Managing Contextual Innovation
An expert based case study at Philips Shaving & Beauty

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<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>1.1</td>
<td>Problem statement</td>
<td>6</td>
</tr>
<tr>
<td>1.2</td>
<td>Research goal and motivation</td>
<td>9</td>
</tr>
<tr>
<td>1.3</td>
<td>Research questions</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Methodology</td>
<td>12</td>
</tr>
<tr>
<td>2.1</td>
<td>Data collection methods</td>
<td>15</td>
</tr>
<tr>
<td>2.2</td>
<td>Research overview</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>Innovation Planning Process</td>
<td>20</td>
</tr>
<tr>
<td>3.1</td>
<td>Process description IPP</td>
<td>20</td>
</tr>
<tr>
<td>3.2</td>
<td>Involved parties</td>
<td>26</td>
</tr>
<tr>
<td>3.3</td>
<td>Shortcomings of the IPP</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>Lean Development</td>
<td>31</td>
</tr>
<tr>
<td>4.1</td>
<td>Theory</td>
<td>31</td>
</tr>
<tr>
<td>4.2</td>
<td>Lean for Philips</td>
<td>32</td>
</tr>
<tr>
<td>4.3</td>
<td>Lean in IPP</td>
<td>34</td>
</tr>
<tr>
<td>5</td>
<td>Contextual Innovation Management</td>
<td>37</td>
</tr>
<tr>
<td>5.1</td>
<td>Theory</td>
<td>37</td>
</tr>
<tr>
<td>5.2</td>
<td>Commonalities and differences of CIM and LPD</td>
<td>39</td>
</tr>
<tr>
<td>6</td>
<td>The practical applicability of CIM</td>
<td>46</td>
</tr>
<tr>
<td>6.1</td>
<td>Choice for Contextual Factors</td>
<td>46</td>
</tr>
<tr>
<td>6.2</td>
<td>Cases</td>
<td>49</td>
</tr>
<tr>
<td>6.3</td>
<td>Positioning of cases</td>
<td>52</td>
</tr>
<tr>
<td>6.4</td>
<td>Process-options</td>
<td>54</td>
</tr>
<tr>
<td>6.6</td>
<td>External expert-interviews</td>
<td>58</td>
</tr>
<tr>
<td>6.6.1</td>
<td>Qualitative results</td>
<td>58</td>
</tr>
<tr>
<td>6.6.2</td>
<td>Quantitative results</td>
<td>62</td>
</tr>
<tr>
<td>7</td>
<td>Conclusions and recommendations</td>
<td>67</td>
</tr>
<tr>
<td>7.2</td>
<td>Conclusions</td>
<td>67</td>
</tr>
<tr>
<td>7.2</td>
<td>Recommendations</td>
<td>70</td>
</tr>
<tr>
<td>8</td>
<td>Discussion</td>
<td>78</td>
</tr>
<tr>
<td>8.1</td>
<td>Discussion of practical goals</td>
<td>78</td>
</tr>
<tr>
<td>8.2</td>
<td>Discussion of theory</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Literature</td>
<td>82</td>
</tr>
</tbody>
</table>
Appendices

Appendix A: Value Proposition House ................................................................. 85
Appendix B: Voice of the Customer Tree ............................................................. 85
Appendix C: Process Survey Tool IPP ................................................................ 87
Appendix D: Improvement actions for IPP ............................................................ 88
Appendix E: Lean goals for Philips S&B .............................................................. 89
Appendix F: Examples of levels for Contextual Factors ...................................... 91
Appendix G: Questionnaire step-by-step ............................................................. 93
Appendix H: Questionnaire ............................................................................... 97
Appendix I: Interviewing step-by-step ............................................................... 105
Appendix J: Choices for process-options ............................................................ 141
Appendix K: Chi-square analyses ..................................................................... 142
Appendix L: Experts from within Philips S&B .................................................... 143
Appendix M: Business Balanced Scorecard ....................................................... 144

Figures and tables

Figure 1: Innovation process Philips Shaving & Beauty ......................................... 6
Figure 2: Questions, methods and output ............................................................ 12
Figure 3: Methods of data collection (adapted from Kumar (2000)) .................... 15
Figure 4: Research overview ............................................................................ 19
Figure 5: Elements in the IPP ........................................................................... 20
Figure 6: Activities in the IPP ........................................................................... 21
Figure 7: IPP major activities and deliverables per department ......................... 27
Figure 8: Goals for Lean Development ............................................................... 33
Figure 9: Positioning of the cases by internal experts ........................................ 53
Figure 10: Recognized modules in IPP ............................................................... 55
Figure 11: Process-option 1 ............................................................................... 56
Figure 12: Process-option 2 ............................................................................... 57
Figure 13: Process-option 3 ............................................................................... 57
Figure 14: Positioning of the cases by external experts ...................................... 61
Figure 15: Graphic representation of process-choices ....................................... 65
Figure 16: Building blocks IPP ......................................................................... 72
Figure 17: Flowchart of recommended steps .................................................... 76

Table 1: Contextual factors per category ............................................................. 47
Table 2: Choices for process-options per case .................................................... 62
Table 3: Chi-square outcomes .......................................................................... 63
Table 4: Context of innovations within Philips S&B .......................................... 70
Table 5: Type of Innovation, factors and levels ................................................... 91
Table 6: Type of Organization, factor and levels ............................................... 91
Table 7: Type of Industry, factors and levels ..................................................... 92
Table 8: Type of Culture, factors and levels ....................................................... 92
1 Introduction

Philips has been one of the most innovative companies in the world, since Gerard Philips founded the company in 1891. The company consistently appears in the top of rankings of innovative companies in the world (Businessweek 2009). With the latest slogan ‘Sense and Simplicity’ the company wants to make clear that their customers come in first place. It wants to create products that make sense to the customer and are easy and clear in use. This strategy calls for a consumer-centered innovation management practice.

Innovation management has evolved over time and can be described in four generations (Ortt 2008). These generations can be shortly summarized as 1) technology push, 2) market pull, 3) parallel processes and 4) innovation in networks and systems (Rothwell 1994).

1) In manufacturing companies the main corporate emphasis was on R&D to create new product ranges and on manufacturing build-up to satisfy the burgeoning demand for them. Under the above conditions it is not, perhaps, surprising that the process of the commercialization of technological change, i.e. the industrial innovation process, was generally perceived as a linear progression from scientific discovery, through technological development in firms, to the marketplace. This first generation, or technology push, concept of innovation assumed that “more R&D in” resulted in “more successful new products out”. This first generation brought the corporate R&D laboratory.

2) During this period of intensifying competition and growing strategic emphasis on marketing, perceptions of the innovation process began to change with a marked shift towards emphasizing demand side factors, i.e. the market place. This is the emergence of the second generation or market-pull model of innovation. According to this simple sequential model, the market was the source of ideas for directing R&D, which had a merely reactive role in the process. This second generation adapted project management methods to R&D.
3) During a decade of severe resource constraint it became increasingly necessary to understand the basis of successful innovation in order to reduce the incidence of failures and, indeed, it was approximately during this period that the results of a number of detailed empirical studies of the innovation process were published. This meant, for the first time, that the successful innovation process could be modeled on the basis of a portfolio of wide-ranging and systematic studies covering sectors and countries. Essentially, these empirical results indicated that the push and pull models of innovation were extreme and atypical examples of a more process of interaction between, on the one hand, technological capabilities and, on the other, market needs (Rosenberg and Mowery 1978). This resulted in the third generation interactive, or coupling, model of innovation. This brought internal collaboration between different functions in the firm.

4) The early 1980s were a period of economic recovery with companies initially concentrating on core businesses and core technologies. This was accompanied by a growing awareness of the strategic importance of generic technologies, with increased strategic emphasis on technological strategies. The notion of global strategy emerged (and there was a rapid growth in the number of strategic alliances between companies. Shortening product life cycles meant that speed of development became an increasingly important factor in competition leading firms to adopt so-called time-based strategies. Two of the most important features of this generation are integration and parallel development. Innovating companies integrate suppliers into the new product development process at an early stage while at the same time integrating the activities of the different in-house departments involved, who work on the project simultaneously (in parallel) rather than sequentially (in series). Even when completely simultaneous development is not possible or, as in the case of science-based sectors, not necessary, a degree of functional overlap with intensive information exchange is essential.

When taking a closer look at the innovation processes within the specific Philips Shaving & Beauty division, an evolvement along the lines of these four generations can be seen. Over the last decade, the general idea of market-pull innovation has been adopted by many companies; including Philips (Elst, Tol et al. 2006). This is clearly
reflected in the mission statement of Philips: ‘We improve the quality of people’s lives through timely introduction of meaningful technological innovations’.

Today, Philips’ innovation process shows a mix of characteristics of the third and fourth generation of innovation management (Elst, Tol et al. 2006).

As innovation within the Business Unit Shaving & Beauty (S&B) has become more and more driven by consumer insights, which is in line with the corporate strategy, the process of innovation within this division has changed as well. In the different generations of innovations management the roles of the Technology and Development department (TnD) and the Consumer Marketing department (CMM) differ (Griffin 1997). In the early generation (technology push), innovation found its way bottom up from the TnD department. The ideas for new products in Shaving & Beauty were originated in Drachten, the location of TnD. The role of CMM contained finding a way to market these new technologies. In the current situation CMM, located in Amsterdam creates the menu for innovations on the basis of consumer insights (market intelligence). This menu is used as the starting point for the function creation and later on for the development of the desired products.

Adaptation to these new roles takes time. Conflicts of interests and differences in knowledge between technicians and marketers leads to inefficient innovation processes during this adaptation phase (Dunphy and Herbig 1995). From the TnD department, concerns have been arising about the long-term development of technology and the continuity in growth of the performance of the products. On the other hand, marketing managers of CMM state that innovation within S&B should be even more demand driven and market oriented. The technological limitations are perceived as hampering for innovation and therefore they believe the TnD department should be consulted in a later phase of the innovation process. It is a continuous challenge to balance all these different interests and aspects of product development within Philips Shaving & Beauty. The ultimate effect of these implications on the result of the innovation process are unclear to Philips S&B. This research will contribute to finding an answer to the above mentioned question in order to improve the efficiency of the innovation process within Philips S&B.
1.1 Problem statement

Innovation within Philips S&B is managed in a structured way. The complete process of innovation from planning to creation is defined as the ‘innovation program’, and is divided into three main processes. The innovation program starts with the Innovation Planning Process (IPP). In this phase consumer insights are transformed into concepts and product propositions, for example a new shaver that can be used in the shower. The second phase is called Technology and Function Creation (TFC). In this phase the actual technologies for the proposed functions are developed. In the last phase, Integrated Product Development (IPD), the product is constructed, tested, mass-produced and shipped for the first time.

![Innovation Process Diagram]

*Figure 1: Innovation process Philips Shaving & Beauty*

The goal of this standardized and structured process is to improve efficiency. However in practice it appears that the early phase of innovation (IPP) is difficult to manage and to forecast due to the inherent exploratory character of this process (Ward 2007). Different IPPs are carried out in very different ways; this translates into a gap between the trajectory described in documents and the way of working in practice. Along the way of an IPP it becomes clear which activities need extra focus and time.
The IPP is described in a work-breakdown structure with ‘major activities and deliverables’ (Appendix II). This schedule describes which departments should complete certain activities and their deliverables. For every IPP this structure is used, regardless of the type of innovation and the context it is in. This means that the timeline set in the work-breakdown is unpredictable and therefore leads to inefficiency (Rothwell 1994). As innovation is to a large degree the driver of the success of Philips, efficient and effective innovation programs are of high importance to the company. In an attempt to improve the performance of these programs, Philips has recently introduced the concept of Lean Product Development (LPD) into this part of the organization. Lean Development considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and therefore a target for elimination. Philips S&B has set goals for lean development (Appendix E) in the innovation program. The implementation of lean development in the TFC and IPD phases has proven to be successful, as is stated by managers from both TnD and CMM. As a number of goals focus on improving communication and cooperation between these two departments, the conflict of interest in these specific phases has decreased. Since the implementation, the process has become more efficient and the end product was of a better quality. The latter is supported by the results on the Business Balance Scorecard (BBSC)\(^1\) (Appendix M). An important item of the BBSC is the field call rate, a number representing the number of products returned from the market. This number has decreased significantly. This success drives the managers to implement lean development also in the IPP. The IPP consists of activities that explore a broad range of possibilities for new products; therefore not all activities contribute directly to the development of a product that customers pay for. This does not mean that these activities can be seen as waste, because such a broad exploration is needed to come to the most meaningful and rewarding innovations. Philips S&B therefore has difficulties recognizing which activities within the IPP are adding value and which activities could be seen as waste. The tools and performance indicators of LPD focus on the reduction of waste in processes, but in

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\(^1\) The Balanced Scorecard is a framework for designing a set of measures for activities chosen as being the key drivers of the business.
order to use the tools and indicators a clear understanding of value within the
development of the product should be present. This leads to difficulties implementing
LPD in the IPP and using the tools and indicators presented by this theory. Because of
the contrast between the exploratory character of the IPP and the more practical and
straightforward character of the TFC and IPD, in which the idea that is created in the
IPP is further developed into a function or product, implementation of lean
development in the early phase of innovation has not succeeded yet. It is unclear to
Philips S&B how to create leaner IPPs.
1.2 Research goal and motivation

As the implementation of standard LPD methods seem to be inappropriate for IPP, other alternatives to come to a more efficient process need to be explored. A new way of looking at innovation management is described in literature by Ortt and Van der Duin. Their concept is called Contextual Innovation Management (CIM), it describes how innovation processes are influenced by their context. In the literature on CIM it is stated that the way of innovating should be adapted to contextual factors such as: the type of innovation, the type of organization, the industry and the country or culture. This proposed contingency approach suggests that companies should use combinations of the former four generations that are described in most literature on innovation and R&D management (Ortt 2008), depending on the context of the desired innovation.

Within Philips S&B, the concept of Contextual Innovation could contribute to better-specified activities and deliverables in the IPPs for different innovations. These better specified activities and deliverables would lead to IPP’s that are better measured to their environment. This could help to better manage and forecast the IPP’s, which creates the opportunity to develop in a more effective and leaner way.

The goal of this research is to investigate the possibilities of improving leanness by adapting the concept of CIM and to translate these possibilities into recommendations for Philips to carry out their IPPs in a more efficient and effective way.

The proposed research is of great relevance for both the science on innovation management and the practical environment of product development companies. It will contribute to the understanding of the limitations of LPD regarding fuzzy explorative front-end innovation processes. The literature on innovation management does not yet cover these limitations and possible solutions to the problems of determining value and cutting waste in exploratory phases of innovations programs. A solution for creating a leaner front-end process of product development by using CIM will contribute to the incomplete literature on innovation management and will be a supplement to the existing theory on Lean Product Development. The more practical
part of the research goal, to provide Philips S&B with recommendations on implementation of CIM in order to carry out their IPP in a leaner way, can be valuable for all companies which struggle to innovate in an efficient and effective way. Many companies perform activities in the front-end of their innovation program, which are fuzzy and exploratory and therefore difficult to measure on performance. These companies are always searching for better ways to optimize these kinds of processes. CIM is a new theory that provides a contextual view on these processes to better measure them to the task at hand. An example of how to implement this theory in a practical environment as Philips S&B has never been described. Therefore, the recommendations made in this research will not only be valuable to the IPP of Philips S&B, but can also be regarded as a guideline for other companies in search of a method to improve the effectiveness of the front-end of their innovation programs.

### 1.3 Research questions

In order to reach above mentioned research goal, the following research question needs to be answered:

**How can Contextual Innovation contribute to Lean Product Development in IPPs of Philips Shaving & Beauty?**

This research question will be divided into the following sub-questions:

**How is the IPP organized within Philips Shaving & Beauty?**

The first step is to take a closer look at the framework of IPP within Philips S&B. The structure of the process is described including the activities, deliverables and the involved departments. Eventually, the shortcomings of this framework are analyzed and possibilities for improvement are described.

The current way of operating in the IPP is now clear. Next, the goals for LPD, which have been set for the TFC and IPD within Philips S&B, are specified. This is done in order to extract the relevant goals for the IPP.

**What goals does Philips S&B Beauty need to set in order to improve leanness of the IPP?**
The next step in answering the main research question will be to determine the common goals of the concepts CIM and LPD. These common goals create opportunities for influencing leanness through CIM.

*What common interests do the concepts of CIM and LPD have?*

The opportunities that arise by comparing CIM and LPD need to be applied to the specific situation of IPP within Philips S&B. Therefore, the most relevant contextual factors for IPP within Philips S&B need to be determined.

*What are the most relevant contextual factors within Philips S&B and in what way could they influence the planning of the IPP to create a leaner process?*

Eventually, the research will result in recommendations that can be used by Philips to implement leaner IPPs by using the concept of Contextual Innovation.

*What can be recommended to Philips S&B for implementing CIM in the IPP in order to innovate in a leaner way?*
2 Methodology

To answer each sub-question, the most effective research method is selected and used. The selected methods are described in this chapter, with further elaboration on the reason for using this method. Data will be gathered to come to a well-founded answer to each question. The sources from which the data needs to be gathered will be made explicit. Also the outcome (product) of each question will be described.

An overview of all the questions, methods and output is provided in the figure below.

![Figure 2: Questions, methods and output](image)

1) How is the IPP organized within Philips Shaving & Beauty?

**Research methods:** Document research and field observations

To answer this sub-question first research is done on internal Philips documents, in which the IPP is described in detail. The choice for document research to answer this sub-question follows from the nature of the required data. The characteristics and phases of used innovation processes are objective and factual described in documents. To gather knowledge of the way IPP works in practice, the method of field observation is used. By observing the process, all different dimensions and possible conflicts of interest become clear.

**Data:**

![Philips Logo](image)

Master thesis Systems Engineering, Policy Analyses and Management
To answer this question, data about characteristics and phases of the IPP within Philips Shaving & Beauty are gathered, in theory and practice.

**Outcome:**
An overview of characteristics and phases of the IPP within S&B.

2) **What goals does Philips S&B need to set in order to improve leanness of the IPP?**

**Research method:** Document research

The choice for conducting document research to answer this sub-question follows from the nature of the required data. The goals set by Philips S&B for LPD are objectively and factually described in documents. From these goals the most relevant goals for the IPP are filtered, together with the management.

**Data:**
Goals for Lean Development described by Philips S&B and the interpretation of managers within S&B.

**Outcome:**
An overview of the most significant goals for LPD within Philips S&B and a selection of most important goals for the IPP.

3) **What common interests do the concepts of CIM and LPD have?**

**Research methods:** Literature study

Due to the theoretical nature of this question, it needs to be answered by studying literature on Contextual Innovation and Lean Development.

**Data:**
Characteristics of both concepts will be described. Common interests will be derived from these characteristics.

**Outcome:**
Set of common goals of CIM and LPD.
4) What are the most relevant contextual factors within IPP of Philips S&B?

**Research methods:** Literature study, expert interviews

An overview of contextual factors derived from literature will be presented to internal experts from Philips S&B. In individual expert interviews they will be asked which contextual factors they perceive as most relevant for the IPP within Philips S&B.

**Data:**

From contextual factors mentioned in relevant literature concerning CIM, the most relevant contextual factors for IPP within Philips S&B are derived.

**Outcome:**

A description of contextual factors that could help Philips to create leaner IPPs, together with the expected effects.

5) In what way should these most relevant factors influence the planning of the IPP to create a leaner process?

**Research methods:** Case studies, expert interviews, statistical analysis

Case studies are used in expert interviews with internal and external experts to validate the choice for the two most relevant contextual factors that resulted from the previous question. Three alternative process options for IPP are designed, in cooperation with management. For each case study, the external expert is asked to select the most effective and efficient of the three process options. To determine the significance of the choices made by the external experts, the Chi-square analysis is used.

**Data:**

8 case studies of finalized innovation programs within Philips S&B are scored by experts on the two most relevant contextual factors that resulted from the previous question. Three alternative process options for IPP are designed, in cooperation with management, which are scored by the external experts in the context of the case studies.

**Outcome:**

Statistic significance of the choices made by the external experts on the 8 different cases.
6) What can be recommended to Philips S&B for implementing CIM in the IPP to innovate in a leaner way?

**Research methods:** Data analysis

A comparison between the characteristics and cases found in literature and the more practical data from the activities deployed for answering the previous questions needs to be conducted. The data will be analyzed and this analysis will lead to recommendations for Philips S&B to implement CIM in order to create leaner IPPs.

**Data:**

No new data is needed.

**Product:**

Recommendations on how to implement CIM in order to create leaner IPPs.

### 2.1 Data collection methods

In this thesis two kinds of data sources are used: the primary sources and the secondary sources (see Figure 3).

![Methods of data collection](image)

**Figure 3:** Methods of data collection (adapted from Kumar (2000))
The two green colored data collection methods (literature and interviews) have been used most extensively for this research. The other two methods are also used but in a less extensive way.

To answer the first research question, research on in internal documents (a secondary source) is combined with observations done in IPP activities (a primary source). These two methods are combined to get an honest insight in the way of working during an IPP. The researcher acquires the possibility to compare the theoretical description of the IPP with the day-to-day business of this process.

As can be seen in Figure 2 the thesis entails a literature review on the concepts of LPD and CIM, a secondary data source. One of the ways to find relevant literature on these concepts is by searching the Internet. Websites like scopus.com and scholar.google.nl are useful sources to start the review to find relevant articles and journals. Also the TU Delft Library has an extensive selection of articles, journals and books in its collection, which could be of relevance for this research. Literature study on these concepts puts the research question in a broader theoretical perspective.

To narrow down the broader theoretical perspective, expert interviewing can be used. Expert interviewing is one of the primary data collecting methods, used for conducting a research. This method is used when knowledge, facts and opinions of individuals are concerned (Stewart and Cash 2008). In addition, interviewing can help to get more in-house information, such as internal documents and annual reports of organizations. Various types of interviews can be used: structured-, semi-structured-, topic-focused- (all written or oral), unstructured or group interviews (Groenendijk and Dopheide 2003). Within this thesis the oral semi-structured interview outline is used. In this type of interview the interviewer uses an interview guide with questions that are mostly open-ended, designed to encourage the respondent to talk freely around each topic. In this case, the concerned topic is the interpretation of the CIM in the chosen cases. It is in particular this ‘respondent encouraging feature’ that makes the semi-structured interview a very useful tool within the problem area specified in this thesis. This feature is also the main reason why for example written questionnaires and observation are not used in this research for retrieving information from external
experts. The concept of CIM in combination with the LPD goals is a particularly new and unknown research area. The experts could add important knowledge to the interview, because of the oral and semi-structured outline, knowledge that could be missed by observation or written questionnaires.

The semi-structured (oral) interviewing has more advantages, next to the ‘respondent encouraging feature’ in that (Van der Velde, Jansen et al. 2004):

- Interviewing produces more response rate.
- Interviewing helps to address more topics; questions may be adapted during the course of the interview in response to immediate feedback from the respondent.
- Information can be supplemented by observations (e.g. non-verbal reactions, field observations).
- Face-to-face interaction tends to heighten the respondent’s interest in participating and forces him or her to consider the question immediately.
- Interviewing has less risk of skipping questions by the interviewee and questions can be explained in order to avoid misunderstanding.
- Interviewing can be a better method, especially in case of explorative researches.
- Interpersonal communication makes the interview not only a method for data collection but also an instrument to stimulate and involve potential beneficiaries or stakeholders.
- Interviewing yields large amounts of information/data in a short period of time.

Using the oral semi-structured interview outline can also have some disadvantages (Groenendijk and Dopheide 2003):

- It is time consuming, while addressing a smaller number of respondents
- This type of interviewing requires a more skilled interviewer, to come to the desired information and to interpret the result of the interviews
- It is difficult to process the interview outcomes statistically; difficult to compare outcomes of the different interviews
- The interviewer/respondent bias may play a heavier role
The second disadvantage is of great importance for this research. A very clear introduction on the topics is key to the outcome of the interviews. Therefore much effort will be put into this introduction and the communication of the goals of the interviews to the respondents. Because the outcomes of the interviews will be used in a qualitative manner, the third disadvantage is less relevant for this research. The aim of the interviews will be to gain information about the view of the respondents on CIM within the IPP of Philips S&B. The disadvantage of the time consuming character of this method is compensated by the ‘respondent encouraging’ character of the semi-structured interview outline. The final info gained can be of more value. The respondents’ interest in participating will be triggered more and could stimulate them to present more strategic information.

For the interviews in this research a distinction is made between respondents from within Philips S&B (internal experts) and respondents from outside the company (external respondents). The choices made regarding these different types of respondents will be further clarified in the particular sections of this research. Overall the following assessment was made for these choices; when the information to be gathered assumes a certain degree of knowledge about processes, cases or roles within Philips S&B, internal experts are selected to retrieve the information. When the information aimed for needs to be unbiased and objective, external experts on innovation processes are approached.
2.2 Research overview

Figure 4 shows an overview of the research. As mentioned in paragraph 2.1, four different sources of information are used in this research.

![Diagram](image)

**Figure 4: Research overview**

The figure shows the information resources for every part of this research. A connecting line displays the links between the different parts of the research. For every part the chapters in which they are elaborated are given. This way, an overview of the total research is presented.
3 Innovation Planning Process

How is the IPP organized within Philips Shaving & Beauty?

The key processes of the innovation program are the Innovation Planning Process (IPP), the Function Creation Process (FCP) and the Integrated Product Development (IPD).

The IPP covers the transformation of market demand and technology into a validated Value Proposition House (VPH), an overview of the specified customer demands and the associated product specifications (Appendix A). Figure 1 on page 3 shows the total innovation program of S&B. The IPP is the first process in the innovation program. In this chapter a description of the IPP within S&B will be given. In the first section the most important IPP schedules that describe the process will be discussed. The second section shows shortcomings of the current process. The gap between the process design in theory and how the process is carried out in practice will be described.

3.1 Process description IPP

Philips describes the IPP in different schematics, which show different levels of detail on the elements and activities.

Figure 5 shows an IDEF-0 scheme presenting the basic elements of the IPP.

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2 A function modeling methodology for describing manufacturing functions, which offers a functional modeling language for the analysis, development, reengineering, business processes.
The IPP is divided in four general activities; ‘Analysis’, ‘Insight development’, ‘Proposition development’ and ‘Validation and programming’. The input for the IPP consists of market knowledge and technology knowledge gathered by marketing management in Amsterdam and technology development in Drachten. The different concerned departments within these organizations will be specified later on in this chapter. During the process a continuous check is done with the general framework of the ‘Business Strategy’ of Philips S&B. This is a set of programs and policy rules, but not a person or department. Methods, tools and management are the enablers for the IPP. The output of this IDEF-0 scheme, being innovation roadmaps and Value Proposition Houses, are used as input for the next process, the TFC. The strength and quality of these Value Proposition Houses (VPH)³ and innovation roadmaps are crucial to the ultimate success of the whole innovation program, as they should be transformed into useful functions in the TFC and eventually into products in the IPD.

In figure 6 the four activities from the IDEF-0 are specified in more detail.

Figure 6: Activities in the IPP

This figure shows the activities along a timeline of approximately 8 months. These activities together form one IPP process, from consumer insights to VPH and innovation roadmap.

³ A VPH is a standard way of representing a value proposition you want to bring to market, capturing what’s in it for the target group, why they would believe it, and what makes the offering distinctive.
The process is divided in 10 major activities:

1) **Proposition development briefing**

   Provides a formal basis for a new project and should outline its main ideas. The briefing makes sure starting points and success criteria, including the evaluation criteria, are clear to all and are agreed by the relevant stakeholders. For example, a market trend shows a growing demand for skin caring and nurturing shaving products. New functions in shaving could be developed to answer to this demand.

   The proposition development briefing should offer:
   - A clear view on why the project should be executed (sales, profit, growth, market share) and which countries will be included.
   - A description of the deliverable and the tasks to be executed to realize this result.
   - An overview of which customers should be appealed by the new product.
   - A planning of the project, including budget and resources

2) **Analysis**

   During the analysis all available information on market demands and existing technologies is collected to prepare the data dump. A data dump is an activity performed to evaluate all present information and to make a selection on relevance. The knowledge gap in the existing information will be determined. Identification of the steps needed to acquire the missing information is done.

   For example, available Consumer Insights of the shaving consumer regarding skin effects from current shaving technologies are gathered.

   The content of the data dump should be tailor made to the proposition development briefing. Missing information can be obtained via various activities, for example through:

   - Personal experience
   - Direct end-user contact (meet-your-end-user sessions)
   - External collaboration with outside experts
   - Commissioned market intelligence
   - Recycling old research
3) Platform generation workshop

The goal of this process is to generate end-user platforms through cross-disciplinary workshops. An end-user platform describes themes around S&B that are based on end-user needs. These platforms should not refer to specific product solutions. For example, in an end-user session with consumers from the new identified segment a brainstorm is done to verify and elaborate on the proposition development briefing. The results are used as input for the next step of insight drafting or as input for focus groups.

A method to come to these platforms is to create moodboards\(^4\). A moodboard focuses on the emotional level of consumers and stays away from abstract words. This way it allows non-verbal consumers to express their ideas.

4) Writing insights

Writing various insights, based on the selected platforms. These insights put in clear wording the results of the platform generation workshop and capture various thoughts and conclusions. It is not a closed statement and contains merely behavior, emotions, motivations and interests of the customer. An insight describes a dilemma of the consumer regarding a product and the reasons why this is a dilemma. The written insight describes a desired end-state that would solve this dilemma. For example, the consumer states that shaving is important for the feeling of freshness and a representative look. However the feeling of the skin after shaving is perceived as negative.

5) Insight confrontation

Getting consumer feedback on freshness and excitement around insights through focus groups or qualitative information. It creates the possibility for improvement of the insights using the new information and the discovering of uncharted territories. Either the same or a new end-user platform is created to validate the written insights externally.

\(^4\) A moodboard is a collage of materials (images, text, colors, textures, website screen shots, etc), which captures the ambience or feel of a place or design.
6) **Insight validation**

Insight validation leads to improvement of the insights using the new information and the discovering of uncharted territories. Also the wrong assumptions can be discarded. In some cases the quantitative strength of the insight can be determined. The insight can be improved. Eventually, the involved departments within Philips S&B commit themselves to the validated insights.

7) **Proposition generation**

Validated insights are the starting point for the proposition development workshop, an internal workshop in which the validated insights are further specified, creating credible and exciting end-user propositions that include benefits\(^5\), reasons to believe (RtB)\(^6\) and discriminators\(^7\). At the end of the workshop a number of propositions has been generated. For example, to solve the dilemma of the shaving consumer regarding the negative feeling of the skin after shaving, propositions could include scrubbing, massaging, steaming.

8) **Proposition confrontation**

The propositions can be validated with the end-user by testing the new functions in a concept lab\(^8\) before going into quantitative research in a later phase. Getting qualitative consumer feedback on validity and strength of propositions through the focus groups of the concept lab helps by improving the propositions on benefits, RtB and discriminators. For example, different massaging concepts are tested and evaluated by the consumer in the concept lab.

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\(^5\) Functional benefit states what the appliance or service actually does. Emotional benefit states how the target feels or what it brings to their life when they experience the benefit.

\(^6\) An RtB makes credible that the benefits will be delivered. This is what buyers refer to when they talk about their purchase choice regarding the product.

\(^7\) The discriminator is what makes the proposition unique and distinctive. It motivates consumer to buy the product.

\(^8\) A concept is tested by consumers in a closed environment in order to gather clear consumer insights.
9) **Proposition validation**

The improved propositions are validated by testing the resonance of RtB with the consumer in focus groups. The different propositions are ranked by the consumer in several ways in order to prove the quantitative strength of the propositions. For example, steaming is perceived a better concept than massaging or scrubbing and is therefore a quantitatively stronger proposition with a better market potential.

10) **Creating VPH and marketing plan**

The VPH is the summary of all that has been learned and decided. This is based on brainstorm, moodboards, validation, workshops, strategic thinking etc. It entails the interpretations and the decisions of all previous steps in the IPP. Philips uses the Voice of the Consumer Tree (VoC Tree). This is a one page summary tool that defines what the product should be capable of in order to deliver on the VPH. The RtB are translated into basic functional expectations of the consumer, which are translated into measurable specifications by Philips S&B. For example, Philips S&B believes that steaming techniques in shaving lead to a better feeling of the skin by the consumer after shaving. In the concept labs, the most important consumer preferences regarding steam are determined and measured and lead to the basic functional expectations regarding temperature and intensity of steam. Philips S&B can transform these expectations into measurable specifications of the product, a temperature of 35 degrees Celsius and an intensity of 2 milliliter per square inch per second.
3.2 Involved parties

The innovation program within Philips S&B has many involved parties from different departments. During the different phases of this program, the composition of the team of involved parties differs. The final responsibility for the whole program lies with the Marketing Director, therefore it is his responsibility to align the interests of marketing and technology within the innovation program and to safeguard the continuity of the knowledge in the different processes, even though different teams perform these activities. Within the IPP of S&B the process is managed by the program manager, which is an independent person who is part of the IPP team. Therefore he is able to manage the different interests of the team members and to guard the process and timeline. The content of the IPP is the responsibility of the line of business manager of Philips S&B, who eventually needs to approve the result of the IPP. As he is not a part of the IPP team, he needs the input of the program manager to base his decision on.

Several parties within Philips S&B carry out the processes described in the previous paragraph under the supervision of the program manager. These parties can be divided in the following five categories:

- Consumer marketing, bringing commercial expertise
- Marketing intelligence, bringing consumer and market expertise
- Marketing management, country management, bringing in business expertise
- Technology & development, bringing in technological expertise
- External participants

When regarding these parties in more detail, many departments within Philips S&B bring their own expertise to the IPP. The roles and responsibilities of all these departments are described in detail in a work breakdown structure for the IPP. The owner of the content is the line of business manager. He is the initiator of the IPP start meeting. The process is owned by the program manager (facilitator), but the responsibility for a validated VPH lies with the consumer-marketing director. The
process should be controlled by the business strategy. This is a set of programs and policy rules, but not a person or department. The processes are translated into activities and deliverables for each department. The work breakdown structure is shown in figure 7. This structure is the guideline for every IPP.

![IDEF translated into activities & deliverable plan](image)

**Figure 7: IPP major activities and deliverables per department**

This structure is presented in this research to give an understanding of the level of detail in which the process is described. As can be noticed there is a high level of details and the structure seems rigid as it is described exactly who needs to do what at which moment in time. To increase the level of structure and standards even more, it is exactly described which different activities and deliverables should be performed and delivered along a timeline of eight months. The structure, activities and
deliverables and timeline are assumed to be the same for every IPP regardless of the context of the innovation program.
3.3 Shortcomings of the IPP

As can be noticed by doing field observations within the IPP of Philips S&B, there are two obvious problems. A first problem with the process is that it is based on a theoretical approach of the IPP in which the ideal process and timeline is described. In practice, this very detailed formulated process cannot always be carried out as it is prescribed. Every IPP roughly contains all the prescribed processes and products, but the overall way of working and timeline can differ a lot. In many cases, at the end of an IPP all of the expected outcomes and deliverables have been produced. However, one IPP can take from eight months up to two years. Sometimes, changes in the environment of Philips S&B (changes in the market, economy, consumer insights etc.) hamper the progress of an IPP. These changes can demand that the involved parties go back to the drawing board during an IPP. Consumer insights change and therefore all derivatives need to be reviewed. In some cases this leads to unfinished IPPs (or IPPs that are changed and renamed half way through). This means that the processes are unpredictable and carried out in different ways on different moments. This has implications for the TFC and IPD phases; therefore the whole innovation program can become unpredictable and thus difficult to manage.

A second problem of this process description can be found in the separation of the responsibilities for the process and the responsibilities for the outcome. The owner of the content is the line of business manager. He is the initiator of the IPP start meeting. The process however is owned by the program manager (facilitator), but the responsibility for a validated VPH lies with the consumer-marketing director. The process should be controlled by the business strategy. This is a set of programs and policy rules, but not a person or department. One could question who is responsible for the overall success of an IPP. For every IPP the same responsibilities are with the designated departments or persons. One could imagine that with different types of innovation and IPPs, there should be different responsibilities within the organization. For example, if an IPP is started because the business unit agrees that a successor for an existing shaver should be developed, it could be more efficient to delegate responsibilities to departments that have been involved in the development of this
shaver. On the other hand, if an IPP is started with the goal to target a whole new customer group for S&B, one could hold the marketing department responsible for the outcome.

For Philips S&B it is clear, largely based on the above, that the IPP does not work in the most efficient way. This notion has led to the initiative to analyze the possibilities of LPD for the IPP. The first step has been to evaluate the IPP by using the Process Survey Tool IPP (PST-IPP). This survey is based on a self-assessment model that enables an organization to score its performance against World Class Performance\(^9\) in a number of key elements on a ten-step maturity scale. This survey tool contains 9 elements that can be graded with a maturity level from 0 to 10. The outcome of this survey tool is an action list, which presents the maturity levels per element and the actions to be taken to get to the target level set by Philips S&B. (Appendix C) The most important shortcomings of the IPP regarding leanness can be derived from this action list. For the selection of the most important shortcomings the elements with a low maturity level or a level that lacks behind on the set target are included in Appendix D.

It can be concluded that most of these shortcomings are related to problems with:
- Planning
- Alignment of different interests of internal parties within the IPP
- Alignment of interests of the IPP with the TFC and IPD
- Involvement and input in process of external parties

\(^9\) A holistic framework for assessing an organization’s position relative to world-class performance, identifying strengths as well as improvement opportunities that support business objectives.
4 Lean Development

What goals does Philips S&B need to set in order to improve leanness of the IPP?

Lean development, which is often known simply as ‘Lean’, is a practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination (Ward 2007). Working from the perspective of the customer who consumes a product or service, value is defined as any action or process that a customer would be willing to pay for (Dunphy and Herbig 1995). Lean Development is centered on creating more value with less work.

4.1 Theory

‘Lean’ was derived from the Toyota way of working and applied mostly to manufacturing processes. This method is called Lean Manufacturing. It is a generic process management philosophy and is known for its focus on reduction of waste in order to improve overall customer value, but there are various perspectives on how this is best achieved. Lean manufacturing is a variation on the theme of efficiency, based on optimizing flow. It is a method towards increasing efficiency, decreasing waste, and using empirical methods to decide what matters, rather than uncritically accepting pre-existing ideas (Åhlström 1996).

Lean Product Development is a methodology that attempts to apply the principles learned in Lean Manufacturing in the product development area. These are made to create a flow in product development that will help the process to go faster. This possibility to realize new products faster will enhance the reactivity of a company in the market (Reinertsen and Shaeffer 2005).

Visualization tools, such as process mapping, show the improvement opportunities in the product development process and enable companies to make the process more fluent. Based on continuous improvement and visual communication, the goal is to enhance customers’ value by developing top class quality products (Morgan and Liker 2006).

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Lean Product Development does not propose a roadmap for product development, but is an initiative that helps to improve and standardize the existing process in a company. Lean Development is known for its ability to (Ward 2007):

- Reduce development time and resources
- Reduce the risk of schedule and cost overruns
- Reduce the chance of failed products
- Increase innovation

Organizations that implement LPD will ultimately reach the above four end-goals by implementing changes in processes and way of operating and thinking. The realization of the ultimate goal will lead to the realization of many other sub goals along the way.

4.2 Lean for Philips

Philips’ compass is the Toyota based ‘Lean Development’ philosophy. The key values of this philosophy are functional expertise, learning, teamwork and discipline. Next to that, tools such as cadence (leveling planning), integral optimization, multiple option search and Design for Six Sigma (DFSS)\textsuperscript{10} are essential (Sigma Breakthrough Technologies 2008).

The key processes of the innovation program are the Innovation Planning Process (IPP), the Function Creation Process (FCP) and the Integrated Product Development (IPD).

The execution of all the innovation processes is by cross-functional teams (matrix organization). Examples are the TFC project teams and the IPD teams to strengthen the core technical competences and to ensure product leadership.

\textsuperscript{10} Design for Six Sigma (DFSS) is a set of tools and techniques that will allow your designs to be right the first time, work better than existing and competing products. These DFSS tools include state-of-the-art Voice of the Customer (VOC) Techniques, New Concept Creation and Evaluation techniques, advanced statistical and experimental tools.
Philips S&B has derived their goals regarding Lean Development from the Lean Product Development System Model. (Figure 8)

The model contains 13 goals for Lean Development. These goals have been important for the implementation of LPD in the TFC and IPD phase of the innovation process within S&B. The achievements in these two parts of the innovation program regarding these goals are shown in detail in Appendix E. These achievements helped S&B to improve the results in the TFC and IPD phase and therefore achieve higher scores on the BBSC. These achievements can be filtered to the following core values for the whole innovation program:

- Technical expertise
- Continuous learning
- Mature communication
- Teamwork
- Deliver on commitment
- Process ownership
- Design ownership
Philips S&B aims to realize a number of the above achievements in TFC and IPD also in the IPP to increase efficiency in the total innovation program.

### 4.3 Lean in IPP

Chapter 3 has shown the weaknesses of the IPP within Philips S&B. Paragraph 4.2 has shown the goals and achievements in the TFC and IPD phase. After expert consultation within Philips S&B, the most important goals for the IPP have been derived from the 13 goals in the Lean Development System Model.

1) **Front loaded innovation process**
   
   To have a clear view on the upcoming activities in an early stage, more work should be done in the IPP and especially at the front-end of this process. Philips S&B aims to make an upfront master planning which includes assignments describing the role of different involved parties. When looking at the defined shortcoming of IPP from chapter 2.2, this first goal clearly addresses the shortcoming regarding planning.

2) **Technically / expert project and functional management**
   
   This means that Philips S&B wants to recognize in an early stage which expertise will be needed in the IPP on project and functional knowledge. If this is agreed upon by all involved parties it should address problems regarding common understandings and responsibilities. This goal addresses both the shortcomings of planning and alignment of different interests of internal parties within the IPP.

3) **Teamwork and integral optimization**
   
   Because of the broad spectrum of parties involved in the IPP, teamwork and integral optimization should be guarded at all times. In the current situation different parties often work independent of each other for too long periods of time. This relates to the different parties within IPP as well as different parties within the whole innovation program. This goal addresses the shortcomings regarding alignment of different interests of internal parties within the IPP and alignment of interests of the IPP with the TFC and IPD.

4) **Fully integrated suppliers**
One of the problems recognized by Philips S&B is the connection with its suppliers. The suppliers and other external parties are not structurally involved and participating in the creative process. This goal addresses the shortcoming regarding involvement and input in process of external parties.

5) **Visual communication**

To make clear at all times what the status of the IPP is, communication should become an integral part of the IPP and made more visual. Explicit communication techniques will keep all involved parties up to date on the progress, which will improve the commitment, and make planning easier. This goal clearly addresses the shortcomings regarding planning and alignment of different interests of internal parties within the IPP.

LPD was derived from the Toyota way of working and applied mostly to manufacturing processes. This method is called Lean Manufacturing. It is a generic process management philosophy and is known for its focus on reduction of waste in order to improve overall customer value. It is a method towards increasing efficiency, decreasing waste, and using empirical methods to decide what matters. Lean Product Development is a methodology that attempts to apply the principles learned in Lean Manufacturing in the product development area. These are made to create a flow in product development that will help the process to go faster. To measure the objectives of LPD in the innovation program, Philips S&B uses a BBSC (Appendix M). Clear targets are set for the TFC and IPD, in order to innovate in a leaner way, but the targets for the IPP are less clear. The measurement of the IPP improvements is done using the Process Survey Tool IPP (PST-IPP). This survey is based on a self-assessment model that enables an organization to score its performance. This survey does not entail objective quantitative performance indicators in contrast to the indicators for the TFC and IPD. The focus of LPD is on optimizing ‘value streams’ and decreasing waste. In the original theory this meant cutting all activities that are not ‘value creating’ or activities that are not turning raw materials toward the products customers pay for. The success of the value stream can then be measured in terms of:
the difference between projected and actual return on investment, project defect rates, the fraction of developer time that is spent creating value, etc.

In order to focus on creating value in product development, a clear understanding of value should be present. This causes the problems for implementation of LPD in the IPP of Philips S&B. It is very difficult to determine which activities add value and which activities can be seen as waste in the IPP. The IPP consists of activities that explore a broad range of possibilities for new products; therefore not all activities contribute directly to the development of a product that customers pay for. This does not mean that these activities can be seen as waste, because such a broad exploration is needed to come to the most meaningful and rewarding innovations.

Because of the contrast between the exploratory character of the IPP and the more practical and straightforward character of the TFC and IPD, implementation of lean development in the IPP has not succeeded yet. It is unclear to Philips S&B how to create leaner IPPs. As the implementation of LPD seems to be inappropriate for the IPP (Cusumano 1994), other alternatives to come to a more efficient and effective process need to be explored.
5 Contextual Innovation Management

What common interests do the concepts of CIM and LPD have?

A new way of looking at innovation management is described in literature by Ortt and Van der Duin. Their concept is called Contextual Innovation Management (CIM); it describes how innovation processes are influenced by their context. Contextual Innovation is an approach in which innovation processes are adapted to their specific organizational and societal context. The concept states that managers in successful companies adapt their innovation management practices to their (business) context instead of following the dominant model of their time (Duin, Ortt et al. 2007). The most successful companies do not succeed merely by one innovation approach, but by carefully selecting the right approach within a given context (Elst, Tol et al. 2006).

5.1 Theory

Innovation management is the discipline of managing processes in research and development and innovation. It can be used to develop both product and organizational innovation. Without proper processes, it is not possible for R&D to be efficient and effective. The goal of innovation management is to allow the organization to respond to external or internal opportunities, and use its creative efforts to introduce new ideas, processes or products.

Innovation processes can either be pushed or pulled through development. A pushed process is based on existing or newly invented technology, that the organization has access to, and tries to find profitable applications to use this technology. A pulled process tries to find areas where customer needs are not met, and then focus development efforts to find solutions to those needs. To succeed with either method, an understanding of both the market and the technical problems are needed. By creating multi-functional development teams, containing engineers and marketeers, both dimensions can be solved. The lifetime of new products is steadily getting
shorter; increased competition forces companies to reduce the time to market. Innovation managers must therefore decrease development time, without sacrificing quality or meeting the needs of the market.

In literature generally 4 generations of innovation management are described (Ortt 2008):

1) technology push
2) market pull
3) parallel processes
4) innovation in network and systems

Contingency approaches are discussed in many innovation management theories. They argue that previous theories have failed because they neglected that management style and organizational structure were influenced by various aspects of the environment: the contingency factors. ‘One best way’ for leadership or organization does not exist according to these approaches. Contingency theories have identified this problem with existing management theories, however, a clear solution is not provided as only broad generalizations about formal structures are described. Contextual Innovation Management further elaborates on the specific influences from the environment and suggests that innovation processes should be adapted to these influences. The first major task prescribed by contingency theories is the identification of contextual factors that influence the organizational structure for innovation. There is a well-established broad range of studies on contextual or contingency factors (Tidd 2001). The categories used in this research for these contextual factors are derived from Ortt and Van der Duin (Ortt 2008):

- Type of Innovation
- Type of Organization
- Type of Industry
- Country/culture

When regarding these four categories of contextual factors in an early stage of the innovation program, innovation processes that are better measured to the task at hand
can be constructed. An advantage of this approach is that it offers innovation managers the possibility to break away from normative approaches (Ortt 2008), that relate to an ideal standard or model (in the case of Philips S&B, the detailed IPP description). A disadvantage of CIM may be that having different models for innovation within one company may make innovation processes within that company more difficult.

Empirical research indicates that different approaches to innovation can be adopted within a single company (Elst, Tol et al. 2006). The underlying idea is that different situations require different kinds of processes. The research illustrates that a context-based approach usually yields the best results (Ortt and Smits 2006). This indicates that a context-dependent approach could become the mainstream practice. The most successful innovative companies do not succeed merely by using one innovation approach more extensively or better, but by carefully selecting the right approach within a given context (Ortt 2008). This is an indication that the concept of innovation management generations could be replaced by the idea that a single ideal approach to innovation management is no longer possible.

5.2 Commonalities and differences of CIM and LPD

Commonalities of CIM and LPD

The concept of CIM describes an adaptation of the innovation process to the context of the targeted innovation. In practice, this would mean that the involved parties of the process (in this research the IPP within Philips S&B) agree upfront on this context, which helps the involved parties to get a clear view on the activities, responsibilities and difficulties this context brings forward.

Example:
(This example is fictive and does not present a realistic view on the complexity of the development of the described innovation)

Philips S&B wants to solve the problem of irritated skin after shaving with an electric appliance. The solution could be found by using additive (gel) coming from the
appliance as a relaxing supplement for the skin. The proposed innovation is completely new to the market, but can be constructed with existing technology. Furthermore, the innovation targets a segment of the market that exists of males who care for a healthy and smooth looking skin. The effects of additive for relaxation of the skin are not yet clear to the company and research needs to be conducted on these effects. The knowledge for doing proper research on these effects does not exist within Philips, therefore external parties should be involved to gather this knowledge or to research these effects. Philips also does not have the in-house expertise to produce the suggested additive. An alliance needs to be formed with a producer of such additives.

CIM prescribes that Philips S&B should regard the context of such an innovation in an early phase of the process. As stated before, the context of an innovation exists of contextual factors in the following four categories:

- Type of Innovation
- Type of Organization
- Type of Industry
- Country/culture

Different contextual factors from these categories determine what kind of process-description is needed for the targeted innovation (the most important contextual factors for Philips S&B will be discussed in the next chapter). For the above-mentioned example, Philips S&B could for instance make the following assessment with a team of involved parties at the beginning of the IPP:

**Type of Innovation**

The proposed innovation does not need completely new technology. However a totally new need from consumers will be addressed. The focus in the early stage of the IPP should therefore be on market research regarding irritation of the skin caused by electric shaving. When the needs and wishes of the targeted segment on improving the negative effects of electric shaving to the skin are known, clear communication is needed between CMM and TnD to start timely with first investigations on the possibilities for technology. As CMM is in the lead for the market research which
needs to be done first, it should be its responsibility to inform and instruct TnD timely.

**Type of Organization**
The success of the targeted innovation is dependent on the participation of internal and external parties. Within the matrix organization of Philips, there is much inhouse knowledge due to its size and specialist departments. This advantage can be captured in IPP by working with cross-functional teams. The relevant parties should be selected and incorporated in an early stage of the IPP, because information from these parties is needed in an early stage to progress the development of the product. The involvement of internal parties with knowledge on for instance liquids, pumps, skin effects and external parties in this field is vital. These parties should be selected and clear tasks and responsibilities should be formulated in the process. Philips has formed some coalitions with external parties in the recent history. Information on the best way of collaborating with external parties can be retrieved from this.

**Type of Industry**
Philips is familiar with the shaving industry, however the relation of the product with the skin-care industry is new. The relevant set of rules and regulations for this industry is unknown, therefore it needs to be investigated this industry. It needs to be determined who is responsible for this investigation, how and to whom the results should be reported.

**Country/culture**
The context of country/culture depends on which markets Philips aims to penetrate with the proposed innovation. Different countries or cultures have different shaving customs and preferences. As this innovation is a new product for a known segment of men who care for a healthy and smooth looking skin, the context regarding culture is less relevant.

As this research focuses on the possibilities to improve leaness by incorporating Contextual Innovation Management, it is crucial to recognize the common interests of both theories. CIM describes a new approach to come to more successful innovation. As stated in the previous chapter, LPD is known for its ability to:
Reduce development time and resources
Reduce the risk of schedule and cost overruns
Reduce the chance of failed products
Increase innovation

These end-goals can be reached by accomplishing improvement on several sub goals.

The example entails the following relevance of CIM to reach the 5 goals to improve leanness in the IPP:

1) **Front loaded innovation process**

   Philips S&B aims to make an upfront master planning which includes assignments describing the role of different involved departments and parties. LPD states that the more a team reflects at the beginning of the project, the faster it will go at the end. The best distribution of responsibilities is subject to many factors, for instance the control mechanisms in an organization, the characteristics of management and employees, the cooperation with departments and external parties and also the type of innovation (Griffin and Hauser 1996). Analysis of the context of an innovation helps to distribute resources and responsibilities within a project (Hanna, Ayers et al. 1995). The earlier the context of an innovation is analyzed, the better the distribution of resources and responsibilities can be made. By evaluating the context of the proposed innovation upfront, an opportunity for a front loaded IPP is created and an upfront master planning can be made.

2) **Technically / expert project and functional management**

   Philips S&B wants to recognize in an early stage which expertise will be needed in the IPP on project and functional knowledge. The commitment of the team members to the methodology, the importance of cross-functional teams and of the project owners and the importance of the definition of customers are crucial in the LPD methodology. Defining the context helps to recognize the needed expertise upfront, therefore Philips S&B creates a possibility to plan resources better and compose the most efficient teams for the IPP.
3) **Teamwork and integral optimization**

Philips S&B aims to align different interests of internal parties within the IPP and interests of the IPP with the TFC and IPD by better teamwork. The commitment of the team members to the methodology, the importance of cross-functional teams and of the project owners and the importance of the definition of customers are crucial in the LPD methodology. An upfront meeting for determining the context of an innovation will contribute to this alignment, because this meeting is the basis for discussion and better agreements on the activities and responsibilities in the IPP (Griffin and Hauser 1996).

4) **Fully integrated suppliers**

One of the problems recognized by Philips S&B is the connection with its suppliers. The suppliers and other external parties are not structurally involved and participating in the creative process. There exists an important opportunity for realizing significant benefits by proactively key suppliers early in the concept exploration and definition phases of product development (Bozdogan, Deyst et al. 1998). An upfront meeting in which the external participants are determined creates the possibility to incorporate the external participants in the process design.

5) **Visual communication**

To make clear at all times what the status of the IPP is, communication should become an integral part of the IPP and made more visual. Aligning all departments in an upfront meeting, in which the process is adapted to the context, will be a good start for clear and visual communication. The conclusions on responsibilities and hand-off moments clarify communication along the process activities.

**Differences between CIM and LPD**

LPD is founded on developing quality products by continuously improving Product development and creating a flow of value added activities (Reinertsen, 2005). The methodology emphasizes effort at the beginning of projects in order to reduce later
rework. The strategy behind LPD is a strong reactivity to market demands and positioning the company as a quality leader. Implementation makes companies centre around the demand for knowledge. LPD emphasizes group work to facilitate communication in product development teams. More effort at the beginning of projects will make it faster and more efficient at the end. LPD helps project leaders to accomplish their tasks of developing, through the use of some tools. LPD seems to be there to help leaders to be more secure about the outputs of their projects and to enable management to see the faults in their product development process and give them the opportunity to improve it.

Secondly, LPD uses cross-functional teams, trying to integrate people from different departments in the projects in order to create interaction between them and to give to the project the insights of their functional organization’s requirements. This should increase the efficiency of the later phases of development. LPD concentrates on continuously improving the product development organization, on showing the opportunities for modifying the organization and on giving deadlines to project workers. LPD states that order in product development is good for innovation since it will come from the interaction of specialists. LPD is driven by and towards customers’ satisfaction. LPD seems to enable the creation of a standard by making the problems in product development apparent. This makes possible an improvement and its standardization. LPD increases the demand for knowledge in the groups and should help the companies to know more about their customers. LPD is used to improve the former product development process or to try to standardize the way of doing things in the company (Womack and Jones 1996). The method uses certain tools for improving the current process and measurement tools to calculate the improvement.

CIM does not aim to optimize the existing process, but states that there is no best practice for all different innovations done within a company. It has no use cutting waste from a process, when for a following innovation this ‘waste’ could be very valuable. CIM is a more holistic theory, that emphasizes on regarding the context for all different innovations and adapt practices to these contextual factors (these factors will be explained in the following chapter). CIM implies that innovation managers
make different decisions in different contexts, which leads to customized processes for the specific contexts. These managerial decisions consist of decisions on a strategic and operational level and include decisions as: whether to choose specific type of internal and external partners, whether to form alliances, schedule activities in parallel or sequential, whether to incorporate much or little flexibility and go-no go decisions, etc. Especially the operational decisions have a direct influence on the design of the process.

The most important difference between LPD and CIM is that the first method aims to make the existing innovation processes more effective and efficient by the use of certain tools and measurements, while the second method aims to construct the most effective and efficient process possible for each innovation within a company by regarding the context of each proposed innovation.
6 The practical applicability of CIM

In the previous chapter, it is stated that the application of CIM could help Philips to improve the IPP. This chapter aims to get insight in the practical applicability of CIM in innovation processes. To research the applicability of CIM several interviews have been conducted with external experts in the field of innovation. In the next paragraphs the chosen input for the interviews will be explained.

6.1 Choice for Contextual Factors

What are the most relevant contextual factors within IPP of Philips S&B?

Contextual Innovation suggests that innovation processes should be adapted to their context. The four contextual factors can be divided in several factors on a more detailed level. In this paragraph the most important contextual factors for innovations within Philips S&B are presented.

The table below presents the most relevant factors for all of the four categories. These factors were gathered through the use of literature on innovation management. The following literature was studied to come to the presented contextual factors:
- Type of Innovation (Tidd and Bodley 2002), (Drejer 2002) and (Ortt and Smits 2006)
- Type of Organization (Hanna, Ayers et al. 1995) and (Duin, Ortt et al. 2007)
- Type of Industry (Miller, Blais et al. 1993)
- Type of Culture (Oliver, Dostaler et al. 2004) and (Tidd 2001)

The selection of the relevant contextual factors is the result of consultation with internal experts on IPP within Philips S&B (For the list of consulted experts see Appendix L). Many more contextual factors are mentioned in literature, for instance; size, overall structure and type of strategy for the category ‘type of organization’, phase of evolution for’ type of industry’ and culture of legislators or authorities for ‘type of culture’. These factors were omitted from the research because they are not important for the IPP within Philips S&B. The size and structure of the organization
are for instance a given fact for Philips S&B and this context does not change for different innovations. This overview of factors is most likely not complete because the total number of factors is indefinite, but the most relevant factors from literature and practice within Philips S&B are covered in this overview.

Table 1: Contextual factors per category

<table>
<thead>
<tr>
<th>Type of Innovation</th>
<th>Type of Organization</th>
<th>Type of Industry</th>
<th>Type of Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of newness</td>
<td>External participants</td>
<td>Technology intensity</td>
<td>Culture of participating companies</td>
</tr>
<tr>
<td>Entity to whom newness refers</td>
<td>Market scope or geographic reach</td>
<td>Culture of targeted consumers</td>
<td></td>
</tr>
<tr>
<td>Driving force</td>
<td></td>
<td>Industry regulation</td>
<td></td>
</tr>
<tr>
<td>Placement within ranges</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Before presenting these factors to the internal respondents for them to choose the most relevant factors, some explanation regarding possible levels of these factors is needed. In Appendix F are four tables, in which examples are given of different levels. The research aims to determine which contextual factors are most influencing for the IPPs within Philips S&B. Consultation of experts from within Philips S&B has lead to insights in the importance of factors from the context (For the list of consulted experts see Appendix L). To investigate which factors are perceived as most important for S&B, the internal experts were presented with all the contextual factors from table 1. After an explanation of these factors with use of the levels from the tables in Appendix F the experts were asked to state which factors they perceived as most relevant for the innovations within Philips S&B. The two contextual factors that
are stated as most important by the experts from within Philips S&B are ‘degree of newness’ and ‘driving force’. These two factors are explained on a more detailed level in the following subparagraphs.

Degree of newness: Incremental vs. Radical

Speaking in terms of newness of an innovation, broadly two types can be distinguished; incremental and radical innovations.

A radical innovation is a new product, service, or technology, which completely replaces an existing one. Radical innovations are disruptive for the current way of working. These breakthrough innovations create big changes in industries, because they go against existing assumptions about consumers, marketing, competitors or technology. Radical innovations make previous products in the industry obsolete (Drejer 2002).

Incremental innovations are new products, services, or technologies that modify existing ones. Incremental innovations do not make previous products in the industry obsolete.

Driving force: Technology vs. Marketing

Different driving forces of innovations can be distinguished in innovation practices. These driving forces have implications on the way of innovating from companies. A market orientation facilitates innovations that use advanced technology and offer greater benefits to mainstream customers (i.e., technology-based innovations) but inhibits innovations that target emerging market segments (i.e., market-based innovations). A technology orientation is beneficial to technology-based innovations but has no impact on market-based innovations (Zhou, Yim et al. 2005). Philips S&B recognizes two main driving forces for innovations. In earlier days most innovations were driven by new technology. The TnD department developed new technologies and the marketing department in Amsterdam was asked to find a suitable marketing strategy for implementing the new technology in a product. Nowadays Philips’ innovation process is focusing on understanding customers’ wishes and development of the market. These findings are translated into consumer insights, which are used as input for the further development of the idea.
6.2 Cases

After defining the most important contextual factors for innovations at Philips S&B in the previous paragraph, the search for relevant cases throughout the recent history of Philips S&B starts. The two factors (‘degree of newness’ and ‘driving force’) were described in detail and internal experts (Appendix) were asked to suggest cases, innovations from Philips S&B, which could be relevant for the research. The criteria for these cases are: a clear distinction on the factors ‘degree of newness’ (incremental as well as radical) and ‘driving force’ (marketing as well as technology driven). Internal documents have been consulted to get a better view on the characteristics of the proposed cases.

The following cases came up from these inquiries and internal documents:

- Coolskin
- Child Clipper
- Arcitec (SR1)
- Arcitec 2 (SR 3)
- Retraction
- Sonicare
- Merlin
- Wake-up light

These eight cases have been selected because they were all significant for the business of Philips S&B and have been developed in an IPP. This set of cases is a good representation of all sorts of innovations done by the business unit. This representation will be further discussed in the next paragraph.

On the following pages, a short description and a graphical representation is given for each case.
Case 1: Child clipper (2007)
A clipper customized to children’s wishes, with a friendly design and lower noise level.

Case 2: SR 1 (2007)
The first high end dry shaver with a complete new slim body design.

Case 3: Merlin 1 (2007)
An update of the coolskin shaver with a complete new slim body design.

An alarm clock that simulates sunrise through slowly increasing light and sound.
Case 5: Coolskin (1998)
The first additive (nivea) shaver, which can also be used in a wet environment.

Case 7: Retraction (1976)
A new system that first pulls the hairs from the skin and then cuts.

Case 6: Arcitec 2 (2009)
The successor of Arcitec, which focuses on a close shave especially in the neck. The new cap with special teeth should provide a better shaving result.

Case 8: Sonicare (2000)
An electric toothbrush that vibrates with sonic speed for a better result.
Involved managers from within Philips S&B were asked to fill out questionnaires about these cases (Appendix H). The questions in this questionnaire focus on the practical workability and the shortcomings of the IPP described in chapter 3. It can be concluded from the answers to these questions, that the managers who were involved in the IPP of these cases recognize the problems regarding planning, alignment of different interests of internal parties within the IPP and alignment of interests of the IPP with the TFC and IPD. The respondents also state that communication between different departments is a big issue and therefore often the cooperation is less fruitful or sometimes even disruptive. The respondents argue that customization of the IPP could be valuable, but the master IPP description has to be the reference for all executions. “The IPP should allow for defined scaling (identifying elements which are not applicable), but only upfront” (Appendix H2)

### 6.3 Positioning of cases

The cases from the previous paragraph have different characteristics. To express the view of the internal experts on these characteristics, being ‘degree of newness’ and ‘driving force’, they were asked the following:

- Where would you position the case on a continuum from radical to incremental innovations?
- Where would you position the case on a continuum from market-driven innovations to technology-driven innovations?

The eight cases from the previous paragraph are positioned on a coordinate system with two axes. The y-axis of this coordinate system represents the continuum from radical to incremental innovations. The x-axis represents the continuum from market-driven innovations to technology-driven innovations.

The experts were able to position all cases on the coordinate system proposed by the researcher. The differences in outcome were negligible. The overall result is presented in figure 9. The minimal differences could be expected, as the respondents are familiar with the presented cases, some were even involved in the IPPs of these cases.

This positioning is done in this research to test if internal experts can reach consensus on the context of a proposed innovation. Later in this research these results will be compared to the results of external experts. This is an important test within this research, because it is crucial to investigate if the context of a proposed innovation is
objective for both internal experts and external experts regardless of their knowledge of the cases and the processes within Philips S&B.

Figure 9: Positioning of the cases by internal experts
6.4 Process-options

In what way should the most relevant contextual factors influence the planning of the IPP to create a leaner process?

As stated in chapter 3, Philips S&B uses one work-breakdown structure for every IPP. The theory of CIM suggests that innovation processes should be adapted to their context to create processes that are better measured to the task at hand. In paragraph 6.2 the two most relevant contextual factors for Philips S&B are described, namely: ‘degree of newness’ and ‘driving force’. In this paragraph, these two factors are used to construct three different more customized work-breakdown structures for different types of innovations.

The program manager of the IPP within Philips S&B, was consulted for the construction of these different process-options. His knowledge of and experience with the IPP in practice made it possible to come to processes that could possibly contribute to the goals of Philips S&B mentioned in chapter 4. For these process-options, an indefinite range of possibilities exists. The aim of the research is not the selection of the ideal process, but to investigate whether the context of an innovation should influence the design of the process.

The construction of the process-options started out in a very conceptual way. The options were described in terms of a linear, parallel or cyclic process. When regarding the goal of the construction of these different options, this conceptual approach does not seem to be feasible. The external experts would not be able to make a choice between these abstract process-options. Furthermore, Philips S&B communicated that it is not aiming to completely reconfigure its existing process description. An agreement was made to stay closer to the existing IPP, for constructing the three options.

The IPP is divided in four general activities; ‘Analysis’, ‘Insight development’, ‘Proposition development’ and ‘Validation and programming’. The input for the IPP consists of market knowledge and technology knowledge gathered by marketing management in Amsterdam and technology development in Drachten.

The starting point for designing the different process-options is the detailed IPP description mentioned in chapter 3. This schematic describes activities and deliverables for all different departments during an IPP. The activities performed by
Philips S&B during the IPP are valuable and well described, therefore these activities and deliverables are used as building blocks for the process-options, in order to stay in touch with the reality of Philips S&B as much as possible.

Figure 10: Recognized modules in IPP

As can be seen in figure 10, seven building blocks can be distinguished in the current IPP description. The four blue building blocks are all marketing related. The three orange building blocks consist of activities performed by TnD departments. The activities performed by design departments are excluded from this research, because design merely operates as an enabler for the ideas created by marketing and TnD and therefore has a reactive role in the process. The designed process-options are not completely different from the currently used IPP-process, but they vary in the sequence of sub-processes and the cooperation between departments on specific moments in product development.
• The first process-option is focusing on marketing in the beginning of the process. TnD is involved in the process after marketing analysis and insight development are completed. This means that marketing will create a clear view on marketing and business objectives, competition and consumer insights before they communicate their findings from these activities to TnD. This way, TnD has a detailed starting point for their activities of technology analysis and feasibility.

Figure 11: Process-option 1

• The second process-option is starting with marketing and technology development parallel to each other. This process shows the most resemblance with the current IPP. After the IPP start meeting both marketing and TnD departments start investigating the possibilities for the proposed innovation. This second process design is shorter than the other designs, because the thorough analysis activities on both marketing and TnD were cut out of the process. This was done to create a process-option that suits incremental innovations. It is assumed that for incremental innovations much of these activities are redundant with previous analyses performed by Philips S&B. When the insights of the proposed innovation are clear and the technology is proved to be feasible, the precise marketing proposition is formulated and an innovation roadmap and VPH are described.
The third process-option is focusing on technology development in the beginning of the process. The aim is to analyze the technology possibilities and feasibility before the exact consumer insights are described. This is needed in the case of a proposed innovation that is completely relying on cutting edge new technology. It has no use to gather exact wishes from the consumer if the technological feasibility of an innovation is unclear.

The external expert interviews will test if the assumed context of a proposed innovation is determining the preferences regarding these process options. The expectation is that for cases that are perceived by the experts as market driven, process 1 will be the preferred process-option. For technology driven innovations the expected preferred process will be process 3 and for incremental innovations the preferred process will be process 2. The eight cases all have characteristics on both the contextual factors ‘degree of newness’ and ‘driving force’, therefore it will be interesting to see which of these two factors is perceived as most important for the process choice.
6.6 External expert-interviews

To minimize the effects of bias and to get more objective outcomes, external experts were involved in this stage of the research. External experts are also involved to make sure the outcomes are not dependent on the knowledge of and experience with Philips products and processes. This is important because within Philips S&B also inexperienced employees, that are unfamiliar with the innovations from the past and the IPP, will be participating in the process. It is desired that the less experienced employees can participate in the determining the context and designing the process, regardless of their (lack of) knowledge.

Until so far, internal experts were involved, which resulted in two main outcomes. Firstly, a clear distinction on the two most relevant contextual factors in the 8 cases could be made. Interviews with the external experts about these same cases are used to validate this first outcome. Secondly, three distinctive process options were designed to investigate the influence of contextual factors on the design of the IPP process. To get an objective result on this investigation, external experts are involved in this investigation.

In this chapter, the outcomes of the interviews conducted with external experts (Appendix I) will be discussed. The first paragraph discusses the qualitative results. These results are based on the explanations given by the experts with which they founded their choices for the three process options. The second paragraph focuses on the quantitative outcomes of the interviews. These results are based on the choices the experts made with regards to the matching of the cases to the process-options.

6.6.1 Qualitative results

The qualitative information retrieved from the interviews focuses on the positioning of the cases on the coordinate system. In the previous paragraph this positioning is shown from a Philips point-of-view. Internal experts have positioned the cases on a coordinate system in which the x-axis is represented by the factor ‘driving force’ and the y-axis by the factor ‘degree of newness’. The external experts have described the
characteristics of the different innovations in the presented cases. Below, the relevant information regarding their opinion on the two contextual factors “degree of newness” and “driving force” of the 8 cases is filtered from the total interviews in the Appendix.

- Coolskin

Eight out of the twelve external experts stated that they perceived the Coolskin as a market-driven innovation, which is relatively new for the shaving branch. One of the experts described it as follows: “This concept originates from a new consumer insight picked up by Philips. I perceive the needed technology not to be very difficult to realize, therefore I would start by refining the exact consumer needs around shaving with additive and in a wet environment.” (I 11)

The other four experts have diverse opinions on the degree of newness and the driving-force of this case.

- Child Clipper

All the external experts agreed on this case. They perceived it as an incremental innovation with more challenging marketing aspects, than challenging technology aspects. The following quote from interview I 1 describes this opinion in a clear way: “This product seems to be just a clipper with a twist. The only new market feature is the lower noise level.”

- Arcitec

The external experts differed from opinion on the degree of newness of this innovation. Some experts believed this to be a rather radical innovation, because of the complete new design and the single drive for three shaving heads. Others claimed that this product has no new functions and doesn’t address any new consumer wishes. Most (seven out of twelve) of the experts however perceived this innovation to be slightly more technology-driven rather than market-driven.

- Arcitec 2

Most experts perceived the Arcitec 2 as an incremental innovation. This is best expressed by the following quote (I 5): “The functionality of this shaver is not much different from its predecessors. It is more an effort to get the customer excited again.” Most of the experts stated furthermore that the technology was the driving-force and the biggest challenge here. This is nicely put by Rob de
Graaf (I 2) in the following statement: “This is a technically better shaver than its predecessors. The focus is on shaving result and therefore on technology”.

- Retraction

Eleven out of the twelve experts perceived this innovation to be technology-driven. The opinions on the ‘degree of newness’ of this case differed a little more, but the majority stated that they thought the new way of cutting the hairs was a fairly radical innovative concept.

- Sonicare

Almost all the statements made by the external experts position this case as a radical and technology-driven innovation. Many quotes along the lines of, “This is a revolutionary innovation. Consumers do not come up with this.” (I 8), can be read in the interviews.

- Merlin

Several experts compared this case to the Arcitec. Most of the experts however perceived this innovation slightly more market-driven than the Arcitec. The experts differed in their opinion on the degree of newness of this innovation. Half of the experts positioned this case as a straightforward update for the Coolskin, but the other half positioned the Merlin as a rather new concept.

- Wake-up light

“The simulation of sunrise to wake you up is a completely new concept. I think that the technology to make such an alarm clock already existed for a long time. The hard part is to get an understanding of the customers’ wishes and the willingness to pay for such a product.” (I 10)

Most of the interviewees said something along the lines of the quote above. They all but one (I 5) believed this to be a radical innovation driven by new insights from the market.

To retrieve the most broad spectrum of opinions on the different types of innovations, semi-structured (oral) interviews were conducted. Therefore, the external experts were not asked to position the cases on the graphic representation of the two factors. However, the results of the interviews made it possible to give
an overview of the most probable position of every case in the coordinate system. If the positioning of the internal experts is compared to the qualitative data from this paragraph, the following figure can be constructed.

![Figure 14: Positioning of the cases by external experts](image)

The positioning of the cases by external experts corresponds mostly with the positioning of the internal experts. If the continuum is divided by two lines that cross the x and y-axis in the middle, four quarters appear. Seven of the eight cases are positioned in the same quarter as the positioning of the internal experts. Coolskin is perceived slightly less market driven by the external and Retraction is perceived slightly less radical by the external experts. Arcitec is the only case from which the context is perceived very different by internal and external experts. These observations will be included in the analysis of the outcomes in the next paragraphs.
6.6.2 Quantitative results

In this paragraph the quantitative results of the external expert-interviews will be discussed. All interviewees were asked to select the process-option of their preference regarding the innovation in the presented case. The following table summarizes these choices per case.

Table 2: Choices for process-options per case

<table>
<thead>
<tr>
<th>Expert</th>
<th>Coolskin</th>
<th>Childclip.</th>
<th>Arc</th>
<th>Arc 2</th>
<th>Retract.</th>
<th>Sonicare</th>
<th>Merlin</th>
<th>WuL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guus Kaspers</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rob de Graaf</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Paul Nijskens</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Ton Langelier</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lex Besselink</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gerard Majoor</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Thomas Hollefeld</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Friso Kolff</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wiet Koenen</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Bart van Asten</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Jelmer Riemers</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Floris Rost v. T.</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

For every case the dominant process-choice is highlighted in the table. To check if the differences are significant, a Chi-square analysis is performed on these data. This tests if the frequencies of the choices differ significantly from the expected frequencies. A Chi-square analysis is suited to research the differentiation of values from the expectation, even for a small sample from the total population.

The expected frequencies, when there would be no preference for a certain process per case, would be 4 for all three process-options (12 interviewees divided by three options). The null hypothesis of this test is: “There is no preference for a certain process-option in order to develop the different innovations presented.”

The outcomes of this test are presented in the table below.
Table 3: Chi-square outcomes

<table>
<thead>
<tr>
<th>Test Statistics</th>
<th>Coolskin</th>
<th>Childclipper</th>
<th>Arcitec</th>
<th>Arcitec II</th>
<th>Retraction</th>
<th>Sonicare</th>
<th>Merlin</th>
<th>WuL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>6.000</td>
<td>4.500</td>
<td>1.500</td>
<td>3.500</td>
<td>6.500</td>
<td>6.500</td>
<td>6.000</td>
<td>9.500</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.050</td>
<td>.105</td>
<td>.472</td>
<td>.174</td>
<td>.039</td>
<td>.039</td>
<td>.050</td>
<td>.009</td>
</tr>
</tbody>
</table>

Chi-square is a statistical test commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis. In this research, if you expected 4 out of 12 interviewees to choose for process-option 1 (no preference assumed) and the actual observed number was 8, then you might want to know about the "goodness to fit" between the observed and expected values. Were the deviations (differences between observed and expected) the result of chance, or were they due to other factors? How much deviation can occur before the researcher must conclude that something other than chance is at work, causing the observed to differ from the expected? The chi-square test is always testing what scientists call the null hypothesis, which states that there is no significant difference between the expected and observed result. If the observed data significantly differ from the expected values, the asymptotic significance is lower than or equal to 0.05.

Table 3 shows that for 5 out of 8 cases, the outcomes differ significantly from the expected values. These cases are: Coolskin, Retraction, Sonicare, Merlin and Wake-up light.

The observed data for the cases, Childclipper, Arcitec and Arcitec 2, do not differ significantly from the expected values. This does not mean that the collected data regarding these cases are totally meaningless. This will be explained in the following subparagraph.
The cases, Childclipper, Arcitec and Arcitec 2, although they are not significant, still provide valuable information on the preferences of the experts. First, Arcitec displays the most variety in the choice for the process-options, all three processes were chosen. This is not surprising, because of the differences in opinion on the positioning of this case (see previous paragraph). The insignificance of both the choices for the Childclipper as well as the Arcitec 2 can be clarified by the chosen process designs. Both internal and external experts perceive these cases as incremental. Childclipper is perceived as a market driven incremental innovation and Arcitec 2 is perceived as a technology driven incremental innovation. Because the three process-options contain both a strong design for incremental innovations as well as for both driving forces, the choice for one of these options was made difficult. In the results of the choices for these two cases we see an almost equal division between process-option 2 and the process that fits best with the dominant driving force.

The dominant choices for the process-options per case are represented graphically in figure 15. All cases are in this figure surrounded by the area of the dominant process-choice corresponding with the case. The insights of the statistical analyses on the choices made by the external experts clearly correspond with the areas covered by the different process-options.
This analysis shows that CIM is applicable in practice. External respondents without knowledge of innovations within Philips S&B and the IPP are able to determine the context of a proposed innovation (see positioning) and translate this in a choice for their preferred process design (see choices for process options). In paragraph 6.5 a prediction is made about these choices. The expectation was that for cases that are perceived by the experts as market driven, process 1 would be the preferred process option. For technology driven innovations the expected preferred process is process 3 and for incremental innovations the preferred process is process 2. These expectations were validated by the choices. The respondents choose significantly the same process options for most cases. These choices correspond with the positioning of the cases. This tells us there are general preferences linked to the context of a proposed innovation. The significant cases show that the dominant process option is never
process 2. The contextual factor ‘driving force’ is stronger represented in the choices than ‘degree of newness’, therefore it is likely that the external experts consider the impact of ‘driving force’ more important for the process design.
7 Conclusions and recommendations

Philips S&B faces the challenge of developing innovative products in a competitive environment. Innovation management is developing over time and it is important for Philips S&B to stay up to date on the latest developments. Its innovation program consists of three major processes, the IPP, TFC and IPD. In order to create efficient and effective processes Philips S&B uses the theory of Lean Product Development. The application of methods from LPD has brought better results in the TFC and IPD. Application of these methods is not suitable for the IPP, because of the exploratory character of this process. This research has focused on reaching the goals of LPD through the use of a theory called Contextual Innovation Management.

7.2 Conclusions

How can Contextual Innovation contribute to Lean Product Development in IPPs of Philips Shaving & Beauty?

This research started with an investigation of the IPP within Philips S&B. It shows what activities are performed and what deliverables are produced. Furthermore, the roles and responsibilities of different departments and employees are described. It became clear that Philips S&B uses one rigid process description for all IPPs in which many different departments are involved. After observations done in practice at Philips S&B and evaluation of the IPP-PST, the shortcomings of the current IPP are described. It can be concluded that most of these shortcomings are related to problems with:
- Planning
- Alignment of different interests of internal parties within the IPP
- Alignment of interests of the IPP with the TFC and IPD
- Involvement and input in process of external parties

To improve leaness Philips S&B uses the Lean Development System Model. After expert consultation within Philips S&B, the most important goals for the IPP have been derived from the 13 goals in the Lean Development System Model.
1) Front loaded innovation process
2) Technically / expert project and functional management
3) Teamwork and integral optimization
4) Fully integrated suppliers
5) Visual communication

These 5 goals aim to solve the shortcoming existing in the IPP. As mentioned before, the methods provided in LPD are not suited to be applied to the IPP. Therefore, other ways of reaching these goals should be explored. The theory on CIM states that processes, like the IPP, should be adapted to the context of the proposed innovation. CIM is a promising theory for reaching the goals for the IPP set in this research. The literature on CIM is very theoretic. In chapter 5 this theory was used to describe, with the use of an example case, in what way CIM contributes to the goals of LPD. The practical applicability of CIM for Philips S&B to contribute to its goals to improve leanness was subject of this research.

Adaptation of processes to their context is crucial for creating processes that are better measured to the task at hand. Defining the context of an innovation is possible by regarding several contextual factors. These factors describe the type of innovation, type of organization, type of industry and the culture in which the innovation will be developed. For these four categories the relevant factors for Philips S&B are gathered in this research by reviewing literature and consultation with internal experts. Furthermore, these experts made a choice for the two most relevant contextual factors. The resulting two most important contextual factors for innovations within the IPP of Philips S&B were ‘degree of newness’ and ‘driving force’.

External experts in the field of innovation management were interviewed. For these interviews 8 cases from the recent past of Philips S&B are gathered. Internal experts, with extensive knowledge on innovations at Philips S&B and the IPP, positioned these cases on a continuum with ‘degree of newness’ and ‘driving force’ on the x and y-axis. The continuum covered all types of innovations from incremental to radical and from market driven to technology driven. Three different process options were designed. These three processes were derived from the existing IPP, but differ in sequence and cooperation between departments. The processes were designed to
adapt to the two contextual factors, ‘degree of newness’ and ‘driving force’. The external experts were asked in interviews to describe the context of the 8 cases presented to them. The focus of the interviews regarding the context of the cases was on the two identified most important contextual factors. This research proves that innovation experts from within the company can distinguish contextual factors in its innovative concepts.

A positioning of the same 8 cases on the same continuum as from the internal experts was derived from the statements made by the external experts. The positioning of the 8 cases corresponds mostly to the positioning of the internal experts, which proves that the context of a proposed innovation can be defined objectively, regardless of the knowledge one has about innovations at Philips S&B and the IPP. In the same interviews the external experts were asked to link each case to the process-option they would prefer for developing this case. For the majority of the cases a significant preference for one specific process-option could be distinguished. The preference of external experts for certain process-options differs significantly for different cases. The preferences from the external experts regarding the process-options for the different cases satisfied the expectations of the link between the contextual factors and the process designs. Especially the factor ‘driving force’ was an important influence for the choices made by the external experts. This research proves that experts can make choices for the design of innovation processes based on contextual factors. It has become clear that driving force has a dominant influence on the design of the IPP.
The paragraph begins with a question: **What can be recommended to Philips S&B for implementing CIM in the IPP in order to innovate in a leaner way?**

In this paragraph a proposition is made to Philips S&B to apply CIM to the IPP in order to improve the leanness of this process. CIM is a theory that regards the whole context of a proposed innovation to adapt innovation processes to the task at hand. This means that Philips S&B should determine which factors constitute the context of its innovations. The level of detail it wants to maintain is a choice that eventually needs to be made by the managers from within Philips S&B. This research has proven that at least two contextual factors are very important, namely ‘degree of newness’ and ‘driving force’. It will not suffice to only regard these two factors in order to define the context of an innovation. With regard to the goals Philips S&B aims to reach for creating leaner IPPs, it is recommended to regard all the following contextual factors. Only by regarding the total context, the best process can be designed.

**Table 4: Context of innovations within Philips S&B**

<table>
<thead>
<tr>
<th>Type of Innovation</th>
<th>Type of Organization</th>
<th>Type of Industry</th>
<th>Type of Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of newness</td>
<td>External participants</td>
<td>Technology intensity</td>
<td>Culture of participating companies</td>
</tr>
<tr>
<td>Entity to whom newness refers</td>
<td>Market scope or geographic reach</td>
<td>Industry regulation</td>
<td>Culture of targeted consumers</td>
</tr>
<tr>
<td>Driving force</td>
<td>Placement within ranges</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

70
‘Driving force’ is highlighted as it is identified in this research as the most important contextual factor.

Normally, every IPP starts with the ‘IPP start meeting’. The program manager for IPP gathers all the different departments that are going to be involved in the upcoming IPP, to describe the initial concept and therefore the starting point for the process. The defining of the context of the proposed innovation should follow this meeting. The program manager determines who should be involved in this meeting. It will be tempting to involve only a small group of employees, because it will be easier to reach consensus with fewer people. However, it is better to involve a broad spectrum of departments and employees in order to improve teamwork and integral optimization and to start the IPP with visual communication for all parties involved. The role of the program manager for IPP is very important in this meeting, because it will be very difficult to align all different interests and views. The participants will be biased on many fronts, but they should all strive for the best process design for the task at hand. The better the outcomes of this meeting, the bigger the chance is for a front-loaded IPP, in which the most necessary activities will be completed first.

As the starting point for designing an optimal IPP, the seven recognized building blocks are used. These building blocks are displayed in the following figure.
The activities in these building blocks are useful and well described. Philips S&B should not compromise the existing IPP description in full, but merely some adaptations resulting from the context at hand should be made. The following steps should be taken in the proposed meeting to come to a satisfying process design.
Step 1: Determining ‘driving force’

‘Driving force’ is identified in this research as the most important contextual factor for innovations within Philips S&B. Determination of the driving force of the proposed innovation leads to insights regarding the desired sequence of activities in the IPP. The seven building blocks will be positioned in this step according to the driving force. Missing information on marketing and technology aspects of the concept is identified and prioritized. The prioritization leads to a customized positioning of the building blocks in the IPP in which the activities with the highest priority are performed first. Clear agreements on communication of the results should be made. The hand off moments will be indicated and responsibilities for this hand off between the departments or employees will be described.

Step 2: Determining ‘newness’

The newness of the innovation influences the extensity of certain activities in the process. As mentioned in this research, the current IPP is suited to develop radical innovations. Especially the ‘marketing analysis’ and ‘TnD analysis’ building blocks are needed to explore completely new concepts. If the proposed innovation is perceived as an incremental innovation, these activities could be redundant with previous activities of Philips S&B. In this case it is inefficient to perform these activities from scratch and it should be considered to cut them from the process design.

Step 3: Determining ‘external participants’

This step aims to get a clear view on needed expertise or supplies from external parties. Philips S&B has difficulties to incorporate such external participants in the IPP. The purchasing department performs the only activity in the current IPP that focuses on external parties. This activity is scheduled in the third phase of the IPP (proposition development), which is scheduled approximately five months after the start. This activity leads to the output ‘alliance and supplier info’. As Philips S&B set the full integration of suppliers and alliances as a goal for a leaner IPP, it is proposed that the identification and incorporation of external participants is done at the start of the IPP. The responsibilities for approaching these external parties should be delegated to the departments that have access to and common understandings with the
external parties. The activities in the IPP in which the external parties should be involved should be marked in order to create a good and clear cooperation between the departments of Philips S&B and the external participants. By including activities in the IPP in which external participants have an active role, Philips S&B creates more involvement amongst its suppliers and alliances.

**Step 4: Determining ‘type of industry’**

The familiarity of Philips S&B with the targeted industry is important for the process design. If the proposed innovation is part of an industry that is familiar to Philips S&B, the current activities of the IPP should suffice. If, however, the innovation is part of an industry that is less familiar to Philips S&B, some exploration of this industry is needed. A clear view on the rules and regulations, the technology and the culture of the targeted industry is needed to successfully develop the desired innovation. This knowledge will be partly provided by the external parties that are incorporated in the process, but some extra activities for departments within Philips S&B could also be needed to get this clear view on the targeted industry. The activities will be made explicit and incorporated in the IPP design.

**Step 5: Determining ‘geographic reach’**

The familiarity of Philips S&B with the targeted countries is important for the process design. Consumer wishes and therefore insights are varying for different geographic regions. Philips S&B has data on consumer preferences from many different regions and consumer segments, but sometimes new segments are targeted with an innovation. For instance, the development of a solution for the problem of shaving ingrown hairs amongst Afro-American males is proposed. This calls for extra focus on the activity performed by the department Market Intelligence and Strategy resulting in consumer insights, as the Afro-American male is a target group with specific unknown preferences to Philips S&B. This activity should be divided in more explicit activities that should be incorporated in the design of the IPP. An agreement should then be made on giving this department the needed time and resources to perform these activities.
Step 6: Consensus on process design
The meeting ends with questions from involved parties, which leads to a discussion on the raised issues in order to reach consensus. The program manager guides this step and decides if and when consensus is reached on the designed IPP.

Figure 16 presents these steps in a flowchart that can be used as a guideline for this meeting.
Figure 17: Flowchart of recommended steps
The proposed steps will lead to better-measured IPPs for the task at hand. The research described in which way CIM can contribute to leanness of the IPP. By performing the recommended steps at the start of every IPP, Philips S&B creates the opportunity for involved parties to discuss upcoming problems and solutions in an early stage of the IPP. In the end, it is believed that this will lead to more clear agreements on responsibilities and communication. Furthermore, a better understanding of internal and external expertise needed will be the result of these steps. Eventually, performing the recommended steps by Philips S&B will lead to reaching its following goals for improving leanness of the IPP:

1) Front loaded innovation process
2) Technically / expert project and functional management
3) Teamwork and integral optimization
4) Fully integrated suppliers
5) Visual communication

During the research, Philips S&B indicated that it would not have their preference to completely change the IPP as it is in the current situation. Therefore, a solution to its problems by customizing the current IPP for innovations in a different context should be satisfying. The given recommendations will not lead to one complete new IPP design, but will help improve Philips S&B to create leaner IPPs.

It may be useful to investigate the possibilities of CIM to improve the other processes within the innovation program of Philips S&B. Implementing LPD in the TFC and IPD already made much progress, but there may be possibilities for improving even more by incorporating CIM. Secondly, Philips S&B should research the possibilities for constructing a measurement system for the improvements made by implementing CIM in the IPP. This system should at least measure the improvements on the 5 goals mentioned above.
8 Discussion

The research was done in-house at Philips S&B in Drachten, which is the location of all TnD departments of the business unit. Although there was extensive contact with the marketing departments during the research, the majority of the input for this research came from technology related departments or employees. This could lead to a bias of the researcher and therefore could be seen as an influence to the research. This in-house situation also made it more difficult to keep a good balance between scientific goals of the research on CIM and the more practical goals of Philips S&B regarding leaner IPPs. Eventually this balance was found, but it took longer than expected.

8.1 Discussion of practical goals

The focus of this research was on the IPP, however this process is part of an innovation program. The consequences of this research for the other two processes in this program, TFC and IPD, have not been investigated thoroughly. To research these consequences, many more experts from within Philips S&B should be involved; this was beyond the scope of this research.

An embarkation of the important goals for LPD in the IPP was made together with managers of Philips S&B. This resulted in five goals, however the other eight goals for LPD set by Philips S&B were not proved to be infeasible. Therefore this research does not ensure that the IPP will become as lean as possible by following up on its recommendations, but it can be seen as a starting point for creating leaner IPPs.

(Big) difficulties were come across when designing the three process-options as input for the external expert interviews. The possibilities for different process-options were infinite and the capabilities of the external experts needed to be assessed. In an ideal situation, the external experts would be confronted with numerous options varying on many contextual factors. This was assessed as infeasible and therefore only three different options varying on two contextual factors were designed. The experts could therefore only be asked for their preferred option, but not for their ideal process to
develop the presented case. The method of expert interviews had another negative side effect. The number of respondents for these interviews was relatively small, because this method is very time consuming. This resulted in a statistical analysis of a smaller data collection. Some solid conclusions came from this analysis, but with a larger sample there would be stronger conclusions on the preferences of experts for certain process designs in certain contexts.

In order to preserve the open minds of the external experts, the continuum of the two contextual factors, ‘degree of newness’ and ‘driving force’, was not presented to them. Therefore it was impossible to let them position the cases on the continuum. In order to make a comparison between the perceived contexts of both internal and external experts, interpretation of the answers given by the external experts was needed from the researcher. Eventually, this led to a validation of the positioning of the eight cases. This validation could be perceived as dependent of the researchers interpretation.

To prove the practical applicability of CIM for Philips S&B in its IPP, a model of the real world had to be constructed. In this research this model consists of eight cases from the recent past of Philips S&B, three different process-options and twelve external experts that explain their perception of the context of these cases and their choice for one of the process-options. This model gave the researcher information on which analyses were performed and eventually it is stated that CIM is applicable in the practice of the IPP of Philips S&B. This statement can only be really validated by the implementation of CIM in the actual IPP. Unfortunately, this was not possible within the scope of this research.

One could argue that CIM makes the innovation management practice within Philips S&B more complex. Because of the extra steps and different process designs resulting from implementing this theory. It is however believed that the gains in efficiency and effectiveness resulting from adapting processes to specific contexts of innovations exceed the losses of extra complexity. In the case of Philips S&B, it is recommended to build upon the existing IPP process. The context influences the sequence of and focus on the different activities within the IPP and the analysis of contextual factors forces the managers to set clear responsibilities for the involved parties.
discussion on these topics naturally cost time and effort at the beginning of an IPP. In the light of LPD, this corresponds with the goal of front-loaded processes. More effort at the beginning of projects will make it faster and more efficient at the end.

8.2 Discussion of theory

LPD is used to improve the former product development process or to try to standardize the way of doing things in the company (Womack and Jones 1996). The method uses certain tools for improving the current process and measurement tools to calculate the improvement. LPD seems to enable the creation of a standard by making the problems in product development apparent. This makes possible an improvement and its standardization.

In order to focus on creating value in product development, a clear understanding of value should be present. This causes the problems for implementation of LPD in the IPP of Philips S&B. It is very difficult to determine which activities add value and which activities can be seen as waste in the IPP. The IPP consists of activities that explore a broad range of possibilities for new products; therefore not all activities contribute directly to the development of a product that customers pay for. This does not mean that these activities can be seen as waste, because such a broad exploration is needed to come to the most meaningful and rewarding innovations. Moreover, activities that can be seen as waste in the process of innovation for one product could be valuable in the process of innovation for another product. Different innovations, within different contexts, demand different process designs. Within the theory of LPD there is no explicit solution given for measuring processes to the context of the proposed innovation. This is a crucial shortcoming of LPD when regarding exploratory front-end phases of innovation programs, like the IPP of Philips S&B. This research shows that CIM can be a valuable method for addressing this specific problem. CIM copes with different contexts of innovations by measuring processes to the task at hand. The methods and tools from LPD that are useful to safeguard efficiency of such processes can still be used by companies if desired. However, for the IPP within Philips S&B these methods and tools were not sufficient to create
leaner processes. It is believed that the two theories can co-exist and supplement one another.

This research focuses on the innovation program of Philips S&B. It offers S&B a new way of coping with the complexity and dynamics of innovation. Many companies struggle to overcome similar problems in their innovation program. Especially, the fuzzy front-end of innovation is difficult to manage and predict in many innovative companies. The recommendations for Philips S&B resulting from this research can be translated for other companies that cope with similar problems. Naturally, the most important contextual factors for every specific company should be analyzed before recommending a way to incorporate CIM in their innovation program. For Philips S&B the most important contextual factors are ‘degree of newness’ and ‘driving force’, but for other companies in a different environment other contextual factors can be of greater significance. After analyzing the context of innovations within the specific company, similar recommendations to the flowchart in chapter 7 can be made for this specific company. The implementation of CIM can help companies to overcome their problems regarding efficiency and effectiveness of their innovation programs.
Literature


Appendices

Appendix A: Value Proposition House

**Inside-Out**
How can we translate our insights into attractive, relevant, credible and distinctive Philips propositions?

**Outside-In**
How can we understand what people are looking for and whom we want to serve?

**Brand Positioning**
How can we make it Designed Around You, Easy to Experience and Advanced?
Appendix B: Voice of the Customer Tree

![Voice of the Customer Tree Diagram]

1 Factory Selling Price (FSP): Material + Labor + Depreciation + Overhead_{int} + Profit.
<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
<th>Score</th>
<th>Analysis</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<td>4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Appendix C: Process Survey Tool IPP
Appendix D: Improvement actions for IPP

Element 1: The Process
There is no upfront master planning which includes assignments. The consolidation of milestones and results by line of business management is not always up to the standards. External parties are not directly participating in meetings.

Element 3: Technology / supplier knowledge
Technology knowledge benchmarks are not always defined and the technology knowledge is not benchmarked with other internal & external partners. Technology partners are not structurally involved and participating in the creative process.

Element 4: Business strategy
In- and outsourcing of competences is not explicitly included in IPP decision-making. Business scope and target setting is not improved by bottom-up IPP experiences.

Element 5: IPP methods and tools
There is not enough explicit evidence that the latest/best practice methods and tools are implemented for use during the IPP and that they are used across all functional groups.

Element 8: Innovation roadmaps
The time horizon of plans represented in the LoB innovation roadmaps covers less than two product generations (or 7 years product planning). No supply plan is available. A marketing roadmap, including claims, distribution channels, marketing communication activities, price-branding structure, is no integral part of the innovation roadmap. There is no clear evidence of a common understanding of the roadmap contents within a Line of Business.

Element 9: Validations of plans
Feasibility studies on suppliers and partners are not conducted together with partners. No value-chain validation together with suppliers and strategic partners takes place.
Appendix E: Lean goals for Philips S&B

1. Customer driven
   The strengthening of the Advanced Research Centre within the organization, as well as the improvement of used testing procedures.

2. Front loaded innovation process
   Decision flow based on in-time (not too early, not too late)

3. Leveled product development flow
   Meetings with roadmap consequences to make the resource needs relatively even

4. Rigorous Standardization
   Design rules for technical standardization
   Standard Operating Procedures (SOPs) for ways of working
   Training for competency development
   Architecture process to maximize technical reuse
   The choice of proven production processes

5. Technically expert project & functional management
   Explicit hiring policy
   Job rotation to develop broad leaders

6. Teamwork and integral optimization
   No power fights between functions and projects

7. Towering technical competence
   Technical competences first in hiring
   Rigorous technical trainings largely by own staff
   Half-yearly job rotation review

8. Fully integrated suppliers
   Early supplier involvement
   External producers in the project teams

9. Continuous learning and involvement
   Explicit sharp product learning and process learning
10. Culture of excellence
   Open Mind Mapping training to enable us to explain in adult way what is needed

11. Customized technology
   New customized technologies in library for standard parts and database for testing

12. Visual communication
   Portal for electronic sharing
   Standard formats

13. Standardization and learning tools
   The Knowledge Portal
   Standard formats
## Appendix F: Examples of levels for Contextual Factors

### Table 5: Type of Innovation, factors and levels

<table>
<thead>
<tr>
<th>Degree of newness</th>
<th>Type of Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incremental innovation, radical innovation, transformational innovation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Entity to whom newness refers</th>
<th>Type of Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New to the world, new to the firm, new to the market, new to technology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Driving force</th>
<th>Type of Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Technology, consumers, competitors, nature, experience</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Placement within ranges</th>
<th>Type of Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High-end range, mid-end range, low-end range, combinations</td>
</tr>
</tbody>
</table>

### Table 6: Type of Organization, factor and levels

<table>
<thead>
<tr>
<th>External participants</th>
<th>Type of Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experts, Companies, Universities</td>
</tr>
</tbody>
</table>
Table 7: Type of Industry, factors and levels

<table>
<thead>
<tr>
<th>Type of Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology intensity</td>
</tr>
<tr>
<td>High-tech, medium tech, low-tech</td>
</tr>
<tr>
<td>Market scope or geographic reach</td>
</tr>
<tr>
<td>Global, country focused, regional, highly localized</td>
</tr>
<tr>
<td>Industry regulation</td>
</tr>
<tr>
<td>Medical claims, pharmaceutical regulation, environmental codes</td>
</tr>
</tbody>
</table>

Table 8: Type of Culture, factors and levels

<table>
<thead>
<tr>
<th>Type of Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture of participating companies</td>
</tr>
<tr>
<td>Hierarchical, flat, bureaucratic, organic, open, closed</td>
</tr>
<tr>
<td>Culture of targeted consumers</td>
</tr>
<tr>
<td>Tolerant for innovation, conservative, proactive, reactive</td>
</tr>
</tbody>
</table>
Appendix G: Questionnaire step-by-step

**STEP 1:**
Information gathering. The first step for sending questionnaires is finding respondents. For the questionnaires about the cases this was a fairly easy step. The IPP-leaders of the case projects were targeted as respondents. The only downside was that some of these project leaders were no longer available for my research and others didn’t feel comfortable in responding to questions about the former project. Fortunately some of the targeted respondents seemed happy to cooperate.

**STEP 2:**
First contact. Eventually, when I found some former IPP leaders of the cases, I mailed them the following letter:

_Geachte …_

_ Ik ben Wieger Aarts, afstudeerder bij Philips Shaving & Beauty in Drachten voor de studie Techniek, Bestuur en Management aan de TU Delft.
_ Mijn afstudeerbegeleider binnen Philips is Jan van Dalen. Ik verdiep mij in het Innovation Planning Process van Shaving & Beauty. Ik doe in mijn onderzoek een poging om het IPP te verbeteren aan de hand van een theorie, genaamd Contextual Innovation Management (CIM). In mijn onderzoek beschrijf ik een aantal cases van S&B, waaronder … Ik probeer erachter te komen hoe het IPP rond dit product destijds verlopen is en of er verbeteringen mogelijk zijn.
_ Ik begreep van Jan dat u destijds betrokken bent bij de ontwikkeling van dit product. Ik zou u daarom graag enkele vragen stellen over uw visie op de voorontwikkel fase (IPP) van dit product. Mijn uiteindelijke doel is om verbeterpunten aan te geven naar aanleiding van uw antwoorden. Deze verbeterpunten wil ik omzetten in voorstellen voor S&B teneinde een betere procesbeschrijving van het IPP te construeren.

_In de bijlage heb ik een document met vragen bijgevoegd. (Deze vragen zijn gesteld in het Engels, omdat dit verwerking in mijn scriptie makkelijker maakt.) Ik denk dat het beantwoorden van deze vragen u niet meer dan 10-15 minuten hoeft te kosten._

_Alsjebeatt erg veel dank voor uw medewerking!

_m.v.g. Wieger Aarts_

(w.t.m.aarts@student.tudelft.nl)

When I did not receive an answer within 1 working week, I mailed them the same letter again. If I did not receive an answer within the following 1 working week, I eventually called and asked for the particular person.

**STEP 3:**
The questionnaire itself. The questionnaire is displayed on the next pages.
Answers to the questions below will be of great help to my research. In order to conduct a comparison to the answers of different experts I ask you to give a rating from 1 to 5 for most of the questions (1= very negative, 5= very positive). I also ask you to give a short explanation of your answers in the provided text boxes.

Questions about the way of working during the IPP phase of [case]:

What is your overall view on the description of the processes (placemat with activities and deliverables) used by Philips S&B to complete in the IPP?
1 □ 2 □ 3 □ 4 □ 5 □

Explanation:

How did you feel about the cooperation between different departments during the IPP?
1 □ 2 □ 3 □ 4 □ 5 □

Explanation:

How did you feel about the quality of the communication between departments/stakeholders during the IPP?
1 □ 2 □ 3 □ 4 □ 5 □

Explanation:

What do you think about the clarity of tasks and responsibilities during the IPP?
1 □ 2 □ 3 □ 4 □ 5 □

Explanation:
How good was the sequence of the sub-processes within the IPP for the development of this product?
1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

Explanation:

Were you satisfied with the speed of the IPP in this particular case?
1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

Explanation:

Were there aspects of the product that should have gotten more attention in the IPP phase?
Questions on opportunities for improvement of the IPP phase of product development:

Do you think a customized IPP-description for different innovations would deliver better results?
1□ 2□ 3□ 4□ 5□

Explanation:

Which factors / characteristics of the innovation, would be of influence for describing the best suited IPP-process?

Which departments or people (functions) should be involved in describing such a customized process?

Which performance factors of the IPP could be improved (p.e. time, cooperation, communication, responsibilities etc.)?

Thank you for your cooperation!

Kind regards,

Wieger Aarts.
Appendix H: Questionnaire

H1

Geachte heer Visser


In de bijlage heb ik een document met vragen bijgevoegd. (Deze vragen zijn gesteld in het Engels, omdat dit verwerking in mijn scriptie makkelijker maakt.) Ik denk dat het beantwoorden van deze vragen u niet meer dan 10-15 minuten hoeft te kosten.

Alvast heel erg veel dank voor uw medewerking!

m.v.g. Wieger Aarts

(w.t.m.aarts@student.tudelft.nl)
Answers to the questions below will be of great help to my research. In order to conduct a comparison to the answers of different experts I ask you to give a rating from 1 to 5 for most of the questions (1= very negative, 5= very positive). I also ask you to give a short explanation of your answers in the provided text boxes.

Questions about the way of working during the IPP phase of [case]:

What is your overall view on the description of the processes (placemat with activities and deliverables) used by Philips S&B to complete in the IPP?
1 2 3 4 5

Explanation:

How did you feel about the cooperation between different departments during the IPP?
1 2 3 4 5

Explanation:

How did you feel about the quality of the communication between departments/stakeholders during the IPP?
1 2 3 4 5

Explanation:

What do you think about the clarity of tasks and responsibilities during the IPP?
1 2 3 4 5

Explanation:
How good was the sequence of the sub-processes within the IPP for the development of this product?

1 2 3 4 5

Explanation:

Were you satisfied with the speed of the IPP in this particular case?

1 2 3 4 5

Explanation:

Were there aspects of the product that should have gotten more attention in the IPP phase? No
Questions on opportunities for improvement of the IPP phase of product development:

Do you think a customized IPP-description for different innovations would deliver better results?
1 2 3 4 5

Explanation: *Depends on the team and the competences of people.*

Which factors / characteristics of the innovation, would be of influence for describing the best suited IPP-process?

**Clear goal, consumer innovation driven, complete team AMS/DTN, out of the box thinking, ‘believe in’ instead of ‘it doesn’t work we’ve tried in the past’**

Which departments or people (functions) should be involved in describing such a customized process?

**MM / CMM / IDT Drachten**

Which performance factors of the IPP could be improved (p.e. time, cooperation, communication, responsibilities etc.)?

**Cooperation between CMM AMS and IDT DTN, communication, responsibilities, ‘don’t sit on each chair’**

Thank you for your cooperation!

Kind regards,

Wieger Aarts.
H2

Geachte heer Peters,


Ik begreep van Jan dat u destijds betrokken bent bij de ontwikkeling van dit product. Ik zou u daarom graag enkele vragen stellen over uw visie op de voorontwikkelfase (IPP) van dit product. Mijn uiteindelijke doel is om verbeterpunten aan te geven naar aanleiding van uw antwoorden. Deze verbeterpunten wil ik omzetten in voorstellen voor S&B teneinde een betere procesbeschrijving van het IPP te construeren.

In de bijlage heb ik een document met vragen bijgevoegd. (Deze vragen zijn gesteld in het Engels, omdat dit verwerking in mijn scriptie makkelijker maakt.) Ik denk dat het beantwoorden van deze vragen u niet meer dan 10-15 minuten hoeft te kosten.

Alvast heel erg veel dank voor uw medewerking!

m.v.g. Wieger Aarts

(w.t.m.aarts@student.tudelft.nl)
Answers to the questions below will be of great help to my research. In order to conduct a comparison to the answers of different experts I ask you to give a rating from 1 to 5 for most of the questions (1= very negative, 5= very positive). I also ask you to give a short explanation of your answers in the provided text boxes.

Questions about the way of working during the IPP phase of [case]:

What is your overall view on the description of the processes (placemat with activities and deliverables) used by Philips S&B to complete in the IPP?

1 [ ] 2 [x] 3 [ ] 4 [ ] 5 [ ]

Explanation: The IPP at that time did not focus on the manufacturability of the proven concept, this has been changed meanwhile.

How did you feel about the cooperation between different departments during the IPP?

1 [ ] 2 [x] 3 [ ] 4 [ ] 5 [ ]

Explanation: Rating is based on cooperation between project management and the IPP execution.

How did you feel about the quality of the communication between departments/stakeholders during the IPP?

1 [ ] 2 [x] 3 [ ] 4 [ ] 5 [ ]

Explanation: The communication was not good as there was almost no cooperation (again, this is from a view of project management).

What do you think about the clarity of tasks and responsibilities during the IPP?

1 [ ] 2 [x] 3 [ ] 4 [ ] 5 [ ]
Explanation: **With the limited scope, responsibilities have been clear.**

How good was the sequence of the sub-processes within the IPP for the development of this product?

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

Explanation: **Cannot judge**

Were you satisfied with the speed of the IPP in this particular case?

1 [ ] 2 [ ] 3 [x] 4 [ ] 5 [ ]

Explanation: **Was running in parallel to the project, speed was ok.**

Were there aspects of the product that should have gotten more attention in the IPP phase? **See above, consider industry as well.**

**Questions on opportunities for improvement of the IPP phase of product development:**

Do you think a customized IPP-description for different innovations would deliver better results?

1 [ ] 2 [x] 3 [ ] 4 [ ] 5 [ ]

Explanation: **The master IPP description has to be the reference for all executions, anyhow it should allow for defined scaling upfront (identifying elements which are not applicable, but only upfront).**
Which factors / characteristics of the innovation, would be of influence for describing the best suited IPP-process?

See above, should be one master.

Which departments or people (functions) should be involved in describing such a customized process?

Scaling should be done by development, engineering, purchasing and quality.

Which performance factors of the IPP could be improved (p.e. time, cooperation, communication, responsibilities etc.)?

So far I know, already good improvement have been made, certainly the involvement of quality is still a point of attention.

Thank you for your cooperation!

Kind regards,

Wieger Aarts.
Appendix I: Interviewing step-by-step

STEP 1:
Information gathering. The first step in the interviewing process is searching for interviewees in the area of interest. Some random search key words used for this process: innovation, product development, process management and so on. This interviewee search could for example be done using social network websites like LinkedIn.com and Facebook.com. I also received a lot of information (mail, phone numbers, background info of possible interesting interviewees) from my graduation committee and supervisor from Philips. Before contacting the experts, I tried to collect as much company in-house information as possible. For example from the particular website and press releases. In this way, I would come across as an interested interviewer with some knowledge about the possible interviewee.

STEP 2:
First contact. Eventually, when I found an interesting company matched the key words, I mailed them the following letter:

L.S.
Ik ben bezig met mijn afstudeeronderzoek bij Philips Shaving & Beauty in Drachten. Mijn onderzoek richt zich op het aanpassen van het innovatieproces aan factoren uit de context van de beoogde innovatie. In het kader van mijn onderzoek wil ik een aantal expertinterviews afnemen.

Mijn afstudeerbegeleider van de TU Delft, Patrick van der Duin, heeft mij uw mailadres gegeven. Hij is van mening dat u mij kunt helpen bij mijn onderzoek.

Is het mogelijk om deze week of volgende week een afspraak te maken, zodat ik u een aantal vragen kan stellen over enkele zaken rondom mijn onderzoek?

Mocht u alvast een meer inhoudelijke uitleg over mijn onderzoek of het interview willen hebben, dan boor ik het graag.

Alvast veel dank,

Wieger Aarts.

When I did not receive an answer within 1 working week, I mailed them the same letter again. If I did not receive an answer within the following 1 working week, I eventually called the company and asked for the particular person.
STEP 2:
Positive response. If I did receive a positive response on the first/second mail or phone call, I explained again what my research implied and, in case of a positive match with the respondent, made an appointment for the actual interview. This appointment could be made by mail, or by direct phone contact. In this mail or phone conference some first information about the purpose of the interview was presented.

STEP 3:
The interview itself. The scheduled time for the interview was totally depending on the interviewee’s willingness and availability to cooperate in the research. The available time was set before the actual interview, so I could arrange the questions on this timeframe in advance and during the interview. All interviews are performed at the interviewees companies or in a public location set by the interviewee.

The interview was performed along the lines of Appendix I, and was semi-structured. The interview started with an informal welcome, explaining what I was doing (TUDelft, Philips S&B, SEPAM etc.) and a brief explanation of the objectives of the interview. The proposed processes were explained again, as was my goal of describing the interviewee’s interpretation of the cases and processes. Appendix I was eventually used as the overall interview guide, containing questions that are mostly open-ended. These questions were designed to encourage the respondent to talk freely around each topic. In this case the interpretation of the cases and the processes by the respondent.

With the approval of the interviewee, the interviews were recorded on a digital voice recorder. During these interviews very little was written down. Sometimes I wrote down some key words, on which I wanted to come back later on in the interview. By putting them on a memo, I wouldn’t forget.

STEP 4:
Finalizing the interview. Time for some comments or recommendations on the research, on the interview (content related and/or process related), or on anything else. Both from the interviewee as from me.

STEP 5:
Elaborating on the results. In case of an interview without the digital voice recorder, I tried to write out the notes as soon as possible after the actual interview. Otherwise I would loose too much information. The recorded interviews had less rush, considering this elaborating and writing down of the results.
Experts:
I 1  Guus Kaspers (Freeway Lighting)
I 2  Rob de Graaf (InnoGraaf consultancy)
I 3  Paul Nijskens (NV REWIN)
I 4  Ton Langelier (Pro-actuate)
I 5  Lex Besselink (World Class Maintenance)
I 6  Gerard Majoor (TnD)
I 7  Thomas Hollefeld (Marketing Director)
I 8  Friso Kolff (Projectmanager)
I 9  Wiet Koenen (Henk Koenen b.v.)
I 10 Jelmer Riemersma (Veeel Design)
I 11 Bart van Asten (Robidus consultancy)
I 12 Floris Rost van Tonningen (Hyves)
Name: Guus Kaspers
Company: Freeway Lighting B.V.

Freeway Lighting BV is an ISO 9001 certified company established in The Netherlands and is active in the lighting field for more than 15 years. Our internationally oriented organization is specialized in the supply of a wide variety of lamps in all major brands, as well as other lighting products like transformers, fixtures, led and project lighting. Exclusive imports of various successful brands together with the worldwide supply of all major brands turned Freeway into a professional organization offering a very wide range of lighting products.

Due to our dynamic strategy we follow every change in market demand, which results in introducing innovative products regularly.

Freeway Lighting BV offers a refined product range, a comprehensive service concept, which enables deliveries with the speed of light. Worldwide.

Function: Managing Director
Background: Marketing
Expertise: Product sourcing

Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? No
Cases:

Link the presented cases to one of the three processes.

**Coolskin**  
This choice is based on the fact that I believe this product doesn’t need difficult new technology and compels to straightforward customer’ wishes.

**Child clipper**  
This product seems to be just a clipper with a twist. The only new market feature is the lower noise level. I believe this is an easy update, which can be best-developed using process 2.

**Arcitec**  
This shaver looks very different from all previous shavers. This new design challenges the old technology. In this case I would start by identifying new technology to fit this design and checking the functional feasibility of the product.

**Arcitec 2**  
The new feature of this product is the cap with new teeth. The Arcitec has already proven the design and functionality. If the technology of the teeth works, this product can be successful.

**Retraction**  
This is a purely technology push innovation. So I would start by proving and testing this new technology before communicating this with the customer.

**Sonicare**  
I have difficulty choosing a best process for this innovation. I think this is a product, which addresses new customers’ wishes and also needs difficult new technology to address these wishes. In this case I would like to know the exact wishes of the customer before developing the technology.
Merlin 1

Although this seems to be a sort of update from the Coolskin, I believe the new design is a challenge for the technological components. The additive cartridge needs to be fitted in a much slimmer design. I would first check the feasibility of fitting everything in the new design.

Wake-up light 1

This is completely new in the field of alarm clocks. I would prefer to get a completely clear view on the customers’ wishes before going any further with the development. You need to know exactly how people like to be woken.

Which aspects of the processes influenced your decision?

I recognized the difference between the three processes. The first process is very market driven, the second more parallel and the third is very technology driven.

In general, I chose process 1 for products, which I thought, originated from customers’ wishes. In that case I would prefer to start with exploring the exact needs from the customer. The second process is best suited for updates and product with little uncertainty in them. The third process is very technology driven and therefore best suited for innovations with a difficult technology component in them.
DeINNOgraaf gives advice and searches, together with their clients, for answers to questions on innovation, cooperation and strategy. For both small and large projects on national or international level in the form of projects, workshops or interim management. They consider strategy as the way to start realizing future goals today.

Three factors are considered relevant for strategy:

- **Present and past**
  Present and past determine whether your company is successful and where it stands with respect to competition.

- **Ambition**
  The ambition of companies automatically focuses on the future. Ambition comes in different forms; growth, more profit, durability, customer satisfaction, etcetera. Ambition is often a combination of the previous mentioned goals and therefore a complex concept.

- **Future context**
  The context of a company entails the market, but also the context of the market. This makes context hard to grasp and therefore often underestimated.

DeINNOgraaf aims to resolve these three factors altogether. The result is a clear strategy and great confidence in the future of the company.

**Function:** Director  
**Background:** Product Development  
**Expertise:** Management  
Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? Yes
Cases:

Link the presented cases to one of the three processes.

**Coolskin** 2

This product is could not be created with the existing architecture of the Philishave. The experience of electric shaving under the shower was also new. That’s why I would start with both the technology and the marketing in a parallel process.

**Child clipper** 3

This is absolutely not very new and exciting. The only thing that could be a bit of a challenge in this innovation is the noise reduction. I would start by getting the technology for the less noisy clipper right.

**Arcitec** 1

This is new in the way of design and usability. I would start with finding out what wishes play a big role with my customers.

**Arcitec 2** 3

This is a technically better shaver than its predecessors. The focus is on shaving result and therefore on technology.

**Retraction** 3

This innovation has very difficult new technology in it. The focus should therefore be on developing this technology in an early stage.

**Sonicare** 2

Marketing and technology need to go hand in hand for this innovation. You need to find out if teeth are really cleaner after using this brush. At the same time you need to know for certain that customers are willing to pay a lot more money for cleaner teeth.

**Merlin 1** 1

The biggest difference with the Coolskin is the design. I believe the technology not to be very difficult, so I would attack this from a marketing perspective. I would develop this product and the Arcitec in one process.
Wake-up light

The wake-up light is a completely new product. This is really market space. There is a strong link with scientific research on waking up. You really need a strong market analyses in the beginning, because this is so hard to imagine for the customer.

Which aspects of the processes influenced your decision?

I recognized process 1 as market driven innovation. This process looks to be very sequential at the start and doesn’t involve the technology departments in the beginning. Process 2 is a parallel process in which the cooperation of technology and marketing is more important. This process is also a little shorter than the other two processes, because the marketing and technology analysis start at an advanced level.

Process 3 is technology driven. Only when the technology is proven, the marketing departments are involved in the process.

If I would summarize my choices for the cases, I would state the following:

When you recognize new technology that could be implemented in for instance the existing product range, I would use process 3. I would use process 1 for situations in which you recognize customers’ wishes and you don’t have products that fulfill these needs yet. Process 2 can be used for market space developments.

So, when you need new technology to address certain new wishes.
Name: Paul Nijskens
Company: N.V. REWIN West-Brabant

NV REWIN West-Brabant is the regional development society of West-Brabant. REWIN enhances regional economical development by stimulating companies to invest in West-Brabant. REWIN gives advice in office and company establishment, growth and financing and promotion and acquisition.

Function: Managing Director
Background: Policy making
Expertise: Innovation

Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? No

Cases:

Link the presented cases to one of the three processes.

**Coolskin** 1
The marketing aspects of this product are more challenging than the technological issues.

**Child clipper** 1
Idem ditto.

**Arcitec** 3
The new slim body is a challenge for technology, because of the limited space for the components. I would start with analyzing and testing these possibilities.
The technology of the new shaving heads seems to be the challenge here. I would first prove this to be working and feasible by developing concepts, prototypes and testing.

Idem ditto.

Idem ditto.

I chose process 1 because of the new design of this product. The functionality doesn’t seem to be something new. I would test in the market if the new design is promising for the customer.

The concept of waking up by means of an ascending light that simulates sunrise is new to the market, therefore I would consider it critical to find out if this idea resonates with the customer.

Which aspects of the processes influenced your decision?

I recognized the difference between the three processes. The first process starts with marketing and is followed by the technology part. The second process simultaneously copes with the marketing and technological issues. The third process is first addressing the technological issues.

In general, I chose process 1 for products that originated from customers’ wishes. I chose process 3 for products that are more technology push. I didn’t choose for process 2 because I think no innovation can be successful without firm analyses on both marketing and technology.
Pro-Actuate offers innovation processes and project solutions, and is specialized in leading innovation projects through to success. 'Actuate' stands for 'start-up', 'motivate', and 'make it work'. We go further than simply advise clients on how to generate and choose a strong product idea; we help them launch it on the market and roll it out. In other words, we not only help you 'do the right project', we also help you 'do the project right' - in a practical, hands-on way. We can help you with project management skills, we can manage the whole project, from start to finish, or provide assistance with any part of it while looking at in the larger perspective.

Function: Director
Background: Electrical Engineering and Business Studies
Expertise: Business Development
Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? Yes

Cases:

Coolskin 1
Coolskin has unique hardware and software as a result of the cooperation with Nivea. Most important in my vision is the reaction of the market on the concept of electric shaving with an additive.

Child clipper 1
I think insight development is the clue here. What exactly do children (and parents) prefer in clipping hair. The technology should be feasible in my opinion.

**Arcitec**

This shaver has a big new technical component. Fitting everything in the new design and the new single drive shaving head pose big technological challenges.

**Arcitec 2**

I would prefer to start on both sides for this innovation. For me the challenge of this concept lies in the coordination of market and technology.

**Retraction**

However this is a very new and difficult technology, I would not choose to start with only technology development for this innovation. Closeness of shaving is the driving consumer need here. I would want to get this need very clear whilst developing the technology to provide in this need.

**Sonicare**

The same story goes for this innovation. It’s a difficult new technology, however it is of great importance to get the customer’s wishes completely clear before developing this product. Start both of these processes parallel.

**Merlin 1**

I think the challenge here is in the determination of the exact wishes of the customer. Therefore I would start with a thorough marketing analyses and insight development, before starting the development of the technology.

**Wake-up light**

This concept entails a lot of interaction between marketing and technology. I would therefore prefer a parallel start on both sides.
Which aspects of the processes influenced your decision?

I recognized the difference between the three processes. The first process is very market driven, the second technology driven and the third is more parallel.

In general, I chose process 1 for products, which I thought, originated from customers’ wishes. In that case I would prefer to start with exploring the exact needs from the customer.

The only product for which I chose process 3 is the Arcitec, because the technology needed for this product seems very new and complicated.
Name: Lex Besselink
Company: World Class Maintenance

World Class Maintenance connects the capital-intensive industries - Aerospace, Maritime, Infra, Process and Energy - in the field of MRO (maintenance, repair and overhaul). We create a competitive edge to secure and create sustainable jobs and business.

World Class Maintenance will lead to high system integrity and high performance in terms of quality, availability and reliability against optimized life cycle costs.

Function: Director
Background: Physics
Expertise: Innovation processes
Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? Yes

Cases:
Link the presented cases to one of the three processes.

Coolskin 3
My first concern would be the safety, usability, cleaning, maintenance etc. of this concept. Only when these features are all up to standard I would begin with the persuasion of customers.

Child clipper 2
This is a pretty straightforward concept. The shorter process should be enough for the realization. It’s good to concentrate on both market and
technology in the first phase of the process, but the analysis phase will not be needed in my opinion.

Arcitec 2
The functionality of this shaver is not much different from its predecessors. It’s more an effort to get the customer excited again. Work needs to be done in the beginning on both technology as marketing.

Arcitec 2 2
Idem ditto.

Retraction 3
Closeness of shaving is going to be improved by use of a new technology. The consumer wish for closer shaving is not very new and complicated. The challenge lies in the technology of this new system.

Sonicare 3
The Sonicare cleans your teeth better. I want to know exactly how this is done, maybe even medical proof. The customer’s wishes regarding clean teeth would be important in a later stadium for me.

Merlin 1 1
I see this as an update of the Coolskin shaver. The technology is at hand, but the consumer wishes that you want to address need to be investigated first.

Wake-up light 1
This is a very new and innovative product. Communication with the customer at an early stage of the development should improve the understanding of the concept on both sides.

Which aspects of the processes influenced your decision?

The first process poses the customer as the driver for innovation. First, you try to find out exactly which desires play a big role among consumers. These desires are transformed into concepts and technology in a later stage.
of the process. The second process constitutes more cooperation between departments in the early phase of the development. The third process starts with the development of technology. After the analysis and feasibility studies, the marketing proposition is made.
Guided by our brand promise of “sense and simplicity” and starting from our consumer insights, Philips Consumer Lifestyle offers rich, new consumer experiences that meet consumers’ desire for relaxation and improving their state of mind. We address the consumer's desire for wellness and pleasure, and we've mapped this approach by looking at the individual's interests in terms of their Space, their Mind, their Body, and their Appearance.

Function: **R&D Manager Male Shaving**  
Background: **Technology**  
Expertise: **Management**  

Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? **Yes**

**Cases:**

Link the presented cases to one of the three processes.

- **Coolskin**  
  No new technology, start with consumer.

- **Child clipper**  
  No new technology, start with consumer.

- **Arcitec**  
  No new technology, start with consumer.

- **Arcitec 2**  
  Some new technology needed, start parallel.
Retraction  2

Some new technology needed, start parallel.

Sonicare  2

Some new technology needed, start parallel.

Merlin  1

Mostly a design question; does the customers like this design?

Wake-up light  1

No new technology, start with consumer.

Which aspects of the processes influenced your decision?

Process 1 is the mainstream process within Philips. This is often the best option in my opinion. Start with analyses of the market and consumer insights. Process 2 can be useful in some situations. When the technology for a concept is hard to realize, it’s wise to start with the development in an early stage. Process 3 is very technology driven and almost never useful in my opinion. This treatment is only useful when one is developing such a new concept that the customers are not able to grasp the idea, for instance ‘laser shaving’.
Guided by our brand promise of “sense and simplicity” and starting from our consumer insights, Philips Consumer Lifestyle offers rich, new consumer experiences that meet consumers’ desire for relaxation and improving their state of mind. We address the consumer's desire for wellness and pleasure, and we've mapped this approach by looking at the individual's interests in terms of their Space, their Mind, their Body, and their Appearance.

Function: Senior Director New Business S&B
Background: Marketing
Expertise: Marketing

Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? Yes

Cases:

Coolskin

The consumer insight for this product starts with the wish for a healthy skin. I would start with determining what the specific needs from the customer are with respect to a healthier skin.

Child clipper

Start with developing a crystal clear insight on the wish for less noise and a friendlier design for child clippers.

Arcitec
With the Arcitec you start out with debate on design in high-end products. Design is very important, but it can be argued that design should follow function. The new function needs new technology, which needs to be developed and tested in an early phase.

**Arcitec**

The problem of a closer shave in the neck needs to be analyzed from a consumer point of view before you can decide on what technology will be needed to address this need. The technology should not be that difficult to develop.

**Retraction**

Competition played a big role in this innovation. The problem needs to be attacked from both sides. Prove the technology to shave closer and make sure that the customer is willing to pay for a closer shave.

**Sonicare**

Prove the technology first. Professional endorsement will be needed for this product.

**Merlin**

No new function is needed for this innovation. It is an update of the Coolskin with a new slim body design as in the Arcitec. First test if such a new design resonates in the market.

**Wake-up light**

Both the technology as the consumer insights are new to the market and new to the company. Start both lines of the process parallel and find out if this product is technologically and commercially feasible.

**Which aspects of the processes influenced your decision?**

In my opinion product innovation always needs to be treated from a holistic point of view. At Philips CL we try to pay attention to every aspect of a product when developing. I can see that the three processes...
presented by you, are varieties of the IPP process we currently use. The difference between the three processes seems to be the sequence of the actions. The first starts at the consumer side, the second is parallel and shorter and the third starts with technology.
Guided by our brand promise of “sense and simplicity” and starting from our consumer insights, Philips Consumer Lifestyle offers rich, new consumer experiences that meet consumers’ desire for relaxation and improving their state of mind. We address the consumer's desire for wellness and pleasure, and we've mapped this approach by looking at the individual's interests in terms of their Space, their Mind, their Body, and their Appearance.

**Function:** Project manager  
**Background:** Mechanical Engineering  
**Expertise:** Technology

Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? Yes

**Cases:**

**Coolskin**  
The proposition of this product is to shave with less irritation and the possibility for electric shaving while under the shower. Try to determine the exact wishes upfront.

**Child clipper**  
This product is a successor of a normal clipper, which Philips produces for a long time now. No new technology will be needed. The insight that children don’t like the noise a clipper makes near their ears, should be
specified in noise levels acceptable. Parallel on this action it is wise to come up with technology that reduces the noise in a clipper.

**Arcitec**

New technology makes it possible to create a slimmer designed shaver. First you need a check in the market if the new design appeals to the customer.

**Arcitec 2**

The new teeth in the shaving heads are the challenge here. Therefore, I would choose for a technical analysis prior to spending money on market proposition.

**Retraction**

This is a technology driven innovation for better performance. I think this could never be filtered from the consumer insights. Customers just cannot think of such a system for a closer shave. This should therefore first be developed prior to communicating it to your customers.

**Sonicare**

This is a revolutionary innovation. Consumers do not come up with this. I would start with technical analyses in the laboratory to prove that this guarantees cleaner teeth.

**Merlin 1**

This is the same story as the Arcitec.

**Wake-up light**

I think this technology was already available. The development of this product is driven by consumer insights and could be fairly quickly be started and finished.
Which aspects of the processes influenced your decision?

I especially looked at the challenges posed by the concepts. There is a big difference in the marketing and technology challenges in the cases. Normally we start at Philips on the consumer side of development, but this is not always the best way to start the process. If a concept poses a big challenge for technology development, I would prefer to know a little bit more about the possibilities before analyzing the market and consumer needs. With other concepts it is exactly the other way around.
Henk Koenen v.o.f. is specialized machinery and shapes used to produce chocolate. The company developed a wheel machine in 1962 and has been improving the product ever since. It is a continuous innovation process to optimize and modernize the machines. The company makes use of the most qualitative and durable products for their machines. The same story goes for the shapes and other appliances in the assortment.

**Function:** Sales manager  
**Background:** Business studies  
**Expertise:** Product management  
Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? **No**

**Cases:**

- **Coolskin**  
  No real innovative technology. Originated from market, so start there.

- **Child clipper**  
  No real innovative technology. Originated from market, so start there.

- **Arcitec**  
  I think this originated from both market insights and new technology that makes a new design possible. I would deploy both sides in the beginning of the process.
Arcitec 2
The slim design already existed. The only new feature to this concept is
the new shaving head. This seems to me to be very technology intensive,
so I would start there.

Retraction 3
I think technology is most important in this concept. You can only test
whether the customer likes this, if you have a working prototype.

Sonicare 3
I think technology is most important in this concept. You can only test
whether the customer likes this, if you have a working prototype.

Merlin 1
No real innovative technology. Originated from market, so start there.

Wake-up light 2
I think this idea has its’ origin at new technology and a new consumer
need. Both are not clear enough to start developing the product. I would
prefer to start both trajectories parallel to get a clearer view on the market
and technology issues.

Which aspects of the processes influenced your decision?
I recognized the difference between the three processes. The first process
is very market driven, the third technology driven and the second is more
parallel.
In general, I chose process 1 for products, which I thought, originated
from customers’ wishes. In that case I would prefer to start with exploring
the exact needs from the customer. I chose process three for cases, which
seemed very technology intensive. When a concept seems to have both
difficult market and technology issues in it, I chose for the second more
parallel process.
Name: Bart van Asten
Company: Robidus

Robidus gives advice on controlling Human Resources related costs and risks. These costs are often up to 40% of the gross remunerations. A company has to pay to many different agencies. The multi-actor setting produces extra risks of overpaying for many companies. To control these costs and risks it is very important to have a solid exchange of information between departments within the company and outside agencies. Robidus has the expertise to help companies to control these processes.

Function: Director Finance and Operations
Background: Management Studies
Expertise: Management

Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? Yes

Cases:

Link the presented cases to one of the three processes.

Coolskin 1

I think it’s more important for this concept to get the market implications clear from the start, than starting with developing the technology. This product is relatively new to the industry and therefore I would start by collecting customer wishes.
Child clipper

There is almost no new technology needed for this concept. The important thing is to get a clear view on what children and parents like or dislike in clippers.

Arcitec

I think that the new design needs lots of alterations of the technology inside a shaver. Everything needs to fit inside a much slimmer handle. The new pivoting shaving head that is connected to the handle at one small point is also new and difficult to construct.

Arcitec 2

I think this is typically a concept that needs a good balance between market and technology. The product is not completely new, but more a version 1.1 of the Arcitec. It is important to get an understanding of the customers’ problems with shaving in the neck and finding a technological solution in an early stage.

Retraction

This is not a new product, but a new shaving system. It seems to be very technology driven and therefore one should first ‘prove’ the technology. If it works, the customers will probably like a closer shave.

Sonicare

This is a breakthrough new concept on dental care. The sonic movement is believed to be cleaning teeth better than existing electric brushes. This needs extensive testing and prototyping in the early stage of the development. In a second stage, alterations could be made as a result of feedback from consumers.

Merlin 1

This concept needs more or less the same treatment as the Arcitec.
Wake-up light

1

The simulation of sunrise to wake you up is a completely new concept. I think that the technology to make such an alarm clock already existed for a long time. The hard part is to get an understanding of the customers’ wishes and the willingness to pay for such a product.

Which aspects of the processes influenced your decision?

The three processes that you present consist of merely the same activities. The biggest difference between the three variants is the sequence of these activities. I can understand why you would want to vary these activities in a way that you start with the issues that have highest priority. I think that this is what happens in practice, but is often not made explicit in planning of projects. It can have advantages to communicate these differences in an early stage of the project.

Some of the cases you presented could profit from extra emphasis on market issues in the beginning of development. For these cases I chose process 1. Other cases need a more broad approach in the beginning. These cases would benefit from a start in which both technology and marketing issues are getting equal attention. For these cases I chose process 2. Last, there were also cases, which presented concepts that are very hard to realize on a technological level. I would start these developments with a thorough investigation of possibilities in technology. So, for these cases I chose process 3.
Name: Jelmer Riemersma
Company: Veeel Design

Veeel Design is a company that focuses on sourcing creative intelligence. A fresh look towards innovation lies within the expertise of Veeel. Veeel focuses on solutions that are free of old-fashioned templates and coffee table diplomacy. Veeel uses their database with hundreds of creative talents to answer the design questions of their clients.

Function: Operational Director
Background: Industrial Design Engineering
Expertise: Design

Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? Yes

Cases:

Coolskin
This concept originates from a new consumer insight picked up by Philips. I perceive the needed technology not very difficult to realize, therefore I would start by refining the exact consumer needs around shaving with additive and in a wet environment.

Child clipper
I think this idea is an offspring of an explorative marketing study. There is absolutely no new technology needed to create this product. If you get the consumer insight right from the start, the development follows easily.
This concept hasn’t got a new function. To get to a better design I would simultaneously analyze the customers’ wishes and the technological possibilities for a slimmer design.

Arcitec 2
This is an update of the Arcitec. I don’t think it is needed to do an extensive analysis of the market nor the technology. The shorter parallel process should sustain for this concept.

Retraction 1
I would assess with my customers if the need for a closer shave is there. Are they willing to pay extra for a closer shave. Make sure that it doesn’t hurt etc. So I would start with an analysis of market aspects.

Sonicare 3
I would want to be convinced that sonic works for cleaner teeth. I think this is only possible by making steps in the technology, maybe in cooperation with medical companies etc.

Merlin 1 2
This is an update of the Arcitec. I don’t think it is needed to do an extensive analysis of the market nor the technology. The shorter parallel process should sustain for this concept.

Wake-up light 1
The technology needed for this concept is nothing new. The issue is on the consumer side. You want to make sure first if consumers like the concept.

Which aspects of the processes influenced your decision?
I very consistently chose for process 2 when the concept seemed to be an update of an earlier product. For the other two processes I looked at the technology-intensity of the concepts. The difficult marketing issues made
me choose for process 1. The difficult technological issues made me choose for process 3.
Name: Floris Rost van Tonningen  
Company: Hyves

Hyves is a free Dutch social networking site, which has been online since October 2004. The site was launched by Raymond Spanjar, Koen Kam and Floris Rost van Tonningen. The name Hyves comes from the English Beehive - not from Hives, hereby comparing the users to bees in a hyve. Since the domain hives.nl was already registered, they chose to call their website Hyves.

The focus of this website is on keeping in touch with existing friends and making new friends. There is no need to have knowledge of HTML for creating a Hyve. It is comparable with other social networking sites. Users can create personalized pages of themselves with rich media content, such as photos, videos, flash content and custom layouts.

In July 2008 Hyves announced that they had reached 7 million users, of which about 5 million were Dutch. This amounts to about a third of the entire population of The Netherlands. In 2007, the website was voted "most popular website of the year" in the "Website of the year" competition. In 2006 and 2007 Hyves also won another "Website of the year" competition in the category for blogs and communities.

As a result of the immense growth of users, the site is regularly subjected to performance problems since the 3 million users barrier has broken. This results in incorrect working links and the slow loading of pages. According to a study of WatchMouse published on the 11th of January 2008, Hyves now ranks among the faster social networking sites.

Function: Creative Director  
Background: Economics  
Expertise: Innovation
Are you familiar with the products and processes of Philips CL (formerly known as Philips DAP)? No

Cases:

Link the presented cases to one of the three processes.

**Coolskin**

I perceive this to be a moderate innovative concept. It has both a few new technical as marketing aspects. I would try to tackle issues on both sides in the start of the development, by using process 2.

**Child clipper**

I think the same story goes for this product. I would use process 2.

**Arcitec**

I believe this concept to be a more technological challenge. The possibility of a closer shave in the neck combined with the slimmer design seems to be a concept that challenges the technicians and designers. I would give them some time in an early phase to come up with solutions to these problems.

**Arcitec 2**

Because this concept is an update of a previous shaver, I think the second process fits best. On both technological and marketing there are some issues that need attention, but I don’t think its rocket-science. The heavy analysis phase can be shortened for this concept I believe.

**Retraction**

This was a complete new system in the early days of shaving I recall. The technical possibilities need extensive investigation and testing before you want any consumer to get acquainted with this concept. Otherwise it could be discarded for the wrong reasons.

**Sonicare**

139
This has exactly the same issues as the previous case.

**Merlin 1**

Again, this is just an update of a previous concept. I would use the shorter parallel process.

**Wake-up light**

I think this is a different story. The exact wishes of customers regarding this concept should be very clear before developing the product. The technology is neither new nor challenging, but the acceptance of the concept from the customer is the key issue here. Therefore I would start by analyzing the customer needs.

**Which aspects of the cases influenced your decision?**

The first process poses the customer as the driver for innovation. First, you try to find out exactly which desires play a big role among consumers. These desires are transformed into concepts and technology in a later stage of the process. The second process constitutes more cooperation between departments in the early phase of the development. This process is also a little shorter in the beginning, so I concluded that less challenging concepts on both technological and marketing level make a good fit here. The third process starts with the development of technology. After the analysis and feasibility studies, the marketing proposition is made.
### Appendix J: Choices for process-options

<table>
<thead>
<tr>
<th>Name</th>
<th>Coolskin</th>
<th>Childclipper</th>
<th>Arcitec</th>
<th>Arcitec 2</th>
<th>Retraction</th>
<th>Sonicare</th>
<th>Merlin 1</th>
<th>WuL</th>
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## Appendix K: Chi-square analyses

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<tr>
<th>Test Statistics</th>
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<th>Arcitec</th>
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<td>.050</td>
<td>.009</td>
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</table>

a. 3 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 4.0.
Appendix L: Experts from within Philips S&B

This appendix shows the names and functions of the internal experts, which are consulted during this research. These experts were involved in many informal discussions on the subject of this research over a period of six months. These discussions have been both one-on-one with the researcher as well as in groups. The list is limited to the people that have been contributing a substantial amount of knowledge and information to this research.

**Drachten site:**
1) Jan van Dalen Senior Developer/Program Manager IPP
2) Peter Rijskamp Senior Architect
3) Gerard Majoor R&D Manager Male Shaving
4) Pieter Musters Department Manager ARC
5) Pieter van Groos FDS Manager
6) Friso Kolff Project Manager

**Amsterdam site:**
7) Thomas Hollefeld Senior Director New Business S&B
8) Pieter Wijffels Senior Consumer Marketing Manager
9) Gael Prat Senior Design Male Shaving
### Appendix M: Business Balanced Scorecard

<table>
<thead>
<tr>
<th>STRATEGIC SUCCESS FACTOR</th>
<th>First time right</th>
<th>Past and efficient FCP</th>
<th>Past and efficient FCP</th>
<th>Past and efficient FCP</th>
<th>IPP process order control</th>
<th>TIM process order control</th>
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</thead>
<tbody>
<tr>
<td>PERFORMANCE INDICATOR</td>
<td>Project starting on time (Y)</td>
<td>Next FCP Milestone to Schedule</td>
<td>% Performances to Schedule FCP</td>
<td>Average throughput time FCP projects (in wks)</td>
<td>% Projects will deviation FCP to commitment at Project Plan</td>
<td>Process Survey Tool IPP Process Survey Tool IPP/PCP</td>
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</tbody>
</table>

**Measures**
- Adherence to schedule
- Adherence to schedule

**Purpose**
- Increase speed of FCP
- Effectiveness of FCP

**Basis for**
- Controlled Development
- Distance Management

**DPI Type**
- Larger Value Is Better
- Smaller Value Is Better

**Responsible**
- Marc Leyenburg (St. Project Mgr)
- Peter Rijkaart (FCP Mgr)

**Who sets target?**
- Gerard Majoor (MTL)
- Gerard Majoor (MTL)

**Who steers?**
- Gerard Majoor (MTL)
- Gerard Majoor (MTL)
- Gerard Majoor (MTL)

**What do they do?**
- A consolidation milestones is considered to be met if the actual milestone does not exceed the planned milestone with more than 3 weeks, except for KOI items in own area.

**Notes/Comments**

**Rationale (Het125)**
- Rationale for target: 80% is considered the desired maximum in order to allow for sufficient new innovation.
- Mandatory D&O - DAP targets (other CoC are reaching this target).
- According to actual figures in previous year no further EPT reduction required.
- 1 of the 5 projects may exceed within 7% from (D) target.

**Source of data**
- Source is FCP update annual program (measures used in planned milestones being set up to schedule. Tasks charged within 2 weeks before most planned milestones)

**Frequency**
- Quarterly
- Quarterly
- Quarterly

**Target**
- Twice a year
- Twice a year

**Notes/Comments**
- Mandatory
- Mandatory

**Rationale**
- FCP. Rationale for target setting 2007 and target 2007 onwards the new FCP tool will be used TUS in a cost of scoring will happen at all

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**Master thesis Systems Engineering, Policy Analyses and Management**