Modelling the Strategic Impacts of Design in Businesses

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Researchers
M.Sc. Terhi Hietamäki, UIAH[1]/Designium[2]
M.A. Jaana Hytönen, UIAH/Designium
M.A. Miia Lammi, UIAH/MUOVA[3]

Supervised by
Project director D.Sc. Eija Nieminen, UIAH/Designium
D.Sc. Satu Lautamäki, UIAH/MUOVA
D.Sc. Markku Salimäki, HSE[4]/IDBM-program[5]

1 The University of Art and Design Helsinki
[2] The New Centre of Innovation in Design
[3] The Western Finland Design Centre
4 The Helsinki School of Economics
5 International Design Business Management – A joint teaching and research program of three leading Finnish universities: the Helsinki School of Economics, the University of Art and Design Helsinki and the Helsinki University of Technology

Executive Summary

This research project studied the impacts of design in different types of companies, aiming at developing a generic model for the evaluation of the strategic impacts of design in companies. As a result of the research, the **Evaluation Model for the Strategic Impacts of Design** was developed. With this analysis tool, the use of design in a company can be modelled and links can be drawn between design drivers, the use of design in company processes, and results. The model contains the indicators with which the impacts of design can be assessed. In addition, this report presents the successful design strategies behind successful product cases in different markets and situations.

The research was conducted in several different companies, representing a broad range of Finnish export industry companies, including ABB, Ekeri, Iittala, Kone, Nokia, Oras, SK Tuote, Suunto, and T-Drill. Most of these companies already utilize design at the strategic level (relating to issues such as brand, corporate identity, etc.). However, the experience in design usage varied from a few years to decades.

Development of the Evaluation Model for the Strategic Impacts of Design was based on case company interviews and literature research. The model consists of three main elements:

- **Drivers**, which concern the reasons why design usage can be profitable in different strategic situations.
- **Enablers**, which deal with a company's design usage – enabler indicators highlight the issues that companies should consider when implementing design strategies and organizing design usage. Enablers are further categorized into three parts: design in vision and strategy development, design management, and operative design usage.
- **Results**, which concern the measurement of design results, including external results such as customer results and financial results, but also internal process results. Accordingly, result indicators concern the realization of strategic goals within a company.

According to the case company practices, the central prerequisites for strategic design usage include the following: linking design usage to strategy, design competence both at strategic and operative levels, adequate design resources, seamless integration of design with other functions, as well as continuity and consistency of design usage. Especially vital is that the executive management understands the opportunities offered by design in different strategic situations. The experienced design-utilizing case companies considered the development of design briefing and evaluation as the main ways of improving their design usage. They also determined the degree to which designers could influence corporate strategy.

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1. Introduction

Studies conducted to date have not been able to ascertain indisputably the causal connections between design usage and its impacts. Studies have provided either correlations between good design (with indicators such as design awards and prizes) and business performance, or management views on the impacts of design. The following paragraphs briefly present two national studies that examine the economical benefits of design usage to promote design in Sweden and the United Kingdom; and indicate how the current research differs from those studies.

In 2004, the Design Council in the UK published a study on the impact of design on stock market performance of UK publicly listed companies. The study tracked 166 design-utilizing companies over a period of ten years, incorporating quantifiable evidence of positive impact of design on company performance. The companies were identified according to different design-using categories. The key finding of the study was that a group of 63 companies, identified as being effective users of design, outperformed the FTSE 100 index over the entire period by 200% (Figure 1). These effective design users beat their peers in the recent bull and bear markets.

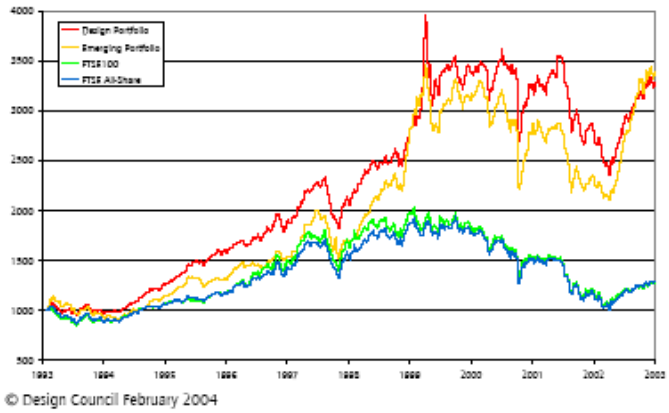


Figure 1. Performance over ten years 1994-2003

The study divided design-utilizing companies into two categories, i.e. companies that have a narrow and short-term approach to the design discipline, and companies with a broad usage and understanding of design.

The narrow, short-term approach defines design usage as a largely product-based activity:

- Focusing on applying aesthetics and form at a late stage in development
- Often acting in response to the market at large
- Leaving little room for innovation
- Not necessarily integrating design with a wider business strategy.

The broad and long-term approach integrates design into the company business:

- Using insights from design methods to guide business strategy and to shape product, service and process development from an early stage
- Enabling innovation based on an advanced understanding of user and market requirements
- Addressing issues of global competitiveness and added value
- Offering a co-ordinated approach to the long-term business strategy, including branding, corporate identity and communications.

The study showed that design investment can be a common denominator of exceptional stock market performance. The Design Council compared rapidly and moderately growing companies and found that design contributed to a great or relatively great extent in new product development in 48% of rapidly and 13% of moderately growing companies. The impact of design to increased turnover was three times more effective in rapidly growing companies than moderately growing companies. However, the research leaves the question of causal connections between the industry, design integration and the design results somewhat open.

In 2003, the Swedish Industrial Design Foundation (SVID) and the Association of Swedish Engineering Industries (Teknikföretagen) commissioned a survey on design usage by Swedish companies; the ensuing report covering attitudes, profitability and design maturity was published in May 2004. Observations supported the correlation between design usage and company performance, but the most important thing seemed to be the question of how rather than if design was applied.

The report presents a four-step design ladder for grouping the companies' experience in design usage on the basis of their own attitudes towards design:

Step 1: Non-design – design is only a negligible part of a company's business

Step 2: Design as styling – design is only used for the final physical form of the product

Step 3: Design as a process – design is seen as an important aspect of the business: it is incorporated into the corporate philosophy and is integrated from the early stages of the development processes

Step 4: Design as innovation – design is of such critical importance that it can reformulate some, or even all, aspects of the business.

This research project is part of the Design 2005 technology programme – launched in 2002 by Tekes, the National Technology Agency of Finland – one of the key measures in the national design policy statement. The Finnish Government adopted a resolution on Finnish design policy in 2000. The objective of the design policy was to establish a dynamic system of design in Finland to enable the nation to achieve the status of a forerunner in the utilization of design, and to improve the competitiveness of Finnish industry through design.

The research focuses on the impacts of design in different types of companies and aimed at ascertaining the economic benefits of design to businesses. The primary goal, and the result of this research project, is the developed 'Evaluation Model for the Strategic Impacts of Design'.

The project is being carried out at the University of Art and Design by Designium, the New Centre of Innovation in Design in co-operation with MUOVA, the Western Finland Design Centre. In order to find reliable indicators showing the impacts of design, the case company structure involves several different business types. Participating companies broadly represented the Finnish export industry – including ABB, Ekeri, Iittala, Kone, Nokia, Oras, SK Tuote, Suunto, and T-Drill. Most of these companies already utilize design at the strategic level (relating to issues such as brand, corporate identity, etc.). However, the experience in design usage varied from a few years to decades.

1.1 Objectives of the research

The goal of this research project was to provide evidence of the impacts of design usage, and to examine differences in design usage through studying design usage in different company and business types. The purpose was to develop the generic Evaluation Model for the Strategic Impacts of Design, containing several indicators with which the links between design usage and its impacts can be assessed.

Thus, the objectives of this research included:

- Developing the generic evaluation model for strategic impacts of design in corporate business
- Finding causal connections between design and its economic impacts
- Comparing the design strategies and practices of the participating companies
- Developing evaluation criteria for the design usage in different types of company.

With the help of the model, it is possible to evaluate design usage in the different strategic situations that a company faces, such as an increase in competition, and to find causal connections between design usage and the impacts of design. The model includes the evaluation criteria for design usage and applicable business performance measures.

In addition to the research objectives, the participating companies had some extra expectations:

- Understanding the meaning of design in the context of one's own business
- Implementing a design strategy – requires the involvement of the top level of management
- Obtaining many different approaches to one problem
- Obtaining best practice examples (benchmarking)
- Enhancing communication within the organization – a common language for all
- Increasing understanding of the user
- Obtaining methods for assessing strategic impacts of aesthetics
- Developing the company culture more intricately – development of both products and people

The most essential goal for the research was to improve companies' understanding of the possibilities of design in different strategic situations, and to give successful examples of design usage in practice. However, there was little dialogue between the corporate executives, as the designers mainly represented the participating companies. Furthermore, the developed Evaluation Model for the Strategic Impacts of Design works as a tool assisting the implementation of design strategy and enhancing the communication of design within the whole organization.

1.2 Definitions of the basic concepts

In this research, design is defined simply as the work carried out by professional designers. The following approximate list defines aspects of design know-how important from the business perspective, according to the literature research and the case company interviews:

- Creativity/innovativeness/future vision
- User focus: aesthetics/usability/functionality
- Corporate/brand profile
- Visualizing and concretizing ideas and viewpoints of different disciplines/creating tools for the decision making
- Problem solving, e.g. for cost-efficiency.

Design management is defined here as the management of operational design activities. Thus, design management concerns the management and support processes of design, above all controlling, co-ordinating, evaluating and developing the resources and processes, i.e. promoting the operational activities to succeed. Design management does not cover so-called 'strategic design management' or 'design leadership', but these issues are included under the heading ' DESIGN IN VISION AND STRATEGY DEVELOPMENT' in the model (see Figure 2, page 10).

1.3 Research methods

The first year of the project (1 September 2003 – 31 August 2004) consisted of background research and interviews of the executive management in the participating companies. The framework for the evaluation model was developed through the business performance measurement models, e.g. the EFQM model and the Balanced Scorecard. At the same time, the success factors in design usage were sought from numerous case studies and the design literature. The research team had access to case material on about 100 companies gathered by Designium, MUOVA and the IDBM programme. In addition, the research group scanned the case studies from the Design Management Institute (DMI), the Harvard Business School, and the Design Council. The background research and the executive management views on the design benefits created the foundation for the preliminary evaluation model.

The company interviews in the first phase included 30 interviews with the executive management of the participating companies, and they took place between 17 March and 11 June 2004. The emphasis was to obtain an overall view of companies' design usage and the expected impacts of design. The framework of questions (Appendix) was the same for all interviews, but the questions were formulated for each interview according to the position of the interviewee within the company and the special characteristics of the company.

The second year of the project (1 September 2004 – 31 August 2005) concentrated on testing the findings of the first year with successful product cases. In each company, approximately two completed product cases were analysed by interviewing representatives from the operative level (15 interviewees) – product managers, project managers, and designers. The emphasis was on the role of design in each product case, and the goal was to delve more deeply based on the results of the first year, as well as to find successful design strategies.

In addition, Muova conducted a survey of design usage in Finnish companies. The objective of the survey was to test the validity of the model with quantitative data and to study the drivers, usage and impacts of design, in general, in different businesses and environments. Modification of the research questions was based on the executive management interviews. The questionnaire was posted to 500 CEOs of Finnish production companies in spring 2005.

The sample was selected randomly from the Statistic Finland's corporate registry. The sample covered companies from different branches of business employing over three people. The final response rate was 19.6%; while 98 companies eventually completed the questionnaire (total response rate was 25%, with 125 companies responding to the study, 24% returned the questionnaire unanswered). Most of the respondents represent small- and medium-sized companies, although big companies were also represented. Categorizing the results of the survey according to company size shows the tendency regarding design in the production companies (Table 1).

Table 1. Company size: Survey response rate and company rate in Finland

Company size/no. of employees	Response rate	Company response rate in Finland/approximate percentages
3–10	5%	93% (less than 10 employees, i.e. 1-10 employees)
11–50	59%	6%
51–00	11%	0.6%
101–250	15%	0.3%
Over 251	7%	0.1%

2. The Evaluation Model for the Strategic Impacts of Design

The Evaluation Model for the Strategic Impacts of Design works as a tool with which a company can model its design-influencing drivers, operations, and the expected results. The basis for developing the Evaluation Model for the Strategic Impacts of Design was to position design within a general view of business activities. The purpose was to find causal connections between design usage and its results and to separate the impacts from those of other functions; nevertheless, design is never solely responsible for the success. The purpose was to depict design decision-making at the strategic level and to ascertain the extent of design usage, i.e. the processes in which design is utilized.

The process to develop the evaluation model for the strategic impacts of design began with the study of numerous case studies of successful design usage and screening the generally used business performance measurement models, for example the Balanced Scorecard and the EFQM model. It was found important for the companies to have indicators for evaluating the design activity as a whole: design drivers, strategic decision making, operative design usage, design management, learning and process results, as well as external results, i.e. customer results and financial results.

The developed Evaluation Model for the Strategic Impacts of Design (Figure 2) consists of three main elements:

- Drivers, reasons for design usage in the company in different strategic situations;
- Enablers, companies' design usage, issues that need to be considered when implementing design strategies; and
- Results, measurement of the impacts of design usage, including learning, process, customer, and financial results.

Reasons for design usage are described as **drivers** in the model. Drivers include external drivers such as market needs and internal drivers such as corporate values. Drivers concern the possibilities of design in different strategic situations.

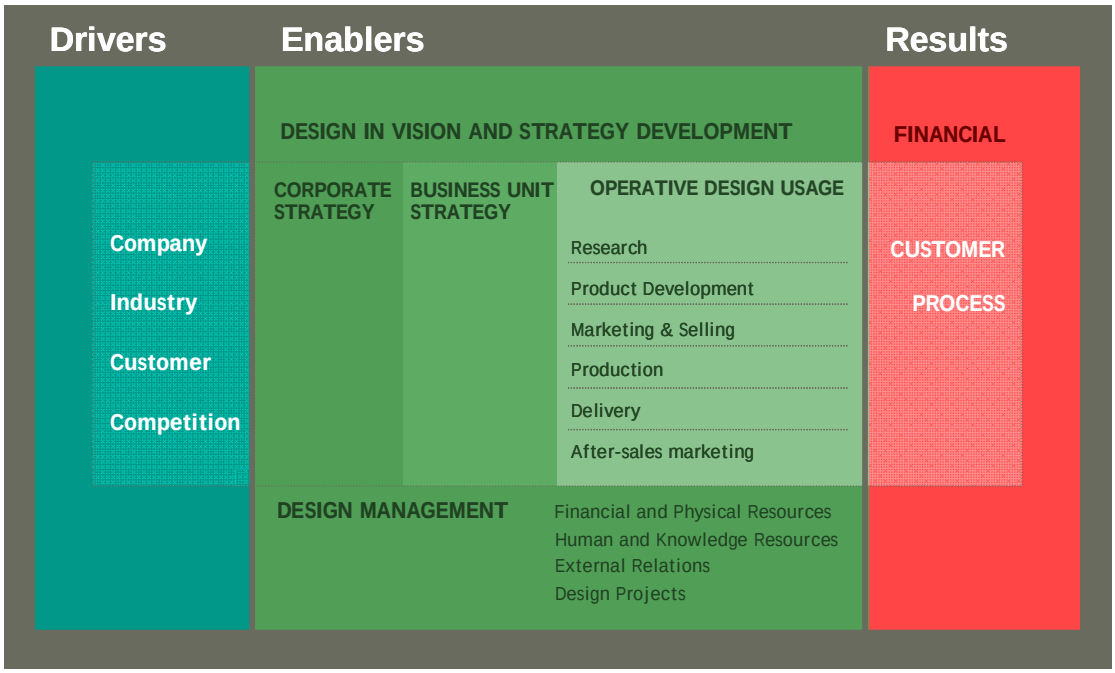


Figure 2. The Evaluation Model for the Strategic Impacts of Design

Enablers concern design usage – how design strategy implementation is realized, how design usage is organized, the scope of operational design usage and identification of design's role in managerial processes. Enablers are further categorized into three parts: design in vision and strategy development, design management, and operative design usage.

The third part of the model, **results**, concerns the measurement of results arising from design usage. Accordingly, result indicators concern the realization of the goals. Results include process results, customer results and financial results. Financial indicators include net sales, return on investment (ROI), and share price, for instance. They indicate ultimately the impacts of design for company success.

The enabler classification is based on the Universal Process Classifications Scheme (Figure 3), developed by a team of business professionals from Arthur Andersen, IBM, DEC, Xerox, and the American Productivity and Quality Center, and the International Benchmarking Clearinghouse has endorsed the scheme as an industry standard, which contains 13 business processes that apply to almost any business.

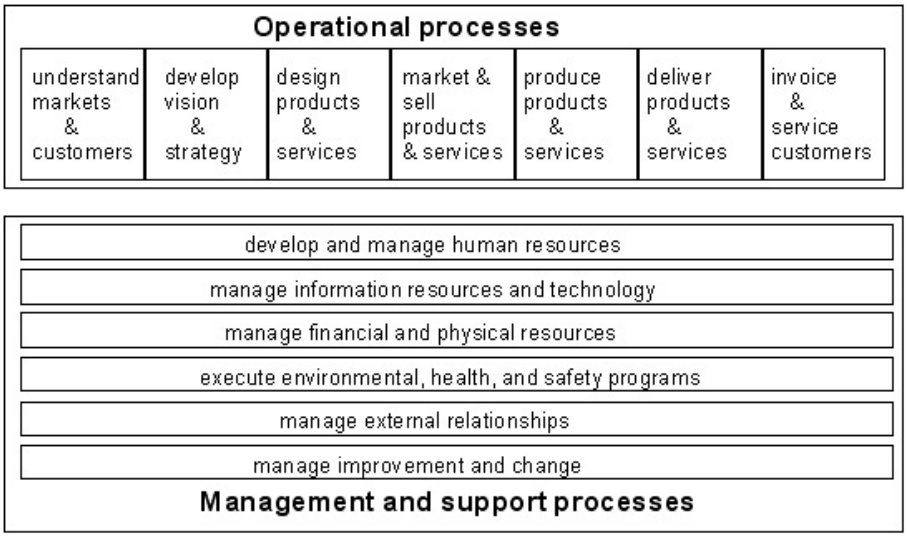


Figure 3. The Universal Process Classification Scheme

Operational processes are categorized into seven processes in the classification scheme. Together with the participating case companies, the research team made some alterations to adapt the classification to a design perspective. The process of 'understanding markets and customers' was modified into 'research' (understanding the customer and the market situation, i.e. competition creates drivers for design usage), and the process of 'invoicing and servicing customer's was renamed as 'after-sales marketing' according to the wishes of the case companies.

In the evaluation model, enablers are divided into three categories: 'design in vision and strategy development', 'operative design usage', and design management. Design in vision and strategy development concerns how to make sure that design is integrated into strategy development, both in corporate and business unit levels. Operative design usage deals with the scope of design usage – in which processes companies utilize design – and how design is utilized in each process. The operative level is responsible for implementing strategies but also for developing functional strategies and producing tools for decision-making at the upper levels.

Design management deals with design integration into managerial and support processes. Design management is responsible for the management of operational design processes, covering the management and support processes of design (controlling, co-ordinating, evaluating and developing the resources and processes), and above all for promoting operational activities leading to success. The categorization of 'design management' activity is based on the grouping of the management and support processes in the Universal Process Classifications Scheme, with some alterations. The execution of environmental, health, and safety programmes is omitted because these issues are not directly connected with design management (environmental issues are a matter for design briefing), and issues of managing improvement and change are included in other management and support processes. Instead, the management of design project management is added since it is an essential part of design management (design briefing, evaluating design, etc.). Thus, the subsections within design management are: financial and physical resources, human and knowledge resources, external relations, and design projects.

In the following chapters, each part and the indicators of the model are presented in detail; enabler indicators are displayed in green boxes and result indicators in red boxes.

3. Drivers for Design Usage

Drivers concern reasons for design usage in different strategic situations – factors in the business environment and the company's characteristics affecting the possibilities for gaining benefits from design usage. This section concerns the questions: How can design impart a competitive edge in different strategic situations? What are the driving forces for design usage? Both the empirical findings of the case company interviews during this research and the results of the literature research, e.g. the earlier studies, are included here to establish a more versatile and comprehensive view of the subject.

Drivers emerge often as a result of changes in the prevailing conditions, for example increasing rivalry in the business environment. On the other hand, drivers can also represent unexploited potential, for example an unsolved customer problem. According to Salonen et al. (1998), design is a topical issue for those companies segmenting or differentiating products, creating new profiles for different trademarks, and developing new products. Cooper & Press (1995) list five example cases of strategic roles for design usage (Table 2):

Table 2. Strategic roles for design according to Cooper & Press (1995)

Challenge	Strategic goal	Role of Design
Small firm in the consumer electronics market	Secure **distinctive international niche**	Provide niche through unique styling, identity and product innovation
Survival in a mature industry with keen price competition	Concentrate on added-value markets or processes	Add value through **fashion orientation**
Transnational manufacturer with diverse world markets	**Coherent identity** and appropriate exploitation of scale economies	Corporate identity and co-ordination of design resources to target global markets
Japanese companies in competitive western markets	Quickly develop products appropriate to diverse lifestyles	Integrate innovation process and **humanization of product**
Service supplier in newly competitive market	Develop **distinctive identity**	Corporate identity and environmental design

Internal drivers, in other words company drivers, include resource-based drivers, such as company size. Corporate culture influences the brand and corporate identities defining and marking out the role of design concerning the company, the products and services. Design competence develops as a result of experience in design usage of a company.

At the corporate level, internal drivers influence design usage through a firm's choices as core values and long-term ambitions. Values are long lasting, and they affect corporate leadership and, furthermore, strategic leadership influences generally the role of design in all units or functions. Actions taken and their emphases are dependent on the chosen values and strategy. The strategic leadership that should follow the core values specifies how the firm reacts to the external drivers. Internal drivers include also the visionary goal, which describes the company's desired future state, and therefore influences also design usage in competition. The visionary goal may also describe internal change – a typical goal for large corporations.

External drivers refer to environmental factors – economic, social, and technological factors – dealing with the basic characteristics of the corporate environment. These drivers determine, for example, how (and if) design can bring a competitive advantage to the particular industry, for example, is design typically used in the industry, and how intensive is the design usage?

External drivers refer to macroeconomic factors, but also to customer, competition, and industry factors. Industry drivers deal with the maturity and velocity of the industry, as well as the product type and standards and legislation in the industry. Customer drivers concern the customer type, market diversity, and the share of new customers. Competition drivers tackle the competition structure and the threat of new competitors and substitutes: how to develop a competitive advantage against direct and indirect rivals in different situations. External drivers define and specify corporate competitiveness in relation to the business environment. Business units develop and sustain competitive advantages for products and services: positioning the business against its rivals, anticipating and adjusting the strategy, for example according to the change in demand or technology, and influencing competition through strategic actions, for example vertical integration.

3.1 Company

Company characteristics are important drivers for design usage. According to Cooper and Press (1995), the bigger the company, the more important the management of intangible design assets; and furthermore, the impact of this must be measured internally. For example, the extent to which design is seen as an individual activity or an important part of the corporate planning process depends upon company size. Other company characteristics influencing design usage are the complexity of its production system and the nature of both the corporate and national cultures.

3.1.1 Company size

The major benefit of large company size is the strategic competence the company can develop to be utilized when needed. In a large case company, there were in-house designers concentrating solely on future concepts; whereas in small companies there were no resources for this, and designers had to do future visioning alongside their daily routines. In the largest companies, **design know-how** is seen as an important part of their competitiveness – it is difficult to imitate. The core competence related factors are kept within the company, or shared with a design consultant who can be trusted on the basis of a long-time relationship. Large companies have the capacity to keep the creative and most interesting design work within the company and outsource their routine work to external design agencies. Large case companies exploited economies of scale through the utilization of a **coherent corporate profile**.

Smaller companies can compete against economies of scale with innovative solutions; the large size easily slows down decision-making. According to Borja (2002), **small firms may gain a competitive advantage by providing a niche through unique styling, identity and product innovation**. In Finnish SMEs, design is seen to be of great potential, but the lack of both financial and human resources sets challenges for design usage. Therefore, SMEs use design merely in those processes where it is seen to be most beneficial or where the risks are lowest. Comprehension of design benefits and design competence, in general, among executive management is vital for design utilization in SMEs. Small size as such is not an obstacle to innovative design usage; overall corporate culture, innovativeness, proactiveness, adventurism and appreciation of soft values are most likely the drivers for innovative design usage.

3.1.2 Corporate culture and identity

Walker (1990) argues that the more mature an organization becomes, the more varied use it makes of design and thus the broader its concept of design and its management become. The strategic value of design as a core competence that goes beyond its economic value is

the knowledge that is acquired through years of experience. Also, according to this research, the values and culture of a company influence the status that design and designers have within the organization. **Experience in design usage in a company affects the level of design integration and the results of design utilization.**

The core values chosen for a company illustrate, for example, the:

- Expectations of different interest groups, e.g. stakeholders, customers, etc.
- Business principles, e.g. innovativeness, social policy (diversity in organization), etc.
- Loyalty and commitment to the company, employees, customers, users, etc.
- Guidance on expected behaviour, e.g. social policy and responsibility (level of openness and control).

Creativity emerges often from the conflicting conceptions of different disciplines, which may result in disorder but also in **versatile skills and new ways of working**. Holistic methods in design influence the utilization of the entire commercial chain. Designers give inspiration to the product development process. Employees get new ideas and visions from the product attributes and image, they learn new working methods, and the company can access new subcontractor networks introduced by the designer. Eventually, design impacts are visible in the company philosophy and management. **Design usage can also strengthen the inner brand**: work motivation increases when employees are proud of working with well-designed products.

Corporate values dictate the position of design within the company. The research also showed that corporate values and brand strategy affect the internal interpretation of external drivers for a product, which means the formulation of the goals. Brand elasticity is tested with new products on the markets. An iconic product can guarantee a strong position on the markets, such as Apple's iPod, but it is not certain that the iconic position will hold for different product segments. Page & Herr (2002) state that **weak brands may be able to compete with strong brands by producing superiorly (functionally and aesthetically) designed products.** For strong brands, a design's impact may initially be much less consequential – while good design supports consumers' product evaluations, poor design does not significantly impact upon such initial evaluations.

The corporate culture and identity influence the design strategy, but vice versa, design usage influences the development of the identity: design affects the way customers see the company and its products (corporate and brand image). This study showed that designers' participation in defining the brand and corporate identity is bound to outlining design; the goal of design is to reflect the set of values that the company strives for in its brand and to attach the values to products, services and environments that the company operates in. **Through design, the company can communicate the desired image to customers in a controlled way.** A company can co-ordinate design resources to target global markets by using a coherent brand image. In addition, design is an essential tool when the company wants to **change its image** in the markets; however, this change has to be based on a true corporate identity. Brand strategy is used to define, for example, how to differentiate the company from its competitors through its own design line. In practice, this means managing the interface between the company and the external world – through products, communication material, environments, etc.

The competitive strategy is derived from the core values. Three main competitive strategies that a company may pursue are product leadership, customization leadership, and cost leadership. Design can bring a competitive advantage to each of these strategies.

Product leadership
Product innovation driven companies seek ideas to develop the business by product innovations. The contribution of design can be effective in all knowledge management based categories: in customer, business and technical know-how. For example, designers keep in touch with and understand customer needs. Business know-how in a design context corresponds to the know-how related to the sales and product concepts. Technical know-how involves information systems, work processes, and technical functionality.

Design is an important means to create added value and strengthen the brand; thus, facilitating the customers' willingness to pay premium prices. **Designers can also find applications for new technologies and introduce innovative solutions**. Outsourced design consultants introduce new ideas, but also in-house designers challenge current patterns of the company. However, the company has to find the balance between maintaining its long-term focus and keeping the company interesting by presenting innovations. The design goal is also to implement the company's business idea – the adaptation to other products and creating a corporate or brand image by recognizable product features.

The case companies used design for **building the interest, intelligibility and desirability of the product, but also for creating product innovations**. Design can speed up customer acceptance of the new product. In a case company, good existing design-based standardization and segmentation made the quick launch of a new technology innovation possible. The product families remained as they were for the first step launch – the visual idea was not changed; the technology acceptance was the risk the company took.

Customization leadership
Customer orientation considers the true needs of customers: design can be directed to finding solutions that are justified by those true needs. Today, customers desire increasingly customized products. For example, designers can create standard collections of colours and materials. For the case companies, design is a tool for **customizing products** (more visual elements to choose) and for **adapting the product to the operating environment**. One case company offered a wide collection of compatible product families from which consumers can select an individual set.

Global business offers growing opportunities and cost advantage over local competitors. Design is used for adapting the product to the global markets. When all competitors use design, e.g. usability, and standard collections, design can represent a new way to integrate the product into different environments and cultures globally, for example replacing different national distinctive features with more global ones. **Especially in business-to-business (BtoB) companies, the role of design can focus on understanding customer behaviour and the decision-making procedures, and can influence the procedures for instance by providing standard collections.**

Cost leadership
If a company desires to be the cost leader, the emphasis must be on the efficiency of processes. For design, this means rapid and prioritized design processes. **Design usage facilitates the development of products with both a proper price and appearance.** Technology-based research and development is costly. Companies can use design to expand markets; a gap in a product range may be an important driver for design usage. **Variation and repetition can provide products that appear new to customers**, generating profits and buying time for the development of radical innovations, for example.

Designers also affect cost reduction through **product portfolio management**. A company gains economical benefits by creating product ranges instead of single products. Design may be defined by style-based categories, product families, or categorizing unique products into different segments. One important aspect of product portfolio management is standardization; the use of standard parts brings a cost advantage. Designers participate in development of a suitable matrix for a product portfolio, where different segments support brand identity.

Furthermore, design improves operational efficiency through providing tools to **improve communication**. Designers can visualize and concretize ideas within and beyond the company by creating sketches and prototypes, thus creating syntheses from the views of different functions and facilitating more consistent interpretation of information from different sources. If the big idea of the product concept can be communicated to the whole organization from the beginning, things run smoother and the product will be completed on time.

3.2 Industry

3.2.1 Maturity

During the product life cycle, the role of design changes. A growing industry with intense competition is likely to stimulate investment in design. **In a mature industry, design becomes a central factor in the customer's purchasing process**, while the technical features remain the same. Design provides a means to add value also through **fashion orientation** (Cooper & Press, 1995). Global business and lifestyle influences may create a considerable potential for design.

During the product introductory phase, a unique design may be essential to attract more attention than rivals in crowded markets; later in the product lifecycle, uniqueness in design may be eclipsed by other criteria, such as user friendliness or other product features. In other words, **during the maturity phase of the product life cycle, design may reposition the objectives or emphasize improvements in product performance and in company image**. While R&D intensity may vary in proportion to technological opportunity, design effort may vary not in extent but in its nature and emphasis during the product life cycle (Walsh et al. 1992).

Gemser & Leenders (2001) suggest that, besides innovative product development, being innovative with respect to design and design strategy can enhance competitiveness regardless of industry evolution. Companies should seize the benefits of industrial design investments early in the industry evolution as another way to distinguish themselves and build a strong brand and corporate identity.

For the case companies, adaptability and environmental monitoring were inevitable in tailoring design elements to the product life cycle. Maturity was found to be an important design driver in the case companies. In mature markets, customers focus more on visual factors since they already trust the technical quality. Design is used as a tool to compete against decreasing sales in mature markets. For example, a **modernizing facelift makes the product appear to be a new product to the customer**. Besides a new appearance, **a simple product improvement can result in the competitive edge**. A case company – a pioneer in its business – emphasizes design's role in communicating the benefits of the new product to users. This research showed that when the core technology is more or less mature, the company could still develop the product by incremental innovations through product features and design.

3.2.2 Velocity

The velocity of the industry was a significant factor affecting the case companies' design usage. In high-velocity industries with short product lifespans, companies need to be able to react fast to new trends and development in the world. **A company can respond to competition rapidly by means of design** – changing the product features, colour or materials, while maintaining the same technological solution. Effective design research and documentation are the main tools for faster and unexpected reactions. Designers

participate in categorizing future and present product concepts and portfolios into different time perspectives to ensure that the strategic goal is adaptable to last-minute changes.

In more stable industries with longer product lifespans, product development can take years. Products have to be long lasting and short-term trends have less significance. The design framework is developed to be ageless.

3.2.3 Product type

Design usage is important for both high-tech and low-tech companies; however, the emphasis of design is usually different depending on the technology rate. Technological development brings new product possibilities; design is a tool for **finding applications for new technologies and for humanizing the technology** (Cooper & Press, 1995). For instance, when technology becomes increasingly complex, the number one goal of design is simplicity. For low-tech products, visual factors are more central, and design is used for creating distinctiveness and adapting products to their use environments.

The role of design is also different when it concerns a high-involvement product – a purchase over which a consumer takes time and trouble to reach a buying decision – or a low-involvement product – a product purchased without much forethought. Moreover, trends in demand for the main products – for example seasonal changes in demand – may be a driver for design usage.

3.2.4 Standards and legislation

Standards and legislation may seem to limit the degree of differentiation in the industry. For example, legislation to ensure safety at work sets constraints. This applies especially to investment goods, and deregulation of the industry may be a significant driver for design usage. However, benefits and creativity of design may unfold particularly in a situation with a lot of constraints: **designers can bring new views and differentiate products** that seem to be impossible to differentiate. On the other hand, design is a means to develop standards and modular features.

3.3 Customer

The term customer is used in this research in its broad sense including actors from the purchase decision maker to the end-user. Customer need is the central driver for design usage. If functional needs are fulfilled, good design has a huge impact on customer satisfaction when the customer feels that he/she has received something extra. Only when all expectations and needs are fulfilled, may the emotional bonds and loyalty emerge. Design usage is important especially for a global company (Jyllilä, 1998): cultural differences come to the fore especially when design issues are in focus: colours, forms, and symbols have different meanings in different cultures. **Design can be used both for product differentiation and for adapting products to different markets** (Salimäki, 2003).

Designers can increase the user focus in a company by emphasizing the human aspect, and thus facilitate developing products that meet the critical and true needs of the user. Using designers in the research process enables better understanding of the business environment, especially the visual language of different cultures. Opportunities arise, for example, from customer dissatisfaction with the product, unsolved customer problems, and replacement of a number of products with a single product.

3.3.1 Customer type

It is essential to know who the customers are, and what are their needs and expectations. The entire distribution channel affects design requirements, not only the end customer. The focus of design is different when it is a question of retail, direct sale, or wholesale. It makes a big difference whether the purchase decision is made by the end-user or by a professional buyer in industrial business. In consumer markets, design benefits focus on the customer results, but, in industrial business, the emphasis is on the processes (Jyllilä, 1998). **In consumer markets, the role of design is to place greater emphasis on understanding the processes of consumption** (Cooper & Press, 2003).

In industrial business, the customer's purchasing process may last from a week to a few years. The sales personnel have more time to address the customers' expectations, demands and needs, whereas, in consumer markets, the product itself has to be its own spokesman and design is the essential competitive factor to make the product interesting and intelligible. Furthermore, design can improve the marketing and selling material, as well as the service and maintenance materials.

The product cases emphasized the attention that design usage should pay to customer behaviour and decision-making procedures. **The design goal was to influence the size of markets by incorporating global features, the desirability of the product and by paying attention to customer needs and understanding the purchasing process.** Design can be used to appeal to the customer's cultural and social standards and to adapt the product, for example, to its usage environment, regarding its form, materials, surface, and colour variations. According to the case company examples, the brand profile development through visual elements is sometimes limited due to customer requirements. This means that products have to be customized according to the customers' own brand profiles. In addition, indirect customers have immense influence on the purchasing decision.

Design appeals both to the emotions and the senses. According to Lash & Urry (1994), aesthetization of goods and services is increasing, which means that design has an increasing role in purchase decisions. Choices of goods and services are often made to differentiate oneself from others; therefore, most companies are competing with non-price factors, such as design and brand. **In consumer markets, design has an important role in personalization of products and in creating the status value.** The product's uniqueness, a special design, outstanding quality, excellent customer service, or style, for example, generates brand loyalty. This loyalty renders customers less sensitive to the price of the product (Porter, 1980). For a case company in consumer markets, the brand incorporating product features, recognizable design language, and usability are constantly the central factors in consumers' buying decisions. Distinctive design may result in better margins; however, consumers' rooted habits limit design innovations – a chair has to be recognized as a chair.

Cultural and societal factors have an enormous impact on design, especially in consumer products. These are, for example, lifestyle changes (working, households), attitudes, fashions and fads, the impact of changes in technology, and demographics (age structure of the population, gender, family size and composition, changing nature of occupations). Furthermore, economic factors are important. For example, pricing trends, the bargaining power of buyers and economic "mood" – consumer confidence – determine the price people are willing to pay for the product. Design can support desirability of a brand, so that the customer is willing to pay more to get the product; in consumer markets, increasingly brand and design together influence the price.

3.3.2 Market diversity

Global business offers growing opportunities; however, the cultural differences in new markets require consideration. According to the case company interviews, if customers

form a targeted group with moderately similar needs, expectations, and requirements, it is easier to address design correctly. The situation is different when the goal is to serve many different customer segments; the designer has to find one solution pleasing the majority of the customer, or to create different product versions for different segments. Increasingly, companies are required to customize their products, and design is seen as an essential tool for customization.

The company has to find the balance between the uniqueness of products and a coherent brand profile. According to family thinking, products have to resemble each other, but unique, different products are required for different segments. Globalization challenges the uniformity of brand profile. According to the case company interviews, designers face big challenges when they have to develop globally attractive products that meet local expectations. Domestic markets are regarded as being more advantageous for domestic players; and, for example, collision of the West and the East is inevitable for western companies in the Far East. For example, the collision of cultures can occur between individualism and collectivism. Usability may weigh in purchase decisions of investment goods in China today; however, it can turn out to be of great potential in the future. Understanding design preferences in different cultures is essential when developing a global brand.

Lower segments demand usually functionality and durability, while requirements in high-end segments include high-quality and visual demands: higher segments pay more for a distinctive design, and customization often pays off. When the target segment is design oriented, visual issues can be emphasized at the expense of usability – distinctiveness is of the uttermost importance. In this case, the designer represents the end-user and his/her opinions should weigh in decision-making. According to the company interviews, the single brand strategy may be advantageous when the company offers products to different segments: **the strong image of distinctive products aimed at niche markets may support the whole product range.** However, if there are many different segments, product branding is conceivable.

In one of the case companies, different markets are dealt with by introducing **design solutions based on the greatest common factors in products**. Other used design options were **modularity and standard collections of materials and colours** (options for lower-end products to suit several markets), **customization** (an option for example in high-end products), and **mass customization** (consumer goods).

3.3.3 Customership

One of the most important strategic decisions the company has to make is the share of new customers in the target group: does the company want to develop strategic relationships with existing customers or to pursue new markets? Design usage is topical, in particular, when the company desires to increase its exports (Salonen et al. 1998). The case companies used design for **differentiation while pursuing saturated international markets**, **global-local adjustments,** and **intensifying the acceptance of a radically new product by appearance and user friendliness.** Design was also used for developing new applications of existing technology for new user groups, as well as for repositioning the brand by developing a radically new product category.

The case companies ventured into niche markets using distinctive design, as a means to later expand into the area. In addition, design push experiments – i.e. bringing out radically new products based on design innovation – had both successful and unsuccessful results. It is important to estimate carefully the potential market size, and furthermore what the customers really want, to determine if there is an existing demand for the product.

3.4 Competition

Increasing competition is an important driver for design usage. A globally operating company has different competitors in different markets. Furthermore, indirect competitors – potential competitors or competing businesses – have to be taken into account. Some of the case companies considered competition as the strongest driver for their reactions.

The competitive edge influences design usage in competition. Companies have different emphases in their competitive edge. They may focus on technology, usability, or emotional aspects, for instance. Design may bestow a competitive edge or support the existing competitive edge. According to case company interviews, **design is a means to react fast to competition**: technological development is slow, design solutions can be implemented more rapidly. Reactivity is extremely important in high-velocity industries, and design is utilized for creating future scenarios, concept and portfolio working, focusing on anticipating the possible change of different customer or consumer environments, as well as for spotting trends in visual design.

3.4.1 Structure of competition

The structure of competition affects how design can introduce a competitive edge; the degree of monopolization or competition in the market is the determining factor. The situation is different when there is a clear market leader or equally sized competitors. The market leader can use design to **stabilize its position**, but also competitors can take advantage of the situation by **copying or using an opposing design**. A follower strategy may be suitable especially in industries where economies of scale are not a considerable competitive advantage. Besides the market leader, there may be important regional or local competitors. The intensity of rivalry between competitors in an industry will also depend on switching costs, that is, the cost of changing suppliers of a product.

The competitive strength can also be created through assets and competences, for example:

- Brand strength
- Customer loyalty
- Distribution strength
- Record of innovations.

Design can be used to **position the company against the competitors through distinctive identity**. Design helps in developing products that are better than or equal to those of the competitors. In saturated markets, design can be used for differentiation, when products are getting older and competitors are making similar products. Competition as a design driver has its base in competitive strategy, which determines, for example, the innovator or follower strategy. All case companies represented an innovator mentality.

It is important to consider design's role in competitors' business, for example the intensity of their investment in product design and visual brand identities. Likewise, it is important to consider what strategic moves competitors might make. Case companies had found that the big problem with direct competitors is copying of design solutions.

3.4.2 Threat of new competitors and substitutes

According to Levicki (2003), possible new competitors are, for instance:

- The current customers most likely to integrate backwards
- The current suppliers most likely to integrate forwards
- Organizations that might enter the industry.

The case company interviews showed that the challenge of indirect competitors is significant. Potential competitors, as well as competing businesses, were considered to have a significant impact on design usage. If there are no direct competitors, **design can be used to enhance desirability of products** to increase sales. However, a case company stated that the strong benefit of design is that it makes products better than competitors' products – the significance of design comes to the fore in comparison.

Tables 3 and 4 present the internal and external drivers of the case companies. Also, the role of design in responding to external drivers is categorized (Table 5). The numbers in parentheses represent the counts of the case companies' answers.

Table 3. Internal drivers in BtoB companies

Values		**Vision**	**Resources**	**Core competence**
Integrity (11) -Respect (2) -Responsibility (2) -Trustworthiness (2) -Safety (2) -Reliability -Integrity -Modest	**Extrovert (4)** -Global (2) -Pro-environmental -Customer orientation	Customer & user orientation	Mergers and acquisitions	
		Technical & market leader globally	Manage distribution channel	
	Human centred (4) -Quickness -Employees' well-being -Pride and joy	Pioneer in niche, known from a certain product feature, customer orientation		
Perseverance (6) -Quality (3) -Determination -Excellence -Stability	**Forward looking (3)** -Innovativeness (2) -Pioneership	Product brand, maintaining & developing activity		
	Competence centred -Specialization			

Table 4. Internal drivers in BtoC companies

Values		Vision	Resources	Core competence
Extrovert (7) **-Openness (3)** **-Customer satisfaction (2)** **-Understanding (2)**	**Integrity (4)** **-Respect (2)** **-Trustworthiness** **-Honesty**	**Personal products regardless of time and place**	**Economies of scale**	**Brand management**
			Diversity	**Expertise in certain lifestyle & technology**
		Best in their niche in Scandinavia		**Innovativeness and usability in niche**
Forward looking (5) **-Innovativeness (2)** **-Renewal** **-Achievement** **-Risk taking within limits**	**Human centred (4)** **-Unique** **-Serious** **-Individuality** **-Entrepreneurship**	**Desired Brand in the world**		**Innovative and usable systems**
	Persistence (2) **-Commitment** **-Quality**	**Globally known, flexible manufacturer of new technology, innovative solutions**		

Table 5. External drivers and the role of design

DRIVERS IN BtoB COMPANIES		Competitive strategy	Role of design
INDUSTRY			
Maturity	Mature (5)	*Differentiate through user focus and design*	
		Prize quality, branding(3)	Durable, quality image /products support brand (2)
		Cost-effectiveness	Durable products, consistent product range
Product lifespan	Long (5)	Technical excellence	Durable products (2)
		Quality (2)	Durable, quality/modern image
Technology rate	High (3)	Intensive R&D (2)	
			Usability, experience/credible image
		Technical excellence	Durable, quality image
	Moderate (2)	Technical development (2)	Usability, functionality
Standards& legislation	Restricted (5)	Design adapted to technology	
		Standard parts (2)	
		Push to technical limits	No room for design
COMPETITION			
Direct competitors	Many global	Space efficiency	
	Yes	Quality, customization	
	Market leader in niche	Maintain position by cost-effectiveness	Consistent portfolio, colour, form
	Market & technology leader	Economies of scale	Use of excellent design resources
	Technology leader in niche	Continuous development, customer orientation	Strong brand, usable products, credible image
Indirect competitors	Low-quality products	Strong brand, bringing out the benefits	
	Other methods (2)	Mass production	
		Benefits for customers	Usability, work safety, product image
MARKETS & CUSTOMERS			
Markets	Global (3)	Meeting global-local needs	
		Global brand, distribution channel (2)	Supports selling & brand
	International (2)	Branding strategy	
		Consistent product range & image	
BtoB–BtoC	BtoB (5)	Limited use of visual brand elements	Competitive quality
		Global brand, distribution channel	Quality image
		Product brand	
		Quality, benefits for customers	Suitable, credible image, beneficial products

Segmenting	Broad scale	Standard collections	Colours, materials
	Focused (4)	Global brand, distribution channel	Quality image
		Customer orientation	
		Manage product portfolio	
		Quick response	Design no answer, yet
DRIVERS IN BtoC COMPANIES		**Competitive strategy**	**Role of design**
INDUSTRY			
Maturity	Mature>new	New businesses	Differentiate through design
	Mature (2)	Innovative solutions within brand limits	
		Differentiate through user focus and design	
	New	Create the use culture	Bring out utility
Product lifespan	Short	Reaction potential	Trend predictions
	Moderate	Reaction potential	Trend predictions
	Long (2)	Variation by design, durable products (2)	
Technology rate	Low	Utilization of classics: retro products	
	High (3)	Intensive R&D (2)	Usability, experience (2)
		Multiple-skilled staff	Usability, comfort
Standards & legislation	Restricted (2)		Standard parts
	Highly restricted	Reliable products	Suitability for use
COMPETITION			
Direct competitors	Many, market leader	Economies of scale, strong brand, design	
	Yes	User focus	
	Lag behind	Delivery chain	
	No		
Indirect competitors	Substitutive products (2)	Emphasizing the benefits	
		Economies of scale	Strong brand, design
	Low-quality products (2)	Strong brand, emphasizing the benefits	
MARKETS & CUSTOMERS			
Markets	Global (2)	Meeting global-local needs	
		Finding similarities in different cultures	
	International (2)	Brand strategy (2)	Designer's brand
BtoB–BtoC	BtoC (4)	Reaching customer (3)	Desirability and utility (3)
Segmenting	Broad scale	Extensive product portfolio	
	Moderate scale (2)	Briefing: high enough goal for designers	
		Volume products and 'design products'	
	Focused	Original course of action	

3.5 Drivers verified in the study

This research listed five driving forces for design usage, i.e. factors supporting design usage in a company, based on the company executive management interviews. The respondents were asked about the key driver of design usage: competitors' design usage, customers' expectations of well-designed products, strengthening corporate image, insufficiency of technology as a competitive factor, or a design-orientated corporate culture. **The study shows that customer expectations is the most important driver in respondents' opinion, with a share of 42%.** The second most important driver is an intention to strengthen the brand; 20% of respondents chose that alternative. The insufficiency of technology as a competition factor, and the competitors' design usage are strong drivers for 8% of the respondents. Only 2% of them agreed that their company is design oriented and that the corporate culture is the most important driving force.

Surprisingly, as many as 20% of the respondents were not able to articulate their opinion on design drivers in their business. The reason for this might be that the companies have not faced these questions before. On the other hand, the companies need to evaluate their business activities according to the results and develop their business based on managers' experience and knowledge. However, business is not an entirely rational process: many decisions are premised on intuitive decisions and tacit knowledge, especially in the SMEs. The CEO might just feel, assume and sense the possibilities of design and not have analysed the business drivers nor determined the strategic goals directing the design usage to those specific drivers (Figure 4).

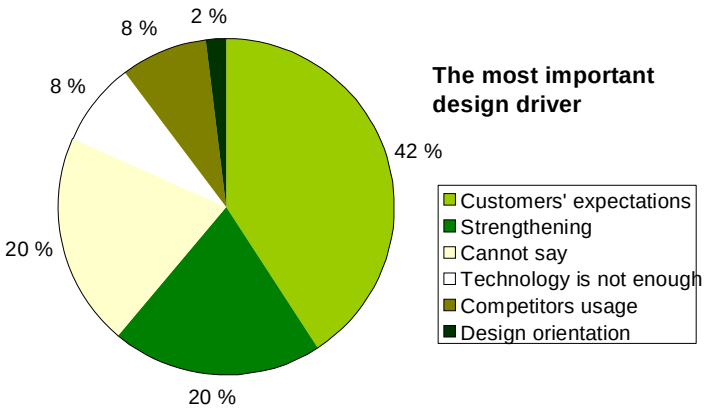


Figure 4. The most important design drivers according to the study

The study illustrated that the markets of a company and the expected product life cycle affect the probabilities of the company's design usage and are therefore a driver. Fifty-two per cent of the companies producing durable consumer goods (over one year lifecycle) use design, 45% do not use design, and 3% did not answer this question. Design usage is fifty-fifty in the companies producing durables with less than a one-year lifecycle. In addition, 38% of the companies producing products use design, and 62% did not. The results imply that the longer the product lifecycle, the more probable design usage becomes in the companies. The least design using of all companies are those having a product range with

various product lifecycles. It is possible that the companies producing durable consumer goods invest more in R&D, and see also design as an investment for the future. It may also be possible that the companies producing durables benefit the most from design. However, it is difficult to assume that companies producing consumer goods would not benefit from design as much as companies producing durables (Figure 5).

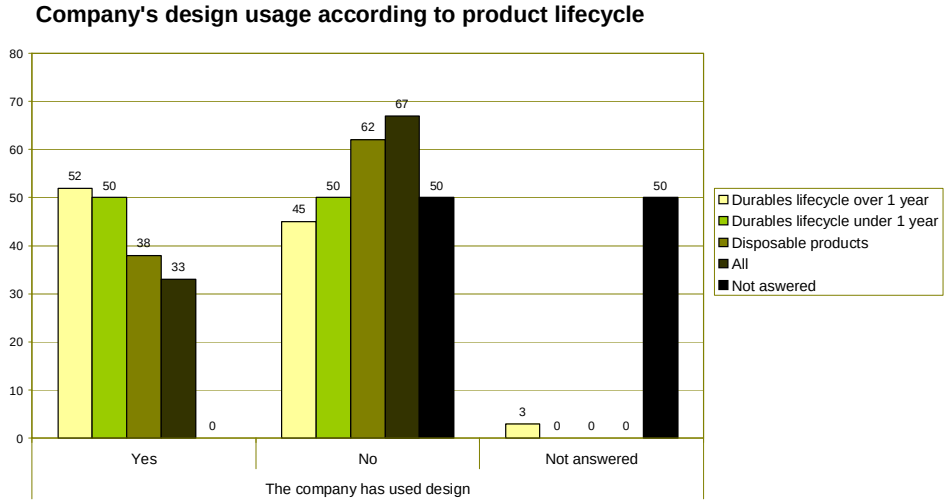


Figure 5. Product lifecycle as a design driver according to the study

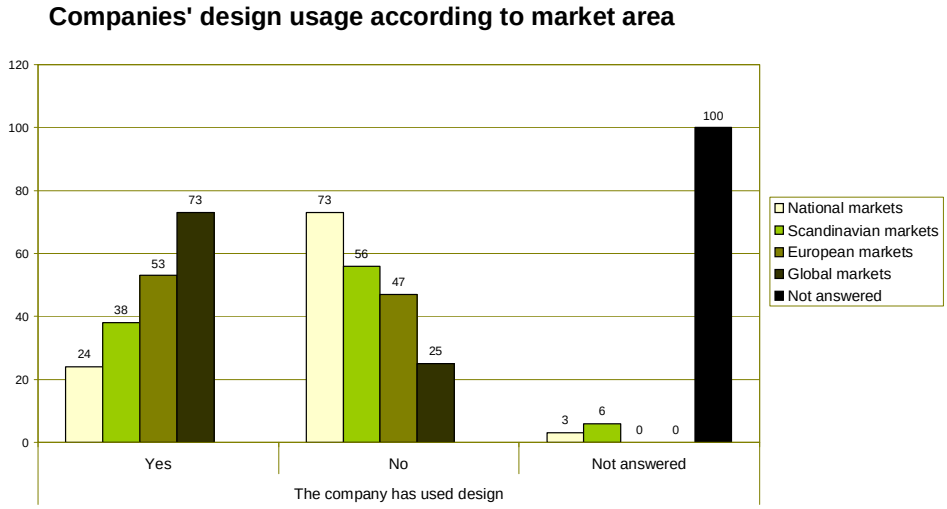


Figure 6. Market area as a design driver according to the study

The study showed that internationalization of the markets is a driver for companies to use design: the more international the markets are, the more probable the design usage is. Twenty-four per cent of the companies using design have national markets, 38% have

Scandinavian markets, 53% have European markets and 73% have global markets. The trend is clear: **internationalization drives the companies to use design** (Figure 6).

3.6 Summary of drivers

Drivers for design usage represent reasons for design usage in different strategic situations. The preliminary fragments of the driving forces in design usage were identified from the executive management interviews and literature research on business and marketing management, and they were further developed according to the interviews on the successful product cases in case companies. The drivers for design usage in the model are a synthesis of the business performance measurement models, literature and case-study background research and the case-company interviews.

Effective design usage necessitates identification of the goals that drives the long- and short-term strategic business planning and thereby brings continuity to a company's design usage. Drivers for design usage emerge often as a result of changes in the prevailing conditions in a company, industry, customer or competition, for example increasing competition or unexploited potential of a customer's unsolved problem.

Company drivers, internal drivers, deal with company size and corporate culture. Industry drivers focus on the basic characteristics of the industry that the company is operating in, such as maturity and velocity, product type, and standards and legislation. Customer drivers include customer type (consumers vs. professional buyers), market diversity, e.g. the different segments that the company services and cultural differences, and the share of new customers. Competition drivers deal with the structure of competition, as well as potential competitors and substitutes.

According to this research, the most important drivers for design usage seem to be maturity and velocity of the industry that the company is operating in (e.g. in mature markets, design provides one of the main competitive edges) and the customer segment (e.g. the varied needs of the different segments that the company serves and to what extent the customer values design issues). The size of the company as a driver means, in larger companies, benefiting from economies of scale through a coherent brand image, while, in smaller companies, the focus is on gaining publicity, e.g. by a distinctive design. In addition, the study showed that internationalization drives companies to use design.

Experience in design usage affects the degree to which the company is capable of utilizing design, and furthermore the results of design usage. The more experienced design user the company is, the more difficult the implementation is to copy, given that design usage covers broader issues than merely styling the product appearance. Experience and design competence imply a clear vision of the goals and how to implement them; however, just a few case companies had sufficient experience for effective design usage on the whole. This is the need that the drivers of the Evaluation Model for Strategic Impacts of Design respond to – successful results require links between business strategy and design usage.

4. Enablers – Design Usage

Walton (2003) defines the term 'Enabler' as 'something with suitable power, means, opportunity and authority to achieve a specific result of action'. In this study, enablers concern design usage in companies: the crucial issues in design usage that need consideration when implementing strategies, such as organizing design usage in a company. There is not just one general way to organize design usage; drivers – e.g. company characteristics and factors in business environment – affect the organization of design in the same way as they affect the content of design strategies.

The evaluation model of strategic impacts of design subdivides enablers into three items: **design in vision and strategy development, design management, and operative design usage** (Figure 7). Design in vision and strategy development is further categorized into corporate and business unit levels. The purpose of this categorization is to make it easier to define and specify the decision-making levels of design, designer's participation in decision-making and, furthermore, to specify the results that can be expected from design usage. The categorization also implies that it makes sense to evaluate the strategic impacts of design for one business unit at a time – the competitive strategy is usually determined at the business unit level.

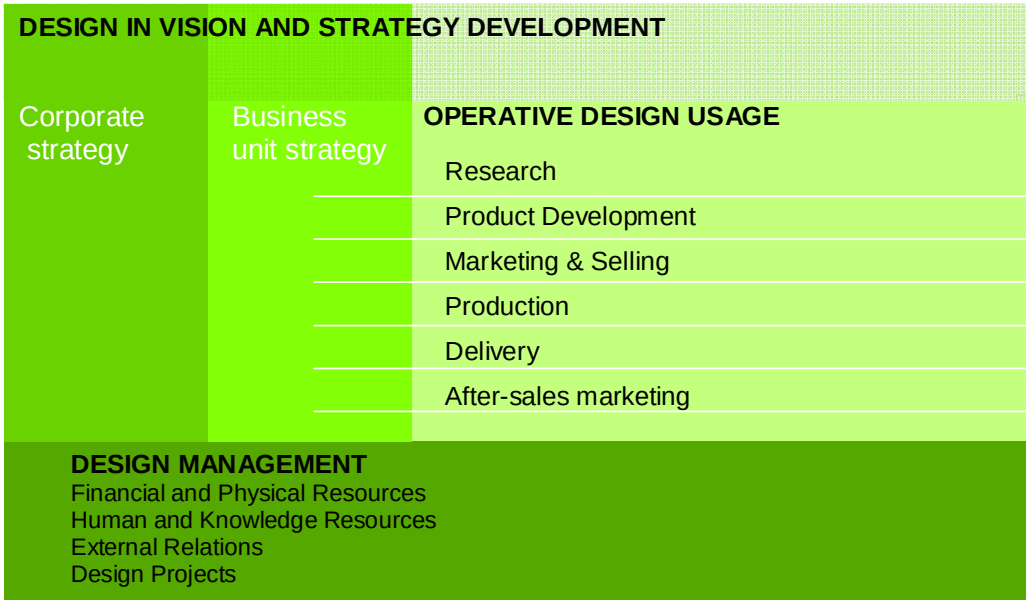


Figure 7. Enablers in the Evaluation Model for Strategic Impacts of Design

The case companies were divided into two groups according to their business: five BtoB companies and four business-to-consumers (BtoC) companies. The interview results regarding design usage in the case companies are presented by comparing these two groups. In some themes, the companies are designated with letters (A, B, C, etc.). Indicators for design usage, i.e. the enabler indicators are presented in green boxes.

4.1 Design in vision and strategy development

Design in vision and strategy development comprises the design's contribution to the corporate and business strategy and the cultivation of the design competence in the company. Especially at the business administration level, it is important to be able to envision the future through design and to understand the incorporation of the corporate strategic goals into design.

This research showed that strategic design usage is engaged in corporate level strategic decisions, such as which product portfolios to expand, which technologies to invest in, and which new markets to pursue. Also, according to Joziasse (2000), truly strategic design projects influence a company's direction in terms of structure, finance, and human resources; and, as this study showed, design can influence the development of project structure, for example, while being connected to existing management systems and structures.

Design conception in the company determines how the company perceives the possibilities design can offer. The more experience the company has in design usage, the wider the range of different possibilities to use design the company can utilize. Furthermore, the experience brings cost savings to the processes.

Strategic-level decision-making development in a company can take place at two levels:

- Corporate strategy: which businesses the company is in and how to manage the business units
- Business unit strategy: how to compete in the particular business

This research showed that design is the concern of both levels in the experienced companies. Designers' input to the development of business unit strategies, such as concept building, is the typical way of contributing to the overall vision and strategy development.

This chapter concerns the process of strategy formation. The content of design strategies – strategic responses to drivers – was discussed already in the previous chapter. In term of design, strategy formation issues according to the case company interviews include, for example, **decision-makers' design understanding, links between strategic and operative levels, designers' involvement in strategy development, and the coherence of design strategy between different business units**.

4.1.1 Corporate strategy

Corporate strategy is mainly concerned with the selection of business areas in which the company will compete, and the development and co-ordination of the business portfolio. The management interviews showed that **the long-term commitment to design usage is decided at the corporate level**. **The full benefit of design necessitates persistent and consistent design usage and the development of design utilization**. For example, a company has to make a stand on technology releases without design. Strategic design projects have long-term effects on corporate business.

Design usage has to be linked to strategy. When design is fully utilized at the strategic level, the **design information supports vital strategic decision-making**. As design is one of the major factors in competition, it must to be represented in corporate level decision-making.

This research showed that the modes of design's strategic role are based on either the design competence of the company management, or the decision-making level that design representatives can influence. However, the role of design typically advances along with experience in design usage, which determines how widely the possibilities of design are understood in the company. Integration and organization of design are also important. The

case company interviews showed that decision-making at the corporate strategy level influences:

- The **role of design in the company**. The recognition of design in the corporate policy makes design utilization more effective and clear.
- Decisions by corporate management **on the level and intensity of design integration** and co-operation with other functions according to the internal and external drivers.

Designers' participation in strategic processes is beneficial especially in **defining corporate and brand identities**. One challenge a company faces is brand management: for example, when a brand has to find its balance regarding value positioning between innovative and conservative assets, as well as between promised utility and pleasure. Sanctioned design guidelines, as a design policy or design standards, are required in two distinct situations: in large organizations with multiple operations, and among companies that make regular use of external consultants (Barros, 2003). A company can define **brand elements** that implement brand strategy in its products. The design elements and the style can be described, for example 'Scandinavian design'. A company may create a corporate visual identity, which is based on colours and selected materials, and determine the design details and design language according to the business units' competitive strategy. However, a lot of resources are required for creating design style categories according to sociological trends.

A design representative on the Board introduces design issues, and makes justified recommendations for corporate strategic-level decision making. A design representative can be a non-designer, a designer, or an external consultant. In the case of a non-designer, adequate know-how of design and its possibilities is required, a designer has to possess enough know-how in design leadership and business, and the external design consultant has to be familiar with the business and the company. A design consultant's contribution may be important, especially when a company lacks knowledge of a design-driven business and doesn't recognize all the opportunities of design.

The practical case company example for integrating design into strategic decision making is through the design manager. The integration level of the design manager varies from the corporate to the business and functional-level management, and to the functional operative level. The design manager arranges the knowledge supply for strategic-level decision-making and presents the preferred design-related alternatives. However, centralizing too much authority in the design manager is not wise – the role of a design manager is to anchor the design policy, not to be an artist. Centralizing the authority brings order and reactivity when needed, although heterogenic evaluation can also be advantageous: decentralized design management (silent design) improves organizational design competence and commitment to design since everybody in the organization is in charge of design issues. The company has to decide whether it will have trust in professional designers' opinions regarding design, or whether it will be more beneficial if many rather than few evaluate design results. However, as one management interviewee verified: '*Everyone can criticize design, but justifying design is hard*'.

Innovative design usage requires understanding the possibilities of design, and thereby, also an ability for risk taking and proactiveness, in other words, understanding design in an innovative way. Risk can be decreased, e.g. by facilitating customer orientation and designers' understanding of manufacturing possibilities; the lack of design know-how increases the risk. The necessary decision-making procedure in a large company can prevent the emergence of good ideas; on the other hand, the procedure and restrictions deter investing in adventurism.

In the case companies, the role of design – compared to other competitive factors – was supportive in BtoB companies, but in BtoC companies, design was one of the main competitive factors that used design also as a sales argument. However, the designer was

emphasized in marketing communications in only two BtoC case companies (Tables 6 and 7).

Table 6. The role of design in a company

	Supportive role	One of the main competitive factors
BtoB companies	5	
BtoC companies		4

Table 7. Design usage in marketing communications

	Design supports marketing and sales	Design used as a sales argument	The designer emphasized in marketing communications
BtoB companies	5		
BtoC companies		2	2

Designers' or design managers' highest position ranged from operative level to corporate strategy level in the case companies as presented in Tables 8 and 9. In the companies where design representatives' influence was restricted to operative level, the company either trusted the design competence of strategic decision makers, or design's representation was not considered important at the strategic level.

Table 8. Highest position of in-house designers or design managers

	Corporate strategy	Business unit strategy	Functional strategy	Operative level
BtoB companies		(G-dc) H-dc	F-dc I-dc	A-dc
BtoC companies	B-dm	D-dm		C-d

dm = design manager; dc = design co-ordinator; d = designer; (x) = position not stabilized

Table 9. Highest position of outsourced design competence

	Corporate strategy	Business unit strategy	Functional strategy	Operative level
BtoB companies				A-o F-o G-o H-o I-o
BtoC companies	E-sp	B-sc D-sc		C-o

sp = strategic partnership; sc = strategic consultation; o = operative design implementation

Design integration in corporate strategy development can be evaluated using the following indicators:

Indicators for design in corporate strategy development

- **Design has role at the corporate strategy level: Design usage is linked to strategy**
- **Recognizing the possibilities of design in different strategic situations: Design understanding at the corporate management level**
- **Commitment to long-term design usage: Consistent design usage and development**
- **The extent of design information supporting the strategic decision making**
- **Design usage in defining and managing the corporate and brand profile**
- **Management and leadership of design: centralized vs. decentralized (importance of organizational design competence)**
- **Capability of directing design investment**
- **Nurturing an environment for innovation**
- **Training for design leadership**

4.1.2 Business unit strategy

A strategic business unit may be a division, product line or another profit centre that is planned independently of other business units. Competitive strategies are usually determined at the business unit level; according to Olson et al. (2000) different divisions (i.e. business units) within a large multidivisional company may well end up adopting dramatically different competitive approaches.

Design-related issues at the business unit level concern:

- Design's role as a competitive tool in business
- Making design strategy part of business strategy, i.e. design strategy following the corporate strategy level framework.

The use of designers in idea generation provides different views on old and new issues. When design is seen **as a competitive edge, design criteria are considered as important as other criteria in decision-making**. Product type and segmentation affect the importance of emotional and rational aspects, and thus the emphasis on the designer's intuition versus market analysis in the design process.

Market information can be collected through market research, but future needs cannot be known in advance – yet design education qualifies **designers to anticipate customers' future needs and tastes**. The direct flow of market information is important: when intermediaries, e.g. market managers interpret the information, some crucial information for designers' purposes may filter out. From the point of view of an in-house designer, it is preferable to receive a description of customer preferences, not pre-determined conclusions. Ideally, a designer can question customers and sellers directly and receive unbiased information. The interviewees emphasized the importance of direct information sourcing.

Design can be managed as a proficiency to **generate unique product concepts and to search for new market opportunities** (Joziasse, 2000). The tactical design manager must always be focused on the extent to which new product concepts meet future customer needs as specified by the objectives of the business unit. A designer's ability to influence the business unit strategy often correlates with the **constraints of a design brief**. The nature of briefing may be communicating the strategy that has been already thought out or creating the strategy together with the designer – often discussion with the designer gives new insights. In one of the case companies, the designer had participated in defining the customer segments and, thus, influenced the product line strategy. There are often problems associated with positioning the product as part of an existing product range: should the product be a part of a series or is it strong enough to stand as a product on its own? How to expand the series with an inexpensive version without damaging the image of the existing series? Different values influence the decisions, for example cost, usability, and aesthetics, and designers' opinion may be valuable to the company.

Design integration in business unit strategy development can be evaluated using the following indicators:

Indicators for design in business unit strategy development

- **Design utilization as a competitive tool in business**
- **Design's role in competitive strategy – main vs. supportive role**
- **Significance of design criteria in strategic decision making**
- **Following and influencing the design framework at the corporate strategy level**
- **Designers' contribution to mediation between the corporate strategic goals and their implementation**
- **Time designers spend on visioning and concept design**
- **The share of projects initiated from designers' proposals**

4.2 Design management

Design management concerns how design issues are integrated into management and support processes. Above all, **design management aims at controlling, co-ordinating, evaluating and developing design resources and processes, i.e. promoting operational activities to succeed.** A successful business strategy depends to a large extent on decisions that are made and activities that occur at the operational level. Operational design management concerns the efficiency and effectiveness of the design process, the design team, and individual design projects (Joziasse, 2000), and in addition, as this research showed, the effective co-operation with related functions, as well. Of particular importance is the management and integration of outsourced design resources; in-house designers should reflect the commitment and general image of the company.

A company has to decide upon the outsourcing of design – whether to use external designers or, if it is viable, to hire in-house designers. In the case companies the briefing process varied greatly depending on the designer being external or internal; in-house designers learn to ask the right questions according to the core competence and business. Although external designers bring fresh thoughts, if there is not enough collaboration, the in-house knowledge cannot be fully exploited. Ideally, the company can utilize both in-house and external designers – both bring certain benefits. Nevertheless, even if a company decides to use only external designers, it must have enough understanding of design to buy design services successfully.

4.2.1 Financial and physical resources

The essence of beneficial design usage is sufficient financial input. According to this research, investments in design consist mainly of:

- Salaries of designers (fixed fee, hourly wages, royalties);
- Costs of design commissions – brief development, focus group working; and
- Design infrastructure – e.g. software compatible with other functions.

Resource allocation between product categories needs to be considered; sometimes it may be better to increase the design budget of the main product at the expense of other products. Moreover, a designer's ability to affect investment decisions is an important issue; for example, the purchase of production machinery may influence significantly the possibilities of design usage. Design investments are typically compared with R&D or marketing investments.

Most of the case companies spent below 1% of their net sales on design. Only one company spent approximately 5% on designers' salaries, including royalties (Table 10).

Table 10. Investment in design (of net sales)

	< 1%	1%	1-5 %
BtoB companies	5		
BtoC companies	2	1	1

Financial and physical resources devoted to design can be evaluated using the following indicators:

Indicators for financial and physical resources of design

- **Investment in design work, commissions and infrastructure**
- **The suitability of designers' terms of remuneration**
- **Investment in development of design usage**
- **The total investments in design**
- **The fluctuation of the design budget**
- **Designers' possibility to influence investment decisions**

4.2.2 Human and knowledge resources

This chapter deals with the management of design-related human and knowledge resources based on the case studies. The theme is further divided into organizational design competence, employment of in-house designers and positioning of the design organization.

Organizational design competence

The major part of organizational design competence concerns the understanding of design and its possibilities, and managing and organizing design. Especially when the company does not have in-house design personnel, the understanding of design by non-designers is of

great importance. Experiences in using design have a big influence on organizational design competence. Above all, experience affects how design is perceived in a company: from styling to product design and concept design. Design usage seems to be connected with whether design is seen as one of the major competitive factors – design has strategic importance and that importance marks the limits of design outsourcing – or, to support the core competence, e.g. technology. If design is seen as a core competence, companies nurture and develop in-house design competence. If the company sees that the role of design is merely to support the core competence, design competence is easily outsourced. However, this may lead to incomplete design utilization – a buyer has to know and understand what kind of design service packages a company needs.

In particular, an organization's capability to evaluate design need and to prioritize design usage, as well as to brief designers and evaluate design outcomes, is important – what is optimal for the company goals. Knowledge transfer between a company and its designers is vital for the development of both the company's design competence and the business know-how of the designers. It is extremely important that designers are aware of the company's competitive strategy. Career change of designers – designers moving to other positions – the natural means for knowledge transfer, has been rare in the case companies.

Companies use different tools to enhance the development of organizational design competence. For instance, design competence can be assessed using design audits. If a company lacks know-how in utilizing design in its business, it can turn to a design agency specialized in strategic consulting. Consultants have access to agency networks, and they can help in segmenting and positioning tasks, as well as selecting and briefing the designers or agencies. Finally, after the learning process, the relationship can end and the focus can turn to fostering in-house design know-how. On some occasions, especially when the company can benefit from co-branding with a design agency, it may be beneficial to establish a partnership with the design agency.

Organization design competence can be evaluated using the following indicators:

Indicators for organizational design competence

- **The share of employees with design understanding**
- **The number of different human resources devoted to design**
- **The share of employees capable of evaluating design need and prioritizing design usage**
- **The share of employees capable of briefing and evaluating design**
- **Turnover rate of personnel with design competence**
- **The distribution of design competence**
- **The career change of designers**
- **The share of designers capable of efficient project management**
- **The level of design competence compared to competitors**
- **Peer review of design competence**
- **Design audits**
- **Facilitation of design awareness and design-driven culture**

Employment of in-house designers

If a company has only a few designers, their personalities will come to the fore in the design process. A critical mass and a combination of in-house designer and consultants seem to be necessary in large companies that want to implement a design strategy; this is also necessary for small companies, but here it can be organized in different ways (Johansson & Svengren, 2003). The size of the company seemed to be the greatest factor

affecting the employment of in-house designers in the case companies (Table 11): smaller companies could not afford internal design personnel. In one case company where design was seen as a competitive edge but the industry was relatively stable, the company had a long-term relationship with a Finnish design agency. In particular, the leading designer of the agency was very familiar with the company and its business, and was considered almost to be an internal employee.

Table 11. Usage of in-house designers vs. external designers

	Only external designers used	Mostly external designers used	Mostly in-house designers used
BtoB companies	4	1	
BtoC companies	1	1	2

According to the study, in-house designers have a better opportunity to gain an overall picture of the corporate strategy and business operations, e.g. familiarity with the technological and business limits and, furthermore, to participate in the development activities of the company. An in-house designer's tasks can also deal with strategic issues that the company does not want to reveal. An important aspect is a designer's suitability for the given task and the company. Issues to be considered are, e.g.:

- Suitable style for the brand, ability to adapt according to the brand
- Specialization area, e.g. operational and design technical know-how vs. strategic know-how
- Experience, knowledge of the product development projects, familiarity with the company and the business, qualifications
- Team working and communication skills, personality.

A designer's process skills include an understanding of the company's processes and the capability to adapt design to these processes. It is often a hard process to start with a new designer; the company cannot know in advance if the designer will be able to understand how to bring value to the company. However, a probation period with the given design tasks might indicate suitability.

The company has to decide whether it will be better to develop designers towards focused or comprehensive competence. In small companies, it is important that the designer has wide design know-how; in large organizations designers can be more specialized. Specialization may be, for example, context related (time, culture) – trends in colours, materials, ornamentation – or technology related – mechanical and software design. Moreover, the company has to optimize the time designers spend in idea creation and implementing phases according to the corporate strategy. Naturally, the designers' capabilities and talent affect the direction of specialization.

Employment of designers can be evaluated using the following indicators:

Indicators for employment of designers

- **The number of in-house designers**
- **Suitability of designers for the given task and the company**
- **Designers' commitment and overall image of the company**
- **Diversity of designers – e.g. age, sex, nationality**
- **Possibility to lure and keep top designers**
- **Specialization rate of in-house designers – e.g. effective vs. creative, technical and material know-how**
- **The share of designers with strategic vs. operative know-how – e.g. expertise in using modelling tools**
- **Development of designers' strategic competence**

Positioning of design organization

Organizational structure and positioning of in-house design organization has to be suitable for the purpose according to the nature of the industry that the company operates in. Design organizations in this study were either separate (independent) design organizations, or design was positioned within R&D or marketing (Table 12). In the case companies, the company size and experience in design usage were the major factors affecting the positioning of design organization. For a large company, separate design organization is possible; however, well-organized and effective design management is required.

Table 12. Positioning of in-house designers

	No in-house designers	Within R&D (1-5 designers)	Independent design organization (170 designers)
BtoB companies	4	1	
BtoC companies	1	2	1

Design resources multiply through the co-operation with other functions. A company has to combine design with other functional areas and disciplines and ensure that design is available for all functions when needed. Combining design within other functional areas can positively affect the results; this kind of arrangement is good especially when the company has a very active leading personality in design, and a relatively informal or small organization.

A separate design organization lends visibility to design within the company. The most important aspect seems to be its position in the organization, the balance between the expectations and goals combined with the resource allocation to accomplish the goals. Positioning design within other functions may result in design not being realized and understood within the entire organization, causing ineffectiveness and overlapping in design tasks, and wasted design out-sourcing, for instance.

Positioning of design organization can be evaluated using the following indicators:

Indicators for positioning design organization

- **Suitability of organizational structure and the location of in-house design organization**
- **Separate design organization vs. design positioned inside other functional department – e.g. R&D or marketing**
- **Combining design with other functional areas and disciplines**
- **Availability of design for all functions when needed**
- **Visibility of design organization, awareness among other functions**
- **Overlapping of design professional tasks**

4.2.3 External relations

External relations in design management are specified in this research as design outsourcing, co-operation with design educational and research institutions, and designers' co-operation with customers, users, and subcontractors. Managing external design relationships contributes to the corporate networks. In small companies, design is often outsourced and even companies with in-house designers utilize design agencies. Moreover, innovative firms pursue more and more co-operation with customers and end-users when developing innovations; however, the designer's direct contact with them is relatively rare. Nonetheless, it is optimal that designers receive market information from the original source, not ready-made conclusions or interpretations.

Design outsourcing

The most important reason for design out-sourcing is the need for competence or resources that the company does not have. In-house design personnel can concentrate on the core competence related design issues; design consultants' contribution to the company may vary between being a resource pool (e.g. technical implementation, rendering) to a source of novel and innovative ideas and questioning conventional ways of thinking. Continuity and depth of the customer and consultant relationship usually affect the level of business understanding of the design consultant, but also the design understanding of the company. In addition, the company can establish strategic alliances with design consultancies. A long relationship brings familiarity with the company and its business, and consequently trust regarding strategic information: developing product families is more fruitful if designers have a general view of the company's business and organization.

External designers can play a major role in company innovativeness. They introduce fresh ideas and new ways of working to the company. The usage of external designers may be beneficial especially if the company benefits from the utilization of a design agency's brand or a famous designer's name. That is, the designer as a person brings added value to the target segments. However, depending on the drivers and corporate strategy, the company has to consider whether it will be more beneficial to use 'a star designer' or a team player. In addition, adequate co-operation with the company is needed for exploitation of in-house knowledge.

Advantages of using external designers include:

- Cost, especially for a small company it is expensive to hire an in-house designer,

- Competence that the company does not have or does not want to maintain, e.g. operational know-how: knowledge about new materials, design process techniques and aesthetic trends, foreign or global view
- Purer touch associated with an external designer, new views, radical ideas
- Possibility to select from many different designers' proposals.

External consultants are also used for future visioning. If external designers form a strategic alliance with the company, a high level of involvement and communication of company visions, strategies and the position and purpose of design are required. Small companies do not necessarily have in-house designers, and therefore, they have to reveal strategic information to external designers. Good communication and trust are required for a good subcontractor relationship.

Design outsourcing can be evaluated using the following indicators:

Indicators for design outsourcing

- **The degree of design outsourcing**
- **Continuity and depth of the relationships with design consultancies**
- **The intensity of co-operation with external designers**
- **The nature of the external designer's task: resource pool vs. strategic partner**
- **The share of ideas from external designers**
- **The necessary competence of external designers vs. company's personnel**
- **The level of business understanding of the external designers**
- **Specialization rate of external designers**
- **The benchmark results compared to the company's own operations – e.g. the share of delayed or failed design tasks**
- **Costs and savings due to design outsourcing**

Co-operation with design educational and research institutions

Co-operation with design-associated educational and research institutions brings new knowledge into the company. The company can for example organize design competitions for design students. All of the case companies had had joint projects with design educational and research institutions.

Co-operation with design educational and research institutions can be evaluated using the following indicators:

Indicators for co-operation with educational and research design institutions

- **The degree of co-operation with educational and research institutions**
- **The number of internships**
- **The improvement of personnel's design competence due to co-operation with educational or research institutions**
- **The share of projects initiated from the idea arising from co-operation with educational or research institutions**

Designers' co-operation with customers, users, and suppliers

Designers' direct contact with customers and end users is often important; however, it was found to be rare in the case companies. In industrial business, particularly when an external design consultancy is used, the presence of a designer at customer meetings is perceived as harassing for the BtoB customer relationship. On the other hand, when designers receive the customer information from marketing, it may be filtered and interpreted, and much important information and 'silent knowledge' is missed. The design organizations of the case companies emphasized the importance of a direct flow of information.

The case companies' in-house design personnel's tasks also included participation in selecting and training subcontractors to assure the design quality and skills required for specific projects.

Designers' co-operation with customers, users, and suppliers can be evaluated using the following indicators:

Indicators for designers' co-operation with customers, users, and suppliers

- **The degree of customer and user involvement in processes**
- **Time designers spend with customers and users**
- **The number of designers receiving direct feedback from customers and users**
- **The degree of designers' involvement with subcontractor selection and co-operation with suppliers**

4.2.4 Design projects

Someone has to be responsible for designers working according to a given timetable, quality requirements, and budget. Requirements for external designers are usually tighter; a clear description of time and money spent is expected. The independency level of a consultant's work depends for instance on continuity and depth of relationship, and the consultant's level of business understanding.

The research showed that the design brief is extremely important: it sets the goals for a design project. The design results can only be assessed in relation to the defined goals.

Some case companies felt that they can improve their design usage especially through better briefing – designers have to have sufficiently high goals. In some cases, this is entrusted on designers themselves.

Briefing designers

Since briefing and evaluation of design are at the core of a company's design competence, it should be considered how they intertwine and if it makes a difference who takes responsibility for them. A company's design manager or in-house designers usually conduct the briefing of external designers. However, representatives from other functions may also be involved in sustaining the direct flow of information. If the briefing comes from the project management, the design manager may specify the brief, by making a sketch for example. If the company does not have in-house design staff, product development management or brand management typically conducts briefing. The project manager is typically in charge of the entity. The product manager's role can be that of a mediator between design and product development, ensuring the fulfilment of the desired design.

The design brief should communicate clearly the constraints (company- and business-specific limitations) but also challenge and inspire designers. For example, a very simple way to concretize the company's expectations is to use visual material of objects from other industries, environments and nature to give hints of what the product should communicate to the target group. Briefing may include visions of the brand position, the product, such as its functionality and operating environment, and the design theme, such as "recklessness" to distinguish it from the competitors. The price of the product is often defined in advance by marketing. In addition to the specific limitations mentioned above, the product may have to be adapted to other products in the portfolio, and above all be suited to the corporate or brand identity. Usually at least some of the materials or components have to be the same as in other collections (technology platforms) to be cost-effective.

Openness of the brief (number of constraints) usually correlates with the nature of the project – the more innovative the results the company desires, the more open the design brief has to be. However, a moderately accurate brief is wiser if the goal is to improve an existing product and there is clear feedback and knowledge of what needs improving. Sometimes it is possible to combine the benefits of the existing products. Also, previous work with the designer and the designer's professional skills affect how open a brief can be. An in-house designer who knows the company and the technical limitations can have more freedom, but external designers need more steering constraints. At best, briefing is a discussion and the designer is involved in defining the objectives: size, style, and materials.

Briefing evolves during the project and can be focused later; different phases of the project may bring new challenges for design. For instance, technical constraints are not always determined at the beginning, but the brief can be focused later with the production requirements. The designer may have options for technical solutions, and counter-briefs follow after a couple of months working, with go/no-go decisions. Material selection may also be done in the later phases. Colour-optional decisions are one of the most stretchable decisions than can be delayed.

The interviews revealed that the production process sets constraints on design usage, especially when the technology level is high. For high-tech products, the case companies felt that it is often advisable to first determine between market information (user benefits) and technical limitations, and only then draw up the design brief. On the other hand, design may also be used to develop the production process.

Briefing designers can be evaluated using the following indicators:

Indicators for briefing designers

- **Design competence of the persons in charge of briefing designers**
- **The degree of specification of the design brief – e.g. business- and company-specific constraints**
- **Capability to inspire and challenge designers – e.g. the usage of visual material in briefing**
- **Focusing designers' personal goals**
- **Evolvement of briefing during the project – e.g. delaying colour decisions to the last moment**
- **Designers' direct information sources**

Organizing the design process

Designing is a creative process; therefore, it may be asked to what extent a company can organize the design process. However, since designers cannot work in isolation but have to co-operate with other functional departments and with each other (in the case of big companies with many designers), organizing the design process is necessary.

The extent to which design is seen as an individual creative activity or as a corporate planning process depends upon company characteristics such as company size, the complexity of its production system and the nature of both the corporate and national cultures (Cooper & Press, 1995). In addition, external drivers have an impact; for instance, in high-velocity industries, companies need to be able to react fast to new trends (product features, colour, etc.) and develop matching products. Therefore, there is an immense need for organizing the design process – the time for experimentation is limited and the focus is on the exploitation of accumulated design knowledge. Moreover, production constraints affect the organization of the design process: a high-technology product requires tight co-operation with other functional departments, and the designer cannot work in isolation. Fluent cross-functional communication is important in any case.

Designers' relationships with other functional departments can be organized or loose; formal or informal – both the activity and the willingness to co-operate are important. When a designer is integrated to the processes, continuity of design usage is assured and there is less need for the designer's own activeness. Nevertheless, it depends on the designer's argumentation skills how well the designer imparts his/her ideas. When design is seen as a part-time activity, there is a risk that its benefits cannot be fully utilized. Separation of tasks between designers and other functional departments can be precise or loosely defined. Equally, co-operation can be organized sequentially – a designer develops propositions that will be either approved or rejected by technicians and marketing personnel – or members of different functions can form project teams and create ideas together. Designers' responsibilities and their role in decision making are an important issue.

Task division between designers depends on the available resources, prioritizing may be needed. If a company has enough design resources it can select a leading designer for each project and use other designers as consultants according to the specifications. Also, regional division of work may need consideration. Resource allocation is important, especially in the case of little design resources. Usually in-house designers are withdrawn from projects as soon as possible and routine work is left to subcontractors. When a design assignment concerns the core competence and outsourcing is not possible, prioritization of the design tasks is inevitable; however, the importance of consistent design usage should not be forgotten.

The case companies evaluated design projects either during the process or retrospectively. A company can determine the milestones, checkpoints for design evaluation. It can be conducted, for example:

- In each programme interface;
- After the sketches, mock-ups, and prototypes the number of sketches must be considered, prototyping is expensive;
- In critical phases when prioritizing is required; and
- Finally when the project should be frozen – before the production tools are made.

The right timing by effective scheduling of decision-making procedure minimizes the need for time-consuming corrective actions in the idea-to-markets process. The company's reactivity under risky conditions is extremely important: for the competitiveness and risks, it is better if the company can make the decisions later in the process. Strategic planning and a well-timed decision-making procedure reduce delaying corrections and renewals.

Organization of the design process can be evaluated using the following indicators:

Indicators for organizing the design process

- **Design seen as an individual creative activity vs. team work**
- **Co-operation organized sequentially vs. a designer working as a member of a project team**
- **The level and intensity of design integration with other functions**
- **The frequency of design being done as a part-time activity**
- **The share of designers working in cross-divisional teams**
- **Designers' relationships with other functional departments: formal vs. informal**
- **Milestones for design evaluation – established points for assessment**
- **Designers' responsibilities and role in decision making**
- **Task division between designers**
- **Effectiveness of scheduling the decision-making procedure**
- **Increase in information delivery**

Evaluation of design projects

The primary measure of a design project is the fulfilment and exceeding of the goals. Design management faces the challenging issue of how much responsibility should be given to a designer: which factors will be assessed by someone else and which will be left solely in the designer's hands? Who defines the brand look? Since many aspects of design – aesthetics for instance – can only be judged subjectively, a company has to decide what is evaluated and by whom.

Design evaluation can be carried out by the project team, or the decision making may be brought to the board, where the CEO, marketing, technical product development, and design management together perform the evaluation. This facilitates the accumulation of design competence within the entire organization. The design manager conducts reviews during the projects. The goal is also to improve the design process. Increasingly, customers' and end-users' opinions are also taken into account in the evaluation.

It is occasionally wise to evaluate the entire project instead of merely the design outcome in order to use the project as a learning process and to improve future projects, especially in respect of product portfolio management. When many projects are conducted from the

same platform, a company can gain cost savings; however, this brings additional challenges for project management.

Evaluation of design projects can be assessed using the following indicators:

Indicators for evaluating design projects

Outcomes
- **Solution to objectives – e.g. visual issues, suitability for the brand, usability, manufacturability, price**
- **Coherence of design language (family features)**
- **Suitability for the target segment, market testing with prototypes**
- **Positioning with competitors' design**

Cost-efficiency
- **True vs. budgeted investments**
- **Manufacturing failure rate**
- **The number of re-design cycles**
- **The number of successful projects**

Time to market
- **The number of duly completed projects**
- **Time needed to begin the full-capacity production since test drives**
- **The average total time for projects**

Innovativity
- **The number of feasible solutions**
- **The number of new product features**
- **The number of launched new products**
- **The number of products first in markets**
- **Patents, trademarks, and registrations of design**
- **Number of process or competence improvement ideas (vs. implemented)**

Reactivity
- **Flexibility, e.g. modularization of product or service selection**
- **Possibility to postpone trend-specific decisions**

Learning capacity
- **The number of clear improvements**
- **The number of products with defects**
- **Waste and quality expenses**
- **Guarantee and service costs**
- **The number of injuries and environmental accidents**

Future management
- **Anticipation of modification needs according to product life cycle**
- **True versus desired project portfolio**
- **The share of projects developed from the existing platforms**
- **The share of projects extending the product life cycle**
- **The possible value of product portfolio**

4.3 Operative design usage

This study showed the importance of understanding the wide range of possibilities in design usage. Design can also bring advantages to other processes besides product development; for example, design helps marketing in several ways. The corporate image and brand are supported and maintained with co-ordinated actions; for example, the coherent product range, communication and environments. Publicity can be achieved by emphasizing the designer in marketing communications, in particular in spot projects when totally new product types are needed to attract attention and develop the brand image.

The number of processes in which a company uses design indicates the scope of operative design usage. However, design can be used in many ways in a process. In order to get the maximum impact from operative design, it needs to be part of the process from the early right through to the end stages. However, the role of design is different at every stage: participating in ideation, commenting, consultation, creating concepts, designing, and evaluation.

According to case company interviews, design is mainly used in the process of designing products and services in both BtoB and BtoC companies, but answers are more confined in BtoB companies. Executive managers and R&D or design managers tend to prefer design to be used on broader scale than marketing or sales managers, for example. In BtoC companies the difference is not so clear. The next section will describe the ways of using design in the operational process in case companies.

Research

Half of the case companies used design during the research process to **enhance the predictability and understanding of future markets, as well as the ability to react fast**. One way of using design in research is through usability and user research, which are ways to understand, identify, and introduce appropriate user values that are appreciated in the designed products, services and processes. Research reveals the user values determining the user's choice and consequently market success. User research is also used to map trends and for analysis of the target group. Using designers during the research process facilitates better understanding of the business environment, especially the visual language in different cultures. Designers can interpret customer feedback and ascertain needs for variation.

Companies use design to **identify the opportunities for product improvements**, i.e. to develop products that correspond better to users' needs. The means of uncovering user dissatisfaction were through customer feedback and observation of users, usability testing, and studying the product usage environment. Design is also used in research to identify opportunities for advanced technology or delivery, to analyse competitors and to facilitate market research using prototypes.

Design-related research is important because of **future anticipation** of the companies. Designers make colour, trend and material analyses and produce design categories for years to come to assure seamless product implementation. The concrete ways of using design in research are scenario and portfolio building, concept and development and testing, long- and short-term trend mapping, user observation, and customer satisfaction research.

Product and service development

According to case company interviews, all companies use design in product development, but the ways and intensity vary a great deal. This section describes the methods and purposes of design usage in product development processes in case companies.

Design is used in product development **to increase innovativeness and desirability**, i.e. to create commercially viable ideas. The means of enhancing the innovativeness of the

products or of the whole development process are **concept building** for new product opportunities, **rich ideation** in order to offer a broad range of variation and choices, **creating need-solution pairs** and **innovations** that offer something new and valuable to the customers.

The companies use design to **develop concepts by integrating the multidisciplinary know-how,** i.e. business, market and supplier knowledge, to enhance innovativeness. **New working methods** are introduced, e.g. by developing different and customized ways of solving problems. New views and procedures for product differentiation are created by **balancing newness and familiarity**: different enough to stand out yet not enough to seem strange. Design is used to humanize radically new technologies by integrating new technologies to understandable user benefits.

Design supports the companies in increasing and maintaining their customer-orientation. At product level this means, for instance, **differentiating and adjusting products and services** for the target markets. Differentiation makes the added value clearly noticeable to the customers. Design is used to increase distinctiveness and status value, as well as to make it possible to personalize the products. Designers pay attention to details, for instance to the position and size of the logo and brand name and the colours, which communicate the required quality and corporate identity in visual terms. Interior-driven design makes it possible for the customers to keep the products in view and as a part of their own interior decoration and design.

Design links the customer to the product development and involves future users by user- or human-centred design. Human centred design, i.e. user-friendly products and services, aims at fulfilling users' needs. This approach to design considers style and cultural differences, aesthetics (form, colours) and suitability to operational environments. Also, functionality, serviceability, installability, ergonomics, safety, user interface, and durability are possible product features achieved by human-centred design. Robust and trustworthy design gives promise to the technical performance of the product.

Design is an important tool for **managing and developing the product portfolio**. Companies can modify products in order to customize them for different market segments or to create a distinctive design style for the entire product range. Designers take the product lifecycle into account when modifying and developing new products, and create design lines for product assortments.

Companies use design in order to **increase or maintain their design know-how**. Design know-how includes **professional implementation of the idea** and **incorporating trends into products**. It also means **holistic design,** i.e. what kind of mood the products communicate, and how that fits into the operating environments. **Aesthetics** is an important part of design know-how: product form, shape, colour, and style, i.e. the definition of the unique qualities of the external form. **Planning and styling of the fine detail** makes it possible to bring a feeling of quality to the products. Designers pay attention to the visual details, aspects of the product itself that might militate against radical design.

Design **facilitates communication through formal and informal means**. Abstract and initiative ideas are integrated with ready-made details. Modelling, sketch modelling, 3D modelling, sketching, technical drawings, prototypes, and presentation pictures enhance communication within the company and with customers. Designers can co-ordinate multidisciplinary networks, and deliver different perspectives to multidisciplinary teams. Design is used for clarifying the development process. Visual decision-making tools give form to abstract thoughts and enable more effective decision-making. Besides facilitating communication, design enhances the co-operative learning process.

Marketing & Selling

Design is used in marketing and selling processes in several ways. Typically, it means using graphic designers to produce visual marketing and sales material. In addition, product

design supports branding and customer orientation. Designers can participate in developing expanded marketing strategies and marketing methods. For instance, market research can be conducted using prototypes made by designers.

Good design can be utilized as a selling argument, a product or picture of it may convince customers, for instance, of the quality. Design improves marketability, marketing and sales material by forming guidelines and creating a perceived quality for the products. Customers choose first with their eyes, and design can be utilized by emphasizing the product's appearance in product demos.

Design is used to develop the **product image**, such as visual convenience, innovative, updated, and distinctive for the corporate, quality and finished image. Products following the design guidelines or visual identity of the company convey a distinctive and differentiated corporate image. Furthermore, a coherent corporate image needs a product image that speaks the same language as other messages that the company communicates. Product image supports corporate image making brand identity visible, and the customers connect products to the company.

Design is used to focus a product to a certain segment and target market, i.e. positioning a novel product, creating infinite variations of products and tailoring individual models to niche markets. It also means visualizing and communicating desired values and delivering those to marketing channels and customers by product and marketing communications.

The companies can also utilize the designer's name in marketing communications. For instance, a designer should be involved in product launches when the target segment is design oriented. Designers can also participate in product launches and PR.

As a result of the product design process, the company receives visual information, i.e. documents such as products, pictures, sketches, prototypes and graphics. The company can also use these to support sales ideas within the company, and for other communication and decision-making purposes.

Production

The companies use design in developing the production process to reduce manufacturing and assembly costs. Competitive features and a modular design are used for keeping investments down, rational standardization, modularity and manufacturability and detailed design becomes easier and manufacturing cheaper. A designer's work also includes taking the product lifecycle into account in the design process.

Designers can influence production design, which can mean innovations in manufacturing. The case companies had also used designers in supplier relationships, so that they can create value by understanding the value chain and improving co-ordination between marketing and production. If production is subcontracted, designers work in quality control.

Delivery

In the delivery process, design is used to design customer companies' interiors and shape customer experiences, e.g. through package design. Well-designed products and marketing material increases the desirability and commitment of resellers. Design can also affect the delivery time and installability.

After-sales marketing

Design enhances a company's capability to serve its customers by creating service selection and products and services for customer training and self-support. Experience design and extending the visual quality of the product are areas of after-sales marketing. Designers can

also be used in designing product manuals and standard parts. Design makes copying difficult through strong brand identity and a design strategy.

The scope of design usage was explored by asking the case company interviewees to specify the operative processes in which a designer participates in their company (the list of processes was given to the interviewees). Interviewees from the same company had different views; therefore, each view is presented (Tables 13–14).

Table 13. Design usage in different processes in BtoB companies

Interviewee (number of interviewees)	Research	Develop a vision & a strategy	Design products & services	Market & sell products & services	Producing products & services	Delivering products & services	Invoicing & servicing customers	After-sales marketing
Executive management (5)	A	A	AFGHI	(A)FGH	(A)		H	
Marketing/Sales manager (4)			FGHI	FGH			H	
R&D/design manager (6)	AAI		AAFGHI	AAFGHI	AAI	A	HI	AA

x = designer participates; (x) = designer's participation would be desirable

Kommentti [TS1]: Tämä selitys tuntuisi viittaavan johonkin muuhun taulukkoon.

Table 14. Design usage in different processes in BtoC companies

Interviewee (number of interviewees)	Research	Develop a vision & a strategy	Design products & services	Market & sell products & services	Producing products & services	Delivering products & services	Invoicing & servicing customers	After-sales marketing
Executive management (8)	BBB	BBBBBDE	BBBBBCDE	B(B)E	BBB(B)(B)DE	BB(B)	B	B(B)DE
Marketing/Sales manager (3)	D	E(C)(D)	CDE	CDE	C(D)E			CDE
R&D/design manager (4)	BD	BE	BCDE	BCD	BC	BD	B	BC

x = designer participates; (x) = designer's participation would be desirable

Kommentti [TS2]: Tässä kuten edellä.

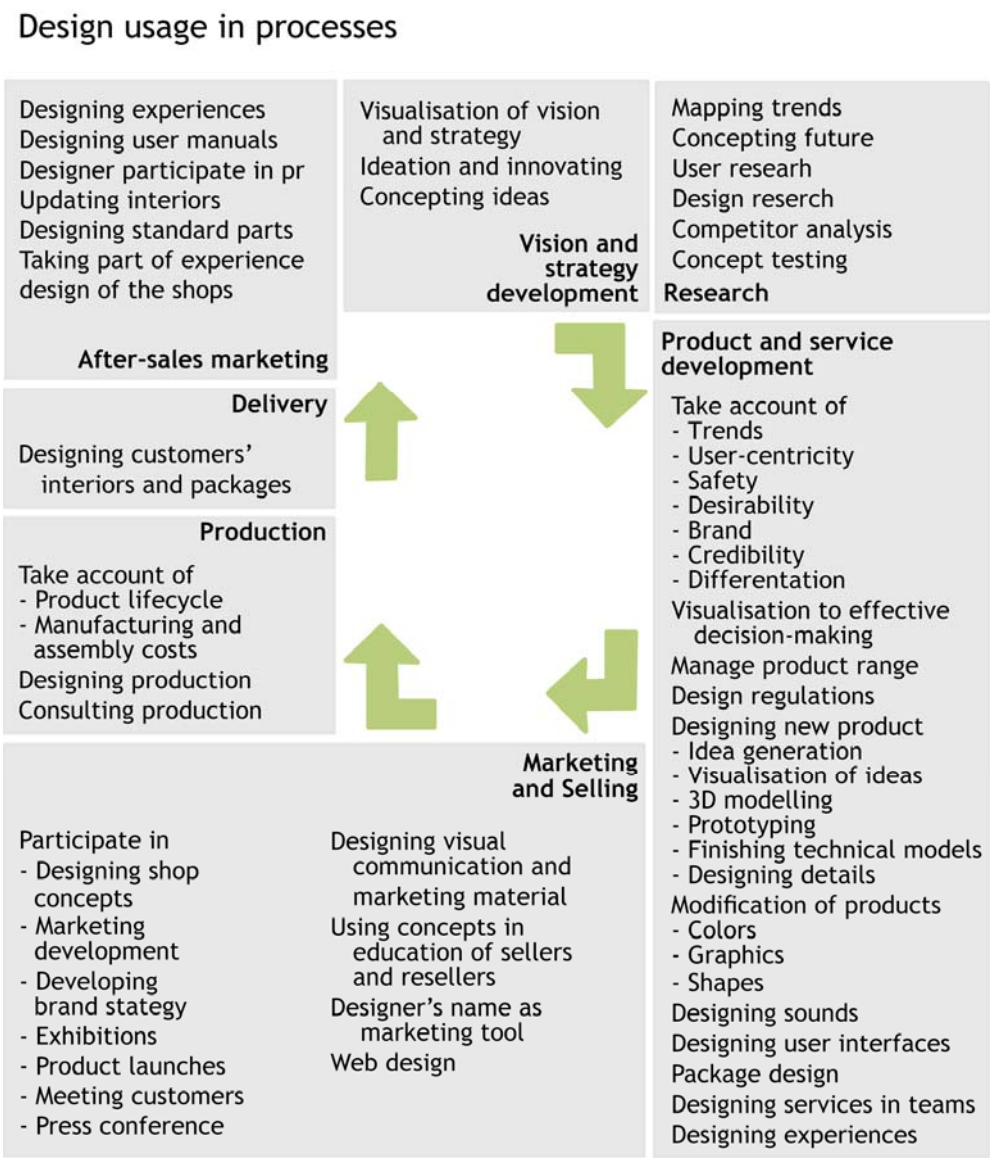


Figure 8. Design usage in case companies in brief

Figure 8 presents design usage in different operational processes based on company interviews. It covers processes from vision and strategy development to after-sales marketing and explains the actual tasks that designers perform in the companies. The variety of responsibilities is wide, but the figure reveals that designers' tasks are positioned mostly in product development and marketing processes.

4.4 Enablers verified in the study

Companies can employ designers within the company or outsource design competence. The study shows that most of the companies have decided to use both in-house and external designers. Thirty-five per cent of the respondents said that they use both in-house and external designers or a design agency. The remainder use a design agency (23%) only, their own in-house designers (21%) or external designers (21%). Surprisingly, the companies not using design stated that they use internal designers. This contradictory result might mean that those companies have design-oriented employees, or that they would hire a designer if needed (Figure 9).

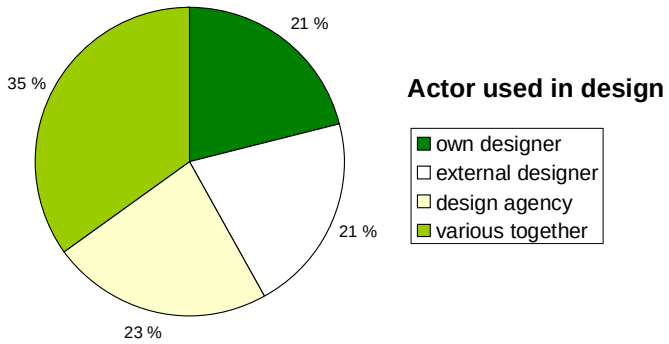


Figure 9. Actor used in design according to the study

According to the study, design is used primarily in marketing; 40.8% used design "a lot" or "some" in marketing. Design is used almost as much in product development (39.8%) as in marketing, but the number of companies that frequently used design was higher in product development (20.4%) than in marketing (12.2%). Design was also used to a certain extent in sales (34%), production (22.5%), customer service (22.5%), development of strategy and vision (17.3%), after-sales marketing (10.2%), delivery (8.1%) and research (7.1%). Though design was least used in research, those companies that did use it do so frequently and invest quite heavily in it (7.1%). The assumption is that investments in design, its usability and its use in predicting future trends, for instance, are an important part of frontline companies' design activity. But as can be seen, design is spreading from traditional areas, i.e. product design, graphic design, and interior design, to new areas. The companies have accepted, at least to some extent, design management as part of their business (Table 15).

Table 15. Design in business processes according to the study

Design usage in business processes	Plenty/Some (%)	Plenty (%)	Not at all (%)
Marketing	40.8	12.2	5.1
Product development	39.8	20.4	2
Sales	34.7	6.1	5.1
Production	22.5	3.1	8.2
Customer service	22.5	3.1	13.3
Strategy and vision development	17.3	2	14.3
After-sales marketing	10.2	3.1	19.4
Distribution	8.1	2	14.3
Research	7.1	7.1	17.3

If companies use design mostly in marketing and in the product development process, what are the ways of using design and what does design mean to those companies? For most of the companies, design means, to a greater or lesser extent, designing usability factors (78.13%), building the product image (75%), and designing the product appearance (74.73%). This shows that **design is understood mainly as aesthetics and usability**. **Also, the development of a corporate image is recognized as an important way of using design** (71.88%). According to the study, traditional design competences, such as material and production technology, have a moderate role in design. Design also means product improvements (65.64%), new product ideas (65.64%), future visioning (61.46%), package design (48.47%), construction design (48.47%), CAD design (40.62%), and, finally, service design (35.42%). It is notable that using design to find new product ideas is important in 27.08% of the companies, and only 2.06% of the companies see design as having no role whatsoever in future visioning (Table 16).

Table 16. Design know-how in the companies and ways of using design according to the study

Design means	Plenty/Some (%)	Plenty (%)	Not at all (%)
Designing usability	78.13	42.71	3.12
Building the product image	75	37.5	6.25
Building the product appearance	74.73	41.05	3.16
Building the company image	71.88	36.46	4.17
Material technical solutions	70.84	23.96	4.17
Production technical solutions	70.84	23.96	4.17
Product improvements	65.72	20.83	3.12
New product ideas	65.64	27.08	7.29
Future visioning	61.46	23.96	2.08
Package designing	48.95	20.83	15.62
Designing construction	48.47	12.63	12.63
CAD engineering	40.62	15.62	12.5
Designing services	35.42	10.42	13.54

There are also obstacles to design usage, which can be based on either knowledge and experience or attitude and beliefs. According to the companies, the two biggest obstacles are the high cost of design (75% cited this to a greater or lesser extent) and the limited resources of the company (72.5%), which are closely linked. Also, a shortage of time resources (68.75%) and a lack of knowledge about design (56.25%) are seen as relevant obstacles to design usage. To some extent, the lifecycle of products (35%), change resistance (31.2%), insecurity concerning the future (30%), redundancy of design (21.8%),

and an absence of competition (12.5%) were also mentioned. On the other hand, 32.05% of the respondents found that redundancy of design is not a relevant obstacle at all, and 27.5% stated that design usage is restricted by a lack of competition and 22.5% by the product's lifecycle. It is also important to note that 24% or 125 of all of the respondents returned the form unfilled, which means they did not consider themselves as belonging to the sample, and therefore redundancy of design might be the biggest obstacle for those companies (Table 17).

Table 17. Obstacles to design usage according to the study

Obstacles in design usage	Plenty / some (%)	Plenty (%)	Not at all (%)
High expenses	75	32,5	1,25
Limited resources	72,5	33,75	12,5
Constraints on time resources	68,75	18,75	1,25
Lack of knowledge	56,25	13,75	7,5
Product lifecycle	35	10	22,5
Change resistance	31,2	3,7	12,5
Insecurity of the future	30	2,5	17,5
Redundancy of design	21,8	10,26	32,05
Absence of competition	12,5	1,25	27,5

In the figure above change "High expenses" to "High cost" and "Insecurity of the future" to "Insecurity concerning the future"]

Table 18. Design usage in the near future according to the study

Design usage in 2 years	Have used design (%)	Haven't used design (%)
Much more	5	0
A bit more	35	16
As much as before	48	20
Less	9	5
Not able to say	3	45
Not answered	0	14

The companies' opinions were sought about design usage in the future. Almost the half of the companies (48%) that had used design before said that they are going to invest in design as much as in the previous two years, and 35% are going to use design slightly more than before. Nine per cent estimated that they would use design slightly less and 5% a lot more than before. Forty-five per cent of the companies that have not used design before were not able to estimate if they will use design in the next two years. Twenty per cent answered that they will continue to use a non-design line and 16% will use design slightly more than before. Fourteen per cent of the companies not using design did not answer the question (Table 18).

4.5 Summary of enablers

Enablers concern design usage in companies – the critical issues that need to be considered when implementing strategies. Enablers have been examined from the process perspective and the enabler classification is based on the Universal Process Classification Scheme with a few modifications. Enablers consist of three parts:

- Design in vision and strategy development
- Operative design usage, and
- Design management.

Design in vision and strategy development concerns design integration into strategy development and designers' involvement in the development of a strategy and vision, both at corporate and business unit levels. Operative design usage deals with the scope of design usage – in which processes companies use design and how they utilize it as part of the processes (benefits of design). There were case companies that used design in all basic business processes (strategy and vision development, research, product development, marketing and sales, production, delivery, customer service, and after-sales marketing) but also some companies that saw the benefit of design only in product development and marketing.

Design management concerns integration of design issues into managerial and support processes, and it consists of four themes: financial and physical resources, human and knowledge resources, external relations, and design projects. Financial and physical resources deal with input in design and resource allocation. Human and knowledge resources concern organizational design competence, employment of in-house designers, and positioning of design organization. External relations include design outsourcing, co-operation with design educational and research institutions, and designers' co-operation with customers, users, and suppliers. Design projects deal with briefing designers, organizing the design process, and evaluation of design projects.

The following enabler indicators for strategic design usage were found:

- Design has to be linked to strategy: the role of design is different according to the strategic situation (internal and external drivers), and this affects also the organization of design usage.
- Design competence is needed both at strategic and operative levels: decision makers have to understand the possibilities of design; also, justifying design solutions becomes easier when the entire organization believes in the benefits of design. The case companies considered briefing and evaluation of design as the main ways to improve their design usage. Constraints have to be appropriate for the purpose and a direct flow of information is required – when market data are interpreted before being received by the designers, some crucial information may be filtered out.
- A company needs adequate design resources, enough designers with suitable skills and individuality. The bigger the company, the greater the possibilities and requirements to have in-house designers.
- Design integration with other functions is vital. In small organizations, design can be a part of another function, e.g. marketing or R&D. In larger companies, visibility of design organization is very important to avoid overlapping and to enhance the utilization of design.
- Design usage and its development have to be consistent – the financial results may not show up immediately but, for example, in the sales of subsequent product series.

5. Results of Design Usage

This section concerns the measurement of the results that arise from design usage. Accordingly, result indicators concern the realization of the goals. Results can be categorized as being internal and external, financial and non-financial, and furthermore, as direct and indirect. Internal results are impacts of design that can be evaluated within the company and external results occur outside the company. Internal results were renamed as **process results**, because they indicate the benefits of design usage in a certain process. Process results are explained in the project management section of this report.

External results contribute from outside the company and they are therefore considered as more objective results of design. In this research, external impacts are subdivided into **customer results** and **financial results**. It is important to note that internal impacts do not necessarily turn into customer results if the needs and desires of the customer and the benefits of products and services do not coincide. Therefore, it is necessary to evaluate both internal and external results and to compare them in order to understand the causal relations of design impacts. **Direct impacts** are defined as immediate consequences of performed actions. **Indirect impacts** are consequences that occur because of design usage but cannot be directly linked to design, e.g. brand equity or an increase in market share.

The basic idea of the Evaluation Model for the Strategic Impacts of Design is based on the Balanced Scorecard framework, according to which financial indicators of the business performance show the ultimate outcome but in order to find the causes for these achieved results, customer results and process indicators are needed as well. In addition, especially in innovation-driven companies, it is important to consider the learning perspective, and it also gives hints of future financial results, making it possible to react in time to things that require action. In other words, both result and cause (process) indicators are needed to provide proof of a design's contribution to business performance (Figure 10).

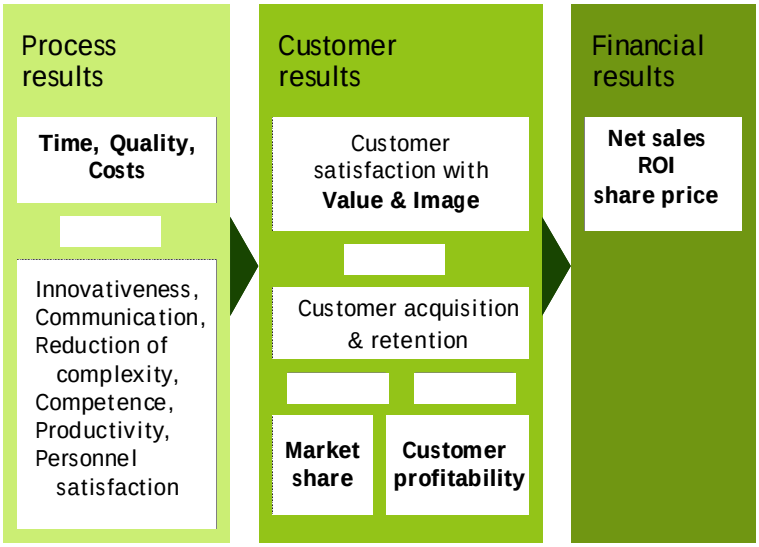


Figure 10. Causal relationships between different indicators (modified from the Balanced Scorecard)

Design wise, different results indicate:

Achievement of strategic goals → Financial results
Success of design → Customer results
Development of design integration and competence → Process results

According to the interviews, the case companies do not have a systematic and continuous method for evaluating design results, even though some companies occasionally measured internal design impacts. The companies collect information on design success by conducting user tests and collecting feedback from sales personnel or directly from customers; however, according to the case companies, customers' positive feedback on design is rare as it is on any other subject. If the design is not correct, the customers can comment on the product, for instance, by saying: 'Ca*ll me when it's ready*'. Therefore, the design results of this research are tacit knowledge and understanding or fragmented information on the impacts of design, rather than systematically proven results of design usage; however, as a result of this research, this information has been used to develop indicators for evaluating the impacts of design.

The following presentation of process results in design usage is based on case company interviews. After that, a theoretical review of customer evaluation of design as well as the financial results are introduced. The result indicators for evaluating design impacts are also listed.

5.1 Process results

The majority of impacts mentioned in the case company interviews are consequences of design usage in the development of products and services. This can be explained by viewing companies' understanding of design as industrial design. **Product attributes** (aesthetic, usable, functional, ergonomic, installable, safe, innovative, understandable and easy-to-service products) arise as a direct internal result of design usage in product development. Aesthetic attributes were referred to as convenient, innovative, updated, qualitative, finished, and the distinctive appearance of the products.

As a direct result of the design process, the company receives **visual information**: products, pictures, sketches, prototypes and graphics. The company can use these to support sales, communication and decision-making. Indirect internal results of the product attributes contribute to a **strengthened inner brand** because the staff are proud of their well-designed products. If product attributes follow, the consistent visual line products make a **coherent product portfolio**. In order to achieve this, the product development process needs to be managed at some level. Well-designed products help and support the selling process – they give an impression of quality and credibility.

According to case company interviews, product attributes lead to external results, first of all **product image**. Design is used to produce the product image, such as visual convenience, innovative, updated, and distinctive for the corporate, quality and finished image. If the products follow the design guidelines or visual image of the company, a distinctive and differentiated corporate image can be created. A coherent corporate image also requires that other messages that the company communicates are along the same line as the product image. Product image **supports the corporate image,** making brand identity visible, and customers connect the products to the company.

The product attributes turn into customer satisfaction if the attributes are relevant, interesting and desirable to the customers. If the needs and desires of customers and the product attributes converge, customers may buy a company's products in the future. Innovative attributes can have an impact on the media: innovative products have gained **publicity** and **design prizes** in the case companies. When design is used to develop standard parts, there are impacts also on customer service and business processes are more **effective**. Briefing and different concepts of the same idea **give order** to the development process. Fast prototyping brings order to the process and therefore the process is more **effective**. At the same time, design gives inspiration and creativity to the development process.

Designers' co-operation with members of other functions and disciplines **increases and extends the competence** of the companies. Design increases company innovativeness. The company gets new ideas and visions of product attributes and image, and learns new working methods. In particular, the company's design know-how increases which means that the entire organization understands better the benefits of design, and design decisions are based on enhanced expertise. The company can also reach new subcontractors via designers, which extends the company's competence network. Using designers in the research process enables the company to understand the business environment better, especially culturally and in terms of the visual language of different cultures, and thereby facilitates adaptability to new markets, and increases new opportunities.

Design facilitates **cost savings** by effective integration and targeting of resources, i.e. decreasing the time-to-market. A product portfolio can offer products in all price classes. The companies can enhance exact targeting of new products by employing an evaluative and customer-driven process, which saves time and money. Or design helps companies to speed up product development by justifying solutions through business. The companies manage prototypes, e.g. by proceeding more rapidly into lots of quick-and-dirty (and less costly) prototyping.

5.2 Customer results

Here, information collected from previous studies in different disciplines and the methods for discovering how design usage turns into customer results are shown. The empirical results of company interviews were also taken into account. According to the Balanced Scorecard, companies can affect financial objectives principally in two ways: increasing market share or increasing customer profitability. Customer satisfaction – the basis for both of them – is the result of product or service attributes, image and relationship (Figures 11 and 12).

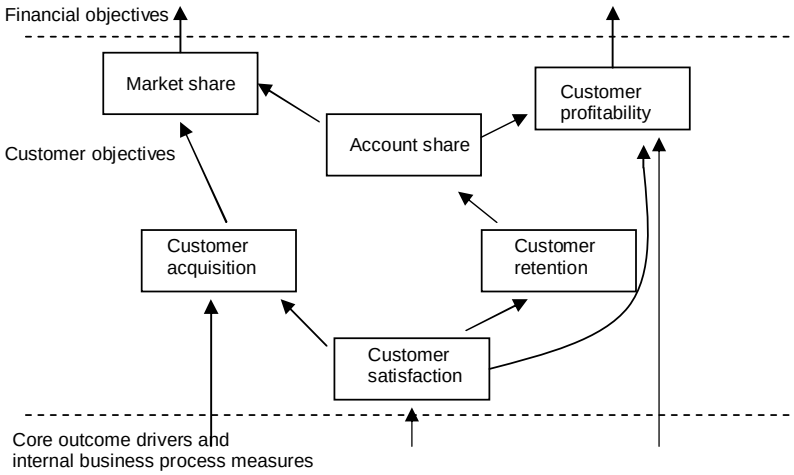


Figure 11. Customer perspective: core outcome measures (Kaplan & Norton, 1996)

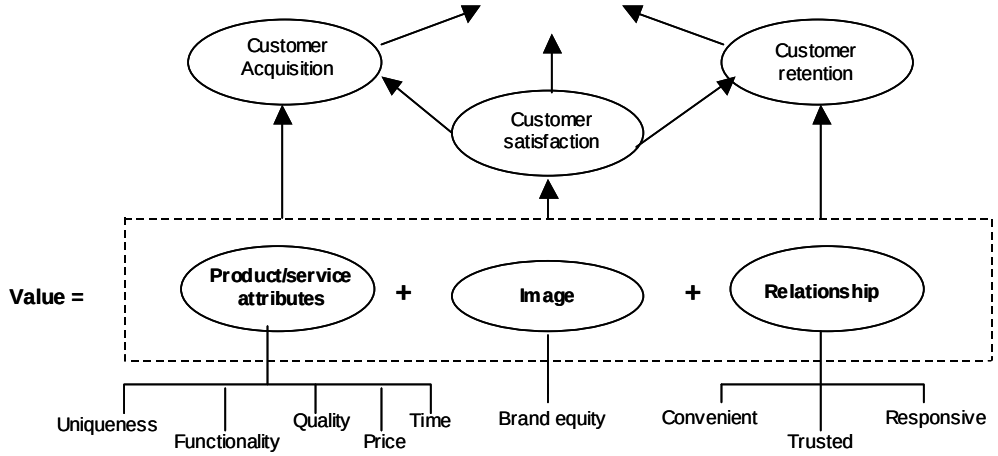


Figure 12. Customer perspective: linking unique value propositions to core outcome measures (Kaplan & Norton, 1996)

When studying customers' evaluation of design, the role of design in purchase and customer satisfaction is difficult to quantify, because design has an impact on cognitive and emotional levels, and also on conscious and unconscious levels. A study of the impacts of design needs methods and quantitative measurements to uncover the effects of design on all these levels. Visual material, for instance pictures, products and line drawings are suitable material for studying emotional and unconscious responses to design. Also, semantic studies using descriptive methods, in-depth interviews, rating and ranking of products, for example, and user observations are preferred to gain a deep understanding of design impacts. (Table 19)

Customers' evaluation in antecedent state

The studies of customers' evaluation of design in the antecedent state are mainly product semantics and other product features or brand strength affect customers' evaluation. Previous studies show that the optimal combination of typicality and novelty jointly affect

the aesthetic preference of the customers (Hekkert 2003). Veryzer (1998) noticed that unfamiliarity causes resistance and leads customers' focus to unimportant product attributes. The brand also has impacts on customers' evaluation. Page and Herr (2002) found that aesthetics and functionality have impacts on liking judgments; however, brand strength has none. On the other hand, the brand strength and functionality influenced the quality judgments.
Walsh et al. (1988) listed customers' views of products affected by design. They are manufacturers' specifications, advertised performance and appearance, test results, image of the products, and the list price. According to Fujito (2000), design works most effectively in the initial stage, i.e. in the stage of attracting attention or at the stage of listing candidate products. This does not mean, however, that design does not influence the final evaluation. Rather, design should be regarded as a necessary precondition.

The possibilities to study customers' evaluation in antecedent states are user tests and panels where people rate and rank products or pictures of products. Tests are mainly performed in laboratory settings (see Page & Herr 2002, Hekkert 2003, Petiot & Yannou 2004). The level of pictures' accuracy can vary depending on the information needed. Customers' evaluation can be measured using the following indicators:

Indicators for customers' evaluation

- **Preferred product appearance through design (aesthetic, symbolic, ergonomic, attraction drawing, functional and categorization)**
- **The impact of brand on product evaluation**
- **Meeting individual preferences by producing products for different segments**
- **Research on customers' cognitive and emotional responses to design**
- **Research on customers' conscious and unconscious responses to design**
- **Advertised performance and appearance**
- **List price compared to competitors and the role of design impacts on price**
- **Test results as a consequence of design usage**
- **Image of products**
- **Image of the company**
- **Publicity surrounding the product and the company as a result of design usage**
- **Brand awareness by making brand identity visible**
- **Brand positioning by differentiated products and image**
- **Consistent and continuous brand management**

Purchase criteria in the purchase environment

Veryzer (1999) stated in his theoretical research study that perceiving, interpreting and evaluating design is probably a non-conscious process. Walsh et al. (1988) listed customers' views of product impacted by design as: overall design and quality, special features, materials, colours, finish, first impression of performance and purchase price. Creusen and Schoormans (2005) studied the customers' evaluation of product appearance in laboratory settings, where people were asked to compare two household products.

Creusen and Shoormans classified consumers' choice reasons according to design values.

1. aesthetic
2. symbolic
3. ergonomic
4. attraction drawing
4. functional
5. categorization

They noticed strong individual differences, but the list above shows the importance of design values appreciated by consumers. The order of the list is presumably different depending on the product, but the method has potential for evaluation of other products as well.

Customers' purchase criteria can be measured using the following indicators:

Indicators for purchase criteria

- **Preferred product attributes at the decision point (aesthetic, symbolic, ergonomic, attraction drawing, functional and categorization)**
- **Purchase situation and the level of evaluation needed (straight re-buy, modified re-buy, new task)**
- **Point of purchase stimuli (design/other)**
- **Buying experience and role of design in creating it**
- **Competitive price due to effective design usage**
- **Possibility to charge premium price**

Customer satisfaction in post-purchase processes

Bloch and Brunel (2003) noticed that there are individual differences in the evaluation of product appearance. Product aesthetics is more important to visually oriented people. They studied it by comparing low- and high-CVPA (centrality of visual product aesthetics) people through a mail survey. Other methods of studying product aesthetics are semantic differential methods (SDM), multidimensional scaling (MDS), pair-wise comparison and visual data: products, drawings and lines.

Methods for evaluating usability are mainly usability tests, user observations and heuristic analysis, which are more often used in the development process. Walsh et al. (1988) have listed design-affected customers' views of product and pooled those with views after initial use, which contains actual performance, ease of use, safety, and long-term use including reliability, ease of maintenance, durability and running costs.

Customer satisfaction and retention can be measured using the following indicators:

Indicators for customers' satisfaction and retention

- **Product attributes meet customer needs (aesthetic, symbolic, ergonomic, and functional)**
- **Short-term results – product performance, ease of use, safety**
- **Long-term results – reliability, serviceability, durability, costs of use and disposal**
- **Value for the customer – e.g. decreasing costs**
- **The share of very satisfied customers**
- **The number of customer reclamations and service repairs**
- **Brand equity**
- **The profit from different customer segments**
- **The market share of target segments**
- **The number of strategic versus unprofitable customerships**
- **The share of customers' total purchases**
- **Increasing the share of purchases**
- **The number of top customers**
- **The quality evaluations from top customers**
- **Time spent on customer complaints**
- **Customers received on the strength of loyal customers' recommendations**
- **The number of improvement suggestions from customers**
- **Comments on design, design preferences**
- **The number of products per customer (cross-selling)**
- **After-sales' share of net sales**
- **Costs of new customer acquisition**

5.3 Financial results

Financial indicators are, for example, **sales volume, profit, ROI, and share price**. The evaluation of financial benefit is connected to the added value that design is able bring to the customer, and to the company's increased chance of earning more by its committed R&D investments.

Measuring the financial benefits of design can begin by calculating the savings as a result of design usage, for instance, in production or marketing or product development costs, estimating the profits due to extending the lifespan of a product or its technology and the coverage in the competing product segments, or increasing the market share, for example. The results of design usage may show in increased sales of other products, for example in the case of spot projects for brand development. Payback time for design usage differs according to the product type. True versus desired time of profitability is also an important indicator.

5.4 Impacts of design verified in the study

The study demonstrated that almost every respondent sees that design has an impact on product (98%) and corporate image (90%) and no one denied the design impacts on image. Fifty-two per cent of the respondents said that design has a strong impact on product image. Customer satisfaction (76%) and product characteristics (74%) are also important impacts of design and are closely related. Relevant, interesting, and attractive product attributes are key elements of customer satisfaction.

The companies consider that design has impacted on their entry into new markets (72%), innovativeness of the company (68%), and accumulation of the company's competence (66%). This establishes that design has a strong strategic impact on development, competitiveness and internalization of the companies. Financial results of design were noted by over half of the respondents: sales volume 62%, market share 62%, and expenses of products 60% of the respondents. Also, publicity regarding the companies (58%) and positioning of products (58%) were considered important design impacts. As much as 24% felt that design has a strong impact on publicity. About 50% of the respondents see that design has an impact on increased co-operation between partners and effectiveness of the product development. It is interesting to note that the increase in co-operation strongly divides the respondents: while 24% had discovered that design has a pronounced impact 12.2% felt that is had no impact on publicity of the company.

Table 20. The impacts of design according to the study

Impacts of design	Plenty/some (%)	Plenty (%)	Not at all (%)
Product image	98	52	0
Corporate image	90	38	0
Customer satisfaction	76	22	2
Product attributes	74	22	6
Entering into new markets	72	22	2
Innovativeness of the company	68	18	4
Increased know-how	66	16	4
Product sales	62	6	6
Market share of the product	62	10	4
Expenses of the product	60	10	4
Publicity regarding the company	58	24	6
Positioning of products	58	10	4
Increased co-operation	52.02	22.45	12.24
Effectiveness of the product development	50	16	4

The companies were mainly satisfied with the co-operation with designers. The experiences in design were mentioned to be, for instance, '*obligatory in our products*', '*even crucially important*', '*positive, but highly dependent on designers' competence and knowledge in the production industry*', '*designed product is more economical to produce and looks better*', and '*our product differs from competitors products*'. But also negative experiences were mentioned, for instance, 'extra costs is a weakness in a competition situation', 'difficult to buy and difficult to timetable', 'ok, but the productivity became complicated', 'Some projects have been more successful than others, a variety of experiences'. Some companies gave measurement modes for design results. Corporate image, product costs, sales, customer results, and the renewal of the product range were mentioned in open questions (Table 20).

5.5 Summary of results

The results of design usage concern how design impacts can be measured. These results include financial results, such as ROI, but also customer results and process results, which indicate the contribution of design to financial success.

All case company interviewees considered the role of design significant for their business – especially in improving the corporate image and making products desirable, intelligible, and distinctive. Furthermore, according to the study, the impacts of design are most apparent in product and corporate images but also customer satisfaction is an important result of design. The process results of design usage are product attributes affecting customer satisfaction and image: aesthetics, usability, functionality, and innovativeness. Design has a considerable impact on the competitiveness of companies; it increases innovativeness, competence, flexibility, effectiveness, and productivity.

When evaluating the perceived impacts of design and investment in it (in most companies below 1%), design seems to be an effective tool. However, design alone cannot assure the success, rather performance is dependent on excellence and seamless co-operation across all functions.

6. Successful Design Strategies

The role of design varies depending on the company's strategic situation. Strategic design usage necessitates that strategic decision makers are aware of the potentials of design in different circumstances. The less common design usage is, the greater the benefits it can bring. The more experienced design user the company is, the more difficult the implementation is to copy.

The product case study outlined a pattern for gaining financial benefits through design. This evaluation is carried through in the framework of Ansoff's 'Product-Market Growth – Matrix (Figure 13), which evaluates the possibilities for growth.

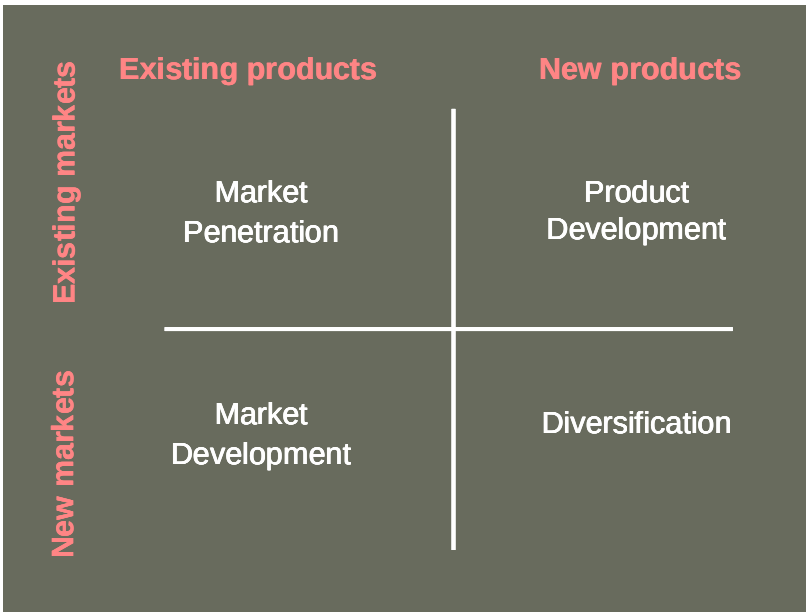


Figure 13. Ansoff's Product-Market Growth – Matrix

1. **Market penetration – Existing products to existing markets**
   Utilizing the untapped potential of the market, such as expanding or going deeper into the customer segments with existing products in existing markets.

   The company can benefit from design in market penetration; the investment in design is typically 1% or less of the investment in R&D. **Design often imbues a major competitive edge: an advantage is gained through design variations and improvements** (appearance, form, material, colour, etc.) **of the basic technology to ensure market coverage**. The goal for design usage is to speed up the payback time for the technology investment and to lengthen the lifecycle of the technology. All case companies had used design for developing product variations in mature markets.

2. Product development – New products to existing markets

Product development is a successful strategy especially when the target customer group is limited (e.g. professionals of a certain field).

Design allows product to be developed so that they appear new to the customer. The goal is to lengthen the growth period and the product lifecycle of a successful product and to design a popular product model (form and attributes) which appears as a new product to the customer. A case company had used design for modernizing the appearance of a successful product series and thus lengthened its lifetime.

Design is a means for humanizing new technologies and adding value through design solutions: improving desirability and intelligibility, cost savings. The goal for using design is to attract attention, improve desirability and user-friendliness as well as create recognizable brand features. A case company had developed a product with new benefits for the user, and design was involved from the beginning of the process in order to make the product user-friendly and desirable.

3. Market development – Existing products to new markets

Bringing the existing product to new markets, continuing the lifecycle and expanding the existing capacity. Market analysis and development are required when existing products are delivered to new markets.

Design is a tool to meet the needs of global-local markets. The goal of design is to intensify the acceptance in the markets through cultural adaptation, product consistency and linking products to a brand. Design can also be used for mass customization: defining mutually shared denominators in prevailing and potential markets, for example through modularity and standard collections of colours and materials. A case company had used design to develop products with different design languages for different markets.

Design provides the possibility for distinctiveness when pursuing international markets. A case company had used design for creating a new, distinctive look at a reasonable price for an existing product and succeeded in tapping into already saturated international markets.

Design is an important tool when focusing on higher segments (premium products). Co-branding with a designer or a design agency may be beneficial when a company wishes to change its image. A case company had co-operated with a famous foreign design agency to develop a product series for higher segments, resulting in an improved brand image and increased sales of lower segment products.

4. Diversification – New products to new markets

Market diversification refers either to new products in new markets or to business innovation transferring existing technology to another branch of business or industry.

The purpose of new design for new products and customer segments is to attract attention by distinctive, desirable and intelligible design. Design can be used for extending the brand limit to effect new business opportunities when competing for a customer's attention by creating solutions that correspond to the customer's true needs.

Design facilitates the acceptance of an innovative product. The R&D and investments in the technology are typically high in innovation-driven products;

furthermore, the innovation transfer to new markets is even more costly, especially if there is a question mark over public and customer acceptance. The design goal is to intensify product acceptance by attracting attention but also creating trust. Too many new details and uncertainties in the decision-making process may intimidate the customer, and thus, act as a deterrent to choosing new technology. For example, existing design can be adapted for the new product when the acceptance of new technology is uncertain.

7. Conclusions

Studies conducted to date have not been able to explain thoroughly the causal connections between design usage and impacts of design. The goal of this research project was to provide evidence of the impacts of design usage, and to examine differences in design usage through studying design usage in different company and business types. As a result, the Evaluation Model for the Strategic Impacts of Design was developed based on both an empirical case study and theoretical research, and in addition, case companies' successful design strategies were highlighted. Thus, the research provided empirical evidence on the impacts of design, as well as the framework for evaluation and development of strategic design usage in companies.

7.1 Evaluation of design impacts

Evaluation of design impacts is challenging – even though it is easy to see the importance of design for company performance. It is difficult to separate design's contribution to success from the impact of other disciplines. Even the customer is not always aware of the impact of design: design affects rationally and emotionally the performance and image of products. Because design operates as a filter for multidisciplinary know-how, it is difficult for customers to classify design attributes clearly and give feedback on design. But design is an issue for the customers when it is not used properly; as one product development manager said: '*The customer does comment when design is bad*'. In the industries with low design intensity, lack of customer demand for design may be a reason for insufficient design exploitation.

The case companies of this research do not currently have systematic methods for evaluating design impacts. The design results of this research are tacit knowledge and understanding or fragmented information on the impacts of design, rather than systematically proven results of design usage; thus, it was not possible to verify objectively the causal relations of design usage and its strategic impacts. However, all the interviewees in case companies' management considered the role of design to be significant in their business – especially in improving the corporate image and making products desirable, intelligible, and distinctive. Also, according to the study, impacts of design are most apparent in product and corporate images. When evaluating the perceived impacts of design and investments in it (given in most companies an investment below 1%), design seems to be an effective tool in enhancing company success. However, design alone cannot assure success, rather performance is dependent on excellence and seamless co-operation across all functions.

The companies found it to be important to have indicators for evaluating the design activity as a whole: design drivers, strategic decision making, operative design usage and process results as well as external results, i.e. customer results and financial results. If companies facilitate the evaluation of design impacts by incorporating indicators into essential processes that design is involved in or that design has an impact on, the companies can develop their design management competence and design activity as a beneficial strategic resource. The evaluation model that covers all company operations offers a basis for the future development of strategic design usage.

Figure 14 depicts the causal relations between the process results, customer results, and financial results of design. Process results are impacts of operative design usage, i.e. a design project executed during an operative design process. Customer results are positive if customers are satisfied with the value and image of offerings. Customer satisfaction may lead to customer acquisition and retention, which in turn may turn into market share or customer profitability, depending on the company's strategic goals. Finally, design impacts are shown in financial results such as net sales, ROI and share price.

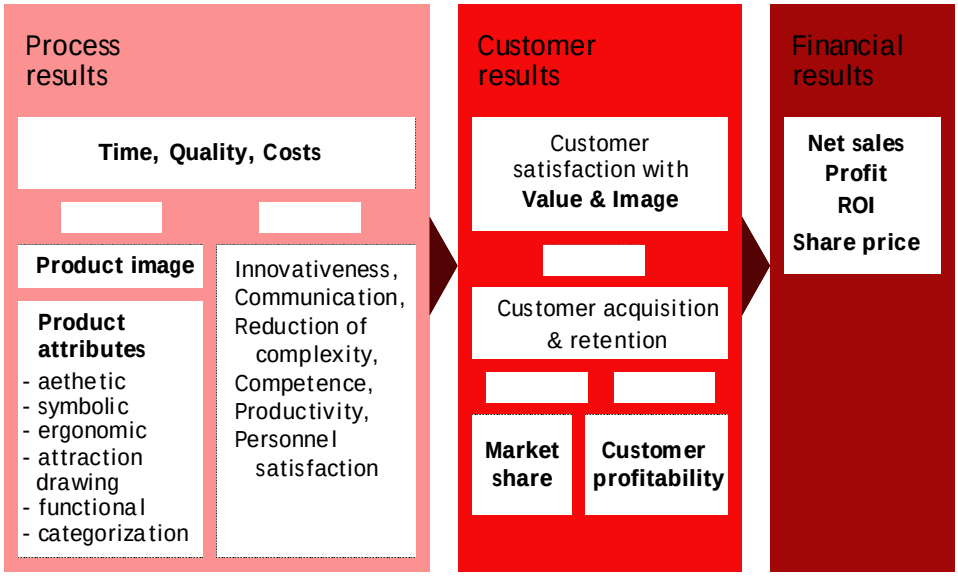


Figure 14. Causal relations of process, customer, and financial results of design

The indicators collected and developed in this research enable evaluating the strategic impacts of design if companies adopt the indicators as part of their own evaluation systems. In particular, it is necessary to evaluate both the internal and external impacts of design in order to get objective information of a company's success in design; the financial results may not necessarily show up immediately. For example, a company launches a product with a highly innovative design, which receives a lot of publicity but not a great overnight ROI. Instead, when the company is better known later and is seen as a forerunner in the industry, the company can make a profit with new products.

7.2 Strategic design usage

The profitability of design usage depends on the strategic situation, which determines how (and if) design can bring a competitive edge. However, it is worthwhile to consider what strategic design usage really means. Does it mean that design usage should be increased, planned in the longer horizon, or that designers participate in strategic decision-making?

According to Gemser & Leenders (2001), investing in design innovation has its risks due to the difficulty in protecting design. If the design usage is merely styling, the risk of copying is high; however, if design usage is based on more in-depth design know-how, it is harder to copy the design ideas and the entire system becomes integrated into the company. A few suggestions for strategic design usage are presented next.

First of all, **design usage has to be linked to strategy**. It is vital that the operative level has direct contacts with strategic decision making to assure that set decisions remain and that information arising in the operative level will be utilized in strategy development. In addition, there has to be **design competence both at strategic and operative levels** in order to assure that design usage supports the company's strategic goals. The company needs people capable of briefing designers and evaluating design outcomes. Likewise,

design resources have to be adequate to meet the goals, there has to be a critical mass of designers but also it is important that designers are suited to the given tasks and the company. A case company representative stressed the significance of the company's ability to lure the best designers – the designer's talent has a huge impact on the result.

Moreover, it is crucial that **design is integrated seamlessly into the necessary functions**. Design has a central role to play in product development and marketing, but forerunner companies have utilized design also for other processes, for example research and strategy development. The representatives of the case companies' operative levels emphasized the importance of having adequate, competent design resources to support internal argumentation in decision making during the whole project: if design work is outsourced and there is no one justifying design solutions, cost-efficiency takes precedence over good ideas. Likewise, if design appears only in the late phases of the project, its impacts are significantly reduced to styling and playing with exterior details, which may cause expensive production costs. In order to get the maximum impact from operative design, it needs to be part of the process from the early to the final stages. Furthermore, the role of design is different at every stage: participating in ideation, commenting, consultation, creating concepts, designing, and evaluation.

In high-velocity industries, the planning horizon cannot be too long; instead, companies have to be ready to react fast to unexpected changes in the business environment. However, **continuity and consistency of design usage and its development** are required.

Another issue regarding strategic design usage is **designers' influence in vision and strategy development**. Designers' participation is beneficial especially in defining the corporate and brand identity. In principal, designers or design representatives can influence the vision and strategy development in the following ways (Figure 15):

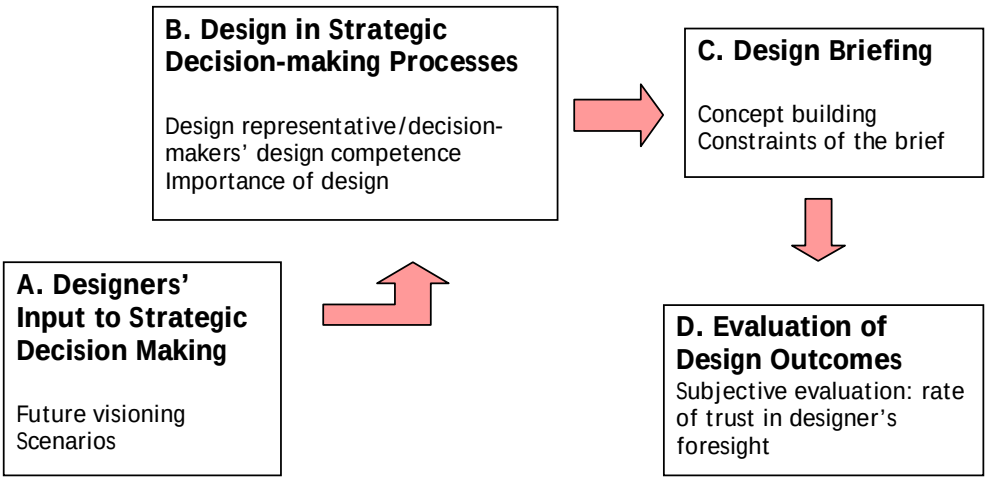


Figure 15. Designers' possibilities to influence strategy development

A. **Providing input to vision and strategy development**, for example by means of future visions and scenarios

When design is fully utilized at the corporate level, design information supports strategic decision-making. According to the study, design is mainly utilized in marketing. Conversely, case companies' designers criticized the excessive market-driven approach: market research gives results of the current situation, but future needs cannot be anticipated. The very essence of design is to create something new. Market research cannot tell how customers will react to new products, and customers are not able to expect something that does not exist.

Designers can anticipate customers' future needs and tastes, but it is not always easy to convince the decision makers with designers' proposals; following sociological, technical, and economic trends and signals is therefore important and helps in supporting and guiding the design solutions. The design organizations of the case companies emphasized the importance of direct flow of information and market research conducted from the design perspective. Some case companies used designers for interpreting the market research.

B. **Participating in strategic decision making** – otherwise decision makers' design competence is crucial

When there is no design representative in strategic decision making but the company relies on the design competence of the management, there is a risk that design decisions are prolonged and the significance of design is not adequately stressed. Centralizing the design authority brings order but heterogenic evaluation has also benefits – discussions and conflicts may also be fruitful and increase management's design competence and commitment.

C. **Influencing the design briefing** – e.g. through creating concepts based on a loosely defined design brief, the strategy is 'emergent' instead of deliberately controlled

The case companies considered the development of design briefing and evaluation as the main ways of improving their design usage. The challenge of managing creative work is to steer the design work along the right direction by constraints, but to avoid restricting the creativity too much. The suitability of a design brief is very important: in innovative projects, the brief has to be open enough, and if efficiency is the goal more constraints are required. Briefing is usually not a single event but evolves during the design process. The case companies emphasized the role of design in creating a concrete and unambiguous interpretation to strengthen and fasten the decision-making process.

The amount and quality of the background information has to be accordant with the goals in design briefing. In a large case company, the representatives of the operative level stressed the significance of the information flow. A designer should receive all the crucial information during a briefing – usually this is not possible but intermediaries interpret and filter the information. It is important that the designer receives the description of what a customer has really said – not predetermined conclusions. In an ideal case, the designer can communicate at first hand with customers and sellers; as a result, the information should be unbiased and the designer receives answers to all critical questions. A creative person absorbs the information – the company should facilitate designers' networking and interaction with important parties.

D. **Influencing design evaluation –** design evaluation includes many subjective issues, and the company has to decide the degree of trust it places in a designer's foresight, e.g. regarding the brand look

Leaving the designer outside the design evaluation is contradictory to the initial choice of investing in design. If design solutions are not justified, there is a risk that they may be neglected. The research showed that when a designer is able to justify design solutions based on the given goals and constraints, decision-making becomes easier.

Even though designers are professionals in visual matters, the company has to be able to assess the suitability of design proposals for the purpose. When a company grows larger, specialization is required; every employee cannot be an expert in each discipline. This often leads to problems with design review: design management concentrates on different matters than project management, and the general view is lost. This underlines the importance of design personnel's co-operation with different functions. Evaluation of design solutions can also be carried out with the stakeholders (focus group tests), thus facilitating the earlier feedback on improvement needs.

In the case companies, designers' participation in strategy and vision development depended on the role of design as a competitive edge: the greater the design's significance was perceived, the better were designers' chances to influence, especially in briefing and evaluation of design. However, in one case company, design was seen as imbuing a major competitive edge but designers' participation in strategy and vision development was seen as a threat instead of an opportunity. The company was afraid that designers' proposals would lead the company 'off the rails', and therefore, used designers merely for implementing long-term strategies. The company relied on its personnel's design competence – design is of such importance to a company that the personnel have to continually follow the design world and develop their design competence.

Figure 16 shows how designers' influence on strategy development increases in parallel with the perceived importance of design in the company up to a point where design is of such great importance that the requirements of organizational design competence begin to overshadow the designers' influence.

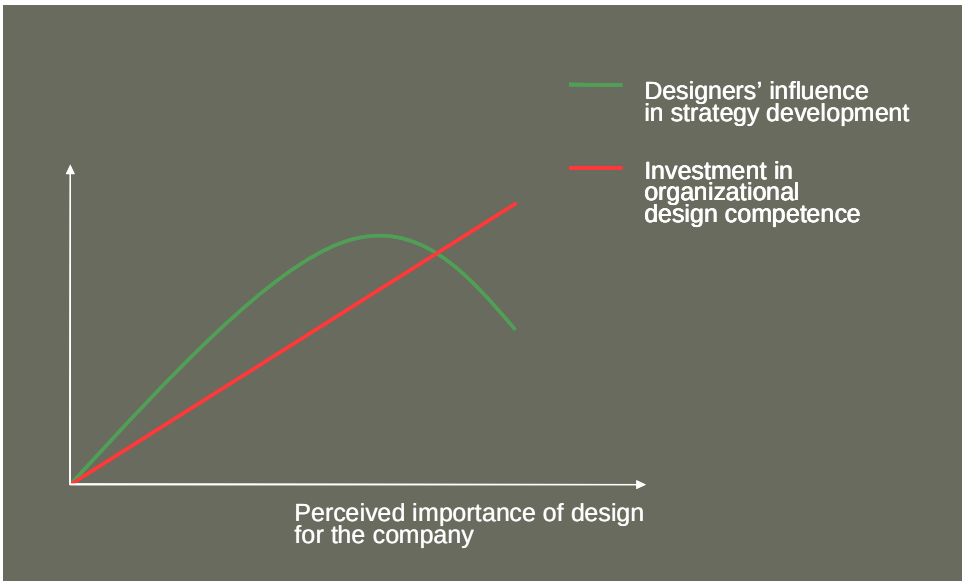


Figure 16. Designers' influence in strategy development in the case companies

7.3 Drivers' influence on design usage

Modelling the strategic impacts of design begins with examining the drivers – environmental and company's internal factors – which determine how design can bring advantages to different strategic situations. Company and industry characteristics, customers and competitors bring different challenges to design usage. For instance, design can be utilized for differentiation between competitors but customer habits and brand identity may restrict the degree of differentiation: the product has to look new but not strange.

According to this research, the most important drivers for design usage are the maturity and velocity of the industry, customer type, and the size of the company. The less usual design usage is in the industry, the more beneficial it is. Design can be part of solutions that are not typically used in the industry. The experience in design usage affects the intensity of design utilization but also the results. The more experienced design user that the company is, the more difficult the implementation is to copy. It seems that the most important factor for success in design usage is the direct connection between business goals, product strategy and design strategy, as well as the link between brand and corporate identity and design goals.

In Chapter 5, case companies' successful design strategies were presented. In all the strategies, desirability of the product and brand profile were the major reasons for design usage. Differences in design strategies were found according to the strategic situation:

- **Design as the main competitive edge vs. added value**
    - In mature markets design provides one of the main competitive edges, but design can also bring competitive advantage in new markets where the competition is based on technology, for example through distinctiveness.

- **Design for innovation vs. follower strategy**
    - The planning horizon of design usage – whether the company creates long-term design strategies or design usage follows current trends
    - In all our company cases, design was used for innovation; however, current design trends were recognized in decision-making.

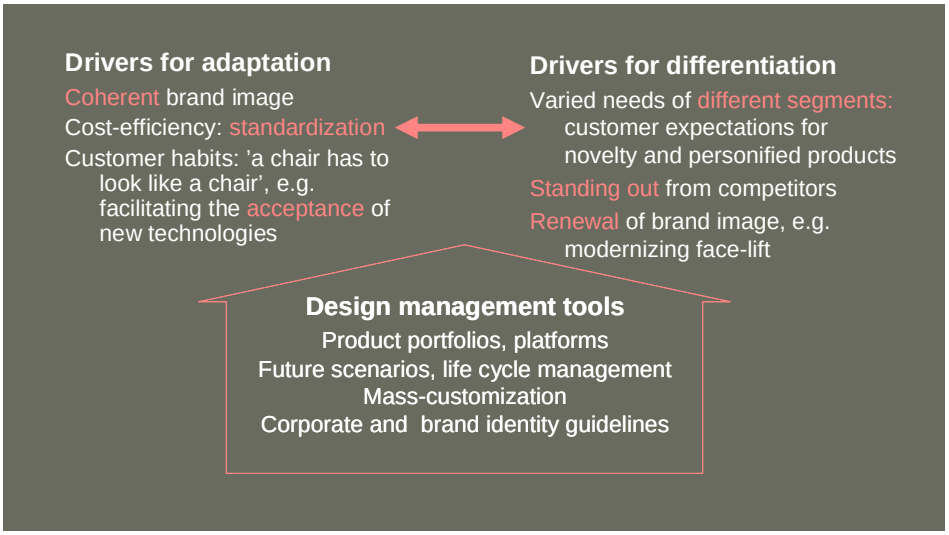
- **Design focus – aesthetics/usability/brand profile/cost reduction**
    - Design focuses either on customer profitability or increasing market share
    - In particular, customer type, but also company size and market size, acting as drivers, affect this decision. A small company, providing premium products, usually competes against bigger companies that can benefit through economies of scale. In addition, when the customer group is limited, it is worthwhile to pursue increasing sales profits instead of volume.

- **Co-branding with a designer or a design agency**
    - In particular, market segment affects whether or not co-branding is profitable. A 'star designer' brings added value to certain segments in consumer markets, but in industrial business the role of design is to emphasize the reliability of the company and the functional features of products.

- **Design for differentiation vs. adaptation**
    - Design for repositioning the corporate/brand image or for facilitating the acceptance of new technologies; design focuses on new business opportunities or on linking new product ideas to the existing brand profile. Corporate identity determines the extent of repositioning – brand profile has to be based on true identity; however, the competition may bring pressures to modernize the image.
    - A coherent brand image or unique products for different segments. Global markets: design focuses on local adjustment or on the greatest common

factors. In particular, customer type and company size affect this decision. In consumer markets, personalized products are required. A large company can use design as a tool for mass customization; for a smaller company, it may be more beneficial to focus on certain segments or the greatest common factors.

- Design often faces the challenge of responding to pressures of both differentiation and adaptation. Figure 17 depicts case companies' design



management tools for dealing with contradictory drivers.

Figure 17. Design management tools for dealing with contradictory drivers

Design strategies may vary also regarding design usage: the scope of design usage – whether design is utilized only in product development or also in other processes, especially in strategy and vision development; organization of design usage; as well as outsourcing of design.

7.4 Final summary

The results of this research imply the importance of sufficient design competence of the entire organization: justifying design solutions becomes easier when decision makers are able to understand the benefits of design. It is especially vital that the executive management understands the possibilities of design in different strategic situations, but of equal importance is design understanding at the project management level to fully utilize the benefits of design in different project phases. Also, projects with different goals need appropriate design competence for the tasks, which sets a condition for suitable human resources. Especially in SMEs, it is vital to seek the most profitable ways of using design because of scarcity of resources. On the other hand, design is an extremely important and efficient resource for innovativeness and future management for SMEs.

This research anticipates that there will be a true need for strategic design competence in Finnish companies in the future; operative design competence can be outsourced. However, even though it is vital that design competence permeates throughout the organization, the company must insure that there is someone responsible for design usage and its development.

The research studied companies' design usage in general, but many important issues require further research. For example, companies' trend-seeking activities and the impact of joint innovation ventures on design management got short shrift. An interesting research topic is also the company's preparedness for strategic design usage when design is integrated into the company's planning methods. Furthermore, the applicability of the Evaluation Model for the Strategic Impacts of Design to different industries and company types requires more testing in the future.

8. References

Barros, I. F. D. R. (2003): Design strategy for innovation and organizational effectiveness [online]. web-page: <URL: http://wwwlib.umi.com>.

Bloch P. & A. Brunel, J. Todd (2003). Individual Differences in the Centrality of Visual Product Aesthetics: Concept and Measurement, 551-566. In Journal of Consumer Research; Mar 2003, Vol 29 Issue 4.

Borja, B. (2002): Design and competitive edge: A model for design management excellence in European SMEs; DMI Journal, Academic Review, Vol 2.

Cooper R. & Press M. (2003): The design experience: The role of design and designers in the twenty-first century. Ashgate, Aldershot.

Cooper, R. & Press, M. (1995): The Design Agenda. A Guide to Successful Design Management. John Wiley & Sons Ltd, Chichester, England.

Creusen M.E.H. & Schoormans J.P.L. (2005): The Different Roles of Product Appearance in Consumer Choice. The Journal of Product Innovation Management. Vol 22:1. 63-81.

Fujito M. (2000): What is design? Definition of the Contribution Rate of the Appeal Indexes and Design Rate in Product Development, Dissertation, Helsinki University of Technology, p. 154

Gemser G. & Leenders M.A.A.M. (2001): How integrating industrial design in the product development process impacts on company performance. The Journal of Product Innovation Management 18:28-38.

Hekkert P., D. Snelders, P. van Wieringen (2003). 'Most advanced, yet acceptable': Typicality and novelty as joint predictors of aesthetic preference in industrial design, 111-124. In British Journal of Psychology; Feb 2003, Vol 94 Issue 1.

Johansson U. & Svengren L. (2003): The need of a critical mass of designers for good design and good business. In Strategic Design, working papers. Publication series F 27, University of Art and Design Helsinki. 46-52.

Joziasse, F. (2000): Corporate strategy: bringing design management into the fold, DMI Journal Vol. 11 nr. 4.

Jyllilä S. (1998): Design Management as a Core Competence in Industrial Business. Case: Finnish Industrial Companies (master's thesis)

Lash S. & Urry J. (1994): Economies of signs and space: SAGE publications, London.

Levicki C. (2003): The interactive strategy workout: analyze and develop the fitness of your business, 3rd ed. Pearson education, Harlow.

Olson, S.F. Slater, R.D. Cooper (2000): Managing Design for Competitive Advantage: A Process Approach, DMI Journal Vol. 11 nr. 4.

Page, C. & P. M. Herr (2002). An Investigation of the Processes by Which
Product Design and Brand Strength Interact to Determine Initial Affect and Quality Judgments, 133–147. In Journal of Consumer Psychology, 12(2)

Petiot J-F & B. Yannou (2004). Measuring consumer perceptions for a better comprehension, specification and assessment of product semantics, 507-525. In International Journal of Industrial Ergonomics 33 (2004).

Piirainen M. (2001): Design and Performance, Master's Thesis, Helsinki School of Economics and Business Administration

Salimäki, M. (2003): International competitiveness and internationalization of Finnish design-companies. Dissertation. Helsinki School of Economics.

Salonen A., Sykkö S., Valtanen J. (1998): Muotoja markkinoille. Miten parannan tuotteitteni haluttavuutta muotoilun avulla. The University of Art and Design, Helsinki.

Tan Tsu Wee, T. & Chua Han Ming M. (2003). Leveraging on symbolic values and meanings in branding, 208-219. In Journal of Brand Management, Feb 2003, Vol 10 Issue 3.

Veryzer, R. & W. Hutchinson (1998). The influence of unity and prototypicality on aesthetic responses to new product designs, 374-395. In Journal of Consumer Research Mar 1998, Vol 23 Issue 4.

Veryzer, R. (1998). Key Factors affecting customer evaluation of discontinuous new products, 136-141. In Journal of Product Innovation Management Mar 1998, Vol 15 Issue 2.

Veryzer, R. (1999). A Nonconscious Processing Explanation of Consumer Response to Product Design, 497-522. In Psychology & Marketing Sep 1999; 16, 6; ABI/INFORM Global.
Walker D. (1990): Design maturity: the ladder and the wall, in Oakley M. (ed.) Design Management: A Handbook of Issues and Methods, Basil Blackwell, Oxford.
Walsh, V.; Roy, R.; Bruce, M. *Competitive by Design, 201-217.* Journal of Marketing Management; Winter 88, Vol. 4 Issue 2.
Walsh V., Roy R., Bruce M., Potter S. (1992): Winning by design: technology, product design, and international competitiveness. Blackwell, Oxford.
Walton, M. (2003): Building a case for added value through design. Report to Industry New Zealand, WALTON – NZ Institute of Economic Research (inc.)

APPENDIX: Research Questions

Research Questions from the Interviews of Case Companies' Executive Management

Design competence of the company

1) How long has the company used design?
2) What kind of know-how does the company expect from design?
3) How many designers does the company employ?
4) To what degree does the company use external design consultants?
5) How much does the company invest in design in relation to the company's total budget (a part of product development)?
6) How is the company going to invest in design in the future?

Strategic view: company's success factors and the role of design

7) What are the core competence and the critical competitive factors of the company?
8) What is the role of design in the company's strategy? (How does design support the competitive factors?)
9) Does the organization structure support the use of design?
10) What is the role of design in the industry that the company is operating in?
11) How does the business environment affect strategy and the use of design (markets, competitors)?
12) What is the design strategy of the company like? (Written or corporate-cultural)

The use of design in the different company processes/divisions and at different levels

13) In which units is design used?
14) What are the tasks of designers and what is their job description like?
15) What is the job description of external design consultants like?
16) With whom do designers co-operate?
17) What kind of decision-making do designers participate in and what is their role in it?

The impact of design in company's business

18) What kind of measures does the company use in evaluating the level of product development, quality, etc.?
19) What comprises the quality of design? (design process, design management, products, contacts with the top management) How can it be measured?
20) How does design affect the company's internal operations? (networking through design)
21) What are the external impacts of design (customer results)?
22) How significant are the impacts?
23) Are the impacts of design measured? How?
24) How do the indicators of the evaluation model correspond with the company's operations?