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**Customer Characteristics, Intangible Relationship Value and New Product Success.**

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ABSTRACT

Customers can contribute to the success of new product development based on their characteristics such as their potential attractiveness as a customer and intangibles such as their willingness to adopt new products and supplier business relationship. This paper reports a study that examines to what extent the intangible relationship value and customers' characteristics influence the eventual success of new product development. The results indicate that some customer characteristics and the human dimensions of the relationship with the seller better predict NPD success. The findings of this study show managers the types of customer characteristics that need be better understood and which intangible aspects of the business relationship are better to focus on.

Key words: Intangible relationship value, customer characteristics, new product development

## Introduction

Interest in the connection between new product development and relationship marketing has grown in recent years. However most of the research on innovation in new product development emphasises the buyer's perspective. Sellers of new products need to be able to judge what aspects of the relationship with customers offer the most potential for new product development. While the technical side of the new product development has been well researched, very little attention has been given as to how the customers' contribution and aspects of the buyer-seller relationship influence the success of a firm's new product development. New product development research has shifted from a product focus towards more of an emphasis on enhancing customer functionality, solution customisation, bonded relationships and network utilisation. This emphasis makes possible the development of products beyond the firm's resources (Srivastava, Shervani & Fahey, 1999). To be able to utilise these external, often intangible resources allows this product development to flourish. Thus there is a need to better understand from the seller's point of view the role that customers have in new product success.

Customers can contribute to the success of a seller's new product development based on characteristics such as their potential attractiveness as a customer and intangible resources such as a willingness to adopt new products and the business relationship with the seller. This paper reports a study that examines how the intangible relationship value and customers' characteristics together influence the eventual success of new product development from the seller point of view. The results indicate that some customer characteristics and the human dimensions of intangible relationship value better predict NPD success. The findings of this study show managers which customer characteristics they should understand better and which intangible aspects of the business relationship are better for them to focus on.

In this study the evaluation of new product success is from the point of view of the selling firm. Here we examine a conceptual framework that explores how customer characteristics and intangible relationship value predict new product success. This study extends Gruner and Homburg's (2000) research on the characteristics of involved customers and their effect on new product success by considering the additional influences of intangible relationship value. Gruner and Homburg's (2000) research is important because it not only focuses on customer interaction but that this focus is from the point of view of the seller. However Gruner and Homburg's research examines one industry, the German printing industry. A criticism of marketing research is that the results of many studies do not replicate in other markets. A further aim of this study is to consider how applicable their results are to other market contexts.

This study is grounded in resource dependence theory as firms have actively manage their resources to achieve marketplace and new product success (Pfeffer & Salancik 1978). In terms of new product development, customer information is important in aligning the seller's processes with customer needs, as customers have control over what information sellers can access. Resources can include information about the customer, the customer's personnel, skills and capabilities. Thus the seller-buyer relationship is important in ensuring this information flow from the customer to the seller. Baxter and Matear (2004) measure the concept of intangible relationship value by looking at both the human and structural

aspects of value. These two intangible relationship aspects capture first the capabilities of buying firm's personnel and second the structure of the buying firm's internal resources. New product development success is a multidimensional construct which reflects the sales, market success and financial impact of the new product as well as the strategic advantage for the seller. Studies of new product success have also highlighted market differences (Souder, Buisson & Garrett, 1997) between new product successes in New Zealand compared to the United States. Their study which also had a seller perspective showed that New Zealand firms paid greater attention to the users of the new product. In this study we test aspects of Gruner & Homburg's (2000) research amongst a broad selection of manufacturing industries in New Zealand which provides another market context for comparison. New Zealand is a relevant market context in terms of new product success as it has a small population, established manufacturing sector and has been said to be very innovative compared to markets such as the United States (Souder et al., 1997). We adapt the conceptual framework of Gruner and Homburg (2000) to include measures of intangible relationship value. In addition we also test a more strategically-based measure of new product development success within this framework.

The research questions for this study are as follows:

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

### **Background**

For a customer to be useful to the seller it must possess suitable intangible resources. The process of value creation through buyer seller relationships is complex and firms can invest considerable resources before they benefit from the intangible value that customers can offer sellers. This intangible relationship value has been identified as being important for future financial performance of the company (Baxter & Matear, 2004).

The relationship between a firm and its customers is an important contribution towards its organisational capital (Bicen & Hunt, 2012) and creates shareholder value. Srivastava, Shervani and Fahey (1999) consider that customer and partner relationships help accelerate the effects of marketing initiatives such as new product development, lead to greater market place acceptance and shareholder value. The resulting market performance leads to a smoothing of cash flow fluctuations reducing the firm's cash flow vulnerability and volatility. The important business processes in shareholder value creation are new product development, supply chain management and customer relationship management (Srivastava, Shervani & Fahey, 1999).

## Literature Review

### Customer characteristics

Customers play an important part of a new product's success and research indicates that lead users who are the first adopt the new product are important part of the innovation process (Schuurman, Baccarne & Mechant, 2013). Identifying other characteristics of the customer allows for the better targeting of more important and more cooperative customers for the firm (Gruner & Homburg, 2000). Gruner and Homburg's (2000) research shows that involving customers in both the early and late stages of new product development enhances the chances of new product success. These researchers identified technical attractiveness, financial attractiveness, the closeness of the relationship with the customer as important customer characteristics.

Lead users are those customers that are "ahead of the market". Such customers adopt the new product create trust and awareness which encourages late adopters to eventually accept the new product as well (Lindgren & O'Connor, 2011). More recent research has expanded the contribution of lead users beyond being just being "ahead of the market" to include new needs for a new product, dissatisfaction with an existing product offering, experience in use, product related knowledge and being user innovators (Schuurman, Mahr & De Marez, 2011).

Technical attractiveness represents firstly the customer's expertise and secondly their ability to innovate (Lüthje, 2004). Interestingly in Gruner and Homburg's research, this item did not have that much influence on new product success. Some research (Luteberget, 2005) suggests that involving technologically interesting customers in NPD may in fact mislead buyers.

Financial attractiveness shows how reputable the customers are and whether they can be treated as being representative of the market (Ganesan, 1994). The existing literature emphasises the importance of information exchange and cooperation between sellers and buyers. Thus the closeness of the relationship becomes more significant during new product development. The closeness of the relationship implies a higher level of trust and less associated risk for the company (Jespersion, 2012). Gruner and Homburg (2000) measured the closeness of the relationship by examining the overall length of the relationship and duration of the relationship between company and customers. Gruner and Homburg's findings showed that lead user characteristics, financial attractiveness and closeness of the relationship were especially important predictors of new product success.

### Intangible relationship value

There are a number of different types of relationship that are important to new product development including relationships with customers, suppliers, competitors, universities and consultants (Knudsen & Mortensen, 2011). Customer relationships are often the most relevant due to the frequent interaction and low cost, while the other relationships are often more formalised, less frequent and more difficult to initiate. Relationship development is often a key step in leading to long term customer loyalty repurchase intention, tolerance to higher prices and cross-purchasing. This loyalty allows firms to plan ahead better and offer quality service (Stump, Athaide & Joshi, 2002).

Relationship value is one of the key intangible resources in a firm (Morgan & Hunt, 1999), the other resources include relational, organisational and informational. Souder et al. (1997) found that NZ firms reported closer relationships, were more familiar with customers and had greater insight into customer needs compared to US technology firms. US firms were more concerned with building better interfaces with customers. Anecdotal evidence from this study suggested that NZ firms are proficient at creating customer relationships. Baxter and Matear's (2004) analysis has identified intangible relationship value as consisting of two relationship types, human and structural value. These relationship types represent the seller's insight of the customer. Human intangible relationship value comprises competence, attitude and intellectual agility. Competence represents the knowledge, skills and expertise of the customer which is demonstrated in a variety of situations (Roos, Roos, Dragonetti & Edvinsson, 1997). Attitude represents the demonstrated personality of the customer's employees and which is manifest in the behaviour of the employees in the workplace. Intellectual agility is the ability to apply competence, self-learning and adaptation (Hamel, 2006).

The structure value of the relationship captures the organisation and informational aspects of intangible resources. This aspect is represented by relationships, organisational benefits and the customer's ability for renewal. The relationship factor does not necessarily mean interaction with the customer, but access to a customer organisation's relationships. The organisational dimension means the customer resources that may be of benefit to the seller. The customer's ability for renewal and development may benefit the firm in the future.

#### New product success factors

A new product development project has the potential to reward organisations with competitive advantage and make a positive contribution overall to the seller's business (Huang, Soutar & Brown, 2004). There are several determinants of new product success including organisational factors (Balachandra & Friar, 1997), technology and the unique features of the product. Research and development, strategic planning and cooperative ability are all important organisational factors. Another determinant is the effects of the relationship network including customer and supplier involvement which can reduce costs and improve quality.

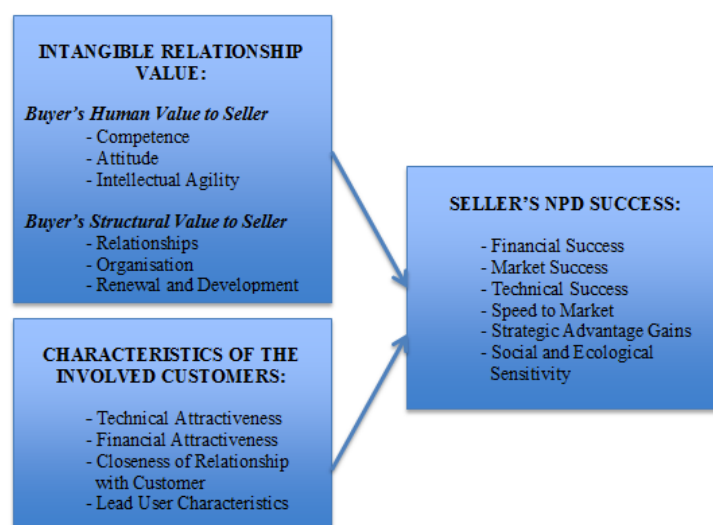
To evaluate new product success in the literature often utilises single item measures such as profitability (Choy, Yew & Lin, 2006) and market share success against competitors. While single measures are efficient yardsticks, a broader evaluation of NPD success requires multidimensional measures. According to Cooper and Kleinschmitt (1997), measures that capture marketplace impact, market opportunities as well as financial performance are needed. Gruner and Homburg (2000) expanded the scope of new product success measurement by looking at items that refer to the product and its link to the customer more directly rather than just financial and market outcomes. They examined the quality of the new product, as well as financial new product success, the quality of the new product development and the importance of the new product for the business customer. In addition they also considered the impact of the new product on the customer's business processes by considering the inexpensiveness of new product ownership reflected in the reduction of customer costs and improving a customers' ability to reduce their own prices. While Gruner

and Homburg's (2000) measure captured the product, customer and financial aspects of the new product, the broader strategic benefits of the new product development are less explicit in their measure.

Griffin and Page (1996) developed a measure of new product success using items such as technical, customer and financial success. Baxter (2007b) argues that to capture the value of new products to the firm in the longer term more strategic, organisationally based measures of new product success are needed. Baxter's (2007b) measure includes such items in addition to the three items from Griffin and Page's (1996) study. These items include speed to market (Cooper & Kleinschmidt, 1997) a measure which has had limited coverage in the literature, the strategic advantage gains to the seller with the new product, and lastly sensitivity to the environment is a customer concern which is reflected in the social and ecological sensitivity. Thus the Baxter (2007b) measure reflects the NDP success from the point of view of the seller and includes the traditional financial, market, technical success factors as well as the more strategic success factors to the seller namely speed to market, strategic advantage gains and social and ecological sensitivity.

The conceptual framework in Figure 1 below shows the coordination of resources needed to provide the flow of customer information for new product success. Sellers need to be able to access information customer needs and a sound customer relationship is necessary. This information is crucial for new product success. The first heading is the human value to the seller which refers to the resources that the seller gains from the relationship with buyer. Examples of such information include market information, technical data and information on distribution channels. The second heading, structural value to the seller shows the intangible resources relationship for the seller and includes the existing information resources such as databases, processes patents and networks. Renewal and development refers to process within the organisation which is in planning but yet to have impact. The third heading customer characteristics have been shown to have a positive effect on cooperative outcomes (Doney & Cannon, 1997) including lead user characteristics.

Figure 1. The relationship between intangible relationship value, customer characteristics and seller's new product success.



## Research method

The conceptual framework in figure was tested amongst New Zealand manufacturers by means of a survey which allowed the impact of customer characteristics and intangible relationship value on new product development success to be quantified. From the Kompass database the email addresses of senior managers in 1000 manufacturers were identified. Additional steps were taken via phone calls to identify company personnel that were informed on new product development for that particular firm. These participants were sent an email with a cover letter discussing the purpose of the research and a link to complete an online survey located on Survey Monkey.

The questions addressed involvement of a business-to-business customer in the NPD processes of their company. Participants were able to rate the customer characteristics and intangible relationship value effects relevant to new product development on new product success as seen from the seller's perspective. Participants were also asked to think about their third ranked customer to avoid any bias that may be present from thinking about their top customer. The data was then analysed using SPSS v19. The analysis included exploratory factor analysis followed by a cluster analysis which was conducted on the new product success items to identify relevant clusters of respondents. The significance of customer characteristics and intangible relationship value constructs on the new product success clusters was assessed by means of a discriminant analysis based on the clusters identified.

The questionnaire consisted of an introduction about new products, then several more sections which measured the items in the conceptual model. The first section consisted of six items measuring human and structural intangible relationship value (Baxter & Matear, 2004). Next six items measured new product development success (Baxter, 2007b), eight items measured customer characteristics (Gruner & Homburg, 2000) and finally a range of demographic questions were included among them: customer industry type, duration of the relationship, and number of employees. Apart from the demographic measures the scale questions used seven point Likert scales anchored with 1 strongly disagree to 7 strongly agree. Pre-tests of the questionnaire were tested informally with several managers to see that the questionnaire performed adequately.

This response rate was about 10%. 102 participants responded to the survey and details of the sample are shown in table 1:

Table 1 Organisational position of participants

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

## Findings

An exploratory factor analysis (EFA) was firstly conducted on the human and structural value measures. This analysis in table 2 shows that the scale performed as expected with two factors that explained 87% of the variance and had eigenvalues over one. The reliability measures for these scales were .94 for human value and .91 for structural value.

Table 2 Exploratory factor analysis -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

The customer characteristic measures were also subjected to an EFA and those items correctly loaded onto the one factor as expected explaining 61% of the variance, with reliability as measured by Cronbach's alpha of .85. The new product success measure also loaded as expected onto one factor and explained 58% of the variance and its reliability as measured by Cronbach's alpha was .83. Thus all the scale items used showed good unidimensionality and reliability.

The next step was to group or classify the participants according to their response to the new product success items. Thus a hierarchical cluster with Ward's method was implemented with squared Euclidean distance to measure the linkage between the groups formed.

The results of the cluster analysis found two clusters, the first cluster consisting of successful new product development firms with 70 participants and the second cluster consisting of 32 less successful new product developers. The clusters and their new product success ratings are shown in Table 3. The differences between the clusters were statistically significant at  $p < 0.05$ . The table show a clear difference between a successful cluster  $n = 70$  and a less successful new product cluster  $n = 32$ . Examining the differences between the groups shows the additional items speed to market, strategic advantage and social and ecological sensitivity discriminate particularly well. Given the 1-7 Likert scale it can be seen that firms in both clusters were relatively satisfied with their new product development success. However the less successful cluster rated poorly on the speed to market and the other strategic measures.



**Table 3. Cluster analysis based on NPD success**

	Less successful cluster		More successful cluster	
	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

The discriminant analysis that followed was based on these two clusters in table 3. The next step was to perform a discriminant analysis on the independent variables customer characteristics and intangible relationship value. This process was carried out separately for these two constructs. Table 4 shows the results for the characteristics of involved customers on new product success. As the sample sizes for the clusters are different the discriminant analysis has to predict the likelihood that the customer characteristics and intangible relationship value correctly predict new product success. The benchmark for this prediction based on the two 70/32 cluster sizes is 57%. A meaningful discriminant analysis should give an information gain of 25% (Hair et al. 2006). The results for the customer characteristic items were Wilks lambda .835, Chi-square 17.5 with 76% correctly classified cases, an information gain of 33%.

The results indicate that the results of technical attractiveness and lead user characteristics are significant indicators of new product success. The discriminant coefficients are over 0.4 and are positive. This result contrasted with Gruner and Homburg's (2000) research which found that technical attractiveness was not a significant indicator of new product success.

**Table 4. Discriminant analysis of Customer Characteristics**

	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

Table 5 shows the impact of the intangible relationship value characteristics on new product success. The standardized canonical discriminant function coefficients are positive for competency, intellectual agility and development work but are negative for attitude,

network relationships and organisational attribute factors. These significant components belong to the human relationship value construct.

**Table 5. 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 Wilks lambda for intangible relationship value was .871 with a Chi-square 17.5 and 75% correctly classified cases, an information gain of 32%. It should be noted that the development work item was marginally significant at  $p < .10$ . Taken together, these results show that the structural component of the relationship has no significant impact on new product success, unlike the human value component.

### Discussion

These findings further add to the list of customer characteristics which are important to new product success. To answer the first research question, and taking into account Gruner and Homburg's (2000) findings on customer characteristics, some differences are evident in these results. The lead user characteristic was significant in both studies, as was technical attractiveness but in this study only. The adoption of the new product by a lead user is seen as an important signal by the seller for the marketplace. Technical attractiveness was non-significant in Gruner and Homburg's (2000) study, but significant in this research. Technically attractive customers have know-how and this latter finding could be a reflection of the relative lack of expertise in the seller firm. This lack of expertise could reflect a smaller technical resource base for firms in this New Zealand sample. The implication is that the seller is more dependent on the technical attractiveness of the customer in terms of this resource. Technical competence has been found by Ritter and Gemunden (2004) to be important in innovation success.

The closeness of the relationship item did not discriminate very well, as it is not statistically significant. This item measured the interaction of the seller and buyer outside the new product development process. This result may point towards more direct competition in the marketplace and a greater need for confidentiality in the new product development process. Another explanation is that it is not the closeness of the organisation relationship that is important but the seller's relationship with the individuals or customer's employees. Previous new product research into in New Zealand showed that technology firms were encouraged to spend time with customers (Souder et al. 1997). The financial attractiveness of the customer was not important to sellers in this sample in contrast to Gruner and

Homburg's (2000) findings. This results may mean that sellers find this customer characteristic more difficult to assess, however in this research specific steps were taken to avoid the biases from choosing the best customer. In terms of assessing financial attractiveness the question could be asked whether it is short term financial attractiveness that is important to the seller or the longer –term financial potential of the customer in relation to the new product. Further research could clarify this point. Financial attractiveness is also a representation of reputation in the marketplace. A further reason for the differences between the New Zealand and German sample could be the broad coverage of industries in the New Zealand sample compared to Gruner and Homburg's (2000) findings which used a sample from one industry.

In terms of relationship value and addressing second research question, the human factors were significant predictors of new product success. Unlike the customer characteristics, these measures focus more on the customer's employees and their attributes. In terms of resources firms are more likely to utilise the personal contact within the customer for information flow and access to other resources. The importance of competence reflects the fact that more competent employees of the customer firm are more likely to aid information flow which enhances the success of the new product. A significant finding for attitude is that personal qualities or motivation of the staff within the organisation is more attractive to the seller. Lastly the ability to apply competencies and new learning is seen as important for sellers in perhaps overcoming resistances to new products. In contrast to the closeness of the relationship, it is the individual human aspects that are important not the relationship per se.

In contrast, the structural or organisational aspects of relationship value were not significant and the result indicates as with the financial attractiveness in the customer characteristics result that the organisational aspects of the customer are less important for NPD success. The customer's networked relationships are considered not important for NPD success. The reason could be that selling firms are unaware of all the networks possessed by the customer or that if sellers are aware of these networks they are unaware of their value. The organisational attributes focuses specifically on knowledge processes and structures are useful to the firm. One reason for this result could be that these attributes may be too specific to the customer to be viewed as useful for new product development. One item that was marginally significant was the importance of customer's development in terms of markets and products. This result is linked to the technical attractiveness and lead user characteristics both of which were significant. These results address the third research question in that characteristics that are customer or buyer focused such as human value, technical attractiveness and lead user characteristics are more useful in predicting new product success rather than the structural value and financial attractiveness measures which seem to be more organisationally focused.

The new product success scale of Baxter (2007) was tested and showed good reliability and reflects a more strategic focus in the measure. One potential limitation is that the use of this scale may have led to the differences in results between the Gruner and Homburg (2000) study and the results reported here. However it should be noted that all items on this new scale discriminated successfully between successful and less successful clusters. This research showed the importance of speed to market, strategic advantage and ecological sensitivity as important items in the measurement of new product success.

The findings of this study indicate the customer factors that new product developers should prioritise, and encourages the managers involved to understand the characteristics of their customers better, in order to develop effective and valuable relationships towards new product success in business markets. Therefore, careful identification of customers based on the lead user characteristics and technical attractiveness as well as the human dimensions of intangible relationship value can increase the chances of a successful new product outcome. The results of this study show that the dimensions of human value to the seller predict NPD success in contrast to the dimensions of structural relationship value.

Managerial implications from this research include the need for managers to recognise the lead user characteristics and technical attractiveness as potential resources for the selling firm in new product development. In addition managers must consider the intangible components of relationship value as important too particularly the human items such the competence of the customer, attitude and intellectual agility. The attributes related the organisation is less relevant including financial attractiveness and closeness of the relationship. In terms of measuring new product success in addition to the traditional measures of such as market success, financial and technical success, managers should be conscious of the need to measure the strategic advantage, speed to market as well as ecological and social sensitivity.

This research has expanded the range of customer characteristics to include some of the human relationship value dimensions which are important in new product success. Previous research into new product success has highlighted important market differences between markets e.g. Souder et al. (1997) and Beverland, Ewing and Matanda (2006). Future research could examine more closely the market differences that affect how customer characteristics and relationship value determine new product success.

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