

**Relationship Value and New Product Development  
Success**

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## **Attestation of Authorship**

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the qualification of any other degree or diploma of a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgments.



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Volodymyr Tashakov

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# **Abstract**

Interest in the connection between new product development and relationship marketing has grown in the recent years. The technical side of new product development has been heavily researched in the last few decades, while very little attention has been given to the customers' contribution to its success. This contribution is based on customer characteristics and the intangible relationship value that they possess. The aim of this thesis is to report on the research examining how intangible relationship value and characteristics of customers influence the success of new product development.

This research is based on the statistical analyses of data collected from a sample of manufacturing industries in New Zealand. The focus of this study is on business-to-business situations. Results of this study indicate that some of the characteristics of involved customers predict the new product development success better than the others, and that the dimensions of human value to seller predict new product development success better than the dimensions of structural value to seller. Therefore, conscious and careful selection of cooperative customers based on the stronger characteristics and dimensions of intangible relationship value can increase the chance for successful new product. The findings of this study indicate which factors should be prioritised, and encourages managers involved in new product development to understand their customers better, in order to develop effective and valuable relationships.

Based on the existing literature related to those three main constructs, this thesis has presented a conceptual model that will allow exploration of how customers should be selected based on their characteristics, and how the intangible relationship value can increase the success of new product development. This study utilizes research presented by

Gruner and Homburg (2000) on characteristics of involved customers, research by Baxter and Matear (2004) on intangible relationship value, and that of Baxter (2007b) on new product development success. The analysis of the data from a survey of the New Zealand market (using discriminant analysis, cluster analysis, and exploratory factor analysis techniques) tests the scales developed for each of three main constructs and answers questions that have not been answered by the existing literature.

# **Chapter 1. Introduction**

## **1.1. Research Background**

The endless race that modern businesses have been pulled into, attempting to survive in this complex and competitive economy, requires constant innovation and frequent new product development implementation. For many decades academics and managers have been focusing on the technical side of the new product development, settling the procedures and creating various frameworks intended to improve the success of NPD projects. Relatively recently, however, the importance of customer relationships during new product development has been emphasized (Gruner & Homburg, 2000).

Relationship marketing has received widespread interest from researchers around the world. It has also been targeted by many managers, as this relationship is identified as one of the biggest assets that companies can create, and benefit from, in the long term (A. Zhang, 2004). The process of value creation around the seller-buyer relationship is very complex, lengthy and costly. Companies have to invest significant resources into developing a strong relationship before they can benefit from the intangible relationship value that customers bring to the company. Considering the fact that most companies' main objective is high profitability; intangible relationship value has been identified as highly important for financial performance (Baxter & Matear, 2004) and for the success of new product development (Baxter, 2007b).

The relationship between companies and their customers “contribute to its organizational capital” (Hunt, 1997) and creates shareholder value. To be able to correctly implement this value for new product development, this relationship has to be carefully understood and

managed. In addition, the value of this relationship is often predetermined by the characteristics of customers involved in the interaction (Gruner & Homburg, 2000). That is why the impact of those characteristics on the outcome of new product development projects should not be underestimated.

## **1.2. Justification of the Research**

The existing literature shows that there has been significant scientific progress in the areas of 1) new product development, 2) intangible relationship value and 3) customer characteristics. However, limited attention has been given to the integration of intangible relationship value (IRV) and customers' characteristics in the research that examines how those factors increase the success of the new product development.

The main aim of this research is to investigate how these three complex constructs fit together, and create an in-depth understanding of influence IRV and customers characteristics have on NPD success. The focus of this thesis is on the relationship in business-to-business situations and the value that occurs mainly for the seller rather than the buyer, as much of the research in this area already emphasizes the importance of increasing value that customers receive from such relationships (Baxter & Matear, 2004).

Based on several conceptual frameworks and findings of the studies related to each of three main constructs, this thesis will explore the importance of certain customer's characteristics and how the intangible relationship value can increase the success of the new product development. The intangible relationship value construct has been developed and empirically tested by Baxter and Matear (2004), wherein they have identified its

significance in predicting future financial performance of the companies. Characteristics of the involved customers construct has been researched by Gruner and Homburg (2000), wherein they have supported the significance of this construct on the success of the new product development in the machinery industry in Germany. And finally the new product development success construct has been implemented from the research of Baxter (2007b).

The findings of the research that will be presented have both practical and theoretical implications. Currently, there is no research that looks at the relationship of these three constructs in the business-to-business situations in the New Zealand manufacturing industry. As mentioned previously, these constructs have been separately researched and tested in different contexts, however, the findings may not be applicable in New Zealand and the age of those studies may affect their suitability for the modern business situation. Therefore, there is a need for research that will explore the relationship between these three constructs from a fresh perspective and with a new set of data.

### **1.3. Methodology**

Based on the researcher's views and relation to positivist/postpositivist theory, a quantitative approach has been taken to answer the proposed research questions, which will be presented further in this study. To be able to answer those research questions, primary empirical data will be collected. Being a quantitative study, and attempting "to increase predictive understanding of phenomena" (Myers, 2010), it was decided to implement the survey data collection method. Therefore, to explain how the intangible relationship value and customer's characteristics influence the new product development success; survey data

collection method will be implemented and questionnaires will be distributed to representatives of the sample.

As mentioned earlier, the study will be conducted in the New Zealand manufacturing industry. The reason for selecting this industry is because it has a sufficient number of companies and it is a good example of an industry implementing new product development processes. Kompass database will be used to draw sample pool for this research. Once the data has been collected it will be analysed in SPSS software.

Following the suggestion of Gruner and Homburg (2000), exploratory factor analysis approach will be implemented. Also, because multiple-indicator measures were used in this research; it was decided to supplement the exploratory factor analysis with cluster analysis and discriminant analysis to form distinct groups for analysis (Bryman & Bell, 2011), similar to what Gruner and Homburg (2000) have done.

The discriminant analysis enables researcher to predict and explain the relationship between the different constructs. The exploratory factor analysis helps to reduce a large number of variables to a smaller number to deal with, by grouping similar variables together. The purpose of the cluster analysis is comparable to factor analysis and aims towards assessing structure, however, the advantage of cluster analysis rests in grouping objectives, while factor analysis groups variables.

#### **1.4. Limitations**

There are some limitations of this study that have to be addressed. This research will be conducted in one country with a sample from a single industry, which means that

potentially, the findings may not be applicable for other industries and countries with different economies. A practical limitation of this study is using only one representative per company to participate in the research, which will capture a single opinion within big organisations that may be different from the perceptions of other people also involved in NPD within that organisation. The timeframe of this study is restricted, so a cross-sectional approach will be used, but it may be interesting to see how results may vary with a longitudinal study in the future.

This research concentrates only on one type of relationship between customer and company; however, it might be useful to explore similar arrangements with different types of relationships. For example, relationships with suppliers or those within the context of strategic alliances or joint ventures, as the potential value these other groups can add is also very important. Addressing these factors could allow researchers to eliminate them as limitations in future studies.

## **1.5. Outline of the Thesis**

This thesis consists of five main chapters. In this first chapter, a brief introduction of the study was presented. The research background, research aim and justification for undertaking this research were also presented in this chapter. A brief introduction of the research methodology and addressing study limitations were also covered in chapter one of the thesis.

In the second chapter, a literature review is presented. Here, the literature relevant to the topic of this thesis is analysed and discussed. Special attention is given to the studies that

have been used to create the conceptual framework for this thesis: NPD success (Baxter, 2007b), intangible relationship value (Baxter & Matear, 2004), and customers' characteristics (Gruner & Homburg, 2000). Value, its importance and various stages of NPD are also discussed. In addition, the development of the relationship and the special characteristics of the seller-buyer relationship are also addressed.

The third chapter is dedicated to the methodology of this research. First of all, in this chapter, the research conceptual model and research questions are presented, followed by the justification of the selected methodology. The sample and data collection are discussed, and the questionnaire structure is presented, explaining where the measures for different constructs originated. In the end of the methodology chapter, a revised conceptual model will be presented, and the chapter concludes with data analysis techniques and the limitations of the selected methodology.

Chapter four presents the findings generated by selected data analysis techniques. First, a profile of respondents is discussed, supplemented by the preliminary data analysis. This is followed by the descriptive statistics of the scaled items. Then, the findings of the measurement analysis are presented, including the results of exploratory factor analysis, reliability and validity analysis. This chapter concludes with a presentation of findings generated by cluster analysis and discriminant analysis, which allowed testing of the revised conceptual model.

The final chapter is chapter five, wherein the discussion of the findings is presented. In this chapter, the research questions are answered, significance of the findings is addressed and an explanation of how they answer the questions is also presented. Theoretical and managerial implications of this study are also presented. The limitations and suggestions



for the future research are presented, and chapter five concludes with a brief summary of the entire study.

## **1.6. Conclusions**

This chapter has created a foundation for the thesis. Research background, research aim and research justification have been introduced in this chapter. Addressing the limitations of this study follows a brief introduction of the research methodology. The outline of the thesis is given in this chapter, summarising the scope of the research and identifying which parts of the research are presented in which chapters. Based on these foundations, further description of the research follows.

## **1.7. Glossary of Key Terms and Abbreviations**

**B-2-B** - Business-to-Business;

**B-2-C** - Business-to-Customer;

**CAP (Customer Active Paradigm)** – paradigm in which customer develops new product idea and takes the initiative to transfer it to an interested manufacturer (Von Hippel, 1976);

**Characteristics of the Involved Customers** - in this study's context it is the four main characteristics of the customers involved in new product development identified by Gruner and Homburg (2000): technical attractiveness, financial attractiveness, closeness of relationship with customer, and lead user characteristics;

**ECV (Expected Commercial Value)** – is a method of defining various possible outcomes of the project with probabilities of each occurring, it is more appropriate for handling higher risk projects (Cooper & Kleinschmidt, 1993);

**EFA (Exploratory Factor Analysis)** – data analysis technique used to reduce a large number of variables to a smaller number to deal with, by grouping similar variables together (Bryman & Bell, 2011);

**IRR (Internal Rate of Return)** - is the discount rate of return in capital budgeting used to rank prospective projects before undertaking it (Bhuiyan, 2011);

**IRV (Intangible Relationship Value)** - construct that has been developed and empirically tested by Baxter and Matear (2004), wherein they have identified its significance in predicting future financial performance of the companies. This construct consists of human value to seller, and structural value to seller, and in this study will be used to evaluate its predicting power on new product development success;

**MAP (Manufacture Active Paradigm)** – unlike CAP, MAP is a paradigm wherein manufacturers do all problem solving themselves, without involving customers (Von Hippel, 1976);

**NPD (New Product Development)** - is the complete process of innovating new products or services and getting them to the market, this process implemented by companies to gain competitive advantage and create new business opportunities (Y. Zhang, 2009);

**NPV (Net Present Value)** – is a method for using the time value for money to appraise long-term projects, and it is defined as sum of the present values of all individual cash flows within a project (Bhuiyan, 2011);

**SME** – Small and Medium Enterprises;

**SPSS** – Statistical Package for Social Science;

**ROI (return-on-investment)** – the profitability ratio commonly used to measure performance pricing policies, inventory investments, capital investments, etc. (Payne, 2005)

## **Chapter 2. Literature Review**

### **2.1. Chapter Introduction**

In this chapter, a detailed literature review will be presented. The existing literature related to the topic of this thesis, relationship value and new product development, has been collected and thoroughly reviewed to create a foundation for extending the knowledge base on new product development success and intangible relationship value between organisations and their major B-2-B customers. The analysis of relevant literature determines to what extent the topic has been discussed in previous studies, and links together the studies related to the main constructs of the conceptual model: which identifies how involved buyer's characteristics and their intangible relationship value influence the new product development success.

Baxter's (2007b) six dimension new product evaluation framework (market success, technical success, social and ecological sensitivity, strategic advantage gains, speed-to-market, and financial success) and its advantage over other evaluation techniques will be discussed and used for measuring new product development success. This approach will also be justified further in this thesis.

In the following subsections, the relevant literature will be summarised to identify existing trends in value and importance of new product development, describing the different stages of NPD success (Cooper, 2001), but concentrating on the stages which have been identified as commonly used by companies to involve their customers in. Also, as one of the main constructs of this study's conceptual model, factors used to assess new product development success will be discussed. Then, the literature review on relationships between

buyers and sellers during NPD will be assessed. This will cover relationship development, buyer involvement and perceived NPD value, intangible relationship value (Baxter & Matear, 2004), and most importantly, characteristics of the buyers' involved in the new product development (Gruner & Homburg, 2000).

The research conducted by Gruner and Homburg (2000) identifies different characteristics of business-to-business customers involved in new product development, and what effect each of them has on NPD success. The characteristics identified by Gruner and Homburg (2000), combined with the conceptual model on intangible relationship value developed by Baxter and Matear (2004), have created a framework for this research and will allow testing of how these identified characteristics apply to New Zealand customers and influence NPD success. The literature review conducted for this study incorporates research on new product development, new product success and relationship marketing. It demonstrates how the findings can fit within various industries and will further be applied in the example of New Zealand organisations.

## **2.2. New Product Development**

A cornerstone of this research is new product development literature. In this section, NPD value, its importance to the company and customers, different stages of NPD and factors used to evaluate its success will be explained to determine clear understanding and create a pathway to answering questions raised by this research.

New product development is a crucial part of most companies' activities. The market environment in developed countries like New Zealand become more complex and

unpredictable. To be able to survive in this complex and competitive economy (Amaldoss & He, 2010), businesses have to differentiate themselves. That is why the ability to offer new products creates strong competitive advantage (Lagrosen, 2005). However, the most common issue that businesses often face, is the lack of knowledge of customers' needs and expectations (Gruner & Homburg, 2000). New product development is not about bombarding the market with random new products: it is about meeting customers' needs, and often customizing existing products and services to meet expectations of a particular target market (Barclay, 2002). Unfortunately, due to the lack of the market knowledge by companies' executives and NPD departments, only a small portion of product development projects succeed (Matzler & Hinterhuber, 1998).

The high failure rates of the new product development projects in the past have initiated the creation of a specific NPD structure with well-defined stages. Research from different countries related to the new product development has returned a broad range of NPD failure rates. It is hard not to notice that those failure rates have not decreased significantly over time. Crawford has found that failure rates of NPD projects range between 20% and 90% depending on industry and product type (Crawford, 1977). Five years later, cumulative new product development failures for the previous two decades has added up to 35% (Booz, Allen, & Hamilton, 1982). These failure rates have been confirmed by most of the following studies (Cooper, 1990; Smits & Kok, 2011; Van Kleef, 2006). A relatively recent study by Barczak et al. (2009) has also averaged NPD failure rates at about 40%. The reason for these high failure rates fluctuations is the different interpretations of the term "failure" used in new product development contexts. Some researchers use "disappearance from store shelves" as interpretation of NPD failure; others just generalize it to the failure of meeting customers expectations (Crawford, 1977). Despite the fact that a new product

might remain in the product range offered by the company, overall new product development projects may be classified as failed due to the inability to meet certain criteria established by the company undertaking the project.

Innovative companies that have years of experience in new product development behind them and have numerous successful NPD projects in their portfolios, have realised that the best way to meet customers' needs and expectations is actually asking them directly (Lagrosen, 2005). For that reason, the majority of the successful NPD projects have their customers involved during different stages of product development. Further in this chapter, different stages of NPD will be discussed and the literature that explains in which stages and why, customers are being involved in the most.

According to Cooper (2001), before undertaking new product development, before awareness of customers' needs and expectations, the company has to have a clear understanding of market requirements based on organizational conditions and the external business environment, factors like competition, target market, product characteristics and organizational goals. Managers must be capable of developing and effectively managing new product development projects, which requires certain skills and knowledge of techniques like market research, evaluation of NPD performance, and management of market relationships. Managing relationships with customers during NPD is of particular importance (Knudsen, 2007).

In this section, existing techniques for the evaluation of new product development success will be presented. As the considerable majority of existing literature agrees that NPD success is a multi-dimensional construct (Baxter, 2007b; Griffin & Page, 1996; Ragatz, Handfield, & Scannell, 1997), there will be several multi-dimensional techniques

developed by different groups of researchers analysed in this literature review (Baxter, 2007a; Cooper & Kleinschmidt, 1987; Griffin & Page, 1996).

Based on the analysis of existing literature on NPD success and relationship marketing, the main target of this research is to identify which customers' characteristics have greater influence on new product development success and how intangible relationship value benefits NPD processes in New Zealand industries. The fact that New Zealand is a developed country allows the implementation of study findings that have been conducted in countries with mature economic structures, like Germany (Gruner & Homburg, 2000) and enables analysis of how these findings fit in the New Zealand market. The main difference between this study and other researched markets is the small size of the New Zealand economy (Baxter, 2007a). This reflects the high number of business with fewer employees (SMEs), which also often contributes to a more neglect of new product development. Often in New Zealand, the same person within a SME has to cover several duties and cannot fully dedicate their efforts to new product development. In the next section the importance and value of NPD will be discussed.

### **2.2.1. Value and Importance of NPD**

New product development has always been considered a high-risk endeavor (Cooper, 1994). As innovation requires considerable resources, the case of failure can result in a serious loss for the company, and sometimes cause entire company failure and bankruptcy. Nevertheless, most companies around the world rely on NPD projects as an opportunity for extensive business growth and profitability of their operations.



Opportunities that new product development opens for the company are endless and very tempting. That is why the majority of businesses are willing to take that risk and increase their chances for survival in competitive and unpredictable markets. Many modern companies implement NPD as one of their primary strategies to gain competitive advantage in the market, and they describe NPD projects as the lifeblood for their company's future development and the possibility to grab larger market share (Wind & Mahajan, 1994).

NPD adds numerous important values to companies, including: matching customers' needs and expectations, differentiation in competitive markets, business extension (Y. Zhang, 2009) and the opportunity to enter new markets (Lagrosen, 2005). All of these benefits, which new product success carries, are highly important and contribute to the overall success of almost any organisation. Companies that make the mistake of giving lower priority to meeting customer's needs and expectations while concentrating on profitability and capturing bigger market share via other temporary means, almost always regret and lose potential future income. Differentiation and business extension are also significant advantages that add to the company's uniqueness, which always carry financial benefits for the company in competitive markets (Barczak et al., 2009).

New product development is used to meet the requirements of existing markets as often it is used as a strategic technique for discovering new markets. Product customization as a type of NPD is capable of discovering new market niches (Stump, Athaide, & Joshi, 2002).

Many businesses often have one main product and then create many other products by simply altering the main one to meet the needs of different groups of customers. This is a relatively inexpensive and simple NPD technique. A simple example of a company using product customization has been implemented by the worldwide franchise called Subway.

Subway cut their sandwiches into "mini subs" and created a "Sandwich Platter" (Subway,

2013), gaining them entry into a new niche: health-conscious consumers who don't want to overeat at parties/events. Subway and other companies who utilize product customization, without inventing completely new products, are undertaking an NPD project that can be extremely profitable and create possibilities for capturing larger market share (Little, 2005).

According to Cooper (1990), successful NPDs are likely to generate high profitability and bigger market share, help meet business objectives, help satisfy customers' expectations and needs, and ensure high overall success rate for the company much more so than undifferentiated products that have been settled in the market for a long period without any alterations. High profitability and matching company's financial objectives are often treated by businesses as the main (and sometimes the only) factors for evaluating the success of new product development projects. Matching customers' needs and expectations significantly increases the likelihood of success of the new product. Being able to solve the problem with a new product in the competitive market instantly provides company with significant market share, generates loyalty to the new product and also creates awareness around other products that company had on the market before. There are still many other positive gains from NPD so success evaluation factors are being continually introduced as the number of studies related to NPD grows.

Product differentiation is one of the main attributes of new product development. The capability of differentiating a new product from the existing products in the same category creates stronger competitive advantage. Additionally, if a new product has unique features that cannot be easily copied; it will generate customers loyalty (Y. Zhang, 2009). There are many different routes that organisations can take to achieve product differentiation. Among the most popular: increasing product quality, adding more sophisticated technological features, offering better customer service, and creating the reputation of being a socially

and environmentally conscious organisation (Boehe & Cruz, 2010). The route that companies choose is determined by the nature of the product they have developed or are about to develop. But sometimes it is the other way around, with new product development being determined by the product differentiation policy that the company has been implementing. Some key definitions of the NPD are presented in Table 1.

The research conducted by Cooper and Kleinschmidt (1993) has supported the fact that product differentiation has the most influence on new product success. They present two types of differential advantage: product differentiation (relative product quality, value-for-money, price/performance, main benefit, meeting needs, unique attributes) and non-product differentiation (salesforce, tech-service, brand name, company reputation) (Cooper & Kleinschmidt, 1993). Although their research was focused only on one industry (chemicals), further implications of their findings has shown that product differentiation is critical for successful product development in almost any other industry: service industry (Yang, Baxter, & Xu, 2007), health supplements industry (Y. Zhang, 2009), machinery industry (Gruner & Homburg, 2000), etc.

Business extension is another important benefit that NPD offers. A large portion of all new product development projects have been undertaken for the purpose of discovering new markets (Cooper, 2009). Competitive and successful businesses are constantly looking for new market niches. Often, after a niche has been identified, the business discovers that approaching it with their existing products will not generate the desired outcome. That is when organisations implement NPD. Business extensions significantly increase a company's competitive advantage, strengthen its long-term cooperation with the customer, and can be a good solution for demand management (Liu & Zhao, 2010).

However, interacting with customers during new product development projects, and actually including them in the process, also has some disadvantages that can be relatively tricky. Modern consumers desire to contribute in the process of value creation; this is referred to as cocreation. There are at least four major impediments of consumer cocreation (Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010): transparency issues, ownership of intellectual property, information overload, and infeasible ideas.

Involving consumers in NPD processes requires a certain level of transparency, as consumers need to know the direction of new product development projects in order to be able to contribute effectively. Therefore, NPD ideas often get disclosed to the public much earlier than they would have been otherwise (Prahalad & Ramaswamy, 2004). This creates a risk of vital NPD information being leaked to competitors. This transparency issue mostly concerns companies at early product development stages.

The second issue is caused by a lack of consistency in intellectual property ownership policies. Some consumers may try to claim ownership of intellectual property, which creates difficulties for implementing cocreation.

Another issue involving customers in NPD is information overload. Frequent interaction with customers during post-ideation stage of NPD may have a negative effect on the project: information overload can slow down the process, as evaluating multiple ideas can be very time consuming. Therefore, companies often integrate customers in evaluating and filtering their own ideas (Hoyer et al., 2010).

The last common weakness of customer involvement in new product development projects are the problems associated with ideas generated that are not feasible from a production point of view (Magnusson, Matthing, & Kristensson, 2003).

**Table 1. Key Definitions of NPD**

<b>Author</b>	<b>Year</b>	<b>Definition</b>
Baxter	2007	New product development – is the creation of products with new or different characteristics that offer new or additional benefits to the customer. It may involve modification of an existing product or its presentation, or formulation of an entirely new product that satisfies a newly defined customer or a market niche.
Cooper	2001	New product development – is “...a rewarding but risky business. Development of new products is vital to the long-term survival of a business as a new product, or a star in marketing terminology, today can be a cash cow tomorrow. New products are engines to growth and profitability for many companies”.
Gruner and Homburg	2000	New product development - is a process of developing new product or service for the market. This is essential step in business to keep up with market changes. New product development is a central point in collaborative relationships between firms.

### **2.2.2. Stages of NPD**

One of the main obstacles on the complicated path to successful product development is the inability of many NPD teams to develop substantial levels of market orientation, which subsequently causes poor interpretation and use of market information and inadequate new product decision-making (Smits & Kok, 2011). It is only recently that academics have realised how vital market information is for new product decision-making, and three main segments of market information has been identified: needs information, customer information and segment information (Smits, 2010).

Attempting to reduce failure rates and make product development a more successful exercise, innovation and marketing scholars have been trying to develop a framework for NPD that would contain precisely formulated stages during which NPD teams have to implement certain techniques and avoid actions that have proved to lead to NPD failures. In previous studies, different definitions for various stages of new product development have been applied. Often, NPD structures are strictly industry-oriented, but lately, general stages have been used as a foundation for all NPD projects. Cooper (2001) has offered a seven-stage NPD process model which is being widely used by academics and practitioners in marketing and innovation fields today.

The first stage of his model is called discovery. During this stage, the NPD team works on idea generation by researching their business internally and externally. Internal research involves cooperation with sales departments (as salesmen most often have the best understanding of customers' needs), employees, and R&D departments. External research aim is towards distinguishing consumer and market trends (often through surveys and focus groups with different consumer segments), competitor analysis, target market analysis,

niche market discovery, and close customer communication. Basic market research and SWOT analysis often give enough information to determine customer's expectations and needs, and draw a basic concept of the new product that should meet those needs and expectations (Cooper, 2008). Well-established relationships with customers allow firms to identify new needs faster than competitors do. That is why every successful company has good customer service and invests heavily in training their employees to communicate with customers efficiently so that they are able to capture any potential issues, which later may initiate new product development if there is no current solution to the customer's problem (Lagrosen, 2001).

The second stage is idea screening. During idea screening, all ideas that have been generated at the first stage are critically evaluated with only the most attractive and feasible being further elaborated upon. Part of the criteria for attractive idea selection are market trends, market acceptance, cost involved in new product development, growth trends etc. (Smits, 2010). To support this stage, the company undertaking new product development project, may implement creative or non-creative techniques, like surveys or brainstorming (Cooper, 2011).

Often, when organizations closely collaborate with their customers during the first stage of NPD, they may suffer from 'idea overload' by the time they reach stage two due to the high number of ideas generated by consumers. This idea overload can't be processed by the NPD team quickly and efficiently enough to ensure good quality idea screening. If this happens, some firms try to integrate consumers into the second stage and supply them with set of criteria for idea screening (Hoyer et al., 2010). Recent observations have proved that organisations involve customers in early stages of new product development more often now than they used to in the past (Lindgren & O'Connor, 2011).

The third NPD stage is called scoping. The main aims at this stage are conducting preliminary testing, and observing the purchasing potential of the new product, its attractiveness to the customer, and demand forecast (Cooper, 2008). During this stage, marketers closely cooperate with various groups of customers, consumers, and distributors to obtain feedback, which will indicate what parts of the product need improvements, and which parts appear to be the strongest and therefore should be emphasized at the initial product promotion. As mentioned previously, cocreation in NPD context is a relatively recently developed technique used by organisations during new product development. It's main purpose is to increase consumers' empowerment and allow them to contribute to product value creation. Companies that practice a high degree of cocreation rely on their customers during this stage of product development significantly (Hoyer et al., 2010).

Idea screening and scoping stages are also referred to as the “fuzzy front end” of new product development, as activities undertaken before the development stage are at the “fuzzy front end of innovation and pivotal activities” (Duening, Shepherd, & Czaplewski, 2012). Duening et al. (2012) mentions that it takes over 3000 raw ideas to achieve a single product launch, as people in NPD teams in bigger organizations have less entrepreneurial experience and make more isolated corporate marketing decisions. That is why people undertaking NPD projects should be able to take an entrepreneurial approach, visualizing what the end product might look like and then working backwards from there (Duening et al., 2012).

The next stage of the new product development is business analysis. During this stage, the NPD team concentrates their efforts around project planning, project justification and project definition by conducting thorough marketing research around specific business cases (Cooper, 2008). The earlier mentioned set of actions and research procedures



undertaken by organizations during the idea generation and the idea screening stages (external and internal business research, market trends, market acceptance, costs involved in new product development, growth trends) are now repeated at the business analysis stage with more consideration of the product fit within the company's vision and mission. This consideration allows for more precise financial forecasts to be produced such as forecasts of production and sales, and forecast of demand and estimate sales (Lagrosen, 2005). Overall, this stage evaluates the quantitative factors derived from the NPD projects, the most common factors being profits and ROI (return-on-investment) (Bhuiyan, 2011). Customer involvement in this stage is reduced significantly in comparison with previous stages of NPD. One of the main reasons to involve customers in this stage is to determine their perception of the product value and the likelihood of them purchasing this new product.

According to Cooper's NPD model (2008), the business analysis stage is followed by the development stage, wherein the intangible idea is transformed into a physical prototype. The development stage can be the most time consuming stage and often, can take years to complete (Bhuiyan, 2011). The market is constantly changing, introducing new competitors, and changing consumers' expectations. It can often change partway through the product development stage, which requires significant restructuring and major alterations to the whole project. Competitors often keep their product development operations confidential until they are ready to launch a similar product, just before other companies have completed their development stage, which makes the market less receptive for their competitor's launch (Cooper, 2001). Reducing development time is very important for companies undertaking NPD projects. Being able to run through this stage quickly

awards the company with a competitive advantage, price regulation power, valuable market information, and also reduces development costs (Bhuiyan, 2011).

During the developmental stage, marketing teams prepares market penetration plans.

Prototype evaluation by representatives of the target market generates valuable feedback, which is then analysed before planning the most cost-efficient way of manufacturing the product and delivering it to the market. Using the information generated from this NPD stage, the financial analysis is updated (Cooper, 2008). Seeking customers' positive feedback is the best way to ensure successful and accurate evaluation of the development stage, as customers intend to give an honest evaluation of the product design, product functionality and the likelihood of recommended pricing acceptance by the target market.

Recently, a New Zealand company has developed a safety lighting system that can be applied to almost any work-gear worn by workers at night or in poor visibility conditions. This lighting system is used to increase visibility and reduce the number of accidents related to people being hit by moving objects, mainly at night. This company claims that their product has been designed "with the industry, for the industry" (LightKnight, 2013). The main product that the LightKnight International offers is industrially oriented, and during the development stage, the company worked with construction, roading, mining and other industry leaders to meet those customers' needs. The outcome of this close collaboration with the industry leaders during the product development stage has attracted a lot of interest from major clients from all around the world such as Ports of America, Rio Tinto, Leighton Contractors, Fulton Hogan and others prior to the product launch (Adams, 2013). This example illustrates how valuable consumer involvement in this stage of new product development truly is.

The next stage of NPD is market testing and validation. The main objective of this stage is to test the product in a real market environment. The feedback from consumers and distributors are collected to evaluate product fit into the market: whether it meets customers' expectations and overall performance against established standards (Cooper, 2008). Those standards can be physical, perceptual or functional. Physical and functional features often command NPD team attention. If, during the testing stage, the product does what it is supposed to do, looks acceptable and creates the benefit for the customer; then it is classified as valid. Perceptual standards are used to determine whether the customers' perceived value of the product matches their desire to purchase the product. The NPD team should focus on measuring customers' satisfaction, perceived product performance and also, customer's preferences in the competitive situation. The qualitative information collected from the testing stage allows managers to capture consumers' dislikes before the product launch, and make the required changes.

Customers' acceptance is critical at this stage. The product must encourage and excite customers so that they like the new product better than the equivalent they are currently buying. Testing is important to verify earlier business judgments (Bhuiyan, 2011). If all aspects of the product meet business objectives, the organization can move on to the next stage of new product development: launch and commercialization.

Launch and commercialization is the seventh and the last stage of the new product development model introduced by Cooper (2001). When the six previous stages have been successfully completed, the organisation can focus on introducing the product to a wider market. However, some refer to commercialization as a post-NPD activity because at this stage, the new product has been developed, tested, and it has been proven that no more changes need be done in order for it to enter the market. During this stage, all advertising

and promotional material is being produced and served to the market, and the distribution channels are filled with the product (Kiruthika, 2012).

During the launching and commercialization process, management is generally trying to minimize internal and external trading risks (Barclay, Dann, & Holord, 2000). External risk areas include: economical input, customers' attitudes about the product, and components' data. Internal risks may include: low investment output, poorly scheduled production timetables and wrongly selected distribution channels (Mamaghani, 2012). Due to high risk at this stage of new product development, some firms do not commercialize their patented products. This situation is more likely to occur with large firms rather than with smaller firms, due to the diminishing returns on research and development for big companies, which already have many other sources of income from well-established products in the market (Manaczynski, 2012).

Cooper's NPD model (2001), as described above, does not necessarily fit every business. Some businesses only follow certain stages of his NPD model and others choose to follow different models. There are many other existing NPD models (Booz et al., 1982; Trott, 2005), but most of them share the same principles, have similar core stages and differ in only small ways from Cooper's. New product development models are implemented by different companies according to company size, market conditions, company conditions and the budget of planned NPDs (Buonansegna et al., 2013).

Another commonly used NPD model is a linear one proposed by Trott (2005) which contains eight stages. The first seven stages are almost identical to the ones offered by Cooper (2001), the only difference being that similarly to Cooper's *scoping*, in Trott's model, this stage is called *concept testing*. Trott (2005) also adds an eighth stage, called

*monitoring and evaluation.* Many academics and practitioners may not agree with this decision, because monitoring and evaluation are thought of as post-NPD activities (Booz et al., 1982).

Before Cooper and Trott proposed their NPD models, Booz, Allen and Hamilton (1982) had dedicated a big portion of their research to NPD processes. They developed a model with seven NPD stages: 1) new product strategy; 2) idea generation; 3) screening and evaluation; 4) business analysis; 5) design and development; 6) testing; and 7) commercialization. It is obvious that all of the described models are very similar, which makes it relatively easy for companies implementing NPD. However, as previously mentioned, some organisations have limited budgets for their NPD projects. In these situations, they are forced to skip some NPD stages. An example of a simplified NPD model is the one used by Jespersen in her research (2012) with only five stages: idea, concept, design, test and launch. Companies that attempt to cut corners during NPD, ignoring stages that seem less important, often suffer from affected quality and low success rates in new product development.

In order to evaluate NPD team performance during every stage of new product development, and in order to evaluate to what extent business goals have been achieved, organizational managers should have the knowledge and skills in order to truly measure NPD success (Baxter, 2007a). In the next section, literature related to NPD success evaluation will be assessed and the NPD success factors used for evaluation will be discussed in detail.

### **2.3. NPD Success Factors**

Every new product can be beneficial for both the company and its customers. Customers get the product that can potentially meet their needs, and companies get new entrance points into the market, eventually leading to more profitable income. In the competitive economy of the modern world, it is vital for companies to introduce new products to replace stagnant products. NPD projects reward organisations with competitive advantage and overall make positive contribution to business success (Huang, Soutar, & Brown, 2004).

#### **2.3.1. NPD Success Determinants**

There are several determinants of new product development success. The most common ones are organizational factors, as they directly affect the success or failure of NPD (Balachandra & Friar, 1997). Research and development skills, strategic planning skills, ability to cooperate, innovation capability, all of these factors relate to organizational determinants of NPD (Sivasubramaniam, Liebowitz, & Lackman, 2012). Another extremely important determinant is the relationship network. The relationship network includes supplier involvement and customer involvement in new product development, which can reduce costs while improving the quality of the product at the same time by offering improved access and application of technology (Knudsen, 2007). Baxter (2007a) has researched intangible relationship value (IRV) in new product development and has found a significant influence concerning buyer's value to seller on new product development success. This specific relationship will be discussed further in more detail in

following sections of this literature review, as the conceptual model of this study is built around intangible relationship value to seller and its influence on NPD success.

The existing literature shows that customers are more likely to be attracted by innovative products, so another determinant of NPD success is technology (Balachandra & Friar, 1997). Technology plays a very important role in the modern world and therefore its influence on NPD is increased, but, this does not mean that the cost of production of a high-tech product is much higher than the cost of the product that uses less “fancy” technology (Sivasubramaniam et al., 2012).

Another success determinant is the product itself. A new product should have unique features or be differentiated from others, so it can deliver more value to the customer and meet their expectations and needs (Mamaghani, 2012).

The most important NPD success determinant is certainly the market. The market should be carefully analyzed, with strengths and weaknesses identified before developing and introducing new products (Cooper, 2009). All different aspects of the market (size, profitability, competition, and exposure to new products) compile to create a strong element that determines the success or failure of any new product (Amaldoss & He, 2010).

New product development itself is the determinant of companies’ success and the factors described above influence the success of the NPD. However, to be able to measure the contribution NPD makes to a company’s sustainability, academics in the NPD and product innovation sectors have established various success factors that can assist managers in the evaluation of NPD success, which will be further elaborated.

### **2.3.2. NPD Success Outcomes**

In the existing literature, researchers mention a few different techniques for measuring new product development success. The most well known two techniques are multi-dimensional measurement and single evaluation (Y. Zhang, 2009). Although NPD's impact on companies is very multidimensional (Huang et al., 2004), both of these techniques will be described further in this thesis.

One of the most frequently used, single-factor success evaluations is profitability (Choy, Yew, & Lin, 2006). Another well-known, single-measure success evaluation is to evaluate a company's NPD success against their success of a direct competitor (Lindgren & O'Connor, 2011). A single measure of NPD success is efficient when it is used for evaluation of financial achievements, but, whenever there is a need for a broader evaluation of multiple NPD facets; this technique proves to be insufficient (Baxter, 2007b). That is when companies implement a multi-dimensional evaluation technique.

Cooper and Kleinschmidt (1997) have suggested that new product success should be measured using a 3-dimensional evaluation technique that would cover the three main aspects of both long-term and short-term benefits: market impact, opportunity window and financial performance. Compared to single measure techniques, multi-dimensional techniques cover several different aspects of NPD and explain new product success much more precisely.

Bhuiyan (2011), in his study, "*A Framework for Successful New Product Development*" has summarised all critical success factors of NPD, and has linked them to related NPD stages. He has used Booz's et al. new product development model (1982) as a base for determining critical success factors.



For example, in regards to the *new product strategy* stage, he has identified a clear and well-communicated strategy for critical success factors and a way to measure those factors through return on investment (ROI) and degree of communication. For the *idea generation* stage, the success factor is customer-focused idea generation. For *screening* and *business analysis* stages, the critical success factor is “up-front homework”, which can be measured using financial methods of evaluation like expected commercial value (ECV), net present value (NPV) and internal rate of return (IRR). For the *development* stage, he has identified the highest number of critical success factors, as this stage is often the most time consuming and complicated. Among the success factors suggested by Bhuiyan (2011) are: speed (development time), customer feedback, degree of team commitment, concurrency of activities, degree of design effort; and functionality and customer acceptance. During the *testing* stage of NPD products, Bhuiyan (2011) considers functionality and customer acceptance as the most critical success factors. The literature suggests that even the most complicated NPD project following the aforementioned steps and paying attention to the critical success factors outlined as above has significantly higher chances for success.

### **2.3.3. NPD Success Evaluation Frameworks**

Seller's new product development success model is used in this research and has been developed by Baxter (2007b). Baxter (2007b) has extended the 3-dimensional NPD success evaluation model developed by Griffin and Page (1996) a decade earlier. Their model had only technical performance success, customer-based success and main factor financial success. In his study, Baxter (2007b) has supported an argument that in the long-term perspective, financial success is primarily the main factor that matters when

measuring the outcomes of NPD. However, he has emphasized the need for extending the multi-dimensional NPD success model, as factors used by Griffin and Page (1996) are mainly represented as “short-term indicators of past performance” (Baxter, 2007b). That is why, in his proposed NPD success model presented in Figure 1 there are six factors. Amongst them are the ones offered by Griffin and Page (1996) i.e. technical success and financial success, but also, some less tangible success factors that in the long-term perspective, also provide financial benefits to the organisation undertaking new product development.

Baxter’s (2007b) seller’s NPD success evaluation framework contains: financial success, speed-to-market, technical success, strategic advantage gains, market success, and social and ecological sensitivity. In the modern competitive market, organisations have to evaluate their NPD success particularly carefully (Y. Zhang, 2009), in order to minimize risk associated with relying on biased NPD projects. That is why SMEs often get only a single chance to capture the available share of the market.

Baxter (2007b) has conducted an extensive literature review to justify the need for each success evaluation factor presented in his framework and this research will provide empirical evidence of the strength and importance of every factor. The importance of financial success has been addressed above, and also supported by many authors in product innovation and NPD areas (Baxter & Matear, 2004; Cooper, 2011; Griffin & Page, 1996; Gruner & Homburg, 2000).

The speed-to-market success evaluation factor has gained far less support from past studies (Griffin & Page, 1996). However, other authors have identified the speed-to-market factor as a “stand-alone performance dimension” (Cooper & Kleinschmidt, 1987). Therefore, the

relationship between NPD success and speed-to-market still remains unclear and has only been partially justified by existing literature and will be further investigated by this study.

Technical success has been justified in many studies and has been proved as very strong determinant of NPD outcome (Griffin & Page, 1996). In the extant literature, authors frequently mention the influence of marketing synergy on new product development performance; therefore, Baxter (2007b) has included strategic advantage gains in his NPD success evaluation framework. Market success has always been one of the most important factors in the evaluation of NPD (Medeiros & Ribeiro, 2013).

Finally, due to raising importance of public acceptance, the “social and ecological sensitivity” factor has also been identified as an important factor that should be attended by organisations while evaluating the new product development (Y. Zhang, 2009). Therefore, this success factor has also been included in Baxter’s NPD success evaluation framework (2007b).



**Fig. 1 - Seller’s NPD Success (Baxter, 2007b)**

Gruner and Homburg (2000) have claimed that before their research on customer interaction and its effect on new product success, there were generally only single-measure items used for NPD success evaluation, and that reliability and validity were two of the

items often neglected. From the above literature review, it is obvious that new product development and its success evaluation are complex constructs, an idea that has also been supported by Griffin and Page (1996). Therefore, Gruner and Homburg have utilized four dimensions (presented in Figure 2) to evaluate the success of new product development in the German machinery industry. These dimensions were developed upon the work of Olson, Walker and Ruekert (1995), the work of Garvin (1984), and the work of Griffin and Page (1993). They are: 1) financial new product success; 2) quality of new product; 3) quality of new product development process; and 4) inexpensiveness of new product ownership (Gruner & Homburg, 2000).

Furthermore, through pilot interviews, Gruner and Homburg (2000) have developed and validated sixteen measure items to evaluate the new product success.

The measurable items they use in the *quality of the new product* dimension are: the technical capabilities of a product related to technically similar products, the technical capabilities of a product related to the competition, technical features, conformance to customer requirements, aesthetics and customer satisfaction with quality.

The item measurements used for the *financial new product success* dimension include: achievement of profit goals, achievement of project break-even time goal and satisfaction with financial success items were created.

Duration of development, timelines of market launch, satisfaction with the development process, inexpensiveness of the project and use of manpower are the measure items created by Gruner and Homburg (2000) for the *quality of the new product development process* dimension.

The *inexpensiveness of new product ownership* is measured by: operating costs to customer and the customers' ability to reduce prices for their own products (Gruner & Homburg, 2000).



**Fig. 2 – New Product Success (Gruner & Homburg, 2000)**

Just as not every business will implement all of the stages of NPD, NPD success frameworks are often only partially applied to evaluate the outcomes of NPD projects. Ignorance of specific success factors often depends on the type of business and the marketplace environment it operates in (Smits & Kok, 2011). As Baxter's NPD success model has been tested only in specific industries in New Zealand, it is obvious that it must be tested in multiple industries in order for it to prove to be an efficient framework.

Further sections of this thesis will examine relationships during NPD: how those relationships develop and progress. Extra attention will be given to the seller-buyer relationship, as this is an accurate reflection of the relationship in the researched audience.

The discussion of this topic will then progress into intangible relationship value and address how this type of value influences success of the new product development.

## **2.4. Relationships during NPD**

The existing literature in product innovation and NPD fields emphasize the importance of relationships during new product development. In his study, Lagrosen (2005) has paid significant attention to the relationship between different parties involved in NPD, and he has identified that relationships are even more important for business-to-business oriented companies than for business-to-consumer oriented ones. If these are maintained correctly; they can contribute significantly to NPD success. To achieve positive performance of new product development, organisations include many types of relationships in NPD processes (Knudsen, 2007). Recent studies have found that relationship value is much more significant than was earlier estimated because during different stages of NPD, different knowledge and information is required to support the activities undertaken during those stages. It is often necessary to source this information from customers because if an NPD team decides to use their own opinion to develop a product, this information may be biased (Buonansegna et al., 2013). However, as previously mentioned, customers do not always need to be involved in every stage of NPD. Unreasonable and unjustified use of relationships during new product development has been identified as having potential negative effect on NPD processes (Y. Zhang, 2009).

The management of market relationships and the evaluation of characteristics of involved customers have been thoroughly researched by Gruner and Homburg (2000). Their findings have made a significant contribution towards the development of a conceptual framework

for this thesis. A more detailed analysis of their findings will be presented further in this section.

Among the many different types of relationships between organisations undertaking new product development and other parties, literature defines several of the most important relationships. Knudsen and Mortensen (2011) mention five types of relationships: 1) customer relationships; 2) supplier relationships; 3) competitor relationships; 4) universities; and 5) consultants. Some authors only name suppliers, customers and universities as major relationships; others emphasize the uniqueness of each type of relationship and often separate relationship types into different, smaller relationship segments. For example, Laursen and Salter (2006) have separated relationship with universities and private research institutes into five different types.

In the majority of past studies, the customer relationship is the most commonly mentioned and considered the most valuable relationship. Relationship with customers in collaborative new product development almost always contributes positively to the overall success of NPD (Ojanen & Hallikas, 2009). Involving customers in certain NPD stages results in achieving product development goals and supplies a company with an opportunity to develop a superior product that is attractive to customers. With careful examination of customers' needs, expectations, desires and their existing problems, companies undertaking NPD gain valuable knowledge and information that leads to effective problem solution and is always beneficial for both parties (Knudsen, 2007). Due to the frequent interaction between customers and organizations and the relatively low cost and simplicity of using this type of relationship in new product development, this type of involvement has become the most valuable and powerful relationship during NPD projects (Knudsen & Mortensen, 2011). However, organizations have to use this relationship wisely and carefully. Too

frequent interaction with customers can be harmful for the new product development because it can overwhelm the NPD team with excessive information and slow down project performance (Hoyer et al., 2010).

The second most important type of relationship for NPD is that between companies and their suppliers. Knudsen (2007) has supported the fact that interaction with suppliers during new product development contributes positively to NPD processes. During new product development, suppliers can often be very supportive and help those companies in various ways. For example, a supplier could provide a company with raw materials at discounted prices. Development time can also be reduced with the help of suppliers because suppliers have significant interest in the success of the new product development, which will most certainly result in more business for both parties (Buonansegna et al., 2013). The most frequent supplier involvement in new product development happens during the early stages and during the development stage of NPD. It is during these stages that access to materials at lower cost can be vital for the organization and NPD success.

According to findings published by Knudsen and Mortensen (2011), over 60% of companies use relationships with suppliers and customers during new product development. The next type of relationship involvement in NPD is competitor involvement. Comparing the first two types of relationships with the competitor relationship in terms of a positive role in NPD, is much more uncertain in the existing literature.

Some past research supports the positive role of alliance with competitors during new product development because there is a significant potential to share and access relevant knowledge, information and valuable resources. This can potentially increase chances for immediate success (Knudsen, 2007). However, a large portion of the literature argues that



close interaction with competitors during NPD can contribute negatively to NPD, and some even define this type of relationship as dangerous for NPD and the company itself (Buonansegna et al., 2013). The competitor relationship can increase the possibility of secret information leaks. A lack of confidence in reliable cooperation and lack of trust between companies undertaking NPD and their competitors makes these alliances very unstable. Relying on a relationship with a competitor can carry significant risk for the NPD project (Gates, 1993).

Existing literature also supports the positive role of relationships during NPD between companies and universities and companies and private research organizations. However, the value of these relationships has been supported mainly in the research conducted with larger organizations (Gates, 1993; Knudsen, 2007; Ojanen & Hallikas, 2009). There is not much evidence that close interaction between universities and SMEs is as valuable. This inequality may be related to the significant costs associated with this relationship. Smaller companies often cannot afford to involve universities and reputable research institutions in their NPD activities. That is why larger corporations gain strategic advantage from the advanced knowledge supplied by relationships with those institutions (Knudsen, 2007).

#### **2.4.1. Relationship Development**

Relationship development is an essential part of new product development success. It requires skill to increase customers value without neglecting customers experience with the company and maintaining their satisfaction level (Payne, 2005). For the purpose of this research only relationship between customers and businesses will be explored. This will allow investigating this relationship more accurately. Therefore, the relationship between

businesses and competitors, suppliers, partners, etc. is a separate topic, which can be addressed in the future studies.

Customer loyalty creation is a priority goal in the agenda of every company. Successful relationships lead to the generation of customer loyalty, which has extremely beneficial consequences for the company's overall success. Loyal customers encourage their friends, family and others to buy products from companies that they are loyal to; they are prepared to spend more money and effort to access and purchase that company's products; and they believe that it is important to continue a relationship with a particular company even after minor breakdowns in the communication occur because they are compensated by the durable relationship and their loyalty (Zena & Hadisumarto, 2012). Gronholdt and Martensen (2006) have described relationship development as a vital step in loyalty creation and support the fact that it leads to repurchase intention, tolerance to higher prices, willingness to distribute positive feedback about the company or brand, and also increases the possibility of cross purchasing.

Relationship development is highly dependent on the size and objectives of a company so the level of closeness between customer and company can vary. However, the NPD process is very similar to the stages of relationship development, from initiation to integration (Ford, 1980). All relationships development processes leading to successful outcomes must meet same conditions as NPD success: the product should be customized as practically as possible; the demographic and psychographic portraits of the customer must be considered; the products supplied should be based on careful analysis of past transactions between customer and the company to avoid repetitive "faulty" propositions; marketing communication should be consistent; and the channels of interaction and their integration

must be thoroughly applied to avoid the customer being exposed to different offers delivered via different channels from the same company (Filip & Voinea, 2012).

The most commonly used framework for relationship development process is the Five-General-Steps Process and was developed almost three decades ago by Dwyer, Schurr and Oh (1987). Many recent studies in this area of research use this framework to describe and evaluate relationship development. For example, Ming-Huei and Wen-Chiung (2011) have studied research development between key account portfolios and organisations making reference to the Five-General-Steps framework. Similar to the topic of this thesis, their research is also business-to-business oriented (Ming-Huei & Wen-Chiung, 2011). The five steps in this framework are: 1) awareness; 2) exploration; 3) expansion; 4) commitment; and 5) dissolution (Dwyer, Schurr, & Oh, 1987).

As an early stage of relationship development, awareness involves advertisements and brand images to influence customers' decisions and attract their attention. Exploration is the second step in the process that leads to early relationship creation. Exploration is characterised as an unstable and weak step (Dwyer et al., 1987). Its key role is to initiate buyer-seller exchange through trial purchase. Expansion is often viewed as the most important in developing successful relationship. During this stage, the customer and the company increase the amount of communication and interactions. This increased communication and interaction is very beneficial for both parties but at the same time, it increases the risk of relationship breakdown due to poor interaction (Donaldson & O'Toole, 2007). The next step or phase in this framework is commitment, when sellers select advanced buyers to ensure higher customer satisfaction, and commitment is created around consistency and the durability of the relationship. The last step of relationship development is dissolution of the relationship. This is not a compulsory step and often does not occur.

Dissolution occurs only when there is a possibility of disagreement or dissatisfaction between company and customer (Dwyer et al., 1987).

#### **2.4.2. Buyer – Seller Relationship**

It is obvious how important the buyer - seller relationship is to the success of new product development. A skillfully managed customer relationship provides competitive advantage and rewards the company with customer loyalty. The benefits of this relationship are enormous and if it is utilized correctly during NPD projects, success is guaranteed. However, careful and knowledgeable customer NPD involvement is required with customers who have strong relationships with the company (Knudsen & Mortensen, 2011).

The creation of strong and long-lasting relationships between buyer and seller is extremely important in a B-2-B scenario, as the interaction between the two parties is very direct and occurs often. As noted previously, close interaction leads to successful relationships, loyalty and beneficial commitments (Y. Zhang, 2009). In the competitive market environment, companies cannot survive without support from good relationships with their customers, as commitment and trust are essential components of strategic operation and a profitable operation. Without certain commitments, companies cannot plan ahead and therefore cannot deliver quality service (Stump et al., 2002).

The problem with the existing literature on business relationships is that studies are mainly conducted either from supplier perspective or the buyer perspective, and only a small portion of the literature presents business relationships from the perspectives of both parties (Geiger et al., 2012). In order to see the complete picture of value created from the

relationship of both parties: it is important to view it from different perspectives because the focal points of the relationship between customer and supplier are not located in the middle, but are skewed more towards the supplier's value chain. The study conducted by Geiger et al. (2012) is a good example of research where the business relationship is examined from the perspective of both sides. In this study, the authors have clearly and simply explained the buyer – seller relationship with emphasis on value creation: the supplier delivers goods/services within the specific relationship, receives payment and makes profit, and without this relationship, none of this would occur (Geiger et al., 2012).

In the NPD situation, efficient and strong buyer – seller relationships direct the knowledge and capabilities of both parties towards collaborative relationships with a mutual goal: a successful new product (Baxter, 2007b).

## **2.5. Intangible Relationship Value**

The concept of intangible relationship value (IRV) has been put forth and discussed only relatively recently by Baxter and Matear in 2004 with their business-to-business study of managers in New Zealand manufacturing and distribution companies. Since then, intangible relationship value has been heavily researched by many academics and postgraduate students in cooperation with Baxter and also independently (Alqahtani, 2013; Baxter & Matear, 2004; Baxter & Zhang, 2006; Y. Zhang, 2009). Considering that a significant part of this thesis research is also dedicated to the concept of intangible relationship, sharing in the topic with the studies mentioned above, a short overview of these studies will be presented further in this paper.

Baxter and Matear (2004) have argued for the importance of intangible relationship value. They warn that marketing managers should not ignore this type of value and that they should understand related dimensions in order to be able to effectively share their firm's resources for mutual benefit. The uniqueness of this approach rests in the evaluation of the value to the seller, rather than to the buyer, as the vast majority of relationship marketing studies are built from a value-to-the-customer point of view (Baxter, 2012). Intangible resources are comprised of four categories: human, relational, organizational and informational (Morgan & Hunt, 1999). Baxter and Matear (2004) have consolidated those categories into two relationship value types: human and structural.

### *Human Value*

The concept of human intangible value is comprised of three characteristics: competence, attitude and intellectual agility. Competence utilizes knowledge, talents and skills and is vital for a stable relationship. Attitude is normally determined by the customers' personality and is displayed by behaviours and how various situations are handled (Roos, Roos, Dragonetti, & Edvinsson, 1997). Intellectual agility is a combination of competence and the ability to apply it through the learning process. This might sound unimportant, but many competent people often cannot implement their competence and adapt to certain situations (Hamel, 2006). An example of an intellectual agility combination is innovation and market adaptation capabilities (Baxter & Matear, 2004).

Companies can utilize customers' human relationship value most optimally during the new product development stage by involving customers who have the best positive combination of all three of these qualities (Baxter, 2007b).

### *Structural Value*

Baxter and Matear (2004) have subdivided the structural component of intangible relationship value into: relationships, organization, and capacity for renewal and development. The relationships dimension does not necessarily mean the interaction between buyer and seller, but instead, the access to customer's relationships (suppliers, customers and consultants in a B-2-B context) which a company receives from dealing with a specific customer (Alqahtani, 2013). The organizational dimension represents the attributes and possessions that belong to the customer and can be of benefit to the seller. This may include tangible and intangible assets, like databases, intellectual property, process manuals, or legal documentation (Baxter, 2007b). The customer's ability for renewal and development also adds to the relationship value and has a positive influence on new product success. This includes the customer's systems/items "that have been built or created and that will have an impact on future value, but have not manifested their impact yet" (Roos et al., 1997). Examples of this are machinery, plants and training courses at the planning stages (Baxter & Matear, 2004).

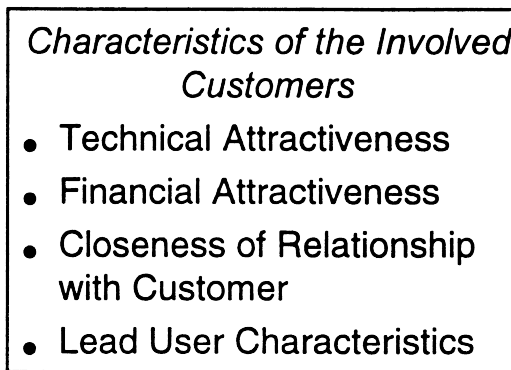
## **2.6. Customers' Characteristics**

An important part of this study's conceptual framework is the characteristics of customers involved in NPD and their influence on new product success. As was mentioned earlier, one of the purposes of this research is to identify important characteristics of the customers that can influence NPD success. However, characteristics of other parties like partners, suppliers, etc. that might also be involved in NPD are not covered by this research.

There is a significant amount of literature that supports the fact that customers play an important role in the new product development and its success. However, very few studies have researched the characteristics of those customers and literature related to this topic is far from being exhaustive. A number of studies recognize the importance of only major customer characteristics or even customer groups. The most widely discussed is the lead user characteristic, which has gained its importance and attention from the academics since Von Hippel researched it almost four decades ago (Von Hippel, 1976). Since then, the importance of lead users in the innovation processes has been heavily researched and supported (Schoorman, Baccarne, & Mechant, 2013).

The study conducted by Gruner and Homburg in 2000 is an example of research wherein other important customer characteristics have been also thoroughly discussed. Gruner and Homburg (2000) have defined four different characteristics and collected empirical data supporting significance of their relevance. The ability to identify certain characteristics of the customers involved in NPD allows the selection of more cooperative partners for the company (Gruner & Homburg, 2000). This research has supported the fact that involving customers in both early and late stages of new product development gives a higher success rate. Figure 3 represents part of the conceptual framework developed by Gruner and Homburg (2000), wherein the four main characteristics of the involved customers are: technical attractiveness, financial attractiveness, closeness of relationship with customer, and lead user characteristics.





**Fig. 3 – Characteristics of the Involved Customers (Gruner & Homburg, 2000)**

#### *Technical Attractiveness*

Two main features of the technical attractiveness characteristic are: the customers' ability to innovate and their "know-how". Lüthje (2004) has conducted research in the outdoor industry in which he has observed how customers' innovativeness influences new product success. He has concluded that this customer characteristic can be an "important source of new product ideas" and so has a positive effect on NPD success (Lüthje, 2004). According to Gruner and Homburg (2000) however, technologically attractive customers do not have a great influence on the success rate of NPD projects. Their explanation of the negative impact of technical attractiveness on new product success is the difference in the needs of customers with these characteristics compared to other customers. Therefore, they recommend avoiding involving technologically-interesting customers in NPD projects as they can mislead companies during NPD (Luteberget, 2005). Firms do tend to involve technically-attractive customers, however, when they need assistance solving technical problems during new product development projects (Gruner & Homburg, 2000).

It is obvious that controversies regarding the performance of technically attractive customers still persist. Therefore, further investigation is required to either support or contradict the positive influence of this customer characteristic on new product success and this will be further elaborated upon in the discussion section of this study.

### *Financial Attractiveness*

One of the most valuable partner types for companies undertaking NPD projects are financially attractive customers. Financial attractiveness is a characteristic that shows how reputable the customer is within a specific market and whether they can be treated as a good representative of the target market (Ganesan, 1994). The financial attractiveness of the customer often serves as a determinant of the actions and attitudes of the company to the buyer, therefore, the buyer's perspective of the relationship is ignored when this characteristic is prioritised during the search for a NPD partner (Baxter, 2012).

Similar to Ganesan's approach (1994), Gruner and Homburg (2000) have subdivided customer financial attractiveness in two categories: the representativeness of target market segment and the customer's reputation in the market. However, more recent research conducted by Baxter in 2012 presents slightly different factors determining financial attractiveness: the sales revenue customers provide to the company, the potential profitability of the relationship between company and a buyer, and the ROI (return-on-investment) (Baxter, 2012). These factors are commonly used by many companies to evaluate any activity they undertake (including the new product development activities), which can be financially measured.

### *Closeness of the Relationship with the Customer*

The existing literature in relationship marketing emphasizes the importance of information exchange and cooperation between businesses and customers (Gruner & Homburg, 2000). The value of this relationship is even more significant during new product development, and directly depends on the closeness of this relationship. It is obvious that a stronger relationship has more benefits for companies. During business activities like NPD, which require customer involvement, customers that have a close relationship with the company will be approached first, due to a higher level of trust and less associated risk for the company (Jespersen, 2012). However, one of the propositions justified in research conducted by Von Hippel (1986) suggests that the benefit of intensive interaction between customers and the company depends on the process stage they have been involved in and can often carry risks and negative results for the company. Therefore, it is vital to moderate this type of relationship and carefully choose when and how to involve customers in business activities (Von Hippel, 1986).

Gruner and Homburg (2000) have evaluated the closeness of relationships by measuring the frequency of interaction with customers outside of new product development, and measuring the overall duration of the relationship between company and customers. Their research has supported the fact that close customers have positive influence on new product success, as companies more easily can share private information with them, which significantly improves the effectiveness of information exchange and cooperation (Gruner & Homburg, 2000).

### *Lead User Characteristics*

The lead user characteristic is defined as being “ahead of the market” in the existing literature (Marchi, Giachetti, & De Gennaro, 2011). The importance of lead users has been widely discussed and empirically supported in multiple research projects. Lead users or early adopters are modern and innovative customers who are often prepared to take on a new product and benefit from it earlier than the general market will. At the same time, by doing so, they create awareness and trust around this product, which encourages late adopters to accept the product as well. Every successful new product development project has lead users involved in various stages, as it is vital for future product success to satisfy the needs of this customer category (Lindgren & O'Connor, 2011).

Von Hippel (1976) argued the active role of lead users when he discovered the Customer Active Paradigm (CAP). In CAP, customers start innovating and taking an active position in NPD. This paradigm is in opposition to the traditional and stagnant, solely manufacture-active paradigm (MAP), wherein manufacturers do all problem solving themselves. In more recent research, Schuurman, Mahr, & De Marez (2011) have paid much more attention to the importance of the lead user characteristic and have eliminated the illusion of simple, single-dimension construct of this characteristic by dividing the concept of a “lead user” into six user types based on five dimensions: 1) new needs; 2) dissatisfaction; 3) use experience; 4) product-related knowledge; and 5) “user innovators” (Schuurman, Mahr, & De Marez, 2011).

## **2.7. Research Questions**

In the introductory chapter of this paper, it was stated that the main purpose of this study is to increase knowledge around the concept of relationship between customer characteristics (Gruner & Homburg, 2000), intangible relationship value (Baxter & Matear, 2004) and new product development success (Baxter, 2007b). A review of these independent constructs and their relationships has indicated that they are highly relevant for New Zealand market. Therefore, the need to research those factors in this particular context arises and will be met by researching it on the example of New Zealand manufacturing industry.

The two key research questions are:

1. To what extent does the customer characteristics impact on new product success in business-to-business situations in New Zealand manufacturing industry?

This research question is based on the findings of the study conducted by Gruner and Homburg (2000) on one of the European markets. As noted previously, those customer characteristics are: technical attractiveness, financial attractiveness, closeness of relationship with customer, and lead user characteristics. The aim of this research question is to test how these findings fit within the New Zealand manufacturing industries.

2. How do the factors related to intangible relationship value influence new product success in business-to-business situations in New Zealand manufacturing industry?

The answers to these two main questions will also provide information on which factors of new product development success (market success, financial success, speed-to-market, technical success, strategic advantage gains, social and ecological sensitivity) (Baxter,

2007b) are the most relevant to the New Zealand manufacturing industry. Considering the two main research questions, a third arises:

3. What is the relevant importance of both customer characteristics and intangible relationship value in new product development success?

These three research questions will be answered by a survey of these characteristics and how these affect NPD success.

## **2.8. Chapter Conclusion**

In the above chapter, a detailed literature review on the topic of this research paper *“Relationship Value and New Product Development Success”* has been presented. An analysis of existing literature has covered and summarised the knowledge and the most recent trends around the main constructs of this paper’s conceptual framework. The literature analysis enables a better understanding of the aim of this study: to shed light on the influence of involved buyer’s characteristics and their intangible relationship value to the seller on the seller’s new product development success.

New product development and its success is a heavily researched segment of marketing and innovation sectors. However, there is plenty of space for further investigation of NPD success in various markets and its relationship with other constructs.

Minor gaps in the literature create the possibility to research relationships between three main constructs in the new environment and test if the findings are applicable in various markets. As previously mentioned, customer characteristics in the NPD context have not

been heavily researched either. In addition, considering the fact that findings by Gruner and Homburg (2000) suggest that impact of customer characteristics on new product success are only satisfactory but not very strong, and that some of them (i.e. technical attractiveness) can have negative impact on NPD success, testing of these customer characteristics in conjunction with different measure of NPD success, as developed by Baxter and Matear (2004), is desirable. A customer has been identified as an extremely important factor for NPD success (Lagrosen, 2005), therefore, low level of attention paid to their characteristics in the NPD context is academically inappropriate.

The literature review conducted for the purpose of this research has allowed emphasis of the most relevant studies and authors in the topic related to this research. A review of separate segments of conceptual frameworks from leading studies in new product development success, intangible relationship value, and customer characteristics in the business-to-business scenario, has initiated the development of a new conceptual model that led to research of all these three main constructs.

To answer the research questions stated above and meet the aim of this research, the next chapter will include a detailed discussion of the methodology. This will consist of a justification of the selected methodology approach, information on sample selection and data collection means, justification of data sources, discussion of preliminary data, and the justification of the reliability and validity of measure items. The chapter will conclude with a disclosure of limitations and suggestions for improvements of the selected approach.

## **Chapter 3. Methodology**

### **3.1. Introduction**

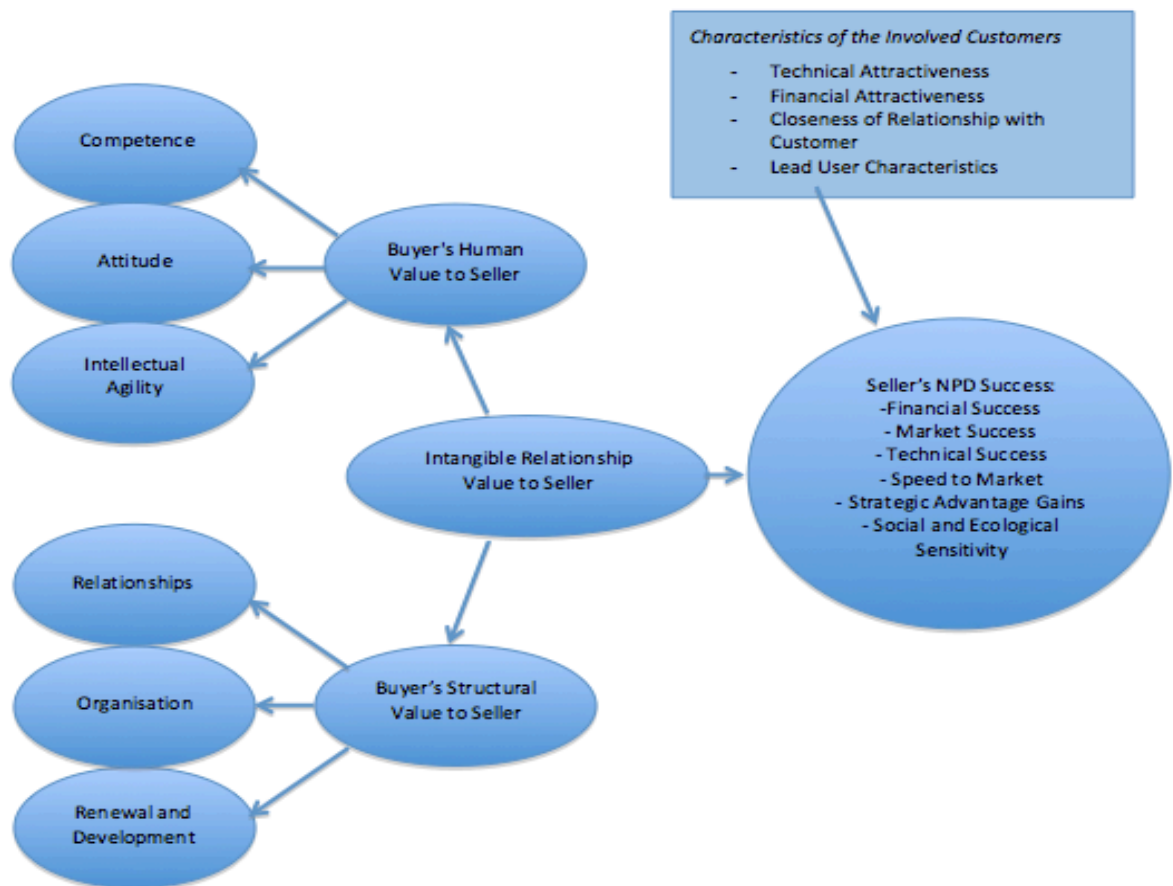
In the previous chapter, the literature review was presented. One of the purposes of this was to explain the conceptual framework. The conceptual framework illustrated below (see Fig. 4) is comprised of three separate constructs developed and separately tested in previous studies. The concept of intangible relationship value (IRV) was developed by Baxter and Matear (2004) and the new product development success scale was presented by Baxter (2007b). As an extension to the framework presented by Baxter (2007b), the customers' characteristics construct was empirically tested by Gruner and Homburg (2000), with the addition of the NPD success context. Based on the above literature review, a detailed research methodology for explaining the relationship between the three parts of this thesis' conceptual framework will be presented. The selected methodological approach will be justified, followed by description of the sample selection and data collection and analysis tools.

Further, the various data sources that have been used in this research will be presented. This is followed by preliminary field research. The instruments for data analysis are also briefly discussed in this chapter. As an important part of the research methodology, the reliability and validity of separate constructs of the conceptual model will be addressed further. This chapter will conclude with a section addressing the limitations of the methodology and suggestions for future research methodology.

The methodology for this research aims to answer these three main research questions:



1. To what extent does the customer characteristics impact on new product success in business-to-business situations in New Zealand manufacturing industry?
2. How do the factors related to intangible relationship value influence new product success in business-to-business situations in New Zealand manufacturing industry?
3. What is the relevant importance of both customer characteristics and intangible relationship value in new product development success?



**Fig. 4 – Conceptual Model – The Relationship between Intangible Value, Customers' Characteristics and NPD Success**

Baxter and Matear (2004) represented the intangible relationship value construct with two higher-order dimensions, and each of these dimensions had three (first-order) dimensions. In their study, they examined the relationship between all higher-order and first-order intangible relationship value (IRV) dimensions. However, in this research, the IRV side of the conceptual model will only be discussed from the perspective of the six first-order dimensions, following Churchill's (1979) suggestion that if first-order dimensions are reliable, higher-order dimensions' reliability will also be secured.

### **3.2. Methodology Justification**

This researcher's world views, actual beliefs and reliance on statistical data when explaining phenomena (Froelicher & Shishani, 2009), predetermines the selection of a quantitative approach, which has been implemented for answering the proposed research questions. Quantitative research is characterized by the positivist/postpositivist paradigm and involves collecting data and converting it into numerical format for statistical analysis (Bryman & Bell, 2011). This allows conclusions to be drawn about the relationships of variables in the proposed framework to answer the research questions.

There are many advantages of implementing a quantitative research approach over a qualitative one. First of all, numbers hold more power than words in terms of measuring the relationship between separate constructs of the conceptual model. Secondly, the quantitative approach enables a way to answer the formulated research questions without using respondents perspectives as the point of research orientation, which is different with

qualitative studies (Bryman & Bell, 2011). Thirdly, the quantitative research approach allows the implementation of highly structured data collection tools, like surveys. These create an opportunity to collect information from a bigger sample and generalize the findings to the relevant population, rather than trying to understand individual behavior (Bryman & Bell, 2011).

Primary empirical data will be collected to answer the above research questions. Being a quantitative study, and in an attempt “to increase predictive understanding of phenomena” (Myers, 2010), the survey data collection method will be implemented. The study will be conducted in New Zealand. The manufacturing industry in New Zealand has a sufficient number of companies and is a good example of an industry implementing new product development processes. So, it was decided to conduct this research using a sample pool drawn from the Kompas database, which supplied the sample frame.

The quantitative approach was selected as the most appropriate for testing this conceptual model (see Fig. 4). Quantitative research involves explaining phenomena by collecting numerical data that is analysed using mathematically-based methods (Gunderson & Aliaga, 2005). Therefore, to explain how intangible relationship value and customers’ characteristics influence new product development success, a survey data collection method will be implemented and questionnaires will be distributed to representatives of the sample. The large amount of data collected from this exercise will be quantitatively analysed using the SPSS software. A more detailed description of the analysis procedures and results will be presented in the next chapter of this paper.

The data for this research will be collected from the sample specifically selected from the sampling frame of all New Zealand businesses involved in the manufacturing industry.

Kompass database will be used to obtain names and email addresses of the companies which meets the requirements of the sample selection and can be used for the research (Kompass, 2012). The Kompass database offers a convenient option for advanced search, designed to create a set of parameters to improve search results. The relevance of this database is the fact that it stores the most up-to-date list of companies worldwide with contact details available for most businesses. The main parameters that will be used to search companies for this research are the geographical location, company information and activity. 1,000 companies involved in manufacturing and identified in the Kompass database by “producer” category will be selected. In the next section, the sample selection and data collection tools will be described.

### **3.3. The Sample and Data Collection**

Applying the survey data collection method requires a relatively large sample in order to answer the research questions accurately. Therefore, in selecting the most suitable segment of the population (researched audience) (Bryman & Bell, 2011), the random sample selection approach will be implemented to draw a preliminary sample of 1,000 companies. The estimated response rate is about 20%. The assumption of response rate is based on information from previous studies that have recruited similar type of participants. Baxter and Matear (2004) distributed their survey to employees of manufacturing firms in New Zealand.

To achieve above response rate, random sampling procedures will be adjusted for an online survey. Research conducted by Cobanoglu, Ward and Moreo (2001) has shown that online administration of surveys is almost two times more effective than postal administration

(26% versus 44%). Therefore, an online survey is selected as a main data collection tool. Correct identification of the person within the organisation responsible for new product development will also contribute to achieving a satisfactory number of responses. The questionnaire will be located at an online survey domain, called SurveyMonkey (SurveyMonkey, 2012). Invitation emails will contain a cover letter introducing the research team and briefly explaining the purpose of the research, a link to the questionnaire and an attachment with details titled “Participants Information Sheet” (see appendix). Consent forms will not be required, as participants will be notified about giving their consent when they follow the link to the online survey and begin answering the questions.

### **3.4. Questionnaire Structure**

The primary data will be collected using a survey data collection tool. The questionnaire is designed using measures from different studies earlier developed by: Gruner and Homburg (2000) (customers’ characteristics); Baxter and Matear (2004) (intangible relationship value); and Baxter (2007b) (new product development success). The questionnaire consists of a small introduction and five sections with questions (see appendix for a copy of questionnaire). To avoid collecting data that would be skewed if respondents were left to select customers themselves (most likely they would choose the biggest customer with a positive relationship), an approach will be taken similar to that used by Baxter and Matear (2004): they will be asked to choose a New Zealand based business-to-business customer that ranks *third* in terms of revenue and not a firm that is a supplier of goods or services to them. The pilot study conducted by Baxter and Matear (2004) indicated the possibility of skewed data as respondents tended to choose larger customers with a good relationship. If

respondents had not been asked to choose the third largest customer, collected data would not have had as much variance for effective analysis. This approach has been proven effective and has been used in other business-to-business oriented studies, like the one conducted by Anderson and Narus (1990).

The main part of the questionnaire consists of: six single-item measures of the buyer's human and structural value to seller; six items measuring each dimension of new product development success; and eight items measuring customer characteristics. Baxter and Matear's (2004) questionnaire has been taken as the basis for the current study's questionnaire. However, a major portion of it has been amended to accommodate scales for NPD success construct and scales for the extension to this study – customer's characteristics construct.

In the beginning, several questions intended to collect general demographic information about respondents' customers, like industry type, duration of their relationship and number of employees, will be asked. Followed by three sections related to different parts of the conceptual model presented above (see Fig. 4). All questions in these sections use seven-point Likert-type scales with anchor points *strongly agree*, *strongly disagree*, or *very much so* and *not at all*.

In the first section, questions about intangible relationship value of the customer to their firm construct will be asked, consisting of human intangible value and structural intangible value (Baxter & Matear, 2004). The scales for measuring human intangible value were earlier tested by Baxter and Matear (2004), and originated from the works of Roos et al. (1997) (*competence* and *attitude*) and Prahalad and Hamel (1990) (*intellectual agility*.) The

structural intangible value scales were derived from the works of Morgan and Hunt (1999) (*relationships*) and Roos et al., (1997) (*organisation* and *renewal and development*).

The next section involves the characteristics of customers involved in NPD. To collect substantial information on this construct, measures developed by Gruner and Homburg (2000) are used: customer's innovativeness and knowledge – technical attractiveness; representativeness of target market segment and reputation – financial attractiveness; frequency of interaction outside of the NPD projects and longevity of business relationship – closeness of relationship with a customer; benefit of the solutions offered by new product development and initiation of new product development by the customer – lead user characteristics, which derived from von Hippel's definition for the lead user concept (1986). All other measurements, except the lead user, were identified in the pilot interviews conducted by Gruner and Homburg (2000).

Finally, the participants will be asked about the new product development success. The measures and the scales developed by Baxter (2007b) are used to create questions for this section related to: financial success, market success, technical success, speed-to-market, strategic advantage gains, and social and ecological sensitivity. The questionnaire will be concluded with several questions intended to capture general information about the respondents firm for comparative purposes, in order to assess the cross-section of responding companies and provide data on their demographics. The questionnaire ends with a thank you statement acknowledging the respondents' effort and input for the research.

Personalized emails will be sent to each of the sample representatives inviting to participate in the research in an effort to establish a positive relationship and improve response rates (Gunasekaran, 1998).

Overall, the questionnaire is made fairly short and easy to follow, designed to minimize the time participants will spend on it. Once the questionnaire is completed; it becomes anonymous. In order to attract participants it will be made obvious that research outcomes are targeted to benefit them and their businesses by increasing knowledge of NPD and customer relations.

The Participant's Information Sheet will advise representatives that participation is completely voluntary and anonymous. It will also inform them that they will be given three weeks to complete the questionnaire, with two reminders near the end of the advised time frame for questionnaire completion and past the recommended date for participating in the research. The participants will be informed that consent to take part in the survey is indicated by survey completion, and they will be offered access to the research results summary in acknowledgement of their contribution to this research.

To ensure satisfactory level of the questionnaire adequacy, pre-tests comprising interviews with several managers involved in NPD, and a pilot survey with respondents meeting the same criteria as the sample representatives, will be conducted. To achieve adequate levels of variance in the data, respondents will be asked to pick their third largest customer when filling in the survey, to eliminate the possibility of only customers with "positive relationships" being selected. Survey pre-tests will ensure that respondents clearly understand questions and eliminate potential confusion for the larger audience.



### **3.5. Revised Conceptual Model**

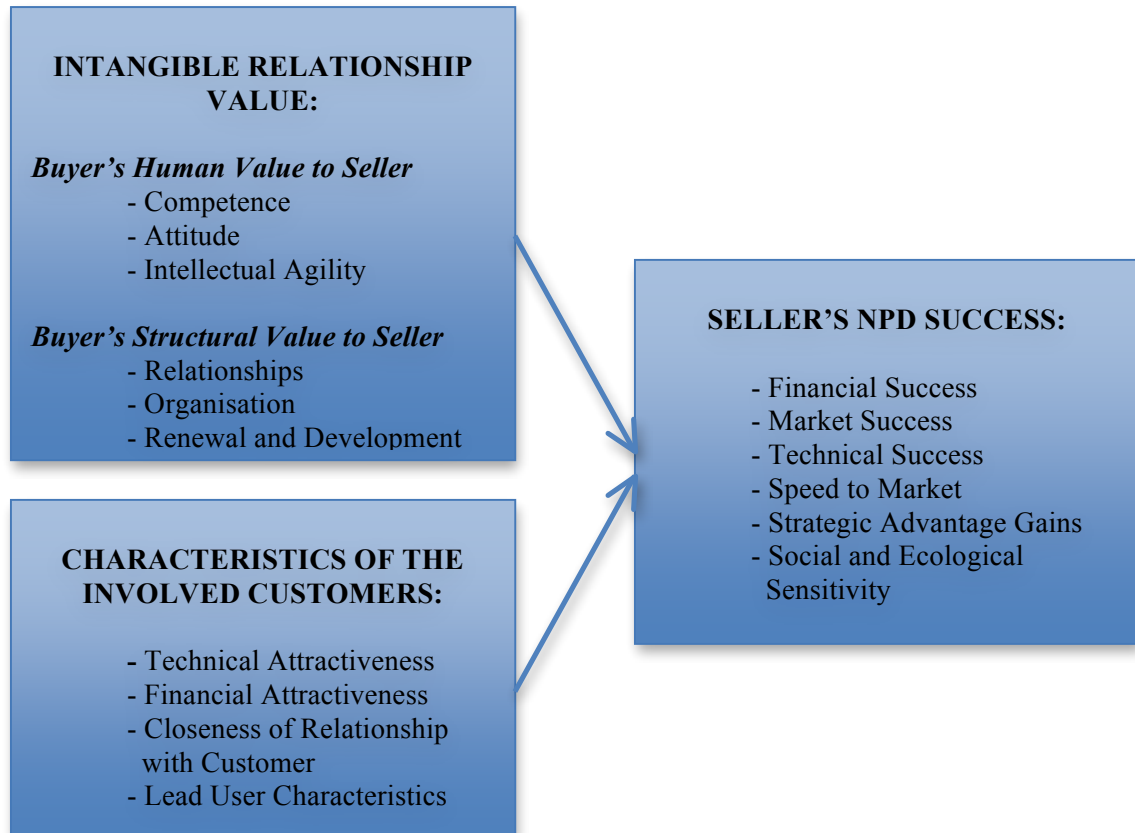
The Baxter and Matear (2004) study concentrated mainly on assessing the validity of the intangible relationship value model and its scales. Therefore, the structure of their conceptual model contains both first-order and higher-order dimensions, which break the IRV construct into human value and structural value constructs and then further into six dimensions. The primary purpose of this research is to assess how IRV influences NPD success, therefore, the conceptual model was simplified to reflect direct relationship between the six first-order dimensions of IRV and NPD success, and higher-order dimensions were dropped out. As noted previously, an extension to Baxter and Matear's (2004) study, customers characteristics construct developed by Gruner and Homburg (2000) has remained in the revised conceptual model. This makes the new model look similar to the one presented in their study.

The revised conceptual model is presented in Figure 5. It is slightly different than the original model presented earlier in Figure 4. This difference can be explained by the different research methodology approach taken by the dominating studies that have encouraged this research.

The original conceptual model represents a combination of the studies conducted by Baxter and Matear (2004) and Baxter (2007b) with the extension taken from Gruner and Homburg's study (2000) and is constructed to represent a hierarchical relationship between different constructs and their elements. This approach was taken by Baxter and Matear (2004) as they were trying to confirm a clearly specified model of the relationship value and find support for the hypothesized scales as measures of the IRV, which has been done using SEM software (AMOS). However, the main purpose of this study is to identify how

intangible relationship value and customers' characteristics influence NPD success.

Therefore, a revised conceptual model better suits the purpose of this research and better fit with the selected methodology approach.



**Fig. 5 – First-Order Model – The Relationship between Intangible Value, Customers' Characteristics and NPD Success**

### 3.6. Data Analysis

The revised conceptual model described in Figure 5 represents the relationship between intangible relationship value, customers' characteristics and NPD success. As mentioned

previously, the approach of this research does not require confirmation of the specified model, as Baxter's and Matear's (2004) did. Following the suggestion of Gruner and Homburg (2000), an exploratory factor analysis approach will be implemented. Because multiple-indicator measures are used in this research, it was decided to supplement the exploratory factor analysis with cluster analysis and discriminant analysis to form distinct groups for analysis (Bryman & Bell, 2011), similar to what Gruner and Homburg (2000) did.

As the relationship of some segments of the specified model has already been confirmed, it was decided to take the exploratory factor analysis approach to determine the underlying constructs in a set of measured variables (Suhr, 2006). Discriminant analysis will be implemented to assess the impact of the intensity of customers characteristics and intangible relationship value on new product development success (Gruner & Homburg, 2000).

The data collected from the survey will be coded and keyed into SPSS data processing software for further analysis. The nature of the research, quality and amount of data collected from the survey should meet the requirements for using this type of data analysis.

The exploratory factor analysis helps to reduce a large number of variables to a smaller number to deal with, by grouping similar variables together (Bryman & Bell, 2011). The EFAs will be implemented on new product development success, customer characteristics, human value and the structural value constructs. The purpose of cluster analysis is comparable to factor analysis, with aims towards assessing structure, however, the advantage of cluster analysis rests in grouping objectives, when factor analysis groups

variables (Hair, Black, Babin, & Anderson, 2010). Therefore, the use of cluster analysis in this research will enable the identification of distinct groups of respondents.

Discriminant analysis enables the researcher to predict and explain the relationship between the different constructs. Discriminant analysis also helps to identify which of the variables accounts for most of the differences in multiple groups, which is extremely important when cluster analysis is being implemented and identifies two or more groups (Hair et al., 2010). The discriminant analysis technique allows the testing of equality of group means for a set of variables in the case when there are two or more groups. After the cluster analysis will be implemented and the number of distinctive groups is identified, discriminant analysis will enable the researcher to investigate discriminant validities of the measurements related to the IRV construct.

In the next chapter, results of the data analysis will be revealed and explained. The findings justified by the data analysis will show how intangible relationship value and involved customers' characteristics influence new product development success.

### **3.7. Limitations and Suggestions for the Methodology**

There are few practical limitations of the research methodology used for this research. First of all, in most cases there will be only one respondent per company, which may provide a view of the situation from the perspective of single actors within a large organisation. Also, the questionnaires will often be addressed to the managers of the companies (due to the type of information provided by Kompass database), but sometimes there may be other people who have a better knowledge of the new product development processes within their

companies. However, overall limitations of the methodology are minimal and offer a good possibility for reliable research with strong and valid findings and answers to research questions.

### **3.8. Chapter Conclusion**

In this chapter, the research methodology was presented. The conceptual model - relationship between intangible value, customers' characteristics and NPD success - illustrated in Fig.5, now shows how different segments of the earlier reviewed literature fit into one framework. Using a quantitative methodology approach allows the research questions that have been presented in the beginning of the chapter to be answered and supported by analysis of the data and findings interpretation. Justification of the methodology, and validity and reliability measurements has created a good foundation for the presentation of the findings in the next chapter. The limitations of the methodology were also addressed.

The online survey data collection method was approved by the AUT Ethics Committee (see appendix for the copy of approval letter). Considering that this study takes a quantitative research path, similar to other papers earlier mentioned in the literature review like Gruner and Homburg (2000) and Baxter and Matear (2004), the data collected by this method will be analysed in the same manner as previous research in this area, simplifying the comparison of the findings.

Baxter (2007b) has presented an earlier developed IRV construct (Baxter & Matear, 2004) in conjunction with NPD success construct in his paper – *Intangible Resource Flow as an*

*Antecedent of New Product Development Success in Buyer-Seller Relationships.* This study replicates the research proposed by Baxter (2007b) with the extension from conceptual model developed by Gruner and Homburg (2000) – *characteristics of the involved customers*, which has also been tested in the context of new product development success. The main purpose of this paper is to create the knowledge in the area of new product development and relationship value, and the presented methodology has been designed to achieve this goal.

## **Chapter 4. Findings**

### **4.1. Introduction**

In this chapter, the data collected for this research will be analysed to answer the research questions formulated earlier in this thesis. This study intends to research the relationship between the new product development, intangible relationship value and customers' characteristics constructs. The findings presented in this chapter will also be compared to the relevant findings of those studies earlier, analysed and discussed in the literature review chapter.

The main purpose of this chapter is to present the data analysis and findings generated from it, and explain how the intangible relationship value items developed by Baxter and Matear (2004) and customers characteristics (Gruner & Homburg, 2000) influence new product development success construct (Baxter, 2007b). The literature review has indicated that these constructs have been separately researched in the past. However, one of the main purposes of this thesis is to present these important concepts in an aggregate form, which allows an analysis of the relationship between these constructs and determines the ultimate combination of intangible relationship value and characteristics for the successful NPD project.

This research is designed to investigate the relationships between the three main constructs, and a quantitative methodology has been justified as more appropriate than qualitative methodology, because the variables involved in the relationship outlined by proposed conceptual model have been previously identified and measured in the past research (Perry, 1998).

The analysis of the data has been achieved via several techniques: cluster analysis to group objects and identify distinct clusters, descriptive analysis to summarise the data, exploratory factor analysis to determine underlying constructs in a set of measured variables (Hair et al., 2010), and discriminant analysis to assess the impact of the intensity of customers characteristics and intangible relationship value on new product development success.

In this chapter, the implementation of these data analysis techniques will be discussed and findings delivered from this analysis will be presented. First of all, a profile of respondents, including the response rate, will be presented. Then, a preliminary analysis will be presented discussing the outcomes and trends of the demographic descriptive statistics. This will be followed by the presentation of descriptive statistics on scaled measuring items of the three main constructs of the conceptual model – NPD success, intangible relationship value (IRV) and characteristics of the involved customers. The next section will discuss the measurement analysis, the findings derived from the exploratory factor analysis and also the reliability of the scales showing Cronbach's alpha coefficients of different measures. The description of the EFA analysis and reliability analysis will be followed by the cluster analysis of NPD success scale. Then, the testing of the model will be presented. Here the findings generated by the discriminant analysis will be discussed. And finally this chapter concludes with a section briefly summarising how the presented findings were generated, and creating a base for the following discussion chapter, where those trends will be explained in more detail, justifying the theoretical and managerial implications of the findings and most importantly, answering the proposed research questions.



## **4.2. Profile of Respondents**

In this section, the profile of respondents is discussed starting with the response rate analysis. The sample pool of 1,000 companies was selected from the Kompas business-to-business database, which provided 1064 email addresses. The questionnaire was emailed to 1,064 email addresses on the 2<sup>nd</sup> of June 2013, addressed to either the companies' representatives in senior managerial positions or to a particular person when their contact details were available. Emails with links to the questionnaires and information sheets were originally sent to those email addresses. Fifty emails were returned as undeliverable. In the end of the questionnaire distribution cycle and after two reminders to complete the survey, the number of responses was 111. 9 of these were only partially completed and so were excluded from the research. The final number of usable responses was 102, which resulted in a response rate of about 10%. One of the requirements for the selection of research participants was the involvement in NPD processes in their companies. Therefore, despite the fact that respondents were mainly people in the companies in higher managerial positions (over 40% of respondents were either general managers, CEOs or directors of the companies they were representing in this research), the final response rate is lower than in the past research that recruited similar categories of respondents (Baxter & Mear, 2004). However, as contemporary managers are extremely busy and tend to ignore invitations to participate in academic research (Smits & Kok, 2011), overall attendance can be classified as satisfactory and the final number of responses has provided enough data for implementing analysis techniques chosen for this research (Hair et al., 2010).

The main parameters that were set when the sample pool was drawn were: geographical location (New Zealand), availability of company information and activity (manufacturing). When a randomly selected sample for this survey was selected from the Kompas database,

there was one category that could be used for manufacturing firm selection: the “producer” category. In the next section, demographic descriptive statistics will be presented, providing further descriptive information about the profile of the respondents.

### **4.3. Preliminary Analysis**

All incomplete and partially complete questionnaires were eliminated from the study prior to the beginning of data analysis, which resulted in the final number of useable responses being reduced from 111 to 102. The demographic descriptive statistics of those useable responses will be presented in this section.

The descriptive analysis was used to describe the main characteristics of the collected data. The main purpose of this analysis was to identify if there were any obvious trends in the descriptive statistics of the collected data. This analysis involves the comparison of mean scores and analysis of standard deviations, which is a measure of dispersion explaining the amount of variation around the mean (Bryman & Bell, 2011).

The descriptive analysis was implemented using collected general information about respondents’ companies and their customer’s companies for comparative purposes. This involved crosstabs, frequency distributions and T-tests. Table 2 represents a summary of mean scores, standard deviation, kurtosis and skewness of all seven general questions.

First of all, respondents were asked about duration of the relationship between their company and the customer that they described in their responses. The number of years varied from 1 to 30, with a mean score of 9.25 and s.d.=7.423. The analysis did not return

any significant results and did not show a strong relationship between NPD success and the duration of the relationship.

**Table 2. Demographics Descriptive Statistics**

	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Duration of the relationship between customer and company	102	0	9.25	7.423	1.113	0.506
Customer's Industry	102	0	8.21	4.087	-0.019	-0.703
Number of employees (customer's company)	102	0	1939.73	8459.404	7.147	57.570
Years worked in company	102	0	7.52	6.660	1.686	2.525
Respondent's position	102	0	2.77	2.014	0.938	-0.279
Number of employees (respondent's company)	102	0	876.60	7429.593	10.029	101.008
Respondent's industry	102	0	3.15	2.926	0.967	-0.738

Secondly, respondents had to specify the industry sector that their customer relates to. For the purpose of this research analysis, all descriptive answers were grouped and coded, resulting in 17 codes representing various industries from education to entertainment. Table 3 represents all 17 industry types and shows the number and percentage of the respondents' customers as related to each of them. However, the analysis of the responses related to this

question did not return any significant results either, possibly because of the fact that regardless of their customer's industry, all respondents represented companies related only to the manufacturing industry. The only noticeable trends of more frequently met respondents customers' industries were retail/distribution with 14 responses, manufacturing with 13, and transportation with 10 responses related to this industry. The smallest out of the 17 sectors were government, printing and entertainment industries, with only 2 responses related to each of these industry types.

**Table 3. Number of Respondents' Customers in Various Industries**

Industry type	Frequency	Percentage %	Cumulative Percentage %
1.Education	3	2.9	2.9
2.Transportation	10	9.8	12.7
3.Construction	7	6.9	19.6
4.Hospitality/Tourism	4	3.9	23.5
5.Cleaning	4	3.9	27.5
6.Packaging	5	4.9	32.4
7.IT	7	6.9	39.2
8.Finance	8	7.8	47.1
9.Manufacturing	13	12.7	59.8
10.Food	8	7.8	67.6
11.Retail/Distribution	14	13.7	81.4
12.Agriculture	7	6.9	88.2
13.Mining	3	2.9	91.2
14.Government	2	2.0	93.1
15.Printing	2	2.0	95.1
16.Health	3	2.9	98.0
17.Entertainment	2	2.0	100.0
Total	102	100.0	

A similar approach was taken for analysing respondents' positions within the companies that they were representing. The descriptive answers were also grouped and coded, which resulted in 7 categories being created: GM/Director/CEO, technical director/NPD, other managers, business development/project managers, customer service, consultants and sales managers. This broad variation of positions can be explained by the fact that New Zealand has a high percentage of small and medium businesses (Baxter & Matear, 2004) and often, people responsible for NPD have other duties and occupy various positions within their companies. Nevertheless, the Chi-Square test of this data has shown that the respondent's position is only marginally significant (chi-square=11.143, df=6, p=0.084) with over 40% of respondents (n=43) occupying the highest managerial positions (GM/Director/CEO), and with the smallest number of respondents in customer service and consulting positions (5 and 3 respectively) (see Table 4).

**Table 4. Respondents' Position within the Company**

	Frequency	Percent	Cumulative Percent
1. GM/Director/CEO	43	42.2	42.2
2. Technical director/NPD	10	9.8	52.0
3. Other managers	20	19.6	71.6
4. Business development/project managers	10	9.8	81.4
5. Customer service	5	4.9	86.3
6. Consultants	3	2.9	89.2
7. Sales managers	11	10.8	100.0
Total	102	100.0	

The independent samples T-Test analysis of the number of employees in customers' companies ( $t=-1.234$ ,  $df=100$ ,  $p=0.220$ ), and in respondents' companies ( $t=-0.762$ ,  $df=100$ ,  $p=0.448$ ) did not return significant results. The Chi-Square test of the number of years respondents worked in their companies varied from 1 to 30 (mean=7.52, s.d.=6.66), and did not result in any significant findings (chi-square=22.961,  $df=20$ ,  $p=0.291$ ).

In the next section, the findings derived from the descriptive analysis of the scaled items related to the three main constructs of the conceptual model will be presented, including the comparison of basic descriptive information with an attempt to identify any outstanding trends in the responses.

#### **4.4. Descriptive Statistics of the Scaled Items**

Descriptive analysis was used to describe the main characteristics of the scaled items used to measure the relationship between NPD success, IRV and customers' characteristics. In Table 5 the descriptive statistics of scaled items are presented, which, in addition to the mean scores and standard deviation, shows the skewness and kurtosis values. Competence, attitude and intellectual agility represent the buyer's human value to seller. Relationships, organisation and renewal and development items represent the buyer's structural value to seller. In the bottom of the table, eight measure items of "characteristics of the involved customers" construct are shown, which represent four dimensions: technical attractiveness - customers' innovativeness and customers' know-how; financial attractiveness – representativeness of target market and customer's reputation; closeness of relationship with customer – frequency of interaction and duration of relationship; lead user characteristics – customer benefits from NPD and customer requested NPD.

Among the measures of the buyer's human value to seller, the mean score for all three items are almost equal, with attitude showing a slightly higher mean score of 5.41 and s.d.=1.381, and competence indicated with the lowest mean score of 5.29 and s.d.=1.324. However, the intellectual agility measure had the highest amount of variation with s.d.=1.437 (mean=5.33).

The analysis of descriptive statistics of the buyer's structural value to seller returned slightly more significant results. Out of three measures, relationships item scored the highest mean of 5.08 (s.d.=1.460) and the renewal & development measure showed a mean score of 4.75 with the highest amount of variation – s.d.=1.590.

The descriptive analysis of the characteristics of the involved customer's construct was conducted on eight scaled items mentioned above. The business relationship measure indicated the highest mean score of 5.98 (s.d.=1.449) representing the characteristic of closeness of relationship with customer. Customers initiation of NPD – a measure representing lead user characteristic, scored the lowest mean of 4.84 with the highest amount of variation s.d.=1.954.

The new product development success - construct implemented in the conceptual model of this research, has been developed by Baxter (2007b) and consists of financial success, market success, technical success, speed-to-market, strategic advantage gains and social and ecological sensitivity. This six-dimension NPD success evaluation model enables the assessment of various business objectives settled for NPD projects by different businesses and explores which factors of Baxter's model are treated as the most important for new product development success in the New Zealand manufacturing industry.

**Table 5. Descriptive Statistics of Scaled Items for IRV and Customers' Characteristics**

		N		Mean	Std. Deviation	Skewness	Kurtosis
		Valid	Missing				
Buyer's human value to seller	Customer's competence	102	0	5.29	1.324	-1.108	1.078
	Customer's attitude	102	0	5.41	1.381	-1.376	1.627
	Customer's intellectual agility	102	0	5.33	1.437	-1.219	1.471
Buyer's structural value to seller	Customer's relationships	102	0	5.08	1.460	-0.586	-0.289
	Customer's organisation	102	0	4.80	1.456	-0.318	-0.855
	Renewal and Development	102	0	4.75	1.590	-0.565	-0.323
Technical attractive-ness	Customer's innovativeness	102	0	4.97	1.601	-0.837	0.288
	Customer's knowledge	102	0	5.37	1.289	-1.437	2.215
Financial attractive-ness	Customer's representativeness of the target market	102	0	5.49	1.340	-1.236	1.519
	Customer's reputation	102	0	5.72	1.415	-1.632	2.714
Closeness of the relationship with customer	Customer's interaction skills	102	0	5.43	1.532	-1.064	0.422
	Business relationship	102	0	5.98	1.449	-1.799	3.152
Lead User Character-istics	Customer benefits from NPD	102	0	5.38	1.449	-1.434	1.749
	Customer requests NPD	102	0	4.84	1.954	-0.856	-0.447



In Table 6 the descriptive statistics of scaled items for NPD success are presented. The results of the independent sample test on new product development success are also presented and indicate that the financial success ( $p<0.000$ ), market success ( $p<0.000$ ) and technical success ( $p=0.012$ ) scales developed by Baxter (2007b) are strong reliable measures of overall new product development success, and that strategic advantage ( $p=0.053$ ) is a less reliable measure. However, speed-to-market ( $p=0.221$ ) and social and ecological sensitivity ( $p=0.434$ ) components are not strong measures of NPD success.

**Table 6. Descriptive Statistics of Scaled Items for NPD Success**

	N		Mean	Std. Deviation	Skewness	Kurtosis
	Valid	Missing				
Financial Success	102	0	5.70	1.233	-1.013	0.909
Market Success	102	0	6.03	1.130	-1.445	2.150
Technical Success	102	0	5.38	1.126	-1.058	2.353
Speed-to-market	102	0	4.86	1.421	-0.639	0.087
Strategic Advantage Gains	102	0	4.98	1.227	-0.652	0.299
Social and Ecological Sensitivity	102	0	4.46	2.062	-0.379	-1.165

The descriptive statistics indicate that market success measure has the highest mean score of 6.03 with the lowest standard deviation of 1.130. This is followed by financial success (mean=5.70, s.d.=1.233) and technical success (mean=5.38, s.d.=1.126). Speed-to-market and strategic advantage gains measures scored lower average means of 4.86 (s.d.=1.421) and 4.98 (s.d.=1.227) respectively, with the lowest results indicated by social and ecological sensitivity – mean=4.46, and the average amount of variation around the mean - s.d.=2.062.

#### **4.5. Measurement Analysis**

In this section, the results of exploratory factor analysis are presented. This includes the results of EFAs on intangible relationship value, characteristics of the involved customers and new product development success constructs. This section concludes with the results of reliability analysis presented by Cronbach's alpha coefficients for the dimensions related to the three main constructs of the conceptual model.

The intangible relationship value construct represents a significant portion of the conceptual model of this research. This construct, developed by Baxter and Matear (2004), consists of the Human Intangible Value and the Structural Intangible Value, which are further split into competence, attitude, intellectual agility, relationship between customer and the company, organizational attributes, and renewal and development attributes. These six value metric dimensions were used in the questionnaire and served the purpose of collecting the data for explaining intangible relationship value and its influence on new product development success. The exploratory factor analysis and the discriminant analysis were implemented to analyse this relationship and identify how factors related to intangible

relationship value influence new product success in business-to-business situations in the New Zealand manufacturing industry.

The exploratory factor analysis was used to investigate if human and structural value dimensions are distinctive and load onto correct factors (Bryman & Bell, 2011). Varimax rotation with Kaiser normalization was used and resulted in the six items of intangible relationship value correctly loading onto two factors: human intangible value to seller and structural intangible value to seller. KMO and Bartlett's test returned significant results and supported the presence of correlations among tested items. When the relevant first-order, value-metric items were separately tested by exploratory factor analysis, they also correctly loaded onto relevant constructs of intangible relationship value.

The customer's competence and attitude components, which belong to the human value to seller construct, accounted for over 86% of the total variance explained, with 63.65% and 22.98% respectively. The least of the variance explained were by components related to structural value construct, accounting for less than 9% of total variance explained, and the smallest component of development was work initiated by the customer, explaining just above 2% of the variance. The results of total variance explained by all six components of intangible relationship value, and the rotated component matrix showing how six different value metric components load onto two factors, is displayed in Table 7.

**Table 7. Results of EFA on Intangible Relationship Value**

	Component	
	Human Value	Structural Value
Competent	0.935	0.171
Good Attitude	0.908	0.256
Intellectual Agility	0.908	0.262
Network Relationships	0.268	0.860
Attributes Organisation	0.202	0.910
Development Work	0.194	0.891
Eigenvalue	3.819	1.379
Variance Explained %	63.651	22.978
Cumulative %	63.651	86.629

Following the analysis of the intangible relationship value construct, the EFA on characteristics of the involved customers was conducted. The exploratory factor analysis was implemented first on all eight scaled items (customers' innovativeness, customers' know-how, representativeness of customers for target market segment, customers' reputation in the market, frequency of interaction with customers outside new product development project, duration of business relationship with customers, customers' benefit from the solution provided by the new product, and customers' recency in the need for the new product), then used to measure the characteristics of the involved customers. The EFA was then implemented on the summated scales of four dimensions of this construct: technical attractiveness, financial attractiveness, closeness of relationship with customer, and lead user characteristic.

The EFA of summated scales resulted in these four dimensions correctly loading onto one factor: characteristics of the customers involved in new product development. The summated scales represent a combination of several variables that were created to measure

the same variable. Using these scales increase the reliability of the measurement (Hair et al., 2010). Table 8 shows the results of the exploratory factor analysis. KMO and Bartlett's test returned significant results and supported the presence of correlations amongst tested variables. The eigenvalue was calculated at 2.464, with 61.59% of the total variance explained.

**Table 8. Results of EFA of Customers' Characteristics Construct**

	Component
	1
Technical attractiveness	.834
Financial attractiveness	.809
Closeness of relationship	.833
Lead user characteristic	.647

Finally, the exploratory factor analysis was used to confirm that dimensions of new product development construct load onto correct dimensions (Bryman & Bell, 2011). Varimax rotation with Kaiser normalization was used and resulted in the six variables of NPD success correctly loading onto one factor with eigenvalue of 3.454 and 57.57% of total variance explained. KMO and Bartlett's test also returned significant results and supported the presence of correlations amongst tested variables. The results of EFA of NPD success construct are presented in Table 9.

**Table 9. Results of EFA of NPD Success Construct**

	Component
	1
Financial Success	.699
Market Success	.765
Technical Success	.792
Speed-to-market	.763
Strategic Advantage Gains	.862
Social and Ecological Sensitivity	.654

#### **4.5.1. Reliability and Validity**

Validity refers to the issue of whether or not a set of indicators applied for measuring a specific concept truly does measure it and reliability demonstrates the consistency of a concept's measures (Bryman & Bell, 2011). Reliability and validity directly affect the findings of the research (Zena & Hadisumarto, 2012). As noted beforehand, all questions in this survey were designed using measures developed earlier, utilized and empirically tested in previous research (Baxter, 2007a; Baxter & Matear, 2004; Gruner & Homburg, 2000).

Due to the fact that multiple-item measures were used in this study, measuring Cronbach's alpha is the most suitable approach, as it calculates internal consistency of the measures. Reliability was tested, to identify to what extent set of variables were consistent in measuring intangible relationship value, customer's characteristics and NPD success.

If Cronbach's alpha is 0.7, then above the scale can be accepted as reliable (Bryman & Bell, 2011). For example, a check of reliability of new product development success construct returned a Cronbach's Alpha reading of 0.826, which proves strong reliability and validity of the scales used to measure this construct. In Table 10 reliability and validity of

other constructs of the conceptual model, represented by Cronbach's Alpha coefficients, show that all coefficients are above 0.7.

**Table 10. Results of Scale Reliability Analysis of Separate Constructs**

	Cronbach's Alpha	Number of items	Items
NPD Success	0.826	6	Financial success, market success, technical success, speed-to-market, strategic advantage gains, social and ecological sensitivity
Buyer's Human Value to Seller	0.940	3	Competence, attitude, intellectual agility
Buyer's Structural value to Seller	0.901	3	Relationships, organisation, renewal and development
Characteristics of the involved customers	0.852	8	Customers' innovativeness, know-how, representativeness of target market, reputation, frequency of interaction, relationship duration, benefit from the NPD, recency in the need for new product

#### **4.6. Cluster Analysis**

To determine the relationship between new product development success, the intangible relationship value and customers characteristics, discriminant analysis was implemented. However, prior to this, a cluster analysis, based on six dimensions of NPD success, was used. The cluster analysis represents a group of multivariate techniques, which allows grouping of objects based on various characteristics they possess (Hair et al., 2010).

The cluster analysis was based on six dimensions of new product development success developed by Baxter (2007b), and its main purpose was to group objects related to NPD

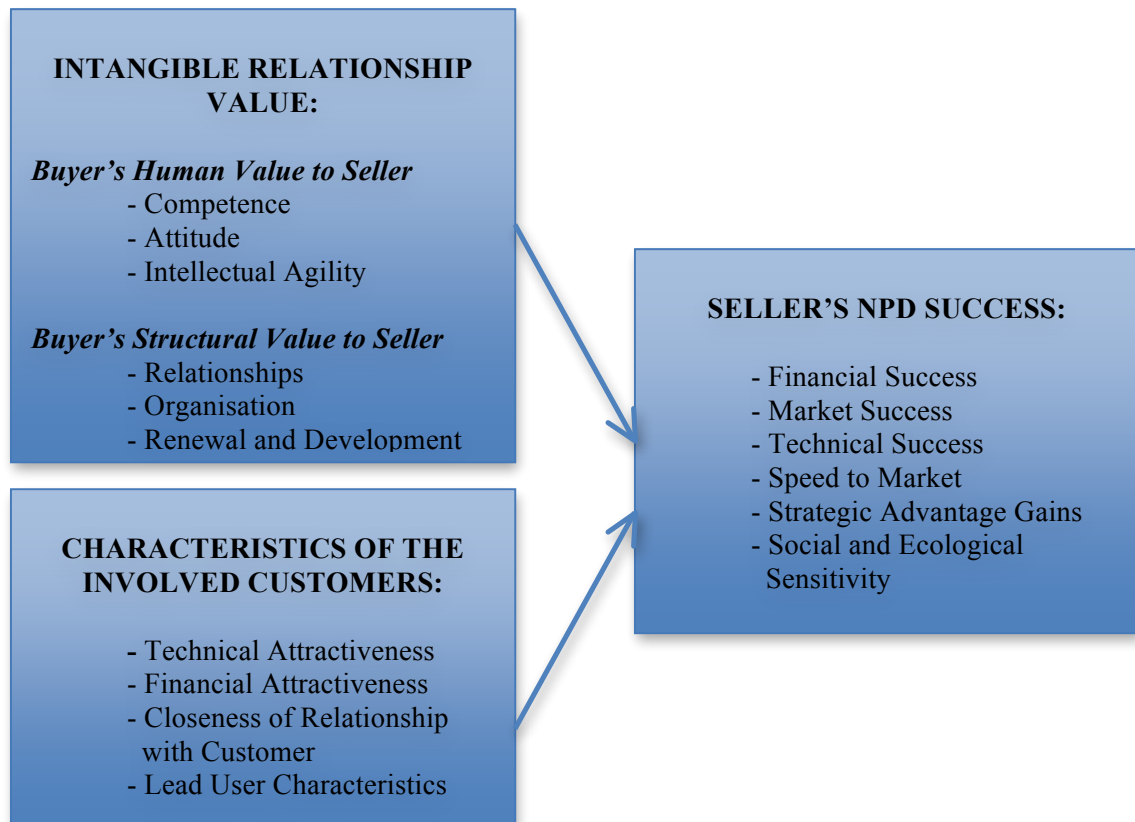
success together. Following suggestions of Gruner and Homburg (2000), a hierarchical cluster analysis with Ward's method was implemented. The squared Euclidean distance measure interval was used for between-groups linkage. Also, following the lead of Gruner and Homburg (2000), the cluster analysis was programmed to split the data into two groups. Therefore, agglomeration schedule statistics and a dendrogram present two distinct clusters. Descriptive information on these two clusters is displayed in Table 11.

These two clusters are clearly distinct, which allows meaningful interpretation of them. The first cluster of 32 respondents was classified as the “less successful group” and the second cluster of 70 respondents was classified as the “more successful group”. From the mean and standard deviation scores, these two groups are easily distinguished, as the more successful group's mean scores for all six NPD success factors averaged noticeably higher than the mean scores of the less successful group's ones. Standard deviation of financial success, market success, technical success, speed-to-market and strategic advantage for the more successful group are  $<1$ , but social and ecological sensitivity appeared to be  $>1$ , similar to the indicators of standard deviation for all six factors for the less successful group.

**Table 11. Results of Cluster Analysis Based on NPD Success**

	Less successful cluster (n=32)		More successful cluster (n=70)	
	Mean	Std. Deviation	Mean	Std. Deviation
Financial Success	5.06	1.645	5.99	0.860
Market Success	5.41	1.478	6.31	0.790
Technical Success	4.47	1.244	5.80	0.773
Speed-To-Market	3.81	1.378	5.34	1.166
Strategic Advantage	3.84	1.194	5.50	0.830
Social Ecological Sensitivity	2.09	1.228	5.54	1.326





**Fig. 6 – Revised Research Conceptual Model**

#### **4.7. Testing the Model - Discriminant Analysis**

In Fig. 6 a revised conceptual model is presented, which illustrates the relationship between intangible relationship value, customers' characteristics and NPD success. The reason for revising and simplifying the original conceptual model was an attempt to highlight the relationship between dependent variables and first-order dimensions. Conducting the cluster analysis on the revised model enabled the identification of two distinct groups; therefore, for further analysis, these two groups are used. To assess the influence of customers' characteristics on new product development success, discriminant analysis was

undertaken, based on the individual item measures for human and structural value and the summated scales for the customer characteristic measures. This approach is consistent with Gruner and Homburg (2000). Considering the small number of clusters and the distinct sizes of those clusters, the discriminant analysis enabled the identification of the significant differences for these defined groups, and if differences exist, it enables determination of which independent variables account for these differences the most (Hair et al., 2010).

The results of the discriminant analysis on characteristics of the involved customers are shown in Table 12. Wilks' lambda is 0.835 and Chi-square is 17.47, with 76.2% of the correctly classified original grouped cases and 74.3% of the cross-validated grouped cases. The discriminant analysis has indicated that the results of technical attractiveness and lead user characteristics are significant.

**Table 12. Results of the Discriminant Analysis of Characteristics of the Involved Customers**

	Canonical discriminant function coefficient	F	df1	df2	Sig.
Technical Attractiveness	0.894	8.628	1	99	.004
Financial Attractiveness	-0.231	1.448	1	99	.232
Closeness of Relationship	-0.611	.966	1	99	.328
Lead User	0.865	9.539	1	99	.003

The results of the discriminant analysis of IRV construct are shown in Table 13.

Standardized canonical discriminant function coefficients are positive for competency,

intellectual agility and development work initiated by customer factors; and are negative for attitude, network relationships and organisational attributes factors. Wilks' lambda is 0.871, and Chi-square is 13.418, with 75.5% of the correctly classified original grouped cases. The findings revealed by this analysis support the significance of competence, attitude and intellectual agility components. All three of these components belong to the human relationship value construct.

**Table 13. Results of the Discriminant Analysis of Intangible Relationship Value**

	Canonical discriminant function coefficient	F	df1	df2	Sig.
Competent	0.083	6.501	1	100	.012
Good Attitude	-0.520	4.278	1	100	.041
Intellectual Agility	1.268	11.414	1	100	.001
Network Relationships	-0.395	.432	1	100	.513
Attributes Organisation	-0.133	1.286	1	100	.260
Development Work	0.483	3.030	1	100	.085

The proportional chance criterion was calculated for assessing hit ratio where average probability of the classification for different size groups is considered (Hair et al., 2010). Using the sizes of two identified clusters, proportional chance criterion was calculated at 57%; therefore, the actual prediction accuracy of 75.5% is acceptable as it is above the proportional chance criterion. The improvement in predictive accuracy has accounted for 32% of information gain, which exceeds the required 25% suggested by Hair et al. (2010).

## **4.8. Conclusion**

In this chapter, the findings generated by the data analysis were presented. The relationship between the three parts of the conceptual model (new product development success, customer's characteristics and intangible relationship value) were empirically tested and created a foundation for answering the research questions.

Reliability of measuring indicators was also presented, demonstrating the consistency of a concept measure (Bryman & Bell, 2011). Reliability and validity directly affects the findings of the research (Zena & Hadisumarto, 2012). All questions in the survey were designed using measures earlier developed, utilized and empirically tested in previous research (Baxter, 2007a; Baxter & Matear, 2004; Gruner & Homburg, 2000). Due to the fact that multiple-item measures were used in this study, measuring Cronbach's alpha was the most suitable approach, as it calculates the average of all split-half reliability coefficients, and also gauges internal consistency of the measures. Cronbach's Alpha test returned readings of above 0.8 for all constructs, which proves strong reliability of the scales used to measure this construct.

The cluster analysis was implemented to group objects related to NPD success based on various characteristics they possess. Based on six dimensions of new product development success cluster analysis identified two distinct groups – a group of 32 respondents that was classified as the “less successful group” and a second group of 70 respondents that was classified as the “more successful group”.

Further, the exploratory factor analysis and discriminant analysis techniques implemented to observe how intangible relationship value and customers' characteristics influence NPD success, and identified which components have greater influence. The analysis revealed

several significant findings, supporting the influence of technical attractiveness and lead user customers' characteristics on the success of NPD projects. But, this analysis also classified two other characteristics – financial attractiveness and closeness of relationship, as non-significant in the researched market. These findings emphasize the importance of careful selection of the cooperation customers, and relying on the specific characteristics they possess, for successful new product development.

Regarding the intangible relationship value construct, the human value to seller component has significant influence on new product development success when the buyer's structural value to seller does not significantly influence the success of new product development projects. This is justified by the fact that a good attitude and intellectual agility, which belong to human value to seller, is indicated as being significant predictors of NPD success with strong canonical discriminant function coefficients (Table 13). Overall, these findings concur with previous research of intangible relationship value conducted in New Zealand.

In the next chapter, the discussion of these findings will be presented. This will address the theoretical and managerial implications and limitations of this research, and present suggestions for future research. The research questions proposed earlier in this thesis will also be answered in the next chapter, using the findings generated by the data analysis described earlier.

## **Chapter 5. Discussion**

### **5.1. Introduction**

Certainly, companies' internal organisational factors, such as financial situation, human resources and their skills are crucial for NPD success. However, this research emphasizes the importance of external factors like intangible relationship value and customers characteristics, which often initiate NPD and significantly influence its development and outcome. From the findings presented in the previous chapter, it becomes obvious that the success of new product development depends on many external factors, with some factors, recognised as highly important ones in previous literature, have been identified as less relevant in the manufacturing industry in New Zealand as researched for this thesis.

This chapter presents a discussion on research aims and research questions, using findings from the previous chapter to explain research development and answers those questions. In the next section, those research questions will be briefly answered. However, following the interpretation of research objectives and how they were achieved, significance of the findings and comparison with previous literature will be presented in more detail. This is followed by theoretical and managerial implications, where the real value of the research will be discussed, summarising the knowledge that has been created around main constructs of the conceptual model, how those constructs interrelate with each other, and how managers and academics around the world can benefit from the generated knowledge and continue building on it. Also for this purpose, suggestions for the future research will be made based on the limitations of this research, which will be addressed in the end of this chapter. Addressing those limitations will help academics to extend future research beyond New Zealand and possibly cover other industries (rather than manufacturing only), which

also enables implementation of the findings related to NPD for growing and maintaining success of businesses.

## **5.2. Research Aim and Research Questions**

The findings of this research, once more prove that new product development success depends heavily on resources and information flow deriving from the buyer to the seller, which fits well with buyer-seller profitable relationship outcomes developed by Morgan and Hunt (1999). The main objective of this study was to identify the relationship between new product development construct (Baxter, 2007b), intangible relationship value (Baxter & Matear, 2004) and customer characteristics (Gruner & Homburg, 2000) and measure to what extent and which components of last two constructs influence NPD success in the manufacturing industry in New Zealand.

To achieve this objective, three research questions were generated, derived from the review of existing literature related to three main constructs of the offered conceptual model. The first research question targets the relationship between NPD success and the characteristics of the customers involved in new product development projects:

1. To what extent does the customer characteristics impact on new product success in business-to-business situations in New Zealand manufacturing industry?

Based on the findings revealed in the previous chapter, the answer to this research question is relatively clear. Characteristics of involved customers play a very important role in the success of new product development projects. Following the suggestions of Gruner and Homburg (2000), there were four customer characteristics that were tested against the

significance of their interaction with new product development success: technical attractiveness, financial attractiveness, closeness of relationship, and lead user characteristic. However, the data analysis indicated that only some of these characteristics significantly influence NPD success. The influence of technical attractiveness and lead user customers' characteristics on the success of NPD projects has been identified as significant. But, financial attractiveness and closeness of relationship have not been supported and were classified as non-significant in regards to NPD success in the manufacturing industry in New Zealand. This result for the closeness of relationship characteristic may relate to confidentiality issues and companies' unwillingness to share private information with close customers during NPD. Surprisingly, financially attractive customers seem to be less valuable cooperation partners as well. This may be explained by the difficulties associated with dealings with large companies that have a good reputation in the market and represent it well. This might seem inappropriate, but when companies are undertaking NPD projects, they might be looking for innovative perspectives. In this instance, involving financially attractive customers with traditional views might be less effective.

The second research question was developed around the IRV construct (Baxter & Matear, 2004), and it reflects the purpose of Baxter's (2007b) study in which he implemented intangible relationship value in the context of NPD. The purpose of this research question was to emphasize the relationship between two components of intangible relationship value (buyer's human value to seller and buyer's structural value to seller) and new product development success, which has also been partially researched by Baxter and Matear (2004) in the manufacturing industry in New Zealand, but only using future financial performance instead of multi-dimensional NPD success. Therefore, the second research question was:



2. How do the factors related to intangible relationship value influence new product success in business-to-business situations in New Zealand manufacturing industry?

The findings related to intangible relationship value have supported significance of the influence that human value to seller (competence, attitude, intellectual agility) has on the success of new product development. However, it was discovered that factors related to structural value to seller (relationships, organisation, renewal and development) did not influence NPD success significantly. Discussion on the reasons for these conclusions will be presented in the next section.

And finally, the third research question aimed to capture the optimal combination of both intangible relationship value and customers' characteristics constructs for successful new product development:

3. What is the relevant importance of both customer characteristics and intangible relationship value in new product development success?

Based on the answers to the previous two research questions, this study claims that a combination of competent, intellectually agile and good-attitude customers with lead user and technical attractiveness qualities predetermines the highest possibility for successful outcomes of new product development projects. Based on the results of the discriminant analysis, factors of intangible relationship value with the highest predictive power of NPD success are: intellectual agility and good attitude with canonical discriminant function coefficients 1.268 and -0.520 respectively. Competence is also significant ( $p=0.12$ ) but weak with canonical coefficient 0.083. Development work, which relates to structural value to seller construct, is also strong (canonical coefficient=0.483), but marginally significant ( $p=0.85$ ) (Table 13). Canonical discriminant function of technical attractiveness is 0.894

and lead user is 0.865, and therefore, these two characteristics are strong and significant ( $p=0.004$ ,  $p=0.003$ ) predictors of new product development success.

### **5.3. Significance of the Findings**

#### **5.3.1. Customers Characteristics**

The only similarity concerning discriminant analysis results between the research conducted by Gruner and Homburg (2000) and this research is the significance of the lead user characteristic. It has been argued that the best understanding and influence on the successful outcome of new product development is held by lead users, as they are classified as good representatives of a marketplace, have the needs for the product, and are prepared to use the new product much earlier than the rest of the market normally does (Herstatt & Von Hippel, 1992). The significance of the lead user characteristic in relation to success of the NPD is rather obvious: since customers with this characteristic ensure early adoption of the new product; their opinions are highly important during new product development.

However, the discriminant analysis in this study revealed findings opposite to those that Gruner and Homburg (2000) presented on the other three customer' characteristics.

Comparison of the findings of this research and the findings of the research conducted by Gruner and Homburg (2000) is presented in Table 14.

**Table 14. Comparison of the Findings of this Research and the Findings of the Research Conducted by Gruner and Homburg (2000)**

	<b>Gruner and Homburg (2000)</b>	<b>This research</b>
<b>Technical attractiveness</b>	Non-significant	Significant
<b>Financial attractiveness</b>	Significant	Non-significant
<b>Closeness of the relationship</b>	Significant	Non-significant
<b>Lead user characteristic</b>	Significant	Significant

The second most significant characteristic of customers in the New Zealand market is technical attractiveness. Despite the fact, that financial attractiveness and closeness of relationship also displayed positive discriminant coefficients; these two characteristics did not influence success of new product development significantly.

In the research conducted by Gruner and Homburg (2000), significant customers' characteristics were: lead user, financial attractiveness and closeness of relationship. The results of this research found the lead user and technical attractiveness characteristics significant. A possible explanation for the dissimilarities may be: different characteristics of the researched industries, differences in the economy structures of the researched countries,

and possibly, the changes that the researched markets has experienced since the research conducted by Gruner and Homburg (2000).

The technical attractiveness customers' characteristic seems to have valuable contribution to the success of new product development, which may possibly be explained by the positive interpretation of this characteristic by the company undertaking the NPD project. This positive interpretation may arise because their customers may have needs similar to the general market, and may also contribute valuable technical information to the new product development projects. A lack of technical expertise in smaller New Zealand companies may possibly exist. Therefore, this finding may also be explained by the reliance of these companies on customers when seeking technical information during new product development. As mentioned by Gruner and Homburg (2000), these companies might have difficulties finding the solution for technical problems on their own so the technical experience of involved customers becomes extremely valuable for companies undertaking NPD projects.

The insignificance of the closeness of relationship characteristic may relate to the confidentiality issues and companies' unwillingness to share private information. A low level of trust between a company undertaking an NPD project and its' customer may have negative impact on the success of new product development.

Summarising the results of the discriminant analysis conducted on the characteristics of the customers involved in new product development has answered the first research question and has revealed findings that support the significance of technical attractiveness and lead user characteristics of customers for the success of NPD projects. Two other characteristics – financial attractiveness and closeness of relationship – have been identified as non-

significant in the researched market. These findings emphasize the importance of careful selection of cooperation partners, as customers with inappropriate characteristics may lead to poor performance of the NPD team and unsuccessful new product development projects.

### **5.3.2. Intangible Relationship Value**

According to the results generated by the exploratory factor analysis and discriminant analysis presented in the previous chapter, the buyer's human value to seller component of the intangible relationship value construct has significant influence on new product development success. This is true when the buyer's structural value to seller does not significantly influence success of new product development projects in the manufacturing industry in New Zealand, which answers the second research question. The discriminant analysis has shown that all three items used for evaluation of the buyer's human value to seller (competence, attitude and intellectual agility) have significant influence on NPD success, when neither of the items of buyer's structural value (relationships or organisation, renewal and development) significantly influences NPD success. The significance of the human value construct may be explained by the flexibility and easy adaptation of customers carrying this value type to complex and company-specific environments of the new product development, which results in immediate contribution to its success. However, Baxter and Matear (2004) would not agree with this statement, as they claim a weaker connection between human value and IRV, due to human value being more mobile (people can leave organisations relatively easily). That is why they think that human value does not contribute as much value as the structural value type does.

The research conducted by Baxter and Matear (2004) has a different purpose than the research conducted for this thesis. Baxter and Matear (2004) were aiming towards testing a hypothesized model of intangible relationship value, and testing how well a conceptualized set of scales predicts assessment of this value in the B-2-B context. They also tested that IRV construct in conjunction with future financial performance, rather than NPD success. The study conducted for this thesis concentrated on the relationship between first-order dimensions of IRV construct and NPD success. That is why, despite the fact that both studies were conducted in the same market with identical respondents type, the findings cannot be directly compared.

### **5.3.3. NPD Success**

The new product development construct implemented in this study was derived from research by Baxter (2007b), as he also researched this construct in conjunction with intangible relationship value. Following Baxter's (2007b) suggestion, NPD success construct was recruited for this research and consisted of six dimensions: financial success, market success, technical success, strategic advantage gains, speed-to-market, and social and ecological sensitivity. Cluster analysis was performed on these six dimensions and two distinct groups were identified: a "more successful cluster" and a "less successful cluster", with almost 70% of respondents landing in the "more successful cluster". Gruner and Homburg (2000) also performed cluster analysis on new product success dimensions, but they originally identified four clusters. Due to the fact that in their research, clusters 3 and 4 yielded medium results, they eliminated those two clusters and only analysed two main clusters. Those clusters are very similar to the clusters identified in this research: "top

projects” (superior projects) is similar to the “more successful cluster” and “flop projects” (inferior projects) is similar to the “less successful group”. Gruner and Homburg (2000) found more respondents landed in the more successful group as well. The significance of each dimension of NPD success will be addressed further.

### *Financial Success*

The results of this research re-confirmed that financial success is the most popular measure of NPD success in the researched industry. Earlier in this paper, a literature review discovered that financial performance/success is the most recognised and widely used factor by many companies around the world for the evaluation of overall success of new product development projects (Griffin & Page, 1996). Baxter (2012) has also supported the fact that financial performance is the most significant measure of NPD success. Despite the fact that financial success is the strongest factor in evaluation of NPD, its main disadvantage is that it is generally based on short-term indicators of past financial performance (Baxter, 2007b).

### *Market Success*

Exploring new markets, creating market opportunities and increasing market share are potential indicators of market success (Griffin & Page, 1993). The significance of the market success factor for measuring NPD success has been previously emphasized and defined as a factor that is more likely to be used by bigger companies, rather than small ones, when they desire more market share and want to test new markets (Y. Zhang, 2009).

The analysis of the market success factor in this thesis research has also returned positive results and supported its significance.

#### *Technical Success and Strategic Advantage Gains*

Baxter (2007b) and Griffin and Page (1996) have found that many companies consider technical success an important factor for evaluating NPD success. The data analysis conducted for this research has also confirmed that this component is a good and reliable measure of new product development success. Technical success is an important factor of overall NPD success, as it can be seen as a provision of technical growth for the evaluation of the currently developed product and for all future products developed by the company that will use the technological value derived from the current NPD.

The strategic advantage gains dimension is a less reliable measure of NPD, but it still supports Baxter's (2007b) six-dimension evaluation framework and reveals the fact that New Zealand companies in the manufacturing sector are still using this factor for evaluating NPD outcomes. This factor is used by many companies because despite the outcomes of financial performance, strategic advantage gains open up new opportunities for other products offered by these companies (Milson & Wilemon, 2005).

#### *Speed-to-Market, Social and Ecological Sensitivity*

According to the results of data analysis conducted for this research, the weakness of the speed-to-market measure has been re-confirmed again. In the study conducted by Griffin



and Page (1996), speed-to-market was researched under the technical performance success dimension but was reported as not being a very strong measure of NPD success.

Social and ecological sensitivity is also a weak factor of new product development success evaluation in the New Zealand manufacturing industry. Despite the fact that Baxter (2007b) has argued the importance of this relatively new factor, this research finds that currently, these companies do not use it as key measure of NPD success.

#### **5.4. Theoretical Implications**

While a majority of existing literature concentrates on the performance of the interaction between customers and companies, the findings of this research suggest that before interaction occurs within a NPD project, involved customers have to be carefully selected based on the intangible relationship value they will add to the project and based on their characteristics. The theoretical implications of this study relate mostly to the field of innovation and relationship marketing. The majority of previous literature takes a very broad perspective on partnership success, and often uses simple single-item measures for assessing new product development success. For the purpose of this research, multidimensional measures were used, as proposed by Baxter (2007a), which enabled a more accurate measurement of performance and NPD success using empirical data collection and analysis in the example of one industry in one country, but with findings potentially applicable to many other markets.

The knowledge generated by this research, around interaction with customers during new product development and the importance of intangible qualities they contribute to the

process, is extremely valuable for studying relationship marketing in the business-to-business innovation context. Expanding the in-depth understanding of intangible relationship value (IRV) and studying how customers with specific characteristics can increase the likelihood of successful NPD projects can be useful to other researchers. This enables them to concentrate on the factors that have been recognised as significant, and to develop them further.

The analysis of the empirical data collected for this research has also revealed important findings regarding the effectiveness of specific components of NPD success measures, which enables researchers to link relationship marketing with separate aspects of new product development success. Therefore, financial success, market success and technical success scales developed by Baxter (2007b) are strong and reliable measures of new product development success. However, speed-to-market and social and ecological sensitivity components are weak measures of NPD success.

## **5.5. Managerial Implications**

This research has a number of implications that managers involved in innovation and those that rely on relationships with their customers will find useful. Knowing customer's characteristics and being able to estimate potential intangible relationship value based on those characteristics, as well as other attributes in possession of a customer's company, allows for more accurate forecasting of NPD projects. It is extremely beneficial for managers to know how to select customers with the characteristics most appropriate for the NPD process, as selecting customers with inappropriate characteristics may lead to poor performance of the NPD team and an unsuccessful new product development project.

Knowing the strong structural value aspects of customers' organizations, those that may be added to the sellers' companies during NPD processes, also enables efficient project planning and increasing the chances for successful outcomes. Specific aspects of intangible relationship value and customers' characteristics should be utilized by managers during the appropriate stages of NPD (Y. Zhang, 2009).

The findings of this research enable managers to create policies that will reinforce relationship and cooperation with the most proactive customers who contribute the most to NPD. Finally, a multi-dimensional approach has been tested in this research and has proven to be the most insightful for NPD evaluation. It allows managers to assess the outcome of a new product development project more carefully, relying on the strongest factors.

## **5.6. Limitations and Future Research**

There are some limitations of this study that have to be addressed to ensure that they will be eliminated in the future research. First of all, this research has been conducted in one country with a sample from a single industry, which means that the findings may not be appropriate in other industries and countries with different economies. Therefore, it is suggested to replicate this study in different markets to ensure that managers and academics around the world can implement the findings confidently. A practical limitation of this study is using only one representative per company as research participants, which captured a single opinion within larger organisations that may have been different from the perceptions of others. Also, the timeframe of this study was restricted, contributing to the selection of a cross-sectional approach, but it may be interesting to see how results vary with a longitudinal study.

This particular research has concentrated on only one type of relationship between customer and company, which allowed the generation of significant findings and should not be viewed as a limitation. However, it might be useful to explore a similar arrangement but with different types of relationship, for example, with suppliers or in the context of strategic alliances or joint ventures. Despite the fact that customers' needs and experience are vital for the company during NPD, the performance and potential value that other groups can add are also very important (Turnbull, Oliver, & Wilkinson, 1992).

## **5.7. Conclusions**

In this chapter, the relationship of new product development, intangible relationship value and customers' characteristics were discussed. Based on the findings, the research questions have been answered and the research aim justified. The significance of the findings related to each construct and each research question has been presented. The theoretical and managerial implications of this study have also been addressed and the limitations of the study were also presented in this chapter.

This study has emphasized the importance of careful selection of cooperative partners during NPD projects. Implementing the various data analysis techniques used in this research generated findings that clearly highlight customers' characteristics and factors of intangible relationship value, which predict the success of new product development. These characteristics are: lead user characteristics and technical attractiveness. These findings are different from a similar study conducted by Gruner and Homburg (2000), which indicate that those findings are market-sensitive.

Findings related to intangible relationship value have indicated human value to seller being a better predictor of NPD success than structural value to seller. All three dimensions of this construct seem to have strong influence on new product development success, therefore, when selecting partners for NPD projects, customers that indicate stronger human value should be prioritised over customers who carry more structural value.

Finally, the multi-dimensional evaluation framework has been tested in this research and proven to be insightful for NPD success assessment, as it covers several different aspects of NPD success, and therefore explains new product success more precisely. The findings of this study have indicated that financial success, market success, technical success and strategic advantage gain scales developed by Baxter (2007b) are strong reliable measures of NPD success, when speed-to-market and social and ecological scales are not as strong. Therefore, these first four measures are the ones that should be used when evaluating the success of NPD projects.

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
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## Appendix 1. Questionnaire (note: looks different in Survey Monkey)



### Relationship Value and New Product Success

#### INTRODUCTION

Thank you for completing this questionnaire. It is divided into five sections. As the subject for all sections (apart from Section E), please, think about your New Zealand based business-to-business customer that ranks third in terms of revenue and not a firm that is a supplier of goods or services to you.

When you are answering the questionnaire, would you please take the perspective of a representative of your firm, as the design of this study concentrates on analysis of factors influencing new product development success between firms. Please, complete all items in the questionnaire.

#### CONFIDENTIALITY

All information you provide will be strictly confidential. Your responses will be presented only in aggregate and no individual firm's results will be highlighted. They will not be released to any third party. Once the questionnaire is complete it becomes anonymous. The demographic information on your firm that I ask you to provide at the end of the questionnaire will be used for comparative purposes only.

#### CONSENT

Consent to participate in this survey will be indicated by its completion.

Contact: Volodymyr Tashakov  
Telephone: 021 8 666 94  
Email: [vovatashakov@gmail.com](mailto:vovatashakov@gmail.com)

Supervisor: Mark Glynn  
Telephone: 09 921 9999 Extension 5813  
Fax: 09 917 9975  
Email: [mark.glynn@aut.ac.nz](mailto:mark.glynn@aut.ac.nz)



**SECTION A:** General information about your customer.

1. For how many years has your firm had a relationship with your third largest  
(in terms of revenue) customer? Years: .....
2. What industry type are they in? Industry: .....
3. Approximately how many employees do they have? Number: .....

**SECTION B:** In this section we look at the intangible relationship value to your firm. In other words, human and structural value that your customer brings into your firm. Please consider your own firm's relationship with your chosen customer at present and rate the following statements as they apply to the relationship on a 7-point scale (1 – strongly disagree, 7 - strongly agree).

- |  | Strongly agree |   |   |   |   | Strongly disagree |   |
|--|----------------|---|---|---|---|-------------------|---|
| 4. The customer's personnel you work with are competent.   | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 5. The customer's personnel have a good attitude to their work with you.   | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 6. The customer's personnel you work with are intellectually agile (they are able to use their competence, apply it in practical contexts, and learn as they do that). | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 7. The customer has a network of relationships that are very useful to your firm.  | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 8. The customer has attributes in its organisation (for example: knowledge; processes; structures) that are very useful to your firm.                                  | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 9. The customer's development work (for example, on products, processes, or markets) is very useful to your firm.  | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |

**SECTION C:** In this section we look at the characteristics of your customer involved in new product development. Please rate the following statements as they apply to your customer on a 7-point scale (1 – strongly disagree, 7 - strongly agree).

- |   | Strongly agree |   |   |   |   | Strongly disagree |   |
|---|----------------|---|---|---|---|-------------------|---|
| 10. The customer is innovative.   | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 11. The customer is knowledgeable.  | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 12. The customer is a good representative of your target market segment.                          | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 13. The customer is reputable in the market.  | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |
| 14. Your company interacts with the customer frequently outside new product development projects. | 1              | 2 | 3 | 4 | 5 | 6                 | 7 |

15. Your company has maintained business relationship with the customer for a long period. 1 2 3 4 5 6 7
16. The customer benefits from the solution provided by the new product your company have launched. 1 2 3 4 5 6 7
17. Your customer have requested or initiated new product development recently (over the last year). 1 2 3 4 5 6 7

**SECTION D:** In this section we ask several questions about new product development success.

Please rate the following statements as they apply to your company on a 7-point scale (1 – not at all, 7 – very much so).

- |   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 18. To what extent you use financial success to evaluate the overall success of new product development process?                | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. How important is market success factor in evaluation of the success of new product development process?                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. To what extent you use technical success of the product to evaluate the success of new product development process?         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. How widely you use speed-to-market factor to evaluate the overall success of new product development process?               | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. To what extent you use strategic advantage gains to evaluate the overall success of new product development process?        | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. How important is social and ecological sensitivity in evaluation of the overall success of new product development process? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION E:** General information about your firm. It will be used for comparative purposes only.

24. How long have you worked in this firm? .....years
25. What is your position in the firm? .....
26. Approximately how many employees does your firm have? Number.....
27. What is the type of industry that your firm operates in? Please be specific.  
.....  
.....

Thank You!!!

## Appendix 2. Participant Information Sheet

# Participant Information Sheet



**Date Information Sheet Produced:** 3<sup>rd</sup> of April 2013

**Project Title:** Relationship value and new product success.

**An Invitation:** Dear Participant, my name is Volodymyr Tashakov, and I would like to invite You to take part in a research exploring how business-to-business customers' characteristics and their intangible relationship value influences new product development (NPD) success. Information you provide is very important, and answering short questionnaire, will enable us to study which customers' characteristics and relationship value dimensions have greater affect on NPD success.

Before you decide to take part in this research it is important that you understand what it is about and what you will be asked to do. Please take time to read following information. The participation is voluntary (you may withdraw at any time prior to the completion of data collection) and anonymous, so no information will be released to third party organisations or to customers of your company, mentioned in the questionnaire.

### **What is the purpose of this research?**

The purpose of this research is to create in-depth understanding of the relationship between new product development (NPD), customers' characteristics and intangible value that they add to the NPD processes in New Zealand manufacturing industry. This research is part of a Master of Business Thesis at Auckland University of Technology (AUT).

### **How was I identified and why am I being invited to participate in this research?**

Sample for this research was drawn from the database of all New Zealand based companies involved in manufacturing, which potentially have an experience in new product development. We believe that you are involved in new product development in your company and you are the right person to represent your company in this research.

### **What will happen in this research?**

I will ask you to fill out the online questionnaire. The questions are about involvement of your New Zealand based business-to-business customer in NPD processes of your company. The data collected by this questionnaire will be used solely for the purpose of this research and will never be released nor to any third party organisations, neither to your customers or competitors. Electronic copies of completed questionnaires will be kept at secured AUT facility for six years, and then destroyed. The questionnaire is fairly short to minimise your time cost.

### **What are the discomforts and risks and how they will be alleviated?**

No potential discomforts are anticipated. No conflict of interests have been identified either. The questions are about your firm, and are not of a personal nature. The questionnaire is fairly short and is easy to follow. Your responses are not traceable to a specific partner and will not be released to

any third parties. Once the questionnaire is complete it becomes anonymous. Information being supplied may be commercially sensitive and you do not need to answer the questions you feel uncomfortable with.

#### **What are the benefits?**

You will receive a summary of the research project report, which can be useful for your business. This is an opportunity to become a part of the research, directly related to your business; become familiarised with modern trends in relationship between NPD and customers involved in the NPD processes; an opportunity to facilitate the research and assist the research team in creating new knowledge useful for businesses involved in new product development and academics researching this area of marketing. The results of this research will contribute to my qualification of Master of Business at AUT.

#### **How will my privacy be protected?**

This questionnaire is anonymous. This means that the researcher will not know who is participating and therefore is unable to identify you or your company in the findings. The subject is relationships of companies with partners who are not identified. So once the questionnaire is complete the responses are not traceable to a specific partner. The data you give will be used for my Master's thesis only.

#### **What are the costs of participating in this research?**

There will be no costs of participating in this research, apart from 5 minutes of your time.

#### **What opportunity do I have to consider this invitation?**

A reply within three weeks from the date you have received the questionnaire would be highly appreciated.

#### **How do I agree to participate in this research?**

This is an online survey, so by completing it you are giving consent to participate in this research.

#### **Will I receive feedback on the results of this research?**

A soft copy summary of the research project will be available for you to download via Facebook when the research project is complete (approx. early 2014), following this link:  
[www.facebook.com/groups/136332629882868/](http://www.facebook.com/groups/136332629882868/).

#### **What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Mark Glynn, [mark.glynn@aut.ac.nz](mailto:mark.glynn@aut.ac.nz), 09 921 9999 extension 5813.

Concerns regarding the conduct of the research should be notified to the Acting Executive Secretary of AUTC, Madeline Banda, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 921 9999 ext. 8316.

#### **Whom do I contact for further information about this research?**

**Researcher Contact Details:** Volodymyr Tashakov, [gx8630@aut.ac.nz](mailto:gx8630@aut.ac.nz), +64 21 8 666 94

**Project Supervisor Contact Details:** Mark Glynn, [mark.glynn@aut.ac.nz](mailto:mark.glynn@aut.ac.nz), 09 921 9999 extension 5813

Approved by the Auckland University of Technology Ethics Committee on **14 May 2013**, AUTC Reference number **13/61**.

## Appendix 3. Ethical Approval Letter



AUTEC  
SECRETARIAT

14 May 2013

Mark Glynn  
Faculty of Business and Law

Dear Mark

Re Ethics Application: **13/61 Influence of involved buyer's characteristics, and their intangible relationship value to the seller, on the seller's new product development success.**

Thank you for providing evidence as requested, which satisfies the points raised by the AUT University Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 13 May 2016.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 13 May 2016;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 13 May 2016 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz).

All the very best with your research,

Madeline Banda  
Acting Executive Secretary  
**Auckland University of Technology Ethics Committee**

Cc: Volodymyr Tashakov [vovatashakov@gmail.com](mailto:vovatashakov@gmail.com)