普通高等院校规划教材

工业设计专业英语

第2版

何人可　张兵　江建民　编

ENGLISH FOR INDUSTRIAL DESIGN

2nd Edition

北京理工大学出版社
BEIJING INSTITUTE OF TECHNOLOGY PRESS

English for Industrial Design

工业设计专业英语

（第二版）

何人可　张　兵　江建民　编

章晋新　主审

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第二版前言

《工业设计专业英语》于1999年9月出版以来，已先后重印了多次，受到了本专业学生的欢迎。一些同学还在网站上开辟了有关本书的论坛，交流学习专业英语的经验和心得。四年来，国际国内工业设计专业都发生了巨大的变化，无论是设计的理论研究、设计技术，还是设计对象都有了很大发展。随着我国加入WTO，和国外工业设计界的交流与合作日益频繁，各种国际设计论坛、设计竞赛、设计培训等设计学术活动日渐增多。国际知名的设计公司纷纷来中国设立事务所，许多跨国公司也开始在中国成立自己的设计中心，并着力培养具有国际视野，又有本土文化背景的设计人才。与此同时，国内的企业为了应付日益激烈的国际竞争，也要求设计师对国际市场有充分的了解，并能与国外的厂商进行有效的沟通。这些都对设计师的专业外语水平提出了更高的要求，本书的内容也必须进行适当的修订，以适应新的形势的需求。另一方面，经过四年来的教学实践，读者也对本书提出了一些中肯的修改意见。有鉴于此，我们对《工业设计专业英语》进行了相应的修订。

《工业设计专业英语》(第二版)保留了初版的结构，但更换了1/3的课文。新的课文反映了工业设计专业的理论研究和实践在近年来的最新发展，有的文章摘自新出版的理论著作，有的文章是最新设计软件和新近获奖的优秀设计的介绍，还有的则是对新兴的网页设计的探索。新版《工业设计专业英语》还增加了有关中国工业设计发展的内容，从外国人的角度来看中国的设计。通过这些新课文，读者可以了解到四年间国际工业设计的新成果和新动向，同时也可以提高自己的专业英语能力和水平。

湖南大学何人可负责《工业设计专业英语》(第二版)的修订工作，张朵朵参与了部分工作。

何人可

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Unit One
Design History and Theory

Lesson 1 Towards the Millennium

With the 1970s came an end to the domination of a single international design movement. While on the one hand Modernism continued to come under attack and to be widely discredited, on the other hand latter-day modernists set out to prove the validity of this movement and to persuade us that, even with changing economic, social and cultural conditions, the impulse of technological progress would lead us into a bright future.

As with early Modernism the hottest debate took place within the world of architecture, with design following. The discussion about Postmodernism and its relation to material culture was stimulated by the work of American architects such as Robert Venturi and Michael Graves, who made cases for influences from pop culture and for stylistic revivalism, whether of the classical past or of Art Deco motifs. What was clear from the debates that accompanied critiques of their work was that, stylistically at least, alternatives to Modernism were in place and that the most important theme of the last three decades of the century was going to be pluralism – the fact that no one single architectural or design theory or approach was going to be pre-eminent any longer. This open-endedness echoed the fragmentation of western society and the emergence of what came to be called "niche markets". Postmodern architecture reflected this diversity. In Great Britain it adopted a conservative approach in the nostalgic neoclassicism of Quinlan Terry and Terry Farrell, whereas in France and Spain it was more forward-looking.

While architects discussed the valid style of the day, rather like their 19th-century predecessors, designers in the 1970s also had other things to consider. These included the effect of the oil crisis on the cost of plastics and society's growing interest in ecological issues such as recycling. These took the emphasis away from the debate about style and suggested a more serious social role for designers in terms of their relationship with the manufacturing industry. The general sense of a developing disillusionment with technology and all that it had promised also threatened to undermine the very premise on which modern design had been established. All these fears and anxieties were temporarily forgotten, however, when in the early 1980s design showed that it was as capable as architecture of raising its cultural profile and becoming a central focus of discussion. The catalyst for the new popular awareness of design emanated, not surprisingly, from Italy. The Memphis exhibition, held in Milan in 1981 to coincide with the city's annual furniture fair, was a turning point. With the help of his young colleagues, and with support from sympathetic non-Italians as well, Ettore Sottsass blasted the international design

establishment with a show of objects that turned all the familiar values upside down. The Memphis designs for furniture and related items were brightly colored, decorated and eccentrically shaped with countless visual references to past styles. For the first time design, without the crutch of architecture, was proclaiming itself to be free from the restraints of Modernism and in tune with the post-industrial age. The impact was felt internationally and such was the Liberating effect of this event that individuals in many other countries – including France, Spain, Germany, Holland, Great Britain, Czechoslovakia and Japan – aligned themselves to what Sottsass himself dubbed "the New Design".

Called "the designer decade", the 1980s enjoyed another worldwide consumer boom and the now fully democratic concept of design took on a new meaning in the context of this affluence. The word "designer" was tagged to any commodity that promoted itself as special, from hairdressers to jeans. In the mass-market context of the late 20th century the term "designer" implied a level of individualism and taste that was reassuring to people who wanted to be different. While this may have been just a new marketing strategy, one side effect was the popularization of the concept of design and of designers. Designers became celebrities along the lines of the American industrial designers of the 1930s. Not only Europe, but also Japan and increasingly Korea, Singapore and Chinese Taiwan were learning the benefits of having an advanced design culture. In this diverse climate many different styles were on offer, from the radical post-Memphis experiments, to the more serious High-Tech style, which encouraged the use of industrial materials in a non-industrial context. Some companies, such as the Italian metalware firm Alessi, prioritized design over all else, commissioning celebrity designers to create objects for them that rapidly achieved cult status. Design culture spread, and institutions such as the Design Museum in London, which opened in the mid-1980s, provided its public face.

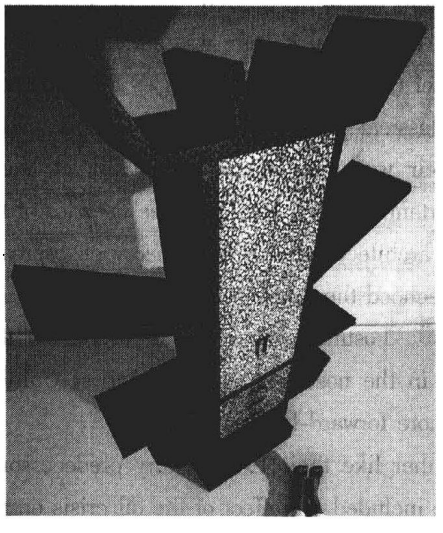

Figure 1 – 1

Sottsass designed the "Casablanca" sideboard for the first Memphis show in 1981; *it is one of the best known of all his pieces, and an icon of Post-modern design. The sideboard's powerful silhouette suggests some kind of space-age robot; the surface is covered with an Abet-Print plastic laminate printed with Sottsass' "Bacterio" pattern.*

While these developments succeeded in giving the designer a higher profile, granting him or her a place in the cultural hierarchy alongside fine artists and architects, it also had the effect of aligning the concept of design very closely with advertising and marketing. The effect of this was to underplay its more fundamental role as an element within the production process and as part of the everyday material environment. When the bubble finally burst and designer culture, along with the economy, took a downward turn at the beginning of the 1990s, designers had to think of ways of overcoming the superficiality that had characterized the 1980s.

The liberating effects of the early 1980s were still felt and it was possible for designers to work outside Modernism,

now with a more mature set of alternative models at their disposal. Equally, however, the values inherited from the early century came back into focus as some designers recognized the continuing significance of these early ideals. Now there were no contradictions, because, with no dominant design theory to react against, each approach could be judged on its own merits. Some designers still wanted a level of celebrity; some preferred a more behind-the-scenes approach. Most understood ecological imperatives and incorporated them into their visions. Above all the design world at the end of the 20th century became global, with awareness that it was no longer possible to think just in terms of local or national identities. From modest beginnings in the hands of a few individuals who sought to create an improved material world that reflected the modern age, design had blossomed into a force affecting nearly every aspect of modern life.

New Words

1. pre-eminent	/pri(:)'eminənt/ *adj*.	突出的,高于所有其他的或比所有人都显著的;杰出的
2. open-endedness	*n*.	开放性
3. disillusionment	/ˌdisi'lju:ʒənmənt/ *n*.	幻灭,觉醒,失望
4. premise	/'premis/ *n*.	前提
5. catalyst	/'kætəlist/ *n*.	催化剂;接触剂
6. emanate	/'eməneit/ *v*.	散发,发出,发源,发散,放射
7. crutch	/krʌtʃ/ *n*.	(跛子用的)拐杖,支撑,帮助
8. dub	/dʌb/ *vt*.	授予…新称号,把…称为
9. tag	/tæg/ *vt*.	加上标签;拴上铭牌
10. celebrity	/si'lebriti/ *n*.	名人,名声
11. cult	/kʌlt/ *n*.	崇拜,风靡一时(常用于修饰另一个名词)
12. hierarchy	/'haiərɑ:ki/ *n*.	层次,层级
13. underplay	/ʌndə'plei/ *vt*.	对…轻描淡写,冲淡…的重要性;掩饰
14. merit	/'merit/ *n*.	优点,价值;功绩
15. imperative	/im'perətiv/ *n*.	责任;义务

Phrases and Expressions

1. come under attack 遭抨击
2. in place 在适当的位置
3. coincide with 与…相符
4. side effect 附带结果,副作用
5. at one's disposal 随某人自由处理,由某人随意支配

Notes

This open-endedness echoed the fragmentation of western society and the emergence of what came to be called "niche markets". 这种开放性反映了西方社会的分化和所谓的"特定市场"的出现。

"niche markets"在商业上指的是针对特定消费群的、占市场份额不大的市场。

Free Reading

1. AALTO, Alvar(1898 - 1976)

Finnish architect and designer. Aalto studied architecture at the Polytechnic in Helsinki from 1918 to 1921. He established himself as an architect in 1923, and his Sanatorium at Paimio (1929 - 1933) is a classic of International Modern architecture. At the same time he began to design plywood chairs, and in 1935 set up a firm, Artek, to market his simple and successful furniture. Some of his plywood is cantilevered like Bauhaus tubular steel, but clearly softer in finish. His furniture was successful in England and in America and prompted other experiments in that direction, notably by Jack Pritchard. From 1937 he designed glass for Iittala, using asymmetrical shapes and subtle curves. Though part of the International Modern movement, Aalto was always sensitive to brick as a material, and he was one of the gentler exponents of Modern forms.

2. BEHRENS, Peter (1869 - 1940)

German painter, graphic designer and architect. He was a graphic artist until 1901 when he built his own house at the Darmstadt artists' colony, two years after having been invited there by its patron, the Grand Duke Ernst Ludwig. From 1906 he established the "corporate identity" of AEG, the vast German electrical company, producing architecture, graphics, kettles, fans and clocks for the firm. In 1907 he became a founder of the Deutscher Werkbund. At one time in 1910 Le Gorbusier, Gropius and Mies van der Rohe all worked in his office. Behrens has been called a pioneer of Modern design, but this preservation of the traditions of the Renaissance and Schinkel suggest how far he was in fact a classicist.

3. RUSKIN, John (1819 - 1900)

British writer and critic. Ruskin was educated privately and at Christ Church, Oxford, from 1837 to 1842. In 1843 he published the first volume of his *Modern Painters*, completed in 1860. He became interested in architecture, and the Gothic style in particular, publishing *The Seven Lamps of Architecture* in 1849 and *The Stones of Venice* in 1851 - 1853. He wrote prolifically, and inspired Morris and the Arts and Crafts movement to turn away from industry for aesthetic and social reasons. He disliked railway trains, glass and iron, machine ornament and any decoration which lacked truth to materials, and wrote, for example, about the "fatal newness" of veneered rosewood furniture. The Stones of Venice contains a chapter "on the Nature of Gothic" in which the beauty of medieval craftsmanship and architecture is equated with the joy experienced in its creation. Ruskin met Morris in 1857; Mackmurdo studied under him at Oxford in 1873 when Ruskin was Slade Professor of Fine Art (1870 - 1879). He held that post again from 1882 to 1884, and although increasingly arbitrary in his judgements, and sometimes even insane, he influenced the whole of the second half of the nineteenth century. His influence was also felt in America, where Charles Eliot Norton was a friend of his, and "Ruskinian Gothic" architecture began to be produced as early as 1863.

4. LOEWY, Raymond (1893-1986)

French designer, naturalized American. Loewy trained in France as an engineer and moved to New York after serving in the First World War. He was a graphic and theatre designer until 1929, when he streamlined a Gestetner duplicating machine. He set up his design office in the following year, and redesigned the "Coldspot" refrigerator for Sears Roebuch in 1934, Greyhound buses in 1935 and streamlined locomotives for the Pennsylvania Railroad in 1937, as well as Electrolux appliances in 1939. Loewy became one of the best-known international designers, with offices in New York, Paris and London, and went on to produce objects for the NASA space programme until 1972. He was so prolific that in the 1950s an estimated 75 per cent of Americans came into contact with one or more of his designs everyday.

5. GROPUS, Walter (1883-1969)

German architect. After studying architecture between 1903 and 1907, he worked for Behrens from 1908 to 1910. His earliest pre-First World War furniture was neoclassical. He was a member of the Deutscher Werkbund and in 1919 succeeded Van de Velde as head of the Weimer School of Arts and Crafts. This became the Bauhaus, first at Weimar and then in 1925 at Dessau, in a new International Modern building designed by Gropius himself. Gropius otherwise designed very little, but as director of the school was a major influence through his selection of staff, for example *Moholy-Nagy*. He went into private practice in 1928, having appointed Hannes Meyer as Bauhaus director. After a period in England between 1934 and 1937, during which he designed some furniture for Pritchard's Isokon group, he emigrated to America to become Professor of Architecture at Harvard. In 1945 he founded the Architects' Collaborative (TAC), which produced, amongst other things, architecture and ceramics for Rosenthal.

6. SOTTSASS, Etoore (b.1917)

Italian architect and designer. Sottsass studied architecture at Turin Polytechnic from 1935 to 1939, and after war service opened his own office in Milan in 1946. He became design consultant to Olivetti from 1958 and set up a design studio for the company at Ivera, near Turin, in 1960. He designed the "Elca" computer for Olivetti in 1959, as well as the "Praxis" and "Valentine" typewriters in 1963 and 1969. Besides producing such examples of "good form", Sottsass became a father-figure of "anti-design" in the 1960s. He produced furniture based on Pop Art for Poltronova from 1966, and Indian-inspired ceramics in 1969. The anti-design aspect of his work increased after 1979 when he became associated with Studio Alchymia, and in 1981 he formed the Memphis group, which continues this tradition. Of late, Sottsass's Memphis designs – for example his "Hyatt" table of 1984 – even pay homage to Post-Modern Classical work by Hollein. The ambiguity of Sottsass's approach to design makes him a key figure in Post-Modernism, in that he is able to reject "good form" where necessary for the sake of light relief.

Lesson 2 Designed in Italy? No, in China

Behold Black & Decker's fleet of new irons. With their streamlined styling, you might imagine they sprang from some hip industrial design firm in Milan or London. But guess what: Their pleasing contours came from drafting boards in China's Guangdong province. The Chinese "are surprisingly in touch with design trends," says Steven Hecker, director of new-product development at Applica Consumer Products, which makes Black & Decker Corp. small appliances under license.

China is no longer content with being just the workbench of the world; it wants to become a force in industrial design, too. The country boasts no fewer than 200 design schools that churn out as many as 8,000 graduates a year. And hundreds of the top Chinese students are flocking to the best U.S. and European graduate programs in design. "It really blows my mind how dedicated they are," says Tim Parsey, director of consumer-experience design for Motorola Inc.'s Personal Communications division, which has an eight-person design team in Beijing. He's not the only one who's impressed. Executives at General Motors, LG Electronics, and Electrolux have all hired hundreds of hot young local designers to create products tailored to China's domestic market.

Of course, these are still the early days of Chinese product design. So far, most of the work has been limited to tweaking colors or shapes of existing products. Conceptual work for new appliances or electronic gadgets is usually done in Europe or the U.S. "They have good designers, but they don't know the U.S. market" in many products, says Jerry W. Edwards, executive vice-president of merchandising for retailer Home Depot Inc., which works closely with Chinese subcontractors to produce items such as faucets and ceiling fans. And most of the work is offered free of charge to international companies by Chinese contract manufacturers seeking to gain an edge on rivals as competition heats up. That's great news for people like Applica's Hecker, who can save $100,000 or more each time he wants to refine a product's design.

China's design push is a sign of its maturing economy. Even as it has become an export powerhouse, most products manufactured for the local market have been knockoffs of designs drawn up elsewhere. Now, like the Japanese in the 1970s and the Koreans in the 1990s, Chinese companies are keen to reap the higher margins and growing market share that often reward flashy, well-designed products. "Our goal is the transition from 'Made in China' to 'Designed in China,'" says He Renke, chairman of the industrial design department at Hunan University.

At the same time, mainland consumers are becoming more sophisticated. Chinese shoppers are developing their own tastes, often influenced by cultural needs. Computer-maker Legend Group Ltd., for instance, now makes a touch-screen computer aimed at elderly users uncomfortable with keyboards, which don't lend themselves to Chinese characters.

For a glimpse of China's design potential, take a look at Haier Group Co. The white-goods manufacturer established an industrial design unit back in 1994. Today the clean, cool lines of its refrigerators and washing machines have helped make Haier a global leader in household appliances.

Haier "has a great reputation" for design, says Patrick Whitney, director of the Illinois Institute of Technology's design school. If those thousands of freshly-minted design grads have anything to say about it, it won't be long before other Chinese companies start building their reputations, too.

New Words

1. contour	/ˈkɔntuə/ *n*.	轮廓，周线，等高线
2. tweak	/twi:k/ *v*.	调节;调整
3. gadget	/ˈgædʒit/ *n*.	小器具,小配件,小玩意
4. faucet	/ˈfɔ:sit/ *n*.	龙头，旋塞，(连接管子的)插口
5. knockoff	/ˈnɔkɔ:f/ *n*.	翻印本,冒牌货未经授权的复制品或伪制品
6. freshly-minted	*adj*.	新近出炉的

Phrases and Expressions

1. churn out 大量产出
2. blow one's mind 使人感到高兴或者惊愕

Notes

Black & Decker 美国著名电动工具制造商

Free Reading

1. Why Good Design Doesn't Always Guarantee Success

If a customer's total experience surrounding a product is bad, it can supersede everything else about the product, even its outstanding design.

"Good design is, of course, a primary building block of the total customer experience," acknowledges Daniel Cuffaro of Altitude, a Boston-based product design and development firm. But good design in itself does not guarantee a positive customer experience. To achieve that, you need to build customer awareness, make the product easily available, price it properly, package it well, and offer support after the purchase. "When these things are achieved in support of an excellent product," says Cuffaro, "they make three things possible – three things that make up a sort of 'value pyramid.'"

The pyramid's first layer is the capability to bring a product to market. That's just the price of entry – the base of the pyramid. The next layer is more difficult. It involves removing all the "negatives" from the customer experience – any attributes that are likely to disappoint the customer (for instance, auto cupholders that are located in a position or are of a shape that keeps them from being usable). The third layer, the top of the pyramid, involves "surprise" – the kind of pleasant surprise, like the bud vase in the new VW Beetle, that make customers say, "Wow."

Not all factors that affect the total customer experience are controllable. If they were, more products would be successful. Cuffaro offers as an example a restaurant with excellent food but no parking. The food is something the restaurant has control over; the parking may not be. The key to achieving a better

customer experience, says Cuffaro, is to optimize, wherever possible, all the factors that can truly be controlled. And because, for most products, there will always be many factors that are uncontrollable (less than knowledgeable salespeople, lack of availability, and so on), the product manufacturer must maximize the quality of each factor that is within its control. The better optimized these controllable factors, Cuffaro explains, "the greater the likelihood that the customer won't base his or her product opinion on factors the manufacturer has no control over."

Manufacturers that consider all the factors can develop strategies that take into account the strengths and weaknesses of each. For example, if the company's advertising budget is small, customer awareness must be built in other ways. If customer awareness comes mostly by word of mouth, the product concept must be simple and obvious, the design must be recognizable and bold, and the packaging must be designed to educate and reinforce the buyer's decision. Here is where design becomes crucial to any strategy that considers the total customer experience.

Cuffaro concludes with a few crucial points for consideration. For instance: Companies that wish to consider the total customer experience must begin by gaining an understanding of their target customers. They need to map the total experience from the point of view of that customer. And they need to ensure a consistent brand message. Design can help with all these tasks. As Cuffaro points out, good design of a product isn't a guarantee of success; but good design of a total customer experience can take a company a long way toward that goal.

2. Designing Automobiles for Global Value: Ten Market Trends

"We wanted a car we could sell in 42 countries." That was part of Bryan Nesbitt's design brief for Chrysler's PT Cruiser and, indeed, the car sold well on both sides of the Atlantic. The same could be said for Ford's Focus.

"A decade ago," says Tom Lockwood, director of worldwide brand and design strategy for the multinational StorageTek, "the differences between cultural design preferences and the communication inefficiencies caused by geographical distance would have made this kind of international appeal difficult, if not unthinkable. But the Internet now allows designers, engineers, and marketers to disseminate ideas globally in a matter of seconds and keep close track of cultural preferences, trends, and design processes. Designing for global value is becoming crucial for car companies competing in an increasingly international market."

Not only that, but communication technology has companies rethinking their creative processes, internal organization, and design-to-completion time. Companies in different countries now have better tools to, as Lockwood says, look over the shoulders of their competitors. In interviews conducted with German, American, and Japanese manufacturers, Lockwood discovered that the Japanese had been eyeing American innovations to consider how they might increase their own creativity. The Americans had discovered that Japanese organizations had a higher degree of integration and involved vendors earlier, which helped them move from design to market quickly. German companies had for their part observed American companies' efforts to co-locate different departments in the same building, which reaped rewards in brainstorming and team energy.

There is also a lot of cross-fertilization going on with the consolidation of so many companies into conglomerates: Witness the relationships among Ford, Jaguar, Mazda, and Volvo. These former competitors are now free to exchange design processes.

Another trend Lockwood cites is that of automotive design studios going up all over California. One industry analyst, he says, calls Detroit "the intellectual center of the industry," while California is "the creative center, the source of design freshness." Recent concept designs to come out of the Golden State include the Plymouth Prowler, the new VW Beetle, and the Chrysler Concorde.

Development time and engineering time are shrinking with the advent of new modeling technologies and global communications. Automakers are also using fewer platforms, while increasing the choice of bodies and amenities put onto the platforms to provide more choice for the consumer. Fewer platforms mean less development time and cost for new models, which makes it easier for manufacturers to respond to consumer trends in shorter periods of time.

So how are manufacturers going to preserve the integrity of their brands, with all this cross-fertilization and global communication? In order to retain their edge in the market, says Lockwood, Ford, Jaguar, Mazda, and Volvo will all try to retain their separate brand images. What that means is that design will continue to be the differentiating factor. The more globally oriented the auto industry becomes, the greater the role designers will play within it. And, concludes Lockwood, that's great news for car lovers.

3. The Forgotten Bond: Brand Identity and Product Design

Brand identity and product design: Without a doubt, these two are related. You could say that products are the most basic of marketing tools. But somehow, products always seem to be the subject of the brand – never its object. How do you design products that communicate brand values? How do you derive brand values from your products?

Guido Stompff is a product designer for Océ, a Netherlands-based company that develops professional products for the office market and is also the leader of the world market for engineering/CAD environments and for the high-speed printing market. Products, he says, do communicate: They arouse emotions, create experiences, age, and break down. Moreover, identity and brand are strongly influenced by the emotional responses of the users of their products. Stompff describes his own company as "nonhierarchical, responsible, truly customer-oriented, and a bit nonconformist" and, in case-study fashion, goes on to describe the products that have created the Océ brand.

Understanding the concerns of your clients is the first step in defining the brand values that will mean success for your company. First of all, says Stompff, "family resemblance" is preferred above the distinctive appearance of individual products. That is, he says, "you buy 'an Oce,' not 'a 3165,' just as you might buy 'a BMW,' 'a Sony,' or 'an Apple.'" The implication here is that it is best to have an independent design policy rather than simply follow trends. Océ was originally known for its printers; now, solutions for the company's clients include scanners and copiers, as well as applications. Combined, says Stompff, "they create an image of Océ, rather than one of each product separately."

Functionality is another issue that is ever-present in design discussions at Stompff's company, and

the lesson here is: Less is more. "The digitalization of our products and the introduction of new software applications," Stompff points out, "present a host of new possibilities." However, he explains, many – even most – of these possibilities are never incorporated into an Océ product, simply because its clients don't need them. After all, consumers can be truly disappointed if they fail to access a product's functionality because the interaction is too complicated.

Brand values are never the starting points for Océ design projects, says Stompff. Indeed, the opposite is nearer the truth. "Océ designers are part of Océ R&D, where all our products are developed. They developed the company's design language through practical experience, experience that is constantly evolving and gradually adapting the brand's DNA." And this demonstrates one of the main conditions Stompff feels is necessary to design for brand identity – a long-term relation between the designers and the company. The designers need to understand the position of the company or brand. They need to breathe and absorb the culture. This can be achieved in two ways, says Stompff: through having an in-house design studio, or through a long-term relation with a designer or a design office. He explains, "Using new designers for every new product can result in the creation of an array of beautifully designed, award-winning products. However, eventually, you risk losing brand identity – unless, of course, being trendy is one of your values."

Stompff's "reverse" look at product design and brand identity should offer a great starting point for a design discussion. Be sure to include the marketers and business managers!

4. Barriers between Design and Business Strategy

By now, it seems that almost every large company is aware that effective product design and development processes, along with a well-defined product strategy, are crucial to achieving a company's business objectives. Unfortunately, the same cannot be said for small and medium-size firms, which rarely have a coherent product strategy and tend to undertake product development on an opportunistic basis. Anna Filson and Alan Lewis, of the National Centre for Product Design and Development Research (PDR) at University of Wales Institute, in Cardiff, studied 88 SMEs (small and medium-size enterprises) in the UK, and came to the conclusion that there were several compelling reasons for this. Managers, they found, often lacked a long-term vision of the future for their companies. Although they claimed to consider innovation an important part of company strategy, closer examination found little evidence of any planning underpinning new product development. Since innovation rarely occurs except in the context of a well-thought-out-product-development process, this was something of a paradox. It may be, say Filson and Lewis, that managers understand much less about this process than they think. The PDR research showed that they often did not know with any degree of accuracy the costs of developing and manufacturing company products, and were also much less savvy than would have been expected in the area of recent technological developments that were relevant to their industries.

Many of these issues may be a result of the prevailing organizational and operational culture within these companies. For one, "corporate culture at many SMEs tends to reflect the personality and idiosyncratic approach of the owner/manager," say the authors. A goal-oriented and output-focused CEO may find it difficult to think in terms of the process of new product development; he or she is only

interested in getting out as much product as possible in the shortest amount of time. In fact, he or she "may be the prime factor in the height of the barriers between design and business strategy."

Small and medium-size businesses also lack the resources of their larger brethren; they are simply too busy "putting out fires" to spend much time rethinking their processes. Although 59 percent of the PDR sample had documented new product development procedures, these tended to correlate with the larger companies. Also, scarce human resources in smaller companies often means that managers can be found filling in for reception staff or designing publicity material-activities that keep them from fulfilling their strategic role.

"An understanding of factors affecting new product development is critical if companies are to make improvements to their development processes," say Filson and Lewis. "By identifying some of these factors, our research is working to convince senior management to take steps to overcome barriers to improved performance."

5. Serious Play: The Future of Prototyping and Prototyping the Future

Michael Schrage studies design behavior. "Not design thinking," he says, "not design knowledge, but design behavior. Certainly I'm interested in design, and I've always been fascinated by how people behave, but what really gets me is how people behave while they design."

A research associate at MIT's Media Lab and the author of Shared Minds, an inquiry into the nature of collaboration, Schrage took his studies a step farther to produce his 2000 book, Serious Play. This article talks about the shared spaces in which collaboration takes place. By shared spaces, Schrage means "the objects and artifacts" – the prototypes – "that people play with to transform their ideas from notions to innovations."

Why is this important to designers? Because, as Schrage points out, "our media and tools for modeling and prototyping are fundamentally changing... and these changes are accelerating. Things that we couldn't meaningfully model at all five years ago, we can now prototype or simulate fast and cheaply." Companies that want to manage their innovation skills most effectively will pay attention to the quality of shared space – be it a model, a prototype, or a simulation – they use to innovate. This job is custom-made for designers, says Schrage: "What other discipline spends more time creating shared spaces? What other discipline uses models and prototypes as emulations to manage interactions?"

The best designers pay attention to behavior around shared space: "They use the shared space, they use the model, they use the prototype to gain insight and understanding into how people are going to behave.... What is the shared space, and how can you use it? That's the knowledge, the understanding... designers can own."

Schrage illustrates his point with several concrete examples of opportunities gained and opportunities missed by paying attention, or not paying attention, to the use of shared space, ranging from NASA's difficulties with "extravehicular activities" – space walks – during the Gemini missions of the '60s, to Microsoft's successful use of beta versions in the launch of its Windows 95 software ("You lure your customer, your client, into co-designing the product with you.... One nice side effect of this is that, as a general rule, although clients are very quick to throw out work that you do, they're not so quick to

throw out work that they do."). Another method he predicts will become popular is backcasting, the process of "running the numbers according to how you'd like them to be," and then working to see how you can get to the numbers you want. Similarly, designers will say, "Here's what we want the product (or service) to look like; how shall we use our design tools?"

Schrage ends by pointing out that as many prototypes as designers are doing now, they're going to be doing 10 times more in the next three years – probably in digital form. So it's not much of a stretch to believe, as he does, that "tomorrow's design management challenge will be: How will we model and prototype the prototyping process?" Eventually, the most successful companies will be the ones that best manage that process: the shared space of innovation.