

**‘Design for Desirability’:
Perceptions and Implications in New Zealand Export Industry**

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ABSTRACT

The value of industrial design’s contribution in creating sustainable competitive advantage is recognised and growing (e.g. Kotler and Rath 1984, Kotler 2003, Hertenstein et al. 2005). The importance of the role industrial designers play in producing products that are successful in the marketplace has also been widely acknowledged, see e.g. Dahl et al. (1999) and Srinivasan et al. (1997).

This study takes the standpoint in the concept of ‘desirability’ as an over arching term for the benefits provided by design in an industrial context. The purpose of the study was to explore industry perceptions of what desirability is and what it means for companies and their products. In the paper, the benefits of using industrial design in terms of product preference, market success, company performance, are reviewed and related to an explorative study of perceptions of ‘design for desirability’ in New Zealand export manufacturing industry.

In the research, the topic of ‘design for desirability’ was explored through semi-structured interview studies with respondents from four companies. The findings revealed that desirability is related to both perceived product performance and company performance and signifies a range of factors. The level of understanding desirability, as well as the ability to engage with designing for desirability, varies across the companies studied. It appears that a stronger market position relates to a more thorough understanding of desirability factors. Across companies, there is a need for approaches that allow for a more thorough understanding of end user needs and perceptions of desirability.

Managerial implications of this study includes that it is important for managers to realise that desirability is complex and interactive in nature and requires a holistic approach which spans across company activities in order to be effective. Furthermore, the development of desirability should be driven by strategic goals, informed by a thorough understanding of target market and end users.

INTRODUCTION

Internationally, the use of design is seen as a significant factor in creating product and business performance value. The need for strong economic development has led to a range of initiatives from the New Zealand government to identify factors for increased competitive strength on a global market. The Design Industry Taskforce (2002, 2003) found that design is under-used by New Zealand businesses that often do not recognise the level of design input needed to succeed internationally. Previous studies have acknowledged the need for more sophisticated understanding of business

improvement and the pursuit of international competitiveness (Knuckey et al., 2002) as well as the need for increased utilisation of industrial design (Slappendel, 1996).

It is well known that design contributes to the experience of products. For example, Givechi and Velasquez (2004) showed that product design is capable of eliciting positive reactions such as joy, inspiration and achievement. Mano and Oliver (1993, p. 451) emphasize the interrelationship between product satisfaction and product-elicited emotions, acknowledging the importance of the subjective, experiential response for product satisfaction. They report that the dimension of 'hedonic' or 'aesthetic' performance, which includes the valuation of products for their intrinsically pleasing properties, is one of the two major dimensions of product relevance; the other being the notion of instrumental or utilitarian performance.

In the field of affective ergonomics, Jordan (1998, p. 25) argued for the importance of making products not only usable, but also pleasurable to use. Jordan found that properties of products that are salient in terms of influencing the level of pleasure/displeasure with a product include aesthetics, apart from traditional aspects such as features, usability, performance and reliability. Seva et al. (2007) found that affect created by product design strongly influence purchase decision.

Authors in a number of fields, from psychology (e.g. Norman, 2004) to design have offered a variety of viewpoints which provide insights into the complex nature of product experience and its relation to, e.g., meaning (Vihma, 1995), formal aesthetics (Muller, 2001; Warell, 2001), and emotions (Desmet, 2002). Clearly, desirability is created through a range of aspects related to the experience of the product.

DESIRABILITY AND INDUSTRIAL DESIGN

The central proposition of this research is that the concept of desirability, seen from the viewpoint of any stakeholder of the designed product, is fundamental for achieving a product that will subsequently be positively perceived and become successful in relevant markets. Thus, it is assumed that a higher level of desirability will lead to a higher level of success in the marketplace, due to a more desirable product offer that is preferred and chosen by customers, thus leading to increased sales.

The term 'desirability' is used in this research to bring the focus to the perceived benefits of the product to stakeholders. At the core of the concept of desirability, thus, are perceptions. Desirability may be seen from the internal perspective, through perceptions of stakeholders within the company, and from the external perspective, through perceptions of stakeholders outside the company. Internal stakeholders may be senior managers, designers, engineers, marketers, purchasers, sales or production. External stakeholders may be wholesalers, retailers, customers and end users. It is recognised that given such a wide range of stakeholders, the interpretation of desirability will be wide ranging. We wanted to explore these interpretations and relate them to previous research. It is thus the experience of the product that is central for how we see desirability; the product is desirable if the product and its benefits are experienced as beneficial for its various stakeholders. From a design point of view, the aspects of desirability that are of interest are related to factors that may be influenced by industrial design in whole or in part.

Specifically, the focus was on the relation between design and desirability. We wanted to explore how what ‘desirability’ means for the studied companies, and how ‘desirability’ influences the design of the companies’ products. Industrial design activity in companies is perceived as contributing to the creation of desirability for internal and external stakeholders.

The term desirability has been used in product design related research, though not extensively. Benedek and Trish (2002) describe ‘desirable’ as “worth having or seeking, as by being useful, advantageous, or pleasing”. Furthermore, they define ‘desirability’ as: “fun, engaging, natural, enjoyable, valuable, essential, suitable, worthwhile, beneficial, likeable, in demand, amusing, and appealing.” In this research, we see *desirability* as

“any perceived factor of the company or product experience that influences stakeholders’ attitudes or evaluations towards the product”.

Focussing on industrial design, Hertenstein et al. (2005, p.4) describe the contribution “enhancing customer interface with the product, including ease of use, capabilities, and appearance”. This is in resonance with the definition provided by Veryzer (1995), stating that industrial design contributes to the process of enhancing the value, utility, appearance, and manufacturability of the product. Industrial design’s impact on, e.g., product appearance and user friendliness has also been noted by e.g. Gemser and Leenders (2001), Ulrich and Pearson (1998), and Walsh et al. (1992). Furthermore, Hertenstein et al. (2005, p.5) note that “industrial designers’ focus on improving customer ease of product use and their graphic and aesthetic capabilities help to differentiate competitive product offerings and attract customers”. This, in turn, enhances perceived product value and strengthens the demand for the product.

In our view, the connection between product attributes and the product experience (including use, attitudes, perception, emotion etc) is the focus of the design effort that contributes to desirability. This leads us to the adoption of an alternative definition of *design* in this context, as

“the creation of appropriate, desirable and meaningful experiences for people”.

Thus, industrial design contributes with these experiences in the context of industrial serial production, with ‘people’ as used in this context referring to customers, users, or perceivers, i.e. anyone who has a subjective experience of any type of the product.

DESIRABILITY AND PRODUCT PREFERENCE

The fact that industrial design related aspects such as product aesthetics can act as a factor that enhances the desirability of a product offering has been noted by many researchers. This is true for company internal as well as company external perceptions.

Yamamoto and Lambert (1994, p.317) recognise that “the impact of product appearance affects people in different organisational functions, across a range of technical orientations”. In ‘buy-to-sell’ situations (such as a manufacturer selling to a distributor), “decisions can be strongly influenced by perceptions of value added to the product or system being produced. The aesthetic properties may be seen as

providing additional value to the purchaser of a product or system that includes them” (p.310). For internal stakeholders (engineers, purchasers and marketers), Yamamoto and Lambert showed that the attractive products outperform the less attractive one in terms of preferred product choice for a set of industrial and consumer products. Their findings provide evidence that (1) pleasing product aesthetics may have an impact on product evaluation, and (2) that aesthetically pleasing properties appear to have a positive influence upon preference.

The relationship between consumer evaluation of product design and choice of product has been studied by e.g. Seva et al. (2007). Their research showed that there is a strong relationship between design attributes of mobile phones and pre-purchase effect. Attributes having a significant effect of positive feelings towards the product such as contentment and encouragement, included the width of the phone’s body, how slim it is, a large display size, and use of several colours (Seva et al. 2007, p. 729). The influence of size and appearance on the choice of mobile phones among people aged 18-34 years was also shown by Karjaluoto et al. (2005). Schiffman et al. (2001) identified emotion as the basis of consumer decision-making (Seva et al. 2007, p.730).

Creusen and Schoormans (2005) recognise the opportunity for product design to offer a differential advantage in the marketplace, stating that “the appearance of a product influences consumer choice in several ways”. Their study identified a number of ways in which product appearance plays a role in consumer product evaluation and choice of products. These factors include the communication of aesthetic; symbolic; functional; and ergonomic information; attention drawing; and categorisation, with aesthetic, functional and symbolic roles being the most important. They conclude that the use of generating generic guidelines for the aesthetic design of products is very limited, as several of the factors, e.g. aesthetic and symbolic, are very personal and thus highly subjectively assessed. Instead, product concepts should be tested with a target group of customers in order to assess the response to product appearance in each specific case. Furthermore, research by e.g. Berkowitz (1987) and Sewall (1978) has indicated that product form affects beliefs about the product and the brand, and that these beliefs are likely to affect consumer preferences (Hertenstein et al. 2005, p.6).

INDUSTRIAL DESIGN AND MARKET SUCCESS

Thus, there is clear evidence of the positive impact of industrial design on customers’ reactions to products (Hertenstein et al. 2005). Studies also provide evidence of the connection between design and sales performance and market success. For example, Block (1995, p.16) states that “the physical form or design of a product is an unquestioned determinant of its marketplace success”.

Furthermore, findings from a study by Cooper and Kleinschmidt (1987) where the performance of 203 new products was analysed showed that product design, including the design process, was the most important determinant of sales success. Specifically, the strongest success factors were (Cooper and Kleinschmidt 1987, p.180):

- (1) *Product advantage*; including a product that offers unique features for the customer, is of higher quality, has reduced customer costs, is innovative, is superior to competing products in the eyes of the customer, and solved a relevant customer problem.

- (2) *Proficiency of predevelopment activities*; including the undertaking a proficient set of 'up-front' activities such as initial screening, preliminary market assessment, preliminary technical assessment, detailed market study or marketing research, and business/financial analysis.
- (3) *Protocol*; a clear definition prior to the product development stage of the target market, customers' needs, wants and preferences, the product concept, and product specifications and requirements.

Yamamoto and Lambert (1994, p.317) conclude that "attention paid to product aesthetics may have a payoff in terms of sales performance. Simply put, industrial design can be a competitive weapon." In a study of senior market managers, Bruce and Whitehead (1988) showed that design was regarded the most important determinant of new product performance; only price was considered more important (Block, 1995).

With respect to product performance indicators, a Dutch study of firms in the instrument and furniture industries (Gemser and Leenders, 2001) found a statistically significant correlation between perceived improvement in 'product appearance' and industrial design investment. They also recognise the role of industrial design to create pleasing product appearances as one of the strategies to create differentiation in the market.

INDUSTRIAL DESIGN AND COMPANY PERFORMANCE

It has also been shown that consumers assign greater value (i.e., price) to well-designed products (Veryzer, 1993, in Hertenstein et al. 2005, p.6), which links industrial design directly to financial result. In an exploratory study of four industries, Hertenstein et al. (2001) found that firms characterised by good industrial design showed better return on sales as well as return on assets (Hertenstein et al. 2005)

Research by Borja de Mozota (1990) provided evidence of a correlation between companies investing in design and the launch of more profitable products through profit increase achieved by expanding sales, reduced manufacturing costs, and reduced advertising costs. However, the impact of industrial design on company performance is not unconditional, but dependent on industry evolution and design strategy (Gemser and Leenders, 2001) – investments in industrial design have a significant and positive influence on company performance, particularly when the strategy of investing in industrial design is new to the company. Walsh et al. (1992) found a statistically significant difference between design-conscious and other firms for profit margin in one of the industry groups of their study (Hertenstein et al. 2005, p.7).

In a study of 93 manufacturing firms, Hertenstein et al. (2005) examined the relationship between industrial design and company financial performance over a period of seven years (1995-2001). Their results indicate that firms having 'high design effectiveness' were stronger than firms having 'low design effectiveness' with respect to return on sales, return on assets, net income, and stock market returns. The measures included expenditures on industrial design (e.g. salaries, resources and facilities) and expenditures that designers influence through their design choices (materials and manufacturing equipment).

A study conducted in 565 French companies (Groupe Bernard Juilhet 1995) indicated that industrial design had a positive impact on aspects such as the image of the firm, the appearance ('look') of products, and customer satisfaction. Furthermore, financial performance, especially in terms of average turnover, export sales, net yield, and net results per employee, was better in firms regularly investing in design than in firms not investing in design (Gemser and Leenders 2001). Gemser and Leenders also report on studies carried out by the British 'Design Innovation Group', which looked at the relation between company performance and the receipt of design awards (Walsh et al. 1992). The studies showed that firms with 'good design' credentials did perform better than the randomly selected 'typical' firms, especially with respect to turnover growth and profit growth, however the results are not statistically significant due to the small sample size and the successful firms were also very good at other business aspects such as marketing and manufacturing.

Findings from a study of more than 1,100 Swedish companies (Nielsen et al., 2004), showed no correlation between profitability and investment in design. However, companies with a high level of design maturity showed very good economical development. The study also indicated that the change in gross results during the studied period (1999-2002) was significantly higher for companies that invested in design. For companies that do use design, results indicate that a more strategic use of design would be beneficial. Thus, Nielsen et al. conclude that it is rather *how* design is used than the mere employment of design as such which is important for company development.

A study on the use of industrial design expertise in 66 New Zealand organisations (Slappendel 1996) suggested that the use of industrial designers is related to strategic orientation, with 'Prospectors' (firms attempting to pioneer in product development) being more likely to use industrial design expertise than non-Prospector types. Furthermore, the use of industrial design expertise had a highly significant positive relationship with organisation size. However, no relationship was found between the use of industrial designers and design performance, as measured by design awards, or financial performance as measured by business growth.

METHOD

In the research, a grounding approach was taken to explore the company internal perceptions of desirability for the four companies participating in the study. Thus, no predetermined definition of 'desirability' was presented or adopted. It was the views and experiences of the respondents that was the basis for the qualitative interview data collected. The reason for this is that we did not want colour the perceptions or focus the attention of respondents to any specific aspect of the term. The intention was to allow for respondents to explore the concept of desirability in their own terms, and for the particular context of their own company. All interpretations of what desirability may be were seen as relevant and valuable.

Four companies representing significant New Zealand exporters to the global market, operating in the business-to-business as well as in the private consumer markets, participated in the study. The method used in the study was the qualitative research interview (Kvale, 1996). In the interviews, a semi-structured interview guide was followed in order to make sure that required topics were treated. The interviews with respondents were done at the premises of each respective company. They were carried

out together with two or three researchers and took around 1½ hours each. The interviews were recorded and transcribed for later analysis. A total of 10 respondents including group managers, sales and marketing managers, design directors, industrial designers, technology leaders, and design engineers were interviewed.

The sample size in terms of companies and total number of respondents of this study only allows for qualitative analysis and the identification of interesting findings valid for this particular study. The purpose was to learn about company respondents' viewpoints on what desirability is for them and their company, and how desirability influences the design of their products.

FINDINGS AND DISCUSSION

In the following, the interview data is presented in a concise manner in four Exhibits, one for each respective company. Each Exhibit presents responses derived from the analysis of the transcribed interviews, according to the following two key areas:

- What does 'desirability' mean for the company?
- How does 'desirability' influence the design of the company's products?

Company A is a business-to-business company operating in a traditionally conservative market of professional end users. The company internal concept of desirability focuses on meeting customer requirements with respect to their development and manufacturing processes. There is a limited understanding of the characteristics of the end user, and of end user perceptions and evaluation of products. This is partly due to the fact that the customer is not usually the end user. The need for improved processes for the elicitation and evaluation of end user preferences and requirements is recognised. Industrial design is a very small activity which has not reached maturity and full potential.

What does 'desirability' mean for the company?

Meeting customer requirements
Being flexible
Providing tailored solutions
Having a professional attitude to product design and development
Being innovative, thinking differently
Reducing assembly time
Providing cost effective production
Putting themselves in the shoes of the end user

How does 'desirability' influence the design of the company's products?

Usability of radio
Focus on robustness or the perception of robustness
Reliability and quality of product
Making a radio 'look and feel' like a radio

Exhibit 1. Perceptions of desirability from Company A, a radio communications industry.

Company B develops, manufactures and markets products for the business-to-business as well as consumer markets. They have a good understanding of their market situation and what design can do to improve the perception of their products. They also have a good understanding of the desirability factors as perceived by

internal stakeholders, retailers and customers. Desirability on part of the retailer is seen as a factor of at least equal importance to the desirability of the end user customer. Although they invest regularly in design, the added value of design to the product is seen as minimal apart from improved appearance.

What does 'desirability' mean for the company?

- Reliability and trust
- Perceived in the market as an innovator
- Deliver to the needs of their customers
- Distribution footprint
- Offering unique premium products
- Product innovation
- Providing an offer for every customer
- Profit: if dealers make good money out of selling our product, more dealers would want to carry them
- Brand aspirations; customers have positive associations with the brand as a 'professional attribute'

How does 'desirability' influence the design of the company's products?

- Consistent use of shapes and certain design elements
- A form that expresses properties and describes functionality and benefits
- Products that do things no other similar products do – unique benefits
- The product needs to tell a story
- Performance against cost
- Core values; reliability, trust, it works
- Specific features; e.g., conserve energy, higher power output
- Functionality; higher performance than other products, and portrays it
- The product says something about itself, expression, description
- "Everyday benefit": Getting more function and performance out of a product with less hassle, maintenance, infrastructure

Exhibit 2. Perceptions of desirability from Company B, an agricultural product industry.

Company C operates on the business-to-business market. They see the desirability of their offer as being manufacturing and knowledge brokering in their market, with the competence to provide their customers with unique benefits and product solutions to meet their needs. Desirability focuses on cost, function and durability. They understand the need to offer more unique and innovative solutions thus creating more desirability for customers.

What does 'desirability' mean for the company?

- Providing clients with manufacturing services and clear expertise
- Meeting the needs of clients (manly function and cost)
- Developing knowledge and innovation in emerging areas

How does 'desirability' influence the design of the company's products?

- Extremely functional products with a high degree of utility
- Smarter or more clever products to differentiate from competitors
- Reducing production costs for clients through smarter tooling and small design changes
- A successful product is one that meets the needs of the client

Exhibit 3. Perceptions of desirability from Company C, a plastics manufacturing industry.

Company D operates primarily in the private consumer market, but also in the commercial market with specifically tailored projects. They have a thorough understanding of the end user and well developed processes for elicitation of end user perceptions and requirements. They operate on a well understood market and recognise that many customers have a strong emotional element in their purchase decision.

What does 'desirability' mean for the company?

The New Zealand part of our story

A brand that attracts customer involvement and a sense of customer ownership

Being part of the 'ultimate experience' through use of our brand products

An element of aspiration in the purchase of our products

How does 'desirability' influence the design of the company's products?

Products can be relied upon

Products that will perform at more than satisfactory levels in the real outdoors

Products that are well designed

Products that can be used in a broad range of environments and conditions

Making people look good

Functionality, durability and usability

Exhibit 4. Perceptions of desirability from Company D, an outdoor equipment industry.

In the following, the findings are discussed with respect to the two key areas.

What does 'desirability' mean for the company? The notion of desirability varies widely between the companies depending on industry type and the customer. Findings also indicate that the level of understanding and engaging with the concept of desirability is very different across the four companies. Some desirability factors are common across companies, such as meeting requirements or needs of users, being innovative, and providing cost effective manufacturing. Brand aspiration seems to be a desirability factor for companies who have clearly defined core values, a strong story and a prominent position on the market. Desirability factors of internal as well as external stakeholders are mentioned by all companies.

An interesting finding is that processes for understanding needs and preferences of end users are poorly developed. However, the need for improvement in this area is recognised by all companies. In terms of creating desirable products it seems this is an opportunity that has not been utilized and which can be led by industrial design activities in the future. In line with findings by Nielsén et al. (2004), it seems that although all companies do utilise industrial design competence, more consideration may be required for effective use, especially for strategic objectives. Organisation size does not appear to have an influence on the perception of and engagement with desirability factors.

How does 'desirability' influence the design of the company's products? Interestingly, while desirability for each respective company is composed of a number of factors ranging across activities such as manufacturing, marketing, sales, design, engineering and management, perceptions of desirability for products seem to be influenced by design and development only. Product related desirability factors mentioned across

industry types include usability/utility, reliability/quality, appearance, and functionality. As for brand aspirations, it seems that the companies with a strong market position also exhibit a world class level of design quality. This is possibly related to a high level of understanding of market and user related desirability factors.

CONCLUSIONS AND MANAGERIAL IMPLICATIONS

Cooper and Kleinschmidt (1987) suggested that the strongest success factors for new products included product advantage, proficiency of predevelopment activities, and protocol. Their findings are interesting for this study, as the success factors relate to how desirability can be achieved through product design. The first factor, product advantage, matches the perceptions of company related desirability factors as identified in this study. The second factor, proficiency of predevelopment activities, includes activities that may contribute with desirability factors from the point of view of marketing and sales. Findings in this study indicate the presence of desirability factors related to these types of activities. Finally, the third factor, protocol, includes the definition of end user and customer needs, wants and preferences. This is a factor that is mentioned by all studied companies as an area for further improvement.

Depending on company and products offered for various markets, desirability is related to both perceived product performance and company performance and signifies a range of factors. The concept of desirability is multi-faceted and elusive in nature, why companies struggle to define and to achieve specific objectives with respect to desirability. The level of understanding desirability, as well as the ability to engage with designing for desirability, varies across the four companies studied. From the limited qualitative study presented here, an indicative result appears to be that a stronger market position relates to a more thorough understanding of desirability factors. Common needs identified in order to improve product and company related desirability include:

- Tools or methods to identify and measure desirability factors related to product characteristics and attributes
- Understanding perceptions of product desirability by users and customers
- Eliciting user requirements and transforming that information into product related criteria
- Approaches that support the development of desirability factors through effective product design processes
- Product planning and development tools to meet meaningful targets on various markets

Managerial implications of this study includes that it is important for managers to realise that desirability is complex and interactive in nature and requires a holistic approach which spans across company activities in order to be effective. For this reason, it is important specifically with respect to industrial design to ensure effective interaction with other disciplines involved in new product development. Furthermore, the development of desirability should be driven by strategic goals, and should be informed by a thorough understanding of target market and end users.

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