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Managing Design and Designers for Strategic Renewal¹

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Managing Design and Designers for Strategic Renewal

Abstract

In this article, we propose a framework for understanding how design and designers may contribute to strategic renewal in producers of traditional and hi-tech consumer durables. Building on a study of outstanding innovators in product design, we describe design-driven renewal as a four-phase process stimulated and supported by design, combining continuous product innovation with the periodic revision of the strategic course of the company. For each phase, we discuss the specific role of managers and the most common pitfalls that arise from poor management of the process.

“The Domestic Appliances division of Philips is a good example of a business that has made innovation through design part of its day-to-day practice (Laura Taylor, Philips Design).”

Introduction

In 1994, giant conglomerate Philips forged a partnership with Italian kitchenware producer Alessi to jointly develop a range of small appliances. The new products – a fruit-juice squeezer, a kettle, a toaster and a coffee machine – pioneered a new trend in the design of home appliances, based on soft rounded lines, pastel colours, and velvet textured finishes. Natural shapes and imaginative names helped new products appeal to emerging needs for affection and domesticity in the consumers’ relationship with the machines. These products soon became design icons, positioning Philips as a design leader in home appliances. According to Stefano Marzano, chief design manager at Philips, the Philips-Alessi line did not merely indicate a new style direction, but reflected an innovative approach to the exploration of consumers’ latent needs and to the use of technology in consumer products, triggering a change in the way managers at Philips looked at design. During the eighties, under the leadership of former design manager Robert Blaich, design was considered primarily as a competitive tool to increase the commercial appeal of new products. Later, Marzano’s work emphasized the potential role of design in driving brand repositioning and inspiring strategy formulation.

Philips is not a unique case. In the last decade, scholars have documented the rising centrality of design and designers in large corporations and small firms, and observed how competitors in different industries have built or reinforced excellent competitive positions through renewed attention to product design¹. Bold, innovative, lifestyle-oriented product design, for instance, played a substantial part in the rise of Nokia and Sony among the most valuable global brands, and in the revitalisation of high-tech brands like Philips and Apple. Even relatively small competitors like Alessi, audio-video producer Bang & Olufsen and furniture-maker Kartell carved out profitable niche positions thanks to the relentless exploration of new conceptual and formal solutions.

In part, the increasing relevance of design may be explained by the increasing role of culture and lifestyles in affecting consumers’ decisions². Clothing, transportation, food and beverages, home furnishings, personal accessories, and even consumer electronics and sports have become means for expressing cultural meanings and signalling social identity³. As the changing patterns of consumption increasingly shift the field of competition, even companies that used to compete primarily on price

or technological performance are increasingly facing the need to develop products that are not just efficient or reliable, but also responsive to emerging lifestyles and cultural values⁴.

Since the mid nineties, we have studied cases of success, failure, decline and renewal (or, occasionally, the other way around) in traditional and high-tech consumer goods industries, in which substantial changes in product design promoted or supported changes in the strategic course of the company (see table 1, and Appendix A for a summary of our methodology). In this article, we build on findings from our study to develop a conceptual framework for understanding how managers may harness the contribution of design and designers along the process of strategic renewal. In the following sections, after having briefly reviewed extant conceptions of strategic renewal, we propose a model of design-driven renewal, conceived as a process of continuous product innovation and periodic revision of the strategic course of the company stimulated and supported by design.

insert table 1 about here

Current perspectives on strategic renewal

Research on strategic change and renewal suggests that adaptation to broad environmental changes – such as the cultural trends and changing customers’ preferences we have mentioned in the introduction – requires firms to reconfigure the way they combine resources and capabilities into their products and services⁵. Scholars, however, seem to share different views about how renewal actually occurs.

Current literature on strategic renewal tends to cluster around two alternative conceptions. Some scholars conceive strategic renewal as a set of activities that a firm undertakes to substantially alter its resource pattern and strategic course, in order to improve its overall economic performance⁶. We may call this perspective *renewal as corporate transformation*, in order to underline the pervasive effects that such process has on the strategy, structure, systems and culture of a firm. These scholars observe how increasing environmental hostility or a deteriorating competitive position may induce managers to initiate a renewal process, searching for a more favourable combination of existing resources and capabilities, and to foster organization-wide proactive behaviour. In rare cases, strategic renewal may even get to the point of inducing transformation in the industry itself, altering patterns of competition in a significant way.

While most scholars embracing this perspective seem to acknowledge the purposive nature of the process and the fundamental role of corporate leaders in starting and driving the process, they tend to diverge over the time-frame of the process. Early research on corporate transformation supported a view of strategic renewal as a rapid, discontinuous process, involving simultaneous changes in strategy, structure, power and control systems⁷. Research findings supported the idea that successful firms evolve through long periods of stability, punctuated by short episodes of radical change⁸. Recent developments of this perspective, however, suggest the existence of a plurality of paths that top managers may follow in their effort to promote a corporate-wide transformation, and observed how strategic renewal in mature business is often a long-term, incremental process, rather than a relatively rapid shift from one configuration to another⁹.

Scholars embracing a second perspective – focused on product innovation and business development – describe strategic renewal as the effect of a relentless search for new combinations of available technologies, underpinned by the creation and exploitation of product and market knowledge¹⁰. They observe how strategic change emerges from internal experimentation occurring in product and business development teams. We may call this conception *renewal as continuous innovation*, emphasizing its two essential features: (i) being driven by technology and product innovation, rather than by corporate-wide change efforts, and (ii) being carried out on a permanent basis.

Proponents of this perspective observe how strategic renewal is continuously, and at times unintentionally, stimulated by development projects that explore new business opportunities. Top managers may deliberately initiate some of these projects; others, however, may arise spontaneously, as people experiment with different combinations or applications of existing capabilities and technologies. All projects generally compete for available resources. The results of this competition depend on how administrative and cultural mechanisms channel attention, resources and rewards to different units, and on the selection process carried out by top managers as they assess the consistency of proposals with existing resources and the current strategic goals¹¹. Over time the strategic course of the company is gradually modified by the interplay of strategic initiatives and the selection process, and the renewal process is carried out by the continuous upgrade of technologies, the revision of product lines and the redefinition of the business portfolio. Whereas advocates of corporate transformation seem to conceive renewal as a purposive process with a beginning and an end, albeit roughly defined, scholars embracing this second perspective emphasize the role of

experimentation in relentlessly promoting an upgrade of a firm's offerings and adjustments to its strategic intent.

At first, these views seem to be describing different phenomena occurring in rather different contexts. Whereas studies embracing the first perspective tend to focus on large, mature corporations facing broad changes in their competitive landscapes, the second draws largely on research on high-technology firms in dynamic environments, where continuous innovation is spurred by intense competition and fast-paced technological change. Our research, however, suggests that both perspectives may be needed to properly understand the potential contribution of design and designers to strategic renewal. In fact, in the cases we analyzed, continuous innovation and corporate transformation appeared as outcomes of different stages of a broader process of renewal based on organizational and product development activities.

Design-driven renewal: a conceptual model

Design-driven renewal can be described through a four-phase model, based on two interrelated processes fostering changes first at a product level (phases 1 and 2) and later at organizational level (phases 3 and 4). The two processes feed upon each other, as successful product innovation may inspire an overall organizational development centred on the revision of design principles and strategic intent, which in turn will later affect how product innovation is carried out in design centres. Table 2 summarizes the content of the four phases. Taken together, these phases describe an overall process of strategic renewal initiated and supported by designers' activity, which is illustrated and discussed in this section.

insert table 2 about here

At Bang & Olufsen, Nokia, Apple and other companies we analysed, designers tend to have a pre-eminent role in driving product innovation by continuously exploring new applications for available resources and capabilities. The *generation of new ideas* represents the first phase of the renewal process, where potential variations to the current offerings are submitted to the attention of managers. Experimentation carried out by internal and external designers nurtures a continuous process of product development resulting in periodic renewal and extension of product lines and features. Designers' concepts and proposals generally reflect a set of principles of design – what we could call a “design philosophy” (see Appendix B) – which orient and stimulate their work and influence the

search for and the development of new concepts and forms. Designers, however, may also occasionally depart from established principles, in order to explore or to test new approaches to design.

The evaluation of designers' proposals represents the second phase of the renewal process. Although managers may not be heavily involved in the generation of new ideas, they usually exercise the right of approving or rejecting designers' proposals. The *evaluation and selection of new ideas* follows criteria which may vary across companies, but usually include expected costs and revenues, and fit with existing product lines, organizational features (technological competencies, current suppliers, distribution channels, etc.) and policies (positioning, pricing, etc.). As criteria may vary, so does the actual involvement of managers from different functions (marketing, operations, etc.) and hierarchical levels (top, middle, local, etc.). Some ideas may be discarded because of lack of fit, others because they are judged too bold and risky. Others, however, receive funding for further development and some of these are eventually put in production and commercialized. Eventually, therefore, the way this internal selection process is carried out heavily influences change and variety in product lines.

The interaction between managers and designers occurring during these two phases affects the evolution – or inertia – of product lines. At this level, renewal tends to occur gradually and mostly within the boundaries of current strategy and design philosophy, as environmental feedback reinforces confidence in the principles underlying product design or indicates opportunities for incremental adjustments. From time to time, however, more pronounced variations of existing concepts and principles may be introduced in product design. Positive and substantial market feedback on some of these products may challenge widespread interpretations of the external environment and activate a process of organizational development, resulting in changes in the principles guiding product development and, at times, in the very strategic course of the company¹².

At times, then, renewal may extend from the product level to the organizational level, as feedback from the market induces managers and designers to question the validity of their beliefs about market segmentation, user needs, cultural values, etc. This phase may be triggered by the unexpected success – or by the persistent lack of – of a firm's new products, which leads managers to urge a *revision of the design philosophy* of the firm (phase 3). A revision of goals and principles driving product innovation is expected to promote or facilitate a redefinition of the strategic intent of the company or a reconfiguration of its competitive scope.

The completion of the renewal process, however, requires managers – and at times designers alike – to engage in purposeful attempts to *diffuse the new design principles*, propagating awareness of the new design philosophy beyond the boundaries of design centres and corporate headquarters, in order to align action of external or peripheral actors such as advertisers, distributors, and freelance designers with the strategic intent and the design philosophy of the company (phase 4). What started as a more or less substantial variation in product design eventually results in an organization-wide renewal in values, beliefs, and strategic positioning.

The substantial role played by design and designers throughout the process led us to define the resulting model *design-driven renewal*. However, our research indicates also that the way the process is managed is crucial to its success. In the following sections, we will use evidence from our study to illustrate more in details the four phases and to discuss their implications for managers guiding the process¹³. Critical managerial tasks are summarized in tables 3, 4, 5 and 6, along with further illustrative evidence of how managers contributed to promote renewal in the cases we analysed.

Phase 1: Generation of new ideas

Design-driven renewal is triggered by designers exploring ideas for new combinations of formal and functional features embodied in new products. Not all the ideas for new products may introduce radical variations in existing product lines. Designers' decisions about concepts, shapes, materials, functions, and packaging tend to be guided by mental frames through which they interpret problems and evaluate the appropriateness of alternative solutions with respect to the objectives to be achieved and their own system of values¹⁴. We may call these frames of reference a *design philosophy* – an internally coherent set of beliefs and principles about how, why and for whom products should be designed (see Appendix B).

While these beliefs evolve over time, they tend to preserve a connection with the heritage of the company and often bear the imprint of a visionary chief designer – people like Jacob Jensen at Bang & Olufsen or Stefano Marzano at Philips – whose personal ideas and values came to influence the way products were developed and designed by internal and external designers¹⁵. Building on these principles, many projects may be simply aimed at expanding product lines, with minor alterations in size, performance, and other features. Other projects, however, may purposefully explore new concepts, new elements of style or innovative functions¹⁶.

In most companies we observed, managers' direct involvement in the generation and development of new ideas was occasional. Nevertheless, managers played an important role even at this stage in providing a favourable context for designers' activity, by emphasizing the strategic relevance of design, legitimating the role of designers in early phases of the development process, and preserving their autonomy from premature interference from other functions (see table 3).

insert table 3 about here

Establishing the strategic relevance of design. Some companies tend to involve industrial designers only in later stages of product development, merely in order to give an appealing form or package to a combination of technologies whose features have already been determined by marketers and engineers. Such behaviour may be symptomatic of an implicit lack of confidence in the innovative potential of design, or indicative of a lack of status of designers in managerial hierarchies, which in turn may negatively affect the capacity to benefit from the contribution of design to product innovation¹⁷. Conversely, engaging in design-driven renewal means acknowledging internal and external designers as primary sources of ideas for new products. In firms engaged in design-driven renewal, instead, design is not merely resorted to as a style-improvement strategy for mature products, but is considered a core capability and a primary source of competitive advantage. Although designers may be also requested to perform simple restyling or upgrade of existing products, they usually enjoy a high status inside the company and are generally recognize as important initiators and drivers of new product development.

In most companies we observed, top managers signalled with symbolic and substantial actions the strategic relevance of design. Excellence in design was explicitly acknowledged in corporate statements and public speeches as a central element of the identity of the organization and a core attribute of the brand image¹⁸. In some cases, the elevation of chief designers at the rank of vice president gave design equal status to other functions in the corporate hierarchies (see table 3). Personal involvement of top managers in design-related activities signalled the rest of the organization that design was a strategic issue, worth the attention of the highest levels in the corporate hierarchy (see exhibit 1).

Exhibit 1: Bringing design back on top of corporate agenda at Apple

Since its foundation, Apple Computers distinguished itself from other computer manufacturers for the innovativeness of the industrial design of its machines. Industrial designers at Apple pioneered new formal and functional solutions, such as the use of a plastic case, an icon-based operating system, and, later, an ergonomic keyboard and the frontal track ball on laptops. In the mid nineties, however, Apple products seemed to have lost originality. Sales were lagging and shares had plummeted. In 1997, the comeback of co-founder Steve Jobs brought design back at the centre of corporate agenda – as products like iMac and iBook visibly indicate – and played a fundamental part in the turnaround process.

Steve Jobs has been described as the most design-savvy corporate leader in the computer industry. Aesthetic perfectionism and obsession for details led him to put emphasis on hardware design since the early days of the company. Back in 1983, he hired Frogdesign design consultants to fashion the unique concepts embodied in Apple computers into an equally distinctive appearance. In 1997, his return as head of the company marked a renewed focus on hardware engineering and design. His long discussions with chief designer Jonathan Ive and his frequent participation to team meetings signalled clearly how design was central again to corporate strategies. His return revived the enthusiasm of industrial designers and encouraged them once again to challenge the conventional wisdom of the computer industry.

Jobs believed that no computer producers were serving the consumer segment well. Therefore, he focused Apple's efforts to delivering innovative products, which addressed needs for ease of use, and the desire of more personal, expressive products. In early nineties the design centre explored several new concepts, few of which actually entered production. In 1996, Gil Amelio, who was briefly in charge before Steve Jobs re-entered the company, found around 350 projects up and running. He slashed them down to 50. Later, Jobs personally reviewed the work of all products team and eventually reduced the number even further, concentrating the efforts of the industrial design group to no more than ten core projects, guided by the precise intent to eliminate overlaps, to simplify product lines and to address more forcefully its traditional target groups. Differences in design supported the positioning of different product families, making products more appealing to their own primary target segments: consumers for the colourful, fashionable iMac and iBook, and business for the sober G3 and PowerBook.

Preserving the autonomy of designers and the integrity of ideas. In design centres and development units, a variety of projects are usually carried out at the same time. In the cases we analyzed, some projects followed inputs from marketers or explicit cues by top managers, who instructed designers according to corporate product or brand policies (see for instance exhibits 5 and 6). Other projects, however, were initiated autonomously by the staff of the design centre, often

under the enlightened leadership of a chief designer. Products like the Oz refrigerator by Electrolux (see exhibit 7) or the popular Sony Walkman (see table 5), for instance, arose from spontaneous initiatives of designers and engineers, who received the support of top managers only when the core concepts had already been developed. Autonomous ideas usually departed from existing product categories, broke with established conventions and conceptions, stimulating an expansion or renewal of product lines.

Exhibit 2. Stimulating and collecting new ideas at Alessi.

At Alessi, some ideas for new products grow out of so-called “meta-projects” coordinated by Centro Studi Alessi (CSA). Set up in 1990, CSA coordinates work with young emerging designers and periodically organizes workshops with industrial designers and social scientists, in collaboration with architecture faculties and schools of arts and design. These workshops are often connected with broader “meta projects” like Memory Container (an exploration into the archetypes of food presentation) or Family Follows Fiction (an investigation of the emotional, playful structure of objects), purposefully aimed at inspiring periodic exploration of new product languages and renewal of product lines. Family Follows Fiction, for instance, explored a new style, based on brightly coloured plastic, anthropomorphic shapes, and allusive names, which eventually added a touch of irony, fun and emotional appeal to the Alessi brand. The colourful, ironic style of the plastic kitchenware designed by Guido Venturini and Stefano Giovannoni affected generations of products for a decade, and helped attract a broader audience of young consumers.

Alessi routinely receives also spontaneous ideas – around 300 per year, at the time of our study – from independent designers who may, or may not, have worked for Alessi before. Co-General Manager Alberto Alessi considers designers as a “window on the world,” because they provide the company with a multiplicity of perspectives on how to interpret and address emerging lifestyles and societal trends. Designers’ intuition and sensitivity are considered more effective than traditional market research in capturing latent, unexpressed needs, and in shaping new product typologies. While most of them tend to develop concepts with little connection to existing styles or typologies, some of the latter, like Philippe Starck’s lemon squeezer or the whistling kettle by Richard Sapper, have led to some milestones in Alessi’s catalogue.

Managers guiding design-driven renewal recognized the value of experimentation, and provided different arrangements to supply designers with the resources and the freedom required to engage in autonomous exploration of new forms and concepts, and ensure that the realization of their ideas is sheltered from arbitrary alterations due to commercial or productive reasons (see table 3). Sales managers are often uncomfortable with product design that substantially departs from what is already on the market, while production engineers tend to assign priority to cost reduction and

exploitation of current technologies, machinery, etc. The conservative, prudent attitude of sales managers and production engineers often clashes with, and sometimes stifles, designers' bold, challenging proposals.

Excessive reliance on inputs from market research or feasibility studies, for instance, may bring some companies to restrain the creative process or subject designers' ideas to pre-mature alterations that essentially betray the concepts embodied in the original concepts. To some extent, interference from sales managers may be justified on commercial grounds, as small changes to original prototypes may be recommended in order to increase the saleability of new products. As some of our informants observed, however, excessive reliance on market research and current beliefs may stifle the creativity of designers and force their work within the straitjacket of conformity to existing product categories and features, and expressed customers' wants¹⁹. Sheltering original concepts from pre-mature interference from other functions was considered crucial to preserve conceptual and stylistic integrity and avoid the dilution of the innovative potential of new ideas, due to conservative commercial or productive concerns (see table 3)²⁰.

Phase 2: Evaluation and selection of ideas

While creativity is central to the first phase of the process, selection is the essence of the second: the allocation of funds and priority among the various ideas, concepts and prototypes proposed by designers. To some extent, the development of designers' ideas is implicitly channelled by their own specific skills, attitudes and values, and by the corporate design policies that we have collectively termed design philosophy. However, as most of our informants observed, exploration and experimentation comes natural to designers, and it is indeed a critical requirement for effective design-driven renewal, as we have seen in the previous section.

Yet, while experimentation is fundamental to frequent innovation, left to their own devices, designers may emphasize formal and conceptual research at the expense of market-oriented refinement and upgrading of existing product lines. Long-term growth requires instead a careful combination of both²¹. In fact, while research indicates that an excess of managerial control may stifle creativity and undermine the renewal of competitive advantage²², an excess of freedom may be equally deleterious. In some of the companies we observed, the gradual detachment of top managers from product policies and from the activity of the design centres was often associated with inefficient proliferation of projects or rubberstamping of designer's ideas, with little concern for projected sales or development costs.

Effective design-driven renewal, instead, requires managers to counterbalance the creativity of designers by implementing a clear product policy, ensuring internal coherence among product design, core capabilities and brand policies, while at the same time adopting broad portfolio logic, evaluating each proposal in light of its potential contribution to the renewal process (table 4).

insert table 4 about here

Implement a coherent product policy. The uncontrolled proliferation of development projects, many of which would never cross the boundaries of the design centres, may lead to a waste of time and resources, and turn designers' attention away from the expansion and upgrading of existing product lines. This seems to have been the case, for instance, at Apple in the early nineties, when the top management gradually lost touch with the design centre resulting in a dispersion of attention and resources on hundreds of projects, many of which would never be put in production. Soon after its return at the head of the company, Steve Jobs dramatically reduced the number of projects, following a clear and consistent product policy. The development of non-core products like laser printers and palmtop computers was discontinued, and efforts were focused on new products that built on unique capabilities, such as hardware design and user interaction, and addressed the traditional target groups of the company: consumers, professionals and educators (see exhibit 1).

What happened at Apple, however, is not uncommon in companies adopting design-based strategies. As design gradually becomes a fundamental element of differentiation and a source of competitive advantage, managers may be tempted to implicitly abdicate product policies, leaving them in the hands of designers, and turn their attention to corporate issues such as diversification, internationalisation, strategic alliances and finance. As their involvement in products – and often brands – gradually decreases, they may eventually give up control over design centres and, in fact, come to rubberstamp their proposals for new products. While not necessarily bad in itself, such loss of control may increase the risk of a divergence between designers and marketers and between the former and the market.

This is what seems to have happened, for instance, at Bang & Olufsen in the mid eighties before the company entered one of the worst crises of its history. Newly appointed top managers dedicated to speeding up the international expansion of the company and the diversification in a number of related businesses. Inside the organization, focus on style, aesthetics, and technological

innovation gradually led to overlook efficiency concerns. Product development became a closed land, a place where top management was barred from any involvement. New product proposals were invariably accepted with little concern for their economic implications. It seemed that neither the development cost nor the commercial success of the products really mattered: winning design awards was implicitly considered more important than selling products. Accordingly, brand policies concentrated on luxury symbols to justify the increasing average price of products. In 1992, after sales decline had brought the company to face record losses, the eventual rejection of a proposal for a new product on grounds of lack of economic viability – something unheard of at Bang & Olufsen – sent a powerful signal that the new CEO Anders Knutsen seriously meant to take charge of product strategies again (see exhibit 7).

While most companies recognise the selection phase as crucial, however, few have developed specific tools and procedures that try to combine an evaluation of the economic and commercial side of the project (expected costs and revenues, estimated sales, etc.) with a thorough assessment of new forms and concepts; the selection process is often described as based on intuition and gut feeling. While the evaluation of new concepts and forms may rely on tools like focus groups, semiotic analysis, and user observation, the final decision tends to be left to the judgement of managers, who may or may not possess the culture and the sensitivity required to appreciate truly innovative concepts. Alberto Alessi is a rare example of a manager who has attempted to codify principles to evaluate projects and to estimate their commercial potential (see exhibit 3). What worked for one company, however, may not work for others. In fact, Alessi's recipe grew out of a personal reflection on what caused success and failure of around 300 products from the catalogue, and it is consistent with the positioning of the company as a high-end producer and design innovator, and with the core attributes of its brand: art, poetry, wonder and surprise.

Exhibit 3. Evaluating and selecting new products at Alessi

At Alessi, proposals for new products are routinely evaluated by a committee chaired by Alberto Alessi. In 1991, Mr. Alessi was pushed by his brothers Michele and Alessio to try to formalize his reasons for accepting or rejecting a product. Alberto Alessi carefully analyzed more than 300 projects assessed in the previous years, and he eventually identified four parameters that seemed to make a difference between extremely successful products, moderately successful ones, and total “fiascos”. These parameters now constitute the so-called “Success Formula”, a heuristic tool used to evaluate proposals for new products and to predict the reaction of Alessi’s customers.

Two parameters address core features of Alessi products. CL (Communication-Language) synthesizes the potential value of the product as a cultural communication tool – i.e. the extent to which consumers will be able to use the object as a “status symbol” or a “style symbol”. The second parameter, SMI (Sense-Memory-Imagination), instead relates to the emotional response aroused by the multi-sensual experience provided to the user, as triggered by an intimate connection with individual memory and collective imagery. Most of the 300 products, however, scored high on both parameters. Two more variables had to be included, in order to discriminate between different outcomes: price and function. A reasonable price and a good functionality, compared to alternative products within the same typology, in fact, generally seemed to be required to expand sales from few affluent design-lovers to broader segments of the market. Rating criteria were defined for each parameter, and each object was rated according to the four parameters. The total score was found to be a fairly good predictor of sales volume.

Under the direction of Alberto Alessi, the “Success Formula” is used by the small committee that evaluates incoming ideas. After a preliminary assessment of technical feasibility, the committee rates each proposal on the four parameters. CL and SMI are crucial: proposals that score less than three points on these two items are immediately rejected. Most Alessi products score between 12 and 18, the latter meaning expected sales around 100,000 units. Some products, however, may be put in production even if they score poorly on price or functionality.

Adopt portfolio logic. While each product is assessed separately, Alessi, like other companies we observed, follows what we could call portfolio logic whereby some projects may be undertaken regardless of their expected cash flow. In other words, management does not insist on all products becoming commercial blockbusters, but recognises the importance of preserving and upgrading the intangible capital on which long-term success rests.

A few companies in our sample periodically developed so-called “image-builders” or “flagship” products in order to reap design awards, attract the attention of the press, support communication strategies and reinforce brand image, even if sales managers did not expect them to produce high volumes or margins (see exhibit 7 for an example). In some cases, following a logic that resembles that of fashion collections²³, “image-builders” were used to explore bold new elements of style, which will be replicated, although in a less radical form, in more commercial lines. In fact, so-called “design factories” such as Alessi, Artemide, and Kartell maintain large, apparently inefficient portfolios where redundancy of lines and concepts is aimed at reinforcing the external perception of central elements of style or core values of the brand, regardless of commercial or economic concerns.

Other projects were pursued regardless of market expectations, in order to explore new technologies or build market knowledge (see exhibit 4). These projects usually departed from existing principles or product lines, and introduced discontinuities in style, technologies, functionality, etc. As such, their commercial contribution was hard to assess or expected to be marginal. Nevertheless, these “experimental products” – some of which would never really be commercialized on a large scale – were used to test and develop new ways of interpreting customers’ needs and preferences and applications of technology, occasionally stimulating broader changes at strategic and organizational level.

Exhibit 4. Design for corporate renewal at Alessi: the Tea & Coffee Piazza project

Completed in 1983, Tea & Coffee Piazza marked a turning point in the strategy and in the identity of the company. The project – a collection of tea and coffee services designed by leading architects and industrial designers – was conceived as “sophisticated design experimentation”, aimed at exploring new forms and product typologies. None of these products was really expected to encounter commercial success. In fact, only one designer, Oscar Tusquet, really concerned himself with the industrial implications of large scale production

However, while commercial results were marginal – development costs were high and each object was produced only in 99 pieces – Tea & Coffee Piazza is credited for stimulating profound cultural changes in the company, with visible impact on product and brand strategies in the following decades. Tea & Coffee Piazza triggered a reflection on the utility of small scale productions, leading to a new high-quality section of the catalogue named Officina Alessi (Alessi Workshop), dedicated to experimental, limited scale productions. Furthermore, the project enabled Alessi to establish relationships with designers like Aldo Rossi and Michael Graves, who will later design some of the most representative products of the eighties.

More generally, however, the project stimulated a reassessment of the competitive scope of the company. It opened up the company to the collaboration with external suppliers for the manufacturing of non-steel objects, laying the foundation for future diversification in ceramics (100% Make-up project), wood (Tvergy) and, most of all, plastics. Even in steel technologies, Tea & Coffee Piazza encouraged experimentation in new productive and decorative solutions that characterised later, more commercial products. In fact, according to Alberto Alessi, the project started off the trend of highly expressive products which have become a distinctive feature of Alessi’s catalogue, and facilitated re-positioning as a widely recognized design leader in the kitchenware industry.

Phase 3: Revision of design principles

Organizational learning and development are intrinsic to strategic renewal²⁴. Strategic renewal implies the willingness to question and occasionally revise the set of goals, values and principles that underpin organizational strategies²⁵. As societal values and demography evolve, new lifestyles and patterns of use emerge. New technologies and intense competition tend to continually increase the available opportunities of production and consumption. Even successful companies ought to periodically reflect on, revise, or at least re-interpret their philosophy, in order to stay in tune with cultural changes and technological development.

In design-driven renewal processes, organizational development tends to be associated to a revision of design policies stimulated by intense positive or negative environmental feedback on experimental products. Negative feedback – sales decline, unenthusiastic response etc. – may raise concerns about the soundness of current principles and aesthetic canons. Conversely, positive feedback – unexpected market success, general acclaim etc. – may reinforce designers’ beliefs in an emerging design philosophy.

In our observations, however, widely acclaimed new features were rarely serendipitous: more often, renewal was initiated by experimental products like the Philips-Alessi line described in the introduction, the colourful Nokia 2110 mobile phone (see exhibit 5) or the self-adjusting Oticon MultiFocus hearing aid (see exhibit 6), which intentionally departed from dominant philosophies, and challenged consolidated “industrial recipes”. Their success facilitated a broad reassessment of the validity of current strategies and promoted a re-orientation, which often resulted in adjustments to the strategic intent. In other cases, a conscious reflection on the validity of current design principles was initiated in order to support and shape emerging strategies (see, for instance, exhibits 1 and 7). In both cases, design philosophy and strategic intent seemed to co-evolve, as designers and managers collaborated to shape a new strategic course.

In the cases we observed, while experimentation was usually carried out autonomously by designers in an idea generation phase, managers could promote organizational development by stimulating periodic reflection on the validity of current principles, and maintain alertness to the environmental feedback.

insert table 5 about here

Maintain alertness to environmental feedback.

Organizations generally display a lack of willingness to question established routines and shared beliefs. Perceptual and organizational filters tend to select environmental feedback that confirms prevailing interpretations of consumers' preferences or the possibilities of technology, and to ignore signals that may question the appropriateness of current practices and principles. Timely and effective renewal, instead, requires alertness to events that may challenge currently held beliefs of managers and designers about the appropriate way to design new products (see exhibit 5). These events include both decline in market appeal of current product lines and unexpected success of experimental products.

Experimental products are usually aimed at exploring market response to new formal or functional features. Sometimes, variations are the result of new entries in design centres, and reflect their personal view on societal trends, user needs, etc. Yet, variations may also be prompted by marketing managers and purposefully address what are perceived to be gaps in the market and unmet customers' preferences. The magnitude of these "niches", however, is rarely known in advance: sales forecasts rarely offer precise estimates of the market for revolutionary products. While variations may reflect emerging or tentative interpretations on the designers' and managers' side, it is only when experimental products are finally put on the market that the validity of the former can be assessed.

In this respect, the unexpected success, or lack thereof, of new products may indicate a discrepancy in designers and managers' interpretations and expectations, on one side, and customer preferences on the other. In these cases, careful monitoring and analysis of the results of these products might help managers refine their understandings of market segmentation and catch early signals of changing customer preferences.

Exhibit 5. Nokia: Designing mobile phones for emerging lifestyles

The success of Nokia in the mobile phone industry is partly linked to the somewhat chance discovery of a wide segment of the market governed by fashion-like dynamics, which in 1994 pushed sales of model 2100 to volumes 50 times bigger than expected. Nokia's casual discovery of an unsatisfied desire for expression and personalization eventually led managers to revise product policies, and gave the company a first-mover advantage in designing and marketing products addressing individual needs and lifestyles.

Nokia 2110 is considered a breakthrough in the design of mobile phones. Details like the rounded keypads and the elliptical shape were due to future chief designer Frank Nuovo's will to enhance the perceived friendliness and

the emotional appeal of the product. However, the idea of releasing the model in five different colours was not purposefully aimed at exploiting an untapped segment of the market. Yet the unexpected success revealed to Nokia's marketers and product developers the changing nature of mobile phones from mere communication devices to personal accessories, and cast doubts about currently held beliefs about customers' preferences.

Market research eventually led managers at Nokia to identify four basic profiles of customers leading the adoption of the new technology – each characterised by a different lifestyle: trendsetters always at the leading edge of technology, style-conscious posers, high-flyers belonging to the business segment, and social contact seekers, who tried to combine reliability, affordability and personal expression. Since then, the segmentation model has been frequently updated, following global consumer studies. Later, for instance, further research brought the number of profiles to six – experiences, impressors, controllers, maintainers, balancers and sharers – each characterized by a different relationship with the object and by specific preferences about style and functionality. Industrial design practices have been changed accordingly in order to be responsive to evolving lifestyles and to tailor the style, features and attributes of each product to precise customers' profiles.

Also, the new philosophy, emphasizing principles such as personalization, simplicity and style, acknowledged changes occurring in mobile phones, which had become, in Frank Nuovo's own words a combination of "personal accessories", "total communication tools", and "entertainment products". Lifestyle segmentation provided designers with a broad framework for the development of new concepts, features, visual appearances and user interfaces tailored to the needs and lifestyles of specific target groups. Increasing preferences for personalized products initially revealed by the success of the 2110 were addressed in different ways, from the introduction of changeable shells to the establishment of a subsidiary, Nokia Vertu, hand-crafting custom made luxury phones for wealthy customers. Particular emphasis was also placed on enhancing user experience by the careful selection of materials, and by the development of friendly, easy-to-use interfaces. Increased attention to trends in fashion, architecture, and other forms of culture reflected the will to keep the company's products always abreast of societal trends, and resonated CEO Jorma Ollila statement that the new strategic intent would be centred on a relentless search for global leadership in mobile telecommunication.

Stimulate reflection on the validity of current beliefs. At times, designers may autonomously engage in formal rethinking of design principles or dominant stylistic traits. Such was, for instance, the cases of the Spirit project at the Sony Design Centre mentioned in table 3, or the new High Design philosophy promoted by Stefano Marzano at Philips (see table 6). Top managers, however, may also encourage re-consideration of current beliefs about appropriate ways of designing products, urging designers to reflect on indications emerging from sales trends, market surveys, and other

forms of environmental feedback (see table 5). These signals rarely lead designers and managers to reject the current philosophy *in toto*. Nonetheless they may induce companies to revise outdated styles, adapting them to new tastes, to re-interpret core principles, temporarily downplaying unwanted features, or even to build on fortunate stylistic or technological innovations.

In some companies we observed, top managers facing corporate decline and loss of market appeal even urged designers and product developers to collaborate in shaping a new strategic course. A conscious revision of the principles guiding product design, then, reflected and in part inspired a parallel redefinition of strategic intent. Experimental products embodying new formal and functional traits were used to test and refine a new strategic course (see exhibit 6).

Exhibit 6. Challenging engineering culture at Oticon

Located in Denmark, Oticon is a leading producer of hearing aids. During the 1990s, Oticon has been widely celebrated for the revolutionary project-based design of its organizational structures and systems – the so-called “spaghetti organization”. Much less attention has been dedicated to its innovations in the design of hearing aids from the functional (automatic adjustment of amplification intensity, digital amplification, etc.) and formal standpoint (satin textures, lean shapes, original colours, translucent plastic, etc.), testified by industrial design awards.

For decades, Oticon had dominated the market for behind-the-ear hearing aids. During the eighties, the success of smaller in-the-ear models – technologically inferior, but cosmetically more appealing – had eroded sales volumes and market shares. Nevertheless, product developers at Oticon refused to acknowledge changes taking place in the market, and persisted in the design and development of technically advanced, but cumbersome devices. In 1988, the new CEO Lars Kolind assembled a project team to rapidly develop and market a self-adjusting prototype code-named E36, encouraging members to adopt a fresh look at issues of product design and development.

What was later marketed as MultiFocus carried the seeds of a new set of principles regarding the aesthetics of hearing-aids, design goals, and user-machine interaction which would later affect generations of product throughout the nineties. The need to accommodate a cumbersome mechanism, for instance, led team members to revise the design of the device. Shapes were redesigned in a more appealing form. The colour was changed from the traditional flesh pink to opaque titanium. The new design was meant to change the perception of the product, so that it would be associated mentally with high-tech electronic items, rather than medical prostheses, thus lightening the “psychological burden” on the user. New packaging was designed for easy use and safe transportation. A notebook called “The Oticon Diary” was included in the package, so that first-time users could use it to record observations and listening experiences.

As a member of the team later remarked, MultiFocus became a means to stimulate changes in entrenched beliefs in the organization. Product developers were encouraged to rethink their approach, expanding their focus from pure technical performance of its products to the user's quality of life, in the widest sense. "Instead of thinking of ourselves as a manufacturer who has to serve his customers, we need to see ourselves as a service company offering a concrete product." – Kolind declared – Oticon has to stop regarding itself as a 'producer of acoustic equipment': our real mission is to help people with hearing problems live the life they wish." The commercial success of MultiFocus went beyond expectations and reinforced Kolind's confidence in his emerging strategy.

Shifting attention towards users' quality of life sensitized designers to the psychological aspects involved in using hearing aids, traditionally regarded as signs of handicap and therefore sources of unease for the wearer. After the success of MultiFocus, the new PerSonic line was released in a whole series of "hair tone colours", meant to help the device blend with the facial features of the user. Later, the OtiKids line introduced leaner shapes, translucent plastic and bright colours in order to help children accept their own handicap with less severity, by designing more pleasing and socially acceptable devices.

The new strategic intent, however, re-oriented the process of new product development even beyond design issues in a strict sense. In the past, product developers placed emphasis on technical aspects linked to the improvement in clarity of sound reproduction and intensity of amplification. Since early '90s, psycho-acoustic research, carried out directly with patients and aimed at identifying the various ways in which hearing problems are perceived depending on age, work, and lifestyle, has become pre-eminent. MultiFocus pioneered the development of revolutionary products such as DigiFocus and DigiLife, guided by the ambition of offering products capable of flexibly adapting sound processing to changes in users' needs and lifestyles. The logic behind the Oticon diary was later developed in what was termed the Human Link philosophy, supporting the transfer of information from patients to audiologists to improve the fitting and fine tuning of products.

Phase 4: Diffuse new design principles

In order for the renewal process to fully display its effects, organizational development must cross the boundaries of design centres and top management teams: changes in beliefs and attitudes about design principles and strategic positioning should affect the whole organization. In well-crafted design-based strategies, designers, brand managers, and advertisers cooperate to develop and sustain brand policies that are faithful to and enhance the distinctive features of products. Like advertisers, product designers contribute to attach meaning to products and names through the use of signs and language, and therefore to create and sustain distinctive brands²⁶. Both advertising and product

design accomplish a process of “representation,” through which meaning is constructed and attached to products and brand names, by imbuing a set of technologies with particular cultural meaning²⁷.

As some of our informants observed, therefore, it is important that all the actors that impact on how products are produced, packaged, advertised, distributed, sold and serviced are aware of the philosophy that underlies product design and emphasize, rather than blur or downplay, distinctive formal or functional features. Ensuring that the new design philosophy propagates throughout the organisation and even across its boundaries, then, seems to be a critical managerial task (see table 6).

insert table 6 about here

Encourage the codification of core design principles. Strictly speaking, a design philosophy needs not to be made explicit in order to influence designers’ work. Sometimes changes in the principles guiding designers are simply embedded in new working practices and incorporated in the design of new product lines²⁸. Coordination with marketers, advertisers, distributors and salespeople, however, is usually required in order to emphasize new features properly. As long as the awareness of a design philosophy hardly crosses the boundaries of design centres, marketing programs may overlook distinctive features of products, the potential benefits of which – be they functional or expressive – are not fully emphasized in market communication and sales behaviour. In this respect, written statements about the essential principles of design that underlie a company’s product may increase the consistency between how products are designed, how brands are defined and the content of advertising campaigns.

In most of the companies we studied, design philosophy was at some point in time made explicit and summarised in formal statements, short documents or corporate speeches, which were meant to become a reference point for designers, helping the former relate their practices and principles to the work of strategists and marketers, and facilitating the coordination between them and the rest of the company (see exhibit 7).

Exhibit 7. Restating corporate values at Bang & Olufsen

For decades, Bang & Olufsen, a Danish producer of high-end audio-video systems, has pioneered innovation in style and technology in consumer electronics. In 1974, Bang & Olufsen's unique design philosophy was codified in what

came to be known as the Seven Corporate Identity Components – core design principles guiding design and communication policies (see table 7). At that time, the mandate of the working group that codified the Seven CIC was not to lay a new foundation for design and communication strategies, but simply to interpret “existing, but unexpressed attitudes,” in order to facilitate coordination among designers, advertisers and dealers, and to provide a stable reference point for product development as well as market communication and sales.

insert table 7 about here

In the mid eighties, however, designers gradually lost touch with consumers’ values and needs. Product development emphasized an aspect, integration of audio and video sources, which was less and less valued by consumers. Communication, instead, de-emphasized the essential qualities of the products, and concentrated on luxury symbols to justify their increasing average price. Eventually Bang & Olufsen came to be perceived as an expensive luxury brand. With the collapse of the yuppie culture and the sudden economic decline in the late 1980s, however, the potential market for these products contracted, resulting in a sudden decline in sales volume.

In 1991, with a view to meeting bigger potential demand and increase sales volumes, the newly appointed CEO Anders Knutsen decided to extend the lower end of the product range. Marketing simpler and less expensive products under the same name, however, might have blurred the image of the company and its products. The new models should have shared the same basic elements and distinctive features of Bang & Olufsen products; the same consistency had to be kept in corporate communication. A formal assessment of the validity of the existing design philosophy and brand identity was perceived as crucial in coordinating attempts to expand the customer base and fuel sales growth, without harming the exclusive corporate image.

An international field survey indicated that Bang & Olufsen was widely regarded as a company that creates harmony between aesthetics and technology. Respondents ranked the immediate perception of technological excellence (reliability, high performance, advanced research, etc.) as the number one feature. Then, respondents indicated the emotional side of the product, as reflected in the design, in the choice of material components, and in the mechanical movements. All the other features were ranked lower. Meanwhile, a project team was assigned the task of reflecting upon and precisely defining the “brand essence” of the company. After several informal meetings, the group came out with what would have later be called the New Vision, the formula used to convey the new strategic intent and the essence of the brand: “The best of both worlds: Bang & Olufsen, the unique combination of technological excellence and emotional appeal.” The words chosen to express the company’s vision summed up what really distinguished Bang & Olufsen products and brand from competitors, stimulating designers and advertises to contribute to reinforce the very

basis of the competitive advantage of the company. Development efforts were re-focused around the capabilities that underpinned the core attributes of the brand: mechanical movements, integration of sound and image, system-human interface, choice of materials, and design. Communication campaigns brought products back to centre stage, emphasizing once again key aspects of the underlying philosophy like individuality, domesticity, and essentiality.

Promote awareness of design philosophy among peripheral actors. Advertisers and brand managers are not the only actors influencing the commercial success of innovative products. In our research we came across cases where lack of clarity about the core features of products and their relevance for brand policies, led to inconsistent sales behaviour, which misdirected potential customers and undermined the commercial potential of new products. In some cases, specific programs and initiatives were undertaken to educate distributors and retailers, and ensure consistent presentation, sales policies and service. At Bang & Olufsen for instance, in the early nineties, market tests showed that products were sold mainly as luxury goods, as salespeople emphasized only the aesthetic side, overlooking technological excellence and the original conceptual solutions. In 1996, marketing managers responded with a massive training program, called Match Point, aimed at raising awareness of the philosophy behind the products throughout the network of dealers, making sure that they shared and conveyed to potential customers the same values and principles that inspired the work of designers (see table 6). While written statements, training programs and other formal communication tools may disseminate analytic information about the core elements of a design philosophy, some companies we observed explicitly used products themselves as carriers of information about emerging philosophies to a broad audience.

Exhibit 8. Product design and brand repositioning at Electrolux

The Electrolux Group is a world leader in the production of household appliances, a position built through the acquisition of companies such as White Consolidated, Zanussi and AEG. In mid-nineties, Electrolux carried out a re-organisation of brands and product lines following the “design families” concept, based on consumers’ different life styles. The plan brought to the identification of a clear target for each of the three main brands of the group: Electrolux, AEG and Zanussi. In the intention of brand managers, Zanussi targeted dynamic, style-conscious customers, who welcomed new ideas and solutions matching their needs and problems, and expressed their personality through their environment. “Zanussi” – read the brand essence statement – “delivers innovative solutions in a distinctive and leading design”

Market research, however, revealed that the positioning of the Zanussi brand varied considerably around Europe. Compared to other core brands of the group, Zanussi enjoyed lower brand awareness, but most of all had a blurred image and a heterogeneous positioning on various domestic markets. In the United Kingdom, for instance, it was known as the leading product as for style and functionality; in Germany, instead, it was considered as medium-quality producer. In a few small European countries the Zanussi brand was little known at all, and in Italy it was only associated to built-in household appliances, as all stand-alone products were sold under the Rex brand. In the words of one of Zanussi brand managers, they “had to strive to explain both consumers and retailers the real emotional and functional benefits of Zanussi products.” The revolutionary design of a new high-end refrigerator, the Oꞑ model, played an important role in promoting a region-wide repositioning of Zanussi and in tightening up the division around the new brand identity.

The ice-blue, rounded, egg-shape of Oꞑ pioneered so-called bio-design in large home appliances. Oꞑ result from autonomous reflections on the changing relationships between man and machine, carried out at the Zanussi industrial design centre under the leadership of chief designer Roberto Pezzetta. In an early stage of development, sales managers pressed Mr. Pezzetta to substantially alter the design of the product, by straightening lines and reverting to white. The prototype was perceived as departing excessively from the design of the vast majority of large appliances, and serious concerns were raised about the saleability of the product. Eventually, however, brand managers perceived Oꞑ as an important step in refocusing the positioning of the Zanussi brand. Semiotic analysis indicated that the principles of bio-design that characterised Oꞑ strongly underlined “conviviality at the expense of functionality, the natural as opposed to the artificial, passion as opposed to reason”, and helped convey an image of Zanussi as a company “capable of producing not just ordinary objects but something extraordinary as well.”

The product became a powerful communication tool. Although production was discontinued after the first batch of 5000 items, Oꞑ quickly became a corporate icon, and appeared on several corporate communication devices – annual reports, catalogues, web sites, etc. – long after that. The revolutionary fridge won Zanussi widespread recognition from the specialized and the popular press, and reaped several design awards. Inside the company, however, Oꞑ is credited for having communicated effectively the new brand identity to marketers and engineers, distributors and customers, helping reposition Zanussi around Europe in a consistent way.

Discussion

The design-driven process we have described in this article presents continuous innovation and corporate transformation as the outcome of different stages of a broader renewal process acting at two levels. At a product level, autonomous or induced projects taking place in design centres or carried out by freelance external designers stimulate continuous renewal of product lines, inspired by

a common set of principles and stylistic guidelines. Innovation at this level may gradually push an expansion in the competitive scope of the company or adjustments in its competitive strategies (see, for instance, exhibits 4 and 8). Occasionally, however, the success of experimental products or lines carrying innovative formal or functional features may encourage substantial revisions in the philosophy guiding product design, and stimulate broader corporate renewal (see, for instance, exhibits 1, 6 and 7). At an organizational level, then, changes in the design philosophy may co-evolve with a re-orientation of the strategic course of the company.

Design management scholars have rarely attempted to connect design activities to the process of strategy formation²⁹. Past literature has generally focused on how careful management of design activities can improve performance, quality, look and cost of the product – and therefore customer satisfaction³⁰. Our research, however, indicates that interpreting product design only as a way to differentiate the offerings of a company in light of factors such as aesthetics, price and performance, may emphasise only the superficial outcome of the design process, overlooking its potential in driving or facilitating strategic renewal. Explicit reflection on distinctive core elements of the philosophy underlying product design and on their connections with technological competencies and brand values may help managers shape or support a coherent strategic intent to regain or reinforce competitive advantage. While using design – or rather “styling” – as a way to stimulate stagnant demand or sustain exports is not new to companies, promoting design-driven renewal means recognizing that design is not simply a matter of enhancing functionality or styling, but is a powerful symbolic medium for expressing or reinforcing a unique set of meanings embodied in a brand. Design may then support the new strategic course by performing an integrative role between technology and meaning, as form and function of new products inspired by the design philosophy of the company draw on core capabilities to sustain public perception of the brand (see figure 1).

The relationships between strategy, design philosophy, core capabilities and brand image, however, do not seem to be univocal and unidirectional. In cases like Bang & Olufsen or Apple, a clearer strategic intent emerged from a reflection on the distinctive capabilities of the company and the core attributes of its brand, mediated by the essential elements of the design philosophy and reflected in unique features of the products. Renewal in product development reflected broader corporate changes. The success of new products consolidated the trend and promoted further organizational development. At Oticon, Kartell and Nokia, the success of experimental products embodying the seed of a new design philosophy set in motion a process of renewal that reinforced

confidence in an emerging strategy and encouraged product designers to explore new ways of leveraging on existing capabilities. In other cases, such as Alessi and Swatch, frequent renewal of product lines was essential to preserve a reputation as design leader in their respective markets. Their design philosophies evolved gradually and almost unintentionally, stimulated by continuous exploration of new formal and conceptual solutions. At times, however, projects like Tea & Coffee Piazza or Family Follows Fiction stimulated broader development in strategy, positioning and culture.

insert figure 1 about here

In practical terms, our research indicates the importance that the design philosophy of a company co-evolves with the company's competitive scope, its broad mission, and its fundamental strategic goals – in other words, with its strategic intent. In this respect, an explicit strategic intent – synthesised in a more or less elaborate corporate statement – may help designers relate their work to broader issues of competition, market positioning and long-term prosperity of the company, providing them with meaningful strategic direction. Consistency between strategic intent and design philosophy may empower the latter as a framework for design and marketing activities, and embed the former in the core intangible assets of the company – its technological capabilities and its brand image.

Practical implications of our study touch also the role of managers in guiding the design process and coordinating its interaction with other functions. While our model acknowledges the primacy of designers in generating or at least developing new ideas that may spark off strategic renewal, nonetheless we believe that managers play a critical role in steering the process as they should legitimate and preserve the leading role of designers in early stages of product development, implement consistent product policies through careful selection of projects, promote reflection on and revision of design philosophy in light of external feedback, and finally spread awareness of the design philosophy throughout the organisation to ensure consistent brand policies and sales behaviour. As we have seen in the previous sections, abdicating this crucial role may underexploit the creative potential of designers, or end up in dispersion of efforts and lack of coordination between design, marketing and sales.

insert table 8 about here

In fact, engaging in design-driven renewal it is not free from dangers. Some common pitfalls have been discussed in the previous sections and are summarized in table 8. While an underestimation of the potential impact of designers on product and organizational renewal (phases 1 and 3) may lead to stagnation and decline, even committing to design-driven renewal has some risks. In some of the cases we analyzed, for instance, designers acquired so much influence that they could virtually dictate development policies, as managers did not dare – or bother – to interfere with their experimentation or to reject their proposals. As a result, an inordinate amount of resources was invested in development activities that often led to products with little commercial viability. Effective design-driven renewal requires instead a careful management of the process, in order to strike a balance between creativity and management. While, to some extent, designers should be sheltered from excessive pressures and constraints from other functions, total lack of control on the managerial side does not seem to be healthy either.

Also, unity of intent and consistency of action between design and branding is critical to support effective design-based strategies. Sometimes, however, the connection between designers and marketers may loosen up. On one side, design centres may become affected by a self-referential syndrome, as designers get caught in the exploration of concepts, styles or technologies that are too advanced for their time, have little market application or little concern for production costs. On the other side, brand managers and advertisers may develop brand-building campaigns that try to appeal to the market, without emphasising or really being supported by the actual characteristics of the products. In this respect, organizational development activities may also contribute to periodically tighten up the various parts of the organization around core design principles and brand values supporting the positioning of the company and its brands.

Conclusions

The evolution of competitive dynamics in a growing number of industries has led, or in some cases brought back, managers' attention to the design process. Strategic management of design activities seems to have become a powerful source of competitive advantage even in high-technology industries, usually dominated by issues of price, performance, and technological standards. The companies mentioned in this article are but the most conspicuous examples of how careful management of the design process can support strategic renewal even in consumer industries which are apparently mature or with consolidated positions. Although they differ in industry, size, scope of

operation, and configuration of activities, they are similar in the way they use or have used design to support continuous renewal of product lines and periodic reorientation of competitive strategies. While the coordination of external designers or internal design centres with other organizational units may pose specific challenges to design managers, our research suggests the existence of commonalities in the interaction between designers and managers along new product development, and in the way design can affect strategy formation. Building on evidence from our study, we have proposed an interpretive framework, highlighting critical issues to be addressed and potential sources of inefficiency, and providing indications for managers engaged in guiding design-driven renewal.

Table 1. Design-driven renewal: some illustrative cases

Artemide (lighting) In 1995, the perceived threat of commoditization of designers' lamps pushed CEO Ernesto Gismondi to explore new design approaches using light as a "construction material" to produce effects of high emotional impact. The Human Light project became a platform for revising brand values and rethinking distribution strategies (see tables 5 and 6). Alessi (houseware) Under the leadership of Alberto Alessi, tighter collaboration with renowned architects and designers has gradually pushed the company to expand its product lines beyond the boundaries of steel kitchenware, and sustained brand repositioning and relentless search for new stylistic and conceptual solutions (see exhibit 4). Apple (personal computers) Since its foundation, the company has pioneered aesthetic and conceptual innovation in the personal computer industry. In 1997, renewed attention to product design – as witnessed by products like iMac and iBook –was central to the turnaround strategy orchestrated by returning founder Steve Jobs (see exhibit 1). Bang & Olufsen (consumer electronics) For decades, a unique design philosophy has differentiated Bang & Olufsen from its larger competitors. In early nineties, a revision of design principles and policies supported refocus of brand identity and expansion of the product range (see exhibit 7). Electrolux, Zanussi division (home appliances) The Zanussi Industrial Design Center routinely explores new product concepts, driving periodic renewal in existing product lines. In late nineties, highly innovative products such as Oz refrigerator and Jetsy washing machines have been used to support brand policies and re-positioning at a regional level (see exhibit 8).	Kartell (furniture) For three decades, Kartell has pioneered technological innovation in plastic furniture. During the eighties, the company declined due to lack of inspiration and the decreasing appeal of plastic. In early nineties, the collaboration with creative emerging designers stimulated the refinement of core capabilities in plastic technologies and supported renewal of product lines and revamping of brand image (see appendix B) Nokia (mobile phones) The serendipitous discovery of a large segment of style-conscious users in the market for mobile phones, and the subsequent revision of design and marketing policies contributed to the outstanding growth of the company in mid nineties and to its rising as one of the most valuable global brands (see exhibit 5). Oticon (hearing aids) Radical organizational changes in early nineties were followed by revolutionary approaches to product design, reflecting a new philosophy centred on improving quality of life of hearing impaired people (see exhibit 6) Philips (consumer products) Under the leadership of Francesco Marzano, the design centre has explored creative applications of advanced technologies to consumers' latent needs and desires. The work of Philips Design has encouraged rethinking of the connections between design and strategy formation, and inspired renewal in areas such as domestic appliances, personal care, and medical devices (see introduction and table 6). Sony (consumer electronics) The Sony Design Centre has historically pioneered innovation in consumer electronics, stimulating diversification and renewal of product lines based on creative applications of new technologies and development of entirely new product concepts (see Appendix B). Swatch (wristwatches) Early Swatch watches combined inexpensive reliable technology with an appealing style, and introduced fashion dynamics in the market for wristwatches. Frequent innovation in style and shapes was due to an unusual mix of industrial designers and artists, and sustained brand positioning as a market leader and innovator.
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Table 2. Design-driven strategic renewal: the main phases

Phases		Description
Product development phases	Generation of ideas	Designers periodically submit ideas for new products. Some ideas follow established design principles, build on existing capabilities, and conform to current style. Others introduce innovation in formal and functional features, departing from the current design philosophy.
	Evaluation and selection of ideas	Some ideas are discarded for lack of feasibility or fit with corporate features. Others are selected and receive funds for further development, exploring new technologies, concepts and styles.
Organizational development phases	Revision of the design philosophy	External feedback on products leads to question established beliefs about market segmentation, user needs and lifestyles, cultural values, etc. Design philosophy is updated following indications from the environment.
	Diffusion of new ideas	Awareness of core elements of the design philosophy is promoted throughout the organisation and across its boundaries. Substantial and symbolic actions are meant to ensure consistency of marketing efforts, and orient generation of new ideas.

Table 3. Phase one: Generation of ideas

The role of managers	Examples
Establish the strategic relevance of design with substantial and symbolic action.	• At Apple Computers, after the return of founder Steve Jobs, design has recovered centrality in the corporate agenda. The industrial design centre has regained enthusiasm and inspiration, leading to commercial blockbusters such as iMac, iBook, and iPod (see exhibit1). • At Sony, proposals for new products often originate from the Sony Design Centre. Quarterly, new concepts and product ideas are presented to managers from the rest of the group. From founders Akio Morita and Masaru Ibuka to current CEO Nobuyuki Idei, top managers are used to visiting the Centre periodically and to sharing their observations with designers. Mr. Idei himself has directed the Centre between 1990 and 1993. • At Kartell, Artemide, Alessi and other so-called “design factories”, top managers personally acted as design managers, by contacting, selecting, hiring and interacting with renowned freelance designers, and often supervising the development process of major projects. • At Nokia, the relevance of design for the corporate strategies was emphasized by the appointment of chief designers Frank Nuovo as Vice President for Design. At the time of our study, Jonathan Ive, director of the Apple Industrial Design Group, held a similar position in the corporate hierarchy.
Encourage and shelter the autonomous development of designers’ ideas.	• In the Electrolux group, while much designers’ work involves incremental adjustments to existing product lines, directors of local design centres in Nurnberg and Pordenone enjoy considerable freedom to explore new forms and product concepts. Bold stylistic or technological solutions introduced by conceptual prototypes or high-end, niche products, often trickle-down to lower lines aimed at a broader audience (see exhibit 8). • New seasonal collections at Swatch emerge from a multiple-level evaluation of proposals from the design group. However, collections “Vendome” and “Spiga”, sold exclusively in France and Italy respectively, provide designers at Swatch Lab with a space to experiment variations in shapes, patterns and materials, while regular collections will include less daring, more saleable versions. • At Bang & Olufsen, internal designers belonging to an organizational unit called “Idealand” collaborate with designer David Lewis to autonomously explore new product concepts. Ideas are then passed on to the development unit for an assessment of technical feasibility. Development engineers are pushed to look for creative solutions for overcoming them, before proposing alterations or rejection due to technical problems. • In 1989, discomfited designers at Sony Design Center autonomously developed a series of concepts, code-named Spirit, that were meant to reinterpret the older values of design at Sony: craftsmanship, integrity and simplicity. Their results became a “genetic blueprint” for the following generations of Sony products.

Table 4. Phase two: Evaluation and selection of ideas

The role of managers	Examples
Implement a consistent product policy, providing strategic coherence to the stream of new products.	• Turnaround at Apple was facilitated by the dramatic reduction of developmental projects – from 350 to 10 in a few years – operated by Gil Amelio and, later, by Steve Jobs. Jobs concentrated efforts on fewer but more promising projects and articulated clear product strategies, where peculiar design would stress and reinforce product positioning. He explicitly connected new product development to its main target audience: consumers and professionals. A rigorous “conceptualization” phase at the beginning of product development was instituted, encouraging designers to clearly spell out the goals of the project and to identify a precise target for the product (see exhibit 1). • At Bang & Olufsen, historically, no idea coming from the design centre was ever refused, regardless of costs or commercial viability. In 1992, on the verge of bankruptcy, new CEO Anders Knutsen refused a proposal for a new loudspeaker, sending a shockwave through the company but re-establishing the pre-eminence of business over artistic concerns. • In Italian “design factories”, design managers like Alberto Alessi and Ernesto Gismondi personally supervise the product development process and usually have the final word on proposals. Coherence within brands and product lines largely lie on their personal taste, vision and sensitivity.
Adopt portfolio logic, assessing each idea in light of its contribution to the renewal process.	• In the Zanussi division of the Electrolux group, so-called “flagship products”, such as the Oz refrigerator or the Jetsy washing machines, are intended primarily to contribute to brand positioning. Their development often enjoys preferential funding and faster procedures (see exhibit 8). • At Artemide, CEO Ernesto Gismondi has supported the development of highly original products such as the Metamorfosis collection, which were not really expected to sell more than a few hundred pieces a year, but attracted media coverage, reaped design awards and added to the prestige of the company. Some products have also been kept in the catalogue long after their commercial potential was exploited, as they are meant to qualify the overall image of the portfolio of products. • Alberto Alessi periodically encourages projects such as Richard Sapper’s The Orion Belt or Tea & Coffee Piazza for which commercial concerns are secondary. None of these projects is really expected to encounter commercial success. These projects, however, are meant to contribute to the development of the company as they explore new product typologies and new productive techniques. These projects are also credited for having gradually brought about cultural changes in the company and helped enrich its brand image (see exhibit 4).

Table 5. Phase three: Revision of the design philosophy

The role of managers	Examples
Maintain alertness to environmental signals.	• The unexpected success of Nokia 2110 brought managers to reconsider product and brand policies, in order to address more forcefully the latent demand for more stylish, personalized products (see exhibit 5). • During the eighties, product development at Bang & Olufsen emphasized costly integration between all audio and video sources. Increasing average prices eventually led to sales decline. Later, market research revealed that system integration was not perceived to be a central benefit of Bang & Olufsen's products, leading to the development of stand-alone products like Beosound Century (see exhibit 7). • During the seventies, plastic had come to be perceived as a cheap, uncool, polluting material. In early nineties, the success of experimental products, such as Philippe Starck's Dr. Glob chair, which used sophisticated surface treatment and colouring, was interpreted by Kartell's managers as a sign of an unexploited market niche. The product portfolio was rapidly reconfigured following the new strategy to combine creative design with exquisite finishing and outstanding technical properties.
Stimulate reflection on the validity of current style and concepts.	• At Oticon, facing lagging sales in traditional, cumbersome, awkward-looking behind-the-ear products, the new CEO Lars Kolind challenged the entrenched engineering-driven philosophy of product developers and encouraged them to be more sensitive to how the design of a hearing aid affected its perceived value (see exhibit 6). • At Sony, new CEO Nobuyuki Idei, former head of the Design Center, encouraged a shift in design philosophy of the company, from what he termed "analog thinking" to "digital thinking". The new principles pointed at the need to establish a dialog with users, and to anticipate future convergence of product categories around the same digital information support. • Launched in 1995, the "Human Light" project was triggered by the perceived threat of commoditization of designers' lamps. Artemide's CEO Ernesto Gismondi gathered a team of well-known designers to explore new design approaches centred on the light itself, rather than the lamp. The project eventually led to twelve seminal products – the Metamorfosis collection – that, thanks to an innovative technology based on combined adjustable light sources, used light as a "construction material" to produce effects of high emotional impact.

Table 6. Phase four: Diffusion of new principles

The role of managers	Examples
Encourage the embodiment of the new philosophy in formal statements and managerial tools.	• Since mid nineties, Stefano Marzano, chief design manager at Philips, has elaborated and widely communicated the new philosophy of the design centre, summarized in the concept of High Design (see table 1). Core tenets of the new philosophy (People-focus, research-based, sustainability, etc.) have been exposed in speeches, writings and internal documents (i.e. “Vision Statement for Sustainable Design Directions”) and now permeate work at Philips Design. • In 1993, Bang & Olufsen’s New Vision – “a unique combination of technological excellence and emotional appeal” – was meant to synthesize the essence of the brand as well as the core competences (micro-mechanics, choice of materials, design, etc.) that designers, product developers and marketers were expected to leverage upon (see exhibit 7). • In 1991, pushed by his brothers, Alberto Alessi tried to formalize the principles that had successfully guided his evaluation of new product ideas in the previous decade. Alessi’s “success formula” was formally adopted as a guide and support to the collective evaluation of the proposals received by the company (see exhibit 3).
Promote awareness of design philosophy and brand identity among peripheral actors (distributors, salespersons, etc.) and customers.	• In late nineties, brand managers at Zanussi used the Oz refrigerator to align brand positioning around Europe, and to signal brand values to customers, distributors and the media (see exhibit 8). • In 1996, the Match Point training program was aimed at ensuring that all the independent retailers selling Bang & Olufsen’s products understood the philosophy behind the products and were able to convey it effectively to the customers. The essential mission of marketing activities was redefined: the key task became “to make sure that the distribution chain all the way through to the customer gets the same message.” A test purchasing program was implemented in order to monitor actual dealer behaviour and, develop a range of loyal and specialized dealers. A comprehensive program of training and visits saw more than 600 dealers visiting the headquarters and participating to a training course which demonstrated new products and explained the selection and rejection of functions in the development of Bang & Olufsen’s product concepts in terms of design philosophy and core competencies. • At Artemide, the Human Light project eventually led to “The Human Light Manifesto”: a public statement of brand values rooted in principles inspiring product design, which underlay the company’s effort to provide “flexible” and “adaptable” sources of light to accompany people in their daily activities and to provide “physical pleasure and mental comfort” in different “contexts of life”. The statement emphasized the revised design philosophy as well as the revolutionary technology for computer-controlled manipulation of light incorporated in new product lines. Mono-brand concept stores would present products in real life situations, emphasizing the integration between light and human activity.

Table 7. Design Principles at Bang & Olufsen, The Seven CIC (excerpt)

• Authenticity	“The best sound or picture reproduction is that which comes closest to reality – as experienced by the human being and not by a measuring instrument.”
• Autovisuality	“The company’s products must provide for immediate understanding of their capabilities and manner of operation. Things should be what they look like they are.”
• Credibility	“In products, dealing and action. Product specifications must be given as minimum data to which every apparatus must conform.”
• Domesticity	“Products are designed to be used by people in their homes. They must be problem-free and easy to operate – even though they are technically advanced. Technology is for the benefit of people and not the reverse.”
• Essentiality	“The products must be conceptbearing. Design should be focused on the essentials of the concept. We must simplify and avoid whims and fancies that have nothing to do with the real purpose.”
• Individuality	“Bang & Olufsen is an alternative to the mass-producing giants of the trade. The company develops, manufactures and markets for the people who place greater demands on quality and individuality than the average user.”
• Inventiveness	“New approaches to solving practical tasks should characterise the company and its products. As a small company, we cannot carry out basic research in the electronic area, but we can implement the newest technology with creativity and inventiveness.”

Figure 1. Design philosophy as a mediator between strategy, capabilities and brand.

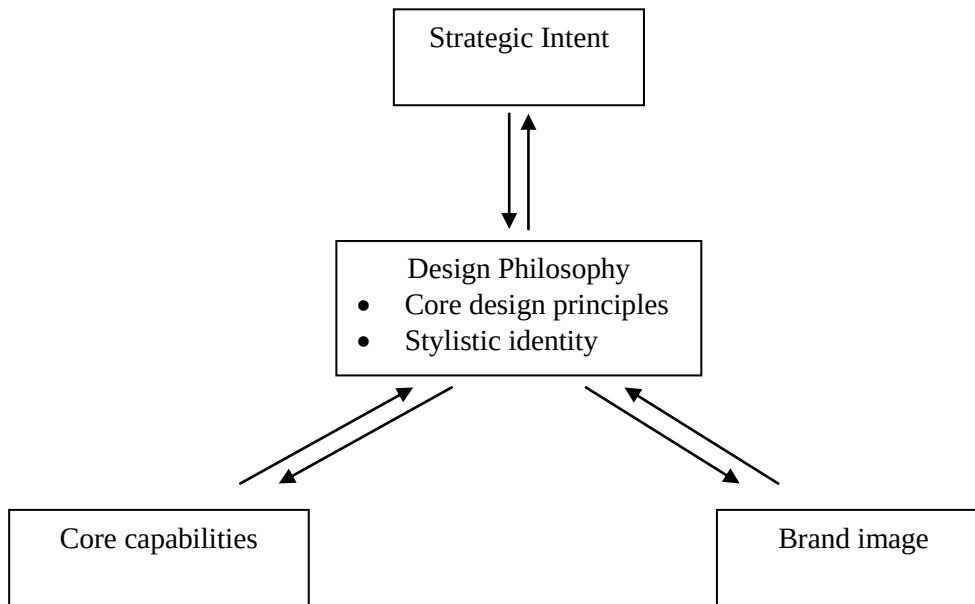


Table 8 Design-driven strategic renewal: key managerial tasks and common pitfalls

	Phases	Key managerial tasks	Common pitfalls
Product development phases	Generation of ideas	▪ Emphasize the strategic relevance of design with substantial and symbolic action. ▪ Encourage and shelter the autonomous development of designers' ideas. ▪ Preserve the integrity of product concepts from pre-mature interference from other functions.	▪ Involving designers late in new product development. ▪ Relegating designers to the role of mere stylists. ▪ Allowing sales and production managers excessive influence over the work of designers.
	Evaluation and selection of ideas	▪ Implement a consistent product policy: provide strategic coherence to the stream of new products. ▪ Adopt portfolio logic, assessing each idea in light of its contribution to the renewal process.	▪ Rubberstamping designers' ideas. ▪ Letting projects proliferate without a strategy.
Organizational development phases	Re-evaluation of the design philosophy	▪ Maintain alertness to environmental signals. ▪ Stimulate reflection on the current validity of style and concepts.	▪ Lack of alertness to signals from the environment. ▪ Lack of willingness to question goals, values and principles.
	Diffusion of new ideas	▪ Encourage the embodiment of the new philosophy in formal statements and managerial tools. ▪ Promote awareness of design philosophy and brand identity among peripheral actors (distributors, salespersons, etc.) and customers.	▪ Unclear indications to external designers and advertisers ▪ Inconsistent sales behaviour.

Table 9. Core design principles: some examples

Apple (personal computers) ▪ User-friendliness ▪ Elegant simplicity ▪ Emotional appeal Alessi (household goods) ▪ Design should address need for art and poetry (design as “commercial art”) ▪ Design should connect with collective imagery ▪ Design should “encourage dreams” rather than satisfy needs ▪ Alessi mediates between the best international designers, the society and the market	Swatch (wristwatches) ▪ Constant change ▪ Provocation ▪ Affordability Philips (appliances, electronics) ▪ Design should be aimed at improving quality of life and try to restore the balance in the natural, social and cultural environment ▪ Design should be based on research and incorporate multi-disciplinary perspectives ▪ Design should help businesses in generating solutions able to stimulate new social behaviour
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Table 10. Stylistic identity: some examples, late nineties

Bang & Olufsen (consumer electronics) Sober, elegant shapes; satin, matte surfaces, anodised zinc and aluminium. Kartell (furniture) Pastel and translucent hues; sophisticated textures and finishing; plastic as core material, occasionally combined with other materials (aluminium, wood, etc.)	Electrolux (home appliances, Zanussi brand) Rounded shapes, curved handles, large knobs and dials; pastel hues, brightly coloured details, stylish graphics. Swatch (wristwatches) Narrow range of standard shapes based on a round case; always changing colours, patterns and materials.
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Appendix A

The conceptual model presented in this paper is based on evidence collected in the course of a research project carried out at Bocconi University and SDA Bocconi School of Management. Our study focused on companies in traditional and high-tech industries. Among the former, we selected companies that are considered outstanding innovators in style, concepts and materials in their respective industries: Alessi (household goods), Artemide (lighting), Kartell (furniture). In the high-tech industries, we focused on companies who emphasize the formal and symbolic aspects of product design, often introducing substantial innovations in product concepts: Apple (personal computers), Bang & Olufsen (audio-video equipment), Electrolux (white goods), Nokia (mobile phones), Oticon (medical devices), Philips (small appliances), Sony (consumer electronics), and Swatch (wrist watches). Our research was based on longitudinal case studies and investigated the way the design process is connected with the process of strategy formation. We examined how design and designers affected or were affected by broader strategic decisions and we investigated the way designers interacted with managers along the process of new product development. Data collection relied on different sources: interviews with managers and designers, annual reports and brochures, in-house magazines and other internal communication tools, internal reports and documents, web sites and other corporate communication tools, corporate biographies and other archival material. Based on a comparative analysis of the interaction between designers and managers across different companies and in different strategic situations, we developed an interpretive framework for understanding how design and designers may contribute to strategic renewal. The analysis of patterns of success and failure helped us identify critical issues to be addressed in different phases of the process. Successive rounds of data collection, and iteration between theory and data helped us refine our emerging interpretations.

Appendix B

The notion of design philosophy is central to our model. We may conceive the design philosophy as a sort of “genetic blueprint” of product development: a set of shared beliefs influencing designers’ decisions about how a product will look and function. Conceptually speaking, a design philosophy is made of two related components: a set of core design principles and a stylistic identity. In essence, *core design principles* are more or less explicit guidelines for designers, aimed at ensuring that all products commercialized by a company or under a certain brand share certain distinctive conceptual and functional features (see Table 9 for some examples). A design philosophy may build on rare technological capabilities – like mechanical micro-movements or human-system interface for Bang & Olufsen, development and treatment of plastics at Kartell, or psycho-acoustics at hearing-aid producer Oticon – or on a distinctive way of managing the design process itself. In fact, effective design principles may be embodied in few simple rules that shape the design process. For instance, since its foundation in 1961, the Sony Design Center has followed simple, yet powerful, principles laid down by co-founder Masaru Ibuka. The implications of these principles on product policies have been tremendous. An inner push to “always do what has never been done before” has led to an impressive array of “first products” in consumer electronics – including the first tape recorder, the first portable transistor radio, the first home-video system, the first portable stereo cassette player, and the first home CD player. By translating in practice Ibuka’s incitement to “always lead and never follow,” designers at Sony did not let themselves be constrained by market research indicating what consumers wanted, but tried to envision totally new possibilities of consumption.

insert table 9 about here

The concept of *stylistic identity*, instead, refers to a unique and distinctive combination of shapes, colours and patterns, and materials that characterise a company’s products, distinguish them from competitors’, and make them immediately recognisable³¹ (see table 10 for some examples). Style is indeed one the most visible form of differentiation and helps communicate the distinctive principles that underlie product design. An original style may influence the perception of a product or a brand as unique and distinctive and help establish or reinforce reputation as product innovator. Product re-styling may reinforce or alter the perception of a brand, as it stimulates associations (fun, performance, style, reliability, environmental-friendliness, entertainment, poetry, etc.) relevant for

certain target groups³². The conceptual and technological diversity of Apple products, for instance, has been often underlined by original combinations of colour, shapes and surface treatment. Since the very beginning, Apple computers were designed to emphasise ease of use, both in the way they worked and in the way they looked. The anthropomorphic shapes of most Macintosh series – the upward tilt and the characteristic protruding “chin”, the tiny plastic feet of Macintosh LC, the “breathing” vents – were meant to establish a personal, emotional connection between the user and the machine, and to support the overall perception of the brand as “user-friendly.” Recently, the curved shapes, translucent plastic and bright colours of the iMac and iBook series emphasized from a visual point of view the way the company, and by transitive property its users, had been perceived for years – original, different, expressive, unconventional.

insert table 10 about here

Just like core principles, unique identities may rest on capabilities of a technological nature. Kartell, a producer of plastic furniture and household products is illustrative of this case. Founded in 1949 to produce plastic equipment for the car industry, Kartell soon extended its product range to household goods, lighting, furniture, and laboratory equipment. In the sixties and the seventies, Kartell was at the forefront of the experimentation and innovation in plastic technologies, reaching exceptional technical and aesthetic qualities, and winning several industrial design awards. In the eighties, however, loss of inspiration, stagnant demand, low productivity, and the deteriorating image of plastic – increasingly considered a poor, polluting and unfashionable material – brought Kartell to the edge of bankruptcy. The turnaround strategy that brought the company back in black in early '90s streamlined the product range, focusing on specific and related product categories (chairs, tables, stools, etc.), and capitalised on unique capabilities for the treatment of polypropylene, polystyrene and polyethylene surfaces and colouring. The new philosophy emphasized innovation in colours (introducing new pastel hues, beside the traditional red, white and black), textures (satin, transparent, translucent) and shapes. International talents, such as Philippe Starck, Ron Arad and Antonio Citterio, were offered the possibility to express their innovative ideas through Kartell's unique competencies in moulding, bending and finishing plastics.

¹ C. Lorenz, *The Design Dimension, The New Competitive Weapon for Business*, Basil Blackwell, London (1986); V. Walsh, R. Roy, M. Bruce and S. Potter, *Winning by Design*, Basil Blackwell, London (1992); J. Thackara, *Winners! How today's companies innovate by design*, Gower Publishing, Aldershot (1997); M. Trueman and D. Jobber,

Competing through design, *Long Range Planning*, **31**, 594-605.

² E. C. Hirschman and M. B. Holbrook, *Symbolic Consumer Behavior*, Association for Consumer Research, Ann Arbor (1980); G. McCracken, *Culture and Consumption – New Approaches to the Symbolic of Consumer Goods and Activities*. Indiana University Press, Bloomington (1988).

³ M. Douglas and B. Isherwood, *The World of Goods. Towards an Anthropology of Consumption*, Basic Books, New York (1979); P. Bourdieu, *Distinction: A social critique of the judgement of taste*, Routledge, London (1986); M. Csikszentmihalyi and E. Rochberg-Halton, *The Meaning of Things: Domestic Symbols and the Self*, Cambridge University Press, Cambridge (1981).

⁴ In 2002, according to the annual ranking published by Business Week, five out of the top ten brands belonged to high-tech companies (Microsoft, IBM, GE, Nokia and Intel). In total, 17 brands, including Sony, Samsung, Apple and Philips, appeared in the top fifty positions (*Business Week*, August 5, 2002, 95-99). See also B. Schmitt and A. Simonson, *Marketing Aesthetics: The Strategic Management of Brands, Identity and Image*, The Free Press, New York (1997); S. Ward, L. Light and J. Goldstine, "What high-tech managers need to know about brands", *Harvard Business Review*, **July-August**, 85-95 (1999).

⁵ C. W. Baden-Fuller, and H. Volberda, "Strategic Renewal. How large complex organizations prepare for the future", *International Studies of Management and Organization*, **27**, 95-120 (1997)

⁶ C. Baden-Fuller and J. M. Stopford, *Rejuvenating the mature business*, Harvard Business School Press, Cambridge (1994); J. M. Stopford and C. Baden-Fuller, "Creating Corporate Entrepreneurship", *Strategic Management Journal*, **15**, 521-536 (1994).

⁷ D. Miller and P. Friesen, "Momentum and revolution in organizational adaptation", *Academy of Management Journal*, **23**, 591-614 (1980); M. L. Tushman and E. Romanelli, "Organizational evolution: A metamorphosis model of convergence and reorientation", in L.L. Cummings and B. Staw (eds.) *Research in Organizational Behaviour*, **7**, 171-222, 1985.

⁸ E. Romanelli and M. L. Tushman "Organizational transformation as punctuated equilibrium: An empirical test", *Academy of Management Journal*, **37**, 1141-1166 (1994).

⁹ H. Volberda, C. Baden-Fuller, and F. A. J. van den Bosch, "Mastering Strategic Renewal. Mobilising renewal journeys in multi-unit firms", *Long Range Planning*, **34**, 159-178 (2001); C. W. Baden-Fuller, and H. Volberda, op. cit.

¹⁰ D. Dougherty, "A practice-centered model of organizational renewal through product innovation", *Strategic Management Journal*, **13**, 77-92 (1992); R.A. Burgelman, "Intraorganizational Ecology of Strategy Making and Organizational Adaptation: Theory and Field Research" *Organization Science*, **2**, 239-262 (1991); S. L. Brown and K. M. Eisenhardt, "The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations", *Administrative Science Quarterly*, **42**, 1-34 (1997).

¹¹ Burgelman, op. cit.; T. Noda and J. L. Bower, "Strategy making as iterated process of resource allocation", *Strategic Management Journal*, **17**, 159-192 (1996); B. Lovas and S. Ghoshal, "Strategy as guided evolution", *Strategic Management Journal*, **21**, 875-896 (2000).

¹² Using a terminology borrowed from literature on organizational change, renewal processes occurring at product and organizational level may be interpreted as "first-order" and "second-order" changes respectively. C. Argyris, and D. Schön, *Organizational learning: A theory of action perspective*, Addison-Wesley, Reading, MA (1978); J. Bartunek, "Changing interpretive schemes and organizational restructuring: The example of a religious order", *Administrative Science Quarterly*, **29**, 355-372 (1984). While renewal in products lines frequently occurs within the boundaries of existing interpretations about technology, markets, users, etc. (first-order changes), at times environmental feedback may trigger broader changes in the interpretations of designers and managers, resulting in a revision of design principles and strategies.

¹³ In this article, by managers we generally refer to people in various positions – marketing managers, product managers, product developers, often even top managers – who take charge of product development and interact directly with designers as well as other functional managers. The actual denomination may vary, also according to the size and complexity of the company. Ideally, effective management of design-driven renewal benefits from a direct involvement of top managers. In some companies observed, however, product developers had considerable influence over other functions (operations, sales, etc.) and enough power to affect strategic decisions.

¹⁴ H. Simon, *The sciences of the artificial*, The MIT Press, Cambridge (1998).

¹⁵ In these companies, the design philosophy tends to be among the core and distinctive features of the organisation. In other words, the design philosophy is at the heart of the organisational identity, and as such is subjected to the conflicting needs to periodically adapt to changing external conditions, while at the same time preserving a sense of continuity and connection with the corporate heritage. See Albert, S. and Whetten, D.A. (1985) "Organizational

identity". In Cummings, L.L. and M. M. Staw (eds.) *Research in Organizational Behavior*, 7, 263-295; Gioia, D., Schultz, M. and K. Corley, "Organizational identity, image, and adaptive instability", *Academy of Management Review*, 25, 63-81 (2000).

¹⁶ Borrowing a terminology from James March, we may observe how some projects *exploit* the current pool of resources and capabilities, while other projects *explore* novel combinations. See J. G. March, "Exploration and exploitation in organizational learning", *Organization Science*, 2, 71-87 (1991).

¹⁷ Gemser, G. and M. Leenders, "How integrating design in the product development process impacts on company performance", *Journal of Product Innovation Management*, 18, 28-38 (2001).

¹⁸ Brand image can be defined as a meaningful set of associations that consumers relate to a brand – i.e. a name, logo or other sign identifying a specific product or producer; see K. Keller, *Strategic brand management*, ??? (1997)

¹⁹ Chris Bangle, chief design manager at BMW has expressed a similar view. See C. Bangle "The ultimate creativity machine. How BMW turns art into profit", *Harvard Business Review*, January, 47-55 (2001).

²⁰ See also K. B. Clark and T. Fujimoto, "The power of product integrity", *Harvard Business Review*, November-December, 107-116 (1990).

²¹ March, op. cit.

²² M.T. Amabile, R. Conti, H. Coon, J. Lazenby and M. Herron, "Assessing the work environment for creativity", *Academy of Management Journal*, 39, 1154-1184 (1996).

²³ See for instance S. Wetlaufer, "The perfect paradox of star brands. An interview with Bernard Arnault of LVMH", *Harvard Business Review*, October, 117-123 (2001).

²⁴ Noda and Bower, op. cit.; T. K. Lant, F. J. Milliken and B. Batra, "The role of managerial learning and interpretation in strategic persistence and reorientation: An empirical exploration", *Strategic Management Journal*, 13, 585-608 (1992); M. Zollo and S. Winter, "Deliberate learning and the evolution of dynamic capabilities", *Organization Science*, 13, 339-351 (2002); M. M. Crossan and I. Berdrow, "Organizational learning and strategic renewal", *Strategic Management Journal*, 24, 1087-1105 (2003).

²⁵ J. M. Mezias, P. Grinyer and W. D. Guth, "Changing collective cognition: A process model for strategic change", *Long Range Planning*, 34, 71-95 (2001)

²⁶ A. Wernick, *Promotional Culture. Advertising, Ideology and Symbolic Expression*, Sage, London (1991); McCracken op. cit., P. du Gay (Editor), *Production of Culture. Cultures of Production*, Sage, London (1997).

²⁷ "To make artefacts sell, designers have to embody culture in the things they design. (...) In addition to creating artefacts with a specific function, designers are also in the game of making those artefacts meaningful. In other words, design produces meaning through encoding artefacts with symbolic significance; it gives functional artefacts a symbolic form (DuGay et al., 1997, op. cit., p. 62).

²⁸ See the replication process described by Zollo and Winter, op. cit.

²⁹ A notable exception is A. Dumas and H. Mintzberg, "Managing Design, Designing Management", *Design Management Journal*, 1, 37-43 (1989).

³⁰ See for instance Kotler, P. and Rath, G. A. (1984) op. cit.; Lorenz (1986), op. cit.

³¹ The concept of stylistic identity builds on research conducted in the fashion apparel industry, which highlighted the connections between a recurrent set of stylistic codes and brand recognition; see G. Comboni and F. Molteni "Prodotto moda e isola stilistica", *Economia & Management*, 2, 20-29 (1994).

³² See the special issue of the *Design Management Journal*, "Designing Identity-Designing Brand and Managing Customer Perceptions", 12 (2001).