

## MASTER

### Superior proposition framework analysing the VPH/IPM and SET evaluation stages

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Amsterdam, February 2015

**Superior Proposition Framework:  
Analysing the VPH/IPM and SET  
evaluation stages**

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In partial fulfilment of the requirements for the degree of

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## **Abstract**

This master thesis investigates the role of different customer involvement methods, the use of hedonic and utilitarian product aspects accompanying the different methods and the relationship with new product development success. This is done by reviewing relevant NPD literature and analysing a total of 24 projects within Philips CL. A theoretical framework is developed based on an identified gap in literature. Observations and empirical analyses have shed light upon the coverage of customer involvement methods, and nature and effectiveness, of the Superior Propositions framework within Philips CL. The results suggest how the Superior Propositions framework can be improved in future. Several implications for NPD literature as well as Philips CL are discussed.

## **Management summary**

This report is the result of my master thesis conducted at Philips CL. The study focuses on the role of different customer involvement methods and the use of hedonic and utilitarian product characteristics accompanying the different methods within Philips' NPD the process.

### **Introduction**

Despite the pre-selection of projects and the use of specific gate criteria within the NPD process of Philips CL, uncertainty remains with regard to the predictability of the NPD success. Therefore, the effectiveness of the Superior Propositions framework regarding NPD success is questioned. To get insight into the specific problem, three detailed research questions are defined.

1. What is the coverage of the Superior Propositions framework? How does customer involvement of the Superior Propositions framework compare to customer involvement options found in the literature?
2. What is nature and effectiveness of the market assessment during the screening stage, i.e. step 1 of the Superior Propositions framework?
3. What is nature and effectiveness of customer market testing later in the NPD process, i.e. step 2 of the Superior Propositions framework?

### **Theoretical background**

In order to answer the research questions, scientific literature is reviewed. The literature review elaborates upon the different customer involvement methods and shows differences in terms of the coverage of different customer involvement methods within the NPD process and the consideration of hedonic and utilitarian product aspects accompanying certain methods.

This chapter sheds light upon a gap in literature, with regard to how the different customer involvement methods relate to each other in terms of the role of the customer. In addition, the function of hedonic and utilitarian product benefits is elaborated upon. A theoretical framework is presented with an overview of different customer involvement methods, according to the defined customer involvement roles within the NPD process, taking into account the consideration of utilitarian and hedonistic product aspects. Further, in short additional criteria are discussed that play a role within the NPD process.

By comparing customer involvement methods across NPD stages for different types of customer involvement, the patterns of customer relations within the NPD process are easily described. The review of the potential customer involvement methods underlines the importance of using multiple methods linked together in an overall process in order to focus NPD efforts on customer-oriented products to improve overall NPD performance.

### **Research methodology and empirical research**

This study is based on 24 NPD projects of Philips CL. In order to create understanding into the nature and coverage of the Superior Propositions framework and to test the effectiveness of the framework an empirical study has been undertaken, including diagnosis and analysis of the different documents within the framework. The case study design encompassed a single case study approach, in which the Superior Propositions framework was investigated. The unit of analysis within this research are the projects under examination within Philips CL.

In order to investigate the Superior Propositions framework, data was collected through documentation on the screening stage (i.e., VPHs and IPMs) and the testing stage (i.e., SETs) of the framework and the acquirement of financial data and customer ratings in order to determine market success of projects. Further, an expert meeting was used to get additional data to complete and improve information on the VPH.

Data analyses were conducted in three steps. Steps one and two referred to the two consecutive stages of the Superior Propositions framework, i.e., the VPH (screening stage) as well as SET (testing stage). Step three analysed the VPH and SET data and their relationship with market success.

### **Conclusions, limitations and further research**

This study proposed a renewed view upon the Superior Propositions framework of Philips CL. A theoretical framework has been developed to depict the coverage of involving the customer within the NPD process. Results of this study are split up into observations regarding the coverage of the Superior Propositions framework and the nature of the different stages, and empirical research on the effectiveness of the stages depicted by PLS path models.

As shown in figure 4.2, the observed documentation within the Superior Propositions framework has limited *coverage* of customer involvement methods. The screening stage, i.e., the VPH and IPM, of the Superior Propositions framework shows similarities with the 'market assessment' and the testing stage, i.e., the SET, shows similarities with 'beta testing'. However, since the documentation encompass 'capturing templates', multiple customer involvement methods within the NPD process can be utilized as input for the Superior Propositions framework (figure 4.2). A better integration of these methods within the Superior Propositions framework is advised.

Conclusions regarding the *nature* and *effectiveness* of stages provided a variety of results. The consideration of utilitarian and hedonic product aspects turns out to be insufficiently conducted within the screening stage of the Superior Propositions framework. As shown within the VPH observations, within most of the VPHs no distinction is made between utilitarian and hedonic product aspect and when a distinction is made, on average, more utilitarian product aspects are mentioned. The subsequent empirical analyses have confirmed that the VPH only shows to have an indirect effect upon the developed product, by providing insight into utilitarian product value. However, the utilitarian product value does not contribute to satisfaction of the product and thus to the potential success of developed product.

The testing stage shows that although, discrepancies are observed among SETs regarding the used parameters and benchmarks, the SET turns out to have a good predictive value in addressing the potential success of products. Mostly, all variables correlate to a high extent within SET and perform roughly the same task of providing insight into the potential success of products, especially financial success. The SET seems to be function as a method to find the most desirable combination of hedonic and utilitarian product aspects to maximize loyalty.

Further, the emphasized concept of 'superiority' within the Superior Propositions framework has been shown to have it limitations, also due to the limited availability of the IPM. On the one hand, no justification is provided for the specific values of the degree of claimed superiority. On the other hand, superiority seems to be proven as soon as a positive SET evaluation is achieved. However, discrepancies among the different SETs and the used measures raise questions regarding the validity of the superiority construct.

Several contributions to existing theory are presented and multiple implications for Philips CL are provided to improve the Superior Propositions framework. Future research among other things should be conducted in other departments of Philips CL and other organizations to increase the sample size and to generalize the findings of this study.

## **Preface**

This master thesis is the final deliverable for my master Innovation Management at the Eindhoven University of Technology. The project took place at Philips CL in Amsterdam, the Netherlands. The graduation project at this organization has given me the opportunity to have interesting look 'behind the scenes' into new product development and performing scientific research in a business environment.

I would like to thank several people who have supported me during the execution of this project. First, I would like to thank my university supervisor Ed Nijssen for his patience. At Philips CL I would like to thank Mirelva Drost for her supervision of the project. You were always willing to help me finding the right information and asking critical questions.

Furthermore, I would like to thank my parents for their love, for giving me the opportunity to complete this study and for their support during this project. Also I would like to thank my friends for their support and always being there with an attentive ear to talk to. In particular, I want to give my thanks to Matthijs, who is the best 'thesis buddy'. Last but not least, I would like to thank my girlfriend Vera for her support, patience and encouragement.

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# **I. Research context**

## **I.1 Introduction**

In today's highly competitive environment, companies that are able to successfully introduce new products are more likely to grow than the companies that do not (Cooper, Edgett & Kleinschmidt, 2004; Gourville, 2006). Introducing successful new products and services are critical for many companies in adapting to changing environments, and ultimately in sustaining and creating organizational performance. However, the success rate of new products worldwide has been low and the failure rate high (Henard & Szymanski, 2001; Gourville, 2006).

To enhance the success of their NPD process firms structure it carefully (Cooper, Edgett & Kleinschmidt, 2004). The NPD process is based upon a series of development stages that are interpolated by a series of evaluative gates (Cooper, 1990; Hart, Hultink, Tzokas & Commandeur, 2003; Cooper, Edgett & Kleinschmidt, 2004; Tzokas, Hultink & Hart, 2004) and can be seen as a continuous interaction between internal actors of a firm and external actors in its periphery (Cooper et al., 2004). Managers have to navigate through the NPD process and avoid go and no-go errors during development. They use development teams to facilitate the connection between different perspectives and develop routines and use different customer involvement tools to support their effort (Cooper et al., 2004).

Listening to customers is referred to as 'letting in the voice of the customer' (Griffin & Hauser, 1993) and this involvement of the customer within the NPD process can improve firms' understanding of their needs and can help avoid wasting time and making costly changes in late in the NPD process (Cooper et al., 2004). Customer involvement can provide one of the fundamental sources of information to reduce managerial uncertainty at different moments throughout the NPD process and areas can be identified where additional attention and resources are needed (Tzokas, Hultink & Hart, 2004). However, some tools may be more effective than others; therefore carefully monitoring these tools is critical to further enhance NPD efforts.

In this study a framework is presented that focuses on the role of different customer involvement methods and the use of hedonic and utilitarian product characteristics accompanying the different methods within the NPD process. The study will shed light upon specific aspects of applied methods within the NPD process of Philips Consumer Lifestyle (CL), the company wherein the analysis is performed, and their relationship to market success.

The combinations of aspects are obtained through an analytical technique called Partial Least Squares (PLS). This technique has been chosen, because it focuses covariance instead of correlations and assesses the psychometric properties of the measurement model and estimates the parameters of a structural model (Ringle, Wende & Will, 2005). PLS is an approach providing indicative results on the interactions between variables, which is important because typically multiple variables are used to assess the success of NPD projects. Research questions will be answered using this technique. Outcomes of the study have implications for the business problem of the Philips CL as well as NPD literature.

The purpose of this study is to understand how the different stages of involving the customer within the NPD process relate to the proposed framework within this study. Second, to discover which aspects within the NPD process affect performance. Last, to give Philips CL advice on how to monitor their NPD performance in future.

## I.2 Problem statement, motivation for study

Philips CL is heavily involved in NPD. The firm is aware of the need of clear customer orientation to enhance innovation success. Within Philips Consumer Lifestyle (CL), there is a focus on integrating the ‘voice of the customer’ in the NPD process. Regarding this focus, a framework can be observed (as done by the author) with capturing templates of information on the potential of products being developed, which is henceforth called the Superior Propositions framework and is the main focus of this project. The Superior Propositions framework is a cross-functional protocol intended to ensure a good fit of the newly developed product with the customer needs of a certain customer segment in the marketplace.

Philips defines superiority as ‘offering an experience that is perceived as better than the available alternatives, in a way that is ‘relevant and meaningful’ to the customer’. Therewith, a superior proposition aims at a product that is superior in the market in terms of a customers’ choice of the product over competing alternatives, by striking a balance between functional (i.e., utilitarian) and emotional (i.e., hedonic) product value, and will help them adopt the new product.

In defining superiority throughout the NPD process, CL qualified a sub-set of 24 NPD projects (from 2012 and 2013) based upon their expected market impact. Of these investigated projects, 22 projects received a superiority approval, at the screening stage (step 1 of the Superior Propositions framework), i.e., intended superiority, and 21 projects have received positive evaluations at the second “gate” (step 2 of the Superior Propositions framework), the testing stage i.e., proven superiority (table 1.1).

Project #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Intended superiority	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Proven superiority	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Successful (= 'S') vs. non-successful (= 'N.S.')	S	S	S	S	S	S	S	S	S	S	S	S	S	S	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.		

**Table 1.1:** Superiority overview per projects, with accompanying success (a black square represents the acclaimed superiority at each stage)

However, only 2/3 of the projects met financial expectations (based on collected financial data of 21 projects). Despite the pre-selection of projects and the use of specific gate criteria within the NPD process, uncertainty remains with regard to the predictability of NPD success. Therefore, the effectiveness of the Superior Propositions framework regarding NPD success is questioned. To find out which aspects affect new product performance, new product performance must be measured (Griffin, 1993). To get insight into the specific problem, three more detailed research questions are defined.

## I.3 Research questions

In order to accomplish the assignment, to contribute to existing scientific literature and Philips business practices, a set of specific research questions needs to be addressed first to help focus this study:

1. What is the coverage of the Superior Propositions framework? How does customer involvement of the Superior Propositions framework compare to customer involvement options found in the literature?
2. What is nature and effectiveness of the market assessment during the screening stage, i.e. step 1 of the Superior Propositions framework?
3. What is nature and effectiveness of customer market testing later in the NPD process, i.e. step 2 of the Superior Propositions framework?

Investigating and providing understanding into the screening stage and testing stage can give answer to the above research questions and provide insight into the Superior Propositions framework. In particular with regard to the applied customer involvement methods and the applied criteria applied within the NPD process of Philips CL.

#### I.4 Superior Propositions framework description

The Superior Propositions framework (figure 1.1) consists of (i) a preliminary market assessment within the *screening stage* and (ii) a customer market test within the *testing stage* (Booz, Allen & Hamilton, 1982). The screening stage consists of the Value Proposition House (VPH) and Ideal Product Model (IPM) and the testing stage consists of the Superior Experience Test (SET).

Within the preliminary market assessment product superiority is addressed. Per project the superiority is defined in the Value Proposition House (VPH) and captured into the Ideal Product Model (IPM), after which product characteristics are defined that will deliver the benefit to the customer.

The testing stage of the Superior Propositions framework encompasses a market test; the Superiority Experience Test (SET) is developed in order to improve the success of product launches by assessing the potential success of products that are being tested. The SET is a discipline to ensure products significantly address and fulfil consumer needs and expectations relative to a number of domains. SET requirements are based upon upfront-defined criteria, which can be set relative to a comparison (either to a previous test or an included 'Best In Class' competitor).

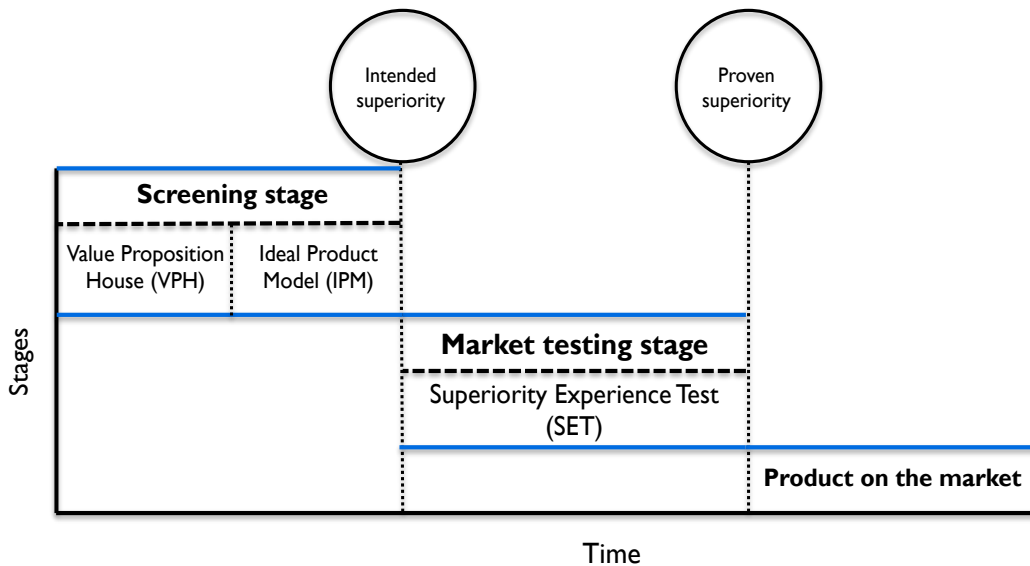


Figure 1.1: Superior Propositions framework with its evaluation gates, constructed by the author

#### I.5 Structure of the report

The remainder of this study reads as follows. Section 2 provides insight into the theoretical background. Section 3 outlines the methodology and addresses matters of the sampling measures and analysis. Section 4 discusses observations on the Superior Propositions framework. Section 5 discusses empirical research. Section 6 presents a number of conclusions, provides managerial implications and discusses some limitations as well as a number of possible directions for future research.

## **2. Theoretical background**

This chapter sheds light upon the different customer involvement methods within the NPD process. First, by examining relevant literature customer involvement within NPD is discussed with accompanying methods. The applied methods with varying degrees of involving the customers suggest a gap in literature, with regard to how the different customer involvement methods relate to each other in terms of the role of the customer. In addition, the function of hedonic and utilitarian product benefits is also elaborated upon. A theoretical framework is presented with an overview of different customer involvement methods, according to the defined customer involvement roles within the NPD process, taking into account the consideration of utilitarian and hedonistic product aspects. Further, in short additional criteria are discussed that play a role within the NPD process.

### **2.1 Customer involvement throughout the NPD process**

Irrespective of where opportunities originate, when it comes to the 'best' new products the customer is the ultimate judge (Cooper & Kleinschmidt, 1987; Brown & Eisenhardt, 1995). Therefore, new products well attuned to the voice of the customer, with technical superiority, timely launched ahead of competition and within budget provide significant competitive advantage for a firm (Cooper & Kleinschmidt, 1987; Cooper & Edgett, 2008). The emphasis on interaction and dialogue between companies and customers is not new. Ideas related to market orientation and customer orientation have resonated the importance of involving the customer (e.g., Narver & Slater, 1990; Jaworski & Kohli, 1993). However, the harsh reality remains that very few new products succeed in the market, which results in a high probability of financial losses (Henard & Szymanski, 2001; Gourville, 2006;).

In order to improve the chance of success within NPD, organizations need to understand and manage risks associated with developing new products (Griffin & Hauser, 1993). Therefore, most best practice companies have implemented a robust idea-to-launch system, and found that innovation in a cooperative mode with involving customers is found to be superior for companies to advance their technology and to enrich and to ensure the relevance of new products, giving the manufactures a significant competitive advantage (Von Hippel, 1986; Brown & Eisenhardt, 1995; Cooper, Edgett & Kleinschmidt, 2004; Cooper & Edgett, 2008; Hoyer, Chandy, Dorotic, Krafft & Singh, 2010).

Although, discussion remains within literature when and which type of customer involvement is most suited across different NPD stages (Veryzer, 1998; Cooper, 2001), roughly three stages of customer involvement can be distinguished. First, customer participation can occur in the front-end stages. Second, customer involvement can occur within the development stages of the NPD process. Third, customer participation can also occur in the testing and validation (Cooper & Edgett, 2008; Hoyer, Chandy, Dorotic, Krafft & Singh, 2010).

A large amount of existing literature in the field of customer involvement suggest the integration of the customers within the front-end of innovation (e.g., Van Kleef, van Trijp & Luning, 2005; Howe, 2006; Cooper & Edgett, 2008; Hoyer, Chandy, Dorotic, Krafft & Singh, 2010). The front end refers to idea generation and product concept development (Gruner & Homburg, 2000; Cooper & Edgett, 2008), wherein ideas and product concepts are shaped, and justified before they receive approval to move to full scale development (Khurana & Rosenthal, 1998). Cooper (1999) revealed that within NPD when missing the voice of the customer, solid up-front work is not done sufficiently and many products enter the development phase lacking a clear definition. In general, involving consumers in early stages early of NPD is regarded as a method to obtain a farther and deeper understanding of customer needs and to reduce the risk of failure of NPD projects (Khurana & Rosenthal, 1998; Van Kleef et al., 2005; Fang, Palamatier & Evans, 2008; Hoyer et al., 2010).

The involvement of customers in the latter two stages is argued to enable firms to detect product flaws. By involving a diverse set of customers, firms can gain a rich understanding how products would fare in a variety of user contexts (Nambisan, 2002; Lagrosen, 2005; Nambisan & Baron, 2009), clarify target markets (Veryzer, 1998) and to forecast sales (Janssen & Dankbaar, 2008). The level of involvement in the in these later stages of the NPD process depends upon how technologically advanced the developed product is, the type of innovation and the degree of customer interaction that is necessary for successful development (Crawford & Di Benedetto, 2010).

## **2.2 Types of customer involvement**

Customers often vary in their interest and ability to participate in the NPD process. Relatively few of the customers will have the willingness to be fully engaged or have the skills to be of much use (O'Hern & Rindfleisch, 2010). Scientific literature discusses a variety of methods to integrate the customer within the NPD process (e.g., Gruner & Homburg, 2000; Cooper, Edgett, Kleinschmidt, 2004; Hoyer, Chandy, Dorotic, Krafft & Singh, 2010). However, despite the acknowledgement of the importance of involving customers in the NPD process, the effectiveness and outcomes of the different forms of interacting with the customer (Carbonell, Rodríguez-Escudero & Pujari, 2009; Hoyer et al., 2010) is questioned. Therefore, debate remains prevalent among scholars and companies concerning different customer involvement methods, with regard to involving the right customers, at the right time within the NPD process, for the right type of innovation (e.g., Gruner & Homburg, 2000; Van Kleef, van Trijp & Luning, 2005; Janssen & Dankbaar, 2008; Coviello & Joseph, 2012).

Within literature multiple methods have been distinguished that can be used throughout the stages of the NPD process, with varying degrees of depth in involving the customer. In general customer involvement methods can be categorized into 'developed for' the customer, 'development with' the customer, and 'developed by' the customer (Kaulio, 1998).

*Develop for:* The conventional view of the customer within the NPD process is either passive or "speaking only when spoken to" (Von Hippel, 1978), wherein the customer involvement is viewed as the extent to which customers provide and share information, i.e., the customer as an 'information resource' (Nambisan, 2002; Fang, 2008). With this level of interaction, products are designed guided by data on users and general theories of customer behaviour that are used as a knowledge base for product development. The customer is not actively involved and are viewed as objects, of which general product requirements are elicited from that are subsequently transformed into performance measures.

*Develop with:* With this level of interaction, data on customer preferences, needs and requirements are utilized. In addition, different concepts/solutions are presented to the customer, in order for the customer to react upon the displays and discuss their opinions. The 'develop with' strategy can be characterized by as a way of maintaining a formal dialogue with the customer. Within this level of interaction, concepts and prototypes are developed parallel to and evaluated in relation to each other in a systematic manner.

*Develop by:* With this level of interaction, customers are actively involved and participate intensively in the product design; wherein the clear distinction between customers and NPD teams ceases to exist. The customers have an active role and are engaged in the NPD process in order to provide solutions for their own problems.



### 2.2.1 Selected methods

In general, the objective of each customer involvement method is to provide diagnostic customer information relevant to the perception, preference and value satisfaction resulting from the use of products (Van Kleef, Van Trijp & Luning, 2005). Research on customer involvement methods is limited on providing insight how different customer involvement methods can be applied (Kaulio, 1998, Van Kleef et al., 2005; Cooper & Dreher, 2010) and despite the high availability of these methods, the majority are mostly applied in an ad-hoc manner and results show a rather unfocused use of most methods (Nijssen & Lieshout, 1995; Nijssen & Frambach, 2000). Notwithstanding this, the choice for using a particular method is not arbitrary. As the phases within the NPD process encounter different levels of uncertainty (Khurana & Rosenthal, 1998; Crawford & Di Benedetto, 2010), the suitability of each method within the different stages of the NPD process depends on the purpose for which it is implemented and the NPD strategy (Van Kleef et al., 2005).

A review of a selection of commonly used methods is presented to provide an outline of the different types of customer involvement methods in the NPD process, which can be used as input for an ‘overarching’ theoretical framework. The methods considered are a combination of ‘classic’ customer involvement literature supplemented with more recent literature, indicating a more active role for the customer in the NPD process. The following customer involvement methods are identified and defined (table 2.1): ‘market assessment’, ‘focus groups’, ‘Quality Function Deployment’, ‘conjoint analysis’, ‘concept testing’, ‘beta testing’, ‘crowd sourcing’ and ‘co-creation’.

**Table 2.1:** Customer involvement methods within NPD

Method	Description
Market assessment	A quick assessment of the market to determine market size and potential, customer interest, initial insights into customer needs, requirements and value, and the competitive situation (Cooper & Edgett, 2008)
Focus groups	A group session of customers in which they react to and discuss a number of topics. The aim is to gather information on underlying needs, wants, etc. (McNeill, Sanders & Cville, 2000).
Ethnography	Ethnography involves camping out with customers or observing customers for extended periods and watching and probing as they use or misuse products (Cooper & Dreher, 2010)
Quality Function Deployment (QFD)	QFD is described as a ‘system to assure that customer needs drive the product design and product process’ (Sullivan, 1986). QFD is a method designed to help the NPD-project team to identify and interpret the needs and wants of customers. The aim is to establish the importance of product attributes and transform them by deductive analysis into product characteristics and process parameters (Hauser & Clausing, 1988).
Conjoint analysis	An approach for concept development, aiming to determine the relationship between product attributes and customer preferences. The respondents are asked to order a number of product concepts consisting of different combinations of attribute scores, based on preference (Green, Carroll & Goldberg, 1981).
Concept test	Concept testing is an approach that aims to involve customers in the front end of innovation (Page & Rosenbaum, 1992). Ideally, the presentation of a concept should offer a realistic description of the proposed product(s), in order to facilitate specific responses from customers. Typically, a concept test is supplemented with prototype evaluations, e.g., beta testing (Kaulio, 1998).
Beta test	Beta testing can be described as an approach applied in the latter phases of the NPD process, and aims to determine if the product does what it is designed to do in the customer environment (Dolan & Matthews, 1993; Nielsen, 1994). The results from these tests are used in order to refine the product further and to

	eliminate 'bugs'. Since beta testing is a field test, comments on the product have to be collected through observations or in retrospective studies.
Crowdsourcing	Crowdsourcing is defined as outsourcing the phase of idea generation to a potentially large and unknown population, referred to as the 'crowd' (Howe, 2006; Poetz & Schreier, 2012).
Co-creation	Co-creation is defined as a collaborative new product development (NPD) activity in which consumers actively contribute and select various elements of a new product offering (O'Hern & Rindfleisch, 2010). Co-creation enables customers to take an active and central role within the NPD process. Co-creation often constitutes the lead users, which are individuals who face needs prior to the majority in the market and are therefore well positioned to solve these needs themselves (von Hippel, 1986)

### 2.3 The role of hedonic and utilitarian product characteristics

Research indicates that the type and intensity of the emotional experience arising from the consumption of hedonic product benefits are qualitatively different from those of utilitarian benefits (Batra & Ahtola, 1990; Chitturi, Raghunathan & Mahajan, 2008). Products that meet or exceed customers' utilitarian needs and fulfil prevention goals, emotions of confidence and security (Higgins, 1997, Chiturre, Raghunathan & Mahajan, 2007), enhance customer satisfaction. Where as, products that meet or exceed customers' hedonic wants and fulfil promotion goals, emotions of excitement and cheerfulness (Higgins, 1997, Chiturre et al., 2007), enhance customer delight.

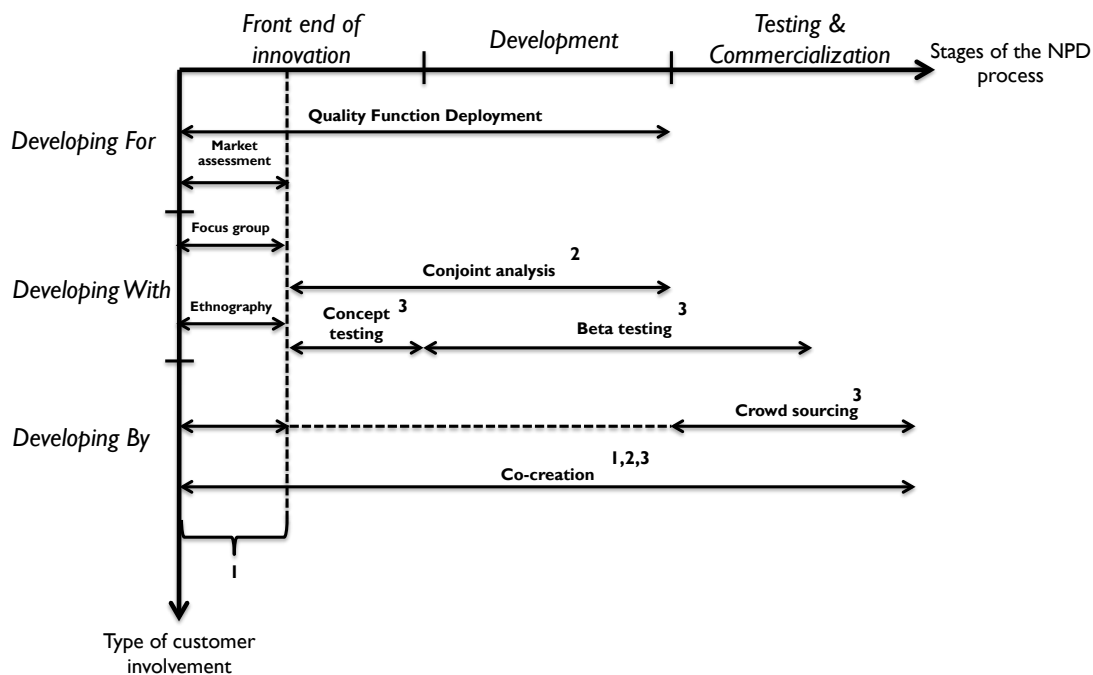
Chitturi, Raghunathan and Mahajan (2008) emphasize that the NPD process can be made much more 'benefit-experience-emotion' centric by focusing on hedonic as well as utilitarian product aspects throughout the NPD process. An improved focus upon customer satisfaction and customer delight can have their positive contribution to customer loyalty (Morgan & Rego, 2006; Keiningham, Cooil, Aksoy, Andreassen & Weiner, 2007; Chitturi et al., 2008) and therefore upon the eventual product success.

### 2.4 Theoretical framework

The applied customer involvement methods within NPD with varying degrees of involving the customers suggest a gap in literature, with regard to how the different customer involvement methods relate to each other in terms of the role of the customer and the consideration of utilitarian and hedonic product aspects. To address this gap a theoretical framework is presented (figure 2.1) with an overview of different customer involvement methods (table 2.1), according to defined customer involvement roles within the NPD process.

The selection of customer involvement methods has been made with the following objectives:

- Describing different types of engaging the customer within the NPD process;
- Indicating customer involvement in all stages of the NPD;
- Illustrating the consideration utilitarian and hedonic product aspects across the different customer involvement methods.



**Figure 2.1:** Framework for the comparison of customer involvement methods, with the consideration of utilitarian and hedonic product benefits (step 1, 2 and 3)

As can be observed in the framework different customer involvement methods are depicted throughout the NPD process for different degrees of customer involvement. Further, following Chitturi, Raghunathan and Mahajan (2008), the displayed numbers indicate the consideration of hedonic and utilitarian product aspects within the NPD process:

1. Rate product attributes on hedonic and utilitarian product aspects
2. Establish the most desirable combination of hedonic and utilitarian product aspects to maximize customer loyalty
3. Iteratively calibrate the ideal product profile until optimal product is achieved.

The ‘develop for’ strategy is represented by the methods QFD and market assessment. Within this category the definition of the roles is evident. The company leads NPD and the customer only functions as information resource (Nambisan, 2002). Although the NPD process is led by the ‘voice of the customer’, the involvement of the customer by using QFD only occurs in the initial phase of the NPD process. The focus within this strategy is on initial diagnosis and deductive transformation of initial product requirements into performance measures (Kaulio, 1998; Akao, 2004).

The ‘develop by’ strategy is represented by focus groups, conjoint analysis, concept testing and beta testing. All methods represent a formal dialogue of active customer involvement within the NPD process (Kaulio, 1998), wherein different concepts are discussed by customer and subsequently revised by the NPD team. Concepts and prototypes are developed parallel to and evaluated in relation to each other in systematic ways. The main differences between concept and beta testing are the degree of product readiness and the absence/presence of the use context. Conjoint analysis is applied in the front end stages as well as during development (Nijssen & Lieshout, 1995). Concept development and conjoint analysis are applied after idea screening and are therefore depicted ‘halfway through’ the front end of innovation stage.

The ‘develop with’ strategy is represented by crowd sourcing in the front end stages and during testing & commercialization, and co-creation methods throughout the complete NPD process. Online methods enable company-customer interactions and customer-customer interactions, which have drastically changed the customer involvement landscape especially in the early stages (Sawhney, Verona & Prandelli, 2005; Piller & Ihl, 2009). Firms can leverage technologies in a more comprehensive and efficient manner (Prahalad & Ramaswamy, 2004), which makes involving the

customer through crowd sourcing in the early stages and later stages of NPD time and cost saving and reducing the risk of new product failure (Hoyer, Chandy, Dorotic, Krafft & Singh, 2010).

Co-creation relates more to the specific relationship companies have with a defined group of stakeholders, e.g., lead users. For that reason, many studies elicit managerial practices with a co-creating mentality and a focus on customers as the drivers of innovative capabilities and even as co-creators of value (Vargo & Lusch, 2004). The wide variety of research evidence on co-creation underlines the value of actively involving the customer throughout the whole NPD process (Hoyer et al., 2010; Coviello & Joseph, 2012), wherein success within NPD depends on clear acknowledgement of the necessity of a deep understanding of consumer needs and product development effort that meet those needs (Hauser, Tellis & Griffin, 2006). By 'developing with' the customer the clear distinction between customer and the NPD firm ceases to exist (Hoyer et al., 2010; Coviello & Joseph, 2012).

Extending the suggestions made by Chitturi, Raghunathan and Mahajan (2008) for the consideration of hedonic and utilitarian is depicted within the framework in three distinct steps (i.e., numbers 1, 2 and 3) applied to the different customer involvement methods. Within the NPD process the consideration of hedonic and utilitarian product aspects is best applied for all levels of customer involvement. More specifically, at the front end of the NPD process, (1) product aspects can be rated on hedonic and utilitarian product aspects throughout the different degrees of customer involvement. Subsequently, (2) conjoint analysis can be applied to find most desirable combination of promotion and prevention goals. Finally, (3) iteratively calibrating the ideal product is done through concept testing, beta testing and crowd sourcing (for crowd sourcing only in the testing and commercialization phase). Since, co-creation is applied continuously throughout the NPD process, all three steps are applied within this method.

### **2.5 The role of loyalty metrics**

Further, research emphasizes the imperative to investigate the link between customer involvement and customer loyalty metrics, because 'you cannot manage what you do not measure' (Cooper & Edgett, 2008). Therefore to assess the possible performance of products during NPD, multiple evaluation criteria are described that can be used during beta testing within the NPD process (Hart, Hultink, Tzokas & Commandeur, 2003; Tzokas, Hultink & Hart, 2004), which are found to be a critical indicators of future business potential (Morgan, Anderson & Mittal, 2005; Morgan & Rego, 2006; Keiningham, Cooil, Aksoy, Andreassen & Weiner, 2007) and thus can act as an "early warning system" (Song & Montoya-Weiss, 1998).

Among other things, customer satisfaction and customer acceptance have been indicated as two of the most important criteria to 'listen to the voice of the customer' (Hart et al., 2003; Tzokas et al., 2004). Customer satisfaction has been found to be a valid predictor of product performance (Morgan & Rego, 2006; Keiningham et al., 2007). Concerning customer acceptance, the popular Net Promoter Score has found to be a very poor predictor of both customer loyalty and customer satisfaction (Morgan & Rego, 2006, 2008; Keiningham et al., 2007; Grisaffe, 2007).

### **2.6 Conclusions on using customer involvement methods**

Based on the discussed literature of customer involvement methods, an overview is provided of the coverage of different customer involvement methods within the NPD process and the consideration of hedonic and utilitarian product aspects accompanying certain methods. By comparing customer involvement methods across NPD stages for different types of customer involvement, the patterns of customer relations within the NPD process are easily described. The review of the potential customer involvement methods underlines the importance of using multiple methods linked together in an overall process in order to focus NPD efforts on customer-oriented products to improve overall NPD performance. In addition, different loyalty measures within beta testing can be applied, which contribute to predicting product performance in the market place.

### **3. Methodology**

To create understanding into the nature and coverage of the Superior Propositions framework and to test the effectiveness of the framework, this chapter describes the empirical study undertaken, including diagnosis and analysis, of the different documents within the framework. The described research methodology will help to outline the problem at hand and to answer the research questions. First, the case study design will be discussed, followed by methods of data collection and additional measures of project characteristics and performance. Second, the methods of data analysis will be elaborated upon.

#### **3.1 Case study design**

The research encompasses a case study. It focuses on problems planning and managing NPD projects at Philips. It enables the researcher to understand how the Superior Propositions framework is organized, performs and can be improved. The research can be defined as a practice-oriented research (Dul & Hak, 2008), meaning the design, implementation and/or evaluation of some intervention, illustration of the usefulness of a theory or an approach to a specific company situation. Although, a practice-oriented research makes use of theories, the aim of this research not to contribute to the development of theory, but rather to use theory in practice.

This research entails a single case study approach, in which the Superior Propositions framework is investigated. The unit of analysis within this research are the projects under investigation within Philips CL. Reason for a single case study design with multiple units of analysis is a critical test of existing theory (Yin, 2003). By means of a single case study, the Superior Propositions framework can be assessed in order to determine whether the theory behind the Superior Propositions framework is correct or whether some alternative set of explanations might be more relevant.

By using a systematic research plan the quality of this case study is enhanced (Yin, 2003) and through exploration of practice not yet identified problems have been revealed (Hak & Dul, 2008). The study is evaluated and the organization is provided with recommendations on the topic at hand. Explanation of the results will be given in the light of existing literature. Furthermore, limitations of the study and possibilities for future research are also provided.

To ensure reliability, a case study protocol and a case study database have been developed (Yin, 2003). A case study protocol and case database are used in order to demonstrate that the operations of a study can be repeated with the same results. Data analysis protocols contribute to the rigorousness and reliability of the research conducted.

The research approach should provide good reasons to believe the research is true (Van Aken, Berends & Van der Bij, 2012). In order to meet internal validity, pattern matching and explanation building is used (Yin, 2003). Pattern matching is used to assess how different aspects of the documents used within the Superior Propositions framework relate to market outcomes. Moreover, explanation building will be used to explain differences among projects and their relationship with market performance. By using multiple projects the generalizability of the research results are enhanced and secured with regard to external validity.

#### **3.2 Method of data collection**

In order to investigate the VPH, IPM and SET in depth regarding the effectiveness of these methods an initial sub-set of NPD projects from the last two years was identified in cooperation with members of the Superior Propositions team. The data collection started with an orientation phase, in order to get a general understanding of the Superior Propositions framework within the NPD process and to generate the problem context (section I.1), followed by the actual data collection.

In the orientation phase, informal conversations were held with members of the Superior Propositions team in order to get to get insight into the different parameters of the problem at hand. Also multiple manuals, presentations and guidelines of the different documents used within the Superior Propositions framework were reviewed. The orientation phase provided insights into the NPD process within Philips CL and insight into the subset of proposed NPD projects. Thus, the orientation phase consisted of:

- Informal conversations on the Superior Propositions framework
- Documentation on the Superior Propositions framework

The actual data collection consisted of contacting, as advised by the Superior Propositions team, product researchers (PRCs) to retrieve specific project documentation, i.e., the VPH, IPM, SET, and financial controllers were contacted to retrieve projects financials (from NPD projects of 2012 and 2013). Further, customer ratings were obtained from customer review sites accompanying the project financial data as an extra project outcome variable. Moreover, to remedy the problem of lack of data per project concerning the VPH, experts were asked for their evaluation/judgements within an expert meeting (in accordance to the availability of accompanying SETs). Thus, the actual data collection consisted of:

- Documentation on the NPD projects
- Financial performance data on the NPD projects
- Customer ratings
- VPH Expert meeting

Because many stakeholders are involved in projects and data are not recorded in one location no complete data could be obtained. Eventually data were retrieved for the subset of 24 projects, though for most of these projects not all documents could be obtained and some VPHs were found to be uncompleted. A total of 23 VPHs, 6 IPMs and 18 SETs and accompanying VPH expert data, financial data and customer ratings for respectively 17 projects, 21 projects and 17 projects were collected. Since the IPM was not deployed until 2012 and its non-mandatory nature, the adaption of the IPM was presumably in an embryonic state and can explain the limited amount of collected IPMs. An overview is presented in table 3.1.

Project #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
VPH	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
VPH expert data	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
IPM						■							■			■	■					■		
SET	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Customer reviews	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Financial data	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

**Table 3.1:** Total data overview; a black square represents the collected document or data per project. Financial data availability is leading in the above overview regarding the sequence of the displayed projects

For internal validity purposes all available VPHs and IPMs have been analysed (even though for some VPHs no related financial data nor customer ratings were available). By eyeballing the available project documentation, general observations across projects could be made. Respectively 23 VPH observations and 6 IPM observations are potentially interesting as input for understanding the screening stage, and 18 SETs as input for understanding the testing stage of the Superior Propositions framework. Further, data from 17 VPHs and 18 SETs are used for subsequent empirical analysis.

### 3.2.1 Measures of project performance

As outcome variables of the Superior Propositions framework ‘financial success’ and ‘customer market satisfaction’ are used. The first outcome variable, financial success of projects was viewed as leading in the categorization of successful and non-successful projects.

In order to make a comparison among projects, following Blindenbach-Driessen, van Dalen and Van den Ende (2010) ‘adherence to revenue goals’ and in accordance to the perspective of a lead financial controller of Philips CL, financial market success was split into the actual sales revenue in the market compared to forecasted sales data (at the time of the execution of the projects’ business plan). For ‘grading’ the success of each project forecasted sales data was compared to actual sales data. The following ratios have been linked to grades from 1 to 10 (table 3.2):

Actual vs. Forecasted	Ratio	Grade
A > F	2 – 1,2	10
A > F	1,2 – 1,05	9
A = F	1,05 – 0,95	8
A < F	0,95 – 0,8	7
A < F	0,8 – 0,7	6
A < F	0,7 – 0,6	5
A < F	0,6 – 0,5	4
A < F	0,5 – 0,4	3
A < F	0,4 – 0,3	2
A < F	0,3 – 0	1

**Table 3.2:** Financial data categorization

Projects with a score of 5 or less are depicted as non-successful. These projects have a discrepancy between the forecasted sales and actual sales that is more than 30%. Projects with a score of 6 to 10 are denoted as successful. Projects with a score between 6 and 8 have a discrepancy that is less 30% between forecasted and actual data. Projects with a score of 9 and 10 surpass expectations. As can be derived from the below table; 7 out of 21 projects are denoted as non-successful, 14 out of 21 projects are denoted as successful (table 3.3).

Project #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Financial succes rating	10	10	10	10	9	8	8	8	7	7	7	6	6	6	5	4	3	2	2	1	1
Successfull (= 'S') vs. non-successfull (= 'N.S.')	S	S	S	S	S	S	S	S	S	S	S	S	S	S	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

**Table 3.3:** Project financial success overview

Regarding the second project performance measure, following Blindenbach-Driessen, van Dalen and Van den Ende (2010) ‘Customer satisfaction’ is used as perceived product performance indicator. Customer ratings (varying from 1 to 5 ‘stars’) were obtained and from customer review sites, e.g., amazon.com, amazon.co.uk, bol.com etc. (depending on availability of the official products’ name and a minimum of 75 online ratings) and subsequently averaged to determine the customer market satisfaction score and applied as a dependent variable within the empirical analyses.

### 3.2.2 VPH expert meeting

A team of experts was used to get additional data to complete and improve information. It helped overcome the fact that the original data offered no insight in quality differences in VPH for successful and unsuccessful projects. The experts had adequate knowledge to evaluate the VPHs of 17 projects, (one project had a completed SET and financial data but no VPH). The IPM was not taken into account because of its limited availability.

The expert meeting involved a meeting wherein experts met for a delimited time and were interviewed by presenting them a survey. A moderator led the expert meeting, and knowledge of group dynamics was used to guide the discussion about the specific topic (Blumberg, Cooper &

Schindler, 2008). The practicability of the meeting was increased, by grouping measures into categories. The measures provided the meeting with structure, however elaboration to a certain extent was permitted and sought after.

The expert team consisted of a panel of three experts. By keeping the group size small, constructive discussion and consensus could be reached within the timeframe of the meeting. The researcher guided the expert meeting through the use of theory and knowledge on the organization and the Superior Propositions framework and by following a topical guide the meeting was steered to make sure all targeted projects were treated.

Measures used in this process, were specifically developed for this goal and wherein each measure represents an aspect of the VPH. The tasks of the experts were first to 1) review the measures and, after approval, 2) to give an evaluation per measures of all VPHs under investigation. The experts evaluated the projects in a 'blind' unbiased manner, i.e., the experts did not know in advance whether these projects were successful or non-successful in terms of market success. Further, the anchors used in the questions are based upon knowledge from the Superior Propositions team, combined with response anchors of Likert-type scales (Vagias, 2006). In appendix A the full overview of the expert meeting protocol is provided.

Two measures could not be assessed by the experts and were therefore left out in further analysis. Thus, after the first round of reviewing the criteria, the experts addressed a total of six measures with accompanying scales (table 3.4): 'actionable insight', 'clearly defined', 'level of detail', 'consistency', 'overall quality' and 'type of innovation'.

	1	2	3	4	5	6	
Project number	The VPH contained a strong <b>actionable insight</b>	The proposition is <b>clearly defines</b> the superiority ambition	The <b>level of detail</b> within the VPH is sufficient	The VPH is <b>consistent</b>	How would you score the <b>overall quality</b> of the VPH?	What <b>type of innovation</b> do you think this product is for Philips?	<b>Financial succes</b>
1	4	3	2	4	3	1	S.
2	4	2	2	3	3	1	S.
3	4	1	3	2	2	1	S.
5	4	3	4	3	3	1	S.
6	4	4	4	4	4	1	S.
7	4	3	4	3	3	1	S.
9	4	4	4	4	4	1	S.
10	3	4	4	4	3	2	S.
11	4	4	4	4	4	1	S.
12	3	2	3	2	2	1	S.
13	1	1	2	1	1	1	S.
15	4	3	4	4	4	2	N.S.
16	3	4	4	3	4	2	N.S.
17	4	4	4	4	4	1	N.S.
19	4	2	2	3	2	1	N.S.
20	4	2	4	3	3	2	N.S.
21	3	3	2	2	2	3	N.S.

**Table 3.4:** VPH expert meeting results

Measures 1 to 4: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree

Measure 5: rated on a scale from 1 to 5

Measure 6: S.I.=Sustaining innovation (incremental innovation), G.C.=Game Changer (radical innovation),

Adj.=Adjacency program (radical innovation)

For category 'Financial success': S = successful, N.S. = non-successful



### 3.3 Methods of data analysis

The data were analysed in three steps. Steps one and two referred to the two consecutive stages of the Superior Propositions framework, i.e., the VPH (screening stage) as well as SET (testing stage). Step three analysed the VPH and SET data and their relationship with market success. Data per category of each document have been listed, averaged (if applicable) and summarized in a table.

Regarding cases of missing data, presumably because different testing companies are used and importance per project is given to different dimensions within the SET, the SET reports differ across projects. Some independent variables are not mentioned in certain SET reports and consequently some have less data. Further, one SET had no accompanying VPH.

Due to the small sample set it is of high importance to maintain all the available data, and to prevent deletion of cases. Since, a too small sample creates a situation in which the sample can have too low statistical power wherein no significant differences can be detected. Therefore data imputation is applied, by conducting 'mean replacement' for all available variables within the VPH and SET with accompanying financial performance data.

Different statistics have been used to assess the properties of the data. First, group comparisons were conducted. Second, exploratory factors analyses were conducted for the variables within the VPH and SET, to reduce the number of variables trying to identify underlying communalities and thus factors (Field, 2009). Third, for the VPH as well as the SET, confirmatory factors analyses using the partial least squares (PLS) approach were conducted to predict market success. Multiple models are estimated to uncover the best predictors.

To discover differences among groups, a Welch's t-test (Kohr & Games, 1974) with  $p < .05$  for mean comparison with unequal sample sizes were conducted using a one-way ANOVA (Field, 2009).

Exploratory factors analyses were conducted using variables of the VPH and SET separately and combined, in order to examine interrelationships and to reduce number of variables and to identify underlying communalities, i.e., factors (Field, 2009). A principal component analysis with oblique rotation (Direct Oblimin) was used. The Direct Oblimin approach was selected as to allow for the identified underlying dimensions to be correlated (Field, 2009). As cut off criterion, an Eigenvalue  $>1$  was applied; this infers that an underlying factor should explain more than an individual variable.

By using Partial Least Squares (PLS) approach path models referring to the interactions between variables within the Superior Propositions framework were estimated, wherein parameter estimates are provided that maximize the explained variance ( $R^2$  values) of the dependent constructs (Chin & Newsted, 1999), i.e., financial and market success. PLS is a form of structural equation modelling, which focuses on covariance instead of correlations and assesses the psychometric properties of the measurement model and estimates the parameters of a structural model (Ringle, Wende & Will, 2005). PLS is a robust technique and therefore allows for more flexibility with regard to normality (Lowry & Gaskin, 2014) and smaller sample sizes (Hair, Ringle & Sarstedt, 2011), although disputed by Lowry and Gaskin (2014). Also, PLS has been proven to be less sensitive to multicollinearity problems (Hair, Ringle & Sarstedt, 2011).

Data was analysed using SmartPLS 3.0, which relies on nonparametric bootstrap techniques to test coefficients for their significance; bootstrapping is a way of computing sampling error and generating values by using the available data as a distribution (Lowry & Gaskin, 2014). The cut-off value used to determine significance was .05 (i.e., the probability of detecting an effect erroneously was less than 5%).

## **4. Observations on the Superior Propositions framework**

This chapter provides a description of the different stages of the Superior Propositions framework and accompanying observations. A total of 23 VPHs, 6 IPMs and 18 SETs are scrutinized in order to provide insight into the *nature* and *coverage* of the stages of the Superior Propositions framework. Providing answer to research questions 1, and the first parts of research questions 2 and 3.

### **4.1 Description of the Screening stage**

Success of NPD is influenced by uncertainties, especially within the initial stages of the NPD process (Khurana & Rosental, 1998). Therefore, choices made within the early stages of the NPD process will ultimately determine which innovation options can be considered for development and commercialization (Cooper, Edgett & Kleinschmidt, 2004). The screening stage within the Superior Propositions framework of Philips CL consists of the combination of the VPH and IPM; together these documents represent a preliminary market assessment.

#### **4.1.1 The Value Proposition House**

The Value Proposition House (VPH) is a one-page document describing the value the proposition brings to the customer, why the customer would believe the proposition and what makes the offering distinctive from other competing products. The process of creating a proper VPH is based upon a manual, trainings, best practices and a community of coaches, which facilitate the product teams with examples to provide insight and to smoothen the process of creating a VPH. Further, approval governance is conducted to monitor and increase the quality of the VPH.

The VPH consists of seven dimensions that are used to describe the product characteristics and market conditions: (1) Target user, (2) End-user insight, (3) Competitive environment, (4) End-user benefit, (5) Reasons to Believe, (6) Discriminator and (7) Brand positioning.

#### **4.1.2 VPH general observations**

Following the guidelines of the VPH and by comparing VPHs across projects observations are made. Each VPH is scrutinized with regard to the application of each dimension and different aspects per dimension have been identified. Within the first three dimensions no clear differences have been observed across VPHs; each VPH appears to have a similar target description, end-user insight and assessment of the competitor environment (see appendix B). The last dimension 'brand positioning' has been omitted in the overview because of lack of data (for almost all VPHs) within this dimension. Within the dimensions 'end-user benefit', 'reasons to believe' and 'discriminator', some discrepancies are observed among 23 projects and depicted in table 4.1.

- *End-user benefit*: The 'End-user benefit' (which builds upon the end-user insight and provides reasons why the new product will satisfy the need that customer experiences) differs across projects in terms of number of defined benefits as well as the distinction between utilitarian and hedonic benefits (9 out of 23 of the projects have made this).
- *Reasons to Believe (RtB)*: An average of 4,3 RtBs (i.e., proof or evidence how the proposition delivers on the stated benefit and why it is better than possible alternatives, providing explanation why the product will deliver on the specified benefit) are mentioned per benefit driver. The RtBs present reasons how the product will deliver on the utilitarian as well as hedonic product benefits.
- *Discriminator*: The discriminator (i.e., one sentence that describes what makes the proposition superior to the competition and should have an immediate relation to the end-user insight) is compared to the end-user benefit and an assessment is made with regard to the discriminator displaying a functional or emotional benefit or both. The discriminator seems to be applied properly across projects according to the stated theory within the VPH guidelines. What stands out is that most discriminators seem to mention only a functional benefit, only 5 VPHs have discriminators focusing on both kinds of benefit.

Dimensions	4. End-user benefit			5. Reasons to Believe	6. Discriminator	
	Number of benefits	Number of functional benefits	Number of Emotional benefits	Number of RtBs	Functional benefit	Emotional benefit
Project number 1	1			3	1	0
2	1			3	1	0
3	2	1	1	2	1	0
4	1			2	1	0
5	2	1	1	3	1	1
6	4			3	1	0
7	2	1	1	3	1	1
9	2	1	1	4	1	0
10	2			6	1	0
11	2			5	1	0
12	1			6	1	0
13	1			9	1	0
14	4	3	1	3	1	0
15	2			6	1	0
16	5	4	1	4	1	1
17	2	1	1	4	1	0
18	5	3	2	4	1	1
19	2			2	1	0
20	1			9	1	0
21	2			5	1	0
22	2	1	1	5	1	0
23	1			3	1	0
24	2			5	1	0

**Table 4.1:** VPH overview

Observations on dimensions 4,5 and 6 across VPHs. Project 8 is missing due none availability of the VPH.

*Differences in type of innovation and RtBs*

When looked at the type of innovation obtained from the VPH expert meeting a clear pattern can be observed. The failure rate of ‘Game Changer’ and ‘Adjacency programs’ is higher compared to ‘Sustaining Innovations’. Three out of four Game Changer programs have failed and also the Adjacency program project is marked as non-successful. Table 4.2 provides evidence for a significant difference ( $p < .05$ ) between incremental (sustaining innovations) and radical innovations (game changers and adjacency programs) with regard to financial success. Based on the set of data radical innovations seem to have less chance of success compared to incremental (i.e., sustaining innovations), within the Superior Propositions framework.

**Table 4.2:** Differences in types of innovation and market success

**Robust Tests of Equality of Means**

	Statistic <sup>a</sup>	df1	df2	Sig.
Welch	7,622	1	6,682	,029

a. Asymptotically F distributed.

Further, the difference in number of Reasons to Believe (RtBs) is assessed between incremental and radical innovations (table 4.3). The difference is almost significant, presumably indicating that there is a difference between the number of RtBs among the difference types of innovation.

**Table 4.3:** Differences in types of innovation and number of RtBs

**Robust Tests of Equality of Means**

	Statistic <sup>a</sup>	df1	df2	Sig.
Welch	4,242	1	7,410	,076

a. Asymptotically F distributed.

### 4.1.3 The Ideal Product Model

The Ideal Product Model (IPM) acts as an extension of the VPH. The IPM is developed to ‘translate consumer understanding into an ideal product experience focused on the superior delivering of the benefit’. The IPM aims at providing a structured, cross-functional approach between the marketing department and the R&D department for translating the consumer benefit into actionable product requirements. Moreover, the IPM focuses on *how* the product will deliver the benefit. Its primary deliverable is the definition of ‘Benefit Driven CTQs’. Similar to the VPH, the process of creating an IPM is also based upon a manual, trainings, best practices and a community of coaches/facilitators, providing information how product teams can construct an IPM.

The IPM consists of seven dimensions, which are used to address the dimensions of the VPH more in depth: (1) Benefit drivers, (2) Consumer need, (3) Product Attributes, (4) Competitive benchmark, (5) Competitive Ambition, (6) Solution direction and (7) Benefit driven CTQ.

The competitive ambition describes how the product will compete relative to the competition; each competitive ambition is either Basic, Benchmark (on par with competition) or Growth. The product attributes defined on Growth, reflect the extent to which the product is *superior* to competition. Subsequently, in the last dimension ‘Benefit Driven CTQ (critical to quality)’ the requirements are specified a specific benefit driver must meet. This dimension is subdivided into ‘User level Benefit Driven CTQs and ‘System level’ Benefit Driven CTQs. The actual assessment of these statements is conducted within the market test (SET) during the testing stage of the Superior Propositions framework.

### 4.1.4 IPM general observations

Following the description of the IPM, by comparing IPMs across projects observations are made. A total of 6 IPMs have been collected. Due to the small nature of the sample of collected IPMs, comparison and generalization is limited when compared to the VPH. Regarding the observations of the IPM, within the first four categories no differences have been observed when compared to IPM guidelines. Regarding the last three categories the following observations stand out (table 4.4):

- The structures of the IPMs differ and information in the IPMs is rather limited, three out of six IPMs have competitive ambitions defined with associating solution directions. Further, two projects have a solution direction without defined competitive ambitions and one projects has none of the last three dimensions completed.
- No justification is provided why certain product attributes are defined on Growth and thus superior to competition.
- Except for one, the available IPMs do not make a distinction between system level and user level CTQs. The last project has made this distinction, but only for some solution directions.

Dimension	Competitive ambition	Solution direction	Benefit driven CTQ
Project number 6	2x Basic 4x Benchmark 2x Growth	▪	▪
13		▪	▪
16	2x Basic 4x Benchmark 1x Growth	▪	▪
17			
19		▪	
22	7x Basic 11x Benchmark 5x Growth	▪	▪

Table 4.4: IPM observations overview

#### **4.1.5 Observations regarding the nature of the screening stage**

Two observations regarding the nature of the screening stage stand out; (1) intended superiority and (2) the consideration of utilitarian and hedonic product aspects.

As mentioned in section 1.1, superiority within Philips CL is described as 'delivering a product in the market that is superior in the market in terms of a consumer's choice of the product over alternatives' in a way that is 'relevant and meaningful' to the consumer', indicating that products with superiority should perform better to competition and thus have a higher degree of market success.

The Philips definition of superiority seems to mirror definitions in literature on 'product advantage', which is consistently linked as the most important feature in explaining NPD performance (Henard & Szymanski, 2001; McNally, Cavusgil & Calantone, 2010), wherein new products need to be meaningful (Narver & Slater, 1990; Im, Hussain & Sengupta, 2008) as well as superior to compete successfully (Rijsdijk, Langerak & Hultink, 2010).

Intended superiority within the screening stage, step I of the Superior Propositions framework, only seems to be taken into account within the last dimension of the IPM. Within the VPH guidelines no obvious reference is made to superiority. As mentioned in section 4.1.3, competitive ambitions within the IPM are either defined on Growth (superior to competition), Benchmark (on par with competition) or Basic (must do requirements). The dimension 'Benefit Driven CTQ' follows on these competitive ambitions and has as purpose to provide 'the most important measurable requirements the solution needs to fulfil, in order to deliver on the intended superiority'. The category Benefit Driven CTQs is divided into user level and system level CTQs.

The system level CTQs seem to represent superiority (Rijsdijk, Langerak and Hultink, 2010); outperforming the competition along existing attributes and functionalities and objectively measurable within the system level of the Benefit Driven CTQs. However, no comparison is made within the IPM with regard to the objective measurable product attributes of competing products. In addition, question marks can be placed with small measurable difference on the system level of product attributes and the claimed superiority. Since, superiority is defined as offering an experience that is perceived as better than the available alternatives, this raises the question how good the improvement has to be to claim superiority.

The user level CTQs seem to represent product meaningfulness (Narver & Slater, 1990; Im, Hussain & Sengupta, 2008); the CTQs are depicted as agreement statements with regard to the product attribute or satisfaction with a specific requirement goal for a Top 2 Box on a 5-point satisfaction scale (e.g., T2B > 80%). However, no justification is provided why product meaningfulness can be claimed when an 80% agreement or satisfaction rate is met and it also raises the question whether such a statement sufficiently represents the potential meaningfulness of the potential product.

Regarding the intended emphasis on making a distinction between utilitarian as well as hedonic product aspects, the VPH and IPM seem to have fallen short. The distinction seems to be applied alternately, only some VPHs make a distinction in emotional (i.e., hedonic) and functional (i.e., utilitarian) product benefits. Moreover, the projects that do make a distinction have on average a higher focus upon utilitarian product aspects compared to hedonic aspects. This seems to imply that the VPHs have a tendency towards a utilitarian product focus.

#### **4.1.6 VPH and IPM in action**

The development of a VPH and IPM for a project is the shared responsibility of a project team consisting of different stakeholders of 'Consumer Marketing', 'Product management' and/or 'Strategy', 'Marketing Management' and 'Market intelligence'. If a project has a completed VPH and IPM, these documents have been revised until approval is met with a Consumer Marketing Director. If a project has a clearly stated superiority ambitions a project is marked as having intended superiority.

## 4.2 Description of the testing stage

The testing and commercialization stages of the NPD process are very critical and often the most expensive and risky stages (Crawford & Di Benedetto, 2010). The testing stage within the Superior Propositions framework of Philips CL consists of the Superiority Experience Test (SET), which is a customer market test assessing the value a product offers to the customer.

### 4.2.1 The Superior Experience Test

Each SET under investigation consists typically of 5 steps; (1) screening of participants, (2) usage of the product, (3) evaluation after first period of usage, (4) Continued usage of the product, (5) Evaluation after second period of usage. Herein, the usage period depends on the kind of product.

Participants are selected based on their demographic characteristics in accordance to the intended target group, as defined within VPH (within the screening stage). Respondents do not own a previous version of the product and are open for a solution for their need, e.g., people with difficulty waking up in the morning and open for (technical) solutions are selected for the sample group of testing a new wake-up light. Participants are willing to pay the proposed price for the product that is being tested, i.e., they fulfil the 'priced purchase intention' criterion. Therefore, these participants have been selected to use the product during the specified usage period, where after the product is retrieved by Philips CL.

Depending on the test company used, usually five dimensions of product performance are assessed: (1) Delivery on Delight, (2) Delivery on Value, (3) Delivery on Brand, (4) Delivery on Basics and (5) What if?. Each SET is divided according to these five dimensions (figure 4.1), either having specific explaining variables or satisfaction and agreement statements on aspects of the tested product. Based on the outcome of these dimensions, overall scores of the variables are depicted in a SET summary. An explanation per dimension with accompanying variables is given in appendix C.

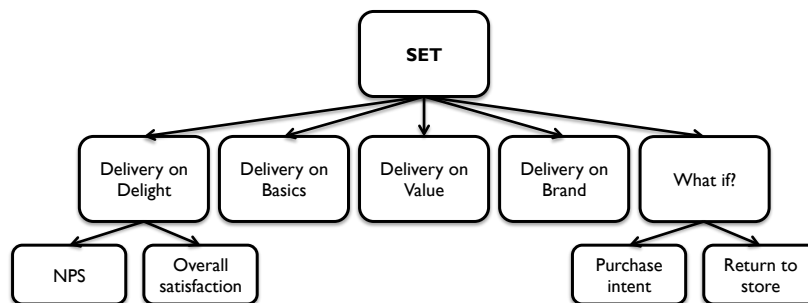


Figure 4.1: SET categories and accompanying variables

Based on the type of project and the ambitions set by the project team, parameters can be set per variable. Parameters are defined by the marketing department and are displayed by a T2B (Top 2 Box) or a T3B (Top 3 Box), respectively on a 5-point scale the two highest scales and on a 7-point scale the three highest scales are taken into account.

### 4.2.2 SET general observations

Regarding the dimensions within the SET, the following observations are made (table 4.5):

- *Testing period and sample size:* The testing period differs among the tested projects, varying from 3 to 10 weeks. Sample sizes differ between 67 and 109 of the projects under investigation, with a mean of 83 per SET. Differences in the amount of participants can be traced back to the initial selection of participants and the quantity of participants who completed the first and second evaluation. Different testing companies are used to facilitate the SET; insight upon the selection procedure of participants is not provided within the SET documentation and guidelines.

- *Utilitarian and hedonic product aspects focus:* Within the SET, the focus upon utilitarian and hedonic product aspects seems to be evaluated within three categories. The variable 'Delivery on Value' is aimed at confirming the delivery of the Discriminator and RtBs within the VPH and thus contains many hedonic aspects representing the distinctive points of the tested product. In addition, the variable 'Delivery on Brand' represents whether the product is in line with customer expectations of the brand and also refers to hedonic product expectations. The variable 'Delivery on Basic' represents 'must-do' aspects of the product the customer expects representing utilitarian products aspects.
- *Parameters:* The majority of the SETs have applied parameters to set certain goals on which the different variables have to score. However, almost all parameter goals are met among successful as well as non-successful projects. Further, no validation is provided for the choice of specific parameters of the different variables and therefore parameter goals vary considerably across projects (especially regarding the NPS variable). Presumably these parameters originate from the IPM. However, due to the unavailability of the IPM this could not be verified.
- *Benchmark:* Of the investigated champion projects only 17% of the SETs use an actual competing product, defined as 'Best in Class' benchmark product, within the SET as a comparative test. Budget restrictions have also been mentioned as reason to only compare the Philips product to the benchmark and not incorporating the 'Best in class' benchmark product in the SET. Moreover, based on the type of product, market and defined key benefits (i.e., the product characteristics on which superiority is claimed) in 39% of the SETs an NPS benchmark is used to compare the tested product to the main competition.
- *Mean satisfaction:* In contrast to recommendations provided by existing literature, (Morgan & Rego, 2006; Keiningham, Cooil, Andreassen & Aksoy, 2007), mean satisfaction is not explicitly taken into account. Next to the Top 2 Box customer satisfaction metric, the mean customer satisfaction is found in literature to be even a better indicator of business performance. While the means of the overall satisfaction are mentioned in most SETs, the mean satisfaction is not addressed as a distinct metric and used within the conclusion of the SET report.
- *SET conclusion:* Typically the conclusion comprises of a single sentence wherein the performance of the product is described accompanied by the degree of satisfaction (e.g., "The wake up light performs very well and participants are very satisfied"). Subsequently, the SET recommendations come after the conclusion and aspects of the product that could be improved are discussed. Because several testing companies are used to evaluate products, small differences exist in the structure and content how conclusions are set up. The NPS and overall satisfaction score seem to be the metrics that are given the most weighing in evaluating the potential success of the product that is being tested. Further, the conclusion is either based upon the scores of the tested product itself, comparison with the NPS benchmark, the comparison of a competitor product included within the test or a combination of these options.

Project #	1	2	3	5	6	7	8	9	10	11	12	13	15	16	17	19	20	21
<b>Aspects</b>																		
Testing period (in weeks)	5	-	10	4	8	8	6	4	6	4	8	3	4	5	7	6	6	8
Sample size	76	80	76	67	85	76	86	84	95	109	73	95	78	80	93	84	78	-
Requirement goals	■						■	■	■	■	■	■	■		■	■		■
Competitor test			■			■		■										
NPS benchmark						■	■		■	■	■		■					■

**Table 4.5:** SET observations overview. For each SET the testing period in weeks is noted, sample size, parameter addressed, presence of a competing product within the test and use of the NPS benchmark. When the latter three aspects are addressed they are marked with a small 'black square', otherwise with a 'white square'.

### 4.2.3 Observations regarding the nature of the testing stage

The way potential success of products, i.e., proven superiority, within SET is established seems to have its shortcomings. The SET, which is a discipline to ensure products significantly address and fulfil consumer needs and expectations relative to a number of domains, seems to be aimed at providing a prediction of customer loyalty. Customer loyalty is closely linked to business performance and market share (Ulag & Chacour, 2001; Rust, Lemon & Zeithaml, 2004), since it is the commitment of the customer to rebuy or repatronize a preferred product consistently in the future (Oliver, 1999).

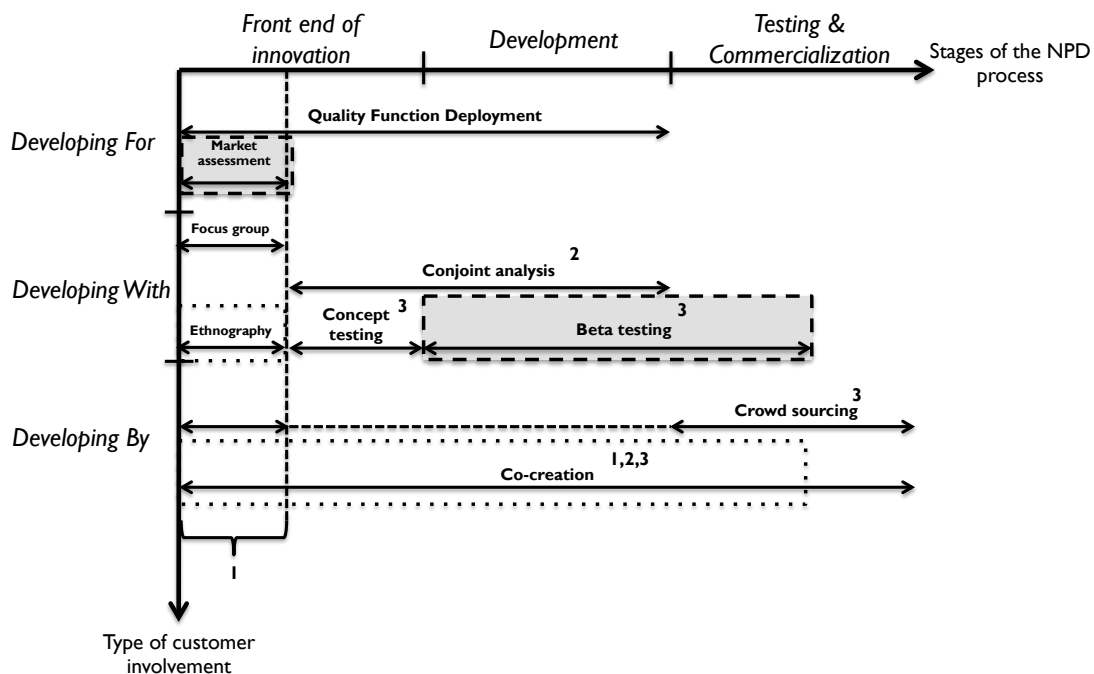
As mentioned in section 3.2.1, the conclusion of SET and thus also the depiction of a product having 'proven superiority', is mainly based upon the variables NPS and overall satisfaction. These variables have been widely examined in literature, with regard to their validity as predictors of customer loyalty. Customer satisfaction has been found to be a valid predictor (Morgan & Rego, 2006; Keiningham et al., 2007), although it has also been shown to have its pitfalls and limitations in its predictability of customer loyalty (Kumar, Pozza & Ganesh, 2013). NPS has been found to be a very poor predictor of both customer loyalty and customer satisfaction (Morgan & Rego, 2006, 2008; Keiningham et al., 2007; Grisaffe, 2007).

### 4.2.4 SET in action

A SET report is the responsibility of a Product Researcher who creates and aligns the report and after review by different stakeholders signs off the report. Further, project management, a Category Quality Leader, a Consumer Marketing Manager and a Category leader. All have to agree to the final version of the report, a project is then typically market as having proven superiority.

### 4.3 Coverage of the Superior Propositions framework

We can now look for the coverage of the Superior Propositions framework (research question 1), i.e., similarities that can be found between the methods conducted by Philips CL and customer involvement methods described within academic literature (figure 4.2). Moreover, the application of hedonic and utilitarian product benefits as well as loyalty metrics also come forward within the Superior Propositions framework of Philips CL.



**Figure 4.2:** Framework for the comparison of customer involvement methods, with dashed lines displaying similarities with Philips CL customer involvement methods and blocks in 'grey' displaying similarities with the Superior Propositions framework. Further, the displayed numbers encompass the consideration of hedonic and utilitarian product aspects within the NPD process. **1:** Rate product attributes on hedonic and utilitarian product aspects, **2:** Establish the most desirable combination of hedonic and utilitarian product aspects to maximize customer loyalty, **3:** Iteratively calibrate the ideal product profile until optimal product is achieved. (Chitturi, Raghunathan & Mahajan, 2008)



As depicted within the dashed lines, the customer involvement methods within the Superior Propositions framework show similarities with the market assessment as well as with the beta test as displayed within figure 4.2. The observed documentation within the Superior Propositions framework has limited *coverage* of customer involvement methods. However, since the documentation encompass 'capturing templates', multiple customer involvement methods within the NPD process can be utilized, as depicted within the dotted lines, as input for the Superior Propositions framework.

The *screening* stage of the Superior Propositions framework, consisting of the VPH/IPM, matches with the 'market assessment' as 'developing for' the customer. The market assessment encompasses an assessment of the market to determine market size and potential, customer interest, initial insights into customer needs, requirements and value, and the competitive situation (Cooper & Edgett, 2008). Similarly, the VPH/IPM describe the value the proposition brings to the customers, why the customer should believe the propositions and what makes the offering distinct from competition. In addition, within the dimensions of the IPM the customer needs are specified into more detail and product characteristics (system level CTQs) as well as process parameters (user level CTQs, which function as requirements within SET) are derived. Key input into the NPD process and thus also into the 'market assessment' of the Superior Propositions framework is customer research, which can encompass co-creation, ethnography and experiences derived from previous developed products. Therefore, the input from the customer can be derived from all three types of customer involvement.

The *testing* stage of the Superior Propositions framework, consisting of the SET, matches with the beta test as 'developing with' the customer. Similarly to the beta test, which is designed to determine how the product functions in the customer environment (Dolan & Matthews, 1993; Nielsen, 1994), the SET actually assesses whether a product addresses and fulfils customer needs and expectations. The SET functions as a final validation of many beta testing interactions with the customer throughout the NPD process, wherein the (prototype) product is presented to the customer in a formal dialogue to actively react upon the use of the product and provide feedback. Next to beta testing, customers can also be involved within the NPD process through co-creation. Therefore, for the testing stage of the Superior Propositions framework, input from the customer is derived by 'developing with' and 'developing by' the customer.

Further, regarding the differentiation between hedonic and utilitarian product benefits, the Superior Propositions framework varies in the degree of attention given to this differentiation within the screening stage and the testing stage. Within the screening stage (as mentioned within section 4.1.5), the goal of the 'end-user benefit' dimension of the VPH is to depict functional as well as emotional product benefits. However, only a differentiation among different product attributes is sometimes made, no rating is given to product aspects on their ability and likelihood to fulfil customer's promotion and prevention goals (number 1 in the framework). Within the testing stage the SET dimensions 'Delivery on Value' and 'Delivery on Brand' focus respectively on hedonic product aspects and the dimension 'Delivery on Basic' focuses on utilitarian product aspects.

The SET seems to be function as a method to find the most desirable combination of hedonic and utilitarian product aspects to maximize loyalty (step 2 in the framework) and also as a method to iteratively calibrate until the ideal product is achieved (step 3 in the framework). However, in the case when a developed product has limited actual customer involvement, e.g., when the product is based upon experiences derived from previous developed products, by using SET as a final validation to find the right combination of hedonic and utilitarian product aspects this assessment seems to be conducted rather late in the NPD process.

## 5. Empirical research

This empirical research chapter consists of empirical analyses of the VPH and SET data in order to explain differences among projects and provide input for answering the second part of research questions 2 and 3 regarding the *effectiveness* of the screening and testing stage of the Superior Propositions framework.

Exploratory factor analyses were conducted for the VPH and SET using IBM SPSS Statistics 20. Thereafter, confirmatory factor analyses were conducted with the Partial Least Squares (PLS) approach using SmartPLS 3.0 (Hair, Hult, Ringle & Sarstedt, 2014) for creating path models.

VPHs (i.e., VPH expert data combined with VPH observations data) and SETs were examined with regard to their effectiveness in predicting market success of products. Hence, conclusions can be drawn from the sample by evaluating how the different variables interact with the dependent variables 'financial success' and 'customer ratings'. The PLS analysis was split up in two steps. First, analyses were conducted of the VPH and SET separately, after which variables of the VPH and SET were combined for an integrated analysis.

### 5.1 Exploratory factor analyses

The VPH and SET variables were highly correlated (table 5.1). Exploratory factor analyses (EFA) were conducted to establish the dimensionality of the variables. For both analyses a principal component analysis with oblique rotation (Direct Oblimin) was used. The Direct Oblimin approach was selected as to allow for the identified underlying dimensions to be correlated. As cut off criterion, an Eigenvalue >1 was applied.

For the VPH initially one factor was found (appendix D), however the variable 'actionable insight' showed some deviation compared to the other VPH variables and was therefore viewed as a distinct construct in subsequent analyses. For the SET one factor was found (appendix E), the variable 'detractors' was left out in order to improve the reliability of the factor.

**Table 5.1:** VPH + SET correlation matrix

	Number of RIBs	Actionable insight	Clearly defined	Level of detail	Consistency	Overall quality	NPS	Overall satisfaction	Mean satisfaction	Delivery on Value	Delivery on Brand	Delivery on Basic	Purchase intent	
VPH	Number of RIBs	1,000	-,603	-,194	,075	-,287	-,220	-,573	-,490	-,660	-,389	-,494	-,642	-,854
	Actionable insight	-,603	1,000	,312	,347	,663	,588	,062	,205	,036	,076	,219	,307	,262
	Clearly defined	-,194	,312	1,000	,618	,782	,824	,285	,179	,055	,211	,059	,492	,216
	Level of detail	,075	,347	,618	1,000	,543	,727	-,107	,170	-,260	,020	-,096	,066	-,105
	Consistency	-,287	,663	,782	,543	1,000	,864	,313	,405	,047	,392	,295	,470	,110
	Overall quality	-,220	,588	,824	,727	,864	1,000	,173	,246	-,052	,288	-,009	,413	,037
SET	NPS	-,573	,062	,285	-,107	,313	,173	1,000	,742	,775	,689	,597	,560	,692
	Overall satisfaction	-,490	,205	,179	,170	,405	,246	,742	1,000	,596	,798	,730	,534	,539
	Mean satisfaction	-,660	,036	,055	-,260	,047	-,052	,775	,596	1,000	,439	,481	,659	,666
	Delivery on Value	-,389	,076	,211	,020	,392	,288	,689	,798	,439	1,000	,514	,549	,369
	Delivery on Brand	-,494	,219	,059	-,096	,295	-,009	,597	,730	,481	,514	1,000	,514	,522
	Delivery on Basic	-,642	,307	,492	,066	,470	,413	,560	,534	,659	,549	,514	1,000	,540
	Purchase intent	-,854	,262	,216	-,105	,110	,037	,692	,539	,666	,369	,522	,540	1,000

### 5.2 PLS analysis

Analysis of the predictability of the variables within the VPH provided no significant results (appendix F). Thus, based on the elements within the VPH no prediction could be given regarding the success of products. The analyses of the SET and the integrated model did provide satisfactory results, as depicted in the subsequent sections.

### 5.2.1 SET analysis

All variables within the SET were taken into account, except for the variables ‘Detractors’ and ‘Return to store’. The latter was left out in the final model, because the loading was less than the recommended .7 (Field, 2009). Thus, for the SET factor 7 variables were retained: ‘Delivery on Basics’, ‘Delivery on Value’, ‘Delivery on Brand’, ‘Mean satisfaction’, ‘Overall satisfaction’, ‘NPS’ and ‘Purchase intent’.

#### Measurement model

Since the structural model consists of two ‘single-item constructs’ these variables display a value of 1.000 for the respective constructs within the tables. The data indicates that the measure is robust in terms of the internal consistency reliability as indexed by the composite reliability. A value of .930 is derived, which is above the recommended threshold value of .7 (Nunnally, 1975). The average variance extracted (AVE) for the measure exceeds .5 (Fornell & Lacker, 1981), demonstrating convergent validity. Further, table 5.2 reports the results of testing the discriminant validity of the measure scales. The elements in the matrix diagonals, representing the square roots of the AVEs, are greater in all cases than the off-diagonal elements in their corresponding row and column, supporting the discriminant validity of the scales.

Convergent validity was also tested by extracting factor and cross loading of all indicator items to their respective latent constructs (table 5.3). All items loaded on their respective constructed from a lower bound of .754 to an upper bound of .902. Furthermore, each item’s factor loading on its respective construct was significant as indicated by the t-statistics of the outer model loadings in the PLS structural model output, ranging from 3 to 6. Taken into account the construct’s item’s loadings and cross loadings in table 5.3 and the significant t-statistic for each individual item loading both confirm the convergent validity of these indicators as representing distinct latent constructs.

**Table 5.2:** Discriminant validity SET analysis (intercorrelations) of variable constructs

	SET	Customer ratings	Financial success
SET	<b>0,810</b>	0,539	0,638
Customer ratings		<b>1,000</b>	
Financial success		-0,049	<b>1,000</b>

**Table 5.3:** SET analysis Factor loadings (bolded and gray) and cross loadings (high cross loadings are bold)

	SET	Customer ratings	Financial success
Basic	<b>0,754</b>	0,586	0,254
Brand	<b>0,765</b>	0,372	0,490
Mean satisfaction	<b>0,816</b>	0,339	0,596
NPS	<b>0,902</b>	0,352	0,722
Overall satisfaction	<b>0,881</b>	0,403	0,650
Purchase intent	<b>0,761</b>	0,467	0,443
Value	<b>0,777</b>	0,587	0,382
Customer rating	0,539	<b>1,000</b>	-0,049
Financial success	0,638	-0,049	<b>1,000</b>

#### Results

The beta values of all path coefficients are shown (figure 5.1) and provide satisfactory results because part of the variance that is explained of the dependent constructs. A large proportion of the variance of ‘financial success’ ( $R^2 = .407$ ) is explained and reasonable results for the ‘customer ratings’ ( $R^2 = .290$ ). The SET factor shows a big positive influence (beta = .638) on financial success as well as on customer ratings (beta = .539).

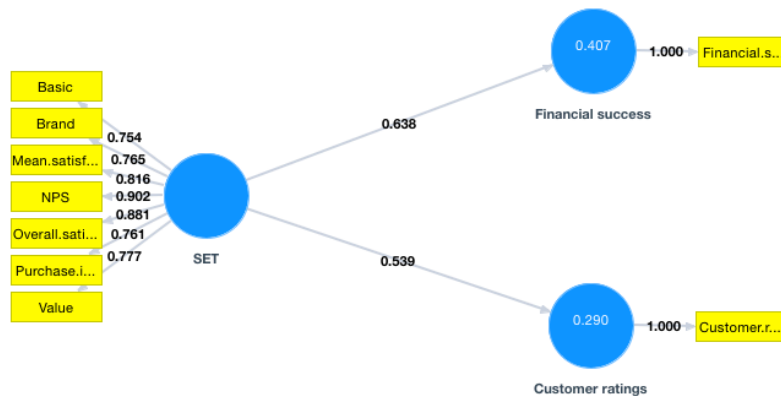


Figure 5.1: SET structural model results

### 5.2.2 Integrated analysis

In order to shed light upon the interaction between the VPH and SET, and the possible indirect effect the VPH has on success of product, in the subsequent analysis the VPH and SET are combined. Two additional changes were made with regard to the described constructs to come to a model:

1. For lack of comprehensiveness of the variable 'end-user benefit', as driver for hedonic benefits within the VPH the variable 'number of Reasons to Believe' (RtBs) was taken into account. Since the RtBs represent proof or evidence how the proposition delivers on the stated benefit and often refers to hedonic product aspects. Due to risk of multicollinearity, no other variables are used to represent this construct.
2. Based on the above described theoretical considerations, insights obtained from the Superior Propositions team and SET observations (section 4.2.1), the variable 'Delivery on Basics' represents utilitarian product aspects and the variables 'Delivery on Brand' and 'Delivery on Value' represent hedonic product aspects and therefore portrayed separately from the original SET factor.

Thus, for the VPH three factors were assessed, respectively 'VPH quality' (i.e., the variables 'clearly defined', 'consistency, 'level of detail' and 'overall quality'), 'Insight' (i.e., the variable 'actionable insight') and Reasons to believe (i.e., the variable 'number of RtBs'). For the SET also three factors were assessed, respectively 'Utilitarian' (i.e., the variable 'Delivery on Basics'), 'Hedonic' (i.e., the variables 'Delivery on Value' and 'Delivery on Brand') and 'SET satisfaction' (i.e., 'Mean satisfaction', 'Overall satisfaction', 'NPS' and 'Purchase intent').

#### Measurement model

Since the structural model consists of five 'single-item constructs' these variables display a value of 1.000 for the respective constructs within the tables. Reliability results are given in table 5.3. The data indicates that the measures are robust in terms of their internal consistency reliability as indexed by the composite reliability. The composite reliability of the different measures ranges from .862 to .931, which is above the recommended threshold value of .7 (Nunnally, 1975). The average variance extracted (AVE) for each measure exceeds .5 (Fornell & Lacker, 1981), demonstrating convergent validity.

Table 5.3: Assessment of measurement model, integrated analysis

Variable constructs	The composite reliability (internal consistency reliability)	Average variance extracted/explained
Customer ratings	1,000	1,000
Financial success	1,000	1,000
Functional	1,000	1,000
Hedonic	0,862	0,757
Insight	1,000	1,000
Reasons to believe	1,000	1,000
SET satisfaction	0,923	0,751
VPH	0,931	0,775

Table 5.4 reports the results of testing the discriminant validity of the measure scales. The elements in the matrix diagonals, representing the square roots of the AVEs, are greater in all cases than the off-diagonal elements in their corresponding row and column, supporting the discriminant validity of the scales.

**Table 5.4:** Discriminant validity (intercorrelations) of variable constructs integrated analysis

	Actionable insight	Customer ratings	Financial success	Hedonic	Reasons to Believe	SET satisfaction	Utilitarian	VPH quality
Actionable insight	<b>1,000</b>							
Customer ratings	0,367	<b>1,000</b>						
Financial success	0,175	-0,049	<b>1,000</b>					
Hedonic	0,167	0,555	0,499	<b>0,870</b>				
Reasons to Believe	-0,603	-0,621	-0,431	-0,506	<b>1,000</b>			
SET satisfaction	0,160	0,446	0,706	0,785	-0,724	<b>0,867</b>		
Utilitarian	0,307	0,586	0,254	0,611	-0,642	0,658	<b>1,000</b>	
VPH quality	0,560	0,427	0,052	0,264	-0,247	0,220	0,484	<b>0,880</b>

Convergent validity was tested by extracting factor and cross loading of all indicator items to their respective latent constructs (table 5.5). All items loaded on their respective constructed from a lower bound of .674 to an upper bound of .950. Except for 'Overall satisfaction' the items loaded more highly on their respective construct than on any other. High cross loadings occurred for the 'NPS' and 'Overall satisfaction' on the Hedonic factor. Since, these variables shared the same initial factor within the exploratory factor analysis, some overlap was expected.

Furthermore, each item's factor loading on its respective construct was significant as indicated by the t-statistics of the outer model loadings in the PLS structural model output, ranging from 2 to 7. Taken into account the construct's item's loadings and cross loadings and the significant t-statistic for each individual item loading both confirm the convergent validity of these indicators as representing distinct latent constructs.

**Table 5.5:** Factor loadings integrated analysis (bolded and gray) and cross loadings (high cross loadings are bold)

	Actionable insight	VPH quality	Reasons to Believe	Utilitarian	Hedonic	SET satisfaction	Customer ratings	Financial success
Actionable insight	<b>1,000</b>	0,560	-0,603	0,307	0,167	0,160	0,367	0,175
Clearly defined	0,312	<b>0,922</b>	-0,194	0,492	0,158	0,215	0,404	-0,053
Consistency	0,663	<b>0,946</b>	-0,287	0,470	0,397	0,270	0,484	0,126
Detail	0,347	<b>0,674</b>	0,075	0,066	-0,042	-0,073	-0,087	-0,013
Overall quality	0,588	<b>0,950</b>	-0,220	0,413	0,166	0,130	0,317	0,065
Number.RtBs	-0,603	-0,247	<b>1,000</b>	-0,642	-0,506	-0,724	-0,621	-0,431
Basic	0,307	0,484	-0,642	<b>1,000</b>	0,611	0,658	0,586	0,254
Brand	0,219	0,135	-0,494	0,514	<b>0,861</b>	0,681	0,372	0,490
Value	0,076	0,318	-0,389	0,549	<b>0,879</b>	0,684	0,587	0,382
Mean satisfaction	0,036	0,016	-0,660	0,659	0,528	<b>0,867</b>	0,339	0,596
NPS	0,062	0,273	-0,573	0,560	<b>0,740</b>	<b>0,932</b>	0,352	<b>0,722</b>
Overall satisfaction	0,205	0,303	-0,490	0,534	<b>0,880</b>	<b>0,850</b>	0,403	0,650
Purchase intent	0,262	0,127	-0,854	0,540	0,509	<b>0,814</b>	0,467	0,443
Customer rating	0,367	0,427	-0,621	0,586	0,555	0,446	<b>1,000</b>	-0,049
Financial success	0,175	0,052	-0,431	0,254	0,499	<b>0,706</b>	-0,049	<b>1,000</b>

## Results

For the integrated analysis, the model (figure 5.2) on the left three factors are depicted for the VPH: a) VPH quality ('Clearly defined', 'Consistent', 'Detail' and 'Overall quality'), b) Actionable insight and c) Reasons to Believe. In the middle the results of the product are viewed. A distinction is made between utilitarian product aspects ('Delivery on Basics') and hedonic product aspects ('Delivery on Value' and 'Delivery on Brand'). On the right the outcome of the model is viewed, with three dependent variables (1) 'SET satisfaction', (2) financial performance and (3) customer ratings are taken into account. The latter two are influenced by SET satisfaction, which consists of all remaining SET variables, within the exception of the variable 'Return to store' which was left out in the final model, because the loading was less than the recommended .7 (Field, 2009).

The beta values of all path coefficients are shown and provide satisfactory results because part of the variance that is explained of the dependent constructs. A large proportion of the variance of the 'Functional' factor is explained ( $R^2 = .634$ ), 'SET satisfaction' ( $R^2 = .666$ ) and 'financial success' ( $R^2 = .499$ ). The lowest proportion of variance can be found for the 'Hedonic' factor ( $R^2 = .363$ ) and the 'customer ratings' ( $R^2 = .199$ ).

The VPH quality factor seems to positively influence the 'utilitarian factor (i.e., functional product aspects) as well as the 'hedonic' factor (i.e., hedonic product aspects), respectively beta = .560 and beta = .338, providing a strong difference in effects. Moreover, the first effect is statistically significant and second effect is insignificant.

Actionable insight from the VPH has got a negative on functional product value as well as on the hedonic product value, respectively beta = -.487 and beta = -.436. Again, the first effect is statistically significant and the second effect is insignificant.

Reasons to believe has got a negative influence upon functional as well as hedonic product value, respectively beta = -.797 and beta = -.685. The first effect turns out to be significant, the second effect not significant.

Utilitarian as well as hedonic product value both lead to more customer satisfaction and customer loyalty, as derived by the 'SET satisfaction'. Although, the effects are substantial, respectively beta = .284 and beta = .611, the hedonic effect is significant and the utilitarian effect is not significant.

Further, the SET satisfaction factor shows a big positive influence (beta = .706) on financial success as well as on customer ratings (beta = .446). Thus, the SET seems to have a good predictive value for potential success of products.

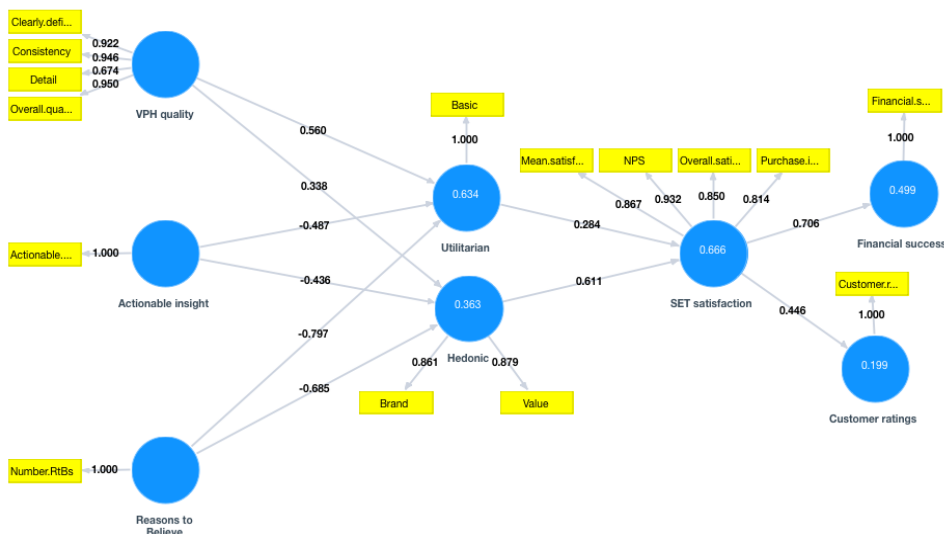


Figure 5.2: Structural model results integrated analysis

### 5.3 Findings

The analyses of SET (i.e., the SET analysis as well as in the integrated model analysis) indicated that the SET does seem to have a good predictive value for potential success of products, with better prediction for financial success compared to the prediction of the customer satisfaction within the market through customer ratings. As has been shown in the initial exploratory factor analysis of the SET variables, all variables cluster together. In subsequent analysis, the role of the variables 'Detractors' and 'Return to store' turned out to be respectively unreliable and statistically not optimal.

Contrary to suggestions by literature (Morgan & Rego, 2006, 2008; Keiningham, Cooil, Aksoy, Andreassen & Weiner, 2007; Grisaffe, 2007), together with T2B satisfaction, mean satisfaction and purchase intent, the NPS metric was found to be a proper predictor of market success (i.e., financial success and customer ratings). This can be presumably led back to the NPS having some degree of predicting value as a diagnostic metric (Grisaffe, 2007) and therefore combined with the other metrics can be valid and useful.

The use of VPH expert meeting data has only provided limited insight into the functioning of the Superior Propositions framework; the PLS analysis with variables within the VPH showed no significant results. It seems that experts have difficulty discriminating between the different dimensions of the VPH. Nevertheless, some interesting findings have been observed as outcome of the integrated model.

In contrast to expectations within the right part of the model (figure 5.2) only hedonic product value drives customer satisfaction. The utilitarian product value does not show a statistically significant relationship with the factor 'SET satisfaction'. Remarkably, the VPH contributes only to the utilitarian value of the product; the impact on hedonic value is not significant. Apparently, the utilitarian product aspects, i.e., 'must-do' aspects, do not contribute sufficiently to the satisfaction of the customer. This underlines the fact that there is an extensive focus within the Superior Propositions framework upon utilitarian product aspects (which is inline with VPH observations, section 4.1.2), but this does not necessarily contribute to further success of products.

Further, the negative effects of actionable insight imply that this variable omits what the variable initially was designed for, i.e., providing insight into the potential of the product. NPD teams using the VPH probably insufficiently understand the constructs within the document.

Even though, reasons to believe (RtBs) typically provide proof or evidence how the proposition delivers on the stated benefit, why the product is better than possible alternatives and provide explanations why the product will deliver on the specified benefit; apparently the negative effect of the number of RtBs upon utilitarian and hedonic product value, leads to less focus upon the main purpose of the product that does not necessarily contribute to value of the product and therefore to product satisfaction.

Moreover, the significant relationship between the number of RtBs and utilitarian product value seems to imply that too much focus upon technical aspects leads to a lower utilitarian value and with a lower product value the chances of success for a product are diminished. This can also be seen in the group comparisons of 'types of innovation' (section 4.1.2); the assessed projects that were unsuccessful were almost all radical innovations and these projects had more RtBs than incremental projects.

## **6. Conclusions and discussion**

In this section, answers are given to the research questions. The similarities and differences between literature and the results within this study led to a number of conclusions. Following on these conclusions, theoretical and managerial implications are elaborated upon. Next, limitations of this study and suggestions for future research are provided.

### **6.1 Coverage, nature and effectiveness of the Propositions framework**

This study proposed a renewed view upon the Superior Propositions framework of Philips CL. A theoretical framework has been developed to depict the coverage of involving the customer within the NPD process. Moreover, the nature and effectiveness of the stages within the Superior Propositions framework are discussed and the research questions have been answered.

- 1. What is the coverage of the Superior Propositions framework? How does customer involvement of the Superior Propositions framework compare to customer involvement options found in the literature?*

As has been shown in figure 4.2, the observed documentation within the Superior Propositions framework has limited coverage of customer involvement methods. However, since the documentation encompass 'capturing templates', multiple customer involvement methods within the NPD process can be utilized as input for the Superior Propositions framework. The screening stage, i.e., the VPH and IPM, of the Superior Propositions framework shows similarities with the 'market assessment' and the testing stage, i.e., the SET, shows similarities with 'beta testing'.

- 2. What is nature and effectiveness of the market assessment during the screening stage, i.e. the screening stage of the Superior Propositions framework?*

Findings regarding the nature and effectiveness of the screening stage mainly encompass the role of utilitarian and hedonic product aspects and the role of superiority.

The consideration of utilitarian and hedonic product aspects turns out to be insufficiently conducted within the screening stage of the Superior Propositions framework. As shown within the VPH observations, within most of the VPHs no distinction is made between utilitarian and hedonic product aspect and when a distinction is made, on average, more utilitarian product aspects are mentioned. The subsequent empirical analyses have confirmed that the VPH only shows to have an indirect effect upon the developed product, by providing insight into utilitarian product value. However, the utilitarian product value does not contribute to satisfaction of the product and thus to the potential success of developed product.

The emphasized concept of 'superiority' within the Superior Propositions framework has been shown to have its limitations, also due to the limited availability of the IPM. On the one hand, no justification is provided for the specific values of the benefit driven CTQs regarding the degree of claimed superiority. On the other hand, superiority seems to be proven as soon as a positive SET evaluation is achieved. However, discrepancies among the different SETs and the used measures raise questions regarding the validity of the superiority construct.



3. *What is nature and effectiveness of customer market testing later in the NPD process, i.e., the testing stage of the Superior Propositions framework?*

Conclusions regarding the *nature* and *effectiveness* of the testing stage, show that although, discrepancies are observed among SETs regarding the used parameters and benchmarks, the SET turns out to have a good predictive value in addressing the potential success of products. Mostly, all variables correlate to a high extent within SET and perform roughly the same task of providing insight into the potential success of products, especially financial success.

The conclusions serve as input for the formulation of several practical implications for Philips CL and theoretical implications depicted in the following sections.

### **6.2 Theoretical implications**

First, existing literature with regard to customer involvement has largely focused on the applicability of single customer involvement methods per stage. This research shows the relationship of different involvement methods with varying degrees of involving the customer within the NPD process and the consideration of utilitarian and hedonic product aspects among the different applied customer involvement methods.

This research confirms the use of the market assessment within the front end stages of the NPD process and the consideration of utilitarian and hedonic product aspects. Although, contrary to suggestions no rating is applied to the different product aspects. Further, in line with literature the SET is used to establish the most desirable combinations of product aspects and iteratively calibrated until an ideal product is achieved. However, in contrast to literature suggestions (Chitturi, Raghunathan & Mahajan, 2008) both steps are conducted within a beta test, omitting the use of conjoint analysis.

Second, contrary to literature (Chitturi, Raghunathan & Mahajan, 2008) the research has shown that utilitarian product value does not necessarily contribute to satisfaction of the customer and therefore to customer loyalty. Within the sub-set of project, only hedonic product value contributed to the satisfaction of the customer and subsequently to product success.

Third, this research partly contradicts the findings on the use of the NPS metric (Morgan & Rego, 2006; Keiningham, Cooil, Aksoy, Andreassen & Weiner, 2007). Although, literature debunks the use of the NPS, within this research the NPS turns out to have a similar predictive value when combined with the T2B overall satisfaction and mean satisfaction metrics.

### **6.3 Implications for Philips CL**

The study also offers some implications for Philips CL to improve the Superior Propositions framework. The combinations of the mentioned focus elements will have a positive contribution to NPD success.

First, the Superior Proposition Framework only considers customer involvement at two points in time of the NPD process, one uses passive (VPH and IPM) and one active (SET) customer participation. The literature suggests that active customer involvement in multiple stages and to larger extends breeds innovation success. Hence, incorporating and extending customer involvement within the Superior Propositions framework will be useful.

Second, evaluation in retrospect is another important tool. Data collection within this research, shed light upon the lack of a good data registration. Documentation on the Superior Propositions framework was insufficiently systematically registered and located within the designated databases. Consequently, analyses of the data are impossible, hindering a good evaluation process and organizational learning.

Thus, to prevent malfunctioning of the Superior Propositions framework and to improve introspection of best practices, (I) a proper data registration system, (I) data access are necessary.

Third, completing a VPH should be done prior to the start of a project and not afterwards. The IPM should also be more supported by the project teams, since it acts as an addition to the VPH and both documents are needed to provide a conclusive picture on the potential of developed product.

Fourth, the majority of the projects have claimed 'intended superiority', however most projects did not have an IPM available. This eschews how the product teams have formulated their goal to deliver a superior product, and whether the VPH and IPM are supported within the product teams and used to facilitate the development of a superior product. This is remarkable, since the subset of projects is designated as potentially 'promising' projects and the Superior Propositions framework is aimed at providing a dashboard for improving and maintaining the success of projects. Therefore, attention should also be paid to the consistency in the way the instruments are filled in. Only if data are comparable can analyses benefit this learning. The higher-level managers should strictly monitor this process.

Fifth, the VPH observations and the empirical analysis confirmed the finding that certain elements within the VPH are not sufficiently understood. Especially, findings on the variables actionable insight and reasons to believe have shown that there is lack of proper insight how these variables should be dealt with. This is a problem that should be taken care of. An improvement of the VPH guidelines seems to be necessary and project teams need to have better training and briefing by providing them with examples of properly completed VPHs. Also closely monitoring of constructing the VPH could probably improve this.

#### **6.4 Limitations and directions for future research**

This research had a number of limitations, which are discussed in hereafter.

First, a clear limitation of this research for the development of general conclusion is that this research took place in a single organization. For better understanding and generalization of findings, it would be useful to research other projects within Philips CL and similar projects within other organizations. Therewith, the sample size can be increased, which will be beneficial to the generalizability of the findings of this study.

Second, the possible effect of NPD projects on each other in terms of new product success was not taken into account. It could be that especially for projects from the same development category, product can have promoting or cannibalizing effects on other products with similar characteristics. Therefore, future research if possible should focus upon a divers set of projects.

Third, literature does not provide a consensus whether the PLS approach is suitable method with small sample sizes (Lowry & Gaskin, 2014). The relative high amount of different variables and the relative low amount of cases, warrants that the generalizability of the PLS results should be taken with a note of caution. Therefore, in line with the first argument a higher amount of cases is necessary to improve reliability and generalizability of the findings.

Fourth, difference in time of measuring new product success is also a limitation of this study. Some projects were just recently launched into the market, whereas other had been on the market for a longer period of time. The latter products had more time to 'prove' themselves in the market, which provided a more reliable picture on the new product success. Future studies should have projects have more similar launch dates and more similarities regarding the measurement time of new product success.

Fifth, this research has addressed differences between types of innovation (i.e., incremental versus radical), although it has not been a main point of focus. Within the research sample the number of radical innovations was less compared to incremental ones. In future, a more balanced set of types of innovations can provide a more thorough picture upon the effectiveness of the Superior Propositions framework regarding the types of innovation.

Finally, three participants only attended the expert meeting. The findings from the expert meeting are therefore biased towards the insights provides by this select group. The research would have benefitted from a higher number of participants, which would have increased the reliability and validity of the findings of the expert meeting.

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## 8. Appendices

### 8.1 Appendix A -- VPH expert meeting

An analysis by experts on the VPH was used to shed further light upon different quality aspects of this document and its relationship with the eventual market success of the product. Within the expert meeting 17 VPHs were examined (according to matching SETs), based on four categories (table A.1): (1) Quality of content, (2) VPH handling, (3) Overall quality, and (4) Type of innovation.

- (1) 'Quality of Content' refers to the strength market opportunity, insight portrayed within the VPH and clarity of the superiority ambition. The category contains the variables 'Actionable insight' and 'Clearly defined'.
- (2) 'VPH handling' refers to the extent to which fact-based evidence is used, level of detail and the consistency of the VPH. The category contains the variables 'Level of detail' and 'Consistency'
- (3) 'Overall quality' refers to the overall quality of the document as seen by the experts.
- (4) The fourth category 'Type of innovation' refers to what type of innovation the experts view the product to be. Herein three types characterize innovation: Sustaining Innovation (i.e., incremental innovation), Game Changer (i.e., radical innovation) and Adjacency program. An adjacency program is described as 'New business creation', wherein the proposition does not replace current Philips products.

Category	Question	Scale
Quality of content	The VPH contained a strong actionable insight	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
	The proposition clearly defines the superiority ambition (Is it there? Does it make sense?) compared to alternatives?	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
VPH handling	The level of detail within the VPH is sufficient	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
	The VPH is consistent	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
Overall quality	How would you score the overall quality of the VPH?	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
Type of innovation	What kind of innovation do you think this product is for Philips?	<input type="checkbox"/> Incremental <input type="checkbox"/> Adjacency <input type="checkbox"/> Radical

**Table A.1:** Expert meeting categories and criteria

The strength of the market opportunity (within the category 'Quality of content') and the extent to which fact-based evidence was used (within the category VPH handling) could not be assessed by the experts and were therefore depicted by the experts as 'not captured' and left out in further analyses. For the first four measures a likert-type scale was applied. For the measures 'overall quality' a rating was given from 1 to 5. Three types of innovation were distinguished: Sustaining Innovation (i.e., incremental innovation), Game Changer (i.e., radical innovation) and Adjacency program. An adjacency program is described as 'New business creation', which is a form radical innovation wherein the proposition does not replace current Philips products.

## 8.2 Appendix B -- VPH complete overview

Dimensions		1. Target					2. End-user insight			3. Competitive environment		4. End-user benefit				5. Reasons to Believe	6. Discriminator			
Aspects	Type (e.g., man / women / family)	Age	Background description	Income	Amount willing to pay	Lifestyle	Target countries	Current preference	Problem context	Current need	Number of competing categories	Number of competing products	Differentiation Functional - Emotional (yes = 1, no = 0)	Number of benefits	Number of functional benefits	Number of Emotional benefits	Number of RtBs	Functional benefit	Emotional benefit	
Project number	1	■	■	■		■	■	■	■	■	0	4	0	1				3	1	0
	2	■	■	■	■	■	■	■	■	■	0	6	0	1				3	1	0
	3	■	■	■		■	■	■	■	■	1	6	1	2	1	1		2	1	0
	4	■	■	■		■	■	■	■	■	0	3	0	1				2	1	0
	5	■	■	■		■	■	■	■	■	7	3	1	2	1	1		3	1	1
	6	■	■	■	■	■	■	■	■	■	0	3	0	4				3	1	0
	7	■	■	■		■	■	■	■	■	7	3	1	2	1	1		3	1	1
	9	■	■	■	■	■	■	■	■	■	1	8	1	2	1	1		4	1	0
	10	■	■	■		■	■	■	■	■	3	2	0	2				6	1	0
	11	■	■	■	■	■	■	■	■	■	2	5	0	2				5	1	0
	12	■	■	■		■	■	■	■	■	7	5	0	1				6	1	0
	13	■	■	■	■	■	■	■	■	■	1	3	0	1				9	1	0
	14	■	■	■	■	■	■	■	■	■	0	4	1	4	3	1		3	1	0
	15	■	■	■	■	■	■	■	■	■	2	5	0	2				6	1	0
	16	■	■	■	■	■	■	■	■	■	1	6	1	5	4	1		4	1	1
	17	■	■	■		■	■	■	■	■	0	5	1	2	1	1		4	1	0
	18	■	■	■	■	■	■	■	■	■	1	4	1	5	3	2		4	1	1
	19	■	■	■		■	■	■	■	■	1	4	0	2				2	1	0
	20	■	■	■		■	■	■	■	■	5	1	0	1				9	1	0
	21	■	■	■	■	■	■	■	■	■	3	1	0	2				5	1	0
	22	■	■	■		■	■	■	■	■	2	5	1	2	1	1		5	1	0
	23	■	■	■	■	■	■	■	■	■	0	5	0	1				3	1	0
	24	■	■	■		■	■	■	■	■	0	2	0	2				5	1	0

Table B.1: VPH observations overview

### 8.3 Appendix C -- SET variables

#### Delivery on Delight

The dimension 'Delivery on Delight' encompasses 'the overall feeling of the consumer toward the product, based on their experience' and is operationalized based on the Net Promoter Score, the accompanying percentage of detractors and the Overall satisfaction.

The Net Promoter Score (NPS) is based upon the following question: "Based on your experience with this product. How likely are you to recommend this product to a friend, relative or colleague? ". NPS is a management tool that is used to assess the loyalty of a firm's customer relationships. The NPS is measured as follows, on a scale from 0 to 10, where 0 is "extremely unlikely" and 10 is "extremely likely", the product is given a score. The score is established by taking the percentage of promoters (participants who gave the product a 9 or a 10) minus the percentage of detractors (participants who gave the product a 0 through 6). A positive NPS score implicates the number of promoters exceeds the number of detractors.

Subsequently, two additional questions are asked to achieve further explanation on the NPS score: "For what reasons would you recommend the product to a friend, relative of colleague?" and "What should be improved to make you recommend this product even more?".

Herein, comments are divided between the detractors (rating 0 to 6), passives (rating 7 to 8) and promoters (rating 9 and 10). Based on these comments the promoters are asked the 'reasons for recommending' the product and passives and detractors are asked for 'possible improvements' of the product.

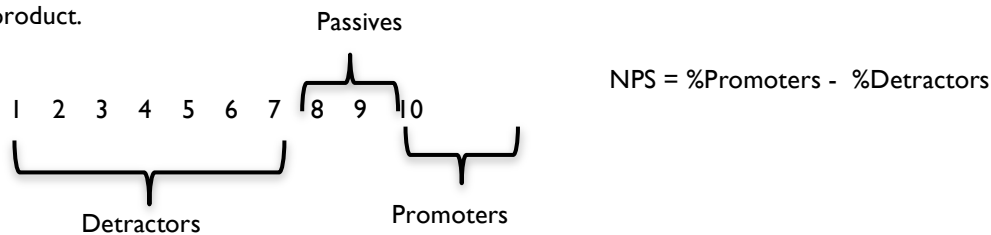


Figure C.1: Net Promoter Score (NPS)

The overall satisfaction is addressed by the following question: "How would you rate your overall satisfaction with the product so far?". Herein, overall satisfaction is measured by using either a 5-point, 6-point or 7-point scale. Overall satisfaction measured with a 5-point scale uses a T2B (Top 2 Box) indication, meaning the percentages of respondents that are either 'satisfied' or 'very satisfied' are used to address this variable. Overall satisfaction measured with a 6-point or 7-point scale is depicted with a T2B or T3B (Top 3 Box) indication. For the T3B the percentages of respondents that are either 'partially satisfied', 'satisfied' or 'very satisfied' are used to address the overall satisfaction.

Subsequently, reasons for satisfaction are addressed by the following questions: (If satisfied) "What is the main reason for being satisfied with the product?" and (If dissatisfied) "What is the main reason for not being satisfied with the product?".

#### Delivery on Basics

This dimension encompasses "must-do" aspects of the product the consumer expects to be delivered to a minimum standard. Meeting basic requirements may not drive the 'delight' of the product, but failure to do so can drive dissatisfaction or lead to detractors.'

Statements with regard to 'Delivery on Basics' are addressed by the following question: "Considering the product you are testing, please indicate your level of satisfaction with the following features/aspects". Each statement is addressed with either a 5-, 7- or 10-point scale, using a T2B, T3B or T4B to indicate the percentage of respondents that are positive about the statement.

### Delivery on Value

This dimension is aimed at confirming the delivery of the Discriminator and RtBs within the VPH. Statements with regard to 'Delivery on Value' are addressed by the following question: *"For each statement we would like to know to what extent you agree that this statement fit the product you have tested"*. Each statement is addressed with a 5-point scale, using a T2B to indicate the percentage of respondents that 'Agree' and 'Strongly Agree'.

### Delivery on Brand

This dimension encompasses that the product must be in line consumer expectations of the brand. Philips CL has four brand statements, which should apply for all Philips products. The dimension 'Delivery on Brand' is defined as the average score of the evaluation of these Philips 'brand statements'. To assess the degree to which the product corresponds to the statements, each statement is addressed on a 5-point scale, using a T2B to indicate the percentage of respondents that 'Agree' and 'Strongly Agree'.

### What if?

In addition to the four dimensions within the SET, 'priced purchase intent' (82% of the tests) and 'return to store' (71% of the tests) are also mentioned in most tests.

The priced purchase intent indicates the degree whether the participants would buy the product they have tested at the intended price. The purchase intent is addressed by the following question: *"Based on your experience with the product up to now, would you buy the product if it costs €X?"*.

The priced purchase intent is addressed with a 5-point scale using a T2B indication, meaning the percentage of respondents that would either 'probably buy' or would 'definitely buy' the product. Subsequently, reasons for positive purchase intent and reasons for neutral and negative purchase intent are identified.

The intent to 'return' the product to the store is addressed by the following questions: *"Imagine that you had purchased this product. Is there any reason that you would definitely return the product?"* and *"Could you please explain why you might/would return the product?"*. The 'return to store' measure is typically addressed with a 3-point scale, with possibility to choose between 'No', 'Maybe' and 'Yes'. Subsequently, reasons for possibly returning the product are identified.

#### 8.4 Appendix D -- VPH exploratory factor analyses

One factor was found to represent 71.16% of the variance. Sampling adequacy was found to be good (KMO = .741). Accompanying a Direct Oblimin rotation only one factor was retained (table D.1). Within the component matrix can be seen that the variable 'actionable insight' shows some deviation compared to the other VPH variables (with a value of .670) and is therefore be viewed as a distinct construct in subsequent analysis.

Additional exploratory factor analyses with SET variables 'Delivery on Brand' and 'Delivery on Value' (i.e., hedonic product aspects), and 'Delivery on Basic' (i.e., utilitarian product aspects) shows that two factors are retained and that 'Actionable insight' again shows deviating behaviour compared to the other VPH variables within the pattern matrix (table D.2).

**Table D.1:** VPH component matrix

	Component
	1
Overall quality	,962
Consistency	,925
Clearly defined	,860
Detail	,768
Actionable insight	<b>,670</b>

**Table D.2:** VPH pattern matrix

	Component	
	1	2
Overall quality	,967	
Clearly defined	,857	
Detail	,855	
Consistency	,843	
Actionable insight	<b>,615</b>	
Brand		,868
Value		,798
Basic		,748

## 8.5 Appendix E -- SET exploratory factor analysis

One factor was found to represent 64.59% of the variance. For verifying the sampling adequacy the Kaiser-Meyer-Olkin was used, (KMO) = .703, which is above the minimum of .5 (Kaiser, 1974). Table 5.7 shows the component matrix with one factor.

**Table E.1:** SET component matrix

	Component
	1
Detractors	-,947
NPS	,904
Overall satisfaction	,870
Mean satisfaction	,819
Brand	,783
Purchase intent	,762
Value	,757
Basic	,724
Return to store	,616

The initial exploratory factor analysis presented one factor with high factor loadings ( $> .7$ ), except for the variable Return to store. Overall the analysis suggested quite a high level of convergent validity and also discriminant validity.

Within SPSS the reliability of this factor was checked using Cronbach's  $\alpha$ . The factor proved to be reliable, providing a Cronbach's  $\alpha$  of .731 for factor 1. However, the reliability for the factor is just above the regularly used criterion of .7 (Field, 2009). In order to improve reliability, the variable 'Detractors' was deleted, providing a Cronbach's  $\alpha$  of .848. The factor was used as input for a subsequent confirmatory factor analysis (CFA) using the PLS approach.

## 8.5 Appendix F -- VPH t-statistics

	<b>t-statistics</b>
Insight -> Customer ratings	0,482
Insight -> Financial success	0,665
VPH -> Customer ratings	0,871
VPH -> Financial success	0,151

**Table F.1:** t-statistics ( $t < 1,96$ ) VPH variables