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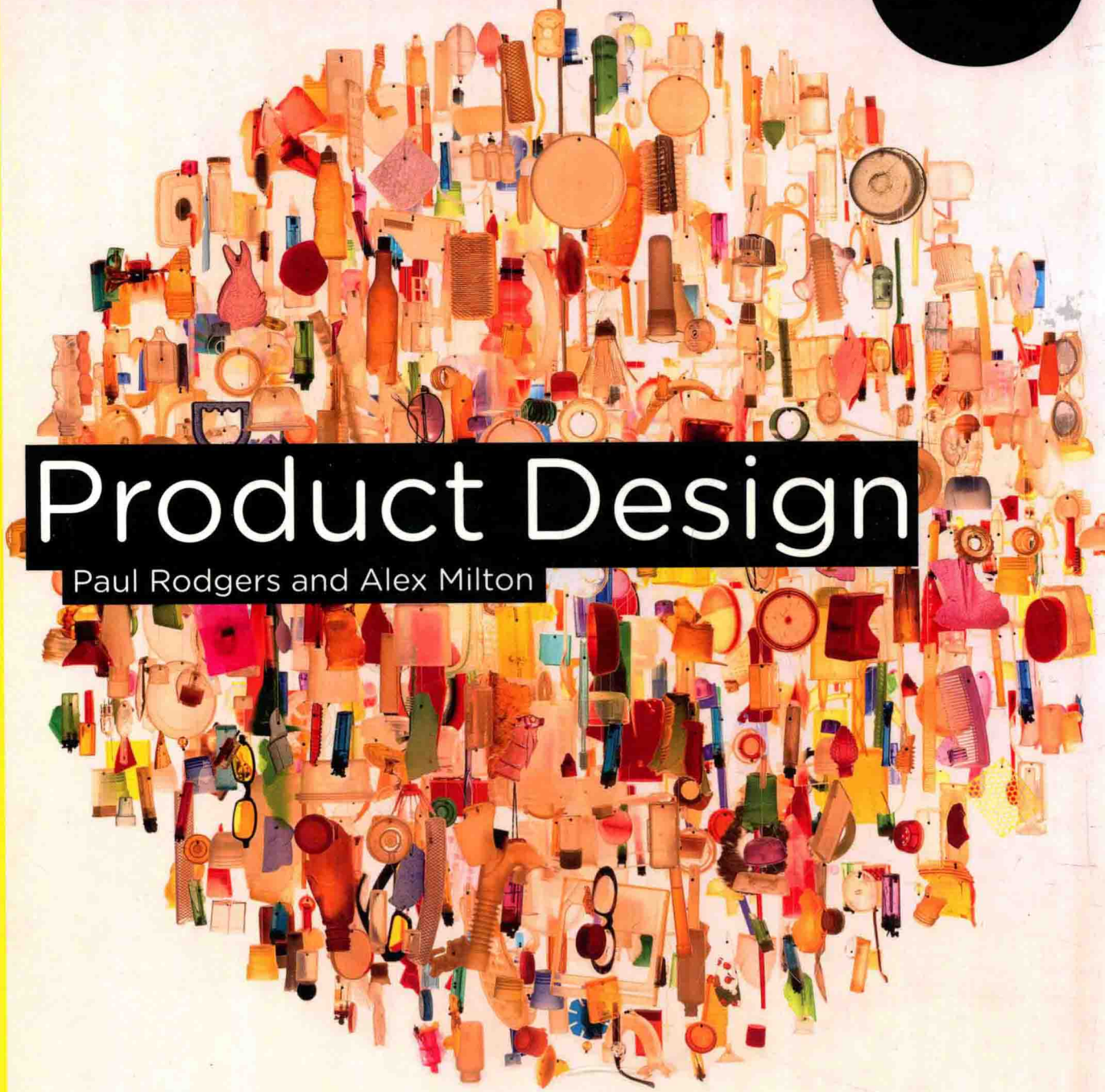

# Product Design

Paul Rodgers and Alex Milton

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Laurence King Publishing

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Chapter openers: (p. 5) Ruminant Bloom by Julia Lohmann; (p. 19) Add-On Radiator by Satyendra Pakhalé; (p. 55) mood board by Tom Harper; (p. 77) Blown fabric lanterns by Nendo; (p. 107) Algue by Ronan & Erwan Bouroullec; (p. 167) Pewter Stool by Max Lamb; (p. 201) page from sketchbook by Tom Harper; (p. 229) Z. Island by Zaha Hadid Architects.

Front cover: Tide, by Stuart Haygarth, 2005.
Back cover: cobi™ chair by PearsonLloyd designed in conjunction with Steelcase Design Studio.

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# Introduction

*It is fair to say that we live in an almost completely designed world. We are surrounded by a multitude of designed products, spaces, systems, services and experiences that have been created in response to some physical, emotional, social, cultural or economic need. In its simplest definition, product design is the design of products, but it also has a wider meaning that includes the generation of ideas, the development of concepts, product testing and manufacturing or the implementation of a physical object, system or service. The role of a product designer encompasses many disciplines, such as marketing, management, design and engineering, and also combines art, science and commerce in the goal of producing tangible artefacts.*

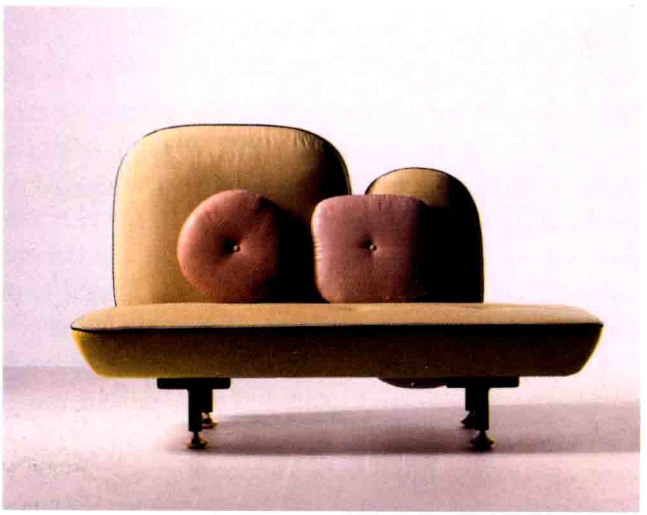
## What is product design?

Product design regularly blurs the boundaries between specialist areas such as lighting, furniture, graphic, fashion, interaction and industrial design. It can encompass the design of products such as spectacles, scissors, cameras, fly swats, waste bins, vases, fruit bowls, telephones, door mats, clothes hangers, razors, bottle stoppers, kettles, cigarette lighters, fire extinguishers, cutlery, salt and pepper shakers, shelving systems, MP3 players and computers. From chairs and lights to consumer and environmental objects, product design is about enriching quality of life, whether in the home, workplace or public domain. Product design is also a commercial activity that can help businesses by ensuring they create and sell products that appeal to, please or challenge consumers. It can provide ways of answering unmet needs, improving function and appearance, or offer new ways of critically engaging with objects. Design is fundamentally about making things better: better for consumers and users, better for business, and better for the world.

The Industrial Revolution, which began in Britain during the eighteenth century, saw the emergence of mass production, with the production of goods revolutionized by new manufacturing processes and the division of labour. Historically, products had been conceived and manufactured by craftspeople, and were often the work of an individual operating within an aesthetic tradition. Manufacturers rapidly identified the competitive advantages designers could bring to their products through divorcing designing and making, and positioning designers as the planners of a complex process. The full integration of design into the industrial production process saw product design become an identifiable discipline, one that has evolved to play an important role in the wider process of developing new products of every type. In some cases this is for high-volume (mass) production, but it can also be for smaller batch production or even one-off products, with designers re-engaging with the notion of neglected craft traditions.

The activity of product design is always relevant to any company manufacturing physical products, and especially consumer (or consumer-facing) products. The word 'product' is widely, and confusingly, used to describe everything, from a life insurance scheme to a new savings account.

**Opposite**
Product designers are directly involved in the creation of a wide range of products. Clockwise from top left: Blanke Ark by Blueroom Designstudio, Innovativoli Industridesign & Kadabra Productdesign, 2008; Craftsman power tool by IDEO for Chervon, 2006; iPhone 3GS by Jonathan Ive and Apple Design Studio, 2009; Girls Ski Helmut by Per Finne for Kari Traa AS, 2008; My Beautiful Backside by Doshi & Levien for Moroso, 2008; Picturemate Printer by Industrial Facility with Epson Design, 2005; and retro design Fiat 500C by Roberto Giolito, 2009, alongside original 1957 model by Dante Giacosa.





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But, wherever 'hardware' and people interact, there you will find product design relevance. Perhaps less obviously, many manufacturers of industrial products benefit greatly from the integration of designers, design thinking and design process into their normal development activities. This is especially true of any manufacturer whose products need an edge in a competitive climate.

For any company involved in the manufacture and marketing of products, the design of the product affects nearly every aspect of the company's business – most obviously and directly on marketing, research and development (R&D), and new product development, but also upon logistics, distribution, sales, public relations (PR) and customer services. This is why senior management typically exerts such interest and influence over the process. Most crucially for a company, the design of its products is invariably the single most important manifestation of its brand.

Public services also make use of product design. This may involve the design of furniture, street furniture, interactive facilities (such as public information points), transport systems and public service equipment (such as fire, police and ambulance), as well as medical, health and even military hardware. They may focus on improving learning, services, environments or other facilities, or simply on enhancing the quality of life for the products' users or operators.

Product design is increasingly being seen as an important strategic tool in creating preference and deeper emotional values for the consumer. Its benefits for the consumer include products that are more usable, attractive, reliable and cost-effective, and that enable greater emotional ties. These benefits may result in the consumer having increased loyalty to the product in question.

## Types of products

Product design covers the range of different types of products outlined below. These classifications are not intended to be viewed as unique or complete, but as fluid and overlapping. Individual products may appear in one or more classification or cross the boundaries.

### Consumer products

The largest category of objects, by some margin, that a product designer is directly involved in is that of **consumer products**. Such products cover a wide range of designed objects including lighting, domestic appliances, medical products, audio-video equipment, office equipment, motor cars, personal computers and furniture. Consumer products need to work on a number of levels: they need to work well (function), they need to look good (aesthetics), and they need to be made available at a suitable cost (to both the client and the customer). A feature of many of these types of product is that they possess numerous components and are, therefore, designed by a team of people including mechanical and electronic engineers, **ergonomists** (who assess the fit between a person and their work, considering the job being done and the demands on the worker, the equipment used, how appropriate

Z. Island by Zaha Hadid Architects, 2006, an example of one-off artistic product design, is a radical innovation in kitchen design that features an intelligent environment for browsing the internet, watching television, or listening to music while cooking.

it is for the task, and the information used) and manufacturing specialists. A vital feature of modern consumer products is that they have an appropriate appearance and operability; they must also project the right brand values of the product and of the manufacturing (or selling) company.

### One-off artistic works

Some classic designed products are considered as much works of art as the works of a designer. The iPod, the Coca-Cola® bottle and the Volkswagen Beetle car are frequently cited examples in this regard. However, the creation of actual one-off limited-edition designed products has been a growing area for product designers in recent years. Many designers regularly create one-off pieces for the yearly design shows at locations throughout the world, such as the Milano Salone, the ICFF (International Contemporary Furniture Fair) in New York, and the London Design Festival. Within the confines of this type of product, appearance is the primary driver; functionality tends to be less important.

**Above**
Folding Plug, designed by Min-Kyu Choi, 2009, 2010 Brit Insurance Design of the Year winner. This ingenious space-saving plug demonstrates how designers can transform an everyday impractical object into something more innovative.

**Below**
Perrier water bottle, an example of a consumable and packaging design.

### Consumables

The next group of products is **consumables** such as packaged butter, motor oil, bottled water, newspapers or fizzy drinks. Here, the focus for the product designer is mainly in the design of the packaging, branding and advertising campaigns. Product designers tend not to be involved in the design of the consumable itself – be that butter, oil or a soft drink – but in the product's packaging, branding, advertising and marketing.

### Bulk or continuous engineering products

The term '**bulk products**' (also known as continuous engineering products) generally covers raw materials used in the manufacture of other products. This includes metal rolled sections, **rod** and **bar stock plastics**, woven sheet and foil, and laminates. Product designers may occasionally be involved in the processes and manufacturing of these products, such as in **embossing** (the process of creating a three-dimensional image or design in paper and other ductile materials), surface texture and finishes for other products.

### Industry products

**Industry products** are items or assemblies that are bought by a manufacturing company for assembling into their own products. The appearance of this type of product is secondary to the primary requirements of functionality and performance. These products include ball and roller bearings, electric motors and controllers, circuit boards, crane hooks and gas turbine engines for aircraft.

### Industrial equipment products

**Industrial equipment products** are self-contained devices (i.e. machines) that perform a complex function and are intended for use within industry. Again, the appearance of this type of product is secondary to its functioning and performance. Among these types of products are industrial work-stations, machine tools, goods vehicles, earth-moving machinery and passenger aircraft.

### Special purpose products

**Special purpose products** include jigs, bespoke tooling, fixtures, special purpose robotics machinery, and specialized manufacturing and assembly machinery. This type of product is usually produced to order as single items (one of a kind) or a small series. The design and development of these products generally takes place specifically for one customer. Product designers involved in the development of this type of product need to be flexible, as the types of tasks change rapidly from one contract to the next. The majority of product design companies involved in this class of product are small to medium-sized enterprises (SMEs).

**Above left**
Jet engine, an example of an industry product.

**Above right**
Airbus A380 passenger jet, an example of an industrial equipment product.

**Below left**
A purified water-filling plant, an example of industrial plant.

**Below right**
KR5 Arc Hollow Wrist robotic arm from Kuka Automation + Robotics, 2008, an example of a special purpose product.

### Industrial plant

**Industrial plant** consists of industrial equipment products and devices to provide control and connections between them. The plant and devices are usually designed to special order and bought from specialist suppliers. This type of product typically incorporates other products, and the task of designing them, and their associated components, is usually the suppliers' responsibility. Examples of this type of product include plant and components for water purification systems, electric power station equipment and telephone networks.

# What does a product designer do?

Product designers design many of the things that we commonly use in our day-to-day activities, from toothbrushes to kettles, DIY tools to mobile phones, vacuum cleaners to laptops. A product designer's role includes making things easier to use, perhaps by improving particular aspects of a product's function; making products more efficiently, by exploiting the latest manufacturing and technological developments; making products cheaper to produce by utilizing new and innovative materials; or enhancing a product's emotional appeal through exploring and pushing new aesthetic boundaries.

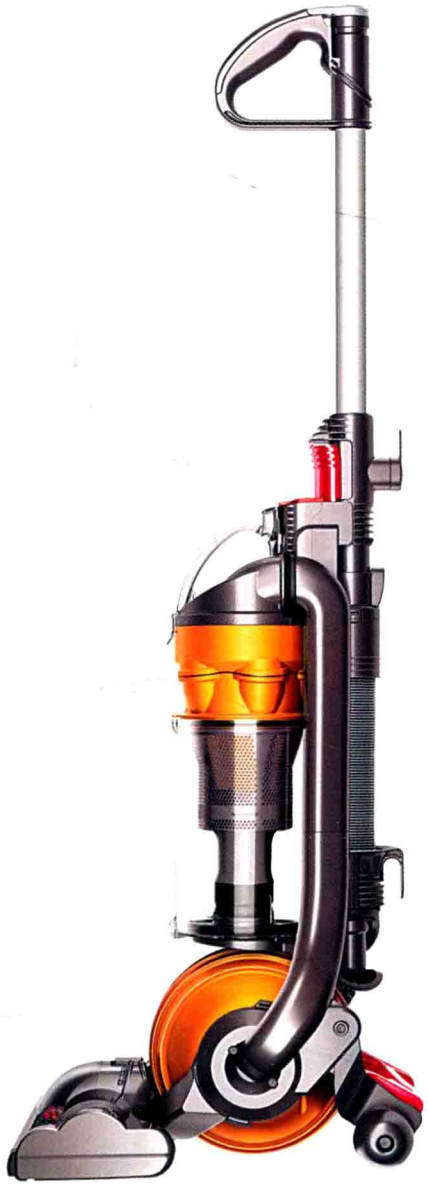
The work of the product designer involves at its core some form of problem-solving. It typically starts with a problem statement given to the designer by the client, or the company involved can initiate the statement in-house. Generally speaking, product design problems have a set goal, some constraints within which the goal should be achieved, and some criteria by which a successful solution can be judged.

There are three main categories of product design: routine, where everything the designer needs to know is provided; **variant**, where some aspects of a brief are open to development; and **creative**, a more unusual scenario where new products or inventions are required.

Product designers are heavily involved in the process of taking a product from a description of users' needs and wants to a developed brief, making initial sketches, preparing detailed drawings, making models and working **prototypes**. In recent years, the role has moved beyond its traditional **hard skills** of concept modelling, new product development, styling and product graphics to embrace newer **soft skills** such as branding, **CAD (computer-aided design)**, trend and forecasting, and graphical user interface (GUI) products based on the foundation of qualitative user and market research.

In general, a product designer today observes people, listens and asks questions, holds conversations with people (end-users, manufacturers, clients, managers, engineers and so on), generates design ideas, communicates them to others, explores and evaluates, makes and tests prototypes, produces detailed drawings, and possibly becomes involved in the final manufacture of the product(s) itself.

Finally, another important aspect of design to be emphasized is the role of the client. The client expects the designer to interpret the problem set before him or her and contribute to it perhaps by highlighting sub-problems and opportunities that the client has initially overlooked. The client also expects the designer to resolve these problems, while at the same time dealing with issues of form, materiality, aesthetics and manufacturing, among others. The client–designer relationship works in two ways: the client expects the designer to consider other problems that may arise during the design process, and the designer expects a certain degree of freedom and flexibility to interpret and define new problems and issues that the client may not have considered. For this reason there is always, not unsurprisingly, an element of tension between



the two. Both are dependent on each other and both are anxious about the other exerting too much control. The harmony of their relationship is therefore a hugely important factor in the successful development of new products.

### Are product designers artists?

It can be hard to separate design from art. This is particularly difficult today given the rise in the number of 'celebrity designers' producing one-off pieces for design shows and auction houses across the world, or even to exhibit limited-edition pieces in galleries, just as artists do. The products of design are often seen by the public as works of art and designers themselves are often referred to as artists. In recent years, the creative processes involved in art and design practice, and the talents required to participate in them, have undoubtedly come closer.

**Opposite**
The DC24 Dyson Ball™ upright vacuum cleaner is a good example of variant design, where some aspects of the design brief were open to development.

**Left**
The Tournament, designed by Jaime Hayon, 2009, a leading proponent of DesignArt. Here, 32 handcrafted ceramic pieces are created in a oversized chess set, which was launched at the London Design Festival. Hayon's work regularly blurs the boundaries between design and art.



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