Industrial Design as a Culturally Reflexive Activity in Manufacturing

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Chapter 1

Industrial Design and Cultural Innovation in Economy

Assisted by Pekka Korvenmaa

When professor Peter Behrens was hired by AEG in 1907, he not only designed the typefaces of the company, designed consumer goods and investment goods, and rules for artistic aspects for production. He also designed industrial and commercial buildings (some of which are still in their original use), pavilions for industrial fairs, villas for AEG management, clubs, buildings commissioned by the German government, and interiors:

> The range and scope of Behrens' activity for the AEG in Berlin can be shown by citing a series of almost randomly chosen examples of his work. He designed an exhibition from the pavilion right down to the invitation card. This work involved brochures and posters for the electrical appliances exhibited and the appliances themselves, such as a dental drill, a humidifier, and the casings for a whole series of arc lamps and electric fans. He also designed the factories in which these things were manufactured - for example, the highly complex factory for transformers, resistors, and high-voltage equipment and the monumental small-motor factory. He was responsible for the planning of the firm's extensive housing estates and for the design of two boathouses, and he laid out a dignified roof garden above the factories at Humboldt-hain illustrations. Behrens' designs for the AEG are too numerous to itemize here. They extend from simple box labels to a large–scale industrial town, and can be found in every conceivable area of the firm's activity. With the exception of the electrical appliances, which as a result of technical development and the pressure of consumerism have become collector's items, many of the relatively large number of works that have survived are still serving their original purposes today. This is true of the advertising graphics and, in spite of the war, of the factories... Behrens's typefaces are still used in the firm's signet, and set a standard against which the firm's present-day graphic material finds it hard to compete. (Rogge 1984: 114)

Although Behrens was trained in three-dimensional arts and architecture (there was no training in industrial design then), his example shows that issues such as product recognizability, loyalty, branding, trust in products, and pleasure in products have been a concern for designers working in industry for a century.

> As Sony chairman Norio Ohga says, "The product itself must be good, but it must also make the customer think, 'I'm glad I bought it,' 'I'm glad I use it,' 'I'm glad I have it.'" (Kunkel 1999: 15).

Although design has been dubbed as the second vainest occupation right next to marketing (Papanek 1970), it is also an occupation that makes the world a better, a more beautiful, a safer, and a smoother place to live in. Design also works interactively with socio-cultural phenomena, articulating into objects the broader parameters operative at a certain historical moment. A good example is the famous Kilta ceramics table- and kitchenware set from the early 1950s, produced by Arabia Ltd. and designed by Kaj Franck. The purist, minimalist appearance of the objects were in tune with the modernist design idiom and afterwards that feature with the interconnectivity of several pieces has been seen as its main merit. But the ideas of stackability, saving space and affordability echoed the societal fluctuations of post-war Finland and the emergence of the welfare state. The set matched the ideas of standardization in architecture and especially kitchen design and the effort to bring a modern apartment also for the majority of the population. This was to be achieved in terms of rational planning, cost and space efficiency. Also, these households were expected not to have domestic labor force. Hence the logistics of the preparation and serving of the food had to work smoothly, rapidly and with an equally efficient set of tools, that is, kitchen and tableware.

The artefactual, material culture inevitably guides our daily life at work and leisure gives us the most immediate and very tangible cultural frame. The effects of material culture are in general not clear to people and evade explication because of the anonymity and self-evident presence of the artefact world around us. The important role design has in enhancing

the aesthetic and functional level of our environment is not generally understood. Design which works via public transportation systems, raising their level of efficiency, comfort and safety is only one example where the returns from investment into design are clear.

On the level of products and consumer commodities not only the functionality but increasingly also the cultural signs and messages transmitted via design help to characterize the habits and socio-cultural profile of groups and individuals. In this way the immaterial, culture-based values have become vital in design practice and the new product development it serves. Also corporations have understood this: Philips is one good example, the automotive industries another. If the prophesies of the New Economy and the Experience Society are valid, increasing investments into the cultural positioning of products, systems and services becomes – actually already is – a key asset in the competition on the global market.

Designers draw on not only arts and other forms of elite culture, but on popular culture as well. The sociologist Harvey Molotch tells that one reason for why car design studios are often located in Los Angeles is that it provides a street life that is a constant source of ideas for designers.

> Those in California auto design disagree among themselves on what, if anything, may be the basis for the region's special design role. For Hiroaki Ohba, executive vice president of Toyota's Calty Design, the company's Orange County location is particularly stimulating, among other reasons because "Newport Beach is a museum for automobiles and an idea place for the automobile designer... We see many antique cars in Newport Beach." There are also "more exotic cars on the streets of a place like Newport Beach (Porsches, Ferraris), more, according to Ohba, than one would find in Germany or Japan. The youth of California have for generations been great style experimenters. One auto designer told me that the fashions on Melrose Avenue, a 1990s hot strip of boutiques and high-end junk shoppes for the affluent young, influence car design. The shapes and colors of jewelry, the textures and combinations of outfits, all may end up

in design details... Even if not consciously inventorying "the trends," designers are alert to such messages from the streets and shop windows. The GM California studio chef says he likes to take "a few of our guys and drive along the beach... to see what people do on weekends with their vehicles." The Chrysler vice president for design explains his company's presence in Southern California as taking "advantage of the local culture there" (Molotch 1996: 257 – 258).

This is "advanced design," early concept creation, rather than "production design," which is done at later stages of the production process (Molotch 1996: 259).

Finally, design translates other sources of culture into products as well. The best example is perhaps the ergonomics movement. Applied sciences like ergonomics have become a part and parcel of design, as have various branches of the social sciences, philosophy and aesthetics. Many innovations in computer modelling and applications in new materials are more advanced in design than in other manufacturing occupations.

These innovations utilize cultural understanding often in a highly conscious manner. Culture can be an important source of new ideas and business. At best, it can articulate scientific, artistic and popular cultural values in the marketplace in those products that people use in their lives. In Weberian terms, design articulates substantial cultural values in an ever-rationalizing world. It introduces content to our lives and thus enhances the quality of our interactions with the material world - and increasingly to services that accompany them.

Design as Reflexive Cultural Action in Modern Manufacturing

Design can be a cultural force in modern manufacturing as well, despite its advanced technology, economy, and social organization. The hub of activity in design is product design. Typically, when designers work only in product design, they cannot affect conceptual and strategic decisions

except in those few cases in which their products have become hits. Normally, they work at the final end of the product development process, with little control over the frames from which they get their orientation for their work. These orientations can be specifications, plans, guidelines, or physical models. This is the typical use of design in manufacturing companies.

In those companies that have an established reputation in design, this is the model from which designers try to get away. Thus, when Knut Yran reorganized industrial design in Philips in 1966 – 1969, he established a specific design track (CIDC), which he defended with vigor.

> The organizational plan for CIDC specified a management process with the design group, but did not identify a pattern of linkage to other functions in the company, and there were still frequent difficulties in relationships with the product divisions. Their managers often continued to regard design as a large, superficial addition to the process of product development and could still impose ideas upon product design, for example, insistence on wood instead of metal for housing. Proselytizing the virtues of design, no matter with how much conviction, was clearly not enough to achieve a fundamental change of attitude in this respect. (Heskett 1989: 25)

Apparently, most manufacturing companies that buys the services of industrial designers use design to create new concepts. In leading corporations, designers not only provide the vision that engineers, product planners and management need to develop a coherent product line. Speaking of Sony, Paul Kunkel notes that these concepts also make that vision seem unavoidable by creating concept models that narrow the gap between what can be and what will be. Because of their sensitive nature, most Sony concepts are rarely shown outside the company and are almost never published. The reason, says DC senior general manager John Inaba, is simple: "Even ten-year-old ideas can have functional and aesthetic features that are useful to us today. At Sony, advanced concepts are treated like fine wine. We can choose to drink them right away. Or we can

put some of them away for the future and not push them into the market too soon. The best ideas never go out of style."

> The belief in conceptual thinking is so strong at Sony that the closets, shelves and hard discs at the Creative Center and Shibaura Technical Center in Tokyo, the B&P Group in Atsugi, the Park Ridge Design Center and offices in San Francisco, Singapore and London are filled with drawings and models that may one day become products that help to define the digital future. (Kunkel 1999: 178).

As mentioned above in the case of Philips, various concepts are integrated into more coherent wholes. There are several techniques for this. Most companies build more or less natural models of environments (kitchen, offices, etc.) in which their products appear. Some companies develop technology based on an evolutionary approach. Thus, at Sony, a specific Sunrise/Sunset strategy guides product development at various phases of the life cycle of a technology (Kunkel 1999: 26 – 29). Another main tactic in manufacturing industry is technology brokering: designers combine existing technologies in surprising ways (Hargadon and Sutton 1997).

In terms of strategic influence, the key question is the strategic level and access to major business processes such as financing, investments, marketing, and key technology decisions. Typically in literature, designers are on a less strong footing that engineers in the design process. However, literature also suggests that in some companies, design is a major component at a strategic level. This seems to be the case of Sony, at which the Design Center system creates a constant flow of ideas and products based on a model reminiscent of the technology brokering model described by Hardagon and Sutton (1987) at IDEO, a major American design consultancy. Designers who are free to maintain contacts over divisions and hierarchical levels can spot technologies that could be used in surprising combinations.

> "What makes Sony unique among high-tech firms is that the designer often starts the process," says DC/Park Ridge [Sony Design center in New Jersey] veteran Rich Gioscia. "We don't wait for marketing or product planning to give us an assignment. We're proactive." (Kunkel 1999: 136).

Also, at Sony, the Design Center has been a major route to senior corporate management. Thus, the current CEO of the corporation, Nobuyuki Idei, is a former head of the Design Center (Kunkel 1999: 15). Because of this personal link, there is a close tie between Sony design philosophy and its strategy (see Kunkel 1999: 195 – 199). This was not the case in the mid-1960s: the strategic role of design is a more recent achievement within the corporate structure (Kunkel 1999: 30). The Design Center creates new realities and possibilities for the corporate management, and thus creates possible futures. Design in Sony is dynamic rather than reactive in nature.

In some major industrial companies, then, design is apparently used as a strategic asset. Based on this preliminary investigation, the stratification model is possible and thus suitable for benchmarking. However, there is little information on how design works at a strategic level. At Olivetti, these links are personal in nature (Kicherer 1990: 80), and at Philips, they are organized through a variety of means ranging from design policy to in-house conferences. This observation leads us to a main observation that guides this study: what kinds of reasons account for variations in the strategic uses of design?

Design in Manufacturing: Research Design

The focus of this study is to find out how designers can exercise their cultural skills and understanding in manufacturing, and articulate culture in products, whether material or immaterial. Designers know how to turn cultural understanding into products. If their work environment does not

allow that, then their skills are underused. Their skills may disappear in the organizational hierarchies, and in competition with other groups at the workplace.

In terms of the research question, the broadest possible formulation is in Figure 1. Here design, the organization of design in companies, is an intervening variable that may either facilitate the transformation of cultural values into products, or temper that process. The key question that arises from this is how to best organize design.

This book looks at variations in the organization of design in the modern economy. More specifically, it looks at how industrial design is organized in manufacturing organizations within two industries, machine manufacturing and health care/medical equipment industries. Its primary focus is in Finland, but current organizational practices in Finland are compared to several international cases that serve as benchmarks in this study. We will not analyze traditional arts and crafts industries, but industries that are important and emerging in the Finnish economy.
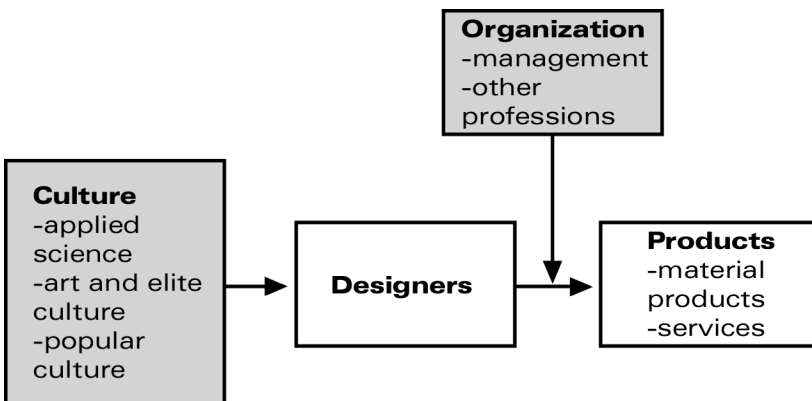
Figure 1: The Basic Structure of Research Design

Our basic assumption is that the more control designers have over their immediate work and the frames (for this term, see Chapter 2) that direct their work, the better they are able to influence production, and promote their core values, whether these are based on applied sciences, or the art world. To understand how design has achieved an important position in some companies, we will develop a model based on research in social movements (see Chapters 2 and 3).

Concepts, Research Questions, and the Organization of the Study

In this chapter, we have raised the question of the relationship of industrial design to manufacturing organizations. However, a conceptual note is needed before proceed. This study focuses on industrial designers, not on members of other design professions such as graphics designers or furniture designers. All these design professions produce usable goods with an eye on mass production. What distinguishes industrial designers from other design fields is that they are not specialized, typically work with investment goods, and their work remains anonymous. We will use "industrial design" and "design" interchangeably. Wherever necessary, we will use more exact terminology.

The main question in this study is how is design organized in those manufacturing organizations in which design is reputedly on good grounds? Our assumption is that in companies known for their design prowess, industrial designers are involved at higher levels of decision-making. At higher levels of the model, design is involved in all major processes of the firm, including market research and analysis, product development, research, and management, which includes both operative and strategic levels. The second question is how and why has design become important in the companies studied? Where does the original impetus come from, and how have designers pursued their cause successfully in companies studied? This question requires a historical analysis.

Third, the new economy model suggests that design can be organized as a network rather than as an in-house activity. What is the prevailing mode

of organization iof design n Finland, and how does the Finnish organization compare to international companies? If there is an in-house organization at work, it may be organized in various ways, ranging from a series of offices run by independent professional designers to a hierarchical organization. Fourth, the economics and the traditions of various branches of the industry vary along many dimensions. What comes to design, the most important dividing line is between consumer products and business-to-business products. Are there differences in how design is organized in business-to-business and consumer product manufacturing companies?

Finally, to participate effectively in strategic design, designers need new skills in organizational processes. Their old skills in concept creation, modeling (including computer modeling), and ergonomics equip them well for product design, but not necessarily for managerial jobs. What are these new skills? Also, skills needed early in the process are apparently different. How about skills in economy and strategy?

Chapters 2 and 3 lay the foundations for the study. Chapter 2 describes the ways in which design is organized in the current economy, and builds a benchmark for a later analysis. Chapter 3 develops a framework for analyzing the process in which design has achieved certain position in manufacturing organizations. Chapter 4 explains the data and methods. The following six chapters are empirical chapters. Chapter 5 looks at the organization of design in our data. Chapter 6 details how design has become a part of company practice, while Chapter 7 looks at how long-term relationships with consultants have emerged, and how they are organized. Chapter 8 compares different industries in our sample of companies, and looks at two advanced companies in detail. Chapter 9 analyzes some of the cultural forces that shape design. Chapter 10 tells the story of Alessi, an Italian designer company, and shows how a whole manufacturing organization can be built around design.

Chapter 2
Design as Culturally Reflexive Activity: The Stratification Model of Industrial Design in Manufacturing

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To understand why industrial design has become important in manufacturing, and how it is organized in manufacturing organizations, we need to contextualize it to the workplace and its developments in recent economy. Piore and Sabel (1984) explain the main trends in production by reference to "Fordism," or (roughly) mass-production based on the conveyor belt technology (this concept will be dealt with in more detail later in this chapter). For them, Fordism arose first in the United States, which had no guild traditions, not fixed tastes as in Europe, and which faced a scarcity of skilled labor for decades at the end of the 19th century. Simultaneously, government policies were needed to stabilize the Fordist model, typically the welfare state that maintained demand for mass-produced goods. The U.S. model slowly penetrated European economies as well. However, today, the conditions that gave rise to the fordist model have grown increasingly problematic because of at least three developments.

> First, with the internationalization of trade, Keynesian policies can no longer effectively govern Fordist institutions, for policies that maintain aggregate demand within a given nation often only benefit foreign producers. The result saddles domestic firms with massive, vertically integrated structures that are plagued by excess capacity and falling market shares. This problem grows more severe as markets for mass consumer goods approach the point of saturation. Second, the ubiquity of mass production has itself stimulated increasing demand for quality goods through which consumers can express their distance from the "vulgar" world of mass taste (Bourdieu 1984; Brubaker 1985). These cultural dynamics, which are not easily squared with the logic of mass production, begin to alter the ground on which production stands. The third development stems from the widespread diffusion of sophisticated information technologies, which reduces the barriers to entry into production of quality "niche" commodities, rendering small-batch production increasingly profitable. These latter developments provide opportunities for small producers using neocraft models to produce diversified quality goods (Sorge and Streeck 1988). (Vallas 1999: 73).

These three trends describe the context in which design works today. There is wide agreement on the consequences of this description for the organization of work. Although some reviews claim that these trends have been exaggerated in theoretical literature (see Vallas 1999), the trend is steadily towards "disorganized capitalism" (Lash and Urry 1987), and organizations characterized by externalization of strategically important resources typically internalized previously. There is also a wide agreement over the reasons for these changes. For our purposes, it is enough to recognize these changes, and describe their main features.

As one of the production professions, industrial design has gone through a set of changes just as other professions involved in production. Its place in the production process has changed, but how? In this chapter, we analyze companies in terms of how strongly and widely design is involved in their decision-making, i.e. setting the premises that form the context in which the production process takes place. These "decision premises" (Cyert, Simon and Trow 1956; March and Simon 1958) are those undeniable, or hard realities that guide work and thinking. We will call these decision premises "frames" (Snow et al. 1986; their definition is based on Goffman: for him, frames are elements which govern the way in which events unfold and participants' involvement in them (Goffman 1974: 10 – 11). Primarily, frames consist of rules and resources, material realities, equipment, organizational processes and strategies. Apparently, a group that controls these aspects of the production process has the ability to impose its own frames over others without force.

In a typical fordist model, this framing is sequential: decisions at one stage are realities that are almost impossible to alter later, since the production process is systematized. People later in the sequence can frame things anew, and thus impact the decision premises of parties further in the sequence, but this power is limited. Generally, only few parties are able to define the basic frames, and this takes place early in the sequence.

In a typical post-fordist production process, there is more flexibility in reframing through means such as humanistic leadership styles, job en-

largement, job enrichment, and teamwork. Furthermore, organizational models such as the learning organization and network models acknowledge this autonomy, and even build on it. Still, there is a sequential model at work behind the apparent autonomy. Parties in such production systems have autonomy within certain limits, and they can enhance their autonomy through a variety of means (the best description is still Mathewson 1931; see also Hodson 1993), but have little say over these previous decisions. Various models of organizing design co-exist in both Fordist and post-Fordist organizational regimes. Next, we shall look at the most typical variants of organization in more detail.

Design in the Fordist Model

In the traditional linear model, design is understood mainly as an aesthetic exercise that typically takes place at the end of the product development process. In an influential description of product development, Ulrich and Eppinger (1995) describe design in following terms. For them, industrial design means aesthetics, ergonomics, and user interface design. Design engineering covers mechanical, electrical, software engineering, and other similar specialties in the field) (Ulrich and Eppinger 1995: 3). Design is an activity that takes place throughout product development.

In this model, industrial design extends over the whole product development cycle. However, its tasks are mainly related to the aesthetics of products. Also, and more importantly, what is left out from the image is important. Design is situated firmly within product development only. This view is restricts the influence of design all too narrowly.

Apparently, this model describes the uses of design in some companies, but every company that utilizes design conforms to this model. For example, whole industries deviate from this pattern in their stress on artistic values and design. These industries, as the example furniture design shows, are not necessarily small. In particular, present CAD/CAM technologies and new forms of 3D software make it possible for designers to commu-

nicate with engineering and marketing right from the beginning. *The traditional linear model* model may have eroded with these technologies that enable communication between various parties in production right through the process, but its efficiency is hard to deny.

In the traditional linear model model, design works within the boundaries set earlier in the process, and elsewhere in the organization. Framing devices such as visions, strategies, and technologies come from upper layers of the organization. Design is involved in product development, but has little control over its direction. This is especially the case when designers focus on the aesthetics of products only.
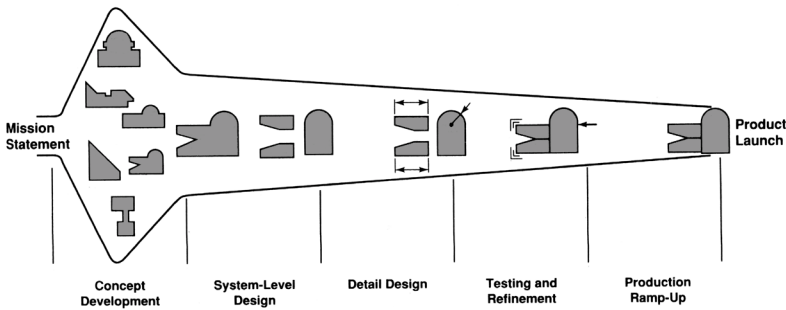
Figure 1: The Linear Production Model (Ulrich and Eppinger 1995: 15)

The Design Management Model

Design may be more extensively involved in organizational activities. A set of designers, usually from graphics design, but also from other design disciplines, including industrial design, are involved in designing the brand identity of companies. They design visual and observable aspects of companies such as logos, packages, style guides, product outlooks, and so forth. The basic idea behind this activity, usually captured in the concept of "design management," is that designers have the skills necessary to construct unified images and product styles for companies (see Poikolainen ym. 1994). With marketing, these are the most important element in brand-

ing. Designers involved in design management also may offer strategic design services: they visualize strategy and communicate it.

Some companies utilize design in this way, but few use design solely for these purposes. Usually, designers are involved in more traditional design tasks. The main aim of design management is to differentiate the company from its competitors in terms of its products and activities, and to make the company image consistent. Thus, design management creates a corporate image that attracts customers and facilitates interactions with them. Here Olins, a leading European consultant in corporate image design, suggests a number of reasons for corporate identity programmes.

> Jay Doblin, one of the most serious of the veteran design thinkers, who started designing streamlined trains back in the 1930s with Loewy recalls that the first major intentional corporate identity was carried out for International Harvester in the early 1940s.

> Organizations like International Harvestes and IBM in the United States, Olivetti in Italy and London Transport in Britain got involved in unified design programmes for a number of reasons. Of course they appreciated the benefits that unified design and a distinctive house style wold bring in terms of internal morale, public recognition, higher standards of performance, improved recruitment and so on, but the individual executives who commissioned the design programmes were also convinced that what they were doing would put them on the side of the angels. Good design meant doing good, raising visual standards everywhere, making the environment more agreeable. (Olins 1978: 153).

Design management focuses typically on packaging, logos, and all other visual elements of the firm that its members, as well as outsiders see and use in construing their impression and in reasoning about the company. Typically, design management also includes products and services, communications, environments (physical), and behaviors (of the staff) (Poikolainen et al. 1994: 40).

The main tasks of design management are to contribute to corporate strategic goals, to manage design resources, to manage the design process, and to cultivate an information and idea network (Blaich 1993). Design management, then, is about managing design activities in companies, not just the organization of designers, even though they are the hub of activity in design management.

At the strategic level, the corporate identity ought to be defined in the corporate vision. This vision says, what the company is, specifies the corporate strategy and its capacity to reach the vision. Also, it ought to specify what the company represents: its total performance based on the corporate values and its visual identity to make the company understandable (Hytönen 1999: 124 – 130). In particular, such unified vision is important in consumer products.

Communicating a coherent corporate image an advertising and other visual communications is easier with a unified style. There is a specific industry that specializes in designing corporation identities and corporate images. A typical program that aims at building corporate image goes far beyond redesigning the company logo. Research consists of an analysis of the current image, as well as the desired image among key stakeholders and customers. Research also means going through materials ranging from papers and clothing to the architecture of buildings. In more ambitious programs, design becomes expensive and requires expertise from several areas of design ranging from architecture and interior design to textile design (and even fashion design), and from graphics design to design management. The change process may require long-term involvement by the consultants (see Olins 1978; Poikolainen et al. 1994).

In this model, the designers' control over the company still remains superficial, but goes beyond mere aesthetics. To act efficiently in building the corporate image, designers gain a say in many company activities. They may not orient the company through their actions. However, they are the architects of the way in which the company presents itself to customers and other public. The public forms its impression of the com-

pany from tangible cues. To make them consistent, design management has to operate on a wider mandate in the company than on product design only.

Comprehensive Design Concepts: The Case of Olivetti

In some large manufacturing companies, design has been used widely for decades (for example, for Herman Miller and Philips, see Blaich and Blaich 1993; for Crown Equipment, Smith and Bidwell 1991; for Bahco Tools, Svengren 1994; for Kenwood, Won Chung 1990). Perhaps the best description in literature is that of Olivetti.

Adriano Olivetti, who followed his father Camillo, the founder of the company in managing Olivetti went as far as producing a regional development plan for Valle d'Aosta and Ivrea. Under Adriano Olivetti, the designers' influence over the company affairs went far beyond product design.

> These products were for Adriano only a means to a higher goal, he was not only concerned with bringing products to mankind, but with opening up the horizons of a modern, industrial society. The task of advertising was to communicate this demand by content and graphic design. Many artists and intellectuals commissioned by Adriano... also contributed to establishing advertising graphics as an independent field apart from art... Advertising was not an isolated instrument but part of a comprehensive design concept, with areas like architecture, product design, advertising and shop design following a common direction. (Kitcherer 1990: 32)

In advertising, Olivetti favored avant-garde, geometric figures, as well as photography, collages, careful typography, and playful compositions. Design also covered company architecture, company housing, as well as designing pavilions, showrooms, shops, and other designs for fairs. Several in-house newsletters and journals, distributed by an in-house publishing house *Comunità* (established in 1946) published journals such as *Comunità*,

Tecnica ad Organizzazione, and *Notizie Olivetti*, all designed in up-to-date graphic style (Kitcherer 1990: 12 – 17).

Adriano Olivetti, aware of the dangers of repetition in industrial work, sought to help the situation by redesigning equipment to ease the lives of their users. Design promoted not just technical values, but cultural, intellectual and artistic values as well. Its aesthetic style was also progressive: it was modern and rational, apparently against the decorative aesthetics prevalent at that time, much in the manner of Behrens in AEG, and with possible anti-fascist overtones in the thirties.

Designers hired by Olivetti were young, talented people, and they were given extensive responsibilities. For example, the sculptor Marcello Nizzoli, and the architect Ettore Sotsass undertook high risk tasks early on in their careers (Kitcherer 1990: 17).

Between 1927 and 1960 an entire concept of a corporate identity and a corporate image was built up, long before this concept was introduced into economic terminology. In contrast to another pioneer in this field, the AEG company in Germany, Olivetti did not rely on a single designers and his particular style, but on a number of people with quite different approaches, setting into motion a dynamic development of the company from all aspects. (Kitcherer 1990: 18).

In addition to tradition and decision-making concentrated on the veterans, there were a series of "red books" that coordinated design at Olivetti. Coordinated by the department of Corporate Identity and led by Hans von Klier (in the 1980s), this red book specified logos, letterheads, colors, and external and internal signs on company buildings and vehicles. The corporate identity group also designs interiors and renovations of company offices, and designs corporate systems for Olivetti dealers and exhibitions (Kitcherer 1990: 113 – 116).

In a model like this, design impacts not only just product design and areas covered today by the term "design management," but it also has wider implications over the company. Designers have a major say over most

company activities. However, the influence takes largely place because of the owner/manager, and is in this sense secondary.

The Designer Firm

Some organizations are devised to be dominated by designers. In this case, designers set the basic frames for the company. Also, even when they delegate work for other professions and groups, they have a veto over everything in the firm. They are thus in the control of the company. Typically, these companies are designer-owned. With the exception of a few, usually small-scale enterprises, this kind of designer-led organization is clearly an exception in the modern economy. Outside traditional crafts industries, this model is extremely rare, though there are industries in which design has been a viable strategy for decades (such as furniture industry or tableware).

A typical case is Woodnotes, a Finnish company with a turnover of 25 million FIM. Woodnotes produces items such as design carpets made mainly of paper and paper string. The original idea behind the company came from the designer Ritva Puotila. Here, the managing director describes the position of design in Woodnotes' policy:

> Have you had a design policy, or a process model for product development?

> We don't have a model, we experiment a lot. If we talk about managing design, our hands are free to experiment all kinds of things. There is no formal process. Things are largely based on Ritva Puotila's ways of doing things. If we hire more designers in the future, it may be that we develop a model, but today, it is based on Ritva's way of doing things. (Interview at Woodnotes, 29.11.2000)

Freelancers are hired for design tasks, but Ritva Puotila is always in charge of the artistic side of the company. Woodnotes's competitors such as

Ruckstühl (Switzerland) and *Paolo Lenti* (Italy) in carpet business are houses in which design and crafts-like quality is the main attraction in products. Even distribution is through design companies and shops such as *Ingo Mauer, Alessi*, and *Cassini*. In Woodnotes, all major activities are led by design. Not only new products, but also new product lines (Woodnotes has currently 7 product lines, carpets being the most important). Only graphics design is externalized in Woodnotes - but is still in the professional designers' control.

This organizational model is typical to traditional arts industries, as Chapter 10 shows. If design is organized in this way, designers do not act in a context created by other professions, but create the context in which they, just as other professions, specialties and groups work. Designers define the policies, draft the organization, make decisions concerning equipment and technology, and new products. Designers' values dominate and direct the whole company. As the example of Woodnotes shows, the designers control extends in this model from idea generation to the management of the distribution chain and the service in the outlets.

Benchmarking Design

When we map the relationship of design to these different modes of organizing, we get Figure 1. It shows what kinds of activities designers typically do in various manufacturing regimes in terms of their control these activities. It is only in the designer company in which designers are able to exert their capacities in full: it is in this type of organization that design becomes a fully culturally reflexive agent. In other modes of organizing design, designers have typically been less successful; they have to take into account frames and decisions set by other groups. However, it is important to note that Figure 1 is a preliminary mapping, not a result of a study. They key question that arises from the figure is, how can design in a typical manufacturing organization, still organized in a linear fashion, reach its influence over product design into other areas of activity.

The Model of Organizing Desing	Designers Have Control Over			
	Aspects of Product Design	Design Management	Cultural Activities other than Product Design and Design Management	Strategic Framing Decisions and Key Business Processes
In Linear Manufacturing Organization	✕			
In the Design Management Model	(✕)	✕		
In Comprehensive Design Organization	✕	✕	✕	
In the Designer Organization Model	✕	✕	✕	✕

Figure 1: Activities of Industrial Design in Organizational Regimes

As this study shows, design is indeed organized in a variety of ways in modern industry. Various factors, ranging from ownership and the management's perspective on art and design, accounts for the position of designers in companies. Existing models are all partial for benchmarking purposes. Consequently, it is better to approach the task in a different way, ask how design activities are organized in terms of a conceptual model, and then elaborate this into an interpretive model of design. This conceptual model works first as an interpretive framework for empirical study. Secondly, it serves as a benchmark for analysis.

The following figure captures the ways in which industrial design works in the current post-fordist, non-linear model. This conceptual model is designed to capture variation in the way in which industrial design is

organized in the current manufacturing organizations. In our research design, it captures the explained variable, the position of industrial design in manufacturing organizations. In organizations, design may be used at three levels. In addition to product development, designers may participate in creating product and service concepts for the company. They may also be a part of defining company strategy not only just through their product-related work, but also through their conceptual designs and other managerial activities.
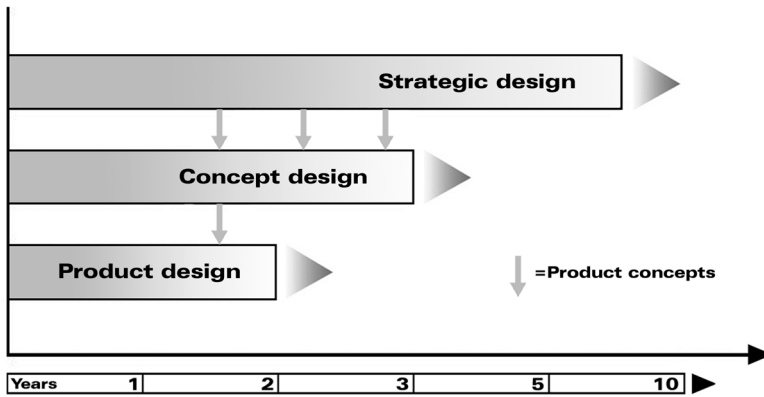
Figure 2: The Stratification Model of Industrial Design in Firms
Source: Salovaara 1998

We assume that these processes are ordered in the following sense. Concept design can exists on the foundation of product design, just as strategic design assumes the existence of a concept design practice. The combination of product design and strategic design is implausible without a concept design practice.

Product design

Product design processes are typically fairly short. They begin with a design brief, and consist of tasks typical to design: study, sketching, ren-

dering, modelling, and communicating the model. The results are intended for production. Designers control only issues arising from the design work are controlled by designers. The reason for the briskness of the process is that part of the work has been done previously. Product ideas are largely specified already, and a good deal of planning has been done at a conceptual level.

Conceptual design

The first important step is conceptual design. It is by designing concepts that industrial design goes beyond the linear processes. Conceptual design involves creating new product concepts, and deviates from traditional practices. Designers create new concepts that may end up in production, but not necessarily. Rather, it is through these concepts that manufacturing organizations probe their markets. Concepts aim several years ahead. Typically, they capture developments for 2 – 3 years in the future. Concepts are grounded in company strategy, which includes competence creation in technology and markets, to name a few.

In this work, designers may even get involved in technological and market research, and may open the frames set by other groups in the organization. Typically, in conceptual design, designers are involved early in R & D processes, where frames are set for future products, and where companies' concept portfolios are crated and managed.

Strategic Design - Towards Culturally Reflective Production

In some companies, industrial designers are involved in strategic decision-making that coordinate not just the creation of concepts but redirect the whole organization as well. We follow Joziasse (2000), who has distinguished three types of strategic design: analysis, choice, and implementation. If designers are involved in these activities at strategic level, it is possible to talk about strategic design.

At a strategic level, designers are involved in setting strategies issues and long-term frames for companies, not just for designers, but also for other specialties. Strategy typically involves understanding processes and decisions that lay the foundations for company direction for five years into the future. If designers are involved in strategy-making, they participate in decisions of new product lines and technologies, may be involved in decisions about entering new markets, participate in creating key documents and policies that apply on an organization-wide basis on issues such as logistics, subcontractor relations, personnel policy, and even strategy. Ultimately, they may be centrally involved in such strategic issues as the planning of acquisitions, mergers, and cutbacks, if these are related to design.

In this model, traditional product design and conceptual design takes place largely as in the previous, linear production models. In addition, industrial designers participate in managing companies' product portfolios and product generations. In some firms, design has some kind of a strategic role. Speaking of Nokia's usability design, Korhonen notes that when a product development decision has been made, the main features of a product are set. The usability group has been accustomed to question these specifications. Do the users really need all these features? Are there other features that would sorely be needed? What kinds of experiences does the user get from this kind of product? By turning the table around, by asking these questions first and by doing product development decisions then, we got into a model that came to be called as "strategic design" (Korhonen 2000: 189).

Strategic design requires new kinds of skills from designers. These skills consists of intimate knowledge of marketing and marketing research, an understanding of the economics of the organization, understanding its politics, and understanding of organizational behavior and theory. In practical terms, there must be a set of designers who participate in strategic management, and are involved in building company philosophy, including its visions, values, and policies. They are able to make design a central premise in the corporation. Through their work, design becomes one of the "master frames" (see Snow and Benford 1992: 138 – 140; their allusion is to Hughes 1984) that guide work in the company.

Strategic design is a logical next step in making design a reflexive agent in developing business. In this model, designers are reflexive agents in the production process, not agents that work within the linear process (see Giddens 1994: 86). They push the company to rethink its activities in terms of cultural values and constructs.

> But flexible production is more than just knowledge intensive. It is at the same time *reflexive* production. Thus is partly encapsulated in Sabel's (1990) invocation of the "reintegration of conceptualization and execution". It is reflexive production in the sense that shorter product runs mean that employees must make decisions more often on the best process suited for new products. It is reflexive in the sense that much work must go into the design of new products; these are typically long-cycle job-tasks entailing a whole series of judgments and decisions between alternatives in regard to product quality and process optimality. It is reflexive in regard to individualization... This increase in reflexivity is registered in the notion of "shopfloor epistemology" or Lipietz's (1992) discussion of an increasingly "reflexive habitus" in economic life. This sort of reflexive economic actor is no longer to such a great extent circumscribed by the constraints of "structure," subject to the rules and resources of the shopfloor. Instead he/she operates at some distance from these rules and resources; he/she makes decisions as to alternative rules and resources; and he/she finally is responsible for the continuous transformation of both shopfloor rules and (in process and product) resources. (Lash and Urry 1994: 122).

This reflexive capacity is initially achieved at the conceptual design level of the stratification model, but the strategic level is even more advanced in this respect. In essence, it means that designers are able to reconceptualize and redefine not just some product in development, but also the whole system of production. Their potential reflexive influence is systemic rather than restricted by the confines of the existing organization, economy, and technology. Apparently, this is primarily true of designer-led companies. However, it may also be true of some advanced manufacturing compa-

nies provided that designers have achieved a major say in the production processes.

In the strategic design model, industrial design is involved at an early stage in product development, no matter whether we are dealing with an evolutionary development or new product development process. Designers collaborate with research and development, with engineering, and with marketing, and are connected to the strategic management. Design activities can therefore change the course of the company. Designers are not bound by the pre-existing definitions the organization provides, but they are free to question even some of the most basic of the company premises. They may even set these basic premises that are then worked out in more detail by the organization.

Conclusion

In this chapter, we have seen several variations in how design is organized in modern economy. The hub of design activity is in product design, but designers do lots of other things as well. We have found that there is lots of potential for making design a more enabling agent in manufacturing. We can assume that design is a strategic asset in some companies, and thus has become a cultural force in the manufacturing economy. How and why is that possible? The next chapter analyzes literature from a group of companies to see how these companies have managed to combine design into their manufacturing activities.

Chapter 3

Industrial Design in Manufacturing Organizations:

In the literature on post-fordism, the typical explanation for reliance on design is based on competition. Competition pushes design forward in those industries in which technology and marketing cannot provide a competitive advantage at a reasonable cost. However, this explanation is too rough to account for specific cases. Why is design chosen as a competitive edge in favor of other means such as technology, investing heavily on marketing, or aggresive competition based on pushing prices down? Also, as we shall see in this chapter, it appears that this process has not been a rational one in any of the most design-oriented manufacturing companies. By "rational," we mean a process in which a company defines its objectives, studies alternative strategies to achieve them, weighs the pros and cons of these strategies, and then invests in the best strategy. In contrast, it appears that a design-based strategy is the result of a more intuitive selection. Exogenous factors probably explain some variations in design, but not the unique historical process in which design has become a part of the fabric of organization.

More importantly, such perspectives do not pay attention to the workplace realities faced by design. Even if design is defined as a strategic asset in companies, and is accepted at the headquarters, design has to win its place at the workplace realities (see Abbott 1988), and *vice versa*: design can be important even though its position is not recognized as such in the company policy. Thus, it is better to look specifically at companies that have adopted an design-intensive strategy, and try to generalize from them rather than vice versa. Strategic choice is an essential feature in the decision to build on design. Next, we will look at why such decisions have been made in some companies, what kinds of processes underlie that decision, and how various parties in the company have contributed to that decision.

Two sets of elaborations to the model are needed. First, there are different ways to organize design in companies. In post-Fordist production (see Amin 1997; Vallas 1999), organizations typically externalize many of the materials, resources, machinery, and labor that were internalized in the Fordist era, which stressed control over these strategically important assets. Such movement is made possible first by new technology such as

CNC-based machinery, digital design methods, and just-in-time manu-facturing and logistics. It is secondly made possible by a movement away from centralized organizational models, in which work was tied into one place and into a regular rhythm. Firms do various things to refashion the structure of work, labor market, and the employment relation:

- They redraw the boundaries that distinguish different groups of em-ployees. Typically, core employees are internalized, while peripherical employees are externalized.
- Typically, they privilege formal knowledge or professional employees over manual skills. Employees with professional skills are quick in adapt-ing of new work methods in unforeseen situations, and can control so-phisticated process technologies and control technologies.
- Increasingly, companies rely on outsourcing and subcontracting. This may lead to the forming of collaborative strategic alliances based on equal-ity, but more often, these networks are dominated by a large company. Again, professional employees in strategic positions win: they control relationships in these networks.
- Because the market has reached the saturation point in many consumer products in the industrialized nations, companies *create* diversity within products and increasingly employ marketing strategies based on fads and fashions.

Several features push organizations into more complex directions. In par-ticular, organizations with a multi-division structure combining many fast-paced changing technologies and markets across cultural boundaries de-velop complex organizational problems (see Chapter 2 for a description of design in Philips, cf. Heskett 1989; Blaich and Blaich 1993). Appar-ently, these changes affect design as well. The first part of this chapter traces these changes.

Secondly, as the argument of reflexivity implies, industrial designers do not act in a void when design is introduced into the company scene. They act in the cultural scene, and shape it. Through their activities, they pro-vide frames for managers for understanding design and for reasoning about its possible relevance. In the last part of this chapter, we situate

design decisions into this larger cultural framework, which is largely shaped by the actions of designers and design-oriented companies.

The Stratification Model and Industrial Design: an Elaboration

This rough scheme has to be related to the stratification model, presented in Chapter 2. The first specification deals with the notion of the order of the three processes outlined in the model. The second specification shows that design, even when strategically important, can be based on tacit knowledge and personalities rather than on a formal organization. The third specification relates to the second one, and shows that the coordination of design can be based on consultancies rather than on an in-house organization.

Simultaneous Processes vs. Linear Organization of Design Processes

In the most advanced companies, design processes take place simultaneously. They are not separate processes that take place in a linear fashion. Designers typically work on tasks and processes that deal with even layer.

> About 10 years ago, Nokia changed the way in which it produces its new phones. Before then, marketing did first its study, product development designed the phone, production manufactured it, and finally the public relations team presented it to the public. Now all units are simultaneously involved in the process, including subcontractors. "It's been noted that this is a good thing. Everyone knows that is the need in the marketplace, and can do their part in a right way and quickly," says Pekka Valjus [from Salo, Nokia]. (Helsingin Sanomat 3.12.2000, E1).

This description is accurate, says one of our informants from the Nokia corporation. This simultaneity guarantees that production knows what it is doing, and that strategic design is not purely dreaming, but connected

to current technology and product platforms. Internet technology, mobile communications and new forms of employment and compensation make such simultaneous organization possible.

Explicit Knowledge/Organization vs. Tacit Skills/Coordination Based on Personalities

It is also important to note that design can be strategically important even without being so defined as such in company documents. Ultimately, design is a community of practitioners who act together, and maintain certain realities through their actions together with other specialties. They maintain their distinctive perspectives through stories (see Orr 1996), visual culture (Gedenryd 1998; Henderson 1999) and through their material work. These perspectives articulate viewpoints that differ from the viewpoints maintained by other professions and the organization. This perspective is largely a matter of tacit knowledge that is transmitted in the everyday practices of design rather than in terms of concepts or theories.

There may be a design policy even though it has not been written down or formalized in terms of a separate design organization. Even if it were written down, it would in all likelihood be different in practice. In fact, there are various ways to organize design in companies. From the outset, the organizational charts of Olivetti and Philips look surprisingly similar (for Philips, see Chart 1). Both connect a hierarchical design organization to top management, and the key links between these are the design managers in charge of design, and the corporate-level head of design. However, that is where the similarities end. There are important differences in the way in which design functions in these companies. In brief, Philips has a formal organization, while Olivetti's design is best described as "Italian drama."

The Philips organization is shown in Chart 1. In 1984, their design policy consisted of four main elements (Heskett 1989: 43). First, the aim of the CID was to develop the corporate visual image to connect products to

Philips Corporate Industrial Design Organization: Main Functions and Locations

	Consumer Products				Professional Products			
Managing Director								
Managing Design Affairs	**Design Manager**	**Design Manager**	**Design Manager**	**Design Manager**	**Design Manager**	**Design Manager**		
Personnel Officer / Secretariat	Consumer Electronics	Domestic Appliances and Personal Care	Major Domestic Appliances	Philips Lighting	Telecommunication and Data Systems	Philips Medical Systems	Industrial and Electroacoustical Systems	Projects
Design Policy / Design Quality / Personnel Management and Planning / Free-lance Input	Eindhoven Hasselt Brugge Krefeld Wetzlar Vienna Suresnes Rambouillet Barcelona Knoxville Mexico City Guarulhos Bombay Singapore Hong Kong Tai Pei Tokyo	Groningen Klagenfurt Essex Tokyo São Paulo	Cassinetta Stuttgart	Eindhoven Lamotte Beuvron	Eindhoven Montreal	Eindhoven Santa Ana	Eindhoven	Eindhoven
Human Factors / Computer-Aided Design / Technology Support								
Packaging and Graphic Design								
Administrative and Financial Services / Facilities / Model Making								

Corporate Design Direction Support and Services

Chart 1: Design Organization in Philips (Blaich and Blaich 1993: 116–117)

product systems and packaging. Secondly, meeting the users' expectations to "satisfy the expectations and sensibilities of the ultimate users of Philips products" became a main priority in design. Third, meeting production and marketing requirements was to be a design guideline: designers should integrate these concerns to their work. Finally, designers' activities included continuous defining of product design quality in qualitative terms by developing criteria and dialogue to increase understanding of these aspects in the organization.

In contrast, "Italian drama" characterizes design at Olivetti (Kicherer 1990: 77). There is a respect for strong personalities and personal relationships, respect for freedom in contacts, friendships, and work as pleasure rather than a burden.

- continuity and chaos, defined by Olivetti philosophy and interpreted by in-house designers such as Bellini and Sotsass (Kicherer 1990: 68)
- continuity of staff: long-term relationships dominate the design process

(Kicherer 1990: 70)

- corporate image was developed in a personalistic fashion by Renzo Zorzi until his retirement in 1987, he combined in his work his appreciation for culture with anything that had something to do with Olivetti's external image, ranging from product design, graphics, and advertising to architecture, gift design, cultural activities, publishing, art exhibitions and design events (Kicherer 1989: 70)

- a combination of in-house designers with independent consultants makes it possible for Olivetti designers to pursue higher cultural goals.

Design at Olivetti is largely self-organized: design is led by external senior consultants working on long-term relationships with Olivetti, in an idiosyncratic manner. Olivetti constantly hires young designers and lets them develop for long periods of time. Design commitment at the top level of the corporation is based on personal, particular relationships (Kicherer 1990: 80)

Organizing Design: In-House Design or Networking with Consultants

Another important elaboration deals with networking. Design can also be strategically important even when it is not internalized in the company hierarchy. Design may be organized in different ways at all levels. The model captures the way in which designers are involved in key organizational processes. It does not say how industrial design is organized in companies. As we have seen, the way in which design is organized varies as well. Typically, there is a group of designers near the company headquarters, often in a separate design unit. In addition, there are designers who work in production, wherever that is located.

One key connection is between in-house staff designers and consultants. In particular, in product design, there may be competition between in-house designers and consultancies. Hiring criteria for these designers vary according to several dimensions.

- typically, routine tasks are allocated to in-house design, while outsiders are involved in producing fresh ideas
- tasks that require strategically important knowledge are allocated to in-house staff, if possible
- flagship products are allocated to star designers/companies, regardless of where they are
- depending on skill requirements, various commissioning models are possible (in-house designers may lack some skills)

In conceptual design, as well as in strategic design, the situation changes. In larger manufacturing companies in particular, confidentiality is a priority. At strategic levels, companies increase their control over information and strategy making by allocating them to in-house staff, who hires consultants for lower-level design processes. Only long-term consultants are able to get to know strategies, and even influence them, but in all likelihood, this is rare. In SME's, consultancies may even be strategy makers, because of lack of internal resources.

This reasoning fits some cases. At Philips, outside consultants are hired primarily for bringing fresh perspectives not tied to the structures of the company (Blaich and Blaich 1993: 143-148). Consultants offer a way of avoiding the strong ties phenomenon (Granovetter 1975). In other cases, this reasoning does not work. Thus, Olivetti's "in-house designers" consist of some of the best known designers in the whole world, including Ettore Sotsass, Mario Bellini, Michele De Lucchi and George Sowden. They are independent consultants, who are able to pursue their societal ends through their broad involvement in the cultural world. At Olivetti, they direct and reinterpret Olivetti philosophy for younger designers. Thus, at the end of 1980s, Olivetti's Corporate Image department, which formally led design in Olivetti, consisted of nine offices of design and the office of cultural activities led by Paolo Viti. With the exception of Viti's organization, all other nine offices were directed by external designers working on a freelance, yet continual and long term basis.

The issue of networking is important for a variety of reasons. On the benefits of networking writers typically point out the following kinds of

advantages in a network-based organization. Organizational costs for companies are minimized and less risky (see Sparke 1988: 166). Contacts and information flow better in an open network than in a closed one (such as hierarchy) (Granovetter 1983). Also, the loss of continuity is not necessarily a risk for companies and consultants, provided that their relationship is long enough to make trust and mutual understanding central elements in the relationship. Manufacturing companies and consultant designers may even align their technologies (such as professional software) and that way form stable design alliances (Bruce and Jevnaker 1997) that work on a long-term basis.

Often, a design consultancy may have only one or two main customers, and because it has to invest heavily in keeping its technology up to date with these clients, here is a dependency relationship, which is balanced by the fact that in such a deep alliance, the consultancy learns the strategic secrets of the client. Ultimately, this relationship may be so tight that it is totally analogous to in-house staff. Problems with trust inherent in exchange relationships are minimized, if this state of affairs is limited. Compensation methods in such relationships vary from royalties in the traditional arts and crafts industries to more typical project contracts, occasionally even yearly contracts to certain companies (as in Philips).

> The designers in the inner circle are responsible for what is referred to as "in-house design." Olivetti provides these directors of the design offices with office space, equipment and administrative staff... Their contracts are on a yearly basis as consultancies rather than on a project by project basis. Therefore they are involved in all kinds of design matters with different departments and people. (Kicherer 1990: 73 – 74).

Kicherer's description fits well the existing wisdom concerning outsourcing of services and network models of organization. If there is no need to keep in-house staff, such commitments are avoided.

Design and Culture: How Designers Shape Design

Design does not exist in a void. Managers and other parties in design construe their understanding of design and its possible necessity from a variety of sources, and only some of these are related to their personal interactions with designers. What are these sources?

Some cues can be found from existing studies. For instance, designers at Olivetti continued to lead their lives in Milan, designing for the art scene and writing their philosophies for the public.

> But there are other reasons beyond control for such an organization of design. These are related to the cultural heart of design. Olivetti subcontracted design as early as in the 1930s, and has continued this policy until its reorganization in the 1990s. The reason for this policy was Adriano Olivetti, who deliberately attempted to win the most interesting personalities from art, architecture, engineering and science, as well as from the intellectual scene. Olivetti became a kind of cultural centre and experimental workshop, similar to the Bauhaus. The first step in this direction was undertaken by Adriano from his offices in Milan. In 1931 he opened the "Ufficio di tecnica e organiz-zazione," which he managed personally, and in 1934 the office for advertising under the management of Renato Zveteremich. Milan offered better access to the design world than the more provincial Ivrea and Adriano felt he could build up contacts, make an impression and personally set up and develop a new kind of advertising and product development from there...

> He gradually gathered together a group of talented people including painters, graphic designers and poets, intentionally looking for people involved in the latest ideas in art and design with a large network of contacts which could be beneficial for the company. Through freelance contracts, he was able to get these people to work together without taking them away from the art scene. This procedure consequently proved to be an important

> instrument for bringing the contemporary cultural trend actively into the company and enabling the company itself to make a contribution. One of the early central figures was Renato Zveteremisch who Adriano appointed as manager of the new department. He had many contacts and brought people like Schawinsky, Persico, Nizzoli, Munari, Veronesi and others into contact with Olivetti. (Kicherer 1990: 17, 25).

This policy has continued until De Benedetti's reign (Kicherer 1990: 83). The art world in the cities –galleries, designer shops, the literary world – is an essential tool for designers just as for any other creative occupation (see Becker 1982). This strategy keeps designers informed of cultural change. Isolation from the art scene, either geographically or organizationally, is bound to be self-defeating and discouraging for top designers. It would be difficult to keep the best talent in routine organizational jobs in which organizational ways and categories have to be respected, especially if the company had wide-ranging cultural policy.

> Designers receive wide-ranging experience in all kinds of design fields, including furniture, architecture, consumer goods and graphics, and come to understand their particularities with re-gard to materials, aesthetics, design trends, manufacturing re-quirements and markets. (Kicherer 1990: 74).

Importantly, this policy keeps these men actively involved in the cultural world, where they think of change as a civilization-wide process instead of being pushed into company categories and company-created visions of the world. Thus, the best-known Olivetti designers are not only superstars of the design world, but above all, major thinkers whose influence spreads not just in terms of their designs, but also in terms of their written interpretations of civilization. Thus, designers such as Bellini and Sottsass make company active, they are agents in a game that change the rules of the game. Through their extra-organizational activities, these people define taste – it is their products, lectures and writings that people use to define good design, which provides further control for designers in their work.

Similarly, we have seen how the German press paid attention to Behrens' work in at AEG not just in the industrial sections, but also in the cultural pages, making AEG products known and accessible to a wide non-specialist audience. Furthermore, designers like Louis Kalff have been active in setting up and running professional associations for design. These associations have been active in promoting design into the public realm and into public policy. Of course, designers have been active in schools. Finally, some designs become "icons" that define he future of the marketplace: the Sony Walkman is perhaps the best-known example of such a product. Thus, much of the publicity that has grown around design lately (Woodham 1997: 154 – 163), just as much of professional activity and policy making in design, has been at least partially influenced by designers in their respective countries.

In many ways, then, designers have created the environment from which outsiders get their tools for understanding of design. These tools are the basis for frames used in making sense of design, and in defining possible interest in design. Designers have created an understanding of what design can offer. At least in some conditions, design comes *before* strategy: when the strategy is formulated, its elements to it are sought from ideas and arguments formulated by the design world, whose discourse thus indirectly influences company policies. It is from this pre-existing public discourse from which managers and decision-makers can create their vision of design and its possibilities.

These activities have served as structuring forces in the field in many ways. In their basic statement of an institutional perspective on organizations, DiMaggio and Powell (1983) ask reasons for why organizations are so similar in many ways, and trace the reason to just those isomorphisms, generalized perspectives, that guide activities *across* organizational fields and subfields, defined as a series of organizations that are dependent on each other somehow.

> Freeman... suggests that older, larger organizations reach a point where they can dominate their environments rather than adjust to them... Organizational respond to an environment that con-

> sists of other organizations responding to their environment, which consists of organizations responding to an environment of organization's responses (DiMaggio and Powell 1983: 149).

The most important structuring forces that make organizations and their actions "isomorphic" (i.e. similar) are coercive (i.e. policy and legal frameworks), mimetic (i.e. companies mimicking successful practices from each other), and normative reasons (i.e. professionalization and the professionalization of management). When organizations respond to these outside forces, they become similar unless they deliberately distance themselves from these sources of isomorphism.

However, there are variations in the conditions of industries. For instance, traditional smoke stack industries, well protected by trade barriers until the late 1980s, have been able to maintain their linear working practices. Since investments in these industries are large, investment goods for them are expensive, and workers are trained to use machinery with considerable investments, also the value of design is defined in these industries differently from consumer goods or from giftware industries. In the latter, changing consumer tastes and preferences are crucial for success, if we believe recent sociological literature (see Featherstone 1994).

Thus, when investments in design have been made, the initial interest to design comes to be based on these isomorphic forces as they are understood from various industry traditions. If we do not pay any attention to this specific, historically construed public discourse of design, we miss an essential feature in understanding design. In particular, this perspective makes it possible to see how design is structured across industries and countries over relatively short periods of time.

Conclusions

The issue of framing is crucial in how designers are able to articulate their visions in production. In a more traditional industrial organization, designers' chances of impacting production are limited: the organiza-

tional model minimizes the involvement of design in production. We have seen first that industrial design can be a strategic asset in companies even though it is not written into company policies, and even when it is based on a network rather than on a standing organization. We have also seen how designers have come to get a central position in some manufacturing companies. In companies studied in this chapter, designers are able to participate in the framing processes, and are not tied to concepts, categories, and practices handed down to them by other parties at the workplace.

There is little information on several other aspects of importance. For example, a few mentions of "headhunting" aside, the literature does not reveal how designers were recruited in the first place (a factor ultimately important for any movement, see Snow, Zurcher, and Ekland-Olson 1980). Also, information about the larger economics or cultural trends is lacking. For example, we cannot but speculate about the relationship of economic cycles for design. Apparently, there are two situations favorable to the establishing of design as an activity in companies. In good economic times, there is loose money in companies to experiment with. In harsh economic climate, previous practices are in disfavor, and new ones are sought after. Similarly, there is little information on changes in the cultural environment. What happens if products are clearly and visibly out of touch with customer taste? Or, are there institutionalization processes of the sort described by Powell and DiMaggio (1991) at work: when company A in industry q invests in design, and gets good results, which are attributed to design, do others follow in the same industry?

Chapter 4

Data and Methods

This chapter describes the research design, data, and methods used in this study. It also gives a basic description of the industries we have studied. Since this is a benchmarking study, we will also introduce the notion of benchmarking. After describing data, we will detail the inference made possible by a benchmarking study.

Why Primarily a Qualitative Study

Our inference is mostly based on qualitative data. There is surprisingly little existing research on the organization of design that would have been useful for us from the outset. Also, we wanted to avoid working with analogies such as environmental management, or marketing. For example, environmental management is a recent addition to companies, but so strongly supported by the public opinion, law-makers, and policy-makers that its institutionalization (see Heiskanen 2000) is smoother than the institutionalization of design. Marketing has a long history in company agenda, and as a profession, it is more than ten times the size of design (in fiscal terms, the ratio is even higher).

This choice gave us little material to work on initially. After a search process in libraries and data bases (whether in Finland or overseas), we found enough good-quality cases to build a stratification model (Chapter 2), and a model of its development in companies (Chapter 3). The scarcity of data guided our study towards an increasingly qualitative study. In situations with little previous research and much expected variation, it makes sense to proceed in an inductive way rather than theoretically - which would risk loosing the phenomenon.

Our qualitative method was somewhat formal, for the following reason. We worked in a design school context that is filled with deep knowledge and rich intuitions about the profession. We wanted to control these professional understandings and make them a resource in our study, not *vice versa.*

- Professional understanding was the ultimate basis of our study in the earlier stages, as well as in building the stratification model. Apparently, the best touch to the Finnish reality is in the heads of competent designers, not in research literature.
- However, we elaborated this model theoretically with ideas drawn from the new economy literature (in particular, the ideas of networking and tacit knowledge)
- Finally, empirical analysis followed the standard logic of qualitative research: it was based on research questions, the notion of benchmarking, and analytic induction. These are explained below.

The crucial thing is that in order to prevent professional understanding from taking over, we tested out research hypothesis deliberately in a qualitative fashion. In fact, our initial understanding was refuted by our data: the stratification model clearly is too rigorous to describe design practice in companies. For example, contrary to professional wisdom, we found that design has little control over strategic decisions in the studied companies.

Research Design in Benchmarking

Benchmarking means a study in which researchers search for best current practices in some business area to be able to improve practices in companies or policies being benchmarked (see Karlöf and Östblom 1993). Through studying best practices, benchmarking, if successful, affects the content of action, quality, and the way in which competence is developed in companies. Typically, benchmarking utilizes quantitative information provided by accounting, however, this was not possible in our study. Consequently, we use the term to denote a research design which seeks a set of companies with a highly organized and efficient design, and compare a set of Finnish companies to them. This comparison is qualitative in nature.

Typically, for a benchmarking study, researchers select a company or an industry, identify a set of companies good enough to be learned from,

either from under the same corporate umbrella or from the same industry. In a more challenging case, benchmarks are found from other industries (see Karlöf and Östblom 1993: 67 – 73). The "benchmarked" companies provide descriptions of first rate business practices that are hopefully transferrable to improve the current practices in the original set of companies. In selecting benchmarks, there is no need to stick to obvious cases (in Scandinavian context, an obvious comparison might be Nokia and Ericsson). Benchmarks can be far-out as well, as long as comparisons are not made between apples and oranges. Comparability has to be maintained in order to make sure that results are transferrable without too many risks.

Our international benchmarks also consist of cases found from literature. An extensive literature review gave us two histories of design in companies (Heskett 1989; Kitcherer 1990) that were detailed enough to be used as data. One history was sufficiently detailed for our purposes (Kunkel 1999), although it was not detailed enough in conceptual terms and in historical detail to provide information for all our questions. Several other company histories were screened for information, but these were found wanting in detail, riddled with anachronism, too distant in time, or too focused on individual designers. Companies screened include such multinational industry giants as IBM, Braun, Coca-Cola, Herman Miller, Bahco, and a series of Finnish companies (see Heskett 1997: 140 – 142; Bayley 1986; Blaich and Blaich 1993; Svengren 1994; won Chung 1990; for Finland, see review by Järvinen 2000). Evidence from these companies proved to be anecdotal, focused on individual designers, or graphic rather than industrial design.

Industry and Network Selection

For this study, two industries were selected. The first one was medical equipment/health care, and the second machinery. In addition, we studied a few companies in electronics/IT, which is converging technologically with both of these industries. The reason for the choice of these industries is that both of them are important in the Finnish economy.

- The medical equipment/health care industry is known for its long history of design, and growth potential due to demographics. The aging population and the rapidly advancing medical science also constantly set new requirements for designers especially in the high-tech area, where products are becoming smaller and personal, and where interaction with products is their crucial component.
- In addition to electronics and paper, the machine industry has been the backbone of Finnish industry throughout the second half of the 20th century. Also, and importantly, it is known to be a difficult area for designers. In this industry, design is still largely seen if not as an unnecessary activity, in any case something that is clearly secondary to engineering. Also, this sector is growing. It is also important in terms of industrial employment.

This selection of industries thus locates two areas in which industrial design services are already used, but could be still enhanced more. The fact that these two industries were chosen also makes it possible to compare the current practices in them, and perhaps even suggest how practices could be transferred between them.

The medical equipment/health care products industry is much smaller in size than the machine industry. According to the member list of the most important industry associations in the former areas, only about 20 companies are working in the medical equipment/health care sector. If we count industrial concerns as one organization, the number becomes even smaller, since the concern Instrumentarium owns, or has a dominant holding, in many smaller companies. Still, the annual turnover of this industry per employee, as well as its research and development investments, are high enough to make this industry important for the economy as a whole.

In contrast, the machine industry is large, and consists of more than 4000 companies. Furthermore, it breaks down into several industries, from mining and metallurgy to shipyards, and from appliances to paper machine manufacturing. Increasingly, it is connected to the information tech-

nology cluster, which centers around Nokia (Ollus et al. 1999: 105 – 112; Ali-Yrkkö ym. 2000: esp. 20 – 33). The annual exports of the electronics industry were over 50 billion FIM in 1997 (Ollus et al. 1999: 103).

Obviously, these industries are different in many other ways as well. The medical equipment/health care industry is typically hi-tech, invests heavily in research, and is heavily reliant on network models of organization. Typically, design work in this sector is outsourced, as well. The machine industry, which has a long history, has charecterstically been organized in a Fordist manner. It is typically blue-collar, unionized, and characterized by technological and bureaucratic control (Edwards 1979). In such context, we assumed, design is typically an internalized activity, which works within the limits set by technology and bureaucracy. However, this proved not to be the case.

As expected, the network issue proved to be important in the medical equipment/health care industry. Contrary to expectations, it proved to be important for machinery as well. With only one major exception (Valmet), design in the machine industry is based on a network. Thus, in addition to studying companies in these industries, we studied their design networks as well. To this end, we interviewed design consultancies used by companies in our sample whenever possible. This was easy enough to do in Finland. First, the Finnish design consultancy industry is small. There are only 60 – 70 consultancies as members in TKO, The Finnish Association of Industrial Designers. Most of these consultancies are small one or two-person offices that do not offer a significant amount of services. Secondly, most companies use the services of a handful of design consultancies. To get a fairly good description of the Finnish network, we only had to interview 6 consultancies. In cases outside of Finland, we interviewed design consultancies (N=3) if it was possible to arrange a meeting during the visit to interview the company.

Finally, we studied a series of deviant cases to find out the limits of our interpretation. These cases were handpicked from two industries: electronics/IT in the consumer products sector, and from designer-led in-

dustries. Two companies from each category were interviewed. In the first category, we interviewed designers in two multinationals, Nokia and Polar Electro (also, Kone could be located in this category: Kone defines itself more as a service company more than an elevator company these days). In the latter category, we interviewed designers and managers at Woodnotes, a Finnish company that specializes on using paper in elaborate designs, and Alessi, an Italian company that is responsible for some of the best-known designer goods of the 1990s.

Company selection

After selecting the industries, the Finnish cases were chosen by industrial designers and professors Juhani Salovaara and Raimo Nikkanen, both long-term members of the profession. In addition, we asked suggestions from our designer interviewees using a "snowball" method of sampling (Biernacki 1979). As background information for them, we compiled a list of companies in these industries. These lists were based on industry associations' member lists.

International cases were selected using a more complex procedure. First, we sought for industries that are known for their design intensity. Secondly, a research assistant collected data from these companies from industry journals – where design prizes are listed – and from the WWW. Third, then the researchers compiled a preliminary list of candidate companies. This list consisted of more than 50 companies, and included a range of companies from these industries.

Apple Powerbook
Philips Medical Systems Netherlands
TekScan
Linde AG
Crown Equipment
Tresu Production A/S

Table 1. Examples of Companies Studied for Sampling

The next problem was to choose the appropriate benchmarks from this list. We presented this list, which was largely based on competitors of Finnish companies, and on the most powerful companies in the two industries, to Finnish respondents. We asked them to name their design benchmarks, i.e. companies they follow in terms of design. Our interviewees listed a set of companies that were then contacted. These companies, we figured, served as better benchmarks than competitors, especially in areas in which Finnish companies are leading the way.

If our list and the respondents' suggestions matched, the choice was obvious. In cases in which they diverged, we gave priority to the interviewees' suggestions: they are the industry experts. Thus, in our interview with Polar Electro, companies such as Nike, Casio and Sony were discarded. According to the designers at Polar, they are vast industrial empires that do not compete with the specialized market niche in which Polar is at the moment.

Medical equipment/health care
Datex/Ohmeda (Finland)
Polar Electro (Finland)
Planmeca (Finland)
Sirona Dental Systems (Italy)

Machinery and electronics
Valmet/Metso (Finland)
Rocla (Finland)
PCE Engineering (Finland)
Crown Equipment (USA)
TGW (Austria)

Deviant cases
Nokia (Finland)
Woodnotes (Finland)
Kone Corporation (Finland)
Alessi (Italy)

Table 2. The Final List of Companies

In addition, 7 industrial design consultancies were studied, one of them American, one Austrian and the rest in Finland.

This procedure matches the rationale behind benchmarking better than selecting competitors, and also offers a way to avoid problems with confidentiality. For instance, we got from Valmet the names of press machine manufacturers rather than paper machine manufacturers. Given the technological requirements, this was an obvious choice which, however, was hardly apparent before a Valmet respondent named the company and explained the reason for this interest. In some cases, no external benchmarks were named. For instance, in PC Engineering, which builds integrated production lines for factories and industrial corporations, no external benchmarks were named.

Interviews

In the early summer of 2000, we contacted companies in the final list to arrange a series of interviews with them. We suspected a denial rate of about 50%, and contacted 22 companies in order to book interviews. Due to the timing of vacation, we started with Finnish companies and continued with international cases. All but few Finnish interviews were completed, before July. International companies, which proved to be largely German, Swedish, and American, were contacted in June.

There were four international denials due to reasons varying from reorganization of the company and vacation time to the decision as not to participate. In addition, we did not get responses to our requests from five companies, one in the machine industry, four in the medical equipment/health care industry.

Interviews were conducted in the summer months and in September. In each company, we contacted members from the management and from the three specialties of industrial design, marketing management, and production management. The aim of this procedure was to control for professional bias. All selected interviewees had a minimum of three years

of working experience in the firm, and at least some managerial respon-
sibilities. The only exceptions to these rules were designers, who were not
necessarily in managerial positions. Among designers, we mainly sought
to find people who had a long perspective on the history of the firm.
The key criteria in selecting interviewees was their knowledgeability of
design issues in their respective firms.

These interviews were semi-structured and typically lasted from 30 min-
utes to two hours. To structure them, three interview guides were used:
one for client companies, one for consultancies, and one for deviant cases.
In addition, the Alessi case was interviewed separately in another on-
going study (see Appendix 1 and 2). The guide was designed to ensure
that all relevant questions are covered and to make interaction smooth in
the interview situation. It does not reproduce research questions: it is the
researchers' task to translate answers into statements for analysis. In each
interview, the list of questions was completed. The interview guide
worked well in other respects as well. Our test questions at the end of
each interview (see the Appendices) did not produce any significant addi-
tions to the list.

In the very first interviews, it also became apparent that to understand
the organization of design, we had to interview design consultants as
well. Design is extensively outsourced, especially in Finland. These inter-
views also make it possible for us to study how the connection of the
client and the consultancy function and develop in a design network.

In all, we studied 14 companies and 8 design consultancies, as repre-
sented in Table 2. We interviewed 53 people, 27 of whom were design-
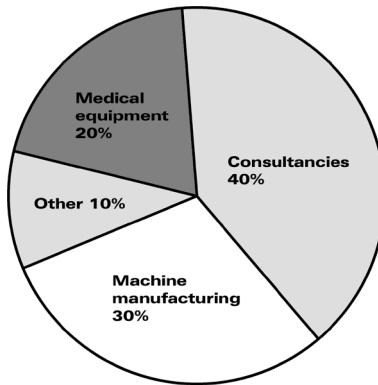
Figure 1. Interviewees by industry (N=53)

ers. Figure 1 breaks up the interviewees by industry, and Figure 2 by their profession.

Inference
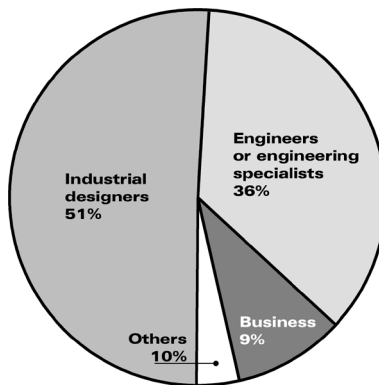
Figure 2. Interviewees by profession (N=27)

The inference of this study was built in the following fashion. The basic outline of the study grew from research questions (see the end of Chapter 1), but other practices were involved as well.

Inference in Benchmarking

In its basic outline, this is a benchmarking study (Karlöf and Östblom 1993). As such, its inference is simpler than in a typical empirical study that aims to describe, and possibly explain some phenomenon. First, we built a benchmark from companies that are the best users of design according to literature. This benchmark, called "the stratification model of industrial design," is described in Chapter 2. We compared other companies against this yardstick. As already mentioned, this procedure gives us an idea of best practices.

- If the best practices are at certain level, but our data is not, then there is room for improvement partly by means of policy, partly by companies themselves. Even if our data would suggest that there is no one best way of organizing design, the mere existence of better practices stimulates to search for better ways.
- Furthermore, benchmarks can point out some transferrable features or, minimally, a direction to be followed. In fact, this is the case with our data. As Chapter 6 shows, the pro-design culture has emerged in the best design-oriented companies over a long period of time.
- Finally, these benchmarks may show some limitations. For example, it is impossible to jump into the design practice of Philips at once. The practice and the problems of Philips are typical to a capital-rich, global industrial concern which operates from a small country. Because of its history and a lack of a dominant host country, its design tends to break into a series of localized products. Fighting this tendency has been a main concern for Philips' design management. These conditions may not be unique to Philips, but are limiting enough to make extrapolation from Philips a cautious matter.

At best, this practice, in which the benchmark serves as a yardstick, lo-

cates gaps in the current practices and suggests ways to improve current practices in Finland, and produces a result that is sensitive to differences between industries.

However, as Chapters 2 and 3 showed, there are several ways to organize design, and certainly no single best practice. There are many types of paths that companies have followed in building design practices.

In each empirical chapter, as well as Chapter 3 that grounded these chapters, we followed loosely analytic induction. Analytic induction proceeds from data to concepts. Accordingly, the first step is to find an initial model from the data. Typically, this is an observation that is then elaborated with additional data. If it appears that some observation might describe the whole data, or most of it, then it is treated as a hypothesis to be first tested and then elaborated (see Seale 1999).

For example, this procedure resulted in the notion of "coincidental" beginnings of design in companies (see Chapter 6), which led us to build an initial model for how design becomes a part of company activities (Chapter 3). For purposes of benchmarking, we built this model with literature on some of the best-known design-oriented manufacturing companies in the world. Chapter 6 compares this model to what was found in interviews. Chapter 7 elaborates this model by concentrating on design consultants, who match this model only partially.

A similar procedure also structured the inference in each empirical chapter. For example, in Chapter 5, the basic hypothesis came from the stratification model: we assumed that it holds among more advanced users of design. A preliminary test of this hypothesis showed that this is not so (Figure 1 in Chapter 5). This gave us an opportunity to describe the best practices in our data, and led to the question of the process in which design has emerged and become a stable part of the functioning of the firm (Chapters 6 – 7).

Industry comparisons and the use of negative cases

Finally, our data allows some industry comparisons. One of the threads that has run through all previous chapters is the difference between consumer products and business-to-business products. We have constantly seen how design is increasingly an essential element in consumer products. Design is important for their success in several ways, and the designers' mandate – to paraphrase Everett Hughes (1984) – broadens. In business-to-business products, designers primarily work on "hard" aspects of design, such as product design and ergonomics. In consumer products, their mandate may include marketing, packaging, and branding, which are all-important for success in consumer markets, fashioned by a multitude of tastes.

Our research design allows an initial examination of this assumption. For example, we studied design in two companies that build entire production lines and services for industrial installations (PCE Engineering and TGW). These are hard-line investment goods in which fashion and packaging play little role. This is also the case with a few other companies that are specialized in producing machinery (Valmet, Rocla), but fashion and packaging do matter to a few other sampled companies in which products interact with lay users, and service is an important component of the product (Planmeca, Sirona, Datex-Ohmeda, Crown Equipment). Finally, it is still more important for consumer products. For instance, Polar Electro is in a market niche in which hi-tech products have increasingly become fashion products. Chapter 8 begins with this comparison.

The basis for weighing business-to-business industries is in the structure of the Finnish industrial design profession. The profession largely works in the business-to-business sector. It is only lately that industrial designers have begun to work on electronical and information technology consumer products.

This bias was controlled by studying a series of cases from more consumer-oriented industries and companies. These are our "deviant" cases in the sense of analytic induction (see Seale 1999: 140 – 158). The results

from deviant cases are compared to results from the main cases in Chapter 8. The aim is to test whether our basic results and inference describes design in the negative cases as well, and if it does not, why is that so. Negative cases are aids to sluggish imagination, to paraphrase Garfinkel (1967).

This logic is taken to its extreme in Chapter 10, which focuses on the designer company Alessi. The result that designer companies are design-led, of course, is obvious. Furthermore, their practices can hardly be transferred to other industries. It is very difficult to see how large-scale manufacturing, with vast capital investments in technology and organization, could follow a royalty-based model of a design firm in which all aspects of production are ultimately up to the whim of the designers. Still, this model can give us useful clues about the best organization of design, and thus sensitize us to what is taking place in other companies. The Alessi case performs this function in the study.

Reliability and Validity – On Generalizing the Results

As previous chapters have already shown, benchmarks are difficult to build for a skilled practice that has evolved in more advanced companies for a long time. It appears that each company is unique with respect to design. Also, it is clear that there is no one best way to benchmark whole industries. The number of companies to be interviewed for such a study would be too large.

However, some features stood out as central for companies with an well-developed design practice. For example, to be proactive, design has to be strategically important, and it has to be based on an internal organization, or a long-term network relationship with a set of design consultancies. The stratification model was built to this end. The second problem is not a major one in a benchmarking study. The question is whether the practices typical to some industries are transferrable to other industries, not whether we have described correctly the current practice in each industry.

Several other issues are involved in our study. First, as in any study based primarily on qualitative data, the results can be generalized only with difficulty. Several issues are involved here. First, the best descriptions in literature are from the 1980s (Philips, Olivetti), i.e. from times before the current digital boom in economy. The Sony case, however, describes this period as well, and does not threaten either the benchmark, or the idea of a design organization. Secondly, it is apparent that there is cultural variation in best practices, as the comparison between Olivetti and other cases has shown. However, in its basic outline, Olivetti is not a real deviant case: although based on "Italian drama," Olivetti has an organization, no matter how centered on powerful personalities.

What comes to the selection of companies, we have been selective from the beginning. From the Finnish scene, we chose the best cases we could find, based on expert judgment. The selected companies represent current best practice in the two industries. In particular, the medical equipment industry is well covered. A similar logic applies to design consultancies. The Finnish industry is small, and its major consultancies have a lion's share of the business. Since they appeared again and again in our interviews, it was easy enough to focus on them. Furthermore, they represent the best Finnish practice. Work is subcontracted to smaller consultancies as well, but they are, with few exceptions, specialized in product design rather than in concept or strategic design. The list of international benchmarks involved in this study is small, but gives an idea of companies that win professional prizes. With the exception of Crown Equipment, these cases are not necessarily the best companies in business. However, they provide us with a clue as to how design is organized in companies that have not served as design industry myths in the manner of Olivetti or Philips. Primarily, these interviews make the benchmark built from the literature more realistic.

Chapter 5

The Organization of Design in Manufacturing

This chapter examines the ways in which design is organized in the organizations we have studied. We analyse our data using the stratification model presented in Chapter 2. Here we situate the companies into that model, and outline a picture of typical uses of design. We see first whether and how design is integrated into company policy. There are various possibilities, as our literature benchmarks show. We saw earlier how design has been methodically built into the Philips practices. On the other hand, we also learned how design at Olivetti is based on an "Italian drama": an outwardly chaotic process in which organization maximizes the freedom of its well-tried and trusted designers. Secondly, we compare the results to our benchmarking cases. Thirdly, we relate these findings to our knowledge of organizational arrangements to see how design is affected by them.

A few expectations can be drawn from literature to guide the following analysis. If it is the case that aesthetics plays a major role in products, as several sociologists have maintained (see Featherstone 1994; Lury 1997), the value of design ought to have emerged, and design should be a normal practice in companies. Similar arguments apply to companies in investment goods. For instance, if the value of ergonomics has increased in the machine industry, industrial designers, who are trained in ergonomics, ought to benefit. If this is the case, and if companies in our sample base their strategy on design even partially, design ought to be a strategic force, and have a voice in articulating company strategy and in evaluating strategic choices. In general, we can expect that companies in our sample populate the two upper layers in the stratification model presented in Chapter 2.

This is the general expectation that we study in this chapter. Chapters 6 and 7 elaborate the results of this chapter further by studying the allocation of various design functions to in-house designers and consultancies. Chapter 6 studies the process through which design has become integrated into company practices in our benchmarking cases. Chapter 7 then looks at the uses of consultancies in these companies. We show that design is, with few exceptions, largely outsourced, and study the implications of that finding. Chapter 8 looks at variations between industries.

Design Policies in the Companies

One of the best ways to make design a strategic asset in any company is to give it a high priority in the strategic documents and mission statements. If such statements are accompanied by design manuals and guidelines, design has the strongest possible sponsorship it can get. Is this the case?

One of the main questions presented during the research interviews was whether the company has a design policy and if so, how it is utilized. Most interviewees presumed first the company they work for has a design policy.

> The interviewee first agreed that the company has a policy, "a mechanical way of fitting design into the process of product development" in the way "this is the way design will be or... this style will be," as he describes it. However, if there is an *actual* policy, he does not know, he retorts. But, in his opinion, *they* (the management in design) have built the "process from the beginning to the very end." (Industrial Designer, machine manufacturing industry)

This quotation was quite a typical answer and consequently, no policies were revealed or presented on paper, these excluding one actually printed design manual.

> Design is strategically significant (in the company). Design policies are documented in the product design manual. It contains design policies as well as written statements, what design means for us in practice. (Director, Marketing and sales, machine manufacturing industry)

It is noteworthy that the notion policy was a in some cases a matter of complications, while it seemed that not all interviewees had either understood the question or the notion itself.

There is no 'Written Statement' as our policy, because the company does not manufacture "trend design." Visually expressed, our design is mostly conservative, but in our design there is plasticity as well. (Industrial designer, Medical equipment industry)

The company's design orientation is not unambiguously determined, as policies are; in other words, colors and forms. Possibly this is because we have worked with the same designer all the time. This forcibly affects that the various designs in our products resemble the designs seen in our previous products. (Marketing Communication Manager, machine manufacturing industry)

With very few exceptions, no policies were specified or analyzed in any greater detail. The policies or models described are merely explained as guidelines for using certain ways of design, commonly agreed ways of adding color, graphics or similar details.

Our design policy is, above all, *form language*, a coherent visual appearance. It has developed in the course of time. We fit all new products to visually match our previous products. In other words, it is possible to distinguish our products from their design (thru design and colors). Later on, we have been using the same consultancy, as they know this business. (Product Development manager, machine manufacturing industry)

These decisions determine the physical appearance of the product line. But they are not complete or "real," particular design policies, in the form of statements containing long-term or comprehensive plans about the holistic use of industrial design in the product development processes. Mostly policies were presented or emphasized as notions existing "somewhere," but not written down.

It (policy) exists, in a way, but it is not written down." (Manager, Technical Department, machine manufacturing industry)

>...Both interviewees ascertain, that there indeed is a certain design policy in the company, but this is not a collection of strict regulations, but above all, guidelines.

There are also contradictions and controversial opinions. For example, not all agreed policies are needed at all and the way of writing instructions for obvious actions would make the design process stiff and unreal.

>The interviewee would like to think that the firm he works for has a design policy but he admits that "they don't use it because it is like writing down the process of 'tying your shoe'- when you read the instructions for how to tie your shoe, it is so unreal and so stiff." He says that (the company) is "more about living it and breathing it rather than 'paperizing' it. (Design director, machine-manufacturing industry)

Another company opinion about strict policies was to actually un-policing them. In this case it is thought, that strict ruling of the design processes via "paperizing" and policing is not favored in the fear of paralysing the creativity in the respective product development processes.

The actual forms a product has bears no connections or is not intertwined into the "policy," that is for example, "a way of adding colors," or using certain forms, which were also regarded as policy. Generally speaking, a coloring scheme or a certain detail can be classified as a policy, if there are no other determined guidelines maintaining the coherency of the line of products.

>It is not officially written down. However, we have a kind of design policy. We have decided to use, if not always the same designer, but at least same range of chosen forms and colors. (Marketing director, machine manufacturing industry)

Numerous similarly inclined comments by the personnel interviewed in different companies support this conclusion and also illustrate the pre-

vailing confusion in actually understanding the meaning of the conception. Thus, one generalization from this would be:

> While certain company regulations understood as "design policies" affect and direct the processes industrial designers are involved in, there is a reason to doubt that the "policies" are more likely unwritten oral contracts ("do´s" and "dont´s") between managerial views and each participant in the product development processes.

It must be noted that this conclusion is valid only when the previously mentioned product development processes are in question. It is not the intention here to juxtapose or relate industrial design to other, management oriented policy issues. It is entirely possible to maintain successful business without a strict, written design policy, but with a more refined product development process and corporate identity. However, lacking all these three components obviously makes business activities unstable.

The Stratification Model:
The Positioning Of Design In The Companies Examined

As the case of Olivetti (Chapters 2 and 3) shows, design may exert an impact into the key strategic and product-related decisions in companies even when it is not written into the key policy documents in manufacturing organizations. Thus, a better test for whether design is integrated to key activities in companies is provided by the stratification model of design presented in Chapter 2. Here, the model is elaborated by positioning enterprises over the three levels of the diagram to illustrate the level and approximate position of industrial design in the companies.

There is substantial variation between the levels at which the companies examined utilize design in their new product development processes. These differences are distinguished according to the depth of influence design has when implemented in the organization. It is noteworthy to compare the model presented here with the table shown in Chapter 6, which lists
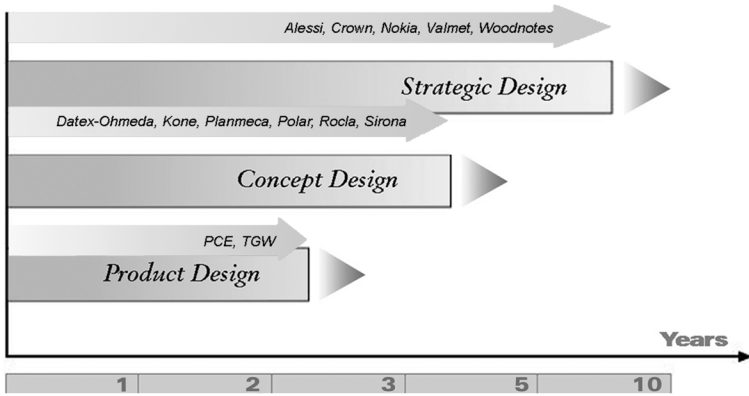
Figure 1. Companies in the Stratification Model

the number of designers and design consultants in firms. It is important to note that the values presented should be considered as estimates, whereas the model is not intended to present criticism against any enterprise. The positioning is merely giving an evaluative overview of the present position in which the companies are when the exploitation of industrial design is considered.

The Product Design Level

Designers work actively in product design in all the studied companies. However, in some companies, this is all they do; designers are not involved in design management, conceptual design, or strategic design. On the Product design level, there are two companies, namely the Finnish PCE and Austrian TGW. Both companies produce machinery. PCE produces concrete-slab casting equipment, while TGW manufactures material handling equipment. Both have utilized the services of industrial design consultancies creditably in realizing their products. However, while designers have participated in the product development processes, the all-inclusive use of design in the product development prevails in this

stage. Usually a lot of the preliminary technical work has been done previously, there has already been a certain conception how the new product should look like or technological restrictions have dictated the appearance. Only after these decisions have consultants have been called in to accomplish their part. Says a CEO of a machine-manufacturing company:

> We decided a long time ago that when we make changes to the machinery, we consult designers - no matter what machine we are dealing with. Designers are involved in the process from the very beginning.

Do designers participate in research, marketing and advertising?

> No, their role is in the background... Designers are not involved in the technical decision-making process. What comes to the shape of the machine, they present their own opinion. Of course, they have no decision-making power. They present their alternatives, and tell their opinion about the best solution. We have the final decision in the process. (CEO, machine manufacturing industry)

Both of these companies have cooperated with design consultancies on the product design level. PCE has co-operated with several industrial design consultancies, whereas TGW's experience is currently limited to one. In both companies industrial design is considered as powerful means in differentiating products from rival ones and further plans of collaboration with design consultancies have emerged.

The Conceptual Design Level

The majority of companies examined in the research belong to the conceptual design level. This is to say, they all have lots of experience utilizing industrial design and implementing design processes into the product development scheme. In-house industrial designers are employed in all

of the companies, while all have long-term contracts with design consultancies as well. In these companies design clearly exceeds and goes beyond the linear design process. Designers casually work in concept design together with research and development and participate in marketing activities to some extent. These companies use conceptual design to explore the possibilities in the near future markets. Furthermore, detail design and components from these concepts may be used in the present design work as well. Products manufactured in these companies are mainly investment goods, except Polar's, but are all often seen in public; especially dental equipment and elevators are substantially more close to the consumer than e.g. material handling devices, often concealed in warehouses and stores. This makes an interesting comparison, as design is widely described in the advertisement materials of all the companies.

> The tasks of designers at Kone are quite limited. Previously, they worked exclusively with user interfaces and product design. The crucial thing in making lifts is always structural validity. It is only after this that you can approach aesthetic factors and requirements…Design came to Kone in early 1980s. It has become "visionarized": today, there are visions of how design can enhance the differentiation of Kone from competitors. On the other hand, our competitors have understood this as well. For example, Porsche Design has been involved in designing lifts. Before the 1980s, Kone products are machinery products, there was scarcely any design in them.

> A good design project helps the company in many ways: it differentiates our products, improves the functionality and ergonomics of the lift, enhances the company identity, and positions products to the market segments better. In such positioning, design is a powerful factor. (Designer, machine manufacturing industry).

The Strategic Level

The companies are placed at the strategic level that operate design in highly organized form. These companies have their own design department that is fully implemented in the company organization. Continuous co-operation with design has been recognized as strategically important, design is the core competence in the enterprise, and designers often occupy key roles in new product development and decision making. Positioned at the strategic level are various organizationally and operationally dissimilar companies: for example, Woodnotes and Nokia both acknowledge design as a strategically important asset. While Woodnotes has only one designer, namely the founder, textile artist Ritva Puotila, Nokia employs apparently hundreds of designers worldwide. And whereas Alessi (see Chapter 10) is famous for the exceptionally stylish high-end consumer product design, Crown Corporation in the U.S. concentrates entirely on electric motor-fork lift trucks. This only shows the fact that it is possible to implement design successfully in almost any area of manufacturing. At Woodnotes, design is in an especially strategic role, as, according to the company website, "Woodnotes is a design and marketing company whose strengths lie in artistic design and technological skills." This is the ultimate model, as design and innovation are primary issues in the company, and the company is actually "built around" design.

> In a sense, we are like any other large company. When we are talking about markets that are as large as ours, it means that any new product results from a huge investment in resources. They require so much resources that the decision about what kind of product we make is in the hands of top management. This is also true of design. We have first noticed, then admitted, and then we have been able to use design as a competitive factor. For that reason, design has a large impact on decision making. Even though technological development is fast, it is still possible to... make our product better than our competitors products with technology. However, standardization benefits all, and in that respect, we are approaching a situation in which products are technologically on a par. This means that design becomes a

differentiating factor and then a competitive factor (Design manager, Consumer products)

Design is a part of the agenda-setting process in the company, although the ultimate decision is in the hands of top management. Says a manager from Nokia:

> We have our own company for this kind of applied research, NRC. Then we have these predesign processes and conceptual design processes at NMP, what comes to the products of NMP, or in the network side in Net, or NVO... For all these layers, there are separate processes... It is clear that in smaller organizations, there exists a similar model, but... because we are so large, we are in a lucky situation since we have separate organizations or functions that take care of various parts of those processes.

It is important to remember that Nokia is an exceptional case in many ways in our sample. Due to its size, Nokia can afford to have separate organizations for various design tasks. Also, since it works in global markets, and its strategy stresses globalism, the amount of knowledge and skills required from its designers justifies layering design, and the allocation of various design functions into separate organizations. Also, such organization means that in product development processes, these tasks are run simultaneously: feedback from product design can alter strategic working. In this sense the design processes are integrated.

Industrial Design in a Multi-Divisional Corporations: The Case of Valmet (Metso Paper)

The stratification model needs an elaboration, which concerns corporations that operate in several industries and markets simultaneously. In this case, it is possible that a corporation has established a design reputation in one business area only, and is lagging in others. Such situation may be based on several reasons. For example, from company is typically based on mergers of acquisitions. Thus, when a plant of a small company is

bought by a larger corporation, it inherits much of its material assets, and immaterial assets such as know-how and personnel as well. Sometimes, it is better to think of rapidly growing corporation as a set of small, fairly independent businesses that are coordinated by the headquarters only to some extent. In such situation, the company faces a challenge of internal benchmarking: it has a best practice that could be transferred within the corporate umbrella.

The best example of such situation is the Metso corporation, which builds paper machines, equipment for mining and mineral processing, automation systems and, through its ventures organization, automobiles and engineering consulting services.

Industrial designers have been involved in product development in Metso for almost three decades. Much of their work has taken place in one business area only, namely the manufacturing of paper machines in Metso Paper (previously Valmet). In this area, Metso has construed a long-standing relationship to a network of consultancies, and one consultancy has become their key strategic partner.

In other business areas, the role of design has been much less important. In terms of industrial design, Metso's main challenge is making design a standard operating procedure across the whole corporation. One of the key questions is product harmonization, which enhances trust in company in the eyes of customers and stock holders, and minimized manufacturing costs. For example, as each plant does not have different practices and technologies, purchasing becomes more cost-efficient. Also, as users learn the logic of Metso machines, they get committed to its products.

In an umbrella-like corporate organizational environment, it difficult to set this particular enterprise into either concept design or strategic design category. The importance of design varies from one business area to another. In contrast, in companies like Nokia that have one main product line, it is easier to make design a company-wide continuous practice or, in want of a better term, a culture, instead of a series of discrete invest-

ments. However, companies that have already been successful in design in one business area, have a model for transferring design into other operational areas. Also, the likelihood that there are design champions and would-be sponsors of design, is increased.

Conclusion

We have examined how industrial design is utilized in the business-to-business context. As we have shown, industrial design is a novelty in many areas of manufacturing. First, we presented results how design policies are conceived in the subject companies. We suggested that while policies were widely discussed and orally presented in the companies, the actual understanding of policies was vague. It seemed that most of the issues presented as policies were merely commonly agreed unwritten guidelines between the management and the product development stage.

We assumed that companies in our sample ought to be located at the two upper layers of the stratification model (they were benchmarks).

- In machine manufacturing, this proved not to be the case: here, design takes place in the realm of product design. Conceptual issues are in the hands of engineers, and strategic decisions regarding design are in the hands of management.
- In medical equipment and in consumer products, designers do conceptual work as well.
- Only in some companies, designers participate in strategic design. These companies can be from any industry.

Thus, our expectation proved to be only partially true. This situation, however, is not unique, as Joziasse (2000) has shown. In his study, design takes its cues from strategy, but that at strategic level, design under-performs the business and operational strategy levels. Corporate strategy remains in the jurisdiction of top management. In this sense, designers in our data work within frames set by others.

Ultimately, a design-oriented strategy is a matter of management decision. As the case of Metso (Valmet) shows, design can be made a strategic factor even in paper machine manufacturing. As the case of Metso also shows, it may be difficult to make design a culture, a self-evident part of the functioning of the corporation, not just a practice in one area of the corporation. Largely, this is a difficulty faced by companies that operate in multiple business areas and in multiple markets. It is easier to make design a pervasive practice in companies with only a few main product lines.

Chapter 6

How Design Emerged as an Activity in Firms

Industrial design is a recent activity among product development activities. If compared to other areas of product development and innovation, it has a short history. Whereas european *engineering design* can be dated back to the 16th century where it has its roots in the renaissance-era achievements, industrial design only saw daylight in the beginning of the 20th century, being more or less one of the fruits of rapidly expanding industrialization and production of consumer goods. In the beginning most persons working in the field of design were not originally educated as industrial designers, but as engineers, architects, and artisans.

Generally speaking, pioneering industrial designers such as Peter Behrens have had to break through various scholarly barriers and clear with their work and theories obstacles of prejudice when trying to convince skeptics about the nature and advantages of industrial design. The educational work is still an issue. Apparently, it will take several more years to convince especially the heavy industry of the fact that industrial design is serious business. This proposition also closely connects us with our main questions in this chapter.

Based on literature benchmarking in Chapter 3, we explore the following issues in this chapter. First, in all benchmarks, design has become a part of company practice over a long period of time. As a practice in the company, design is one among many competing practices. The change of frame was a social movement rather than a rational choice by the management (Zald and Berger 1978). Is this the case in our data as well? Secondly, the role of management interest in design is crucial for its success: it is trough interaction with management that designers are able to fuse their ideas about the company into its practices. Does this judgement hold? Third, a crucial step in making design a force to be reckoned with is the setting up of a stable design organization, even if it would be amorphous, as in Olivetti (Kitcherer 1990). How do companies in our sample fare in this respect?

On Design Histories in Companies

Design had not arrived in any of the studied companies as a result of a rational, carefully researched decision. Rather, interest in design has resulted from accidental beginnings that have given rise to a design culture. Implementing industrial design into the company infrastructure is also greatly dependent on the visions, decisions and conclusions drawn at the managemental level. Later on, in practice, there is need for design infrastructures, studio rooms, departments, buildings, facilities; these require time and resources, and make design an inevitable part of the working practices and frames of the company. The question is, how are those design visions and interests generated? Is it possible to determine the essence, that makes a CEO to start thinking in a design-oriented way, making him or her the design visionnaire? How significant is the influence of early visions, or the significance of artistic hobbies when design histories are considered? In the following section we examine closer how design work has begun in firms.

Coincidences in the Design History of Companies

It is significant to understand the particular details in the starting points design has had in the firm's past. It enables us to determine how the general awareness of design has increased in the firm and how this awareness has actually triggered the design adaptation process. In this light, sifting through the facts provided by the interviewees would have been straightforward. But, as Lorenz (1990) describes, the "changeover" process varies widely. In many companies design professionals have had to struggle for years before being taken seriously. In other companies design has been quickly adopted in use because of momentous occurrences such as failures in the marketing strategies, or to stimulate new product development, or because of the new CEO. Often these three factors go hand in hand. (Lorenz 1990: 77) Our evidence supports Lorenz's conclusions as well.

Often design in the firms surveyed has had coincidental beginnings. For example, all company cases researched in Finland verify some of our assumptions about randomness of the starting point of design. These assumptions already emerged earlier during preliminary conversations in our team. While one of the main questions presented to the interviewees was "What is the design history of your company (or of your client company)?" it was quite surprising to notice after the interviews that the supposed contingency was an actual issue. This was clearly illustrated in the interview material, as for example in the following:

> At that time no one, not even the designers, were able to determine, what the designer should do in the company. The picture was only beginning to emerge. However, we had opportunities and we had abilities, so to begin with, we just started to work with these. After some time things began to take their initial shape. (Industrial designer, machine manufacturing industry)

It should be remarked, that some of the interviewees could describe their company design histories, mention persons who have had their effect in the overall development of industrial design in the firm and so on, but no accurate figures or dates were recorded. The "Big Picture" remains unclear.

> The interviewee has worked for the client company already during the seventies and eighties, he has merely been involved in the so-called re-design. The contact between the designer and the client company was established somewhat ambiguously, "with the help of wife's cousin." The interviewee worked in the field of a dental unit design, however having his position as designer at Salora as well. But, as he recalls, design was too much of a "novel issue" for the client. As a result very few dental clinics were equipped with prototypical treatment stations and design co-operation between the consultant and the client faded. The situation was stable but the close relationship prevailed. "We worked now and then." (Industrial designer, consultant)

While the previous comment is from the medical high-tech manufacturing industry, the following, and rather similar quotation is from an interviewee working in the machine manufacturing industry.

> I really have no recollection whose idea it was to include design in our product development process in '87 or '88. At that time... we began to use the service of a design consultancy, while developing our casting machine. We had an industrial designer working with us and eventually the product was well received at the fair in 1989. During the mid-nineties, when the development of our new line of machinery products was in progress, we contracted an industrial designer as well. Indeed, we changed the consultancy; however during product development processes, updating machinery and equipment, we work with industrial designer. (Managing Director, machine manufacturing industry)

From the personnel interviewed working in in-house operations, only seventeen persons out of forty-four could specify the *decade* when industrial design was adopted into use. With this we mean the period when design could have been considered having had a significant effects on the product development process.

In all, according to the evidence provided by the interviewees there seldom seems to be any specific occasion or date. Even rational reasons for introducing design in the products, such as safety or environmental factors have appeared slightly accidentally.

> Apart from coloring, the design in machine industry was practically nonexistent during the seventies. Work safety gained more foothold in the mid-eighties, but probably only in North America and in the Nordic countries. Then came environmental requirements, and primarily because of this machinery was later on equipped with enclosed cabins. In the developing countries no one cares about these, while in the Nordic countries it is impossible to get anyone climb on a machine without a properly protected cabin. It is the same with dust, design was needed to help

in solving the problem. (Marketing communication manager, machine manufacturing industry)

In the light of the evidence it seems that there is no distinctive model to illustrate the particular moment when design actually "entered" a company. This is not to claim the decisions made in the companies to begin using design have somehow been haphazard. Merely, after sifting the rather metaphorical expressions of the interviewee "reminiscences" it must be concluded that it is difficult to unambiguously determine and present any *typical pattern* of how design as a resource has accessed the companies examined.

"The Silent Design Phenomenon"

Designers do not enter into an empty workplace. Instead, they face other professions and occupations, as well as management structures in their new organizations. In our benchmarking companies, these existing parties have been constructive towards design in the early stages of this new activity. In fact, they have been doing "silent design" by themselves before the arrival of trained professionals, who have thus entered an agreeable territory.

These companies have had a need for design in their immediate past but no design department. It seems that those enterprises have had to rely on a phenomenon called "silent design." It is a process in which marketing, production and other staff contribute to design decisions or do design part-time. (Walsh 2000: 76) In those companies, before the design function had been properly established or consultants contacted, people participating in design decisions are perhaps talented people, but without formal qualifications. For example, one interviewee described his early participation in the company's design affairs as "practicing quackery."

> The interviewee claimed he had understood the benefits of design already earlier in his career. He then worked in design as quack, practicing "design quackery, without proper education."

> Before the company had any in-house designers, design was assigned to external consultancies. (Product development manager, medical technology industry)

The relationship with the (client) company has been fantastic. The initial contact to the company was just a phone call- (the consultancy) offered its services. The response was that the company was interested in design. The company invited the consultancy to introduce themselves. After that initial introduction, they started a project together. (Industrial designer, consultant)

Referring to the latter quotation above, in one case the decision to use design consultancy was made after single phone call from a design consultancy that was seeking new assignments. This story differs from the others told, as it took place only one-and-a half years ago and the resulting co-operation between the consultancy and the company was the first time for the company in question.

Situations Conductive to Design: Company in Crisis

The evidence presents models how design has first been recognized. In all the companies examined, design has had rather obscure origins. In one interview the person being interviewed boldly stated how design "suddenly occurred," (to one's mind or) to the company. Another interviewee told how "there was some kind of crisis" in the company which practically activated the management to consider how the situation could be improved.

> I've been working in the company for twenty years now. I began my career as a product designer. From the very beginning I have been involved with design and designers. The company in its infancy was small, employing only about a hundred people. Then came the period of depression; I proceeded and ended up leading the product development sector. Meanwhile some kind of crisis happened in the company, and subsequently the invest-

> ments into the product development have been increasing since '93 – '94. (Product development manager, machine manufacturing industry)

> The client explicitly changed their business policy during the years of depression, when the company was actually near bankruptcy and a petition was being prepared. However, new products incorporating design, attracted potential customers and even competitors had to re-evaluate the situation. Exports flourished once again. Both the range of products and production was rationalized. Design work was orientated to facilitate this via modularity, emphasizing a wider range of possible variations from similar components. (Industrial Designer, Consultant for the company in the previous quotation)

When in crisis, company management seeks new opportunities and fresh starts to compete in the marketplace. Design can provide such a fresh start, and thus get a chance - especially when it is deemed a cheaper strategy than engineering or marketing. Fresh starts are justified in crisis situations.

In this case it could be speculated what would have happened if design had not been accepted or it had had no impact? But, initially it was this crisis that resulted in the utilization of industrial design. In this particular case design consultancies were employed and design was vigorously utilized in improving the company's main products, thus resulting in a new economic growth. Successful differentiation via design started a new era in the firm and nowadays design is considered one of the key assets in the company.

The Importance of Managers as Design Champions

In a company willing to be successful in design today, consciousness for design must begin at the managerial level. Design cannot make an effective contribution in any company unless there is strong understanding

and support at the highest levels of management. (Heskett 1991: 153) Hence, it is interesting to notice that in the otherwise random-like design scene the question *"what effects has a personal relationship to art and design at the managerial level had in a company,"* is raised. With this we mean the key personnel originated awareness of different areas of arts and understanding the possibilities and advantages "concealed" in industrial design. On the other hand this can be seen as bearing a close relationship to the way of thinking and understanding industrial design as art, but it is fine art that has actually had its effects in some companies, leading to the path towards industrial design.

There are numerous examples in the literature of how the sense of design has affected companies. To mention one, the famed designs of Olivetti grew from the vision of Adriano Olivetti, who saw design as both an expression and a medium for obtaining unity between living and working life, and by placing the emphasis on contemporary design thus making the utilization of latest achievements in engineering possible. Furthermore, he understood how visually enjoyable design can inspire people's intellectual and artistic values (Kitcherer 1990: 16). Adriano was a "design champion" (Blaich and Blaich 1993: 126). With good justification, Olins notes that

> There is an inescapable similarity between Adriano Olivetti, the prince-patron of all that is best in modern Italian design, and Lorenzo di Medici, the patron of the Florentine masters of the Reneissance. (Olins 1978: 153).

Adriano's commitment to design has been continued by Renzo Zorzi and Bruno Visentini and, later, by De Benedetti (Kitcherer 1990: 80).

A similar direction is found in the vision Masaru Ibuka, the founder of Sony, already when writing the founding prospectus of the company in 1946. He wrote, among other objectives, how the aim of the company is to "apply advanced technology to the life of the general public and thus bring untold pleasures and untold benefits." (Kunkel 1999: 14) It is doubtful whether these visions, today so well known all over the world as Sony

products, would have been materialized without the extraordinary design work that resulted from Ibuka's initial vision. While Sony had to revise the design department organization three times during 1978-85, the management's deep understanding of design as a key factor to Sony's success has continued trough decades. (Lorenz 1990: 78: Kunkel 1999: 14; for AEG, see Rogge 1984: 110, Buddensieg 1984: 49).

Or, let us take an example among companies in our research, the open-minded and design-oriented managing directors in one machine manu-facturing company. In this particular case the orientation toward design issues began already a decade before design was utilized in the company, as the founder of the company had been deeply interested in aviation and design. An engineer from the firm in question described their present managemental attitude towards design issues:

> The attitude towards the design begins from the top. The top management is not only interested in design in the products, but also in the buildings - the company facilities. All that belongs to the corporate identity. You can see this attitude in the products. (Director, product development department, machine manufacturing industry)

This example shows how thoughts from the past can connect to the present, linking the thoughts of the founder and the attitudes and perspectives of present management, and resulting in a closely-knitted managemental "attitude model" to assist design procedures. Design has become a cul-ture: a framework that is a natural part of the whole frame of mind of the company. The designers' frame gets a responsive, although demand-ing, audience from the top management an others in the company in such cases.

The positive attitude towards aesthetics and design in this particular ma-chinery-manufacturing plant is also notable in the company's headquar-ters building. Its wind tunnel-on-the top-design is both architecturally bold and interesting. Such details surely highlight the overall corporate image of the company and enhance the company's holistic design views to clients as well to passers-by. In fact, the building in question bears a

curious resemblance to AEG´s famous Turbine-manufacturing plant, designed by *the "first non-technical specialist"* Peter Behrens in 1907 (Zaccai 1995: 7). This importance is further illustrated by Lorenz, who, using as an example the headquarters of the American machine company John Deere in Moline, Illinois, designed by the famed Finnish architect Eero Saarinen, writes how "the functionality of the company's products should be in perfect balance with the overall image of the company, including the company buildings." (Lorenz 1990: 101).

A second and an even more illustrative example is from still farther away in the past. In one interview we were told what happened in the fifties. An engineer had turned down an art scholarship in favor of a manufacturing career. Art-loving, but frustrated as an artist, he unleashed his ambitions on machine manufacturing. The story tells how he

> ...believed that the engineering needed to be more of a refined art. One day in 1959 Deane Richardson came to Crown and agreed to do a project for 500 dollars- the product won a design award. That was everything that the lead engineer, Tom Bidwell, wanted at that time. So, Tom Bidwell grew on the company, the design grew on the company, success grew on the company through design; one after the other towards what it is today. (Design director, machine manufacturing industry)

This was the utmost beginning in the company's design history. It started the continuous usage of industrial design in the product development process (This "incidental" story is also described in a case by Freeze 1991). Interconnected with the management's serious interests and respectively, hobby in both fine arts and design the previous incident indeed was *the* starting shot, creating, what the interviewee describes as *design culture* in the following quotation.

> One of the best ways for design to excel is to create the culture. It is easier to do one successful design in a culture that is not used to a good design process, it is much more difficult to create a design culture because it takes a long time to achieve and to get

> the organization breathe that... With that (design culture) you will get more consistently recognizable design. (Design director, machine manufacturing industry)

These individuals believed in design and they understood what design is all about. Their visions were based on a strong, at the time quite unprejudiced belief in the positive effects of good styling. The engineer in question was acquainted with *real* industrial design matters as well. Also, the importance of the relationship the company had later with a design consultancy the company must not be underestimated. And again, the first account is a narrative about a visionnaire, who acquired his inspiration from the art world and applied it to manufacturing and technology, bringing two different spheres of practice and knowledge together.

Organizing Design: In-House Organization vs. Networking

A deep commitment to design is a matter of long history and often results from coincidental beginnings, as we have called them. It is also largely dependent on managerial interest in design. These features of design support the literature based picture created in Chapters 2 and 3 (Sony, AEG, Philips, Olivetti). Still, these literature benchmarks prompt one more question: what is the role of a possible design organization in companies? When design becomes a standard part of company practice, investments are made to design in some form or another (in materials, machinery, software, people). Also, as design becomes standard practice, companies become committed to design indirectly: when some functions are taken up by designers, other professions lose these skills. Dependency on design develops.

Such a situation is conductive to building an in-house organization for design. However, as Chapter 3 argued, such organization does more than just stabilize an existing fact. For instance, it can do internal marketing for design effectively, organize design competitions within the firm, and maintain internal publicity that further promotes the cause of design in company. In particular, this was the case with Philips - even Olivetti was

not found to be a negative case, no matter how amorphous its design organization appeared to be in the first instance. Such internalization provides designers with a long-term vision on the company, and enables many kinds of organizational learning. Thus, setting up a separate organization for design can be regarded as a sign of strategic commitment to design.

However, this is not the only possible path. There are consultancies from which design can be bought (for IDEO, see Kelley 2001). Relying on them provides a series of obvious benefits for companies willing to invest on design. For example, in terms of costs, consultancies are paid only for the work they do. When times are bad, they can be used with in a more flexible manner than an in-house organization. Also, in creative areas of business, freedom to change designer means better possibilities to get fresh ideas. This organization provides benefits for designers as well. Remember the case of Olivetti: working in their own studios in Milan instead of the Olivetti headquarters provided Olivetti designers freedom to pursue their artistic and creative activities.

There are competing rationales at work. Which path is chosen by the companies in our sample?

The following chart lists the number of designers and main types of consultancies utilized in the companies that were surveyed in the research. Even a quick overview of the chart reveals the obvious importance of design consultancies to these companies. The chart is divided in four columns, each listing the number of design services in use. The in-house designers are listed in the first column. The second column gives the number of external design consultants for each company. With external design consultants we mean design offices, not individual designers, who are then listed in the following third column. The fourth column lists subcontractors in design, i.e. design consultancies with only occasional activity and co-operation with the company mentioned.

The reliance on external design services, at least in the investment goods

manufacturing seems to be all-inclusive. However, there are interesting exceptions. Firstly, Crown Corporation has a separate design central, employing an average of twenty designers. Secondly, Nokia Mobile Phones has a massive in-house design organization, but also utilizes a large network of consultancies and subcontractors. Thirdly, Metso Corporation employs a bunch of roughly twenty consultant designers. In all three enterprises, design is considered to be of strategic importance.

As a family-owned company, Crown has a rich history in design originating back to the beginning of the sixties. During the past two decades the design department has determinedly been developed to exactly correspond to the product development needs. Crown's internal design organization is a rare bird among the companies examined; as shown, consultancies are preferred. However, before internalization, Crown had a thirty-year-long relationship with RichardsonSmith, one of the world's most respected design consultancies, now called Fitch. During that time the two companies "grew together" (Freeze 1991). In the late eighties Crown's design went through a major organizational refinement program. One of the reforms called for the establishing of an in-house design organization. An in-house design group was as being attractive for several reasons. The communication between design and engineering departments at Crown was likely to improve, as designers could meet engineering personnel on a daily basis; the consultancy was located 100 miles away. The in-house team was exptected to integrate better into product development process, resulting in an understanding and an in-depth knowledge of the entire processes as well as in a faster process (Freeze 1991). Crown had also another advantage, facilitating the decision to internalize most of their design activities was existing design culture. Design culture takes a long time to develop. The thirty-year experience of doing industrial design in the firm had established a solid ground onto which internalized design activities were built.

Nokia Mobile Phones (NMP) has a substantial design organization, which is currently best explained by Keinonen et al. (2000). Because of the sheer size of the enterprise, we are able to present here only a brief overview how design is organized in the company. There are also limita-

tions in the availability of information due to its strategic nature. In industrial design, NMP uses both external design consultancies and subcontractors, and operates a network of subsidiaries within the company. The organization is capable of utilizing company-owned know-how resources as well. This emphasizes specialized know-how is easily distributed inside the organization. NRC, Nokia Research Center is in a key role when technological competence is concerned. NRC and its network of international collaboration ensures that progresses in international technology and research are carefully utilized. (Korhonen 2000: 183). As an informant at Nokia says in an interview, reliance on consultancies limits the possibilities for design because of the complicated, information-overload-ridden environment of modern industry.

> The decision to focus on in-house design was made quite early, as was the decision to build most of these functions into the company... You have to handle a vast amount of information in a project, and if you are not in the house, you don't have access to all necessary information, and can't take a product from the beginning to the end. Smaller consultancies focus only on the conceptual side. Outsiders can't even influence our aesthetic developments because of lack of information, if they are not involved in interaction in the house. (Design manager, consumer products)

The company organization of the Valmet Corporation (Currently belonging to the industrial concern Metso) is more informal and matrix-like, but there are certain hierarchies maintained, mainly for practicality reasons, e.g. as one of our interviewees at Valmet stated:

> The linear organization at Valmet is emphasized so we know who pays our wages. However, when going operative, there are no barriers. Yet, an appointment is needed to meet the managing director. But communication is not difficult otherwise, thru the

Next Page: Table 1. The Organization of Design in Case Companies

Branch of Industry; Companies	In-house designers	Design consultancies	External indiv. designers	Sub-contractors in design
Medical technology				
Datex-Ohmeda (FI)	1*	1	none	none
Polar Electro (FI)	2	2	none	none
Planmeca (FI)	1	1	none	none
Sirona (D)	1	2	none	none
Machine industry				
Valmet/Metso (FI)	2	20 -----	------	------**
Rocla (FI)	none	2	none	1
PCE (FI)	none	1	none	none
Crown (US)	Ca. 20***	1	none	none
TGW (AT)	none	1	none	none
Kone (FI)	1	n/a†	n/a†	n/a†
Other				
Nokia (FI)	n/a†	Ca. 3-4	n/a†	several††
Woodnotes (FI)	1	none	n/a‡	none
Deviant Cases				
Alessi (IT)				

*)Separate design dept. Employs more designers in the U.S.
**) An average of 20 designers (see text)
***) Average, staff incl. other product development professionals as well
†) Data not available
††) Both internal&external
‡) Currently none

organization or even upwards. The "designer's voice" is heard loud 'n'clear at Valmet, throughout the concern.

Similarly as in most companies surveyed, also Valmet employs a few in-house industrial designers while rest of the design activity is outsourced to consultants. Valmet is building a design organization structure consisting of several separate consultancies of various sizes. For example, while other consultancies are contributing to the network with only one designer from their senior designer staff, other consultancies commission the client's project with several young professionals. The structure is not rigid, but the variations and number of designers can depend upon the projects. In all an average of twenty designers participate in this design network. In this model there is one further option. In addition, as there are several simultaneously working consultants, the design organization is can be operated on two different levels, thus creating a parallel-line consultant arrangement. This is a rather clever arrangement, where the first-line consultants control the work of the other consultants. However, at Valmet it is strongly emphasized this is not a matter of hierarchy, but the structure is intended to ease the strain of coordinating the process from the in-house product development and design. Design management is seen as a important notion at Valmet: one of the main tasks for the in-house designers is to manage the processes between Valmet and their consultancies. With ca. twenty designers in separate consultancies, all working together, the planned organization of design at Valmet would be substantially large.

Keeping the size of the enterprise in mind, it is easy to agree on the stress that is laid on the importance of networking practices at Valmet. And it is suggested in a brochure published by Design Forum Finland that "Finnish design consultancies should form networks of know-how to be able to have sufficient resources to serve clients of the size Valmet is." However, in comparison, the field of other R&D at Valmet is notably larger, divided into ten separate centers worldwide (Färm et. al. 2000: 58).

Conclusions

This chapter has dealt with the design histories in the companies researched. We have also examined how design is introduced in the manufacturing of investment goods industry. We have seen that in the companies in our sample, design has not been introduced by a rational decision of the management. Building design into the foundations of the company practice has been a long process. From initial, often minor beginnings, designers have won the respect of other parties in the company. Some contingencies were outlined that make such process easier (like crisis situations and "the silent design phenomenon"), but the key player is top management. Here, our data corroborates the results of our literature-based benchmarks analyzed in Chapters 2 – 3).

As a profession, industrial design is a relatively young profession in the sphere of other product development professions. Industrial design in capital goods production has seen only about fifty years to day, contrary to engineering design, which actually has its roots in the days of the Renaissance. This difference makes it understandable that during the nineteen-fifties and sixties industrial design was an almost unknown branch of activity among the capital goods producers.

Finally, we learned that outsourcing seems to be the norm in the ways in which companies utilize design. Typically, companies hire only one or two designers, who act as design managers. It is their job to maintain an understanding of on-going company processes, and hire consultants for projects. Only two companies in our sample, Crown and Nokia, have a substantial in-house design organization. This leads us to the central question of the next chapter: how do companies work with consultancies?

Chapter 7

Networks and Consultancies

We saw at the end of the previous chapter that design is largely an outsourced activity. Only two companies, Nokia and Crown, have a substantial in-house design department. In addition, Valmet (Metso) has built a network of long-term consultancy relations (in a manner reminiscent of Olivetti). Still, although only a small number in-house designers are found in most firms, in the execution of actual design processes consultancies are heavily relied on. Self-evidently one or two persons are not capable of taking care of the massive workload of design requirements that new product development processes usually demand. Instead this suggests the in-house designer(s) participate in the projects, but merely act as intermediaries or coordinating personnel, controlling the actual work of consultancies.

These results support the conclusion (see Chapter 5) that commitment to design is not on the same level if a company chooses to work with consultancies as it is when there is an in-house organization. In this respect, the difference between the literature benchmarks is illustrative. This state of affairs probably also explains partly why design is not a strategic asset in most companies. However, the new economy model (see Vallas 1999; Amin 1997) fits this practice better, as it stresses networking and outsourcing as typical modes of organizing in present economy. By and large, design seems to be organized along the lines of the new, globalized economy.

This said, we shift our focus of questions to another set here. Industrial design consultants are contracted and these relationships are maintained for various reasons. There are visual aspects, where the company's in-house designer or design team is often prone to become tunnel-visioned, if certain repeated design-processes are in constant use. Consultants are utilized to present fresh visions and points of view. When business aspects are considered, lack of time, several simultaneous projects with approaching deadlines, lack of specific professional skills or lack of industrial design professionals inside the company are the most commonly mentioned reasons. A successful mutual co-operation between a design consultancy and the company takes time to develop, but often develops into a lasting one.

The use of consultants belongs closely to the organization of design in companies as well. When a company is about to assign personnel to work for industrial design processes there is usually a choice of two: to contract external consultants or assign the project to the designers working internally, if any. Is it necessary to use external consultancies, or should the firm improve its in-house resources instead? What are the pros and cons supporting the resulting decision? These are carefully considered by companies. A combination of both is used often. But how?

Taking Consultancies into Good Use:
Concept Design and Idea Generation

In general, there are no differences in the skills between trained designers who work in-house and who work in consultancies. They do product design, conceptual design, and design management. How and why is design bought from the market, then?

The main important reasons is a need for fresh perspectives, not the price of service. A company with an in-house team or in-house designers can easily revive or stimulate creativity inside the company by contracting consultancies to present differing and controversial views to design problems. Thus consultancies are also used to positively enhance and activate the mutual competition *between* the consultancy and the representatives of different professionals in in-house design teams. This enables the avoidance of tunnel-visions, easily created in in-house teams when not enough comparisons are available.

> Consultancies are used in the commencing stages of a new project, in a way also to enhance internal competition. (Product development manager, medical equipment manufacturing)

> We use consultancies, and have stable relationships to three or four companies. We use them because they have developed a good understanding of our system over a long time that they are not totally outsiders any more... Consultancies typically work in the early stages: they create ideas and concepts, and other things like that. (Design manager, consumer products)

While it seems that larger consultants contract large company assignments more often, there are exceptions. Thinking design-wise this is apparently coincidental. Or not? As we have mentioned earlier, a consultancy with less experience is definitely eagerly waiting for the "show-time." Some client-companies have taken the risk and indeed made good use of a newcomer design consultancy. A variety of different views to a design problem from a small consultancy is notably better than one view from one designer working in a larger consultancy. A company in the field of machine manufacturing was seeking their first design consultancy to realize the planned product concept. An interviewee demonstrates the situation that prevailed:

> We thought that in contracting a large renowned consultancy, we'll get only one concept, while contracting this four-man consultancy we will have a concepts from the entire consultancy team. In other words, the broadest possible conception. We did not want a single concept from a single designer. This was actually our main criterion when selecting a proper consultancy. Certainly, Tampere is located nearer than Turku when viewed from us and the consultancy was small, but we thought they might be more flexible, and so it has been indeed. (Manager, Technical department; machine manufacturing industry)

This makes the consultant scene interesting. Large consultancies are often able to assign only one person to realize a certain project. It is possible that this can stimulate pragmatic attitudes towards the project and result in concepts delivered "as is," without adequate possibility for client to communication and response. With this we mean that a consulting

designer starts to make decisions on behalf of the client, perhaps rigidly gripping to the presented proposals, consequently injuring the two-directional communication. When there is a constant flow of concepts from different consultants, individuals or design firms, each providing the client with different angles of views, this does not so easily happen.

Towards Long-Term Relationships

In many areas of technology adapting and acquiring in-depth understanding of the client's business takes considerable time. In the investment-goods manufacturing it is economical to maintain longer relationships.

> We've been quite satisfied with the present concept and consultant we've worked with. When the design firm is the same, it is easy for us to maintain a coherent (product) range. (Managing Director, machine manufacturing industry)

In consumer production areas where technological levels are equal between rivals, and the competitor's response is rapid, similar products can appear in the markets in a short time. In the times of industrial espionage and the ever-present danger of plagiarism it is safer to deliver critical information to one consultant only, instead of distributing a mass of information or details to several different consultancies. Curiously enough it seems that it is more economical to put all the eggs in one basket. Hence, in the industrial areas producing novel, complex and/or specified applications it is even more economical to create and establish long-term relationships with only a few suitable industrial design consultants and designers. And, as expenditures rise design is increasingly to be seen as a weapon of precision, exactly targeted to the needs of the particular process in the client company.

When a consultancy has been selected and a suitable and reliable relationship with the consultancy has been established there are various other influential factors effecting to the durability and span of the initial relationship. These range from the consultancy's professional experience and

size to credibility matters. Quite obviously while economical aspects are important, contracting a "star designer" is not a matter of investments. Also, consultancies provide useful benchmarks for mirroring a company's own skills and ideas.

> Which consultancy should be chosen, it depends on the candidate's previous history, merits and achievements, previous acquaintance; and understandably, price affects also. But price is not always the only one that matters, at least in the case of hiring a renowned designer. (Marketing director, consumer health care equipment manufacturing)

> Also, when needed, we use other consultancies to get a sense of reference point... we want to measure the quality of work of our long-terms consultancies and, above all, our own work: we need all the time some kind of mirror to be able to do that. (Design manager, consumer products)

Flexibility between the two participants is a bipartite affair. As a client to a design consultancy the company indeed requires the consultancy to work exactly as they want, while the consultancy prefers to have freedom to execute these requirements in the best possible way. This is the critical moment when a new relationship has been established. Especially, if the clients have not utilized the services of the particular designer before. Both participants need a reciprocal balance in their joint work. Any contradictions leading to a clash between the two in this situation may seriously harm the future relationship.

> The ideal is when the external consultant thoroughly understands the design needs of their client. On the other hand, a bad example of a design company is a consultancy trying to do everything according to their own preferences. Any attempt to place restraints is received with arrogance, saying 'you don't have guidelines for this anyway.' A design company must be able to listen to their client, as they're not certainly aware of what is actually needed inside the company. The designer cannot have

> expertise in what the client actually needs. Why produce insignifi-
> cant products for the market? Disappointment is surely felt in
> the companies if there is no market response for the product.
> It is entirely different to make fine arts." (Industrial designer,
> consumer health care equipment manufacturing)

Apparently these contradictions are often activated because of lack of
appropriate flow of information. This is avoided, if, during the early stages
the consultancy acts as a "two-way listener" to client's needs, and rapidly
responds to these needs and opportunities. It should be noted that later
on, the flow of information must be equally fluid.

Understandably, the consultancy that accomplishes the first project satis-
factorily is more likely to contract a new one, thus climbing one step
towards a long-lasting partnership with the client. This is a twofold mat-
ter. A consultancy with a certain "design handwriting" creates a line of
design that, *if* successful, it can be obtained only from this consultancy.
Usually in industries, including the investment goods industry, this model
of action results in long-term partnerships. And especially in the invest-
ment goods producing industry, where models are altered and modified
at a considerably slower pace than in the consumer production, firms are
actually able to benefit from this.

> In practice it takes at least two years to learn what is customary
> in the company. Today the 'preferred supplier' thinking is in-
> creasingly popular; we are no more seeking suppliers but endur-
> ing partnership, as it is more economical for both. It's not prof-
> itable to change consultants all the time. Run-in periods take
> time. (Marketing communication manager, machine manufac-
> turing industry)

Long-time co-operation usually transforms a consultancy relationship from
vending design services to a trustworthy partnership. This trustworthi-
ness needs to be nurtured. An usual failure is to assume that the consultancy
is responsible for maintaining the connections to their clients. This often
creates unfavorable results. However, consultancy-client relationships are

composed of two equally important parties. It is important to the client to understand the nature of the relationship. It is suggested thar the consultancy should be kept involved, even there are few of nonexistent projects. A continual flow of assignments ensures constant interaction (Hull Faust 2000: 44 – 45).

Networking

The appearance of the network organization between the product development teams and the in-house designer or design consultants and the clientele is a question of bipartite nature. Theoretically, designers or external consultants are able to provide their clients with special skills, contacts to sub-contractors or component manufacturing plants, but on what level these are utilized in the companies? In practice, the evidence suggests that the level of specialization inside the networks is substantially low (see Table 1 in Chapter 6).

> I am not very familiar with the networks our designers (consultants) may have. For the time being we've got what we've wanted. Some kind of marketing functions might exist. I don't know what they need in their office. I'd guess they are quite independent. I would imagine they'd have some visions towards marketing issues, if possible. (Technical department manager, machine manufacturing industry)

Is it plausible that the networks described really are, as the ideal would be, a plexus of interfacial and reciprocal know-how delivery systems. In the industries examined, networks are merely a local, either in-house or external "close-support supply" of tacit knowledge, or of minor details in professional knowledge.

> In practice, when work is done in the 3-D world, we usually take care of subcontracting all the needed stereolitography models and so on... Generally, we consider it important to act as distributors of new material and possibilities... These can be materials,

new components, for example hinges. An massive amount of research in done here, as well as actual design; detailed information cumulates here and we distribute it further. (Two industrial designers, consultants)

Most of the designer and consultancy originated resources or external company networks mentioned in the interviews (computer 3D-modelling, model making etc.) could, at least theoretically, easily be adapted to work inside company organizations as sub-networks. On the other hand, incorporating e.g. specific material resource supplies or the like into a company would cause financial strain on the organization. Furthermore, several of the design consultancies surveyed actually maintain sub-contractor-connections to their clientele in the form of supplying information about organizations producing sub-components, detail parts or working in rapid prototyping, all specified fields of manufacturing.

Design consultancies that have been operational and in the professional field for a longer time are able to present and supply their clients with several external networking contacts and communication, the assortment of contacts thus extending outside of their own range of skills. Consequently, this arrangement is able to rotate anti-clockwise, as the client company is also able to feed the consultancy with its own network containing information, skilled subcontractors and the like.

> Surely, larger design companies have larger networks of specialists, networks probably grow exponentially in relation to number of personnel. We use consultancies with one, two or three persons, this means their networks are rather limited. In practice we offer them our own network, in other words we distribute to them our knowledge and contact information about proper subcontractors, for example in issues concerning production techniques and the like. (Product development engineer, machine manufacturing industry)

This kind of networking might be valuable if the case is that the consultancy is a newcomer in the business, a minor one *or* the area of

business is exceedingly specific and the data and information commonly accessible is scarce. However, it must be remembered that the distribution of information to the consultant is always somewhat restricted, and details often dispensed in briefs only an as needed basis. In areas of a specific technology, for example, in mobile phones manufacturing it is conceived impossible the consultancies could handle all the information needed, even they were delivered such vast amounts of knowledge.

Theoretically, when the distribution of information to the design consultancy further expands, design activities become more easily incorporated into the client company itself. If the amount of information needed to brief the consultant increases and simultaneously design is considered as the core competence in new product development, internalizing the complete design process may become more tempting. Naturally this would increase business safety and ensure all-inclusive control over the process, while making the overall organization heavier.

However, reality seems to be somewhat different. Networks seem to take on a more restricted role than presumed. There and the reasons for this are merely practical. A large network of information and know-how distribution between companies and designers would be ideal, keeping the areas of businesses constantly informed about new special technologies and expertise. However, agreements between consultants and the clients often restrict the distribution of information to any third party. Perhaps a certain, perhaps massive, amount of know-how resources, however beneficial these would be to the overall design scene, remain in the firms and in the confidential archives of the consultancies.

> As a design consultancy, the (company's) principal "export product" is know-how. Know-how is accumulated into the company, from where it is then forwarded. On the other hand, agreements often bind the consultancy, thus unable to deliver their know-how or knowledge to external parties. (Project coordinator, design consultancy)

Furthermore, the changes and effects in digital technology have been

rapid. During the eighties and mid-nineties, most designers still had their own networks of know-how and specialized skills. These were knowledge of distributors of equipment (materials, presentation techniques etc.) services (photography, repro studios, printing houses etc.) and subcontractors (model makers and the like). Today, digital technologies have made many of these areas of specialization obsolete. Nowadays when the possibilities in 3D-design are almost limitless, presentations are quite often held digitally. Sketching is limited to the early stages of the project, and there is decreasing need to make elaborate presentation renderings by hand. Expensive physical scale models are built, not in the initial, but only during the last stages of the project, if at all. All these developments in computer technology have decreased the need for designers to have external know-how networks, however small, as more and more tasks are possible to be accomplished by the designer themselves.

The Size of Design Consultancies as an Argument

Which factors are involved in the development of lasting relationship? How do consultancies actually sell their know-how to the clientele?

Generally, the size of the consultancy organization often makes the difference. Less capacity affects the consultancy's potential in ensuring the flow of new assignments. A minor design company with only few people working has, understandably, relatively more difficulties in marketing their work and simultaneously working on the already contracted projects.

A major internationally operating design consultancy is able to operate a separate marketing department. The marketing department is able to brand their suggested design-work to the clientele. Marketing can survey the possibilities and threats the client has and establish their business propositions according to these and other factors. Therefore a major consultancy is capable of making tailored design project propositions from the brief the potential client presents. These marketing departments have one more particular advantage. When the personnel is combined from marketing professionals who understand the meaning of design there are no histori-

cal tensions hindering their work. "Selling design" is not a matter of mythology but business, as is selling anything else. This sounds self-evident, but in Finland it is not, as there are factors that make the situation more complex.

Apparently, the small and unexperienced consultants have difficulties in assuring the potential clients about their abilities. This results easily in a vicious circle familiar to everyone left without that first proper job, because of lacking experience, which is initially impossible to gain without that first place to work in! Usually due to economical reasons and cautiousness in unnecessary risk-taking, it is felt that consultancies with less personnel are not suited to realize extensive ground-up projects.

> The more finalized we need a certain product, the larger the consultancy must be, to have the capacity to finish the project. A one-man consultancy quickly runs out of capacity, then it's not going to be a turn-key delivery any more. (Product development engineer, machine manufacturing industry)

Let us allow some speculation here. What happens in the long run, if the design-markets are saturated with large, though experienced consultancies. Does this influence these markets in general? If new, innovative consultancies with perhaps unprecedented ideas have only restricted access to the design business and clients? Does this not hinder the development and growth of the whole business? Utilizing simultaneously the services of various consultancies of differing sizes would prove a good solution.

The use of variety of consultants is largely a matter of resources. A large company is able to employ several consultancies. Financial backup ensures, that whenever there are opportunities to obtain fresh visions, it is possible to do so. One interviewee, an industrial designer in a large finnish company described how they are always interested in using new talents or novel know-how, parallel to the usual consultancies they work with. There are no unsurpassed hindrances if something novel appears in the consultancy scene.

Small or mid-sized consultancies frequently contract minor projects, while ground-up projects are handled by the in-house designers.

> When we don't have enough internal resources we use consultants. Often there are several projects overlapping each other. Strategically important projects (complete product ranges etc.) are usually realized by our in-house crew. Separate and minor projects are assigned to the consultants. (Manager, product development, consumer health care equipment manufacturing)

This is not an unexpected diversion but there is merely some ambiguity to be found. It is customary that also major consultants are contracted to complete minor or sub-projects, filling the gaps in the project schedules or doing face-lifts on an existing product or a line of products.

Marketing Design

Marketing measures in design are nowadays implemented in full, but the consultant marketing appears to be quite different in Finland. Contacting a potential client is done more discreetly than in the rest of Europe. An interviewee (a Finnish industrial designer) describes, how in Central Europe marketing the services of the design consultancy takes more aggressive and consistent forms. Consultancies seeking new assignments prepare the first meetings carefully, having thoroughly examined the background of their potential client, and gone through the possibilities and hindrances. This enables the consultancy to present and specify their proposal in more detail.

> Over here (in Finland) it seems that it is customary to first make a somewhat timid phone call...often some famed designer pays us a visit and describes the possibilities a bit. In Central Europe, Britain, Italy and so on, the culture is different. Larger design companies have their internal marketing, which then first contacts the potential client, taking also care of pre-planning and background work. When designers then visit us they have a

> good deal of information...that's quite professional, branding
> their services towards us! (Industrial designer, machine manu-
> facturing industry)

A preferred consultancy is reputable, trustworthy and experienced. Previ-
ous experiences in co-operation are considered as well. The data col-
lected shows how the larger and thus usually more experienced consultancy
gets the contract more often than a new, unexperienced one.

> Consultants, design offices or freelance designers are chosen
> according their previous experience in the particular business,
> i.e. those who have previous experience from designing medical
> equipment. (Industrial designer, medical technology industry)

Also individual or small groups of designers can take an advantage from
the situation. There are several examples in Finland from the early eight-
ies when professionals from large consultancies have started a versatile
spin-off design business of their own, thus successfully utilizing the experi-
ence and knowledge in the area gained from their previous practices
when working for the large consultancy.

Conclusions

Analysis in this chapter shows that although design, with few notable
exceptions, is bought from the market mainly for fresh ideas and con-
cepts, designers' networks are fairly limited. Long-term relationships pre-
vail because building the trust and knowledge base for one takes time.
We also saw that a key decision criterion in hiring a consultant is the size
of the consultancy.

This situation represents something of a paradox. If design is a strategic
asset, it ought to be internalized, which provides further evidence that
design is not a strategic force in most companies. If design is in fact in
the core of a corporation, then literature on post-fordism (Amin 1997)
argues that it ought to be internalized. Several companies in consumer

electronics have done this. Perhaps in the future when its strategic value increases, design will increasingly become an in-house phenomenon.

So far, however, the model is decentralized and networked. This does not mean that relationships exists in an anarchy. Rather, in addition to the typical juridical contracts that stabilize interfirm transactions, there are other, design-specific ties as well. For example, investments into technology and software are heavy investments from consultancies signaling commitment to the principal (the client of the consultancy, or the agent). Similarly, learning the ways of the company may take time, but it improves the performance of the consultancy. Long-term consultancies know the technology and the practices of the firm, as well as its social landscape. Some ties grow from interorganizational learning. At best, such long-term relationships allow companies to completely rely on outsourcing, at least if design is not defined to be at the very heart of the corporation.

A possible future for design may grow from not just control, but also the limitations inherent in outsourcing. As developing technology and aesthetics becomes more demanding, outsourcing becomes increasingly difficult, as decisions concerning these aspects of products become so complex that only in-house staff can have an access to all such information. Globalizing markets have a similar effect. Product design processes for global products are complex, and without multidisciplinary design resources in expertise even large consultancies cannot understand them simply because of access to too many critical areas of technology.

Chapter 8

Industry Differences

Industrial design is exploited and used in many fields of manufacturing and technology to improve the usability, ergonomics, safety, quality and finally, also aesthetical visual appearance of products. The analysis of this chapter is based on DiMaggio and Powell's (1983) notion of "mimetic isomorphism." In the context of design, this concept describes a historical process in which design becomes a competitive advantage on an industry-wide basis. When one company within an industry has gained advantage from design, others have responded. At some point, design becomes a established tradition in the industry. This is the situation in some areas of glassware and porcelain industries, as well as fashion industry. To some extent, this also described car industry. Companies respond to competitors' design innovations by more design; if they do not follow suit, then their value may drop. Price competition becomes the main tool in such situation.

This chapter asks whether there is evidence of such historical process in industries studied in this research. In particular, we focus on differences between three industries.

- In consumer products, consumers' emotions, experiences, as well as fads and fashions play a crucial role in decisions concerning what is deemed desirable and what is not (see Simmel 1990; Sassen 1991; Soja 2000; Knuuti 2000, quoted in Chapter 1). The nearer the product is to consumer products, the more importance aesthetic design features achieve.
- In contrast, in business-to-business sectors, professional buyers stress features such as reliability, performance, cost-effectiveness, and maintainability. Professional buyers, well equipped conceptually and in terms of research, often use large sums of money to buy systems rather than isolated items.
- The health care/medical industry is located between these two industries. Its products are typically bought and used by professionals, but they are used in situations in which lay public is present. Lay public brings its aesthetic and moral judgements with it. The service environment may be a key component in establishing a reputation in such semi-professional industries.

Design for these markets has to be different, just as design processes. In the following we will examine why consumer goods manufacturing stress design more than in the, say, machinery manufacturing industry. Later we present some examples how designers and design take position in some enterprises that were examined in the research.

Designing for Capital Goods Production: Product Design and Ergonomics

The competitive edge of the design materialized in the product is affected by the typical characteristics of the context of use. It is at least partially affected by the *physical measures* of the actual end product also. We demonstrate this with two examples: paper mill machinery and heart rate monitors, almost opposite extremes in terms of intended use.

It is doubtful whether a manufacturer of a paper mill machinery would claim that products are foremost sold because of their design, even there would be some positive customer feedback supporting this conclusion. Benefits achieved in productivity, rather than beautiful design are the client's reason for the acquisition. Design is one among various other consequential factors, all components forming the product to the client's satisfaction. Beauty in machinery design is not the ultimate aim, but above all, an additional advantage. As Richard Buchanan, citing George Nelson, writes:

> The creation of beauty cannot be the aim. Beauty is one of the aspects of appropriateness, and it still lies pretty much in the eye of the beholder, which makes it a by-product rather than a goal. (Buchanan 1995: 54)

This rhetoric comment might very well also apply to aesthetics in the machine industry. And, as we were told by one interviewee in the paper machinery industry, claiming that design is the main factor affecting paper machinery sales is to be doubted. This is a fitting hypothesis even design *is* acknowledged as a competitive factor in capital goods manufacturing.

Keeping the previous in mind, it can be suggested that in physically large products such as paper machines design is divided into two components: *styling* design (aesthetical aspects) and *industrial* design. Styling contributes to the overall appearance of the machine, whereas the more functionally oriented industrial design improves usability in minor details and facilitates service on operation panels and other interfaces. For example, when Valmet was developing a new user interface for their winder machine, the design specification for the product development process was divided into five sub-requirements that should be fulfilled in the final outcome:

> -reliability
> -usability
> -easiness of projecting
> -safety
> **-design**
>
> (Färm, Lehmusvaara, Keinonen 2000: 61)

These requirements could well include the word "design" in brackets after each requirement. This shows how specific areas of design are closely contributing to the first four aspects mentioned, but that aesthetic factors still provide the final touch. Design has a twofold position here: on the one hand it is making the whole concept work, on the other hand it is identified as giving the produced outcome its aesthetic appereance also. The interface requires knowledge in ergonomics and usability (design), but the physical design and its associated features require industrial design. Moreover, the user interface is a single component of the machinery, whereas the machinery could be left un-designed, if desired.

The investment goods industry benefits from design as added value in the product. The long-lived production commodities are always acquired after careful consideration. A paper mill machinery is built to a definite order to fulfil defined requirements to last decades and more. Trucks are ordered and redeemed to solve material handling problems, enhance transportation and logistics in warehouses and storages, but nothing else. Industrial design in the machine manufacturing is not decisive if it does not

create also beneficial functional values. Paper machinery looks good if the designer has managed to encase otherwise cluttered mechanical details, but this design improves nothing, if these design panels hinder service operations. Designed material handling systems in storages or warehouses are visually impressive, but their design must help their operators to do their work more safely and effectively. Designed cockpits, operation levers and controls in a truck are a definite sales argument, as long as the solutions are also ergonomically correct and functioning. The balance between usability and design is accentuated in capital goods. As said, bad design can spoil any product, but good design is not able to save an otherwise bad product.

Designing for Businesses When Consumers Are in Contact with the Product

When medical equipment and machine industry products are compared from the design philosophy point of view, there are notable similarities. Intensive care monitors, defibrillator devices and dental units are not only designed but also marketed using features such as functionality, usability and hygiene as competitive arguments. This is quite natural. In intensive care rooms or in first aid stations, where the ergonomically positioned switches, easily usable cord, tube and lead connections and displays readable instantly often equal the question between life and death, ergonomic design is indeed important. Cleaning and hygiene are essential in medical technology, so design must facilitate them. This must be taken into consideration during the design process by reducing the amount of joints, seams and separate panels.

While perhaps not so critical, dental units are everyday tooling for dentists, so the unit must be easy, effective, hygienic and safe to operate. As in intensive care equipment, also dental stations are subject to constant cleaning and disinfection and surface design must facilitate this. External dental consultants can help in defining the product requirements. Dentist's work requires bending and standing in various positions so these must be taken in consideration in the design process. Design must facilitate the

possibility for the dentist to work without an assistant. Differences between cultural environments must be taken into consideration also. In some countries it is conceived indecent for the dentist to work too close to the assisting nurse. Furthermore, it is preferrable in some environments to place the equipment trays out of sight, especially from a timid patient's point of view. The positioning of instrument trays outside the patient's field of vision, comfortable seating, and an uncluttered appearance all enhance confidence, which is always an important factor when medical treatment is in question. Computer tomography equipment requires even more careful and considerate designs, as patients are already under great stress and concerned about the possible findings. Clients evaluate service not just by how professionals act, but also by the environment of the clinic.

> Design has not been a particularly important factor in this line of business. However, its importance is growing. In America and in Europe, people in hospitals have in no uncertain terms told that equipment should "look nice." One of our competitors has products that are popular because users say they "look cool," and even populistic, even though their measured performance on paper is not so great. On the other hand, clients do not always dare to say that aesthetics is important... in practice, they appreciate design aesthetics in equipment. (Chief engineer, medical technology industry)

However while for example smooth and seamless surfaces contribute to hygiene and cleaning, colors may contribute the patient is feeling of comfort. Further aesthetic oriented designed features, such as colored panels, surface treatment or decorative materials and graphics are usually secondary aspects in the medical equipment business. They may have their effect in case there are several products on offer, all having equal performances features or auxiliary equipment. As stated previously, for example some dentists prefer to choose the dental unit's colors to match the colors of their office, but foremost these are personal choices. There is no decisive evidence that these requirements are taken into serious consideration, or that they are standard procedures in public health service. It is

more apparent that apart from the mentioned cases they seldom have actual effect in the initial go/no-go purchase decision.

Aesthetic Value and Design in Consumer Goods Production

In consumer goods manufacture aesthetic design gains more foothold. There are various articles where the aim of design is to enhance functionality in addition to the advantages gained from visually attractive design. Many everyday household appliances incorporate design mainly to attract the potential customer casually browsing in the shops.

Among the researched products are wrist-worn heart rate monitors. Containing state-of-the-art technology, these are interesting examples of both consumer and not-so-consumer products. A wrist-worn heart rate monitor is probably sold on the basis of its purpose and functions, while purely aesthetical or fashion oriented aspects of its design affect the customer's decisions too. Today, there are many manufacturers and brands available.

Previously, heart rate monitors were merely intended as information-providing tools for accurately controlling and analyzing a professionally inclined workout program. Today these have become an article of fashion and indicator of certain lifestyle as well. Heart rate monitors are sold in sporting equipment shops selling also constantly changing fashionable clothing and sporting articles (see Kotro and Pantzar 2001). Consequently in the consumer's mind, designed equipment is quite automatically linked to fashion issues.

There is nothing new about this, as the sales in most consumer goods and products are largely dependent on the trends in fashion and the fluctuations in the markets. Moreover, for heart rate monitors the future looks good, as a healthy lifestyle is an growing trend. Competition between firms is increasing and a functionally attractive design is needed to differ products from rival ones.

When there is nothing to follow, consumer tastes can be created. The best examples are found in the fashion world, but other product lines can be utilized for this as well. In these processes industrial design and especially styling gains increased importance. The Sony Walkman is a good example of how top management innovation and effective product development processes together build successful products. When Sony introduced the Walkman in 1979, actually only four months after the creation of the initial concept idea of a small portable cassette player with headphones instead of loudspeakers, and it became an instant market hit. Similarly, as Caterpillar has come to mean all tracked bulldozers in general, the name Walkman become synonymous with portable personal audio - it has become a design "icon" (or, alternatively, "dominant design"). Sony had managed to create an entire taste, later broadening into several varieties, actually transforming to a lifestyle culture (Kunkel 2000: 42). In the Sony Walkman story it is notable, how the managemental influence to the actual process was especially important. The Walkman's primary idea was developed in the top management level (Kunkel 2000: 42).

Changing Markets and the Role of Design in the Process: Two Case Studies

As we have seen in the three previous chapters, design is conceived differently in the medical and machine industry than in consumer products. The design of instruments and machines is largely evaluated according to the benefits it brings to the user, may these be economical, ergonomical or work safety issues. In the consumer market, fun is a new dimension of diffrentiation. Designers of consumer products are more often involved in strategic design related issues such as marketing. In the business-to-business production they participate in the design process, but seldom in the basic engineering, or marketing decisions, either. The more strictly the company is in the business-to-business context, the more designers work mainly on product design.

In the following part, two cases are presented as examples of what happens when companies reorient themselves from a focus on technology to a more customer-oriented market. Design has gone through a series of changes simultaneously.

Kone Corporation: From Machinery to Service Production

> "In the 1970s, the products of Kone were traditional machine shop products, in which there was virtually no design involved."

Kone Corporation is, according to the company's official website, one of the three leading companies in the global elevator and escalator business. The use of industrial design at Kone began in the eighties. We were told that one reason for utilizing the services of designers was to create more coherent product lines: before the eighties elevators were more or less "tailored" to meet the building requirements at a given time. Technological innovation is ranked high at Kone. Today the company is positioning itself much more among service enterprises than machine manufacturer. Excluding special assignments, elevators are often designed on a platform basis.

The organization of industrial design inside the company is reduced to the minimum: they use consultancies. There are not many financial restraints for using design, and this practice is mostly maintained because of other profitability reasons. External consultancies fit the practice of industrial design at Kone.

In the vertical transport business industrial designers have more restricted possibilities when compared to architects and architecture, another significant factor defining the visual outcome of the design process. Since elevators are always components of larger complexes, buildings etc. the visual relationship between the work architects and designers do is almost inseparable. Whereas architects evaluate the wholeness and the aesthetical fit between elevator and building, industrial designers are left with less possibilities. Many laws and regulations dictate the product out-

come and the possibility to execute design in its aesthetic form is always somewhat limited. The available space in elevator, with floor area often totalling only a few square meters, restraits the more exotic design proposals. At Kone it is also conceived, that architects are often better at understanding and controlling the restricted entity of space available. Architects often design the elevator chassis interiors. Moreover, famous architects can be used as references in marketing.

When architects are involved in the elevator chassis design process in a holistic way, industrial designers working in the same projects, concentrate on usability and ergonomics in the user interface area and other control components: lighting, fixtures and the like. As in many other forms of capital goods manufacturing, also in elevators successful design often remains quite invisible, even inside the chassis, while shortcomings in design are easily detected by one being transported.

Polar Electro: From Hi-Tech to Fashionable Consumer Products

Polar Electro manufactures heart rate monitors and other high-tech equipment for personal training purposes. Design is considered as core competence at Polar. In Polar's philosophy their products are seen as tools for training rather than decorative objects. The heart rate monitor markets is highly competitive, and design is seen as part of the product, not an absolute value, but it must be incorporated in otherwise meticulous product design. This makes an interesting comparison, as the value of design at Polar is somewhat similarly conceived as in the machine industry, where plain decorative design is seen unfavorable as it does not enhance the product's overall functionality.

However, the situation has changed. International competitors such as Nike and Reebok have entered the market, and sports have gone through a change. In the 1970s and 1980s, the market was adequately served with products for heart rate monitoring, today the scene has changed, and product appereance has become more important:

> Our advantage has been technological. Competitors have chosen either design or price, or both as their strategy. However, we have to be careful that products look good... People are adamant what comes to this type of product. Previously, our products were seen by customers as devices for physical workout, but the sports market has changed as a whole. Today, sports shops are largely clothing shops in which you sell fashion that changes several times a year. You have to be able to react to that market...

> Product appereance are not the only important factor, technical quality has to be there as well. Still, you look for a certain trendiness. It is nice to have a product that communicates to a person that it is nice to wear the monitor on his arm. Today, heart rate monitor acts as a wrist watch outside practice. Previously, practice was all that mattered. Surely, it is the aim of design that people wear products also outside practice settings. (Marketing manager, Polar Electro)

Designers are brought into the product development processes in the quite early stages. Consumer surveys and focus groups research are often conducted prior to this. Design and product development departments are physically positioned close to each other and informal communication and meetings are encouraged. Clashes between personnel in different departments are understood, and these are primarily taken as a constructive part of the process. Principally, decision making in product development processes takes place at the marketing management level, but designers are able to do decisions concerning design issues. At Polar, we were told, design activities are externalized and much of the design-work is performed by consultancies. It is noteworthy that consultancies are used when there are not enough internal resources. As with decision making, the in-house designers do not usually participate in other process activities than design, but they act as coordinators between Polar's internal design activities and consultancies. However, the two in-house designers are mainly used in major or ground-up product development processes,.

Polar products are communicated effectively with visually coherent advertising and marketing. It is desired that packages and products together

communicate a similar message. In advertising, matching commercial material with the products is seen as a natural continuum to the initial product development process.

Conclusions

In this chapter we have explored the hypothesis that design process and outcome are considerably different depending on whether they take place in the consumer product or in business-to-business industry. We have studied how consumer production, often dependent on rapidly changing fashion attributes, emphasizes shorter product life cycles. Finally we have examined, how design has been positioned in some of our research subject companies.

While much work is done for improved usability and quality, in many areas of consumer production e.g. household appliances, designers work also with superficial styling and additions. In the business-to-business products area, design contributes to the overall performance of the product. It can be claimed that design often gains more reasonability in the investment goods production. Such important issues as operation, functionality, usability and safety actually hinder excessive designs. If design does not first fulfil these requirements, it is considered more insignificant. Aesthetic refinement is important today, but only after other problems in the product development process have been solved. Nowadays, companies are interested in investing in designed equipment. While a uniform design in production lines or in production tools altogether not only looks good and benefits the overall tidiness, it has its effects in increased pride of work and productivity. The warehouse workers, "at the start of the shift, sprinting to be the one to spend the day aboard a Crown truck," are a good indicator of this.

This is not the whole story. While the overall consciousness of the benefits of industrial design is rapidly expanding also inside the capital goods industry, there are still some opposite views to be found. In these views the primary emphasis is on the engineering of the product instead of on

incorporating design and styling in a holistic way into the process. To some extent this seems to be apparently due to pure skepticism about the value of design. However, the marketing value in design is marked, and in certain cases it can be the decisive factor if several products of similar technological properties are available.

Is there, then, evidence of design becoming an institutionalized means of competition in industries studied here (DiMaggio and Powell 1983)? Apparently, this is not the case in machinery. We purposefully selected companies with an established design reputation, but found that industrial design in these companies is still mainly limited to product design. In consumer goods, design is utilized more widely, but still there are few companies in which design is involved not just in early product development and in product family development, but also in strategic decision-making. Industrial design, then, is not an institutionalized means of competition in the industries studied here. Instead, industrial design is underutilized as a competitive means in many key industries. Even in more design mature industries, there are still gains to be obtained from more intensive and systematic use of design.

Chapter 9 shows how a company works in an industry in which high quality of design is not just a competitive advantage, but also a necessity, if the company wants to be successful.

Chapter 9

Design, Isomorphism, and Variation between Industries

Design does not evolve in isolation from the rest of society. Occasionally, designers are also involved in shaping society and culture at large. For example, Olivetti designers were active in the academic world and the art world of Milan, and they created not only design, but also concepts and theories for understanding design. Similarly, Peter Behrens was an influential figure in the art world and through his architecture, also in the German government. Louis Kalff was actively involved in setting up a professional body for Dutch designers. Even today, prominent designers lead professional associations, and influence the environment through their practical, artistic, and professional activities in many ways. They are also involved in policy formulation in those countries in which the government is actively involved in design.

Through their designs and activities, designers *create* an understanding of what design has to offer. The ideas and arguments formulated by the design world influences the economy indirectly. As noted in Chapter 3, one good way to understand this reflexive loop is provided by the institutional perspective proposed by DiMaggio and Powell (1983). This perspective focuses on how generalized perspectives such as government policies and professional activities guide activities *across* the economy. They call these perspectives isomorphic forces, and classify these into coercive, mimetic, and normative forces.

- coercive isomorphism (mainly government policy): With few historical examples (see Korvenmaa 2001), governments have pushed design into national agendas in the 1990s (Korea, Norway, Denmark, Finland, U.K.)
- mimetic isomorphism (companies react to each other). With proceeding globalization, markets for investment goods and consumer tastes have become increasingly global from the late 1980s onwards although some countries and industries have been trailblazers before that
- normative isomorphism (professionalization) goes back several decades. Industrial designers have organized themselves mainly since the 1960s. In some industrial countries this process has taken place earlier and this process still continues. At least one feature of this process is evident in previous chapters: the skills of industrial designers are fairly standardized, ranging from product design through ergonomics and usability to

concept design and, today, increasingly to business skills associated with strategic management.

For complex professionalized areas of economy, DiMaggio and Powell's model provides us with a suitable framework conceptually rich enough for understanding design. In particular, it does not offer only an economic explanation of design. Economic explanations focus only on mimetic isomorphism: companies react to each other, and copy models from each other. Of course, this view is partially true. Some companies have differentiated themselves from competitors with high quality and design, and others respond to that by investing in design, which creates others possibilities to compete with price, and so forth.

However, it is important to note that design does not evolve merely within companies as a response to the market place, but that it also responds to other societal pressures such as policy and professional structures and activities. As policy and mass media publicize design, it becomes a thing to be considered in company decision-making. The result of these various pressures is an organizational field that is interdependent, though not isomorphic, as DiMaggio and Powell argue, although some isomorphisms flow from professional activities. Rather, these fields have isomorphic islands that differ from each other, but are interlinked into a system, no matter how loosely coupled it may be.

This chapter elaborates the analysis presented in Chapter 8 by tracing some of the tensions between organizational rationalities and these discursive openings. It was in the 1990s that all the various isomorphic forces worked simultaneously to push design into the forefront in several industrialized countries. This should be seen in our data as well: more companies should have decided to choose a design-oriented strategy instead of a technology-based or a price-based strategy. How have companies taken action in response to this renewed discursive environment?

The Changing Faces of Design after the Eighties

According to our data, a watershed in understanding industrial design is a fairly recent phenomenon. The important line is between the 1980's and the 1990's. During and before the *eighties* design in machine manufacturing was mainly considered a secondary artistic activity with little or no commercial benefit for the industry. It was commonly believed that design is something merely suitable for artistic craftsmen making pots, pans and one-off products.

Considering the traditional imagery of design and designers during the 1960's and 1970's is considered this is no surprise. For example, Finnish Design was crafts-oriented and construed as such in the public (Takala-Schreib 2000; Kalha 2000). It produced often unique, quality goods for household use. Thus, as a notion, as well as in practice, industrial design was relatively unknown, at least from the point of view of the heavy industry. In Finland, for instance, the first "real" industrial designer (and lecturer in industrial design), who worked in heavy industry was Börje Rajalin, who designed electric motor casings for Strömberg Oy (now ABB Finland) in the late fifties (Hoffman 1989: 392).

Meanwhile, in the more design-aware companies, understanding the opportunities of industrial design was still an interpretation of the traditional or basic linear product development model., The simplified role of design in the process is as follows: instead of participating in the product development from the initial beginning, designers, perhaps called "the company artists," were, in the finals stages of the concept, often requested to "curve the edges" and give the new product an attractive color.

> We were willing to change our previous practice, in which the process and mechanical engineering was accomplished first and only after that the designers were allowed to curve edges and add color. Changing the long-established practice resulted in good deal of opposition; it was not understood what it was all about. Only after a while we began to understand design. (Senior Vice President, machine manufacturing industry)

In practice, these tasks were realized by the designers when it was found necessary to do so. In the meantime, designers were asked to work on whatever other development projects and design they were assigned into. This was rather easy, as most designers had more or less a mixed-bag-type of education at the time. These stories quite equally cover also the other areas surveyed in this research, including medical equipment industries. During the era, industrial design was somewhat alienated from the general product development scene. This affected the consultant business also. As a result contacts between the "newly-born" design consultation professionals and companies producing investment goods were made only occasionally.

However, the progress in establishing national design education programs and especially the ideas of the benefits of highly rationalized design, distinctive to the 1970's, brought also ergonomics into the game. The famous West-German HfG Ulm, considered as one of the most important design schools since Bauhaus had been closed in 1933, had a significant role in this. The focus of the Ulm design was a way of introducing a collection of scientific methods and techniques into design (Buchanan 1995: 41). The result was rational, socially acceptable design where "industry is (was) the central agency shaping culture" (Buchanan 1995: 40). The German influence in design with its revolutionary principles, gained strong foothold in other European countries, also in the Finnish design environment. Exporting rational, ergonomical issues into the Finnish industry began largely in medical equipment area. Ergonomical design was more or less one of the first aspects of industrial design to surface into the business. But it would take another decade before the machine industry would make acquaintance with industrial designers.

The Growing Importance of Design in the Nineties

The beginning of the 1990s brought a rapid expansion in design. The medical equipment business had at least casually exploited the benefits of industrial design in the 1980s, but design in the machine industry had been scarce and aesthetic aspects were allowed to enter the industry only

a decade later. The most obvious reasons for the growing importance of design in the 1990s is government policy: several industrial nations launched a design policy almost simultaneously. These countries include U.K., Denmark, (South) Korea, Sweden, Norway, and Finland.

This reaction has taken place across industries and countries. According to our data, the main reasons for this change are mimetic in DiMaggio and Powell's (1983) terms. Stakeholders in companies see that since little competitive advantage can be won by technical improvements in a cost-effective manner, other means of competition have to be sought. Design offers one possible strategy for such differentiation.

> The meaning of design to the business has been intensifying after the mid-nineties. Previously, products only had to fulfil certain technical specs while in design angularity equalled design policy. Today soft contours are favored. Along with the co-operation we've found proper functionality to our products, but good looks have been accentuated as well. A product needs to be good-looking. Because of our clients and competition design has progressed in this area of business. (Director, Customer services, machine manufacturing industry)

> In principle, it is still possible to gain advantage from technology... However, we are approaching a situation in which products are technologically on par with those of our competitors. Traditionally, it is design that differentiates products then. (Design manager, Consumer products)

According to this construction, previously there had been no need to build strategies on design: only few competitors were utilizing design in their products. Designers were still merely considered as color stylists. Deciding color schemes was *the* refinement, if there were any "artistic" requirements present. On the other hand there was a certain unfamiliarity with design issues among designers altogether.

Not surprisingly, the phenomenon of rather sudden transition was apparently being a direct derivative from the growth of the general acceptance in the benefits of industrial design in Finland. First, there was resistance to do so, as design has been generally considered as something artistic, carrying non-rational, engineering-hostile, non-measurable elements. In some occasions design was thought to be not belonging in the industry environment at all and hence its acceptance into the business has been slow, resulting in a traditional design process. Design was surrounded by unsolved mysticism.

> It used to be that design created a mystique, a magic... while design is today becoming a commodity... that is traditional design, in which the client describes a new product idea to a designer, who then makes the product look nice by giving it a visual design. (Vossoughi 2000: 51)

Gradually, when the manufacturing organizations in the machine-manufacturing industry competing for same market shares had technically reached same levels with each other, it was necessary to differentiate the products. And when the notion *design* became "fashionable" in the machine-manufacturing industry, the door was wide open. Having said this, however, it must be stated, it is only surprisingly late, in the mid – 1990's that design has been understood as a valuable competitive advantage. But still while design is *considered* a strategic asset in many companies, is design really strategic? Perhaps the strategic meaning of design actually means it is *important,* ensuring the product is attractive to consumers, but this kind of design is unlikely to be strategic, as Wynn (2000) suggests. There is indeed scepticism around.

> Companies are beginning to understand that design can affect decision making on a strategic level. However, although you hear a lot of talk from design firms about strategy, dig deeper, and you discover their strategy is nothing more than placing information on a chart, or adding pictures to a piece of cardboard. They may be step further from traditional design but they

> are not on the path the design industry is following as a whole. (Vossoughi 2000: 51)

This problem was also present in our research interviews. In many companies design has been valued and understood, but the actual utilization has often been minor. One problem is that the understanding what design is for, gets sometimes stuck in certain levels of organization. It is not enough that the managers stress design if their subordinates do not think so. Once again, the fluent flow of information plays a distinctive role here. These have been common problems in the Finnish industry until recently.

> Design was actually a minor component up until the late nineties. We did employ some designers... on the other hand, foreign contacts intensified due to our global activities... in fact, the majority of this growth has happened during last two-and-a half years. (Industrial Designer, consumer electronics manufacturing)

Among the reasons for this change of attitude, our interviewees offered several examples. In particular, these were prevalent in consumer electronics which leads the way towards more design in our sample. Design may be the only way to communicate the key values of the product to the customer:

> Designers have put their heads on the line in arguing that if you put a little more money for design, the consumer understands it. If you have hi-tech products, expensive technology inside, design has to support that. In our research we found out that previously our products looked cheap: "how can you pay so much for this product, which looks so cheap!" Our designers have tried to communicate the idea that the product has to be balanced with its package. The consumer is willing to pay because of design, which also convinces him of the hi-tech quality of the product... Previously, heart rate monitors have been a tool

> for those who work out - today, our strategy has changed, based on how the product is experienced by customers. (Designer, Consumer products)

Design also supports marketing, which finds it easier to focus on customers. These values are in demand in markets driven by consumers interested in fashion and emotional aspects of products. As the marketing manager of Polar Electro says (Quoted more extensively in Chapter 8),

> The sports market has changed... sports shops are largely clothing shops in which you sell fashion that changes several times a year. You have to be able to react to that market [and] you look for certain trendiness.

This is no news to sociologists and art historians who have been studying consumption in the post-modern era in where products have become a key for building identities and building distinctions between people (for example, see Featherstone 1991: 86; Dormer 1998: 160 – 161, quoted in Chapter 1). The work done by designers has become more diverse with this development: some designers focus on technology, product design and styling, while some are more involved in marketing and trendwatching. As one of our interviewees explained, there is increasing demand for conceptual design. An ordinary user has to be able to use a product. "It is not always important to think about only what technical qualities it is possible to build into the product. Thinking in product development is changing: products and design are understood in a more holistic way today than previously" (Designer, Consumer products).

Isomorphic Pressures and Clashing Rationalities in Business-to-business Industries

When we focus on consumer products alone, the message is clear: there exists a trend towards a wider appreciation for design. The actual reasons for such trend are unclear, although our data suggests for "mimetic" isomorphism (DiMaggio and Powell 1983). Companies react to their com-

petitors' design efforts, and increase their own design efforts in order not to lose markets. However, there are no reliable comparative studies on "coercive isomorphism," although various governments have introduced policies to enhance design over the past decades (for an overview of the Finnish situation, see Korvenmaa 2001). Also, it is difficult to evaluate the importance of "normative isomorphism" from our data: it is apparent that managers follow trends in their line of business, and get an idea of what is going on through their hobbies (see Kotro, forthcoming). It is also apparent that the design world is important in producing frames and promoting design in public. Finally, the role of schools in managerial education should not be underestimated. (see Joziasse 2000, and compare this to the IDBM program at work in Helsinki).

Although it is impossible to evaluate the importance of these various sources of isomorphism, it is still possible to pose a question: there exists an understanding of the importance of design, and this understanding has been grabbed by at least some companies in our sample. However, our focus has been on consumer products that lead the way according to all indications. How about other industries? As we saw in Chapter 8, economic rationalities and histories in industries like machine are in many ways different from consumer products. In the rest of this chapter, we focus on this question. We will study whether and how design discourse affects these industries, despite their different economic basis and social organization.

Design in Machine Manufacturing Industry

There is a notable difference in the usage of design between the heavy machine manufacturing industry and the production of other investment goods. While the machine manufacturing industry is utilizing industrial design only partially in the form of aestheticization, and in a lesser scale in other aspects, the industry producing investment goods exploits design in full, using it to facilitate the realization of such elements as usability, ergonomics or functionality. Hence, the heavy machine´industry merely uses design to add further value to its products, whereas the production

of other investment goods exploits the "other" possibilities of industrial design in depth.

However, machine is not separated from other economy. When the importance of design is articulated in public in the context of consumer products, how does the machine industry define the relevance of design? The answer to this question is a mixture of stressing traditional hard values such as ergonomics with new values such as usability and marketing.

Industrial design is not an absolute value in machine, but merely seen as means of achieving the values, usability or other functional aspects. In addition, often the operators (end-users) are not aware or interested in the possible advantages a design. They are "not that much interested" whether a feature is actually designed or not, but are merely absorbed in the matter whether the product is practical enough. Furthermore, there are some operators that are less interested in design matters altogether, as long as the product fulfills the requirements for effective operation.

> Do your customers require design?

> No, not actually, our customers want to buy a good truck. Design comes from ergonomics and usability.

> Does the customer recognize a good-looking product is or not?

> It depends, beauty is in the eye of the beholder! Some are not attracted by certain products, however all customers accept functional and practical products. There are customers preferring more traditional-looking equipment, they want that a machine looks like a machine. For them this looks too futuristic. (Director, Customer Services, machine manufacturing industry)

However, this is not the whole picture. When publicity is considered (see Chapters 2 – 3 for publicity brought by Behrens for AEG), design is of course appreciated and welcomed, both in the producing companies and

among the operators. It is beneficial for the public image of the company, if the equipment are attractive and modern. This understandably enhances the company's image as a credible supplier. An investment good in the form of a machine with good overall design and impressive visual appearance or designed features also easily attracts potential customers at e.g. a trade fair.

> What our customers want is proper machine that fulfills their requirements in the manufacturing process. They are not necessarily willing to pay much for design, but as a whole, it does affect indeed. Of course, if technical requirements are in order, they take the design that is more attractive.

> However, we do not have the capacity to cut prices because of design. Design comes only after the proper engineering solutions. Design helps us to differentiate: when we have good and impressive machine it attracts customers at fairs to take a closer look. So designed machine can be an eye-catcher as well. Our worst competitors do not invest in design. We've been in the business with designed products for twelve years now, but our competitors have remained inactive. They aren't following us. When our competitor sees our machine, they probably think, it is complicated and expensive to manufacture, and these thoughts keep them from using design. As our rivals haven't reacted at all, design remains as a quite unique approach in this area of business. (Both quotations from the interview of a Managing director in the machine manufacturing industry)

> The importance of design has increased in the latter half of the nineties... We do not focus solely on functionality, but also on that the product looks good. Because of customers, and because of competition, industrial design has been progressing even in this industry... Design helps marketing. It is used – in a cold way – as a bait in marketing. (Marketing executive, machine manufacturing)

In one interview it was described how operators in a factory, proud of their new casting machine, were taking snapshots of the machine and presenting the photographs to friends in a pub. Even if this quotation is of anecdotal value, the more interesting point in the story is the evident added value design creates. As the interviewee said, similar, but ordinary looking machine was often "treated with a sledge hammer," whereas new, designed machine was a matter of pride to the operators. In other words, design had enhanced motivation, the professional pride of the operators and thus, apparently productivity.

> Customers have noticed (our design). For us, design has acted as means of differentiation from our rival companies. Afterwards we have received positive feedback from our customers: it appears that designed machine and equipment is treated better than standard machine. (Marketing manager, machine manufacturing industry)

While this accentuates a welcome progress in design knowledge in general, the overall effects are still minor. It is doubtful if this is anything else but using design in a machine as a flagship element to conceal the fact that the other products still would need to be re-designed.

> As most of the customers do not recognize design, they do not require design itself... but instead they want more comfort, ergonomic features, quality, in all: solutions where design can fix the problem. (Industrial Designer, machine manufacturing industry)

In all, a certain segment of the clientele in the machine industry are not conscious of design itself, but see the value of design in improved ergonomics, usability, publicity and marketing instead. The better usability, enhanced by design is percolated thru their own professional experience during operation of the machinery. In such case successful design, easing strain from work, remains otherwise "invisible."

Design Characteristics in the Medical Technology Industry

The machine manufacturing and medical high-technology equipment industries are similar when the overall philosophy of producing long-term investment goods is considered. Otherwise, the similarities are less easily defined.

> In the medical high-technology equipment industry, design is first of all harnessed to serve ergonomics, hygiene, usability, cost reduction in production, and life-cycle costs. This is understandable, as design is always applied in environments where the user needs of both patient and medical staff are specific. These impose stringent responsibilities on designers and manufacturers (Heskett 1989: 67).

It should be kept in mind that while the designed solution may incorporate aesthetics, in the design process plain aesthetical issues are treated only after the former issues have been considered. This merges the ways of understanding design in both medical technology with machine manufacturing industry.

> Design has not been a particularly important factor in this line of business. However, its importance is growing. In America and in Europe, people in hospitals have in no uncertain terms told that equipment should "look nice." One of our competitors has products that are popular because users say they "look cool," and even populistic, even though their measured performance on paper is not so great. (Chief engineer, Medical equipment)

> However, the customers are often hesitant to accept aesthetical design as an important factor. "It is said: It is all the same how they look like as long as they work well. And still, in practice all customers appreciate design." (Engineer, Medical technology manufacturing)

In the previous quotes our interviewee admitted styling-oriented design possibly affects the go/no go decisions. However, there is no distinct evidence on how much plain aesthetics in design affect any purchase decision in the medical technology, so it is difficult to determine if this really is the case. However, there are exceptions. Colors are nowadays considered more closely. For example, as we were told in one interview (in medical technology industry) the clientele has been more or less divided in two groups, those, who prefer more technical-looking equipment, and those, who prefer aesthetically pleasing units with only "few buttons." Especially female dentists are nowadays fashion-conscious, and prefer choosing attractive color combinations to their new dental unit. This is interesting, as the majority of all medical equipment have previously been painted or moulded in white, a color facilitating hygiene and symbolizing cleanness.

> In the past it was customary to discuss only what would be the utmost practical and functional environment in the dentist's clinic." Nowadays, the aesthetical side of design has gained more importance. "The dentist's room (clinic environment) should look clean and tidy in a fresh manner. All instruments should be designed to be compatible in this environment. (Industrial designer, consultancy)

Furthermore, the aesthetically pleasing appearance benefits the patient. The feeling of discomfort during some medical examinations (e.g. during dental care) can be reduced with a carefully designed, reassuring environment containing also aesthetically designed equipment. The quality of design enhances the patient-practitioner relationship. Furthermore, the excellence in ergonomic design mitigates the apprehension of patients, eases operation and thus helps to create an atmosphere of confidence. (Heskett 1989: 69) This kind of design requires consulting of professional personnel during the development stages to be succesful.

> Where usability, comfort, and effectiveness of operation are a major concern, operator/user feedback in the early stages of the development process is important information. Consulting the

> operators and gathering first-hand information of the pros and cons is essential. For example, when Philips was developing the MTCSS, Motorway Tunnel Control and Signalling System, a unit consisting of several control interfaces, the intended operators of the system were contacted early in the project to enhance the development process and avoid mistakes in the earliest possible stages. Furthermore, the project showed also the important role of industrial design in the user interface aspect. (Heskett 1989: 117)

While professionals are frequently consulted during the medical equipment design processes, the experience feedback from medical equipment operators should be considered important as well. However, there are problems. If the finished product functions well, feedback is apparently difficult to obtain. We were told that e.g. anesthesiologists are merely interested in the functions the equipment provides, while it is the end-users, for example nurses, who are interested how the actual design, overall usability, positioning of switches, regulators and displays is realized. A further complication to this is that various medical equipment, intensive care unit monitors, defibrillators, X-ray equipment and the like are operated by the nursing staff, while equipment acquisitions are decided in the health care managemental level, where all persons are perhaps not familiar with medical issues at all.

In the personal health care section design understandably matters more, as product marketing is supported with trends. Fashion aspects and attractive design are increasingly important to the consumers.

> We have to be discerning in order to make sure our products look good. The real challenge for design is to fit the required electronics inside the casing. People are quite critical when dealing with these products (wrist-worn heart rate monitors): previously these were merely seen as tools for training, but nowadays sports markets have changed altogether. Today sporting equip-

ment stores are constantly changing fashion outlets as well. We must be able to react." (Manager in marketing, consumer health care medical equipment manufacturing)

The imagery of wrist-worn heart rate monitors as tools to assist effective training has changed and these are more and more used as everyday objects. Many have substituted ordinary watches with their wrist-worn heart rate monitor. As it is with watches, also the monitors should make a perfect match with one's style. Hence, for the manufacturer, the importance of design increases substantially.

Conclusions

Due to the intensifying competition, improvements in both education and knowledge about design, and to the professionalization of the field, companies having operational activities then also began experimenting with design and employing consulting designers in larger scale in the 1980s and the 1990s.

In terms of DiMaggio and Powell's (1983) terminology, we find that before the 1990s, industrial design had gone a long way towards normative isomorphism. In some industries - mostly traditional arts and crafts industries - design had also become a means of competition: mimetic processes had been at work. In addition, there had been isolated policy efforts. The nineties saw increase in coercive isomorphism in several countries. Several industrialized countries have established design programmes (see Korvenmaa 2001), and have thus started to compete with each other with design. Simultaneously, new consumer industries have found that design is increasingly important for their customers. Today, all three types of isomorphic processes are at work simultaneously for the first time, pushing design into industry and policy agendas.

As this rough sketch shows, the importance of design has grown towards the new millennium because of several partly overlapping tendencies. However, there are industries in which tradition and prevailing economic

rationalities hamper design. In particular, there are industries in which customer perceptions are not driven by aesthetics and fashion, but by economic investment thinking. Still, even in these industries, design has gained a foothold, although stress is on skills such as ergonomics and usability design rather than on aesthetics. Also, some limitations to our conclusion stem from our research design. Ours was a benchmarking data, which means that our deductions apply only to the design-intensive end of the market. Should we study small and medium-sized companies (SMEs), our results would in all likelihood show more variation in the uses of design, and a generally low level of usage. In any case, our data shows that there is room for increasing the uses of industrial design in almost all industries.

Still, despite increasing education, the knowledge of the meaning of design and the position of industrial design especially in the Finnish machine-industry SME's is still quite unclear. The majority of machine-manufacturing companies in Finland are in the mid-size category, and in that area of business there are only relatively few examples to indicate how successful design can promote and develop business. Without good examples of good design to observe, these companies will continually remain the blind spot of design.

This affects and makes it difficult for the knowledge about design advantages to circulate. It effectively prevents the chances of successfully assuring the companies about the benefits design can bring into the business. Furthermore, if there is lack of knowledge about design it can also affect the investments made in design. However, if the position of design in the capital goods industries is vacillating, the overall situation is not this grim. In this chapter we have discussed how well-adopted design has been beneficial and used in various business patterns. But there are differences in the ways design is understood and valued in the respective industries. As industrial environments, capital goods production differs and, where design is used to enhance usability and safety factors and productivity, there are few indicators for plain aestheticization and styling.

Styling can be considered belonging to the superficial elements added only after designing the object has been benefited otherwise via design. We are not saying that reasonable and functional design should equal visually ugly semblance, on the contrary, but we suggest, that design has various forms of manifestation and these are accentuated differently, depending of the branch of industry and the products in question.

Chapter 10

Culture, Design and Business: Alessi on a Fine Line

By Tanja Kotro

In previous chapters, we have studied the use of design in two industries, manufacturing and medical equipment and health care. We have seen that with few exceptions, design does not play a major strategic role in them. We have explored those differences and suggested a series of explanations for them. The main finding is that the central role of design usually derives from close interactions of company management with designers.

What about when there is no doubt about the importance of design, design is seen as a central part of the strategy of the company, and it is seen in many ways as an end as such? How is design organized then?

This chapter provides some preliminary remarks on this issue with a case study of a renowned designer company. The Italian design and manufacturing company Alessi is a successful case in design management for its ability to time and again generate interest and to attract customers. Alessi is also an exceptional case compared to the Finnish design context because of its organization and the communication of design. In this article I analyze how the design organization works and discuss the understanding of design within Alessi.

Company in brief

Alessi's products are design products for the kitchen and table, the bathroom, office and house. The roots of their production are in the metal tableware manufacturing at Alessi's own factory in Crusinallo, about 100 kilometers north-west of Milan where their headquarters are located. Together with stainless steel products Alessi has since the beginning of 1990's designed and produced a range of plastic products that have become widely known. Their products are sold in Europe, USA, Japan and Australia in Alessi's own flag-ship shops, shop-in-shops and specialized shops for kitchenware and gifts. The company's turnover is 190 thousand million liras (year 1999) which is equivalent to about 120 million Euros.

Organization of Design

The Alessi company turned into a design factory in the 1950s, in the period of Carlo Alessi, the father of the present managing directors Alberto Alessi and Michele Alessi. Carlo Alessi was trained as an industrial designer and before taking the responsibility for the firm in the fifties he designed many of the company's products. As head of the technical department, Ettore Alessi, the brother of Carlo Alessi, started to collaborate with external designers in 1955, which enhanced the design identity of the technical department.

During the same period an important innovation occurred in the materials' and stainless steel began to replace brass and nickel silver. Stainless steel has since then been the basis for company's design and manufacturing competence. Fruit baskets and other stainless steel objects for hotel and catering and trade made in collaboration with architects Mazzeri, Massoni and Vitale commenced the design orientation of Alessi. The external designers of the 1950s were yet not as celebrated as in the Alessi brand nowadays. The first Alessi *maestro* was the famous Italian architect Ettore Sottsass, who designed trays and condiment sets for Alessi in 1972. Since then the Alessi brand has been associated with famous designers.

Alessi has no in-house designers. Alessandro Mendini has acted as a central design consultant for the company since 1979. Alessi directly employs around five hundred people who work within manufacturing, administration, sales, research and development. Office is the resource for different phases in the product development. It is divided into different sections as most companies, including a commercial department, communications, export, administration, finance, design assistance, and external production and purchasing direction.

Designers are accepted to design for Alessi. In most cases it is decided in the company that a new product within a category (for example coffee makers) will be launched. As it sometimes happens, for example in the case of the famous lemon squeezer by Philippe Starck, designers come up with a different object than was originally planned (according to the

story, Starck was asked to design a tray when he sketched the squeezer during a dinner in a restaurant). A product development process within the company can take from two to six years, which is a fairly long time compared for example to fashion business. New products, 250 items, are launched twice a year.

Alessi has produced objects by over two hundred designers. Most of the designers are world famous: Ettore Sottsass, Richard Sapper, Achille Castiglioni, Aldo Rossi, Michael Graves, Massimo Morozzi, Philippe Starck, Stefano Giovannoni, Guido Venturini, Enzo Mari and Alessandro Mendini.

Alessi has since 1970 enhanced its position as a company that combines design and mass production successfully. Alberto Alessi's role has since then been to be "responsible for encouraging and harnessing the vast body of talent... as catalyst and conductor for the orchestra of designer-performers" (Sweet 1998:9).' The ideas and explorations of designers are put before technical and economical restrictions.

The Design Philosophy – Business Based on Art and Poetry

Alessi's design ideology has been built on two poles: on the one hand through famous designers and on the other hand the key design concepts that link products across various categories. These concepts are stated philosophically: the aim is to discover the "panness" of the pan, the "oilcruetness" of the oil cruet and the "coffeepotness" of the coffee pot (Meneguzzo 1996, 29). The aims of a good design are set in enhancing the well-being of people by addressing their dreams, memories and sensorial experiences (Alessi 2000). In the company's design philosophy there exists the "SMI" parameter, which stands for "Sensoriality-Memory-Imagination" (Alessi 1993). The other parameters in the "formula of success are" (Sweet 1998: 11 – 12) price, function and communication.

Some of the business failures are considered important experiments: for example Philippe Starck's *Hot Bertaa*, a kettle that does not work properly.

These failures are turned into success in the way that shows where the fine line between art and business currently lies: it is somewhere between interesting new design and dysfunctional objects that no-one would buy. This is the theory of the borderline in Alessi (Sweet 1998: 11). The company has worked successfully within the fine line between art and business. In that sense Alessi is not a traditional manufacturing organization. Alberto Alessi's policy is that the company works as a mediator:

> Alessi is not a normal factory. I think it is an applied arts research laboratory. We have devised a unique system of harnessing the talent of the world's most interesting designers, we call them maestros, and encouraging them to make use of and stretch our technical expertise. We want them to push our knowledge to the extreme. Alessi's role is to mediate between the most interesting expressions of creativity of our times, and the dreams of the consumer. (Sweet 1998: 7)

Alessi's ideology is built on the idea of rethinking and redesigning daily objects. Alberto Alessi (2000: 19) himself explains his manifesto to be "offering the consuming masses veritable artistic items at low prices". Daily objects are designed in exceptional ways either so that the design is architectonic (stainless steel products) or so that the objects remind of cartoon characters and toys (plastic products). The articulated core of the policy is to reconcile industrial needs in terms of operations and products with the tendency to consider the company more as a 'research laboratory in the field of the applied arts' than an industry in the conventional sense (see e.g. http://www.alessi.com).

> During the 1990's the company rejuvenated its design policy partly by creating new product lines with young designers and new materials. Prompted by a number of consultants as well as by our own curiosity, we felt the urgent need for an operation that would attempt to balance the authoritativeness, expressive impact and culturalization of the projects developed for us by the "great masters" in the 1980s. This would be done by introducing a more empathic, affective and confidential note into our

catalogue. Of course, it was not my intention to stand in any way aloof from those designs of the '80s – indeed we are still working with great passion in that direction, which is central to Alessi's identity. Nor did I intend to look at any cost for novelty for novelty's sake. I simply wanted to make our catalogue a richer and more balanced thing. My intention therefore was to explore more explicitly and directly a number of expressive keys, such as play, memory and emotive involvement, that were in any case certainly already present, though in a more hidden form, in the works of those designers. (Alessi 1993, 32.)

Recently, Alessi has been related in the media more to plastic production than to steel that has for a long time been the company's core competence. This is partly because the media brings plastic products in are colorful and therefore eye-catching illustrations and partly because plastic products are comparatively inexpensive and their number of sale is relatively high. This however can be considered a problem for the company's image, since the company's stainless steel production is based partly on values contrary compared to the plastic production. Stainless steel is considered ecological because of its durability while plastic is considered disposable material. Design of the stainless steel products is of high-culture tradition while plastic products have their roots and reference in popular culture. To hold the different categories and associations of the brand together is indeed the current challenge for Alessi design as well as communication. In the next section I analyze how the Alessi brand has been created, what are the key elements and continuities of the brand that hold "Alessi" together.

How "Alessi" is Created – Conceptualization and Communication of Design

Not only products themselves communicate design concepts. Product categories and names enhance the general idea of design. The company's production usede to be divided into four sub-units. 1) Mass produced industrial products made of stainless steel and plastic were marketed un-

der the label 'Alessi'. 2) 'Officina Alessi' referrred to research and experimentation and products that are made of metal, stainless steel and precious metals. 3) 'Twergi' covered wooden products and 4) 'Tendenze' porcelain and glass products.

A new product classification was introduced in the year 1999 when all the products were produced under the name 'Alessi'. The major classification groups are now 1) The Years 50 – 60, 2) Authors' Families (e.g. Sottsass, Castiglioni, Graves etc.), 3) The Other Authors (eg. Arad, Morrison, Newson etc.), 4) Historical Re-edition 5) Family Follows Fiction and 6) Memory Containers. These categorizations appear e.g. in The Dream Factory, a review of the company's history and production by Alberto Alessi.

Alessi has created an ideology of design that is expressed consistently in every medium of communication from books to package cavaliers (the leaflets that support objects in packages). Members of the organization respect and share the definitions of the company policy that originate from stories of the past and are enhanced through the charisma of its current leaders.

I would argue that together with the products themselves the main elements which constitute what "Alessi" is, are therefore the designers, *maestros*, history (tradition), family and the character of Alberto Alessi. These elements are consciously and constantly communicated in products, books and in shops that sell the company's products.

Their marketing strategy is interesting. Alessi has a reasonable amount of advertisements in design and architecture magazines as well as in travellers' magazines, for example airlines magazines. What is notable is that advertising is not the main function of communication. Instead of that Alessi products attract a lot of publicity in life style magazines columns. Alessi gives away a lot of material on new products and their own publications are made to high quality standards. Launching new products is news for the design and architecture scenes as well as it is news for consumers.

The Italian Tradition – History, Family and *maestros*

History is told and retold in the same manner in different occasions: in books and in interviews and seminars. History is a story, which builds the identity and culture of the company members and consequently communicates company values to the public.

The company was founded 1921 by Giovanni Alessi. During the nineteen-twenties and thirties copper, brass, and nickel silver tableware, and household objects were the main products.

> Grandpa Giovanni was a talented sheet-metal worker. In 1921 he bought a plot of land at Omegna and founded Alessi. He started handmaking objects for the table and for the home in copper, brass, and nickel silver, which were then either nickel-, chrome- or silver-plated. Grandpa was a real stickler for quality and for work well done: the things he made quickly won acclaim for their workmanship and perfect finish. (Alessi 2000:8.)

One of the central characters of the company is early history as well as of the start for design-orientation in the company history, was Carlo Alessi, Giovanni Alessi's eldest son who was trained as industrial designer. He designed the majority of new products from the mid-thirties up until the mid 1940s. In the fifties, he became Chief Executive of the company and together with his brother Ettore he began to call in free-lance designers. During the war years Alessi produced stars for uniforms and mechanical parts for aeroplanes. After the war, Alessi's mass production was enhanced, partly because of the demand for brass ladles for the U.S. army and hence the decision to double the number of machine tools. In the Year 1970 Alberto Alessi, Carlo Alessi's eldest son was given responsibility for design management. His brother Michele – nowadays managing director together with Alberto – and the third brother Alessio Alessi, is the commercial director. Their cousin Stefano Alessi also works in the company as the chief of the department for external production and purchasing direction.

The company's history is a history of a family. This should be understood as part of the Italian cultural context where family bonds have been and still remains close and important (Kicherer 1990: 77; see also the case of Olivetti in this report).

Along with the family and the managing directors, great emphasis is placed on the designers who are brought to the front in the production as well in the public material:

> "I prefer... to work with the most cultivated, experimental – and let's face it – perhaps the most difficult designers. Nevertheless, on analyzing the story of Alessi designs, I must admit that our best quality designs have also been the ones most appreciated by the public, that have been understood and welcomed by largest numbers of people."(Alessi 1993:34)

There is a mutual respect between the company management, especially Alberto Alessi, and the designers. As the French designer Philippe Starck (1989), one of the most successful designers who has worked with Alessi, describes, the cooperation is dependent on the character of Alberto Alessi:

> Je ne travaille pas avec Alessi, je travaille avec Alberto Alessi. Je ne travaille pas avec des sociétes, je travaille avec des humains. Seul le fait de jouer au projet m'intéresse et le résultat n'est qu'accessoire. Alberto Alessi est un grand joueur et cela me suffit.

> I do not work with Alessi, but with Alberto Alessi. I do not work with a company, I work with humans. The only thing that interests me in a project is to take part in it, not the result. Alberto Alessi is a great gambler and that is enough for me. (-TK)

Alessi relies on the designers' capacity to tell stories through in the products, to give something that customers want. In this sense Alessi is a traditional company offering products to markets. But it has also been visionary with the conception of role of the designer. The ideas that have

been trendy in business books around the turn of the century were present ten years earlier in the design policy of the company. The creative author telling stories appealing to memories and feelings were the findings among business consultants all over the world, but they are also the main themes in Alessi publications from the early 1990's.

Alberto Alessi's visions both inside and outside the organization hold the Alessi brand together for their part. Alberto Alessi is a design manager *an sich* even though he is trained as a lawyer. His interest is in the same subjects and texts that are discussed within universities in semiotics, philosophy, sociology and organizational studies. His texts continuously aim to discuss the socio-cultural contexts of the company's production and the philosophy behind the objects. Brand-wise the problem with this is again the communication of abstract and intangible elements of the company. Some of the intended meanings are communicated to the public by products themselves, and the character of Alberto Alessi. However, a very marginal public is familiar with the texts and books published by the company or Centro Studi Alessi. The company has tried to articulate diverse standpoints in production through launching experimental projects, the metaprojects, through which new products have been developed and marketed.

Other Strategies for Articulating Design Policy – The Metaproject

An important mediator of the Alessi identity and philosophy have been the metaprojects. These are implemented for the most part through the Centro Studi Alessi, The Alessi Research center. Centro Studi Alessi, Family Follows Fiction (F.F.F.) and a project called 100% Make Up have maintained, reformulated and communicated the Alessi corporate brand identity.

Centro Studi Alessi, The Alessi Research Center, was established in 1990. Nowadays the actual Center does not exist anymore, but the director of the Center still works as a consultant for the company.

The main purposes of the Center were to publish theoretical papers on topics that are connected with objects and to coordinate collaboration with young designers, who approach the company with new design ideas. The Center was run by Laura Polinoro, with her background in semiotics and sociology. The research center explored questions similar to questions often raised among culture studies: *What is the role of an object? What is it that changes its form, in the perception we have of it and in its use? How does an object become a cultural subject?* (Polinoro 1991: 12) The activity of cultural research is not easily communicated to wider audience. However it seems to be an important resource for the Alessi identity within the firm, and is clearly expressed in the interviews with company members who referred to the interest of Alessi to do research not only on materials but also on the semantic and poetic aspects of products. Even though the Centro Studi Alessi does not physically exist any more, the ideas developed together with managers and the center still live within the company through publications and the consultant role of the former director of Centro Studi Alessi.

Workshops organized by the research center had the main function of communicating with young designers. Workshops have been held with students in numerous countries, including Finland.

Memory Containers was another metaproject coordinated by Centro Studi Alessi. The idea was to bring women designers to the male tradition of design at Alessi. 200 young women designers from different countries were asked to design objects and the aim of the project was to answer the questions such as how objects change when they are moved from one culture into another and how an object becomes cultural. "This was an exploration into the archetypes of presentation and the 'offering' of food and its rituals, with inspiration coming from the memory of a culture or a personal experience" (Alessi 2000: 104).

Metaprojects are not always directed at changing or adding new ideas to production, as was the case of the metaproject Family Follows Fiction that started plastic production in the beginning of 1990's. One metaproject that did not have clear connection to production was 100% Make Up,

which clearly articulates the role of the designers as artists within Alessi. One hundred "authors" were asked to decorate identically shaped vases and these vases with the signatures of the designers are presented in the showroom of the head office communicating the art and the author behind the business.

These projects can be considered cultural activities that have enhanced and rejuvenated the design policy of the company through research of cultural phenomena and theoretical approach and through working with young design students from different cultures. Metaprojects have therefore been important for the reflexivity and also cultural responsiveness of the Alessi organization. Metaprojects have had their effect on manufacturing as they started for their part new product categories that still form a great share of Alessi's production.

Art and Business – Together with Markets

However, the communication of "Alessi" is not a one way process from the designers through the company to the consumers. What I therefore wish to argue here, is that the thorough knowledge of different cultural landscapes and responsiveness to changing environments has been the cornerstone for the company's success. The term cultural landscape of a product refers here to the totality of cultural interpretations and meanings that are related to a specific product and the tradition that it comes from (see Kotro & Pantzar 2001).

Alessi succeeds in binding art and business because it is done in a clever and credible manner. Under one brand there are at least three attracting cultural landscapes that are well understood by the company. First there is the Italian tradition of handwork and taste appealing to customers which appreciate the value of the product both in the material and semantic sense. These customers purchase Alessi products because they are familiar with and appreciate Italian culture and Alessi represents continuity of tradition and high culture. A sip of espresso made with Aldo Rossi's *La Cupola* stands for the wondrous landscape of Italian Alps and

the traditional Italian kitchen. These customers can afford to buy the most expensive Alessi products, cutlery, pots and pans made of stainless steel. They value the exceptional aesthetics, cultural specifity and the durability of the products.

At the other end of customers are those who do not know so much about Alessi but who sometimes buy objects of the *Family Follows Fiction* collection because the products are colourful and funny. They agree to pay the price that is asked for *Firebird,* Venturini's lighter for gas stoves or for Giovannoni's *Merdolino* lavatory brush made to look like a flower because these objects are usually bought as gifts.

Between these two ends are the "design victims". They are familiar with the names and products of Alessi designers and they buy both stainless steel products as well as plastic ones – depending on their current money situation. For themselves they buy maybe one or two of the more expensive Alessi kitchen ware, maybe Achille Castiglioni's *Oil and vinegar cruet*, but for a stylish little present they buy Alessandro Mendini's *Anna G.*, the colourful doll-shaped corkscrew.

Even though marketing and communication is arranged in the Alessi organization in the manner that is common in business organizations in the industry, it is an interesting exception as a company in which design is the heart and soul of the business. In a market analysis for example, not only business factors are tested. The feelings about a new product are inquired within the company from those employees that have not taken part in the product development process in question.

> An object could be awarded one of five grades, from 'out' (for the obsolete or kitsch) to 'illuminating' (for products with cult status). A further two components were added: price and function. Some items might score well as sensual communication tools and perform less well on price and function. (Sweet 1998: 12).

Design policy and corporate image are thus embedded within all activities of the company rather than having a separate department dealing with corporate image. The designers are different from each other and the designs vary but what holds everything together is the Alessi brand as a sign and a story arousing associations. It is interesting to see how Alessi will develop its policy concerning the diversity of these associations discussed above.

Conclusion and Discussion

In many ways, Alessi is a parallel case to Olivetti (Kitcherer 1990; see Chapters 2 and 3 in this report). Family, family history and the Italian tradition of manufacturing form an important frame for the corporate identity and image. This crystallizes in figures like Adriano Olivetti and Alberto Alessi, whose interaction with the designers can be considered to be a basis for credible and continuing design activity.

Continuity of design is what is characteristic for Alessi. Design activity is not restricted to a department of design within the company, but it is rather a ubiquitous set of parameters that are considered to be important in the different phases of the product development and manufacturing.

Continuity comes from the history. In the case of Alessi this means three generations and over half a century of family business to become a leading design company. As we have seen here, Alessi did not start as a design oriented company in the sense that we understand design nowadays. It started as a manufacturer of coffee pots and trays of good quality. Carlo Alessi, the son of the founder, was the first designer in the sense that he had training as an industrial designer and designed tea and coffee sets that are still in production today. External designers were introduced to Alessi in the 1950s when Ettore Alessi was the head of the technical department and started collaboration with some of the interesting architects of that time. During the 1970s the role of external designers grew:

Franco Sargiani and Eija Helander were the first designers that Alberto Alessi brought into the firm. And after that came the world leading designers and architects to design for Alessi.

Cultural values and activities have continued within Alessi. The sense for cultural shifts and changes has been part of the success. Early 1990s Alessi rejuvenated itself by launching new product lines coordinated by Centro Studi Alessi – a good example of the reflexivity and responsiveness of the company management and culture. This is explicable through the role of Alberto Alessi who is reflexive towards Alessi's development and has a delicate sense for cultural developments as well as ability to accomplish change. This together with the designs by the world leading *maestro's* has lead to a situation were designers and manufacturers the world over follow and sometimes copy Alessi's products.

In many ways, Olivetti under Adriano Olivetti and Alessi of today are parallel cases in this report. They together are exceptional compared to other companies described here in two ways. First of all, they are design-intensive, and have managed to combine large scale manufacturing with an exceptional quality of design. Secondly, both have a decentralized design organization, which distinguishes them from companies such as Philips, in which design is integrated into company activities by explicit organizational arrangements. In contrast, design at Olivetti and Alessi is based on close personal contacts of management with desigers and other creative professions. This provides designers an edge in production in competition for power with other professions: their visions are given a chance to structure the frame that defines the direction of the company. Alessi provides an important example of the way that design can be embedded in the organization not as an external activity but rather as a ubiquitous philosophy.

Chapter 11

Results, Conclusions and Policy Implications

**Assisted by
Pekka Korvenmaa**

This book has been a study on how design is organized in Finnish companies. To that end, it has sough benchmarks from literature as well as from a set of international comparison cases. We have studied two industries: machinery and medical equipment (and health care technology). In addition, we have studied a set of companies from consumer electronics, and two designer-led firms.

As we have seen in this study, organizations can both enhance and interfere with design. As one of the creative professions, designers can be important cultural innovators who translate cultural values into products, be these material or immaterial, and thus enrich our lives. They are among those actors who are able to see and formulate culture into design proposals through visualizations, sketches, renderings, and models, among other things (see Gedenryd 1998; Henderson 1999). At best, they may be cultural innovators who creatively interpret events in their surroundings, and articulate these interpretations in products and the way in which we use products (see Kelley 2001).

Of course, several types of knowledge and culture are involved in this process. At one extreme, designers utilize skills from applied sciences such as ergonomics, software ergonomics, and psychology and sociology (see Korhonen 2000). In particular, this is the case in technology-intensive industries, while working in business-to-business areas this role is less important. In the case of design management, these disciplines include marketing research and other disciplines in business economics. In consumer product manufacturing, designers often draw on a wide variety of sources, ranging from popular culture to street fashions, not just the art world. Finally, in some cases, the line design and the art world is fine. This is especially the case with star designers' compositions. Take the case of Alessi's *Tea and coffee piazzas*, where Alessi commissioned eleven designers to produce tea and coffee sets. Only 99 editions of each of these supremely designed and crafted sets were produced. These sets were launched in galleries in New York and Milan simultaneously in 1983 at the staggering price of £12,000 per set. Products such as these are

made for but a small minority of consumers; in this, they function in essence like art, even though these objects do have a function. This function, however, is secondary to the symbolics embedded in the product.

Design, then, is one of the creative professions. How is design organized as an activity in companies so that designers are able to articulate their understanding of applied science, art and culture in products that inhabit our material culture?

Benchmarking Design: The Main Results of the Study

For benchmarking purposes, we have developed a model of strategic design. This stratification model of design, developed in Chapter 2, displays design as a process consisting of at least three types of activities: product design, concept design, and strategic design. Our interest has been in how design is organized in companies, and our main hypothesis has been that at the more advanced end, design works at these three levels simultaneously. We have assumed that only if design affects the strategic level in companies, it can affect the main framing processes of organizations, and designers are able to control their conceptual and product design environments.

Chapter 2 elaborated this notion of design, and showed that it is possible for design to be a strategic activity even if it is largely a tacit process rather than an explicit company policy. Design can consist of a network, which is coordinated by individual designers, and still be strategic. Based on historical literature, Chapter 3 elaborated the process through which designers may become key players in company framing. The main result that arose from this examination was that the fate of design centrally depends on its relationship with the management, and the way in which designers seize the opportunities created by the management.

Against this model, the main result of this study can be stated in a simple way. Design is a strategic activity in a few companies only. In our data, it seems that design is involved in strategic framing processes mainly in

consumer products such as Sony and Nokia. In these companies, designers work at many fronts simultaneously: they improve the usability and ergonomics of products, and their skills in the artistic side of products gives them an edge over other professions. Making design as one of the activities in strategy framing is a strategic decision, though: in some consumer product companies, design is not among the strategy-formulating processes, and thus not among those activities that provide decision premises for the company. For example, this is the case at Polar Electro, a sports equipment manufacturer. On the other hand, there are companies that work on investment goods in which design is a strategic activity, as the cases of Valmet and Crown Equipment show.

What characterizes all these companies in which design is a strategic activity is that in these firms, designers continuously interact with top management of the company. It is with and through top management that design becomes influential in the framing processes of these companies. Also, a few other reasons are typically involved.

- In particular, design has had important and powerful sponsors in the company. Typically, these sponsors have been owners, the CEO, or a powerful engineer who has been interacting with designers earlier in his career.
- Also, design has established itself into the company way of thinking over a long time that typically extends over several decades. Even when a company starts to develop a design orientation, it takes a long time to get it integrated into strategic processes.

 Interestingly, and this is well in line with the literature on the new economy, companies in which design is strategically important have internalized design into their organization. Some companies have done so, as the cases of Philips, Nokia, and Crown Equipment show. Even in these companies, the services of design consultancies are utilized for various reasons in varying circumstances.

However, in a few other cases, design is largely a networked, or even outsourced activity, and still can be strategically important. In particular,

this is the case with Alessi and Woodnotes, which are designer-led companies. Two large corporations, he paper machine manufacturer Valmet and Olivetti also have a network-based design organization. We did not get enough detail to evaluate the economic reasons for this organizational solution. However, there seem to be design-specific reasons for this model. In the case of Olivetti, a network model of design made it possible for designers to pursue their cultural interests in the Milan art world while still working for Olivetti. Also, the case of Valmet illustrates another kind of logic. Valmet can externalize its design to a large extent for a simple reason: it relies on a sophisticated and very expensive digital design technology. Consultancies that are able and willing to update their technology so that it is on par with Valmet, place their stakes on working with Valmet for a long time in the future. In such situations, investments bind the company and consultancy together, and create a trust relationship between them. What other issues there may be were not revealed in this analysis.

There are interesting variations in the ways in which design is organized in companies. Some companies have built an in-house design organization that improves the position of design in several ways (esp. Philips). It helps to pool resources for design, communicate the importance of design, and its mere existence makes it possible to develop organizational processes in which design is a part. However, these kinds of organizations are rare. As we have repeatedly noted, in most of our cases, design works as a network rather than an in-house organization (esp. Olivetti). In both cases, top management support is more essential for the increasingly important role of design than the form of the organization. Also, in both cases, there are means for maintaining design consciousness in the company. Typically, internal publicity maintains the idea of excellence and the importance of design through internal newsletters and other means of communication.

Alessi provides an interesting variant of the traditional network model of design. Alessi organizes its design activities not only trough projects and continuous development, but also trough "metaprojects" aimed at producing new ideas and concepts. These concepts sometimes lead to fur-

ther development. Sometimes, they are just published in books that circulate internally. Apparently, Alessi has innovated here. Perhaps a part of Alessi's success is based on a systematic method of thinking products anew.

Interestingly, the way in which design evolves into a prominent role in companies (see Chapters 6 and 7) displays characteristics typical to innovations generally as well. The notion that design typically has almost coincidental roots fits well to what Miettinen et al. (1999) have argued in another context for technical innovations. These typically emerge from almost coincidental interactions and surprising combinations. Success changes the way design is understood from being an artistic activity to a more comprehensive understanding of the skills of designers. However, in every company in which design has become a central framing activity, it has been powerful members of the management that have been involved in these early interactions. Their support has given the new activity a chance, which has been utilized by designers, who have gradually been able to extend their influence to framing activities. It is the interplay of management and the profession that produces the momentum design needs to be recognized.

Finally, our final research question explored the differences between industries. Generally speaking, the basic hypothesis concerning the relative importance of design in various industries is valid: in consumer product manufacturing, design is more important than in business-to-business production (see Chapter 8). More interestingly, the skills required from designers vary according to the industry.

- In machine and process industries, design largely consists of product design peppered with conceptual and research skills in ergonomics and usability research.
- In medical equipment, where products interact with a dyad of lay customers and professionals, design is more important and conceptual in nature. Key skills in this area include not just those skills typical to design in machinery, but also skills in designing the appearance of products.

- Finally, in consumer products, designers' skills are increasingly more complex. In addition to product design skills, they need skills in ergonomics and usability, aesthetics and other cultural aspects of products and, increasingly, future studies.

In all advanced companies, designers not only work in product design, or even in new product development, although this is their primary area. They also work on a variety of design management tasks such as graphics, packaging, logos, typefaces. In current parlance, these activities are collected underneath the rubric "design management" (see Poikolainen et al. 1994). As we have seen, in some historical cases (AEG and Behrens; Olivetti under Adriano Olivetti's early reign), designers' skills are called even more widely for building and interior design, and for devising plans for streets, yards, and even city neighborhoods.

Finally, an obvious exception to this scheme is design in design-intensive industries (Chapter 10). In these industries, some companies compete not so much with functionality, but with pure design. In particular, customers may be design-conscious, and judge new products not just in terms of the qualities of products, but also in terms of design. This seems to be the case in some consumer products such as mobile phones and - perhaps - cars. Design is an indispensable part of production, which resembles fashion in its social form. In extreme cases wild, playful, and fantasy-like images and materials in existing design products can become a source of new design, which comments upon existing design. In this Baudrillardian world, design comments on other designs, and designers as well as customers (and other professionals) play an integral part in this reflexive game. Design may even become a pure activity, done for the sake of design only.

Policy Implications –
The Present Condition in the National Design Policy

The essential document of the Finnish national design policy, Muotoilu 2005! – called Design2005! Government Decision-in-Principle on Finn-

ish Design Policy in English, was approved by the government 15.6.2000. This principal document was fortified in Fall 2000 when a treaty of intention to make the document operative was signed by representatives from Ministry of Education and Ministry of Trade and Commerce together with representatives from the main organisation of the industry, Teollisuus ja Työnantajat TT (The Confederation of Finnish Industry and Employers). Today, in the world scale, Finland has one of the most far-reaching and consensus-based design policies. In comparison with similar efforts in eg. Denmark and Sweden the Finnish policy is unique in stressing the industry as a driving force behind the furthering of industrial design – although the public sector is seen as a vital client for design services, too. Globally taken perhaps only some Far East countries such as Korea have in a similar manner amplified the role of design in industry and international economic competition.

This point has been reached successively through goal-driven efforts sponsored by several actors. These are SITRA, the educational sector at the University of Art and Design as the main player, together with the government, the leaders of industry with their major spokesmen and at this stage also Tekes (the National Technology Agency) and the Academy of Finland.

SITRA took in 1996 design into consideration as one element of national excellence and as a part of the national innovation system. After an informal discussion forum SITRA financed a survey on the condition and future challenges of Finnish design in1997 – 98. The two-volume report Muotoiltu Etu I – II (The Designed Advantage) was launched in Fall 1998 and gained wide media coverage and became topical reading for the design community and its partners. The timing was right – also regarding the role of the state. The government set up their own working group to formalise the national design policy paper basically on the ground set up by the SITRA report. In conjunction with the Design 2005! report a Round Table of Design was initiated as forum for discussion and innovation incubation consisting of major actors of the design context, both public and private.

National policy papers issued by the government are not often very successful in becoming strategic tools, let alone operative. The design policy appears to be an exception. At this stage Tekes has already made the decision of funding a R&D programme in design 2002 – 2005. The Academy of Finland has a national, multidisciplinary research program in design for 2002 – 2005 on its agenda; the final decisions of launching the program will be made Spring 2001. Tekes and the Academy work collaboratively in shaping these programs which also is a feature worth of interest. So far not a single Western country has made similar plans for the furthering of the knowledge base of design through r&d and research.

In Winter 2001 we are in a situation where the national framework for furthering design also in industry is in existence. The main actors are basically aware of their respective roles. The Ministries of Education and Trade and Commerce are informed and have directed responsibilities to respective departments and officials. The industry voices its opinion via the Round Table as well as through the Design Forum Finland, the main state-sponsored organ for promoting Finnish industrial design and the companies using it. A network of regional centers of design education, knowledge-base and promotion is active and is currently joining the operationalisation of the national agenda. The last action of national importance has been establishing of Designium – The New Centre of Innovation in Design at University of Art and Design in Fall 2000. Designium acts as a portal for design innovation transfer to industry not only regarding the university but also in co-operation with other actors including the regional centers.

Following from the previous we can state that many of the issues that engendered the inclusion of design into SITRA's innovation research program have been if not resolved but at least included in a national framework of policy and decision-making. But some utmostly vital areas regarding future policies remain to solved.

Areas in Need of Immediate Development

In terms of the immediate near future, the promotion of design requires several actions from a few main actors, both from the public and the private sector. The conceptual background for the following recommendations is based on the notion of strategic design outlined in Chapter 2.

- Design does not work in the industry on a strategic level up to its full potential
- Finnish design consultancies do not operate in a mode vital for present conditions regarding domestic need or international competition. Their capital of expertise does not generally exceed the limits of the design work itself – that often of high level – and thus their service palette is limited. Their economic structure is weak and cash flow less than could be expected in comparison with the value they create for their customers.
- Design consultancies are not international actors – thus vulnerable for external competition.
- The leading design consultancies have reached the limits of their growth on the traditional basis of the services they offer – to reach the next stage certain interventions and external investment may be needed. If this is not done also the Finnish industry remains without a deeper, strategic design expertise they need in their development and international competition. Or, they buy it from abroad.
- The division of responsibilities on the national scale has to sharpened even further. In a small country we can not waste any expertise, allow overlaps or tolerate gaps.
- Research into the nature and uses of design has to grow in order to generate a research-driven, knowledge-accumulating design practice both in the industry and in the consultancies.

Finally, design education has to be even to a higher degree than now organized cost-effectively, regionally and content-wise in a manner which

produces professionals mastering all levels of design skills from the technical to the strategic-conceptual. If only conceptual skills are emphasized nation-wide a loss is felt on the technical sector and vice versa: the MA education in design has give future professionals tools for complex, broadscale problem solving.

Implications for the Role of SITRA in Developing Finnish Industrial Design.

SITRA could use the financial instruments in their possession to help Finnish design consultancies in their efforts to reach a new stage and scope of operations. This may include launching an internal mode of operation but certainly the development of knowledge and expertise capital of the consultancies. This means the inclusion of knowledge areas into their operations already at work within their international competitors.

From point a follows that SITRA now has a possibility to continue its ground-breaking role as the developer of Finnish design by launching a project where the knowledge-capital of Finnish design comes under scrutiny. The overwhelmingly tacit knowledge embedded in design has to be explicated and new, research-based areas brought in. This knowledge and expertise has to be made a strategic tool in the business of design consultancies. Because of the small inner market of Finland it may be hard to use the international model of outsourcing the knowledge-creation to specialised consultancies. Instead, a portal may be created serving the business as whole.

In general, SITRA could strenghten the role it already has given design in projects such as Divan and Taitotieto. Small, design-driven SMEs might be a target area for engendering return to design investment in the precarious stage of establishing these enterprises.

Appendix 1.

QUESTIONNAIRE FOR THE COMPANY

1. PERSONAL BACKGROUND
- Could you briefly describe your training and professional background?
- How are you involved with the design?

2. DESIGN IN THE COMPANY
a) What is the design history of your company?
b) The role of design in the company
- Which processes are the designers involved in? (Product development, research, marketing, advertising, leadership…)
- How is the design process organized?
c) Does the company have a design policy?
d) How are the designers involved in the decision making process in the company?
- Which professional categories are the designers mostly involved with? Who else?
- Is the voice of the designer heard in the organization? How are the relationships between the different professional categories within the organization?
e) What kind of special skills can the designers bring into the company?
f) Is the company willing to invest in design, e.g. in the form of new equipment, expositions, communications, IT, participation in the design competitions etc.?

3. ORGANISATIONAL CONTEXT
a) What is the organizational structure of the company (hierarchical, informal, matrix, network…)?
b) Is the role of design accentuated in the company documentation and symbols (legends, advertising and such…)?
c) *Design Management* –wise, does the designer participate in the overall communication of the company or coordinate the different design and company image related functions?

4. USE OF CONSULTANTS
- Does the company use design consultants?
- For what kind of reasons does the company use the services of an outside consultant rather than an in-house designer?

5. NETWORKING

- In your view, do the designers combine expertise within the company in a way that other professional groups cannot? Which kind of expertise?

- For example do the designers bring any other particular expertise from the outside of the company? What kinds of networks if any do they bring into the company?

6. AREA OF BUSINESS

- Is the design an important competitive advantage in the field of business of the company?

- Do the customers require the design?

- Do the economical cycles have an influence in the investments made in the design? Fluctuations according to high/ low season? How to balance the fluctuations?

7. COMPETITORS AND DESIGN

- Which companies are the major competitors of your company? And design-wise?

- Do your competitors invest in design, how? E.g. functionality, ergonomics, impressive visual design, other…

- Has the company had to change its tactics due to the design of the competitors?

- Which company is the market leader design-wise in your field of business?

8. CLOSING

- How could we get some additional information concerning the design in the company?

- Who would you recommend for further interviews? E.g. are there in product development any key-persons that we should interview?

Appendix 2.

QUESTIONNAIRE FOR DESIGNERS AND CONSULTANTS

9. PERSONAL BACKGROUND
- Could you briefly describe your training and professional background?
- What kind of companies have you worked for? Do you have some other experience from the fields which interest us (high technology medical equipment/ metal manufacturing/ process technology)?

10. RELATIONSHIP TO THE CUSTOMER
a) Could you briefly describe your relationship to the Client Company?
b) Does the company have a design policy? What is your evaluation of it?
c) The role of design in the company:
- Which processes are the designers involved in? (Product development, research, marketing, advertising, leadership…)
- How is the design process organized?
e) Decision process
- Which professional categories are the designers mostly involved with? Who else?
- Is the voice of the designer heard in the organization? How are the relationships between the different professional categories within the organization?
f) What kind of special skills can the designers bring into the company?
g) Is the client company willing to invest in design, e.g. in the form of new equipment, expositions, communications, IT etc.?
h) What factors are considered in the account? How do you influence in the outcome of the account?

11. ORGANISATIONAL CONTEXT
d) What is the organizational structure of the client company (hierarchical, informal, network…)? Does the organizational structure facilitate your work or make it more difficult?
e) Is the role of design accentuated in the company documentation and symbols (legends, advertising and such…)?
f) *Design Management* –wise, does the designer participate in the overall communication of the company or coordinate the different design and company image related functions?

12. USE OF CONSULTANTS

- For what kind of reasons do the companies use the services of an outside consultant rather than hire an in-house designer?

13. NETWORKING

- In your view, do the designers combine expertise within the company in a way that other professional groups cannot? Which kind of expertise? What kinds of networks if any do you bring into the company?

14. AREA OF BUSINESS

- Is the design an important competitive advantage in the field of business of your client?
- Do the customers require the design?
- Do the economical cycles have an influence in the investments made in the design? Fluctuations according to high/ low season?

15. COMPETITORS AND DESIGN

- Which companies are the major competitors of your client company design-wise?
- How? E.g. functionality, ergonomics, impressive visual design, other…
- How do you take into account the design of your client's competitors in your own work?
- Which company is the market leader design-wise in the field of business of your client?

16. CONCLUSION

- How could we get some additional information concerning the design in your client company?

Who would you recommend for further interviews?

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