's. DE was not focusing on one segment of the market, but was operating at all segments in order to design new concepts. Therefore, I decided together with my supervisors to choose DE as best practice. After these decisions, I could start planning the interviews. The shifts in labor caused some difficulties by selecting the Sales areas to be researched. Some functions were not fulfilled at the moment of the research, other functions were just fulfilled by a new employee. Incorporating those new employees, would not have given a valid view. Therefore, I decided it was more valuable for the research to select a TC of another Sales Area. The new TC was chosen based on the knowledge that this employee had worked in the chosen area before. Furthermore, it was not possible to plan focus group meetings with all the selected participants. Therefore, it was chosen to only schedule one meeting. The first meeting was designed to discuss the results and gather inputs for improvement directions, while the second meeting would focus on the choice of the improvement directions. The gathering of input for improvement directions consisted of multiple sources, while the choice of the improvement directions was strongly depended on the focus group. Because only one meeting could be scheduled, to was chosen to schedule only the second meeting. The results were shortly mentioned, in order to detect major disorders. Furthermore, a

summary of all the results were sent to all the internal respondents, to give them the opportunity to identify potential disorders. Because planning more formal meetings was not feasible, questions about the design were asked when meeting stakeholders in an informal matter. This gave insights in the ideas for the design and in the feasibility of the proposed designs. This leads to an iterative and creative design process.

Secondly, the design of the research caused difficulties in following the planning of the project. The focus of the design was relatively broad, by incorporating general aspects of the company. During the project the scope was narrowed down. However, time already has been invested in these aspects. Even though this has led to a rich result and interesting future research implications, a more narrow focus at the beginning of the project could have led to more in-depth results and a less timely project.

Finally, the literature research preliminary to the master thesis, showed some interesting insights on how companies, groups and individuals can learn from the environment. Those insights might have been useful, when more insights on the learning processes of the company have been determined.

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Appendices

The appendices of this thesis report are made confidential.