# A study of the design process

How do leading companies manage design in their businesses? Our in-depth study of the design processes used in eleven global brands gives real insights into the way design operates in these firms, and delivers usable lessons for all designers and managers.

## Delivering competitive advantage through design

**Design plays a fundamental role in the success of many of the world's leading companies. But how do those firms ensure that they are getting the best return on their investment in design?**

To find out, we spent time with eleven of the world's top design teams.

### A qualitative study of the modern design process

For our most in-depth study ever, Design Council researchers visited the design departments of eleven companies, all world-leaders in their fields and all with a public commitment to the use of design to improve their brand strength and product and service offerings.

The study looked at the way design is used in these firms, how designers work with staff from other disciplines and how the design process is managed to deliver consistently successful results. How is design managed across complex, global, product and brand portfolios, we wanted to know. So we asked leading design teams how they select and organise their designers, and when they bring designers into the product or service development process. We also wanted to find out what skills today's designers need in order to succeed.

From this in-depth examination we aimed to draw out some of the key features that define the state-of-the-art in modern design practice, as well as the unique approaches that set some firms apart.

The full study includes eleven case studies looking in detail at the processes used at each participating company. These can be accessed using the links below.

**Eleven world-leading companies**

Alessi, one of the world's leading manufacturers of designer kitchen and tableware, puts design at the very heart of its business and has developed sophisticated processes for finding, commissioning and developing new designs from a worldwide network of talented designers and architects.

A pioneer in the delivery of multi-channel television in the UK, BSkyB has recognised the potential to use design as a market differentiator. While continuing to evolve its product offering, it has focused on developing in-house design management capability while building a strong relationship with an external design consultancy for the execution of product designs.

Communications service provider BT is one of the UK's best known companies. A diverse and rapidly evolving organisation, it makes extensive use of design in many aspects of its business, closely integrating it with the BT brand. The company has developed tools and processes to manage an extensive roster of external design suppliers and help them communicate the brand.
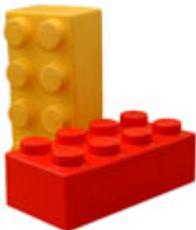
Danish company LEGO, the world's sixth largest toy maker, has transformed the processes of its design function in recent years. These changes have streamlined product development and the processes developed by the in-house design function are now being used as a method to improve innovation across the entire business.

Microsoft, the world's leading supplier of operating system software, has completed a significant evolution in its attitudes to design. Having once been a technologically-driven organisation, Microsoft now uses design thinking to focus on developing products that answer users' needs. With management support, this focus on user-experience is also influencing Microsoft's organisational structure and culture.

Electronics, games and entertainment giant Sony has used design since the 1960s to differentiate its products and maximise the usefulness of its advanced technologies. Sony Design Group across the world employs around 250 designers and has developed a set of core design values against which the company judges the success of all its products.

From its beginnings as a single coffee shop in Seattle 35 years ago, Starbucks is now a global brand which uses design to aid the delivery of a distinctive service experience to its customers. The Starbucks Global Creative team has developed a strategy that allows it to balance regularly changing design themes with a consistent set of brand values.

Virgin Atlantic Airways, founded in 1984 by British entrepreneur Richard Branson, has innovation as a core brand value and uses design as a key competitive differentiator. The in-house design team manages many aspects of design for the airline, including service concepts as well as interiors, uniforms and airport lounge architecture, and works with a number of agencies worldwide.

Whirlpool Corporation is a leading manufacturer of major home appliances. The Global Consumer Design unit at Whirlpool has a staff of over 150 people and has developed expertise and processes that help the company respond to the demand for increasingly sophisticated and complex appliances and develop individual products under different brand umbrellas worldwide.

Xerox was founded in 1906 and has been developing pioneering office automation technologies since it introduced the first photocopier in1949. The design function at Xerox plays an increasingly important role in the organisation, and has recently been implementing a significant programme to broaden the breadth and scope of design input into new and existing product development.

Founded in 1994, Yahoo! has grown from a pioneering search engine to become one of the most popular portals on the Internet. An organisation that uses technology to focus on customer needs, Yahoo! operates a highly customer-centric design process, with user research instrumental in the development of new products and the evolution of existing ones.

# Background and methodology

**In 2007, the Design Council was asked to conduct a study of the design processes used in leading global companies. The remit of the study was to understand the design processes used by leading corporate users of design, what elements they involve, and how these processes take a product or service from an idea through to implementation and launch. The creative or design heads of eleven leading users of design took part in in-depth interviews.**

The key aim of this design process study was to seek the answers to five questions:

— What is the design process used in leading corporate users of design?
— How is the process managed?
— What benefits does it bring?
— What are the similarities and differences among these companies' design processes?
— Are there activities or methods among the design processes observed that could constitute best practice?

A mix of companies with product and service-based offers was sought and agreed to take part.

The criteria for the companies selected for the design process study was that they be leading corporate users of design with a reputation for successfully applying design to either their product or service, or both. Equally, the companies needed to represent a variety of sectors. A list of companies that fulfilled these requirements was compiled, and contact was established with eleven design heads willing to take part in the study.

Clearly while these companies have their use of design in common, one key challenge in investigating the design process across several companies is taking into account how such a process will differ depending on the companies' product or service offer, size, shape and location, legacy of design use, and its supply-chains and production systems.

The participating companies originate mainly from Western Europe and the United States, and all are global in their operations. This does not, however, reflect a predominance of design process expertise in these regions.

**Methodology**

The design process study was conducted using a qualitative research methodology, and drew heavily on the Design Council's knowledge of and expertise in the theories and practices of design management and strategy. The stages of the study were as follows:

— An initial desk research project summarised the evolution and development of design process methodologies from an academic perspective, and highlighted the leading insights on areas such as the benefits of design process and best practice models. This served to inform the overall study and to aid the discussions with the design teams that were interviewed.
— Face to face interviews were conducted with the design or creative heads of eleven leading users of design.
— Prior to each interview, basic corporate data and information was gathered for each participating company. This was used both as a background for the interview, and in the formulation of the summary report and the case studies.
— The interviews were conducted by a design expert and a researcher. This, together with the discussion guide, provided both the deep understanding of design process and strategy and the robust research methodology needed to guide the collection and analysis of information from the interviews.

With this background and methodology as its starting point, the interviews that formed the basis of the design process study were conducted between March and May 2007.

**In more depth**
Learn more about the way design processes are modelled and understood by downloading a PDF version (464KB) of the in-depth Desk Research Report.

**Eleven diverse companies, a single commitment to successful design**
The Design Council offers its thanks to the eleven companies who participated in this study, and to their designers and design managers who gave up their time to take part in the project.

**Other ways to view the content**

— See how design is used to meet different business challenges
— Learn how companies who participated in the study manage their design function
— Find out how to deliver great design with the help of these tools and techniques

# The design process

Different designers manage the process of design in different ways. But when we studied the design process in eleven leading companies, we found striking similarities and shared approaches among the designers we talked to. In this section we show one way of mapping the design process, and give more detail on the key activities in each of the process's four stages.

## The 'double diamond' design process model

**The double diamond diagram was developed through in-house research at the Design Council in 2005 as a simple graphical way of describing the design process.**

Divided into four distinct phases, Discover, Define, Develop and Deliver, it maps the divergent and convergent stages of the design process, showing the different modes of thinking that designers use.
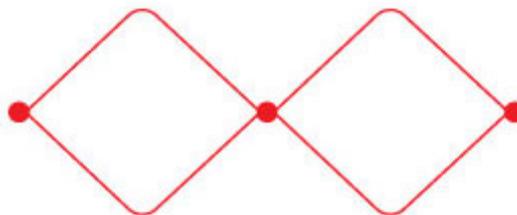


### Discover

The first quarter of the double diamond model marks the start of the project. This begins with an initial idea or inspiration, often sourced from a discovery phase in which user needs are identified. These include:

— Market research
— User research
— Managing information
— Design research groups.

### Define

The second quarter of the double diamond model represents the definition stage, in which interpretation and alignment of these needs to business objectives is achieved. Key activities during the Define stage are:

— Project development
— Project management
— Project sign-off.

### Develop

The third quarter marks a period of development where design-led solutions are developed, iterated and tested within the company. Key activities and objectives during the Develop stage are:

— Multi-disciplinary working
— Visual management
— Development methods
— Testing.

### Deliver

The final quarter of the double diamond model represents the delivery stage, where the resulting product or service is finalised and launched in the relevant market. The key activities and objectives during this stage are:

— Final testing, approval and launch
— Targets, evaluation and feedback loops


### The design process in eleven global companies

To find out about the design process in leading global companies the Design Council undertook its most in-depth study ever.

Researchers visited the design departments of eleven companies all world-leaders in their fields and all with a public commitment to the use of design to improve their brand strength and product and service offerings. You can use the links below to navigate the individual case studies:

— Alessi
— BSkyB
— BT
— LEGO
— Microsoft
— Sony
— Starbucks
— Virgin Atlantic Airways
— Whirlpool

- — [Xerox](#)
- — and [Yahoo!](#)

While the companies we spoke to had very different ways of managing their design processes, and though the terminology they use may differ from that of the double diamond model, there are some core stages within a design process that are common across the participating companies.

**In more depth**
The double diamond model is not the only model of the design process. You can find out more about the way other academics and design researchers define and measure design processes by downloading a PDF version (464KB) of our detailed [Desk Research Report](#)

# Discover

**The start of a project is marked by an initial idea or inspiration, often sourced from the Discover phase.**

The objective of the Discover stage is to act as a 'phase of divergent thought', where the designers and other project team members keep their perspectives wide to allow for a broad range of ideas and influences. In this stage of the design process, the company is asking a question, posing a hypothesis or identifying a problem by analysing market data, trends and other information sources.

During our in-depth study of the design process in eleven global brands, we found that [LEGO](#) refer to this stage of the process as Exploring, [Microsoft](#) call it Understand, while [Starbucks](#) have coined the term Concept Heights.

It is worth noting, however, that in practice an element of discovery takes place throughout the design process, aimed at taking into account new information, user needs, competitive contexts or challenges that arise as the project progresses.

### Initial influences and inspiration

Companies begin the design process when they want to develop a new product or service, or refine an existing one. The initial influence or inspiration for this can be triggered in a variety of ways. It may involve picking up on social or environmental trends, the launch of a competitor product or service, or tapping into the ideas of staff or networks.

Within the company, the originator of an idea or suggestion could be a product manager, CEO, designer, user research, or even a customer. Indeed, companies like [Whirlpool](#) encourage all of their employees to take part in corporate innovation. In contrast, [Alessi](#) may be approached by a well-known designer who is seeking a

collaborative venture, or Virgin Atlantic's design head may receive a speculative email from the Chief Executive.

Wherever the initial idea comes from, the design process in general and the Discover stage in particular provides a framework within which to process the initial ideas or inspiration. The Discover stage helps to identify the problem, opportunity or user need that should be addressed, and introduces the space within which design can provide a solution – the playing field for design. It is important that the design process used in the company allows for ideas to be captured and developed in this way, and fosters this type of creative environment among designers and other staff.

## Information sources



We've seen that the initial influence or inspiration for a project could come from key individuals – such as the design leader in the company. It can also come from the need to regularly update or change a product or service. However, the design process most commonly begins with teams finding their initial inspiration in information about user behaviour. Indeed, the most formalised sources of inspiration and information are the outcomes and interpretation of market research and data, observation, primary research or ideas that have been generated in formal or informal settings by members of the team.
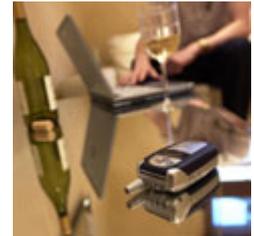
This often takes the form of three key sources of information:

— Use of market research
— Generating user research (such as ethnography and observation)
— The involvement of a bespoke design research group

While their focus and settings differ, the design teams in all the companies we visited share a user-driven mentality, which is apparent in the up-front phase of enquiry and gathering of initial research into the behaviours, needs and perceptions of users. This information is digested by multi-disciplinary teams during the design process, including researchers, designers, product manager, engineers, research and development experts and developers.

All this research and knowledge-gathering activity creates an enormous amount of information. Managing that information is another key challenge that many of the companies in the research are addressing in creative ways.

## Limitations of research

While most companies used the research methodologies described above, it was generally acknowledged that such methodologies were not without their limitations. Some designers expressed concerns about whether consumer feedback could 'take you to the next level' when it comes to product and service development.

While consumers can react to what exists and relate back to what they know, some designers felt that consumers are less able to contribute to the development of completely new product or service concepts for the future. Indeed, academic studies of design-inspired innovation have noted Alessi's Juicy Salif lemon squeezer by Philippe Starck as a product where the design has not relied on 'classic market analysis based on surveys of focus groups', due to a belief that 'radical innovation of meaning is not pulled by the market [but] results from a vision about a possible future'. Design teams in companies like Virgin Atlantic Airways and BSkyB conduct user research at a stage where a prototype is well developed, rather than involving users at the concept development stage.

The outcome of the Discover stage of the design process is a project brief for a design project, and signifies the practical start of the design process.

# Market research

**One source of information that can lead to the development of new products and services is market and research data. This can mean the outputs from companies' own internal marketing, consumer insight or research teams, who commission and manage regular information and data from key target customer groups.**

It involves tracking perceptions and attitudes related to the company, its products and services, brand perceptions and customer satisfaction, and is also likely to include competitor analysis, and gathering feedback on the commissioning company's performance and reception in contrast to that of their competitors.

Through the analysis of such data by designers and other members of a project team, gaps in the market and areas for improvement and innovation are identified.

### Future trends
While timely and regular market and research data can help to identify user needs and future trends, there is equally a need to anticipate future user or consumer needs. In order to address the requirement for information of this type, specific future-focused or trends analysis is often used.

Particular topics of interest here revolve around:

— Consumer behaviour and preferences in relation to the product or service offered by the company
— New modes of communication
— New service needs that may emerge on the basis of social, economic or environmental changes

The breadth of focus here opens up the possibility of a wide range of impacts on companies' products and services – from complete product innovation (in response to issues such as global warming or technological changes), to styling preferences such as colours, finishes, materials and textiles.



An example of a design process involving the anticipation of future user needs is Sony's development of the mylo personal communicator. The mylo was designed to use the many WiFi networks that are being installed in offices, university campuses and towns across the world, and its design involved understanding and anticipating the needs of a user 'on the run'.

Similarly, Whirlpool's conceptual research initiatives have involved studying future trends in food sourcing, storage and preparation.
Finally, at BSkyB the Research & Development team is a future-focused group who look for new cabling solutions, and ways of using technological advances to provide better service solutions in customers' homes.

# User research

**The emphasis on user needs and experiences in the companies we visited means that user research features heavily in the design process.**

User research is used to identify:

— How users are accessing current products and services
— Areas for improvements or innovation
— Opportunities for new products and services that will address a user need

Many user research methods find their roots in traditional market research methodologies, particularly when it comes to the gathering of data on customer satisfaction and trends. A significant proportion of user research is conducted through qualitative research with consumers, ranging from focus groups and depth interviews with target audience groups, to more focused and detailed ethnographic and observation based techniques.

Stimulus materials such as cartoon strips to portray service propositions, storyboarding, scenario-building, multimedia, prototypes and other tools (such as eye-tracking technology for testing user interaction with software packages) are used to illustrate present and future user scenarios involving the use of their products and services. Using images and illustrations to bring the use of complex products and services to life is a useful way of communicating during user research.

**Designer involvement in user research**

A key activity we noticed across all of the Discover methods and processes was involving designers as far as possible in conducting, analysing and understanding research.



Many of the companies in the survey found that actively encouraging - and in some cases expecting - their designers to take part in user research allowed them to gain faster, deeper insights and better product ideas. This approach ranges from general multi-disciplinary design practices (which keep designers, user researchers and product or service developers working closely throughout the design process), to methods made available for designers to view user research) in practice, either remotely or in person.

Some noteworthy examples of designer involvement in user research observed in the study include:

— Starbucks sends their designers to work as baristas in their stores for up to a month to fully immerse them in the coffee and user experience that the Starbucks brand embodies.
— Xerox sends designers out with service engineers when they visit customer sites to observe customers interacting with the product while in use.
— Microsoft live-streams user research focus groups and sessions to all of its global locations. These are accessible by all employees but of particular use to designers, developers, programmers and researchers across all business functions.

The benefits of involving the designers closely in user research are broadly that:

— Designers bring particular creative skills or idea generation to the analysis of research-based information, and these skills help to identify problems and solutions emerging from the data
— Having designers involved directly with other teams in the analysis of data and research involves multi-disciplinary working and thus gives other teams an insight into the skills that designers bring to the process
— This kind of collaboration helps to clarify project objectives at an early stage.

# Managing and planning information

**As well as gathering these types of information during the Discover stage of the design process, design teams also face a key challenge in the way in which this information is used by, and shared with, the design function and with a wider project team.**

The design processes we observed managed this challenge in two key ways:

Planning with information - Using the design process to plan the flow of information through the development phase and manage the interaction with designers and other teams throughout

Designer involvement in user research - Ensuring that designers are contributing to and taking part in research with users themselves.

## Planning with information

Reflecting the findings of market data, research and future trends - and making appropriate design changes where necessary - presents a considerable challenge when planning the development of a new product or service.



Most companies deal with this issue by setting strategic targets, deciding their objectives at least one year in advance and drawing up new product and service development plans accordingly. This is supported by having a formalised design process, which acts as a roadmap from the point of receiving information on users.



For example, Whirlpool has defined a set of metrics through which it aims to predict consumer behaviour and design or innovate ahead of the curve so that needs have been anticipated and addressed in advance. And Starbucks plans its promotional campaigns one year in advance, with the help of its design process, starting with information from market research.

# Design research groups

**One criticism levelled at trends research is that future trends are sometimes researched in isolation of design thinking, with design thinking applied only after a trend has been identified. In order to bring design thinking closer to new business areas, product opportunities and user needs, several businesses have set up design research units whose main purpose is to generate new ideas alongside design thinking.**

The Design Innovation Team at Yahoo! in San Francisco functions as an off-site incubation centre for designers on sabbatical from project work, allowing them to actively experiment, create and design for a period of three to six months. As such, it stands slightly removed from the design and project work conducted within Yahoo!, but can still yield ideas for products and services that are then exploited within Yahoo! at a later stage.

In other cases, externally commissioned designers are brought in to generate ideas for the business, such as in Xerox's Design Research Group, based in the US. The designers commissioned by this group generate ideas through research with customers and focus on visual identity, such as colour and finishing trends.

At Virgin Atlantic Airways, the design team works in a more informal manner with the Research & Development group to access future thinking and ideas that may prove useful to their design solutions.

# Define

**The Define stage should be thought of as a filter where the review, selection and discarding of ideas takes place. This is where findings from the Discover stage are analysed, defined and refined as problems, and ideas for solutions are pitched and prototyped.**
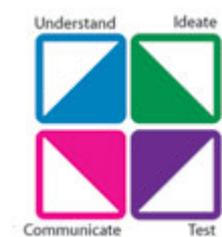
During our in-depth study of the design process in eleven global brands, we found that Microsoft call this the Ideate phase, Starbucks have named it Downtown and Whirlpool refer to it as Synthesis.

During the initial Discover stage of the design process, the design team and its partners must keep a broad perspective and open mind in order to identify a problem - a user need or an opportunity that needs to be addressed and channelled into a design-led product or service development process.

At the Define stage, a combination of the ideas or directions identified during the Discover stage are analysed and synthesised into a brief with actionable tasks related to new and existing product or service development.

The Define stage ends with a clear definition of the problem(s) and a plan for how to address this through a design-led product or service. In practice, the Define stage ends in a project go-ahead through corporate level sign-off.
Key activities during the Define stage are:

— The generation of initial ideas and project development
— Ongoing project management
— Corporate objectives agreed and project sign-off.

At most of the companies we visited, the Define stage would end with final sign-off of the concept and approval of work to begin on design and development. In some companies, much of the actual designing has effectively been frozen until the match between the concept and the overall corporate objectives that it will be aligned to and measured against have been agreed. Here, strategic dialogue takes place up front, and potential bottle necks, opportunities and no-go areas are defined ahead of the concept

approval. In this way, the development of the design project gets as far as possible without impacting negatively on finance, time and resources.

It is worth mentioning at this stage that the companies we visited as part of the study place particular emphasis on the Discover and Define stages of the design process, which no doubt contributes to the overall success of their design and design processes.

# Project development

**Having defined the problem in the Discover stage, the Define stage covers the initial development of project ideas and components needed to solve the problem at hand.**

Here, it becomes important for the whole team working on the project, and not least the designers, to have an awareness of a number of factors that influence the possible solutions to the problem.

Firstly, designers must understand the context within which the project is being undertaken. The Discover stage establishes that a problem or opportunity exists, and that a product or service development or iteration is necessary as a result.

During the Define stage a designer must engage with and understand the wider context in which this problem or opportunity sits, both within and beyond the company. This might include considering the company's own financial situation and the extent to which it is able to invest in a project, the recent launch of a competitive product with similar features, or social and economic contexts which require a certain approach or sensitivity, such as an awareness of sustainability issues.

At Virgin Atlantic Airways, the role of design in the innovation process is valued, but is subject to the careful development of a robust business case before a project commences, and must – in many cases – also be compliant with airline regulations. Once a large monetary commitment has been made there is little tolerance of failure, requiring the need for the in-house design team to innovate in-line with very strict business guidelines.

Secondly, the designer must equally keep in mind what is feasible within the company's technological or production capabilities. A clear understanding of details such as materials, logistics, time-to-market and other influencers is a key part of understanding the wider corporate ability to develop a design solution.

This enquiry is not as detailed during the Define stage as during the Develop stage, but rather serves as a filter that allows designers to identify which idea has legs and should be pursued and developed.

Communication with other experts and departments internally is important at this stage. In most cases the design process oversees clear lines of communication between designers and other area experts, such as engineers, developers, materials experts, Research & Development teams, and product or service managers who are able to input the right information that will guide the designers' initial ideas.

Air safety regulations, weight and dimensions naturally affect design of products at Virgin Atlantic, and the design team runs regular milestone meetings where designers and manufacturers meet to make sure that they have the same interpretation of the design and that production is feasible.

Similarly, BSkyB must take manufacturing capabilities into account at this stage in the design process, as its set top boxes are manufactured by three different companies.

Thirdly, initial ideas generation must consider the corporate brand. The design process involves constantly checking to ensure that ideas generated are in line with the corporate brand vision, mission, values and guidelines. Starbucks checks each graphical execution of campaign materials against five core values. Any executions which are deemed not to fulfill each of these values go back to the drawing board for development or amendment.

Another example of brand awareness at this stage of the design process is within Whirlpool, where its Platform Studio, consisting of an inter-disciplinary group of designers, advanced manufacturers and engineers, think about new areas for innovation.

They act on the basis of market research and data that is interpreted and analysed for product solutions, and use design thinking and prototyping as ways of interpreting user needs. The outputs from the Platform Studio are then passed on to the brand studios for consideration and implementation. The brand studios consider the fit between the latest design features and functions and the brands themselves.

This exchange is a key part of the design process in Whirlpool and allows the brands to retain their own integrity while still capitalising on the design guidelines of the central design and innovation function.

In sum, the project development and initial ideas generation phase of the Define stage reviews the context for the product or service development, the realism of what can be done, and the corporate brand. Taking these considerations into account, designers work through the project development and initial idea generation stage to define a project which will address the initial problem identified.
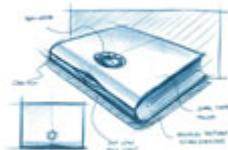
Designers work in a variety of ways to do this, to refine the scope of the project, and to home in on which solutions can have impact, which product or service has scope or potential, which product or service

would push the business and design in the right direction. Some of the methods used include reviewing further research, role-playing, paper prototyping, day-in-the-life scenarios, sketching, reviewing ideas, considering colours, styles and trends, project team scrums, selections, and brainstorms, among others.

# Project management

**As design projects move from their initial discovery phase into the more structured process of definition, so the companies in our survey began to use a variety of more formal project management tools.**

Formal tools serve two main purposes during project definition. They help design teams to ensure that they have considered and captured every essential aspect of the design problem – to avoid unpleasant surprises later – and they help in the communication of the design specifications to other parts of the organisation, so they can make go/no go decisions or sensible choices about the resources required to support the development of the design.



LEGO uses a series of process documents, which it calls the Foundation Overview, Foundation Document and Roadmap to effectively communicate the current status of a design project and to make the case for a particular product adjustment, redefinition or reconfiguration.

In the Define stage of the process, the Foundation Document is particularly important. It attempts to present the full rationale behind every project, including the concept, its business rationale, its target market and the required sales, marketing and communication support. The Foundation Document also allows LEGO management to assess the key risks associated with a new product idea, by spelling out the complexity of the product and any particular development challenges, together with recommendations for risk mitigation.



A similar approach to project management is used by Starbucks. Originally, graphical executions of in-store promotional campaign work were posted internally in a shared space in the Seattle office for the wider Global Creative team to review and comment on. Team members would provide feedback in writing on each execution, suggest amendments and alterations, or sign-off approval.

This system is now being transferred into an online workflow management tool, which manages this process of design iteration in a highly efficient, automated way. By capturing design iterations and feedback in a central repository, the workflow management tools speeds up the approvals process and captures important design information for wider use.

While some project management approaches attempt to define the project specifications in as much detail as possible before design development begins, others adopt a fundamentally different philosophy. Some companies, particularly in the software sector, consider changes in project definition to be an inevitable part of the design process. Their management systems try to make the implementation of those changes as quick, cheap and painless as possible.

Yahoo! product development makes use of project management systems for software development. AGILE is one of these systems, and is one of a family of approaches to software development. A number of key principles underlie the AGILE methodology:

— Customer satisfaction by rapid, continuous delivery of useful software
— Working software is delivered frequently (weeks rather than months)
— Working software is the principal measure of progress
— Even late changes in requirements are welcome
— Project progress through close, daily, cooperation between business people and developers
— Face-to-face conversation is the best form of communication
— Projects are built around motivated individuals, who should be trusted
— The development process should pay continuous attention to technical excellence and good design
— Simplicity
— Projects are delivered by self-organising teams
— Regular adaptation to changing circumstances.

In the AGILE system, designers, user researchers, developers and commercial staff work closely together on a given project. Team members may work separately on their particular parts of a project, but they come together frequently to take projects forward, and adapt quickly to changes and new information where possible. This type of project management, helps designers to identify where and when their input is most valuable, and to communicate that input frequently to other members of the team.

# Corporate sign-off

**At most of the companies we surveyed, the end of the Define phase is a pivotal point in the design process. It is at this stage that projects are either killed off, or given the budget and approvals to move on to production.**

In order to make this go/no-go decision sensibly, companies must have a detailed understanding of the likely market for the new design, together with a good idea of the cost and complexity of producing it.

The ability to present a well argued business case alongside a proposed design approach was a key attribute for almost every design team we spoke to in our survey. Yahoo!, for example, says that its project teams, including designers, must be able to

explain how their proposals will 'move the needle' and produce a dramatic improvement in revenue.

Companies in our survey did vary, however, in how far they allowed or required a design to progress before making the go/no go decisions. At Xerox, the aim is to present one concept that has been thoroughly reviewed and tested. At Yahoo!, the 'demo or die' principle necessitates the existence of a working prototype. At Virgin Atlantic Airways, before official sign-off, there has already been an intensive period of collaboration working with external agencies to 'define' very closely their business case and employ model makers to create a 3D prototype.

Many companies have formal processes to manage the corporate sign-off process and to ensure that project teams and designers deliver comprehensive and consistent information to those responsible for sign-off. At Yahoo!, when the AGILE methodology is used, a Product Requirements Document is produced by the product and marketing teams and presented to the General Manager of a business unit for approval. This one page document shows the concept, confirms its logic through research and information from internal experts, and demonstrates tie-ins with the overarching corporate objectives.

At Virgin Atlantic Airways an Opportunity Identifier is presented to the board, followed by the development of a detailed business case to request financial and corporate backing for further development. At LEGO the Foundation Document is used also to bring together all the information needed assess the viability of a project.

Some companies use less formal processes to make the go-ahead decision for design projects. It is not unusual for the final decision about the viability of a project to be made by the CEO. Indeed, a close link to the CEO can have a significant impact on project success. In BSkyB and Alessi, for example, the proximity of the company head to the new product and service development process lends itself to speedy sign-off and wider support.

# Develop

**At the Develop stage the project has been taken through a formal sign-off, which has given the corporate and financial backing to the development of one or more concepts that have addressed the initial problem.**

During our in-depth study of the design process in eleven global brands, we found that Microsoft refer to this process as Implement, while Virgin Atlantic Airways call it Design.

Key activities and objectives during the Develop stage are:

— <u>Multi-disciplinary working</u> and dependencies with other departments
— <u>Visual management</u>
— <u>Development methods</u>
— <u>Testing</u>

During the Develop stage, the design team, either together with key internal partners (such as engineers, developers, programmers, and marketing teams) or via external design agencies, refine one or more concepts that will address the problems or issues identified during the Discover and Define stages.



Design <u>development methods</u> used here include creative techniques and methods such as brainstorming, visualisation, prototyping, testing and scenarios. The methods and working processes are in many cases similar to those during the Define stage, but are this time focused on bringing the agreed product or service to fruition.

At the end of the Develop stage, the design process will have brought the product development team to a stage where the product or service is ready for delivery to production.

# Multi-disciplinary working

**Multi-disciplinary teams are a key feature of the design processes observed in the companies that took part in this study. And multi-disciplinary teams are a feature strongly in the Develop stage, where input and advice from other areas of expertise are essential to finalising the product or service at this stage.**

Key to this is the way in which the design process aims to break down walls and silos internally, for example between design and manufacturing. The benefits of doing this include speeding up problem-solving during the project, as potential issues and bottle-necks are identified early on, and potential delays are addressed.

In the case of <u>Virgin Atlantic Airways</u>, the design development stage of the design process involves a series of meetings with manufacturers to present the design to manufacturers and gain their feedback.

At <u>Whirlpool</u> the innovation process and product development phase starts in the Platform Studio (in which designers, advanced manufacturing experts and engineers work together to think about new trends and products) and ends up with a prototype being handed over to the brand studios for final preparation for launch, including user testing.

During this entire process, a multi-disciplinary team including product and brand managers from brand and marketing backgrounds, designers from Global Consumer Design, and Global Product Development groups (representing the product category being developed) manages the design process. In doing so, designers are consulting with R&D experts, the advanced materials group, and other key stakeholders.

Designers and team members from other functions and disciplines are effectively involved from beginning to end in Whirlpool's innovation process, and work together to succeed in bringing the best possible product to the market.

# Visual management techniques

**During the Develop stage of the design process, project management is carried out in much the same way as during the Define stage.**

For example, at Yahoo! the project management tools such as the AGILE principles will still apply, as does Starbucks' online workflow management tool. However, it is worth noting that many of the tools for project management take on a visual nature at this point in the process.
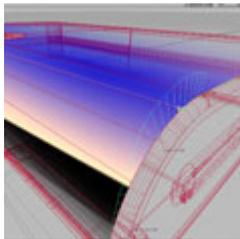
Visual management techniques allow internal stakeholders to track progress on the design project and see different phases and iterations of sketches, prototypes, and other design work on the product or service concept.

The workflow management tool used at Starbucks is able to showcase graphical work examples and iterations, while LEGO's Roadmap which is contained in a poster and Excel spreadsheet, and allows the team to plan together how to reach the next stage, by aligning objectives, tasks and deliverables. Such visual management techniques are equally a key communications tool for the rest of the team, and are used to track project deliverables, developments, timings and internal or external dependencies.

# Development methods

**Whatever a company is designing, the principle of the Development phase is to prototype and iterate the concept to get it as close to an end product or service as possible. Lessons from each round of development are fed back in through formal and informal communications within the project team and with its stakeholders.**

In order to reduce costs and development time, companies are increasingly turning to virtual prototyping methods during the early phases of design development. Such methods can range from sketches and renderings to detailed 3D computer models of potential designs. Visual representations are supplemented by physical models made using rapid prototyping equipment or traditional model-making skills.

At the product-based companies we spoke to, the Develop stage included close involvement with colleagues in R&D, materials and engineering departments, and with external suppliers and manufacturers. These detailed insights into materials and engineering requirements help to reduce the number of physical prototypes required and ensure that fewer problems are discovered during testing.

At Xerox, the designers have manufacturing expertise, giving them the ability to assess, together with other experts, what is possible from an engineering or development perspective. The company also uses Failure Mode and Effects Analysis (FMEA) to evaluate potential failures in a design before they take place. The use of FMEA and other analysis methods helps Xerox's design process in whittling down the number of concepts which are put forward for approval, and can usefully help to manage and reduce the cost of prototyping, engineering and tooling.

Very often, insights from development rounds produce changes in product specifications. As development is often the most lengthy part of the design process, external factors can change too, with shifts in the market or competitor activities requiring late changes in requirements to be met.

In most product-based companies we spoke to, actual manufacturing was outsourced. Liaison with manufacturing partners is often a lengthy process as design and engineering teams ensure that their requirements match the processes available at their manufacturing partners.



In the case of Virgin Atlantic Airways' Upper Class suite development, areas of the new interior, product and service impacted on cabin crew, so Human Resources, Health & Safety experts and cabin crew themselves were consulted during its development.

There are of course some differences in the development methods used when products are less tangible. The development of software products or graphical executions of campaign materials, for example, also involves continuous iterations and the sourcing and use of new information. In software development particularly, new products can to be prototyped in situ as the designers, developers and user researchers work out ideas and test them themselves and with external users to iterate a solution.

A good example of such in situ prototyping and evaluation is Microsoft's design philosophy that designers should 'eat their own dog food' - encouraging them to work with their own products as they are in development.

# Testing

**The testing of concepts and prototypes form a major part of the Develop stage.**

Some companies use particular principles to guide their testing of products. For example, Xerox tests its products with Six Sigma principles in mind. The basic methodology consists of a number of steps that are aimed at checking that the design is consistent with user needs and corporate strategy, checking product capabilities, requirements and the ability to meet these, and optimising the design to combine these two. In fact, the Six Sigma process overall can be said to include a lot of what happens in general during the Develop stage, not just the testing phase.

Essentially the methods of testing used rely heavily on traditional market research methodologies, and in most cases testing is carried out with consumers through in situ observation, focus groups and other techniques. Generally the concept is well developed and near final before being tested with users. Whirlpool carries out simulated and real-life testing of its products with consumers in relevant market and audience groups. BSkyB will field test its products, such as set top boxes, in people's homes and gather feedback over a period of time.



In the development of Office 2007, Microsoft observed 200 users interacting with the new user interface over more than 400 hours. Virgin Atlantic Airways, meanwhile, invited a selection of frequent fliers to come in and sleep overnight in its Upper Class Suite prototype chairs.



Dogfood

There is similarly a tendency in some companies to self-test a product. This was observed in companies like Yahoo! and Microsoft. Again, Microsoft's designers and developers engaged in the principle of 'eat your own dog food', turning the project team (including designers, researchers, developers and programmers) into users and requiring them to use the beta product and report back on issues or amendments needed.

# Deliver

**The Deliver stage of the double diamond design process is where the final concept is taken through final testing, signed-off, produced and launched.**



It will result in a product or service that successfully addresses the problem identified during the Discover stage. It will also include processes for feeding back lessons from the full design process to

inform future projects, including methods, ways of working and relevant information.

During our in-depth study of the design process in eleven global brands, we found that Virgin Atlantic Airways have named this phase Implementation, Microsoft call it maintain, and Starbucks describe it as the Production District.

Key activities and objectives during the Deliver stage are:

— Final testing, approval and launch
— Targets, evaluation and feedback loops.

# Final testing, approval and launch

**This final stage of the process is designed to identify any final constraints or problems before manufacture and is when the product or service is checked against standards and regulations, and undergoes damage testing and compatibility testing.**



At Virgin Atlantic Airways, final testing involves practices such as First Article Inspection and snagging. First Article Inspection is an assessment of the first item off the production line to ensure that it is fully functional. This will happen in parallel with production as there will be many components being produced and assessed in parallel at any one time.

Alongside this, snagging involves picking up any small adaptations necessary in relation to the product which are picked up at the point where it is tested in an aircraft environment, as opposed to in the factory environment.

## Launching the product or service

At this point in the design process the product or service is launched, and the process now includes liaison with appropriate internal teams in areas such as marketing, communications, packaging and brand.



At Starbucks, the importance of internal communication and the acceptance of designs is acknowledged during the production phase too. Shop floor representatives are involved in final product reviews and part of the design process is the production of photographic instructions to help store managers install and arrange new items correctly once delivered. These directions are distributed in the form of a magazine - Siren's Eye - which describes every element of each season's offering, with full instructions on installation and display to ensure a consistent brand experience in every store world wide.

# Targets, evaluation and feedback

**Most of the companies we spoke to are required to report back on the success of the launched product or service. The common aim in doing this is to prove the impact of good design on the success of the product or service. Being able to prove that design contributed to business success helps to gain buy-in for design and maintains the team's credibility and perceived value to the organisation.**

Measuring the impact of the product or service is done by collecting data from a number of sources. For example, companies use their internal consumer insight, research or marketing functions to carry out customer satisfaction tracking surveys and link changes in satisfaction to the introduction of products or services.



The introduction of a new product or service can be linked to other business performance metrics, such as sales and market share. Virgin Atlantic Airways was able to link a 2% increase in its market share to the launch of the Upper Class Suite, worth £50 million annually, a significant measure of success which is widely attributed to the design team.

Companies will also encourage customer feedback through in situ channels – via baristas at Starbucks or service operators for Xerox. Equally, data on the sales of spare parts or logged in-service failures are tracked in companies like Xerox and Whirlpool, and may indicate where design has successfully overcome problems in a product or need to be developed in more detail.



Finally, where companies see design as an extension of the brand, design is valued as part of the overall company brand value. This is the case within BT, where design is assumed to be strong contributor to the overall £6 billion brand value of the company.

Companies take their responsibilities in reporting back on the success of a design project very seriously, and many point out that they are required to do so. Whirlpool has a one page summary of performance of their products against a number of hard metrics, which is circulated widely internally to demonstrate the level of success achieved.

At Virgin Atlantic Airways, in-use evaluation of designs is quite extensive. Not only is the company's senior management 'a group of frequent fliers who provide extensive feedback,' it also gives customer the opportunity to fill in detailed evaluation questionnaires – called Xplane – after every flight.

The link between interior designs and Xplane data is very robust, with even small changes in seat design, introduced to meet the size constraints of individual aircraft, being reflected in customer response. Virgin Atlantic also uses third party benchmarking data to compare ongoing customer satisfaction with that of its competitors.

**Feedback loops**

The information and metrics that are gathered are, of course, not always quantitative business metrics. Feedback related to problems with a product or service, or suggestions for improvements, flow back into the organisation via other channels, and can be used to spin off into new projects or improvements. One example of this type of information would be feedback gathered by BSkyB from its customer service centres. Ideas that have emerged during the design process or in post-launch feedback may be put to one side but developed later, and will then go through the design process again on its own. Alessi's private design museum, for example, houses a vast number of prototypes that were 'frozen' at some stage and never developed. However, some of these prototypes have been known to be 'unfrozen' and brought into production at a later stage.

Equally, lessons from the entire design process are usefully documented and logged in the various methods banks and case study libraries used by the companies.

**Other ways to view the content**

— See how design is used to meet different business challenges
— Learn how companies who participated in the study manage their design function
— Find out how to deliver great design with the help of these tools and techniques
— Read about the design process at individual companies
— See how formal processes allow companies to track their design activities

# Meeting business challenges

**Find out how leading companies use sophisticated design management techniques to compete in crowded marketplaces, connect with their customers and capitalise on the power of their brands.**

## Design as a competitive weapon

**Why do some of the world's leading companies think it worthwhile to invest so much effort managing and optimising their design processes?**

To answer this question, the Design Council undertook its most in-depth study ever. Researchers visited the design departments of eleven companies, all world-leaders in their fields and all with a public commitment to the use of design to improve their brand strength and product and service offerings. You can use the links below to navigate the individual case studies:

— Alessi
— BSkyB
— BT
— LEGO
— Microsoft
— Sony
— Starbucks
— Virgin Atlantic Airways
— Whirlpool
— Xerox
— and Yahoo!

While design can be used as a tool to improve many product characteristics, and many aspects of a business, some key themes emerged very frequently when we asked the companies in our study where the benefits of design lie.

Design has helped many of these eleven companies respond better to common business challenges:

— Good design makes products more competitive. It keeps production costs down but allows higher prices in the shops
— Good design keeps users happy, making them come back again and encouraging them to recommend things to their friends
— Design applies the power of the brand. A strong brand identity encourages customers to trust existing products and to try new ones

The Eleven Lessons study shows that design plays a fundamental role in the success of many of the world's leading companies and it picks up plenty of tips and design tools which smaller businesses can take advantage of.

# Making products more competitive

**Good design makes products more competitive, better, quicker and cheaper. It keeps production costs down but allows companies to charge higher prices.**



Many of the companies in the Eleven Lessons study use design as a tool to ensure that their products can meet increasingly demanding cost and quality constraints. These organisations are not simply making use of design to add a little extra value at the end of the product development process: they demand that their design teams squeeze every drop they can from initial idea to final recycling.

At LEGO the design process is focused on producing products that can compete with an extraordinary new array of distractions for children. To do this they must be appealing look at, satisfying to construct and fun to play with.

Whirlpool uses its platform and brand studios to produce thousands of products with different brand identities and to suit the needs of different types of user, while still maximising the number of parts and subassemblies that are shared among them to keep overall costs down.

Designers at Xerox know that the people who purchase their products will probably buy them unseen, then use them every day for years. They build products to withstand tough use and abuse, leaving customers satisfied and ready to buy again.
Naturally, great design can do more than just deliver good products efficiently. It can also produce products that offer customers something extra and that create better brand impact

# Design for happy users

**Good design is a way to exceed user expectations, keep them happy, make them come back again and encourage them to recommend things to their friends**

For several of the companies in the survey, use of design allowed them to position their products apart from many of their competitors.

By applying good design to products in categories where users have low expectations for visual appeal, functionality or usability, design helps to create entirely new market niches and even new product categories. By delighting users who merely expect to have their functional requirements fulfilled, these companies are using to design to help breed customer loyalty.

BT's Home Hub router, for example, took a product that was normally concealed by users and turned it into a piece of furniture people were happy to display in their homes.

BSkyB achieved a similar effect with its set top box range.

Whirlpool's round microwave oven brought innovative form into a category where products were only available in one basic shape.

For big companies, design is not all about the product, it is also about the brand. Done well, good design and a great brand serve to reinforce each other.


# Managing the impact of the brand

**Design applies the power of the brand. A strong brand identity encourages customers to trust existing products and to try new ones.**

The company brand has a significant impact on the design process. This is particularly the case in companies where the brand sees customer experience as a key value enhancer. In these, the design process reflects the need for design to be used as a mechanism by which a consistent message about the company and its products and services is delivered to the end user.

For example, in companies such as BT, Starbucks and Virgin Atlantic Airways, the strength of the brand and the way in which a customer experiences it is strongly linked to the quality of the product or service that is offered.

There are several key examples of how brand impacts upon the design process at Starbucks. For example, the designers in Starbucks' Global Creative group test each of its graphical executions for store promotional materials against five key principles that represent Starbucks brand values. If an execution does not live up to each of these guidelines, it is not in line with the brand and therefore discounted or changed.

Starbucks also has a brand guidelines manual, which is handed out to every employee, and a manual which explains how the designed campaign materials, such as carrier bags, promotional materials, posters and cup sleeves should be arranged and used throughout the Starbucks chain of stores in a consistent and brand-conscious manner. This awareness of brand in the design process enables the effective translation of the Starbucks brand into the store environment and customer experience.

Within product-focused businesses the brand is also a key guiding principle in the design process. For example, at BT, all Brand and Identity Managers report to the Head of Design, and design and the design process is inextricably linked with the corporate brand and marketing. This is evident in the example of the Home Hub, where the product design of a router has become the vehicle representing the BT brand in consumers' homes, and has now become an integral component of advertising strategies for BT's broadband offer.

Similarly, product design at BSkyB emphasises the importance of brand consistency and recognises the Sky set top box as a key brand touchpoint which the consumer will place in their homes.  In the BSkyB product design process, while formal interaction between the design and branding departments is limited once product development is underway, a key aspect of their approach to product design is to commission an agency that has a deep understanding of the Sky brand and the ability to place this at the heart of its product design.

In contrast, the Alessi brand is comfortable with accommodating the ideas and artistic expressions of the individual designers with whom it works. This approach necessitates flexibility in the design process, allowing Alessi to adopt the design process of a given designer once it starts working with them, and to adjust internal processes accordingly through the group of design engineers at Alessi's HQ who manage the interface between designer and manufacturers.

**Other ways to view the content**

— Step through our study of the design process
— Learn how companies who participated in the study manage their design function
— Find out how to deliver great design with the help of these tools and techniques
— Or read more about the design process at individual companies

# Managing for design excellence

**Find out how some of the world's leading design teams are managed, how design teams work within global businesses, and why leadership matters...**

## Putting the right people - and the right processes - in place

**What lessons about managing design and designers we learn from eleven world-leading companies?**

To understand the way design operates in leading global companies, the Design Council undertook its most in-depth study ever.  Researchers visited the design departments of eleven companies all world-leaders in their fields and all with a public commitment to the use of design to improve their brand strength and product and service offerings. You can use the links below to navigate the individual case studies:

— Alessi
— BSkyB
— BT
— LEGO
— Microsoft
— Sony
— Starbucks
— Virgin Atlantic Airways
— Whirlpool
— Xerox
— and Yahoo!

All the companies we visited have invested heavily in people, processes and infrastructure to make design work in their businesses. Looking across the eleven companies, we can see some common themes emerging, with key areas of focus. The study shows that design has helped many of these companies respond better to management challenges that will be familiar to many businesses - including

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integrating, managing and motivating designers within the organisation.

Key activities undertaken by almost all include:

— Ensuring strong, visible leadership of the design function
— Fostering a corporate culture that values design
— Integrating design activities as tightly as possible with wider business processes
— Equipping designers with broad, business relevant skills beyond their core functional capabilities
— Maximising senior management support for design
— Developing and using design tools and techniques
— Promoting formal but flexible control of the design process

The Eleven lessons study shows that design plays a fundamental role in the success of many of the world's leading companies and it picks up plenty of tips and design tools which smaller businesses can take advantage of.

# Leadership

**Most successful business processes require good leadership. Design is no exception. The 11 companies from our study show that leading by example is a good way to make sure design is an important business practice.**

A defining factor in the companies interviewed in our survey is the presence of one or more design champions who drive the development of the design function and its recognition internally and externally.
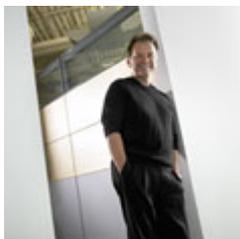


Some of these design leaders have been responsible for a very radical change in the profile of design in their company, while others have transformed the processes by which the design function operates. All of the heads of design we interviewed were charismatic, passionate and skilled in design subjects and were capable of communicating their activities in a commercial context.

Extending the influence of design upstream and downstream in the business was a priority for most of the leaders we spoke to. Upstream influence gives design input into product and service roadmaps and top level brand values. Downstream influence helps to prevent the dilution of design intent in the production and delivery phases of the product cycle.

Design champions in our survey also shared a strong interest in the development of talent in their departments. They emphasised the importance of maintaining a creative and inspiring environment for the designers they employ, but placed equal focus on the development of new skills to help their designers work more effectively in the wider context of their organisations.

The position of the design champion varied significantly in the companies we visited. In some cases design leadership emanated from the CEO or from senior management and was pushed through the company in a top-down approach. In others, the leader of a smaller team was the instigator for design, driving a bottom-up approach and expending significant effort 'selling' the value of design to more senior personnel.

**In more depth**
A key role of the design champion in many organisations is to provide an effective link between the design function and the senior management team

In some cases, changes in corporate strategy or market conditions provide the catalyst for a transformation of the role of design within an organisation. For example, as Xerox changes from being a vertically integrated designer and manufacturer of equipment to being a horizontally integrated business services organisation, the role of design in the company is also changing. Design champions within Xerox say that design's role in the organisation will change from being a horizontal function, which plays a limited role at select points in the product engineering process, to being a vertical function, informing all of the company's activities, from board room to product end-of-life. Many of the activities of the design team at Xerox are geared towards achieving this goal.

# Culture

**All the companies interviewed were open about their design processes and happy to share these as part of this study. This signifies a level of comfort with the design process that they use.**

Bar any directly commercially sensitive methods or data, the companies were eager to communicate about their design expertise and confidence in their design process. In some cases, the existence of a robust and functioning design process is seen as one factor that may attract the most able designers to apply to the company.

Having this attitude and confidence in the design process, and being willing to communicate externally about it has a subsequent positive impact on the corporate brand. The Desk Research Report drew on the example of Philips Design, and pointed to the way in which the company builds its ethos and image on its creative processes and regularly presents at conferences sharing its best practice and design process. Consequently, Philips's confidence in its methods strengthens its design-led brand values and profile.

Indeed, the companies that participated in the design process study were equally adamant that design, including its processes, internal profile and the product or service generated, is a key element in developing and enhancing brand qualities for commercial

leverage. In fact, their participation in the design process study demonstrates their confidence about the methods, tools and techniques used in executing design within the business.

Companies that recognise that the relationship between corporate growth and strategic design decisions, and present their design-led thinking as a central component of the business, do more than produce a product. They are able to build on their reputation for design and design process and create a sense of emotion and desirability around their standard product or service. The company's market, customers and stakeholders subsequently are quick to identify and establish a link between design and brand equity.

# Integration

**Design can't be treated in isolation from other business processes: designers have always needed to interact with commercial functions, with manufacturing and with product or service support. Multi-disciplinary teams and working processes are a key feature in many of the companies from our study**



While these interactions are an essential part of the design process, they can be carried out in many different ways. For every company in our survey, managing the interactions between the design function and other parts of the organisation was a key concern.

Interaction requires more than regularly scheduled meetings, however. Designers, engineers and commercial staff often look at the world in different ways. They each speak their own language and can be motivated by rather different concerns.

For many of the companies in our survey, these cultural barriers were overcome by educating designers in the language of other functions.

At Yahoo!, and LEGO for example, designers must be able to speak fluently about the commercial implications of their design decisions. At Xerox, designers are fluent in the analysis methods and processes used by their engineering colleagues.

For many of the organisations in our survey, strong interactions between designers and other functions are achieved not by building formal communication processes, but by integrating the designers directly into cross functional development teams.
Yahoo!'s AGILE development process is a good example of the way cross functional teams are operated, with frequent formal and informal exchange of information between team members from different disciplines.

At Microsoft, engineers, product managers, designers and user researchers are all part of the process of developing a new product or service. The central driver for multidisciplinary working throughout the design process at Microsoft is a focus on the user, with team members all equally engaged in finding solutions that adequately address user needs.

Integration has gone so far at Microsoft that the company argues that everyone involved in its development process – including the users, executives, developers and programmers – is a designer.

# Skills

**WWhile the eleven companies we spoke to employed designers with expertise in different design disciplines – such as graphic design, product and industrial design, visual communication and human interface expertise – in these organisations there is a common requirement for, and emphasis on, a wider skill set.**

There was a clear and strategic requirement from the heads of design in these companies to recruit and train designers who demonstrate multi-disciplinary working, business acumen and strategic thinking.

The types of skills highlighted by these companies can be delineated using the following characteristics:

— **Business acumen:** An understanding of the business and the ability to put design solutions through the test of business objectives and priorities is key for most businesses.
— **Design management skills:** Given that many businesses now have outsourced manufacturing and commodity activities, the design process can equally be a design management process. And where design is outsourced, this can be about managing design implementation remotely.
— **Multi-disciplinary skills:** Whether it's an understanding of software programming, materials development, higher levels of technology or user research methodology, designers are expected to actively and effectively engage with other disciplines. The purpose is for them to understand the touch-points that design has with and its effects on other parts of the business, and to learn how to work with these in practice. This involves learning different 'languages' and using appropriate communication tools to achieve cross functional and cross departmental project management.
— **A 'go-getter' attitude:** Designers need to be inquisitive, daring and take initiatives to move 'beyond the drawing board' and act strategically. They need to seek opportunities to engage with the wider business and use their design expertise to spot areas for innovation and improvement.
— **User focus:** Again, given the emphasis on the user in these companies, it was seen as important that designers could understand and interpret user needs.
— **Evangelising:** Companies expect their designers to act as advocates for design within the business, and to be able to promote its role, benefits and importance to other functions and departments.

This follows on from a general trend in many sectors where employees with a cross-function appeal and style of management are sought-after.

Tim Brown, CEO of IDEO, has pointed to the necessity for 'T-shaped employees.' He describes them as: 'people who are so inquisitive about the world that they're willing to try to do what you do. We call them 'T-shaped people.' They have a principal skill that describes the vertical leg of the T - they're mechanical engineers or industrial designers. But they are so empathetic that they can branch out into other skills, such as anthropology, and do them as well. They are able to explore insights from many different perspectives and recognize patterns of behaviour that point to a universal human need. That's what you're after at this point – patterns that yield ideas.'

# Senior management support

**Corporate and senior management support for design is beneficial. The success of the design process in a business is augmented when there is buy-in from – and acceptance of its value by – senior management.**

In the companies we surveyed, we saw three primary drivers for top management support of design.

— Design's role as a value creator
— A new focus on user needs
— Design as a tool to deliver the brand

In many of the companies we spoke to, the successful completion and communication of a single design project that fulfilled one or more of these drivers was a decisive factor in achieving top-level support for the design function. Whirlpool's Duet washing machine was more popular and more profitable than any machine in its history. BT's Home Hub wireless router helped to redefine the organisations' position in the minds of its customers and Virgin Atlantic's Upper Class Suite was a decisive differentiator in a highly competitive market.

### Recognition of design's role as a value creator

Where senior management accepts that design itself is crucial to the success of the company's products and services, this has a positive impact on the buy-in to the design process and its links with the company's overall new product development

processes. This is particularly important where design can be used as a key way of differentiating products and services from those of competitors.

At Whirlpool, for example, the use of design to produce highly successful, high margin products has driven a wider management enthusiasm for the application of design across all brands and product ranges. Today the role of design is accepted across the organisation and is seen as inseparable from the company's overall investment in, and emphasis on, innovation.

While design is most commonly used to increase the customer's perception of product value, it can also cut costs. At LEGO, productivity increases and radical inventory reductions have been an important result of the design process, which successfully reduced the number of bricks produced from about 14,000 shapes and variations to just 6,500.

## A new user focus

A second and very significant source of support for design and consequently design process comes from the growing centrality of the user to the company's strategy. Organisations that deliver complex and sophisticated products and services are increasingly recognising that usability issues are becoming the biggest barrier to success.

Today, these companies are paying extremely close attention to user experience and needs. They invest heavily in user research during the design process, and realise that designers can play a significant role in the translation of user needs into appropriately designed products and services.

## Design to deliver the brand

Brands are hugely powerful things. They are also tricky to manage. Whether companies, like Whirlpool, need to cost-effectively manage and differentiate a diverse brand portfolio or whether, like Yahoo!, LEGO or Starbucks, they need to make a successful brand work in a growing variety of product and service contexts, design input can be instrumental in successful brand management.

Whirlpool's platform and brand studios, for example, have helped the company to greatly increase the use of common parts across its different brands, while actually increasing brand differentiation and the number of markets served.

At Starbucks, the use of design filters to evaluate every product or piece of merchandise is helping to deliver a consistent user experience and brand recognition as the company's offering diversifies rapidly.

The design process study findings show that senior management support for design is on the increase, with several of the companies having convinced senior management of the real impact of design in only the past decade.

# Tools of the trade and methods

**The companies we visited use some key tools and techniques in order to manage their design processes in an effective and consistent manner.**



Design methods such as sketching, prototyping, and storyboards are all used throughout the design process to develop and demonstrate the potential of a product or service.

Several of the participating companies' design processes included the practice of documenting design methods in a central resource. For some, this resource constituted the only formalised element of a design process, whereas for others it was just one key component.

### Methods banks

A handful of the companies in the study used the central documentation and communication of design methods as an important part of the design process itself. Consequently, a need had been identified for design methods to be logged and communicated widely within the company.

Often this takes place through an intranet or a methods bank where methods are uploaded by users with descriptions, videos, sketches or flow-charts. Live discussions or blogs can take place around each individual method topic, and users are encouraged to contribute, discuss and exchange experiences.

A few examples of such methods tools include LEGO's Design Practice and emerging methods bank, Microsoft's User Experience best practice intranet, and the methods section of Starbucks' online workflow management tool.

Given the proximity of design and brand in BT, their brand intranet could also be included as an example of a methods tool through which brand guidelines are communicated both internally and to external design agencies.

The capture and re-use of best practice design methods in 'banks' or programmes such as these are considered to encourage best practice in design, avoid re-work and improve robustness and efficiency of outputs.

## Capturing knowledge

In some companies, other departments, functions and experts are given equal access to methods resources, and are encouraged to contribute as well. In these instances, the resource is populated by views from across the business and becomes less design-driven.

This makes it more widely relevant, intelligible and current to different functions of the business, such as programmers, developers or user researchers. At Microsoft, software developers, user researchers and designers alike would access and contribute to the internal User Excellence Handbook.

Given that companies such as Microsoft believe that employees across the board – and not just designers – can contribute with innovative ideas and reflections that are valuable to the company's products and services, this open source mentality makes sense.

The practice of documenting design methods has some key benefits for the company: Design methods are fundamental tools for designers and help to illustrate the important ways in which a designer works. Documenting them in a formal tool shows the designer and the company that their work is valuable, appreciated and has tangible outputs.

Knowledge management and transfer is another driver for documenting design methods, enabling both other designers and non-designers to access a bank of methods and best practice in design or user experience. This is often made possible on a global level, covering a multitude of teams and markets.

Where methods banks or similar tools are made accessible to external users, the company can benefit from demonstrating its expertise in design and development and willingness to communicate with its users, building the company's reputation for design. Design methods help to define the project that will prove a product or service's business potential and bring it through development and implementation phases. Having a resource that advises on this helps process planning and management.

# Formal design process management

**The majority of the companies we interviewed had a formalised design process which they used in new product and service development.**

In some cases, such as for Microsoft, LEGO, Sony, Whirlpool, Starbucks and Xerox this process was clearly structured, documented and communicated both within the immediate creative team and to other departments or groups involved in the new product or service development process (such as engineers, software developers, research & development staff, and user researchers).

Other companies who outsource most of their design implementation work focus more on a design and brand management process which takes the design project through to implementation, and to varying degrees pulls the project back into the in-house design team for creative iteration and development.

It is important to note, however, that the design process used by these leading corporate users of design, no matter how formalised or documented at the time of this study, is under continuous review.

As and when difficulties or challenges are identified as part of the process – perhaps as the result of changes in product and service, competitive context, user context and needs and other influences in the business – the design process is adjusted and revised accordingly. Many of the companies noted that if the design process were to be reviewed by this study in a year's time, it would already look different.

It is likely that the main four stages of the 'double diamond' design process model used in our analysis, would survive such changes and iterations. However, the methods used, the differing emphases on different stages and the individuals and roles involved are all influenced over time.

The core stages of any design process can be expanded or retracted to accommodate a particular project and context to reflect individual needs and requirements as they pass through the design process.

One particular trigger for this might be changes to the role of design in the company, which might see design's role stretched both upstream and downstream in the product development process.

## Other ways to view the content

— Step through our study of the design process
— See how design is used to meet different business challenges
— Or read more about the design process at individual companies

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# Design at Alessi

**Alessi, one of the world's leading manufacturers of designer kitchen and tableware, puts design at the very heart of its business and has developed sophisticated processes for finding, commissioning and developing new designs from a worldwide network of talented designers and architects.**

## Overview

**Alessi has built a successful business by selling the idea of design, and of designers, to consumers. The company relies entirely on outside designers for all design execution and for the majority of concept initiation activities.**



Because of this, the company has developed sophisticated in-house techniques for evaluating the potential of particular concepts and for preserving the designer's original intent from drawing to mass production. Key elements of this capability include:

— A formula for the assessment of the potential of new designs in four key dimensions, supported by sophisticated market size and manufacturing cost analyses
— Skilled technicians who act as intermediaries between designers and manufacturing engineers
— A network of suppliers with high quality, low volume mass production capabilities
— A willingness to maintain a large product portfolio and to market test designs for extended periods.

Alessi operates in a market where novelty is very important to sales, where production volumes are usually low and where customers are extremely demanding in terms of the manufacturing quality of products. It faces continual pressure to find suppliers capable of producing products and components to its specifications.

The company also needs to ensure that the designs it chooses to bring to market continue to be in line with evolving public needs.

## Innovation

With a relentless concentration on the introduction of new designs to the market, innovation is central to Alessi's business model. The company, inspired by its designers, has also pioneered the use of new materials in kitchen and tableware, in particular making extensive use of plastics in high-quality contexts.

## Meet the team

Alessi retains no internal designers at all. Despite this, design is the very heart of the Alessi market offering. Finding, commissioning and developing new designs from talented designers is the core of the company's business. Design, therefore, has an extremely high status within the firm.

All design is outsourced at Alessi. The company does retain a team of two 'design assistants' whose role is to facilitate communication between designers and the company's engineering function to manage the transition from design to production reality. The design assistants have deep technical knowledge, and combine this with extensive experience in bringing designer goods to market. This is essential, says Alberto Alessi, the company's owner, since 'they know better than the other technicians the importance of the designer, the design aspects to be preserved.'

According to Alberto Alessi, keeping expertise within the organisation is also challenging, particularly at the present time when a number of key figures in the company are approaching retirement age.

## History

Alessi was founded in 1921 by Giovanni Alessi, the grandfather of the current owner. The firm began life as a workshop in valle Strona in the Italian Alps, producing a wide range of tableware items in nickel, chromium and sliver-plated brass. The company's intention was to produce hand-crafted items with the aid of machines.

From the start, Alessi produced a large number of different product designs, but the company's present form only began to emerge when Carlo Alessi, father of the current owner, joined the firm in the mid 1930s. Trained as an industrial designer, Carlo Alessi was single-handedly responsible for the design of most of the company's output between 1935 and 1945.

In the 1950s Carlo took over the management of the firm from his father. He stopped his design work at this stage, but began a tradition of hiring freelance designers to work for

the company. That tradition continues to this day. Carlo also expanded the output of the firm dramatically, introducing more automation and expanding sales to include exports.

Alessi's current owner, Alberto Alessi, joined the family firm in 1970. Passionate about design and the relationship between manufactured products and the societies that use and consume them, Alberto began a policy of using external designer as a key differentiator. In the process he shaped Alessi into one of the most important manufacturers of designer kitchen and tableware in the world today

# The evolution of design at Alessi

**The design process at Alessi can begin in several ways, explains the company's owner, Alberto Alessi. As Alessi's products are so closely identified with their signature designer, finding - and maintaining relationships with - a wide range of product designers and architects is a key task for the company.**



Alberto Alessi says Alessi needs to continuously develop the network of designers with whom they work if they are to continue to offer a differentiated and varied range of products.

He enumerates seven ways in which contact with new designers might be initiated before the design process commences:

— **Designers speculatively contact Alessi with an idea or concept:** Around 350 designers a year contact Alessi in this way. Alessi's exacting standards, however, and its demands for highly individual aesthetics and strong personalities mean that ideas initiated in this way are rarely followed through to production
— **Design workshops:** Alessi organises 4 to 6 workshops each year, mainly with young designers through universities and industrial design schools across the world, although again this seldom results in a concept that will be followed through to production
— **Recommendations from journalists on the ground:** A coterie of industry journalists who Alberto Alessi calls his 'antennae' journalists regularly suggest potential new designers with whom the company will then initiate contact
— **Suggestions from current collaborators:** Designers already working with Alessi will often recommend other people in the field that have potential. This is a key information channel that has led to many successful collaborations
— **'Design explorations':** The company identifies an emblematic domestic object (most recently tea and coffee sets) and gives a group of architects free rein to design products around that theme unconstrained by the demands of series production (the products are handmade in silver by craftsmen). From a group of

over twenty products, maybe five might be explored further with a view to creating mass production versions.This is a long-term and expensive method but the one favoured by Alberto Alessi: it's worth noting that while return on investment is not guaranteed in terms of production-ready product development, Alessi leverages valuable publicity from the process and product concepts developed

— **Competitions run by Alessi:** This is a less frequently used method of searching which, although deemed interesting, does not always see entries translated into real products

— **Contact from well-established designers:** This type of direct contact with Alessi occurs frequently and will often result in a collaborative project.

However the initial contact has been made, when designers submit proposals for the company to evaluate, its internal teams select some of those to take forward towards production.

**In more depth**
Find out more about how the Discover stage of the design process works in other companies that took part in our study

Alternatively, where designers have experience working with Alessi and a track record of success, the firm may suggest product ideas to them. Alessi emphasises, however, that this process is nothing like the traditional briefing process that might typically be seen when a firm engages an outside designer. It is not 'a restricted briefing,' he explains, rather, 'just an idea, and they could react by giving us some projects.'

Indeed when Philippe Starck created the Juicy Salif, one of the company's most iconic products, for Alessi in 1989, his original brief was to design a tray. His response was an idea for an octopus-like lemon squeezer sketched on a napkin still grease-spattered from a calamari lunch.

The design cycle takes between 18 months and two years, depending primarily on the main material from which the item in question is made. Stainless steel has the longest lead-time, explains Alessi, with porcelain and glass a little faster. Tooling and manufacturing engineering processes take up the majority of this time.

Once a concept is received, the technical evaluation and construction of an initial prototype is usually done in around three months. Analysis of the item's market potential may take another month. If a go-ahead decision is made, production engineering will be completed in around a year, with the manufacture of moulds and tools taking up the remaining six to eight months.

**Market**

Today, Alessi continues to produce a wide range of kitchen and tableware. Its current catalogue contains around 2,000 different items, some of which are still manufactured at the company's Italian factory. The company divides its product offering into three separate ranges:

— The **Officina Alessi** collection which includes 'sophisticated, experimental and innovative products' and small-scale and limited production items
— The **ALESSI** collection which includes mass produced items using premium materials, high quality manufacturing and sophisticated design
— The **A di Alessi collection**, a range of products produced at high volumes and slightly lower prices.

Alessi has also extended its activities, using its design management expertise, to deliver a range of joint venture and licensing activities with outside manufacturers. These activities have included wristwatches, textiles and automotive designs.

# The Alessi design process

**The Alessi design process includes a rigorous monitoring and evaluation module to ensure design ideas are viable for production.**

By whatever route the designer's initial concept has been generated, which may be a sketch, a detailed drawing or a physical prototype, it is analysed first by the company's owner, Alberto Alessi and senior colleagues.

Alessi has a formal set of assessment criteria it applies to a new concept to decide if it should be developed for production.

The formula measures the proposal along four dimensions:

— **Function (F):** The function of the design. Does it work? Is it practical, functional and labour saving?
— **Sensoriality, Memory, Imagination (SMI):** Does the design please the senses? Is it memorable? Does it engender emotion?
— **Communication, Language (CL):** Will the product give its owner status? Does it fit with current trends?
— **Price (P):** Can the product be made and sold at a sensible price, both relative to substitute products and to the customer's sense of its value?

Items are given a score from 0 to 5 along each of these four dimensions, with five being the highest score, and three being neutral. A prospective design must have an overall score of more than 12 (equivalent to four neutral ratings) to be considered worth taking forward to the next stage.

Alessi emphasises that the formula may need to be applied repeatedly during a project, since during the earliest phases, manufacturing costs and functionality, for example, may not be easy to establish. If the potential success of a concept is not clear from the outset then the design is given to Alessi's technical department to assess its manufacturability and to its marketing department to consider its saleability. The two departments produce a brief report on the concept and the formula is applied again.

Many projects are frozen after the initial assessment, and their prototypes and production details are placed in the company archive. These products may be revisited in future if trends change.

**Status**
Today Alessi remains in private hands. The company does not publish its full financial results but does release the information that 65 per cent of its output is exported to over 60 countries, and that its products are available in more than 5,000 retailers. Today the company owns 14 Alessi 'Showroom' and 'Flagship' stores, located in key markets worldwide. It also runs 175 'shop in shop' concessions.

# Tools, techniques and tips

**Once the initial design idea has been evaluated and has proved itself to be fit for production, it moves on to the next stage of the Alessi design process. This is managed with a variety of tools and techniques, not least the metal manufacturing tools Alessi has retained to produce metal items in-house.**

If a design is approved for development, it will be assigned to a design assistant, who will work with the designer and the production engineers to take the project forward.

Today, the company has two engineering departments – one for the stainless steel production process, whose engineers complete the detailed engineering of stainless parts to full production readiness. The other engineering team works with suppliers to engineer parts of plastic, silver and the other materials used in Alessi production today.

Alessi makes prototypes of most designs at an early stage. Sometimes these are produced by the designers as part of their internal processes. In other cases Alessi will manufacture a prototype from the designers' drawings in order to better facilitate discussion of a given design.

'If we can understand the drawing, we will make the prototype ourselves,' says Alessi, 'if the concept is not clear, we will ask the designer to oversee the production of a prototype themselves to ensure their concept is articulated properly.' Prototypes stored at the company museum range from very rough concepts constructed from paper or clay to production-representative models.

**In more depth**
See how other companies in our study use final testing to identify and constraints or problems with their products before manufacture

## Manufacture
Alessi retains a policy of producing a very wide range of designs, often in small production quantities. Today, these items may be in any one of a very wide range of materials. Metal items are manufactured in-house and can be produced in volumes varying between 100 and 60,000 per annum. Alessi's suppliers are located all over the world, from the US to China.

A key challenge, says Alessi, is to find suppliers who can produce items at the right levels of quality and in the low quantities required by the firm. 'Manufacturers usually have no problem working with the materials we need to use,' explains Alessi, 'but they often struggle to achieve the surface quality we require.' Designers, he explains, often have very particular requirements for the surface texture of their concepts and manufacturers are placed under a lot of pressure to get this aspect of their process right.

## Evolving consumer demand
While for functional items, at least one test is carried out on a prototype, sometimes two, the majority of testing at Alessi is informal and is carried out by the market itself after launch. Content to produce models in low volumes and keep them on the market for a long period, Alessi will scale production up and down depending on demand for the product.

In fact, once in production, Alessi products typically have a very long lifespan, sometimes measured in decades. As Alessi explains, however, the product's customer base, price and performance against its measuring formula all change during its lifespan.

The company considers a product's market lifecycle in two phases. In the first phase, most often spanning the product's first three years on the market the customer is 'the design aficionado or design victim'. These customers, says Alessi, are very concerned by the two central parameters in the formula and less by price and function. They are 'very forgiving,' he notes.

**In more depth**
Read about how other companies in our study set targets for evaluating the success of their products' design

In the second phase, beginning after the product has been on the market for around three years, the customer base changes subtly. With a perhaps previously avant-garde product now more familiar, customers treat the objects not merely as a piece of design, but as a functional item that must compete with equivalents from other makers. Now the two central criteria are still significant, but the function and price take on an increasingly important role.

**Tools**
Alessi keeps a private museum of past and present output. Since 1998 all designs, prototypes and products have been represented here, and the collection includes nearly 17,000 items, most of which are prototypes. Designers working for Alessi can ask for access to the space to look at previous output, including items that never make it as far as production. For all products, there is also an archive of information including sketches, notes on production processes used, and a dossier including details of press coverage, any museum collections that include the product and even a list of films where the product appears on set.

# With thanks to Alessi

We spoke to Alberto Alessi, the company's owner and Metaproject Responsible, and to Gloria Barcellini, Assistant Metaproject at Alessi.

To find out more about Alessi, visit www.alessi.com

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Eleven lessons: managing design in eleven global brands

# Design at BSkyB

**A pioneer in the delivery of multi-channel television in the UK, BSkyB has recognised the potential to use design as a market differentiator. While continuing to evolve its product offering, BSkyB has focused on developing in-house design management capability while building a strong relationship with an external design consultancy for the execution of product designs.**

## Overview

**As a pioneer in the delivery of multi-channel television in the UK, BSkyB has continued to evolve its product offering, being an early adopter of interactive television services, downloadable TV content via broadband and hard-disc based video recording systems to allow subscribers to pause live TV and record large quantities of content for later viewing.**

BSkyB has its own brand management department, but no in-house product designers. All product design activities are outsourced, but the external consultancies are managed by Ed Snodgrass, the Product Design Manager at BSkyB, who is also responsible for liaison with manufacturers.

Key elements of BSkyB's product design strategy include:

— Ensuring the commissioned agency had a crucial understanding of the brand and positioning, and briefing them to incorporate brand identity into product design
— Developing a formal design language to give all products a consistent brand identity
— Working with its external agency partner during early market position, user behaviour and concept development phases
— Creating separate identities for individual product lines based on the requirements of their specific markets
— Developing a policy for visually identical products with multiple simultaneous manufacturing partners, using different internal electronics

— Getting buy-in from senior management (and a direct link to CEO) which makes it easier to justify investment in design and gives it a higher status within the organisation.

The company has its own innovation manager, who is responsible for generating ideas and for encouraging innovation throughout the wider organisation through innovation workshops and related activities.

## History

BSkyB was formed by the merger of two early incumbents in the UK multi-channel TV market.

Sky, launched in 1989, originally offered four TV channels to subscribers using the Astra communications satellite. Rival British Satellite Broadcasting launched a year later and quickly merged with Sky to form the basis of today's organisation. BSkyB grew rapidly over the rest of the decade. By 1995 it had more than five million subscribers and offered them 23 channels. In 1999, free Sky set top boxes and mini-dishes helped Sky digital become the fastest growing digital platform in Europe, acquiring over 1.2 million subscribers in just 10 months.

# The evolution of design at BSkyB

**BSkyB operates in an increasingly crowded market. Many customers now have multiple options for TV delivery from digital broadcast services, cable and satellite. They are also consuming media in different ways on new devices.**

Some audiences are moving away from traditional pushed media such as TV and radio towards more interactive forms including electronic games and user generated content channels.

BSkyB has developed a range of set top boxes and associated remote controls, that enable much of the user functionality of the company's pay-TV-services, as well as handling channel decryption, subscriber identification and, in some cases, recording functionality.
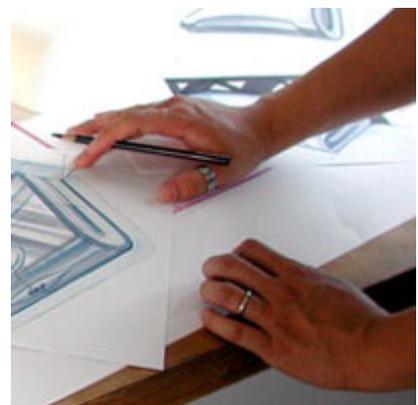
## Design process evolution

BSkyB's set top boxes are produced by multiple manufacturers and originally the design of the boxes was left entirely to the manufacturers' discretion. Around three years ago, however, there was a change of attitude among BSkyB's senior management, who recognised that the set top box was a highly visible element of the company's presence in the customer's home and could benefit from a consistent brand identity. BSkyB

organised a competitive pitch, evaluated ideas from three agencies and eventually selected Frog to develop the design of its new set top box range. To do this, BSkyB recognised it would need design management capability, so it recruited Ed Snodgrass, who has a background of product design at an electronics specialist, to lead the project.

## Organisational position and influence
Snodgrass operates in BSkyB's Strategic Product Development department, which is responsible for the development of all aspects of the company's set top box offerings, including hardware and software. Unusually for a functional department head, Snodgrass has a direct link to James Murdoch, the company's CEO.

The company also has an R&D department, which focuses on future orientated developments such as new cabling solutions or new ways of getting satellite signals into the home, and a consumer technology department, which manages the engineering standards of its delivery mechanisms. Snodgrass has a close relationship with this latter department, ensuring that new generations of set top box are evolving with the capability to handle the latest functionality.

## Status
Today British Sky Broadcasting (BSkyB) operates the UK's largest multi-channel television platform. In 2006, the company had just over 13,000 employees, a turnover of £ 4,148 million and an operating profit of £ 877 million. The company had more than eight million TV   subscribers in 2006, a growthof 389,000 in the year. (Source: 2006 Annual Report).

# BSkyB case study: discover

**For the set top box project, Ed Snodgrass, Product Design Manager at BSkyB, worked with the company's product development managers to prepare a brief for design consultancy Frog.**

The company wanted to develop a series of three separate set top box units, offered at different price points and with different capabilities. Each unit was to have its own distinct identity, but they should share a common design language.

BSkyB's aims included:

— Differentiating its set top boxes from other entertainment products in consumers' homes
— Reflecting the high end technology within the set top box, but remaining usable by anyone from 7 to 70
— Developing a solution that could be practically implemented with existing manufacturers and did not excessively increase manufacturing costs.

BSkyB also provided agencies with brand information at this stage. Frog responded with a detailed proposal and the two organisations agreed a budget and timescales for the project.

### Discover – Design – Deliver

After the initial pitch, Frog was invited to produce initial concepts for the new BSkyB set top boxes, using the process it has developed for managing all design projects which it calls Discover – Design – Deliver. Alongside this process, Frog operates a formal internal management structure for its design projects, with a Programme Manager and Creative Director responsible for coordinating all Frog's efforts and ensuring that research, client liaison and creative activities are tightly coordinated. The Creative Director is also responsible for coordinating the activities of the designers working on the project.
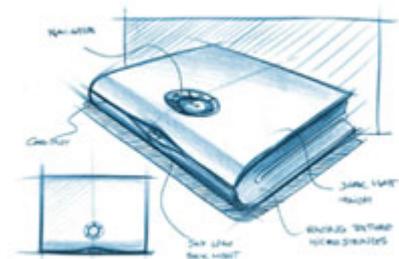
Accordingly, Frog approached the set top box project with an intense 'Discover' phase which was used to analyse the BSkyB brand values, consumer expectations, the manufacturing envelope and future roll-out, and rationalise these into formal design language documentation that would enable the organisation to gain significant control over future design and 3D brand representation of BSkyB.

### In more depth
Read more about the Discover phase of the design process

Frog developed four concepts in line with a positioning model, which mapped out the opportunity for BSkyB to not only express key brand values (such as 'entertainment') through product design, but also to differentiate the BSkyB brand from its competitors. 'We came up with the recommendation that BSkyB needed to have a much more expressive product on the market, that it needed to create identity,' explains James Whittaker, Creative Director at Frog's German offices.

### User Research

BSkyB places high priority on research - carrying out extensive user research, particularly on the ergonomics of its products and remote controls as well as the usability of its software offerings such as the on screen electronic programme guide with which users navigate the platform - and this philosophy was well complemented by Frog's capabilities in this area.

An important element of this in the BSkyB set-top box project, says Whittaker, was to give both consultancy and the client a deeper understanding of real consumer behaviours and needs. Frog and BSkyB applied a broad range of techniques including

ethnographic research and observational studies, before creating a highly detailed internal brief used to take the design processes forward.

Both Snodgrass and Whittaker emphasise, however, that user research cannot be limited to 'asking consumers what they want,' and Snodgrass notes that while this research is a powerful tool to improve usability, its utility is limited for the evaluation of the industrial design of the company's products as customers rarely articulate useful feedback on these aspects of the products.

**In more depth**
Find out more about how [user research](#) can help identify user needs and experiences and lead to product innovation

**Market**
BSkyB produces its own media content, supplies channel packages to cable companies and other TV   distributors and distributes content via broadband and mobile networks for consumption on a wide variety of devices. Its primary activity, however, is the distribution of more than 138 TV   channels and audio content to subscribers in the UK.

# BSkyB case study: design and deliver

**After four weeks on the set top box project, Frog responded with around ten initial concepts, in sketch form. Snodgrass and the product managers selected preferences from these initial offerings**



According to Whittaker, Frog's objective at this stage was to agree an overall concept for the design with BSkyB.

The concept that was chosen was one the Frog team christened 'flow', where the product form contrasted an outer protective shell with curved elements across the sides and front of the box which provide a glimpse of 'the juicy bits inside.'

'It's like a bit like an orange,' Whittaker explains, 'it has this protective skin but it looks like if you squeezed it, the brand essence would come out.'

With the basic design language agreed, Frog and BSkyB then worked to develop variations on this theme, designed to give the individual boxes in the range a distinct identity that would support their market position.

The basic set top box, therefore, was given a friendlier, fun appearance, while the high-end HD unit was designed to look 'a bit more dark and mysterious, more visually powerful.'

Although design consultancy Frog, BSkyB and the manufacturers had been in conversation since the start of the project, once the concept was agreed, the dialogue with the manufacturers could begin in earnest.

According to Ed Snodgrass, Product Design Manager at BSkyB, there was considerable tension early in the design process between the designers and other stakeholders in the organisation, who needed to ensure that the product could be delivered within acceptable cost, manufacturability and reliability parameters. This involved re-establishing previous PCB design constraints, and positions for card slots, connectors and status LEDs.

Once the basic dimensional constraints were established, Frog built the first 3D CAD models of the proposed solutions. From these models, machined foam mock-ups were made to allow BSkyB stakeholders to get a better grasp of the size and shape of the proposed solutions. Final approval was carried out by the company's CEO, who, after requesting changes to form, interface, or finish, selected a single solution.
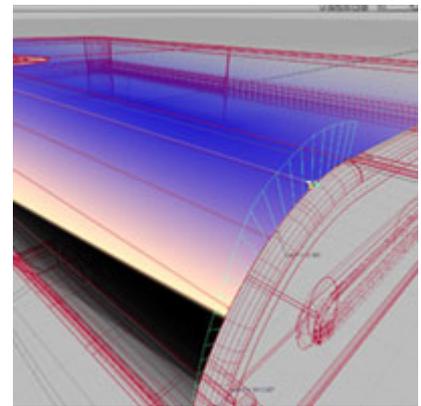


Critical at the next stage, says Snodgrass, was an understanding of the ventilation system that would be used to keep the electronics in the box cool. Different manufacturers, he explains, use different ventilation principles, with some preferring to use a fan and others relying on natural convection.

For Frog, the use of multiple manufacturers meant that it had to evolve three separate designs for the set top box, with identical outer 'A' surfaces, but different internal structures and supports. Another key negotiation with the manufacturers was to limit their branding to the back of the box, so that the front of the box is 'owned by Sky.'

In the early stages of the design project, says Whittaker, Frog's designers would communicate with the client 'every few days,' but this intensity increased as the engineering of the project progressed, to the point where designers, client and manufacturer were in conversation 'several times a day. It's about having a common goal, a common aim.'

### Delivery

Snodgrass and the Frog designers then entered a detailed dialogue with the manufacturers to evolve the design to make it suitable for their manufacturing processes.

'As we were dealing with some quite new chipsets in these products, we didn't have some dimensions finalised until quite late in the project,' explains James Whittaker, Creative Director at Frog's German office, 'That meant we had to modify overall dimensions sometimes during the project.'

The manufacturers then carried out the detailed engineering of the product, a process which took up to two years, depending on the lead times for tooling, chip sets and software development.

**In more depth**

Read more about the Deliver stage of the design process, where the final concept is taken through to launch

### Evaluation and iteration

Before production began, Snodgrass and the manufacturers worked together to fine-tune, fit and finish before pre-production units are made and sent out for user testing. Initial product field trials involved around 100 customers and were managed by the BSkyB Product Manager. Field trials resulted in small changes to software or user interface characteristics, which were integrated into the product before launch.

**In more depth**

Read more about how the testing of concepts and prototypes is a major part of the Develop stage of the design process

Increasingly, products are also designed with maintenance and disassembly in mind. In part, says Snodgrass, this is to make service and repair cheaper, but tightening waste legislation is also encouraging the company to produce equipment with longest possible lifetime and with easier and more cost effective recycling at end-of-life.

Once a product is in use, positive or negative customer feedback on set top box design and performance is collected at BSkyB service centres and sent to Snodgrass and his team, to be absorbed for future design revisions and product updates.

**In more depth**

Read about how other companies in our study use feedback to spin off into new projects or improvements

# With thanks to BSkyB

Our interviewees were Ed Snodgrass, Product Design Manager at BSkyB and James Whittaker, Creative Director at the German offices of US-based design consultancy Frog, to which BSkyB outsources all its set top box design activities.

To find out more about BSkyB, visit ⊡→[www.sky.com](http://www.sky.com)

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# Design at BT

Communications service provider BT is one of the UK's best known companies. A diverse and rapidly evolving organisation, it makes extensive use of design in many aspects of its business, closely integrating it with the BT brand. The company has developed tools and processes to manage an extensive roster of external design suppliers and help them communicate the brand.

## Overview

BT has had to evolve rapidly in order to maintain its position in its traditional markets, as well and gain a foothold in new ones. The company sees design as an integral part of its marketing and brand strategy.

Key elements of the BT's design strategy include:

— Use of an extensive roster of outside design agencies
— The importance given to brand within the management of design
— Control of brand representation by capability building within its agency roster and internally
— Ongoing brand education and help for everyone within BT through brand web sites, the Brand Helpdesk and brand web conferences for global teams
— The use of dynamic interaction between external agencies and internal design management rather than through any formal design process.

The communications industry is rapidly evolving. Historically, fixed line operators, with their background as nationalised industries, enjoyed a robust competitive position thanks to their control of the expensive 'last mile' infrastructure connecting subscriber homes and offices to central telecommunications networks.

Today, the situation is very different. Consumers can choose between a variety of network options including services bundled with cable TV and Internet provision, and mobile telephony infrastructure. Fixed line networks are also open to competition and capacity on BT's

infrastructure is bought by competitors and sold to consumers using different business models. In some of these models, access to the network is free to the user, with money being made by selling extra services.

After abandoning product design almost entirely in recent years, BT is now returning to the development of its own products having recognised that they can perform an important role in differentiating its brand and service offerings in consumers' eyes. The company is now evolving its design strategy with the ambition of delivering a totally consistent user experience across all points of contact with the company.

### Innovation

BT has an extremely strong record in innovation. R&D underpins BT's increased focus on developing innovative products and services for a converged, networked world. Innovation work on key areas support BT's business and technology strategies, which included filing patent applications for 141 new inventions in 2006. The company has a large research and development centre capability, at its research centre at Adastral Park, near Ipswich.

As the use of design is spread so widely in the BT organisation, the company relies on formal processes to ensure that design resources are procured and used correctly. There is a company-wide process for the purchase of design inputs, and business units must select from a roster of agencies. Agencies on the roster include graphic designers, online agencies, and product design agencies, events and direct mail agencies.

### In more depth
Read more about how successful businesses require good leadership

### History

BT is one of the UK's best known companies. Its ancestor, the Electric Telegraph Company, was established in the UK in 1846, and was the first organisation outside the US to implement a commercial telegraph infrastructure.

In 1912 the telegraph and telephone infrastructure in the UK was nationalised and became part of the General Post Office. Telecommunication services in the UK remained under national control until 1984 when just over half of the shares in the Post Office telecommunications arm, then named British Telecommunications, were offered to the public.

In 1991 the company began trading as BT, and by 1993 the UK government had divested itself of almost all its shareholding in the company. Its transformation from an

'old fashioned telco' to a modern communications service provider is accelerating as the convergence of IT, communications and networking technologies continues.

# The evolution of design at BT

**David Mercer, Head of Design at BT, is responsible for the whole of BT's brand identity and he reports to the company's director of marketing and brand. The rapid pace of change within the sector, says Mercer, is creating 'a more dynamic role for design' as the company must adapt and extend its brand to encompass new service offerings and its new position in the economy.**



Mercer and his team are responsible for the design and creation of the brand, and for the delivery of specific products, such as the company's new generations of broadband access hardware. But design touches a very wide range of other aspects of the company's diverse businesses.

The majority of design work is carried out by an extensive roster of external design suppliers: Mercer estimates that 99 per cent of design is carried out by external agencies.

## Capability building

Mercer's team runs an extensive programme to help other members of the BT organisation (100,000 employees worldwide) understand the brand, and design's role in the brand. 'We want everyone to be brand advocates and to apply our brand correctly,' he says. Brand workshops and conferences contribute to this process.



Anyone coming to BT for the first time and who may be involved in the purchase or application of design takes part in a half day brand workshop. In addition there is an online resource, the BT Brand Site. This includes guidelines on applying BT's brand values and visual identity, as well as offering a section on policy and process, which includes guides to briefing marketing, communications and creative agencies.

BT brings all its external design agencies together on a quarterly basis to brief them on developments in brand strategy and identity requirements, as well as brand support 'on demand' for project or team needs.

Regular brand briefing meetings also allow the different agencies to get to know one another, which is essential, says Mercer, as agencies are strongly encouraged to

collaborate and work together to deliver consistent product across a range of activities. Annual audits of agency expenditure and reviews of performance are used to evaluate the performance of agencies on the roster and to make changes where necessary.

**In more depth**
Read more about how creating the right [company culture](#) can help drive innovation

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**Market**

Today BT is one of the world's major providers of communications solutions. The company operates in the UK, Europe, the Americas and the Asia Pacific region. It has more than 20million customers (both business and residential) and in its traditional business area operates more than 30million telephone and data lines.

BT has four principal lines of business:

— **BT Retail** is the UK's largest communications service provider, offering voice data and communications products directly to customers.
— **BT Wholesale** sells network services to other communications providers. It has more than 500 communications industry customers.
— **Openreach** operates BT's physical assets – the local phone lines and network infrastructure that deliver both BT and other services to end customers
— **BT Global Services** provides networked data and voice communication services to large organisations world-wide.

There are also two recently created areas of operation:

— **BT Design**, responsible for designing the technology and processes that provide solutions for customers over the global '21CN' advanced communications network platform
— **BT Operate**, responsible for deploying and running these new services

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# The BT design process

**BT has no formalised design process. In fact, its Head of Design, David Mercer, is emphatic that formal processes do not adequately describe or control the interaction between designers and design management necessary for delivering a good quality result.**

'It is a common misunderstanding that management of design is just about buying design,' he says, 'It is not. In the eighteen years I've been involved with design at BT, there has never been a single instance when an agency has come back first time with a concept against a brief that is exactly spot-on.'



The process, he says, is two way and interactive, it is 'more touchy-feely than a process, it's about understanding how creativity works.' In the best cases, he says, the designer can 'take the business somewhere it didn't quite know it was going.' To make the best of these opportunities, says Mercer, BT must be able to work with the agencies and encourage them to deliver great work.

Much of this, he notes, is down to the chemistry between designer and client. It is also a delicate process to manage. 'It's a bit like glass blowing: you are on the edge of disaster all the time, you have to be quite careful – it's easy to make mistakes, to go too far down the track and find the agency has gone in the wrong direction, so you have to bring them back.'

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## Status

BT employs 100,000 people. In 2006 BT's turnover was £ 19.5billion, up 6 per cent on the previous year. Its profits before tax and specific items were £ 2.2billion.

(Source: BT overview presentation, February 2007)

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# BT case study: BT Home Hub

**The design of BT's recently launched Home Hub product is a powerful example of the way BT is now using product design as a core part of its brand strategy. Home Hub is a broadband router with VOIP (voice over Internet protocol) capabilities and can be fitted with an integral handset.**



The Home Hub was designed, says Mercer, to give tangible form to the BT brand in the home in the way that the domestic telephone handset had done in years gone by.

Most broadband connection equipment, he explains, is hidden away under the computer or 'in the airing cupboard.' The BT Home Hub, by contrast was designed to be 'displayed on the shelf, becoming part of the home.'

The Home Hub also forms an integral part of BT's overall marketing campaign, appearing as a highly visible and central element of the company's web site, and in its TV advertising campaigns. In this way it operates as 'an icon for the brand.'

## Product development

The Home Hub was a very short lead-time project, a response to a dramatic change in the broadband market. A competitor had started to offer free-of-charge broadband lines, and this threatened BT's business model, which was to charge subscribers a monthly fee for their lines. So the company needed to respond by emphasising the value-added services that its broadband offering included.



As they were looking for response strategies, Mercer and his team were also involved in the final stages of commissioning a new, high performance router product. They saw an opportunity, says Mercer, 'to re-establish a relationship with our customers through the design of a particular device.'

Mercer and his team engaged a designer, Paul Priestman of agency Priestman Goode, to look at how the new hub could be made more useful and more appealing than the 'piece of grey plastic' that BT would usually use as a router enclosure.

Priestman had to work in a highly constrained environment for the Home Hub project. Not only was the electrical design of the product already finalised, but BT was engaged

in a tender process with prospective manufacturers, so the design had to be completed within three weeks, without any engagement with manufacturing engineers.



Despite the difficult environment, Mercer and the designer were able to dramatically alter the nature of the router. By turning the device onto its end, building in a cradle for a telephone handset and by including clever cable management functionality, they delivered a product that was appealing and easy to use for consumers.

They were also able to change the design of the packaging of the unit, ensuring that it was elegantly presented and logical to set up. The objective, says Mercer, was to give consumers a consistent experience through their whole contact with the BT brand, from seeing a piece of advertising, through buying, receiving, installing and enjoying the product.

## Product as brand

The Home Hub has itself helped to evolve BT's design process. The product has been so successful in marketing terms that advertising and marketing requirements are now being included in initial briefs for the next generations of equivalent products, with representatives from the departments and agencies involved in BT's marketing becoming involved in early stage discussion to ensure that that everyone has a good idea of 'how the design will manifest itself in advertising.'

## Impact

In its first year of availability, BT has shipped more than 250,000 Home Hub units. It is hard to underestimate the importance of the Home Hub to BT's overall strategy in consumer broadband, says Mercer. 'Out of designing the casing for a piece of technology, all of a sudden we have managed to differentiate the brand fundamentally and stabilise the whole scenario in terms of BT's main product. This is absolutely fundamental.'

BT has metrics for its overall brand value, to which design inputs contribute, but Mercer says that it is not possible to separate the direct contribution of design inputs from the building of brand value.

# With thanks to BT

For the purposes of this study, our interviewees were David Mercer, Head of Design and Susan Roche, Brand and Identity manager – Global.

To find out more about BT, visit [www.btplc.com](www.btplc.com)

**Please note**

# Design at LEGO

Danish company LEGO, the world's sixth largest toy maker, has transformed the processes of its design function in recent years. These changes have streamlined product development and the processes developed by the in-house design function are now being used as a method to improve innovation across the entire business.

## Overview

**LEGO has developed a new design system, called Design for Business (D4B), by which its whole innovation process is run.**

Key elements of the LEGO Design For Business process include:

— The alignment between corporate objectives and design strategy
— Strengthening the collaboration in core project teams containing a design, a marketing and product manager
— Challenge sessions for the team during this process, run by colleagues and D4B members
— The development of a standard sequence of activities for product development, with frequent evaluations and decision gates
— The development of standard processes for presenting the outputs of design phases to allow straightforward comparison of different projects and options.

### Meet the team

LEGO's design function includes 120 designers of 15 nationalities, based in Billund, Denmark. A further 15 designers work from Slough in the UK, and other satellite offices operate in several key markets and regions, either developing ideas for local market tastes or acting as a monitor of trends and new technologies (which is particularly the case with the Japanese unit).

For individual design projects, LEGO operates a matrix organisation containing core teams. Each core team

involves a marketer, a project leader and a design manager. Part of the objective of this structure, says Torsten Bjø rn, Creative Director, was to align our activities and focus them around the development of strong propositions where collaboration between functions became better, the D4B methods and tools have helped to leverage this'.

## Designers

Traditionally, LEGO has rated the ability to model creatively with its system as the key criterion for its designers, leading to the recruitment of staff from a tremendously wide range of educational and career backgrounds. More recently, there has been an increasing uptake of 'professional' designers, namely those who have received more conventional academic training in design disciplines.

Today, according to Smith-Meyer, the company is placing renewed importance on its designers' enthusiasm for LEGO itself and is employing new members of the design team who are passionate and excited about designing for LEGO.

## History

LEGO was founded in 1932 by Danish carpenter Ole Kirk Christiansen. The name is an abbreviation of the Danish words " leg godt", meaning play well. Now owned by a grandchild of the founder, LEGO has remained true to its original mission of producing toys that encourage children to create and use their imagination.



The product has established an iconic status and has a strong following of users, many of whom have had a relationship with the product since childhood. Central to LEGO's offering is the concept of 'systematic creativity', 'unlimited play' and the company's mission which is 'To inspire children to explore and challenge their own creative potential.'

The LEGO concept is simple. Injection moulded plastic bricks can be snapped together to build extremely elaborate structures. Key to the longevity of the system is its flexibility. Just six of the basic 'eight stud' LEGO bricks can be combined in more than 900 million different ways. In fact, there are thousands of different brick designs and colour combinations in the LEGO range, leading to an effectively infinite range of creative play possibilities.

# The evolution of design at LEGO

LEGO has continually evolved its system of bricks and applications for it since its invention. The original system elements have been extended in numerous ways to include, for example, people and special parts to allow the construction of moving vehicles and working train sets.

LEGO has ongoing collaborations with several universities in the UK, the US and Germany. The company has been involved in a joint R&D effort with the prestigious Media Lab at Massachusetts Institute of Technology in the US since 1984. Commercial outcomes of this research have included the company's Mindstorms system (now in its second generation). This is an advanced kit that includes sensors, actuators and a programmable logic controller. Mindstorms allows users to design, build and programme robotic systems that can sense and react to their environment.

## Context and challenges

However, recent years have not been easy for LEGO. The company has faced intense competition from the explosive growth in computer-based children's toys and the rise of low cost production of traditional children's toys in the Far East and stiff competition between retailers pushing margins and prices down.

After trying a variety of compensatory strategies during the 1990s and early years of the 21st century, the company has more recently made the decision to re-focus on the core and most popular product, namely the " Classic" product lines. An increased emphasis on these in recent years has lead to a warm reception from toy retailers and consumers. Combined with extensive reorganisation and outsourcing, the new approach has transformed the company's financial performance, putting it on a strong footing from which to go forward.
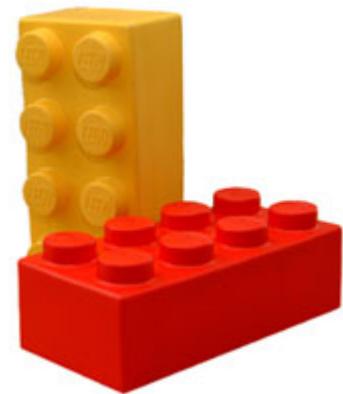
Given this context, LEGO's design team saw some challenges ahead: It needed to define a more holistic approach to innovation moving away from a predominantly product focused approach while maintaining an approach to design that would professionalise the department, leading to more efficient use of design resources and increased effect of the offerings in the market.

## Design process evolution

Design has traditionally been held in high regard at LEGO. The company considers design to be a key element in the development of their products, has used design as a competitive weapon and has given high levels of autonomy and responsibility to its design teams.

LEGO has transformed the processes of its design function in the last two years. The design team itself precipitated this process transformation. Existing processes, while they allowed the design team exceptional creative freedom, had resulted in too many commercially unsuccessful products coming to market and had also produced significant additional complexity in the LEGO system, which by the early 2000s had, risen to more than 14,000 different components.

In order to address these issues, the LEGO design team, led by Paal Smith-Meyer and Torsten Bjørn, Creative Directors, Concept & Design, started an initiative called Design For Business (D4B). Couched within LEGO's overall development process, the objective of D4B is to ensure that all design activities are supported by a real business case, and that proposed solutions can be tested against financial requirements before being adopted. Simultaneously, LEGO wanted to improve its responsiveness by cutting the length of the design cycle down from an average of two years to less than 12 months.

The rigorous process transformation approach adopted by the LEGO design function has helped to maintain and enhance its status within the company. Indeed, the processes developed in the design division are being used as a method for innovation across the entire business.

Design For Business represents a combination of LEGO's overall corporate strategy and design strategy, and has been instrumental in achieving some of LEGO's recent business performance successes. Find out more about how LEGO's Innovation model and its Foundation overview fit in to D4B.

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**Status**

In 2006, LEGO was the world's sixth largest toy maker. Revenues in that year were DKK (Danish Krone) 7,823million (£717million), up 11 per cent on the previous year. Profits were DKK1,348 million (£123.5million), up to 19.5 per cent from a level of 6.5 per cent in the year before. The company employs 5,000 people worldwide.

LEGO has its main facilities in Denmark. In recent years, LEGO has been through an extensive program of structural simplification. In particular, it has taken the strategic decision to outsource parts of its production, largely to manufacturers in Eastern Europe, and has divested itself of its own manufacturing capabilities and its LEGOLAND parks, retaining the most complex moulding inside the company, securing future expertise in the field.

# The LEGO design process

Design For Business essentially describes the overall innovation process within LEGO, and maps how a project is conceived, assessed and developed with design as a key stakeholder.

The Objective was to move from a primarily product focused innovation approach to a broader view of innovation in the organisation, enabling concepts to have more impact.

Design for Business includes three devices with which LEGO conceives, maps and tracks a project:

— an innovation model
— a foundation overview
— and a roadmap.

To the right, is part of a diagram explaining how these three devices fit together to form LEGO's D4B programme.
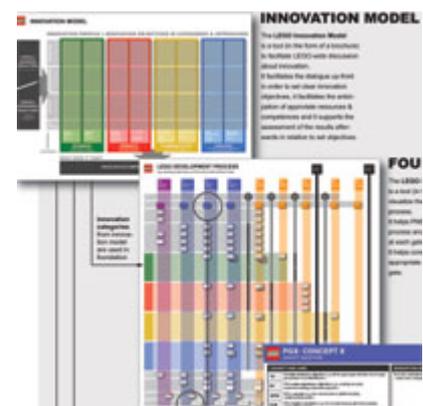


The LEGO roadmap tool is used to plan how each phase relates to the next. This helps to align key objectives, tasks and deliverables during the development stage.

Based on these initial phases of objective setting and project agreement, the stage where design tools and skills are brought in to further the concept begins.

**Market**

LEGO exports its products to more than 130 countries around the world, with the US and Germany its largest markets.

The company develops three core product platforms:

— Duplo, a system of large bricks for babies and younger children
— The core LEGO System, which is available in numerous different themes and configurations for children aged from four to adult
— Technic, an extension of the basic LEGO system that includes mechanical elements allowing working models to be produced. It's aimed at children aged from seven to adult.

In recent years, LEGO has entered licensing agreements with a number of filmmakers and other content owners to produce specialised LEGO sets with popular cultural themes. Examples of this approach include kits for the Star Wars and Harry Potter franchises.

LEGO has an exceptionally wide user base, ranging from pre-school children to a significant population of adult users. The company even sells products specifically to be used by adults in management training activities through LEGO Serious Play.
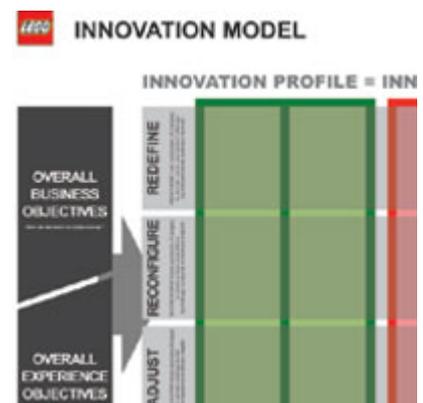
# LEGO case study: LEGO's innovation model

In the first instance, the LEGO innovation model is designed as a 'quick guide' to help foster a shared understanding and language around innovation in LEGO

The model and tools helps the entire company to:

— Participate in a dialogue early on in the process to define project objectives for the project and the innovation approach needed to deliver this
— Anticipate and acknowledge the resources and skills required for succeeding
— And enable the assessment of results against set objectives at different stages of the project

In order to prevent unnecessary redesign or replication of work without stagnating creativity, the LEGO innovation model is applied to all the four fundamental areas of business at LEGO: business, product, process and



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communication. In each area, activities are constantly reviewed and the right level of change is selected.

Approaches of innovation used in the model are:

— **No change** – a product or process is currently fit for purpose
— **Adjust** – minor changes and optimisation of known parameters are used to update products or modify processes in order to improve performance
— **Reconfigure** – known and often of multiple parameters, are put together in a new way in order to better meet existing business and/or customer needs
— **Redefine** – an entirely new approach and offering are introduced in a business area or market sector – existing products and processes may undergo quite fundamental modifications

# LEGO case study: LEGO's foundation overview

The LEGO development process uses a stage gate system to ensure that new designs are regularly evaluated against their business criteria and the portfolio so that costly investments are not made in projects without firm financial and market justification, aligned with the original objectives.

The foundation overview is a poster-based tool used to visualise the LEGO development process. This helps the Product Market Development team to review the whole innovation process and manage stakeholder expectations.



The development process has four prototyping phases (P0 to P3) and five manufacturing phases (M1 to M5).

— **In P0 (portfolio kick-off)** the business objectives for the project are defined. At this stage, the key question asked is: What are the critical issues that should be solved for product groups/lines across the portfolio? This takes about two or three months
— **In P1 (opportunity freeze)** the team assesses what opportunities would solve the issues identified in P0 and should be taken forward for development into concepts. The marketing team becomes involved to build market and customer insights into the business case and begin to define product requirements.

**In more depth**
Read more about other visual management techniques that could be useful during the development stage of the design process and find out how formal design process management works in other companies that took part in our study

Only when the project business criteria are in place, and the financial case for a new project has been proved, does the design team become involved.

— **In P2 (concept freeze)** the team establishes what the concepts are about in the context of overall business, product, communication and process requirements. The design team becomes involved, concepts are created and evaluated, some initial prototyping may be undertaken, the first full business case is prepared and detailed market analysis is used to identify the market opportunity for the new project
— **In P3 (portfolio freeze)** the team establishes which concepts are ready to be turned into projects. The full project requirements are established, including staff requirements, tooling and design costs and the full business case is put forward for approval. Some concepts that arise at this stage may not be LEGO-based and can be taken to other areas of the business for further exploration.

Overall, the journey from P0 to P3 can take up to six months.

Teams present their outputs from the P prototyping phases using standardised document templates. The foundation document is formed from a series of templates, and is used to create a foundation for each stage gate activity. It brings the core team activities together in an easy to understand document.

Tools such as the foundation document have made comparing different project options much more straightforward, and make decisions more objective says Smith-Meyer. 'Before, we had some people presenting 6 pages, some presenting 86 pages, some used CGI and interactive presentations. Now everyone presents in equal terms, focusing more on content than presentation, so we can compare apples with apples.'

# Idea generation at LEGO

LEGO has produced a detailed idea-generation process to assist its design teams during each phase of the overall development process. Operating as the full design cycle in miniature, the process is intended to transform business objectives into design recommendations by encouraging the development team to conduct a logical sequence of actions, with each part of the sequence having its own defined deliverables.

This sequence begins by Exploring the problem. In this research phase, the team examines the background to the design challenge through desk research, field studies and interviews with consumers and expert knowledge holders.

Insights from the exploration phase are delivered at the end of the process, and these are used by the team in the Developing phase. During this phase, basic ideas are sketched out, from mood and colour guidelines to visual or solid mock-ups of proposed designs, packaging or themes.



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The ideas from the exploration phase are presented formally to the entire project team, and then undergo a rigorous process of Validation, during which they are shown to key stakeholders including potential users, their parents, retailers and sector experts, and assessed against the objectives set.

Feedback from the validation phase may be used to refine design recommendations and to generate new insights, resulting in an iterative process before the final deliverable, recommendations on how the project will be taken forward.

**In more depth**
Read more about [development methods](#) and how, in this stage of the design process, prototyping and iterating the concept can get it as close to being an end product or service as possible

After completion of the cycle through the P prototyping stages, the project is reviewed and a go/no-go decision is made before the M phases take the concept forward to manufacture.

— In **M1 (project kick off)** designers and product managers work together to refine the product definition and the business plan that will be used to bring it to market, ensuring that all design activities will be focussed on fulfilling the precise business brief
— In **M2 (business freeze)** the business case is finalised and product design can be completed to meet the business requirements
— In **M3 (product freeze)** product design is complete and attention turns to the packaging, marketing and communication aspects of the project
— In **M4 (communication freeze)** all physical aspects of the product, packaging and communication materials are finalised and LEGO's manufacturing specialists can begin the process of building the supply chain necessary to deliver the product to market
— In **M5 (procurement freeze)** the supply chain is completed, manufacturing is started and the product is launched.

For Smith-Meyer, the inclusion of all elements of packaging and communications design into the core Design For Business process was an essential element of the transformation. 'For me, a product itself is communication, it sends a signal to the consumer, it goes hand in hand and is as much communication as the packaging and design of the advertising.'

Does such a formal overall process stifle individual creativity? Bjørn is emphatic that it does not. 'I think it allows us to be more creative, because now our designers don't have to think about how they are going to structure a new project as a design manager, they don't have to spend time and suffer pain trying to reinvent things
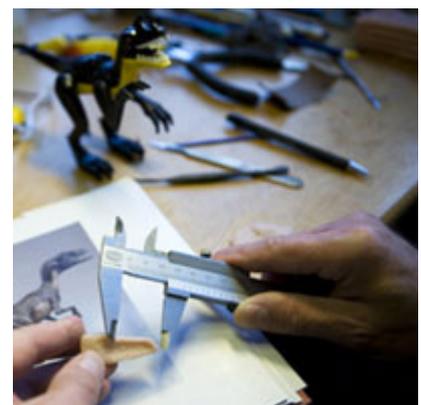
that somebody has already done. Through this we become more efficient and effective as a design team.'

# Tools, techniques and tips

**LEGO has developed a wide range of tools to help its designers, development teams and the wider business to apply its Design For Business process. The process is explained on colourfully illustrated posters and leaflets, and a series of standard templates is used by the development teams to allocate tasks, record progress and present the results of each phase of the design process.**

For example, the Foundation document is a standard Microsoft PowerPoint template used by development teams to present their ideas. The template helps the teams to explicitly link their proposals to the original business goals and objectives. The designers then use a standard roadmap in poster form to monitor their progress through the design process aligning with other activities in the project also mapped in the same roadmap.

LEGO is in the process of building two additional support tools to help designers to converge rapidly on the best solution for a given problem.
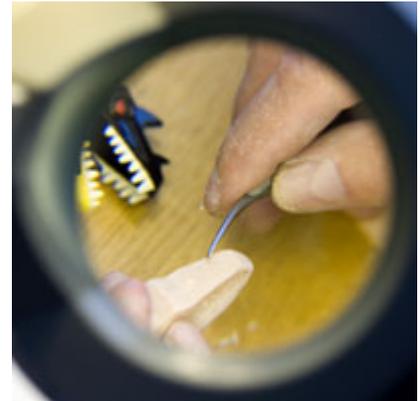
The first of these is LEGO Design DNA, a tool to manage the design language of each product group, ensuring both that products designed for a particular group work cohesively within it, and that the different product groups remain distinct from one another.

LEGO Design Practice is a knowledge base of tools and methods to help designers identify, use and share best practice in their design process. The system covers everything from research, validation through build ability and stability criteria to the quality of the building instructions and user testing.

LEGO also uses a bespoke 3D CAD tool that, combined with physical modelling, helps its designers build virtual concept and final models of new designs. The tool has huge productivity benefits, says Paal Smith-Meyer, Creative Director, not only because it speeds up modifications compared to building physical models, but also because the finished CAD model is used extensively by the wider organisation. 'The 3D team use it together with the communication department. This allows them to quickly work on close to final art and basis for box design, communication material, building instructions, ability to also use different versions that can become assets on the web site or in animation production.'

**Concept lab**

In addition to its core team of designers, LEGO has a group of 15 designers in a concept lab, with the aim of identifying opportunities to deliver more radical products that redefine particular markets. The concept lab operates on a different cycle to the core LEGO Design For Business process, producing quarterly reports on novel ideas that are evaluated for possible inclusion in later production products. The concept lab exists, says Smith-Meyer, because 'we need to continually explore entirely new ways of using our systems for future product offerings, allowing core business to focus on optimising existing offerings.'

**Capability building**

Today, the D4B process and tools are at the core of the entire development organisation and will continue to expand into other areas of the organisation. As pioneers of this process, the development department was the first to institutionalise the new approach, which will in future form a core part of the induction process for new design staff and core team members.

# With thanks to LEGO

For the purposes of the design process study, we met with Paal Smith-Meyer and Torsten Bjø rn, Creative Directors at LEGO.

To find out more about LEGO, visit the corporate section of www.lego.com

**Please note**

# Design at Microsoft

Microsoft, the world's leading supplier of operating system software, has completed a significant evolution in its attitudes to design. Having once been a technologically-driven organisation, Microsoft now uses design thinking to focus on developing products that answer users' needs. With management support, this focus on user-experience is also influencing Microsoft's organisational structure and culture.

## Overview

Design is considered to be a core enabler of both current and future success at Microsoft. The need to deliver consistently high quality products has led to the integration of design thinking into user-led product solutions, which has influenced the culture across Microsoft.

Key elements of this strategy include:

— The management led support for a focus on user experience as a key differentiating factor in the development of Microsoft products and services
— Integrating designers with product development teams, fostering an environment of efficient collaborative working
— The establishment of central excellence groups, such as the User Experience Excellence group, to gather and disseminate best practice
— The use of intranet tools and templates to deliver best practice methods to designers
— The development of techniques for communicating design principles across the business
— Extensive use of user research methods with tight integration of user experience and test activities with product development teams.

## Design challenges at Microsoft

As the dominant player in several of its operating areas, Microsoft has a user base of more than a billion people and supplies products in 130 languages. Its products often become de facto standards and, as such, can generate strong, vocal criticism



The rapid pace of development in the software industry and the emergence of new ways of working, which emphasise flexibility and the ability to work on multiple devices in different locations over the traditional dominance of the desktop PC, are also putting pressure on Microsoft to continue to evolve its offerings to maintain its strong market position.

In its productivity tool markets, Microsoft must combine increasing product complexity and sophistication with the need to maintain usability and improve user experience. Its Word document-processing application, for example, had less than 50 individual menu items when it was first launched. Today, users can choose from nearly 300. This increase in complexity has required the development of different user interface paradigms.

The company also launches new products at an extremely rapid rate. It brings more than 200 new products to market every year, and over 360 internal product teams are also constantly engaged in a process of revising, improving and updating their products.

Thousands of companies also develop products for Microsoft platforms, and the company enters into collaborative relationships with a large number of other organisations.

## History

Microsoft was founded in 1975 to develop software for the nascent personal computer market. It was an extremely early entrant into this sector, beginning its business at a time when few believed that the PC would come to play a significant role in business or personal life.

Microsoft launched its first operating system (MS-DOS 1.0) in 1981 and entered the productivity applications market in 1989 with the launch of its Office suite. A year later, the company launched the first version of its Windows graphical operating system.

# Designers at Microsoft

**Designers at Microsoft operate in a multi-disciplinary environment. They are selected and trained for their ability to communicate and collaborate across disciplinary borders, and for their ability to understand the technology, business and user goals of their project and create designs that effectively meet those goals.**

Microsoft integrates its design and product development teams totally, and design input takes place as part of the overall product development process. Each product team, such as Mail and Calendar, is comprised of representatives from programme management, test, development, design, user research, product planning, marketing, international project engineering, content publishing, and so on. These in turn draw on several key central resources, among which are the User Experience Excellence group, the Central User Experience Support Team, Microsoft Research and product design experts from across the company.



## In more depth

Find out more about how multi-disciplinary working in the design process can lead to the development of new products and services

The User Experience Excellence group is central to the designers' ability to work in this way. Headed by Surya Vanka, this is effectively a group of 'culture change agents' who are engineering standards to create Microsoft products that provide customers with a high-quality user experience. They are responsible for the harvesting and dissemination of best practices to the designers and researchers operating within product development teams.

According to Surya Vanka, Manager of User Experience in Microsoft's Engineering Excellence Group, teamwork, humility and a user focus are key personality traits of designers in Microsoft.

## Capability building

Designers' skills, training and career development are carefully monitored in alignment with the User Experience Excellence group's targets and a comprehensive capability building programme is implemented for Microsoft's designers, managed by the group in partnership with Human Resources. Developed and customised for each individual, online training programmes and modern delivery mechanisms such as on demand video archives are supplemented by a range of general development activities. These can include visiting lectures from leading academics and design practitioners, as well as regular and actively promoted discussion groups and ongoing internal product or innovation forums.

Peer to peer coaching is used to help transfer key skills and best practices across the design function. Designers receive training on integrating effectively with other engineering disciplines, which is required to effectively deliver their input to the rest of the development team.

**In more depth**
Find out how other companies in our study hire designers who demonstrate a wider skill set including: multi-disciplinary working, business acumen and strategic thinking

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**Status**

In 2006, Microsoft employed more than 71,000 people worldwide and received net revenues of US$44.28 billion. The company grew 11 per cent last year.

Microsoft's headquarters are in Seattle, US and the majority of the company's activities are still based in the Puget Sound area of the US, with 33,000 employees at various facilities in the region. More than 50 percent of Microsoft's employees are US based, but the company has operating subsidiaries in more than 100 countries worldwide.

As part of the design process study, Microsoft's User Experience Excellence group and Windows Live Web Communications user experience team (comprised of design, user research, and technical writers) were interviewed to understand the context for design in Microsoft and how their processes integrate design into the product development process.

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# The evolution of design at Microsoft

**Microsoft has transformed itself from a technology-centric to a user-centric organisation - and the role of design in this new paradigm has been central.**

'In 1993 design was a luxury. It is now generally accepted that design is critical to our success,' says Brad Weed, Director of User Experience at Microsoft, who led the transformation of MS Office 2007 through a core set of design principles. Support for this new strategy comes from the very top in Microsoft, being driven by Bill Gates, the company's chairman and chief software architect.

**Design process evolution**
Microsoft's design process has evolved as the company realised it needed a more user-centred approach to product development.

A key element of this was the realisation that the growing capability of its technology brought greater complexity - and that this could adversely affect the way in which users responded to the company and its products. In response, Microsoft identified design as a critical method to quickly translate user needs into products.

**Surya Vanka**
Manager of User Experience Excellence, Microsoft Engineering Excellence Group

'Technology can master complexity, but design must master simplicity'

The way design is considered in the role of product development has also changed in that time, with the design process moving from a 'user interface' to a 'user experience' paradigm. 'It's not just about real estate', adds Erez Kikin Gil, Product Design Lead at Microsoft, pointing to the need to move the scope of design into experience, almost taking for granted that the necessary technology exists. This change is mirrored in Microsoft's own shift in offer: and a company that was once entirely product focused now offers an increasing number of services to its customers.

## Organisational position and influence

As design has taken on a more central role at Microsoft, so the company's design function has become central in developing some of the key ideas for user centred product development. Today, design is represented in all product development teams.

In order to monitor the standards of excellence that Microsoft sets for its products and services, and for them to adequately reflect user needs, a User Experience Excellence group supports skills and expertise that are part of new product development, including design.

The central User Experience Excellence group, and indeed other Excellence groups covering other areas within Engineering, act as repositories of best practice and as agents for change. They encourage wider management to understand the power of strong design input and ensure the creation of a culture and the tools required to do this.

## In more depth

Read more about how successful design companies need good [leadership](#)

## Innovation

New product introduction and product evolution are both key to Microsoft's competitive position. The company has always pursued the development, acquisition and protection of innovation as a core part of its strategy. In 2006 Microsoft was granted its 5000th patent.

# The Microsoft design process

**Today, Microsoft is the world's largest supplier of operating system and productivity software and has greatly expanded its product offering to include a broad range of software for business and home use, as well as products for the video games and mobile technology markets.**

Microsoft's new product development cycle will usually begin with a need identified by product planning or user research teams. These needs emerge as a result of extensive market and consumer research, conversations with customers and extended user research ranging from exploratory field research to usability lab studies to identify currently unfulfilled needs and opportunities.

A key element in the new 'user experience' paradigm, which draws heavily on the input of design methods, is that technology has moved away from being at the centre of the design process. Development teams proceed on the assumption that a technological solution to a given problem will be available, but the trigger to begin the development of such a solution has to be an identified and well-understood user need.

## A user-centric product development cycle

According to Surya V  anka, Head of the User Experience Excellence group, Microsoft's new product development adheres to a five step cycle:

— **Understand** - A phase of research and information gathering intended to give designers a deep insight into the real needs, motivations and issues among the product's users. This phase often results in initial key observations: the 'ohs! '
— **Envision** - In this phase designers are encouraged to think broadly about what they might offer the users based on what they learned during the Understand phase. This phase often results in new insights and conceptual breakthroughs: the 'ahas! '
— **Specify** - In this phase designers and other members of the product development team establish a detailed specification for the product they intend to deliver
— **Implement** - The process of delivering a working product. A successful culmination of the Specify and Implement phases often produces 'wows!' from the customer
— **Maintain** - Software products undergo continuous evolution as new needs emerge, new capabilities are added and the wider environment changes. As a consequence, a product's design team will have continual input into modifications throughout a product's lifetime.

## Project management

Multi-disciplinary teams and working is equally prevalent in the general project management of a design project. Periodic design cycle meetings allow the full range of project stakeholders to look at progress and check if a proposed design meets all the project's business goals. The whole development team attends these meetings, ensuring that they have a clear understanding of business requirements as well as user needs.

## Evaluation

Ultimately, says, Kikin Gil, design is integrated so tightly with the rest of the product development process at Microsoft, that it is difficult to evaluate its impact separately. Nevertheless, the company makes extensive use of measures of product satisfaction and adoption rates as a key indicator of user experience success. On the principle that users who enjoy their interaction with a product or service will return to it, says Kikin Gil, this measure gives a robust indication of the success of the user experience design.

## Testing

Once a proposed solution to a problem has been identified, this is prototyped quickly and taken to user test for evaluation. User testing is absolutely critical to product development at Microsoft. 'Our internal audience is hungry for user research as it proves product relevance,' says Kikin Gil. The company's user experience function is thought to be the third largest in the world, with more than 45 separate user experience teams and there is a total staff of more than 550 within these teams globally. This includes both designers and user researchers.

User experience teams will test prototyped products with sample user groups. They will also contribute to the design process at earlier and later stages through ongoing testing of existing products and long term beta test programmes with expert users. User experience teams across Microsoft will also be closely involved with new target markets, helping to determine the characteristics of particular new user groups, and assessing the impact of existing and proposed products in that context.

Microsoft has made strenuous efforts to make user testing feedback available as widely as possible throughout the organisation. Most user testing sessions can be viewed and accessed remotely via video link. Any observation of user testing in progress will be supplemented by a formal report on the outcomes from the user experience team, and the outcomes and other insights from this process will be fed back into the next round of product development.

Some of the general principles and approaches typically used by user experience teams at Microsoft include the following:

— Design decisions should be based on deep evidence of actual user behaviour, not assumptions on the part of the development team.
— Products must be able to scale to billions of users worldwide without losing intimacy with individuals.

— New paradigms are often essential to solve very different and far more complex new problems.
— Microsoft has a responsibility to help users learn and adapt to the new interfaces that it introduces.
— Continuous feedback from users forms a virtuous circle, helping to improve product performance, product team empathy and product quality.
— Bringing the user into the development process in tight iterative loops can deliver new insights. This type of approach is increasingly popular in the computer game space, where users can take an active role in shaping future products.
— Simplicity is difficult to achieve, but worth striving for.

# Case study: design development of MS Office 2007

**Microsoft recently saw its efforts in user-centred design translated into the successful update of one of its core software packages, namely MS Office 2007.**



Since its initial launch in 1989, there have been several iterations and re-designs of the MS Office software. However, the launch of Windows 2007 in 2006 included the revised edition of MS Office products. This was a turning point because it implemented a substantial design shift rather than a small incremental change. In many ways this represents the centrality of design to the product development process at Microsoft.

For this major new version of Office, Microsoft's product team recognised that it had a major opportunity to drive the user experience forward, but that it also had to manage the experience and expectations of millions of users of the existing product.

Previous design changes to Office had been smaller iterations, conscious of user aggravation at changing functions and capabilities. However, faced with quantitative data that suggested that people were having usage problems and that Office purchases were trailing off, the development team, led by Brad Weed, established a set of design tenets to underpin the re-development of Office. These were:

## A sense of 'mastery'

— People should be able to focus on the content they're working on in Office, and not on user interface. The design of Office should help people work without interference
— Choices should be reduced to increase the user's sense of mastery
— The efficiency of access to features should be increased
— The soul of the programme should be brought out and embrace consistency rather than homogeneity
— Features should be given a prominent home in a consistent location rather than activate a 'smart' user interface that guesses what the user needs

— Straightforward is better than clever – and promotes the feeling that this is still Microsoft Office.

**Taking the 'big bet'**

— Making a big change is difficult, but must be done
— Trust in users to learn a new way of working
— You must remove to simplify

The resulting design of these principles is felt to have delivered a product that feels 'different but familiar'. The development of Office 2007 took place between 2003 and 2006 and involved over 1,000 people at Microsoft. In addition, it involved more than 200 users who spent more than 400 hours with the new interface testing the experience of almost 30 new core tasks.

# Adapting the design process for different products

**Individual product teams at Microsoft work on the innovation and development of new and existing products, and while they use methods aligned to the wider user-centric design process, the groups have a degree of autonomy when it comes to the specific methods they use.**

Erez Kikin Gil, Product Design Lead for the Windows Live Web Communications product team, described a user experience design process which the team follows to meet the specific needs of their target users and to best fit their individual product development environments.



In this case, the web communications user experience team for Windows Live, which is comprised of designers, user researchers, and technical writers, follows a four-phase process while developing individual elements of their products.

The process involves four phases: Understand, Ideate, Test and Communicate.

**Understand**
What is the challenge that needs to be addressed? The answer to this question is sourced from marketing, product planners, market research, ethnographic user research, and design research. The trigger is always user needs.

**Ideate**
This involves broad visioning, sketching, and building scenarios (such as 'a day in the life of a user', envisioning the impact of a design change on the user, and so on). Kikin Gil emphasises that everyone is a designer at this stage of development, including

researchers, developers and product executives. During ideation, it is common for the web communications design team to hold internal participatory design sessions, asking the product team members to imagine themselves in particular users' situations and designing products to meet those needs. User input is also critical during this stage, with researchers employing creative methodologies such as participatory design activities and story-book exercises to help users brainstorm new ideas and imagine themselves using the products in new ways to solve existing problems.

### Test

User research sessions are conducted throughout ideation and product development, using a combination of observation, participation, videos, listening and viewing. All research is conducted either in-house or in the field, in the users' natural environment. Microsoft sites have purpose-built studios equipped to carry out such research to the highest standard, including living room set-ups for example. Researchers employ a variety of methodologies to ensure the concepts from ideation will meet users' specific needs and desires, such as comparison studies, benchmarks, and product usability. Some projects may go back to ideation at this stage, depending on user perceptions and reactions.

### Communicate

The results are always communicated back to the stakeholders of the project. This is done through both informal and formal channels such as project meetings and intranets. There is no internal limit to who can view the results.

# Tools and techniques at Microsoft

**Microsoft makes extensive uses of tools to assist its designers in adopting best practice. A full time, three person 'practices harvesting team' works to identify and distribute best practices as they emerge. These practices are reviewed and included in a comprehensive methods bank, giving designers access to a broad range of tools.**

The company has a User Experience Handbook, which is a frequently updated internal microsite containing details of current best practices in user experience design. The site is created and moderated by the User Experience Excellence group but can be contributed to by designers and researchers alongside their work, which further enhances the collaborative nature of the Microsoft working environment.

Extensive work has also been conducted to ensure that designers, software engineers and business teams have a common language with which to discuss product developments. The product development teams, which include designers, also has regular meetings to formally share best practices and research findings with each other.

Erez Kikin Gil, Product Design Lead for the Windows Live Web Communications product team, explains that Microsoft's overall user-centric product development cycle is supported by with some practical design principles, often visually represented by diagrams or icons.

### Simplicity and delight

This is one of the underlying principles behind all Microsoft design activities. Following that principle is design for user emotions. Designing for both simplicity and emotion produces an experience that is efficient as well as user-friendly. These two reinforce each other as simplicity makes room for emotion and emotion influences the perception of simplicity.
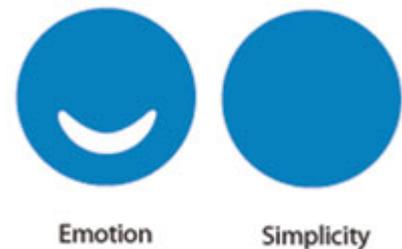
The principle is that 'delight' and 'simplicity' follow on from each other. In designing their Mobile Messenger product, the web communications user experience team took this principle to heart, employing a range of methodologies in the lab to access users' emotions and reactions to specific visual and interaction design concepts while balancing it with their need for simplicity on the mobile device.

They compared user reactions and statements to the designers' explicit goals and analysed the different emotions each design connoted, ranging from more angular and boxy designs that were perceived as safe and secure, to more light-infused designs that were perceived as fun, playful and personal. They then compared this to usability results around simplicity and ease of use, and chose the designs that were the best balance of the two.

### People-centric design

Designing software according to the way a user works is critical to the success of the web communications team.

Erez Kikin Gil uses the Edo clock, a timekeeping device that was used in Japan from the 17th to 19th century, as a great example of a people-centric design.

Unlike the Western analogue clock, the Edo clock showed the relative hours of daylight throughout the year. For people who rely on light, this technology and interface provided a clear way to manage their life and work.

'So if you think about the way we design software today,' says Kikin Gil, 'instead of designing software that will make users adopt tools, we are designing software that adopts to the way the users work and perceive the world.'

This approach can be seen in design decisions the web communications team made for their latest release of Windows Live Hotmail. The team learned that while some users preferred to use checkboxes to successfully manage their mail, others wanted a system that was similar to Outlook. As a result flexible options were created for users to choose the interface that works best for them.

**In more depth**
Read about the benefits of  [user research](#) within the design process

### The Devil and Angel approach

This approach also focuses on simplification - this time about simplifying the options that are presented to users.

Choices are an important part of the experience design - narrowing choices to the absolute minimum makes it easier for users to make decisions which help them continue their interaction smoothly - instead of making the interaction about the selection process itself.



Devil          Angel
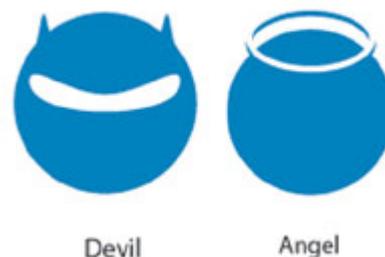
 As Erez Kikin Gil explains it, this process is about 'looking at what you're designing and asking yourself, will the user be able to find what is bad or wrong here?' This, he says, needs to be a yes or no question: 'Is it an angel, is it a devil?'

For example, the web communications user experience team applied this holistic design principle when thinking about the best way to help users recognise and delete harmful messages from their Inbox.

Rather than providing five different choices for deleting, reporting, adding to contact list, and so on (and ultimately confusing users with all of the options), they chose to focus the user on one simple yes/no decision at a time. So if they are told 'You do not know this sender' they are given just two options: 'Mark as Safe' or 'Mark as Unsafe'.

If the sender is unsafe, the Microsoft design team decided that all of the deleting and reporting of spam email addresses could be done at the back-end, so the users' steps to solve the problem were minimised to the one yes/ no decision.

### 'Eat your own dog food'

As part of their process, designers at Microsoft are encouraged to 'eat their own dog food' or 'dogfood a product'. This is means that developers and designers are encouraged " to use the product yourself that you are trying to sell to your customers."  Wherever



Dogfood
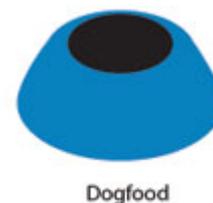
possible, members of the design team should make use of their own products.

Making everyone on a development project use the product, even in its roughest state, enables everyone to:

— Flush more bugs out of the product.
— Encounter the same bugs and design flaws that users would see, thus giving designers incentive to fix them.
— Learn how products actually work, which is often than not exactly how we think they work
— Gain a reality check that the product is as good as they say it is, and proves to customers that the company believes in the product

And because Microsoft is such a large organization, this process can flush out problems that could not otherwise be found prior to full-scale rollout at launch.

# With thanks to Microsoft

For the purposes of this study we spoke to Surya Vanka, Manager of the User Experience Excellence in Microsoft's Engineering Group and Erez Kikin Gil, Product Design Lead at Microsoft.

To find out more about design at Microsoft, visit www.microsoft.com/design

**Please note**

# Design at Sony

Electronics, games and entertainment giant Sony has used design since the 1960s to differentiate its products and maximise the usefulness of its advanced technologies. Sony Design Group across the world employs around 250 designers and has developed a set of core design values against which the company judges the success of all its products.

## Overview

Sony uses design to successfully unite different aspects of its business, focusing on the main pillars of electronics, games and entertainment. The company continues to evolve its processes to meet emerging needs.

Key elements in Sony's design strategy today include:

— The establishment of centres of design excellence in key markets around the world
— A focus on cross-fertilisation of ideas through regular design review meetings and the rotation of design staff between functions
— An increased use of multi-functional design teams to deliver a consistent user experience in even complex, multi-functional products.

Since the early days, Sony had established a passion for unlimited creation and its long list of successful products continues to grow. In 1950 Japan's first tape recorder was launched, followed by the first transistor radio in 1955.

Amongst many others, Sony created the portable music device market with the groundbreaking development of the Walkman in 1979. Since then, few companies have matched the track record for invention and innovation.

## History

In 1946 Sony was established by Masaru Ibuka and Akio Morita in Tokyo under the name Tokyo Tsushin Kogyo (TTK). The two young founders, Ibuka an engineer and Morita a physicist, spent their first years in business repairing and building electrical equipment, like war-damaged radios, and marketing rice cookers.



Having little equipment and no machinery the young company's ideals were based completely on combining engineering know-how with the creative desire 'to do what never has been done before.' Recognising the whole world as a market place the Sony logo was introduced in 1955 to the public and three years later Tokyo Tsushin Kogyo was renamed to Sony Corporation.

# The evolution of design at Sony

**Today, Sony has Design Centres in Tokyo, Los Angeles, London, Singapore and Shanghai. In total, Sony Design Group across the world employs around 250 designers.**

Designers at Sony Design have a variety of backgrounds including product designers, human interface designers and visual communication designers.

## Design process evolution

Sony established its first formal design group in 1961. In 1968 it opened its first offshore design centre, in the US. It has continued to pursue the strategy of investment in overseas design capability, opening centres in Europe in 1980, Singapore in 1993 and Shanghai in 1995. In the past the European Design Centre has rotated between locations, but has been in London since 1991.



Sony Design Group has a set of core design values against which it judges the success of all its products. These are detailed below:

— **Originality** - Sony Design continuously strives to create something original. To their mind, products are intended for people to use, so it only stands to reason that these products be designed with a human touch. For Sony, human-focused design is the foundation for creating something original.
— **Lifestyles** - People often note that the Sony Walkman changed their lives. In actuality, the Walkman's success can be credited to the public's demand for a 'music on the go' lifestyle. The Walkman touched the hearts of consumers by making it possible for listeners to take their music with them and access it on demand. The Walkman story is a perfect example of what it takes to create consumer lifestyle changes - a product must strike a universal, heart-touching chord with people everywhere.

— **Functionality** - When Sony Design was established in 1961, its black and silver design language elevated the Sony image. The idea was to do away with excessive ornamentation and accentuate a powerful, high performance, professional feel through the use of simple, cool colours and materials.
— **Usability** - It all starts with the principle of carefully listening to the user's needs. Every aspect of Sony design considers the needs of people who use their products. This includes everything from the shape of each button and dial, the position of every switch, to the interface design. Sony carefully observe the conditions under which the product is operated and pursue continuous improvement. their products are not only functional but also give full expression to the beauty of functionality.

In the past, designers were closely aligned to particular product groups. Today, however, product characteristics are changing. In particular, the emergence of many devices that interact with the Internet is placing new demands on designers at Sony. As a result, designers from different backgrounds are working more closely together in order to ensure that physical products and their Internet interfaces offer a consistent design language and user experience. The design of the mylo communicator (covered in the following pages) is a good example of this evolving way of working.

Also, Sony encourages its designers to circulate and most move between product groups on a three-year rotation.

**Status**

Today Sony employs approximately 163,000 people worldwide and recorded consolidated annual sales and operating revenue of EUR 55.68 billion (yen 8,296 billion) for the fiscal year ended March 31, 2007.

# The Sony design process

**The origin of the design projects undertaken by the Sony Design Group varies. An idea may originate with design centres themselves, product planners or marketing. Design briefs vary considerably in their level of detail and sometimes projects are run on a competitive basis given to several studios simultaneously. The centres then compete to be chosen to deliver the final project**

The leader of a design project is the interface between the design centres and the rest of the Sony organisation. In this role, that person negotiates the terms of each project.

When a project is sent to a design studio it will be assigned either to an individual or to a team of designers who will then be responsible for the design until completion. During the design process, the designer or designers report their design at weekly crits and review meetings at the design teams to ensure that designs in progress are extensively judged and tested.
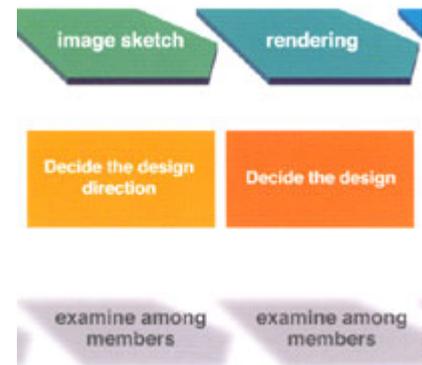


During the evolution of a design, Sony Design generally uses a five step process for its industrial design.

— **UUser analysis** - Designers and product managers will occasionally use information about the product's market. This may cover user behaviours, the environments they operate in and the lifestyles they enjoy
— **Image sketch** - Initial concepts are presented as 2D sketches so that the direction of the design can be commented on and agreed quickly
— **Rendering** - Once the concept is approved, Sony uses the latest 3D CAD technology to construct a detailed model of the design. This allows the designers to ensure that the concept will accommodate its mechanical and electronic elements properly and will allow the cost and ease of manufacture to be evaluated
— **Mock-up model** - A physical mock-up model allows a proper understanding of the design in context, identifying potential usability issues.

It is emphasised that the design process for product design as described above is necessarily flexible, and has to adapt both to different projects and contexts in Sony. Also, this process is currently under review, so that Sony can assess how best to plan and carry out its designs going forward.

# Sony case study: developing the mylo personal communicator

**The development of the mylo personal communicator provides an example of how a product has been taken through the Sony design process, with a particular emphasis on a multi-disciplinary design team working on its development**

The mylo was designed by a team of four at the Tokyo Centre: Soichi Tanaka, Makoto Imamura, Yoshiyasu Kubota and Tetsuro Sano. The device is a new type of portable communicator specifically designed to use the many WiFi networks that are springing up in offices, university campuses and towns across the world.



The mylo is able to operate as a mobile telephone using the Skype Voice-over-Internet-protocol telephone system, but the designers were encouraged to consider

what other functionality the system would be able to offer.

Starting with only an LCD screen and a keyboard as requirements, the designers worked on an extensive list of features for the product as they evolved ideas for form and behaviour. It was, says Tanaka, quite an unusual way for the design team to work. 'At the time, it was probably very rare for designers to collaborate this way in product development. I've been in design a while, and it was certainly the first time for me. But without this arrangement, the ideas behind the mylo would never have seen the light of day.'

One of the key innovations that the mylo exploits was the use of a range of internet technologies to give its users a richer communication experience. As Imamura explains, he wanted the mylo to exploit a concept he calls pre-communication, which 'takes place one step before you contact someone. When you might decide that someone is still awake, has a bit of free time, and wouldn't mind talking, for example. But that's not possible over the phone, is it? You can't guess if your friend is asleep, and you always have to keep their schedules in mind. With Instant Messaging technology, you know immediately if someone is online. And you can let your friends know what you're doing, what music you're listening to now, and so on. So they're awake and listening to that kind of music... You're not asleep yet? How about the report due tomorrow? You like that music?" It can be a conversation starter, or users can just relax, feeling better knowing their friends are around. "Pre-communication" is appealing because of this flexibility.'

Another key tenet of design at Sony today is a focus on the user experience. For Sony, an optimum user experience goes beyond conventional measures of usability to assess the overall feeling of a product in use. This approach, says Kubota, led to an interface where the user interface is an additional level of abstraction away from the underlying technology.

The main way this manifests itself in the device, he explains is in its 'What's Up' screen. 'It's an integrated interface for Skype, Google Talk, Yahoo! Messenger and ad hoc apps. Unlike using a computer, you don't need to worry about starting different apps to communicate with different friends. Accessing this screen shows photo icons of registered friends. Those who are online are highlighted, regardless of their means of communication.'

With so much novel technology packed into it, the mylo had to look unusual too. According to product designer Tanaka the curved shape of the device was inspired by his experience using and testing hand held devices. 'I noticed when testing different product shapes, holding devices, and making calls that I was inevitably touching the edge of the product. So we relaxed the outline into two joined circles, rounding it in gentle curves students will appreciate. This is the distinctive mylo shape.'

To make the device appear fun and exciting from the outset, the design team decided to use light extensively in the operation of the mylo. The device has a glowing ring around its circumference that changes colour and flashes at different frequencies according to its mode of operation. That excitement was carried on when opening the device by colouring the keyboard a bright orange, so it dramatically contrasted with the outer shell, 'like cutting into a fruit.' The colour not only looks exciting says, Tanaka, it also met the contrast criteria of Sony's usability engineers.

Finally, the design team ensured that the packaging and marketing of the product worked consistently with the mylo's design, to reinforce its' unique appearance and demonstrate its function. 'The shape of the mylo, two joined circles, also represents a unique design,' says Tetsuro Sano, the director of the mylo project. 'Of course, we couldn't resist the opportunity to use this shape as an icon or symbol as often as possible. The package window outlines its distinctive shape, revealing the mylo and presenting the shape as an icon. And naturally, the logo design is rounded.'

**In more depth**

Find out more about how market and trends research can lead to the development of new products and services and how multi-disciplinary working can help in the design process

# With thanks to Sony

For the purposes of our study, we met Fumitaka Kikutani, Director of the Sony Design Centre Europe, situated in London. Sony Design Centre Europe is used by Sony to ensure that it communicates new product concepts based on European culture and creatively supports the visual communication of Sony's brand.

To find out more about Sony Design visit www.sony.net/Fun/design

**Please note**

# Design at Starbucks

**From its beginnings as a single coffee shop in Seattle 35 years ago, Starbucks is now a global brand which uses design to aid the delivery of a distinctive service experience to its customers. The Starbucks Global Creative team manages regularly changing design themes while working within a global brand.**

## Overview

**Starbucks uses design It has developed a strategy that allows it to balance regularly changing design themes with a consistent set of brand values, and uses design as a way of aiding the delivery of a consistent service experience to its customers.**

Key elements of that strategy include:

— The development of detailed guidance for internal and external designers in the company's brand and design principles
— The use of a five word filter against which all design concepts are judged
— A defined Processway to take designs from concept to delivery, encompassing a detailed suite of technical, legal and customer checks
— The development of an electronic workflow management tool to automate much of the design Processway and to further support designers with access to additional resources.

### Meet the team

The Starbucks Global Creative team is responsible for the delivery of all in-store collateral and packaging, for the design of much of Starbucks' advertising and marketing materials, and for a visual merchandising group that works on the visual presentation in the stores and of the products. The group also commissions external creative agencies that deliver worldwide advertising campaigns.

A separate store design group is responsible for the design of the furniture, fittings and layout of Starbucks' retail outlets. The Starbucks brand itself is managed by a brand

group that strategise new brand platforms, such as a new product line and new identities.

The Global Creative team is led by Hainsworth who manages just under 100 staff at Starbucks' Seattle Support Center. Around 50 of these are designers, the rest responsible for project management. All design departments within Starbucks, as well as external agencies, work from 'the same creative palette,' says Hainsworth.

### Designers

Starbucks' Global Creative team employs graphic designers together with technical and packaging specialists. Some of the team also bring fine art and illustration skills to the mix.

Designers are also encouraged to think of themselves as business owners, and an emphasis is placed on employing designers who are also thinkers and strategists.

Hainsworth believes that fostering a creative culture in Starbucks is important, and in his role as creative director, he is the face of design within the organisation, and is responsible for showing that designers aren't just 'off the wall wacky people.'

### In more depth
Read more about the skills that business leaders are looking for in their designers

### History

Starbucks was founded 35 years ago as a single coffee shop in Seattle's Pike Place Market. The company in its current form began in 1982 when Howard Shultz, now Chairman, joined as director of retail services and marketing. Shultz scaled up the import and distribution of fine coffee and identified an up-market niche for coffee houses, combining some of the atmosphere of Italian espresso houses with American values of friendly, efficient service. The first of this new style of coffee bar was opened in downtown Seattle in 1984.

By 1990 Starbucks had 84 stores around the US During the 1990s it continued to expand and entered significant distribution relationships with a number of large US retail, air travel and hotel chains. It also extended its brand to encompass other aspects of the coffee shop experience, such as selling CDs of the music played in its stores as well as ground coffee and related products for home consumption.

# The evolution of design at Starbucks

**Starbucks deliberately avoids changing its core offering – the coffee. However, it does have a policy of continually refining other aspects of its products and services. Such innovation can be seen in the vast range of coffee-based products that it offers, the transition from foam to paper cups for take-away drinks and in the growth of its non-coffee retail items.**



Starbucks enjoys a market leading position among coffee shops, but the concept that it developed has been imitated and modified by an increasing number of competitors. Starbucks must continue to evolve its product offering in order to maintain its leadership position. It also faces the significant challenge of managing a consistent brand experience over thousands of separate retail outlets.

Simultaneously, the company has pursued a strategy of enriching the brand wherever possible, branching out into areas such as Hear Music, its music recording and distribution venture, and consumer goods. Such ventures, in turn, complement the customer experience.

## A two-way conversation

Design at Starbucks, says Stanley Hainsworth, V ice President of Global Creative, 'is about a two way conversation between the company's customers and partners.' The need to address internal audiences as well as external ones is vital, he says, since it is the essence of the brand that employees share with their customers that plays a key role in delivering the right Starbucks service experience.

Hainsworth's team, based at Starbucks' Seattle Support Center, is responsible for the design elements of the Starbucks experience. Those elements include the design of posters, cups and cup sleeves, advertising, packaging and numerous other items large and small that together make up much of a customer's experience in a Starbucks store, or when interacting with its products elsewhere.

'We are responsible for basically everything but the physical stores; everything that's in the stores, everything outside of the stores, advertising and partnering with advertising agencies, collateral, packaging, products in grocery and communal stores, and the website,' says Hainsworth.

## Design process evolution

The current design process adopted by the Global Creative team evolved in parallel with the group's changing internal role. Originally, says Hainsworth, the department was more like a creative services function, creating design and print creative processes for the wider company. This approach led to inconsistency in output and the production of designs that didn't always match Starbucks brand values.

In response, Hainsworth took steps to allow the department to have much more control over designs. The basic mechanism introduced to do this was a five-word 'filter,' against which every prospective design is evaluated.

The design process at Starbucks also covers the need to express the experience of Starbucks. Starbucks realises that coffee isn't new in itself, and therefore they use design to build on the coffee experience, including the way in which baristas interact with their customers. Hainsworth cites an example of a Starbucks outlet in which the baristas had established a '100 club,' where staff had committed to memorising the names and drink orders of 100 regular customers.

As a consequence of such experience design, Starbucks has found that customers who feel comfortable in the Starbucks environment want to 'take it home with them' in various ways. This demonstrates both the challenges and opportunities around designing the Starbucks experience, particularly when they are able to drive trends and establish industry standards.

## Organisational position and influence

'Design has always been important to the company, but it hasn't always had a prominent place at the executive table,' says Hainsworth. 'But lately there has been a lot more realisation that it can drive business and enhance sales. We can be strategic about design. It's not just pixie dust that you sprinkle on things.' He cites top-level support as a key enabler for design's current position with Starbucks. Howard Shultz, Starbucks' Chairman, he says, 'has a real appreciation for the transformative power of design.'

## In more depth
Find out more about how successful design processes require good [leadership](#)

## Market
Starbucks continues to be the largest player in the premium coffee shop market. The market for take-away coffee has trebled from US$30 billion to US$90 billion over the past ten years, and shows no signs of slowing down. In the US alone, it increased by 10 per cent last year when compared with 2005.

Today an increasing proportion of its revenues come from products sold through other channels, including supermarkets, concessions at hotels and airlines and even (via its dedicated iTunes store) the internet. The company says that in 2006 there were 550 million 'brand experiences' outside its traditional store environment.

# The Starbucks design process

**Starbucks has a well-defined 'Global Creative Processway' to describe its design process. Presented as a subway map, this process defines all the steps a project must pass through from concept, through execution to eventual production.**

There are two basic routes through the Processway: the 'Mainline' for standard projects and the 'Express' for simpler projects with no new creative requirements such as reprints of existing material. You can see part of Starbucks' Global Creative Processway to the right, but to see the full picture you can  download a PDF version (10MB).

The mainline process begins in 'Concept Heights' where concepts are developed, presented and approved. Agreed concepts continue to the 'Downtown' phase of the Processway, where detailed implementation of the design is carried out, final approvals are obtained and prepress work commences.

Express projects may enter the process here, or join it in the next phase: the 'Production District.' In this final phase the completed work is signed off by the project's owners and liaison with printers, packaging makers or other production resources is managed.

**In more depth**

Read more about other visual management techniques that could be useful during the development stage of the design process

Project lifecycles for Starbucks range from between just a few weeks to 72 weeks from concept to delivery, with much of this time taken up in the production phase. Starbucks makes combined use of offshore and onshore print and manufacturing suppliers and relatively long lead times are designed into the process to maximise the cost effectiveness of outsourcing in this way.

**Theme selection**

Design at Starbucks begins with a strategic planning process to select key concepts, themes and palettes for the coming year. Stores carry seasonal themes and the Global Creative team works with the store design team and other top-level stakeholders to decide on these themes, taking input from the trends group and customer insights.

Each theme requires a full suite of materials. Once the theme has been established, individual design projects follow the Global Creative Processway. Project managers work with the design customer to prepare a brief for the project and to agree budgets and schedules.

## Concept development

The design process itself begins with a 'creative scrum,' a meeting in which members of the Global Creative department brainstorm ideas and generate concept ideas.

After the initial concept meetings, a single designer, paired with a copywriter or other specialist, typically takes design projects forward. Together, they develop a concept for the project which is reviewed and approved internally – measured against the five word filter before being presented, reviewed and approved or rejected by the customer.

Once concept approval is underway, the designer works to generate a first draft of the project. This again is reviewed internally and for any potential legal, or customer sensitivity issues. The first layout is then delivered to the client for approval. Once approved, more costly aspects of the process – specific photo shoots, for example – are completed and the designers produce the final product for evaluation.

## Approval

Today, final approval of Global Creative output is completed with a physical presentation and sign off process. Final designs are put on display in an approvals room in Starbucks Support Center, configured in exactly the same manner that they will be when deployed in stores. Project stakeholders then have a two day period in which to view the designs and either sign them off or request changes. The review team includes the internal design management, Starbucks' legal team and, of course, the Starbucks client. Once all required stakeholders have approved the production-ready concept, it enters the manufacturing or print process.

This sign-off process, says Stanley Hainsworth, Vice President of Starbucks' Global Creative is one that will change dramatically with the introduction of the new online workflow management tool, since stakeholders will have the option of signing some designs off electronically.

## Delivery

The importance of internal communication and the acceptance of designs is acknowledged during the production phase too. Shop floor representatives are involved in final product reviews and part of the design process is the production of photographic instructions to help store management to install and arrange new items correctly once delivered. These directions are distributed in the form of a magazine - Siren's Eye – which describes every element of each season's offering, with full instructions on installation and display to ensure a consistent brand experience in every store world wide.

The process of installing promotional campaign materials in-store is conducted simultaneously worldwide, and involves the efforts of a dedicated distribution team.

## Evaluation

Front line staff and customer feedback are central to the design evaluation process at Starbucks. During development the five-word filter drives go/no-go decisions on designs, but it is feedback from retail staff and customers that is used to assess the success of a project.

Starbucks has worked hard to develop effective mechanisms to link the development of the brand directly to the customer experience. One aspect of this approach is a concentration on internal communication with the thousands of individual baristas who are the brand's direct connection to its customer base.

Customer feedback is provided directly through a consumer insights group that talks to customers and directs their feedback to the business. A sophisticated feedback mechanism from the stores also ensures that all customer feedback is collected and acted upon. Baristas feed customer comments back through their store management to Starbucks Support Center, where the appropriate department undertakes to respond to the customer within a certain time frame.

For Stanley Hainsworth, Vice President of Starbucks' Global Creative, this means that if a customer has concerns about elements of a particular poster, he must respond to them explaining the rationale and decide whether the comment warrants future redesign or alteration.

## Status

Today, Starbucks has 12,440 stores in 37 countries. 2,199 of these were opened in the last year. Annual revenue growth in 2006 was some 22 per cent, to a total turnover of US$7.8 billion.

The company aims to keep opening outlets a rate of at least 2,400 stores a year with a long-term target of 40,000 outlets. Both domestically and internationally, outlet ownership is a combination of company owned and licensed or joint-venture premises.

# Tools, techniques and tips

**Starbucks is now moving to a policy of multi-skilling its designers wherever possible, ensuring that graphic designers have an understanding of the 3D design environment and vice-versa. Sitting designers of different disciplines together so that they can learn from one another wherever possible is reinforcing this flexibility.**

Starbucks' Global Creative team produces a book of brand guidelines for use by all creative people internally and externally.

The book provides a comprehensive platform for the Starbucks design process, covering the company's values, describing its design filters and offering specific recommendations for photography, illustration, typography and logo usage.

**In more depth**
See what tools and techniques other companies in our study use

The Global Creative team is also involved in a major project to build a fully electronic version of its 'Processway.' The new workflow management tool will automate the distribution of materials for sign-off and will provide a variety of other resources for designers, including a document library where approved photography, illustrations and logos can be accessed, together with guidelines for use and best practice.

**In more depth**
Find out how formal design process management could help your business

# With thanks to Starbucks

For the purpose of the design process study, we visited the Starbucks Support Center in Seattle and spoke to Stanley Hainsworth, Vice President of Starbucks Global Creative.

To find out more about Starbucks, visit the About Us section of
[www.starbucks.com](www.starbucks.com)

# Design at Virgin Atlantic Airways

**Virgin Atlantic Airways, founded in 1984 by British entrepreneur Richard Branson, has innovation as a core brand value and uses design as a key competitive differentiator. The in-house design team manages many aspects of design for the airline, including service concepts as well as interiors, uniforms and airport lounge architecture, and works with a number of agencies worldwide.**

## Overview

**Virgin Atlantic Airways makes use of a mix of in-house design capability and a number of agencies to deliver design projects.**

The company's central design function has a strong, hands-on approach to design, carrying out much initial concept development itself and using external inputs selectively to achieve the desired end result.

Key elements of Virgin Atlantic's process are:

— The preparation of a detailed business case before every design project
— The use of physical mock-ups to gain buy-in from internal and external stakeholders
— A formal design freeze and an end to external design input before the start of manufacturing engineering
— A holistic approach to design which embraces service design, bringing distinct advantages but also a host of new challenges.

### Meet the team

The design team at Virgin Atlantic Airways is 15 people. They are located in a single office at Virgin Atlantic's UK headquarters, and work closely with the company's brand design team – as Joe Ferry, Head of Design and Service Design at Virgin Atlantic Airways, says, 'It doesn't feel right for me that brand is separate to product. The company also makes extensive use of external design consultancies to implement design projects.'

## Designers

Historically, Virgin Atlantic employed designers with single functional roles: interior designers, architects, industrial designers and product designers. Driven by the need to rationalise during the post 9/11 economic slowdown in the air travel industry, a policy of multi-skilling designers was introduced. Today, designers from a wide variety of backgrounds will be involved in all projects at Virgin Atlantic, although Ferry admits that work is still tailored so 'people's specialisms come to the fore.'

## In more depth

Find out how other companies in our study hire designers who demonstrate a wider skill set, including: multi-disciplinary working, business acumen and strategic thinking. Read more about how multi-disciplinary teams are a key feature of the Develop stage of the design processes observed in other companies that took part in our study

## Innovation

Innovation is a core brand value at Virgin Atlantic. The company uses unique elements of its service offering as a competitive differentiator and has a strong track record of market firsts. Since its inception, the airline has concentrated on delivering a high quality service at lower cost than competitors. Developments such as its Premium Economy class have helped it to do this.

## Context and challenges

The airline industry is a difficult one in which to operate. Fixed costs are high, demand can fluctuate quite dramatically and shortages of key airport infrastructure all make it difficult for airlines to operate profitably. Commercial aircraft produce significant quantities of $CO_2$ and governments are under pressure to increase taxation of airline fuel consumption in order to drive improved environmental performance. Recent agreements between Europe and the US are expected to open key routes in and between both regions to wider competition. Implementing design changes is also a costly process for Virgin Atlantic. Like all airlines, it must get maximum use from its assets, thus minimising the time aircraft are taken out of service for refits or modifications.

## History

Virgin Atlantic Airways was founded in 1984 by British entrepreneur Richard Branson. Originally famed for his record label, the development of Virgin Atlantic Airways marked a major step in a significant diversification process for Branson's Virgin Atlantic brand.

Virgin Atlantic Airways grew rapidly during its first decade of operation, aided by its founder's decision to sell his recording

interests and invest the proceeds in the airline. In 1999, Branson sold 49 per cent of Virgin Atlantic Airways to Singapore Airlines.

# The evolution of design at Virgin Atlantic

**The design team at Virgin Atlantic Airways manages many aspects of design for the airline, including interiors, service concepts, uniforms and airport lounge architecture.**

Virgin Atlantic's product and service group also includes two heads of product - one responsible for the design of the company's Economy and Premium Economy classes, the other for Upper Class - and a head of Clubhouses, all operating at the same level as Joe Ferry, Head of Design and Service Design at Virgin Atlantic.
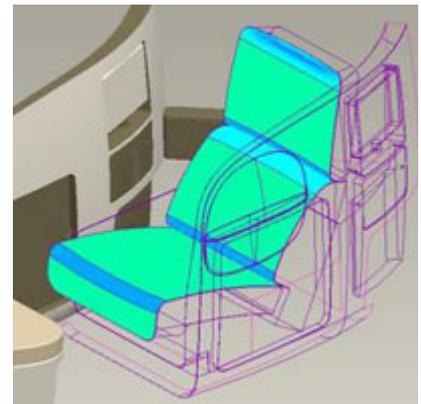


Design is considered to be a key competitive differentiator at Virgin Atlantic and (awaiting the appointment of a Director of product and service) Ferry currently reports directly to the company's Chief Operating Officer. Virgin Atlantic has what Ferry describes as a 'very flat structure' and both the COO and CEO are 'design literate and very supportive of innovation.' This senior management buy-in is deemed very important: 'if we didn't have those two it would be a completely different story,' says Ferry, who also mentions the design team's alliances with key figures like the Head of Brand.

**In more depth**
Read about the importance of  senior management support of the design process

Perhaps because of this, the pressure on the design team to succeed is quite strong within the company, says Ferry, noting that, 'you expect oil prices to go up, you expect occasional problems from external forces, but nobody expects us to deliver bad design, ever.'

Ferry says that strenuous effort over recent years – not only in developing relationships but also in communicating the value of design across the organisation – has given design 'a level of respect within the company.' The process has been difficult but effective, he notes, citing design's relationship with Virgin Atlantic's engineering function as a strong example of this success.

By working extremely closely with Engineering, he says, the latter department will voluntarily seek design input if a product needs to be altered or updated but now knows when 'not to meddle.' Ferry adds that designers at Virgin Atlantic need to develop

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flexible communication skills to suit their wide range of audiences, which include both manufacturers and senior management.

Historical successes have also helped the wider organisation understand the value of design, with the company's Upper Class Suite being a strong example. The introduction of the radical seating design and configuration in Virgin Atlantic Airways business class is credited with giving Virgin Atlantic Airways a two per cent increase in market share, worth some £ 50 million annually. Intellectual property developed during the design of the Upper Class Suite has also been licensed to other organisations, turning Virgin Atlantic Airways design department into a direct source of revenue for the first time.
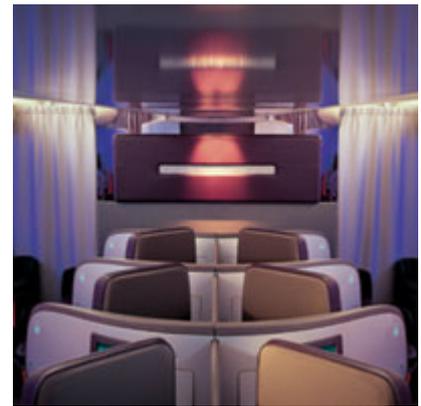
### Service design
Service design is the newest function to be integrated into the department. Virgin Atlantic Airways service design team is responsible for developing all aspects of the customer service experience and for ensuring that customer-facing staff throughout the organisation adopt and follow the correct procedures.

Service design uses a different skill set from the other design specialities and, while the management of the function comes from a conventional design background, Virgin Atlantic Airways has additionally recruited people with a cabin service background to staff the team.

The implementation of service design is also rather different from other areas of the design team's responsibility. Changes to service practice have implications for the job design of cabin crew and must, as a result, be handled with care and sensitivity. The Virgin Atlantic service design team works with the company's crew management as well as with its human resources department and with its training arm to ensure that new offerings are accepted, integrated and delivered successfully.

### Capability building
Virgin Atlantic prides itself on having a low staff turnover within its design department. This is achieved despite the department's relatively small size and flat management structure limiting the opportunities for staff progression. Instead, says Ferry, capability building efforts concentrate on educating designers in a broad range of specialisms. The wider company also runs general management training programmes, in which designers may participate.

The cross-functional sharing of ideas is strongly encouraged at Virgin Atlantic. Co-location of the designers helps with this, but formal meetings every six weeks allow all designers to share their current work, providing 'inspirational cross over and stimulation,' says Ferry.

Individual development within the team is formalised, with designers agreeing annual objectives with their managers and a link between pay and the achievement of those objectives. As well as direct project responsibilities, these objectives will include R& D and innovation activities.

## Status

Today, Virgin Atlantic Airways employs just over 9,000 people. 4,300 of these are crew. In 2006 the company had a turnover of £ 1,912 million and made a pre-tax profit of £ 41.6 million.

The company has a fleet of 37 aircraft and Virgin Atlantic announced in March this year that it is ordering 15 of the 787-9 Dreamliners – with options on ordering another eight 787-9s and purchase rights on a further 20 aircraft. The 787-9 Dreamliner burns around 27 per cent less fuel per passenger than the A340-300, the aircraft it will replace in the Virgin Atlantic fleet. The order will see Virgin Atlantic take delivery of its new planes from 2011.
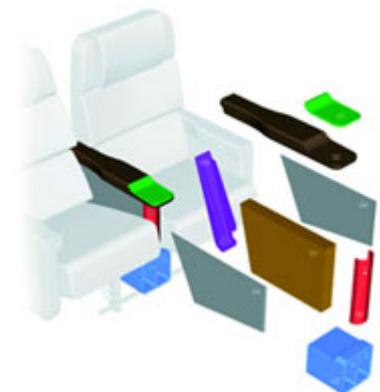
# The Virgin Atlantic design process

**To help staff operate within its challenging time and resource constraints, Virgin Atlantic Airways has a company-wide project management system that is used for all significant projects, including design activities.**

Joe Ferry, Head of Design and Service Design at Virgin Atlantic Airways, emphasises that the system does not constitute a design process, merely a way of ensuring that projects progress within time and budgetary constraints. The design process itself, he says, has no formal structure – however it does regularly follow the three consecutive stages – R& D, Design Development and Implementation.

Designers can be involved in a number of projects simultaneously, each of which may be at a different stage. Each stage involves a number of milestones outlined in the following sections.

This process does differ for service design projects which have added complexity due to the multiple stakeholders involved.

**Research and development**

The design process at Virgin Atlantic Airways begins with a research stage during which ideas are deliberately kept as fluid as possible. The R&D phase starts with what the company calls a Product Challenge. This could be a recognition by the company that there might be a need to carry out some particular activity, either to boost performance or to prevent a decline in performance (for example as ageing infrastructure or competitor activities reduce the distinctiveness of Virgin Atlantic's offering). Or it could be the result of brainstorming or blue-sky thinking in response to a challenge from, say, the CEO.

**In more depth**

See how design research groups have helped other companies in our study generate new ideas

Then the project moves into the Opportunity Identifier (OI) stage, where Ferry and his team take a project idea to the Product and Service senior directors group and put the case forward for an initial release of funds to conduct scoping work. At this point, budgets and timelines begin to be set and risks are assessed. If approved, funding is released for the preparation of a piece of work that will, as Ferry puts it, 'help us understand how much we need to develop a detailed business case.'

The Product Brief builds on the OI concept, incorporating commercial awareness and also formulating Key Performance Indicators (KPIs), including less tangible KPIs based on customer satisfaction as well as return on investment.

The Business Case for a new design project is built in a dialogue between the design team and the business unit in charge of the project. The dialogue is essential says Ferry, to ensure that all stakeholders are committing to something they believe can be delivered under the financial and time constraints. Rapid execution of design processes is important at Virgin Atlantic Airways. For example, its latest clubhouse, at Narita airport in Japan, opened in June 2007. The design process for it began three months earlier, in March. CEO input in the design process begins, says Ferry 'at day one.'

Obtaining board approval for new product development and design investment is not an easy task according to Ferry, who says he must often fight hard to be given the resource he wants for a project - 'We are popular at the end of a project,' he says, 'but not at the beginning' – and there is considerable investment of Ferry's time into creating

what he calls 'a robust justification' for investment. The Business Case will often include the presentation of fully developed mock-up designs and a Detailed Design Specification, both key tools with which to gain buy-in from the senior level. The creation of a Detailed Design Specification involves deep collaboration between Virgin Atlantic's in-house design team and the external consultancies from which they outsource expertise.

**In more depth**
Read about how corporate objectives are agreed and projects are signed-off at the end of the Define phase of the design process in other companies that took part in our study

## Design Development

As a project enters the 'design development' phase, there are a series of checks in place to essentially ensure that the final product is as close as physically possible to the Detailed Design Specification (DDS).

This involves designers and engineers working very closely with manufacturers and there are a number of key milestone meetings throughout this phase:

— **ITCM:** Initial Technical Coordination Meeting - This is the first meeting where the DDS will be presented to manufacturers to make sure that is the design is possible to manufacture: for example that it would be possible to reach the necessary weight target with the existing design
— **PDR:** Preliminary Design Review - At this meeting, the manufacturer presents their understanding and interpretation of the design to the designers. Up to this point, there is some flexibility to revisit the Business Case as design development progresses, this will not necessitate repeated formal sign-offs unless a major problem has arisen that requires significant additional funds to rectify
— **CDR:** Critical Design Review - At this stage, both parties agree on a common interpretation and it is agreed that this design can and will be manufactured. It is a 'cardinal sin' to make changes after this point
— **FAI:** First Article Inspection - This is when the first item is taken off the production line to ensure that it is fully functional etc. This can run in parallel with the following production stage as different components can be produced and assessed in parallel at any one time.

**In more depth**
Read more about other visual management techniques that could be useful during the development stage of the design process and how other development methods can help get a concept as close to being an end product or service as possible

## Implementation

In this phase, production (which can run in parallel with the first article inspection phase) is followed by implementation, snagging in the aircraft environment, and then finally the evaluation of the project's KPIs. During the implementation stage it's key that expensive aircraft downtime is minimised and as a way of managing risk, products are usually ready and in storage up to six months before the scheduled roll-out begins.

## In more depth

See how other companies in our study use [final testing](#) to identify and constraints or problems with their products before manufacture

## Working with external agencies

The vast majority of design projects at Virgin Atlantic involve the use of one or more external consultancies. The Virgin Atlantic internal design team tends to do the 'front end innovation' says Ferry, then once need-identification and early solution concepts have been developed, one or more external agencies is often brought in to work alongside the team in order to develop the final solution. Ferry adds that collaboration with highly creative design specialists is one way to ensure that the creative side of the in-house team is constantly 'invigorated.'

Managing this relationship can mean weekly meetings between the internal and external design teams help to keep both closely aligned, and during critical phases meeting frequency may be higher, with the teams doing 'whatever it takes to get the project running as smoothly as possible.' Virgin Atlantic maintains a policy of keeping all its external design suppliers separate. Ferry and his team coordinate the process centrally and little direct agency to agency communication takes place, particularly at the early stages of a project. Ferry is adamant that this separation allows the external consultancies to use their creative capabilities to the full: 'you need to give the consultancies the space to create and experiment.'

## Evaluation

Evaluation of Virgin Atlantic designs is quite extensive. Not only is the company's senior management 'a group of frequent fliers who provide extensive feedback,' it also gives customer the opportunity to fill in detailed evaluation questionnaires – called X plane – after every flight. The link between interior designs and X plane data is very robust, says Ferry, with even small changes in seat design, introduced to meet the size constraints of individual aircraft, being reflected in customer response. Virgin Atlantic also uses third party benchmarking data to compare ongoing design satisfaction with that of its competitors.

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**Market**

Today Virgin Atlantic Airways is the second largest long haul airline in the UK and the
third largest European carrier over the North Atlantic. The company's route network has
grown to include destinations in the US, Caribbean, Far East, India and Africa. The
company's headquarters are in Crawley, UK, near London Gatwick Airport, with
overseas offices in the US, Caribbean, South Africa, Hong Kong, Tokyo, Shanghai,
Delhi and Lagos.

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# Virgin Atlantic case study: designing the Upper Class Suite

**Perhaps the largest single design project conducted by Virgin Atlantic Airways in
recent years is the design of the company's new Upper Class Suite. Introduced in
response to a direct competitor action (BA's introduction of the first fully flat
aircraft seat-bed), the Upper Class Suite was a totally new concept in aircraft
interior design and was designed, engineered and brought into production in only
36 months.**

The original requirement for the Upper Class Suite was
simple: Virgin Atlantic needed to introduce a flat bed into
its upper class cabins. Joe Ferry, Head of Design and
Service Design, and his team began by exploring a wide
range of different configurations, including the use of
seats with separate sleeping areas. Eventually they
settled on the concept of a seat and a bed that were in
the same space, but separate entities.



During the early concept phases Ferry and his team also
spent considerable time with Virgin Atlantic's
management discussing different seat design features and assigning relative priorities
to each, so decisions could be made on what to include and what to remove from the
final design.

As concepts developed, the team worked with Virgin Atlantic's engineering function to
understand whether particular concepts would be acceptable under safety and
airworthiness regulations. It also brought in its first external support – in the form of
Design Q, an automotive design consultancy used for its layout design and model
making skills, which could help to produce 3D concept models to assist with evaluation.

At the end of this initial phase, Ferry and his team presented their concepts to the board, which gave the project the green light to move forward to the Design Development stage.

## From concept to prototype

Once the overall concept was evolved, Virgin Atlantic began to involve more specialist outside design support, including a structural engineering firm to assist with the mechanical design of the new seat and to ensure compliance with the very stringent aircraft safety specifications. They also brought in furniture design specialist Pearson Lloyd, after briefing the agency to produce a hypothetical concept for a competitor product to understand its design language and style.
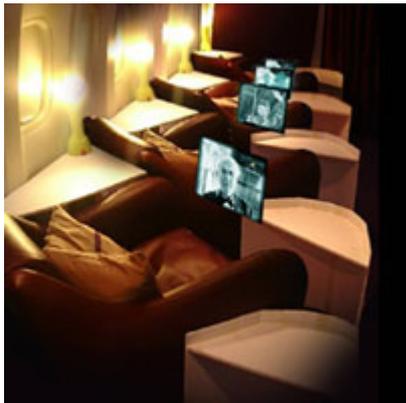


Ferry emphasises that the Upper Class Suite experience is a holistic approach covering much more than just the seat design, involving not just the cabin ambience but also associated service elements including limousine pick-up, in-flight massage and a range of dining options.

The company brought in additional specialists during the design process to achieve this.

Another design agency, Softroom, was used to develop a concept for the whole interior ambiance and specialist lighting design consultancy DHA assisted with illumination concepts.

Pearson Lloyd used its own ergonomic experience to optimise the comfort of the seat concept and used ergonomic data that Virgin Atlantic Airways had commissioned from Qinetiq. Within 12 months the team had built a full-scale dynamic prototype seat for evaluation purposes.

The prototype Upper Class Suite business case was approved by Virgin Atlantic's executive board and the seat design then underwent an extensive evaluation process. Members of cabin crew were seconded onto the design team to evaluate usability from a crew point of view and frequent flyers even came in to sleep in the test seat at Virgin Atlantic's HQ. These extended test sessions were augmented by shorter review sessions in which the company's top 50 passengers would come and assess the new design. Such user evaluation was important, says Ferry, but must be treated with caution as passenger feedback – which can be limited in so far as consumers are only able to react to what they have already experienced - won't 'take you to the next level.'

## In more depth
Read about how corporate objectives  are agreed and projects are signed-off at the end of the Define  phase of the design process

## Manufacture

Once the board had approved the seat design, The Virgin Atlantic design team turned its attention to the manufacture of the seat. At this point in the process, input from external design consultants stopped: Virgin Atlantic and the consultants recorded the agreed design in a Detailed Design Specification Document and through it Ferry and his team became 'guardians of the design' throughout the engineering and manufacturing process. Here again, the availability of a working concept model was extremely useful, as without it, says Ferry, 'the manufacturers would have said, "It can't be done."'



Manufacturing engineering took 24 months and at the same time the Virgin Atlantic design team conducted an extensive value engineering programme, looking for opportunities to reduce costs without affecting user perception of the product by, for example, ensuring that the leather seat cover designs make maximum possible utilisation of a single hide. The Upper Class Suite was delivered to aircraft in late 2003. Virgin Atlantic continues to use a similar process on other projects and is just completing a redesign of its Premium Economy class cabin.

# With thanks to Virgin Atlantic

For the purposes of the design process study, we spoke to Joe Ferry, Head of Design and Service Design at Virgin Atlantic Airways.

To find out more about Virgin Atlantic, visit the corporate section of
www.virgin-atlantic.com

# Design at Whirlpool

**Whirlpool Corporation is a leading manufacturer of major home appliances. The Global Consumer Design unit at Whirlpool has a staff of over 150 people and has developed expertise and processes that help the company respond to the demand for increasingly sophisticated and complex appliances and develop individual products under different brand umbrellas worldwide.**

## Overview

**Whirlpool established a programme to transform its global design process over a 12 month period beginning in 1998. The aim of the process was to equip the company's design function to support its emerging platform approach.**

Since then, Whirlpool has used design and innovation as a central part of its strategy to grow in a mature and highly competitive market. Core elements of this strategy include:

— A formal innovation process with widespread employee participation
— The use of a common platform design approach to allow cost effective brand differentiation
— A centralised Global Consumer Design function to control costs and exploit emerging trends across the whole organisation
— Extensive use of ethnographic and consumer research
— Robust metrics linking design and manufacturing quality to sales and support costs.

**Meet the team**
Whirlpool's Global Consumer Design unit has a staff of over 150 people. This function has quadrupled in size over the last four years and expanded its capabilities to include interaction design and an enhanced usability function that includes staff with expertise in ethnography and anthropology. These functions were added in response to the design demands placed by increasingly sophisticated and complex appliances, together

with the desire to engineer core product platforms to suit the widest possible range of brands and markets.

The Global Consumer Design function is represented in the US Mexico, Europe, India and China. Most of the organisation's designers operate in brand studios, with 14 major brands and 30 sub-brands supported in this way.

Brand studios are responsible for taking the company's core product platforms, which contain the majority of the product engineering and functionality, and modifying them to suit the language of each individual brand and the specific requirements of its customers.



Whirlpool's Platform Studio, established three years ago, is staffed by designers, engineers, manufacturing and materials specialists. Platform development work typically begins five years before a product reaches the market. This provides an environment where the integrated team can set global standards for colour, materials and finish. They create initial design concepts based on market data, research and information, as well as trends analysis.

It is acknowledged that the design outcomes from the Platform Studio find a better fit with some Whirlpool brands over others. The Platform Studio's role is to reach across to the brand platforms with their design outcomes and work with them to implement and test the concepts. This allows for cost effective modifications to suit diverse brand requirements.

**Designers**
Part of the programme to unify Whirlpool's design capabilities has involved a drive to standardise the capabilities available in different design offices. Today the company has industrial designers, usability specialists, human factors engineers and interaction designers in all its major design facilities. It supports these with graphic design and model making capabilities.

According to Chuck Jones, Vice President of Whirlpool's Global Consumer Design unit, great care has been taken to ensure that the designers can work in an environment that maximises both their creativity and the effectiveness of their work in business terms. In practice, he says, this means ensuring that designers are 'shielded from the noise of the organisation,' while still ensuring that their work is recognised.

Designers are also required to have a good understanding of the business goals they are attempting to fulfil, and the fact that they are producing 'art for commerce.' Jones says, 'My job is to make sure that every designer inside Global Consumer Design understands how their efforts are being translated into business results for the corporation.'

Whirlpool also makes selective use of external design consultants where appropriate. It uses five external agencies worldwide, choosing them when it identifies a requirement to bring in 'fresh approaches in terms of process and methodology.' External agency staff members are treated as an extension to the Whirlpool design team, and are even given performance reviews. Normally, the agencies represent different areas of expertise.

Most recently, Whirlpool has increased the recruitment of people with design planning skills in order to support its efforts to build a logical, differentiated brand architecture. 'We are employing street smarts in equal proportion to book smarts to make sure that we're getting the desired outcome,' says Jones.

## History

Whirlpool Corporation is a leading manufacturer of major home appliances. The company was founded as the Upton Machine Company by brothers Louis, Frederick and Emory Upton in St. Joseph, Michigan US in 1911.

Originally manufacturing washing machines, the company quickly expanded, briefly diversifying into the production of metal toys. Expansion continued during the 20th century, and through a combination of organic growth and acquisition the organisation became the largest washing machine manufacturer in the US Renamed Whirlpool Corporation in the 1950s, the company's activities included the production of automatic dryers, refrigerators, cookers and air conditioners.

By the 1960s Whirlpool was active in overseas markets, through export and investment in local appliance manufacturers. This expansion continued for the next three decades, as Whirlpool established a market presence in Europe, South and Central America and Asia.

# The evolution of design at Whirlpool

**Whirlpool prides itself in having an innovative ethos. The company attributes US$ 1.6 billion of its 2006 revenues to innovative products. Its policy of encouraging all employees to take part in innovation processes led to its inclusion in Business Week magazine's top 100 innovative companies list. The company values its current innovation pipeline at US$3.6 billion.**

To shake up part of this pipeline, its design strategy, Whirlpool appointed Chuck Jones in 1995 to head up a central Global Consumer Design group as its Vice President. Under Jones's leadership the company linked all its global design functions into a single structure, rather than running design functions for individual brands as had been done before. It also merged its usability and human factors groups into the design department.

### In more depth
Find out more about how successful design processes require good [leadership](#)

Jones essentially challenged the previous configuration of design in the company and pioneered new processes throughout Whirlpool and successfully demonstrated to the company that design input could add significant additional value to both the profitability of individual products and the nascent product platform strategy.

The Duet washing machine, launched five years ago, was the first big win for the common platform approach.

By redesigning an existing product, using the same underlying technology but with modifications to the appearance and user interface, the design team created a product that could be sold at three times the price of its predecessor and competitor products.

More recently, with the launch of its Garage Works range of storage furniture, the design team was able to take a totally new product line from early concept to launch in only 12 months.

The design process within Whirlpool, says Jones, is effectively inextricable from the company's innovation process.

### Organisational position and influence
Whirlpool has been working to achieve a more strategic role for its design department. Jones has, he says, been 'chipping away at this since 1999.' He has also worked at breaking down traditional functional silos and improving the links between design and other corporate departments. Whirlpool's Platform Studio is an example of success in this area. The design-led Platform Studio is central in developing brand engineering for Whirlpool at a strategic level.

## Market

The company sells Whirlpool, Maytag, Kitchen Aid, Jenn-Air, Amana, Brastemp, Bauknecht and other major brand names in hundreds of countries worldwide.

Traditionally, the domestic appliance market has been extremely price sensitive, with major manufacturers competing to deliver acceptable levels of performance and reliability at ever lower price levels. This situation is changing in many mature markets, however, as consumers are beginning to differentiate products on the grounds of energy consumption, environmental performance, design and ease of use.

# The Whirlpool design process

**Whirlpool has its own innovation process model which links research activities with idea generation techniques to drive the creation of new ideas. All Whirlpool employees are encouraged to participate in its innovation programme and many receive training in innovation techniques.**

New ideas generated during an initial Discovery phase are formally evaluated, and the most promising are taken forward to the subsequent Synthesis stage by the creation of a business plan and the commencement of a development programme. The company attributes much of its commercial success since 1999 to the use of the innovation model, which, it says, has encouraged its employees to spend less time looking at competitors and more time trying to understand customer needs. This innovation model is what Chuck Jones, Vice President of Whirlpool's Global Consumer Design unit, says is inextricable from the design process, which, through various tools and processes, links into and delivers design expertise from cradle to grave in the product development process.

## In more depth
Read about how some companies use a double-diamond model to manage their design process through Discover, Define, Develop and Deliver stages

## Research
Whirlpool makes extensive use of a range of research methodologies. Ethnographic and anthropological research is used during the early phases of product development. Researchers observe activities such as food preparation or laundering among target consumer groups in diverse social and cultural settings.



Whirlpool uses a broad range of different research environments, including observation of users in their home environments, contextual research labs (which are home-like environments artificially recreated with extensive video monitoring and observation facilities) and full lab testing environments (used for research into

specific product characteristics such as acceptable door operating force). Ethnographic research results in the development of products aimed at specific regional habits, such as the Tapa Lava-Lava scrubber lid, a clothes scrubbing and drying attachment to manual washing machines used by customers in Mexico.

**In more depth**
Find out how market research can help the development of new products and services and can predict and help your business respond to new trends.

Whirlpool's research is also conceptual, such as the 'What to eat' initiative, which investigated different food stream processes across the world, including transportation, storage, treatment, preparation and clean-up. 'We did this study probably two years ago and I would say that we've got so many learnings from it that we're probably going to be living off the research for the next five years,' says Jones.

On some occasions, new product innovations can be generated from what were originally intended as purely conceptual studies. In 2003, for example, Whirlpool conducted a major study called Macrowave on consumer trends in the microwave oven market. Working together with an external design team, Whirlpool Global Consumer Design developed eight different scenarios for possible future architectures for microwave ovens. The final concepts were shown to the public and even exhibited in the Louvre in Paris.

**In more depth**
Read about the benefits of user research  (and designer involvement in user research)

'One of the concepts that came out of the exercise was a completely round microwave,' recalls Jones. 'And no matter where we took it, people said "that's a great idea". So we actually partnered up with our microwave engineering group in Sweden and we ended up bringing it to market. It was a hugely popular product in Europe.'

Other major conceptual projects have included:

— **InKitchen** - which investigated kitchen and food preparation spaces for the future family unit
— **InHome** - explored the way a home can change and adapt according to a family's changing patterns of behaviour and moods throughout the day
— **Project F** - which explored the future of fabric care for the next ten years and how this would affect the manufacture of major domestic appliances.

The outcomes of Whirlpool's research are studied as much for their similarities as for their differences. However, research data such as diagrams of food preparation habits

often have common elements that can be used to identify which current or proposed product platforms might be suitable for the market in question, and to help focus the fundamental requirements of those platforms. The brand studios can then accommodate market differences when products are designed for their final markets.

## Status

Today, Whirlpool has annual sales of more than US$ 18 billion, more than 73,000 employees, and more than 70 manufacturing and technology research centres around the world. Revenues increased by 26 per cent in 2006.

Whirlpool has its worldwide headquarters in Benton Harbor, Michigan, US The company has manufacturing and administrative facilities in more than 20 cities in the US and worldwide.

# Whirlpool's key principles for designers

**On the basis of information acquired from its different types of research and initial ideas, a concept is developed through an ideation phase which involves a variety of design methods, as well as interaction between the Platform Studio and brand platforms.**

In terms of design methods, Chuck Jones, Vice President of Whirlpool's Global Consumer Design unit, points to the need for 'sandbox time' and 'designer think time,' where designers are free to spend time exploring initial ideas and solutions to the opportunity or user need identified.

Jones notes, 'I would say that the thing that we do inside of Global Consumer Design is to ensure that we've got smart people working on an innovation initiative.'

'We're giving them the time and space to think and reflect and nose around and try some things and probably fail, and you know, give them that time to do that.'

**In more depth**
Find out more about what happens at the Develop stage of the design process

Another key feature of the way in which designers contribute to product development at Whirlpool is to work in multi-disciplinary teams throughout the development process. In both its Brand Studios and Platform Studios, Whirlpool operates a phase gate process to ensure that each stage of the design is signed off by all the relevant stakeholders. In the Platform Studios, the development process is best described as a 'creative scrum' says Jones. While design, engineering, manufacturing and materials specialists all work

on platform development, the leadership role shifts back and forth between them as the project progresses. 'Sometimes design has the ball, sometimes it's engineering.'

All roads for the outcomes of the development of the concepts are leading towards the Opportunity Brief Development, which is the point at which Regional Innovation Boards, led by the regional business owners, review concepts for sign-off. This multi-disciplinary group interrogate the concept, and seek the answers to questions around brand fit, whether the concept links to an existing product or a potential new business area, what the revenue stream may be, and what investment is required.

## Evaluation

Whirlpool operates an extremely thorough evaluation process once a design has entered production. Evaluation starts on the factory floor with end-of-the-line craftsmanship audits. These are used to ensure that production quality is running at the appropriate level and to feedback manufacturability insights to the design teams.

After products have been with users for six to eight months, the design group conducts a post-launch usability audit with selected customers. The results of these audits can be linked closely to the costs of supporting a product in the field. 'We know that for a certain usability score, we will receive x number of service calls,' says Jones. Metrics like this help the design team to prove its cost effectiveness in future product launches, he says.

All design metrics are fed back to the design team using a standard one page template. The metrics for a project, circulated at product team level, allows them to compare performance on different projects, evaluate the effect of process changes and ensure that all worldwide design groups are continuing to improve their overall performance.

# Tools, techniques and tips

**Even with a formalised innovation process in place, which has a clear role for Global Consumer Design throughout, the team's Vice President Chuck Jones argues that 'the magic is never in the process.' Rather, he emphasises the importance of change management, and being able to constantly iterate the design and innovation process to adapt to changing conditions and contexts.**

However, Jones does trumpet the impact of the current process, which has delivered clear benefits, both in financial and time-saving terms. 'As we sit here in 2007, the design process, which was implemented in around 2000, has delivered an innovation pipeline with a value of slightly over US$5 billion and so clearly, just from a pure shareholder value perspective, this initiative has done tremendously good things for the organisation,' says Jones. Global Consumer Design is consequently being looked at to drive Whirlpool's overall brand architecture.

## Capability building

Jones says that one of his key responsibilities is to ensure that his designers have 'the tools to do battle' in discussions with the wider organisation. In practice, these tools include effective metrics linking aesthetics, perceived quality and usability to sales and service costs.

## In more depth

Find out how other companies in our study hire designers who demonstrate a wider skill set including: multi-disciplinary working, business acumen and strategic thinking

Every designer also undergoes continuous professional development during their career at Whirlpool. This development programme is divided into two parts. The first concentrates on aligning the designer's development with the current and future needs of the company. The second is about ensuring their growth meets their personal objectives. Jones says that ensuring his designers have a 'robust part B' is a key to ensuring their ongoing satisfaction.



Periodic 'town hall meetings' involving the entire design function worldwide, linked by video conference, are used to ensure that the whole design organisation retains a good understanding of its overall performance and focus. Members of Whirlpool's senior management staff are encouraged to speak at these town hall meetings, reinforcing the link between design and top line business drivers.

At the project level, a range of activities are used to help designers gain a strong understanding of the customer needs their products must fulfil. Examples of such activities are spending time with service engineers carrying out on-site repairs and responding to service calls, or spending two weeks working in Ikea stores (which sell a lot of Whirlpool products) to understand the retail environment.

## Resources

Whirlpool's design teams can draw on the experience of the company's extensive central R&D capabilities. For example, says Jones, Global Consumer Design works with two other departments on the development, selection and application of new materials:

'The Advanced Materials group does basic research on new materials that might have great properties for our products.'

'In GCD, we look three to five years out at the types of colour schemes and finishes the market is going to require to create a consistent palette that gives all the brands what they need without requiring too many different material combinations.'

'Then the Materials Engineering group takes our requirements and the cool new materials coming from Advanced Materials and works out how we can get them to work reliably in real conditions and how you can get them through all our factories with their different production processes and capabilities.'

**In more depth**
Find out more about  planning and managing  the design process

# With thanks to Whirlpool

For the purposes of the design process study, we spoke to Chuck Jones, Vice President of Whirlpool's Global Consumer Design unit. Based in the Benton Harbour headquarters, Jones leads a team of designers, usability and human factors experts and guides their input into Whirlpool's overall innovation and product development process.

To find out more about Whirlpool, visit www.whirlpoolcorp.com

**Please note**

# Design at Xerox

Xerox was founded in 1906 and has been developing pioneering office automation technologies since it introduced the first photocopier in1949. The design function at Xerox plays an increasingly important role in the organisation, and has recently been implementing a significant programme to broaden the breadth and scope of design input into new and existing product development.

## Overview

**Design input is important to Xerox because it has helped it respond to challenging market conditions. The expiry of a number of key patents on its copying and printing technologies during the 1980s opened up many of its core markets to significant new competition.**

In response, Xerox was forced to transform its business practices, concentrating on adding customer value to its traditional technology offering through improved design and the growth of significant service capability.

This transition continues today. The company has sold its manufacturing capability and has changed from being a vertically integrated player in imaging, printing and document management markets to being a horizontally integrated supplier of business automation services.

Xerox sees design and the user experience as key competitive differentiators in the current market and invests heavily to improve this aspect of its entire product and service offering.

Xerox has a strong history of engineering and innovation. The company invests six per cent of its annual revenue into R&D, runs four research centres worldwide and holds a portfolio of more than 8,000 active US patents. Current areas of research include colour science, digital imaging, computing, work practices, electromechanical systems and new materials.

Xerox is a strongly engineering-led organisation, with a large workforce of design-engineers. The company's Industrial Design and Human Factors (IDHF) function, traditionally a separate department within Xerox, is now fully integrated with its wider product development organisation. Based at Xerox Europe Technical Centre in Welwyn Garden City, the IDHF team comprises around 14 people, and is managed by Les Wynn who is also the champion for new ways of using design within Xerox as a whole.

Xerox has a strong record of design and human factors expertise. Today the company is transforming its design processes to allow designers to exert more effective influence as the organisation increases its focus on user experience. Key elements of this transformation include:

— Aligning central design research activities with the needs of specific product programmes
— Equipping designers with manufacturing engineering capabilities to help preserve design intent through to production
— Using informal networks to promote an appreciation of design upstream and downstream in the organisation
— Making use of more strategic business tools such as Six Sigma and FMEA processes, both to improve the effectiveness of design decision-making and to ensure designers communicate using the same language as their engineering counterparts

## Designers

Wynn's team of designers at Xerox Europe Technical centre consists of industrial designers, user interface specialists and human factors experts. Most designers are highly experienced and it is normal practice for them to have expertise in more than one design discipline. For example, many of the designers have multiple degrees combining psychology, computer sciences, ceramics, user interface, human factors, engineering and graphics.



Wynn considers that it's the combination of skills such as these that enables the designers to feed into multiple stages of the development process. The UK office has a core team of eight designers, and workload requirements are supplemented with temporary contractors. This occasionally expands the team to over a dozen.

One consequence of the requirement for this level of skills is that Xerox's designers tend to be mature and experienced. Wynn adds: 'I think the skills sets will be changing…you can't look at the process without looking at how the business itself is changing.'

## History

Xerox was founded in 1906 as the Haloid Company. Based in Rochester, New York, US, the company's initial business was the manufacture and sales of photographic paper. In 1947 the firm licensed patents for the then new electrophotographic process.



The process, which became known as xerography, was brought to market two years later, when the company introduced the Model A, the first photocopier. In 1956 the Haloid Company formed a joint venture with the Rank organisation, naming the new company Rank Xerox.

Xerox continued to expand through the 20th century, developing a number of pioneering office automation technologies. In 1973 the company's research division in Palo Alto, US, produced the first prototype of what would later be recognisable as the personal computer, featuring a What You See is What You Get editor, a graphical user interface and a mouse for cursor control. In 1977 the company produced the first commercially available laser printer.

# The evolution of design at Xerox

**Design has historically held a high priority within Xerox, says Les Wynn, Xerox's Manager of Industrial Design & Human Factors, but in recent years there has been a significant programme aimed at improving both the breadth and scope of design input into new and existing product development and of the design function's ability to respond appropriately to specific internal product programme needs.**

Led by Wynn, Xerox has moved away from a very formal approach in which the design team was handed a specific brief and brought in to work on a project for a short, defined period of time between engineering prototyping and final production. The disadvantages of this method of working were two-fold, says Wynn.



Firstly, key design elements could be lost in the downstream manufacturing engineering process, and secondly design options were limited by the advanced state of mechanical design at first design input. There was a need, he points out, for designers' inputs to extend both upstream and downstream in the product development process.
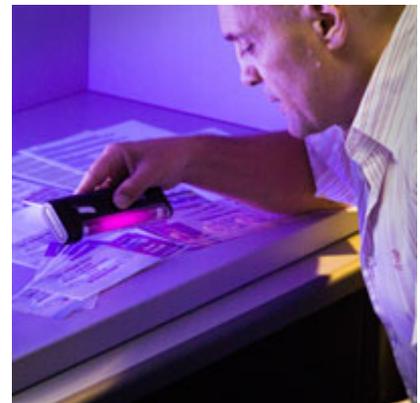
## Upstream and downstream

To tackle problems further down the development stage, such as during manufacturing, Xerox has increased the manufacturing capability of its design team, allowing it to work much more closely with manufacturing engineering, and increasingly with external tool

makers and injection moulders. This ensures that tolerance and manufacturing issues are accounted for in the design stage.

Design's movement upstream to strategic planning of product development has been less formal, but just as important. By integrating the design function into product engineering and eliminating the formal briefing and handover processes, the design team has the opportunity to input much earlier in the process.

The uses of this input, however, depend on the design team's ability to demonstrate that its input will be valuable during early project phases. This has been aided by the professionalism of Wynn's design team, and the injection of business acumen and expertise.

**In more depth**
Find out how working in multi-disciplinary teams can mean design is not isolated from other business processes and how designers need to interact with commercial functions, with manufacturing and with product or service support

**From top down to bottom up**
Currently, Xerox has a Design Research Groupbased in the US. This group carries out design research and focus groups, and engages design consultancies from around the world in this process. Examples of work conducted here include colour research and trends.

From this work, the team generates stylistic ideas, which are successively narrowed down to three or four key ideas that form a guideline of what the next product will be like. The directions and information gathered includes input from global design teams within Xerox, who will all participate in a workshop with the Design Research Group and present their findings together with external design consultancies. The final guidelines apply to product development activities for the next two to three years and beyond.

**In more depth**
Read more about how design can apply brand power and design research groups have helped companies that took part in our study bring design thinking closer to new business areas, product opportunities and user needs

Unfortunately, says Wynn, this process is time consuming and difficult to properly integrate with activities in ongoing product programmes. The result is often that the guidelines are out of sync with the product programmes' activities and different products in the same line are designed using different sets of guidelines.

Wynn is advocating that the company adopts a bottom-up approach to design process, driven by product programme needs. Design standards should continually be evolved and tested by the company's Industrial Design and Human Factors (IDHF) function.

This type of approach to design process, says Wynn, would mean that establishing design guidelines could take as little as two weeks, rather than two years. A model that depicts the flow of process that Wynn envisages is shown below.

## Organisational position and influence

As Xerox changes from being a verticalllly integrated designer and manufacturer of equipment to being a horizontally integrated business services organisation, the role of design is changing too.

In the new environment, non-core activities are now expected to be outsourced. Wynn believes that design is, and should always be, a core activity which sits at the centre of the organisation and advises on product strategy. To do this, however, design's role in the organisation must change from being a horizontal function which plays a limited role at select points in the product engineering process, to being a vertical function, informing all of the company's activities, from board room to end-of-life of the product.

Wynn says, 'the whole aim at the moment is to drive design earlier in the process, and then to drive it outwards towards and closer to product launch.' In order to achieve this, Wynn has had to change the structure of the design group and ensure that design receives support and buy-in from vice-presidents, some of whom are direct sponsors of the design function. 'Quite a few key people, including the CEO, are recognising that user experience drives a lot of decisions about what a commodity and core activity is,' says Wynn.

He hopes that the design function, through its increasingly important role in the business, will continue its journey towards a key role within the organisation.

## In more depth
Find out more about how successful design processes require good leadership

## Status
Today, Xerox employs 53,700 people world wide, just over 50 percent of whom are based in the US. In 2006, Xerox had a turnover of US$16 billion. The  company operates in 160 countries worldwide

# The Xerox design process

**Design cycles at Xerox vary in length, from four years for the introduction of a major new product line or technology, to six months for the updating of an existing product range.**

With the new focus on design input during the fuzzy front end of projects, the beginning of the Xerox design team's input into a process will vary according to the individual project. The design team at Xerox rarely receive formal briefs anymore, but rather aim to work with the product programmes to identify opportunities and address user needs.

The team has had, says Wynn, 'some success with design-led projects', where the design team will contribute in the initial product specification phases, define the desired end form of the product and establish size and shape parameters to be fulfilled by engineering. The company also undertakes an extensive competitive benchmarking programme, dismantling competitor products to understand their designs and their designers' approaches to cost reduction and quality assurance.

Most commonly, designers work on top of an existing engineering platform, which defines the key physical parameters of their solution. Designers will have at least two or three projects on the go, and work is integrated with the project team, which will be familiar with the project's overall success criteria.

**In more depth**
Read about how during the Define stage of the design process the product develops

**Concept development**
Concept development may involve several members of the Xerox design team and the department completes strenuous internal reviews before taking a concept proposal forward to the wider team for evaluation. The objective, says Wynn, is not to give the wider team multiple options from which to select, but to recommend a single, best option that can be refined in later iterations to achieve the desired result. That way, he says, 'the arguments are over the details and everyone takes responsibility for the finished product.'

The design team uses a wide range of tools more familiar in the engineering design context in order to make sure its proposals are robust before taking them forward. It will, for example, conduct a thorough failure modes and effects analysis (FMEA) to identify

and compensate for potential problems. An FMEA study identifies the different ways in which a product may fail, then prioritises these potential failures according to their likelihood, seriousness and ease of identification, allowing the designers to concentrate improvement efforts on known weaknesses of a product.

The designers develop their solutions using 3D CAD. Xerox has extensive in-house rapid prototyping capability, but the desire to deliver rapidly and at minimum cost, combined with the design team's extensive experience in 3D CAD, means that physical prototyping is kept to a minimum until concepts are close to completion.

**Evaluation**
Xerox makes extensive use of useer observation to evaluate the performance of its designs. Xerox is a business-to-business organisation, not business-to-consumer. This makes a profound difference to the requirements placed on the designers, says Wynn. 'Many of our products are bought without people ever seeing what they look like, so design does not fulfil the role in retail that it might in other businesses,' he says. 'However, once in place, our products are a very direct advertisement for the company. A lot of our attention today is on designing for five years in use. Will the product degrade elegantly? Is it easy to clean?'

Given this context, user research and observation is conducted in a variety of ways. Machines are set up in real office environments – including, quite extensively, Xerox's own offices - and equipped with cameras that automatically record user behaviour, using a sensor to activate the recording system when the machine is approached.

This type of observation is supplemented by analysis of service calls and demands for spare parts – both strong indicators of the frequency of machine and design failures.

Designers also spend time with service engineers visiting customer sites and discussing issues with customers. More recently, says Wynn, he has also encouraged designers to visit suppliers in the manufacturing chain, who can provide powerful insights into the implications of certain design decisions for manufacturing quality and cost.

Xerox's designers also get involved in post-product launch focus groups, including helping to produce the visual materials and models used in the sessions.

Measuring the impact of design input separately from other aspects of product performance is difficult, however, according to Wynn. Xerox uses customer satisfaction scores as a key performance measure, but design is only one of many contributing factors here.

## Implementation and productisation

Xerox has a business group that looks after each product segment at the launch stage. The team consists of marketing and product planners. This group is responsible for working out the product portfolio and ensuring that the correct target markets are identified. This group is closely aligned to the marketing and design teams.

## Market

Xerox now produces a wide range of commercial and industrial printing, scanning, copying and document management products. Its offering includes both hardware and software and, increasingly, the company offers business process outsourcing services to customers via its Xerox Global Services consulting division. Xerox Europe's operations cover seventeen countries across Europe

# Tools, techniques and tips

**Xerox keeps a 'lessons learned database' to capture key insights from previous design projects, to ensure that mistakes are not repeated and that lessons on best practice can be taken forward to future projects.**

Today the design department is making use of Six Sigma tools to make many of its activities more robust and data driven. A good example, says Wynn, is user testing which utilises quite rough, low fidelity hardware prototypes. 'No one likes using rough prototypes, so often user testing is left until late in a programme, by which time changes are very costly to make. Using Six Sigma, we can statistically remove the effects of hardware fidelity from our test results so we get good, early data on usability before we've committed to tooling and costly manufacturing of production-representative hardware.'

**Capability building**

For Wynn, equipping his designers with the skills they need to interact successfully with the wider organisation is a key priority. He does this by ensuring that they receive training in business strategy in addition to specialist design skills. In particular, all Xerox designers are trained to use the Six Sigma and Quality Function Deployment techniques in use with the rest of the organisation. This, he says, helps to give them a common language with which to communicate with other teams internally.



DESIGN IN XEROX – Planning for intercept model
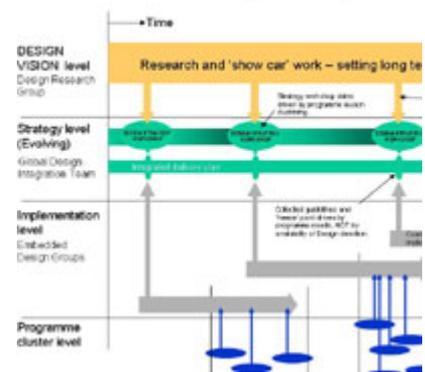
You can see a diagram of how the Xerox design strategy is structured by downloading a PDF of Xerox's Planning for intercept model.

**In more depth**

Find out how other companies in our study hire designers who demonstrate a wider skill set including: multi-disciplinary working, business acumen and strategic thinking

As important as specific skills training, however, is the design team's ability to build relationships with others and form an effective internal network in the organisation. It is through informal relationships and their ability to communicate their creative ideas effectively, says Wynn, that his designers will be able to bring the strongest influence to bear during the critical fuzzy front end of projects.

'We don't want to force ourselves into projects, we'd rather the teams said "it would be really useful to get some input from the design team now,"' he explains. In fact, Wynn contends that a designer mentality permeates the business, in that a large number of Xerox's engineers and mechanics would call themselves a designer.

# With thanks to Xerox

For the purposes of the design process study, we visited Xerox's European office in Welwyn Garden City. Les Wynn, Xerox's Manager of Industrial Design &  Human Factors, presented the company's design process and explained the changing role of design in the company.

To find out more about Xerox visit www.xerox.com

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# Design at Yahoo!

**Founded in 1994, Yahoo! has grown from a pioneering search engine to become one of the most popular portals on the Internet. An organisation that uses technology to focus on customer needs, Yahoo! operates a highly customer-centric design process, with user research instrumental in the development of new products and the evolution of existing ones.**

## Overview

**Yahoo! has a 'one size doesn't fit all' attitude towards the concept of a formalised design process. However, the speed of its market and the pace of technology both require Yahoo! to be keenly aware of how to best manage product development.**

Project management tools, such as Agile (described in detail later), provide the backbone for product development while allowing the design team to be creative. Key elements of this process include:

— Using product development methodologies with short design iterations, continual prototyping and product development and small, tightly integrated development teams
— Providing designers and other project team members alike with the business tools needed to relate design actions to financial goals
— Building of methods and patterns libraries to encourage consistency and reduce repetition across products and teams.

**Meet the team**
The design function at Yahoo! has a staff of over 300. The majority of them are based at the organisation's US headquarters, the remainder spread around the world.

The company's User Experience Design group includes user researchers, visual designers and interaction designers. In addition to this, specialist knowledge is heavily

drawn on from teams at Yahoo! on a project by project basis, such as the Mobile team who advises on the transfer of technology to small user interfaces.

Yahoo! completes 90 percent of its design activities in-house, but occasionally uses external design resource for unusual or high-profile projects, a type of activity the company calls 'hyper design.'

## Designers at Yahoo!

Typically, Yahoo! recruits highly qualified designers with a decade or more of professional experience and high levels of academic qualification (often PhD level, particularly in its user research activities).

Some Yahoo! businesses also hire staff with creative backgrounds that fall outside the typical web-development career path. The company's news and sports portals hire professional photographers, for example, in order to inject added visual insight into their product ranges.

Yahoo! requires all its designers to have a business focus, to be capable of understanding the business goals of the projects in which they are working. 'The designers who take the time to learn the business do not think that their value is just making great designs, it's making designs that move the needle,' says Joseph O'Sullivan, Senior Design Director. 'They're the ones who are successful.'

Indeed, designers are encouraged to think more widely than the boundaries of their own discipline. 'The design industry in general has the tendency to only own half the problem. If you want to take a strategic leadership role in any problem then you need to own it,' says Luke Wroblewski, Senior Design Principal for Search at Yahoo!.

## In more depth

Find out how other companies in our study hire designers who demonstrate a wider skill set including: multi-disciplinary working, business acumen and strategic thinking

## Innovation

Perhaps like no other industry in history, the Internet exhibits a relentless pace of innovation. Being first to market with a successful new technology or a popular application can earn its owners millions. Successful Internet businesses have learned how to scale their activities with great rapidity and to evolve the business models and roll out new services with similar speed. This sometimes involves buying out smaller niche market product or service providers in order to remain at the frontline of market developments.

Yahoo! fits this model precisely and its board cites a policy of continued and accelerated product innovation as being fundamental to its sustained growth. Recent innovations brought to the market by Yahoo! include its Yahoo! Go product (a multi-device interface for its mail and personal information management products), a new interface of its email

application, and continued expansion into new content areas including Yahoo! Answers, which allows users to post a question online and view a series of relevance-ranked responses from the overall web community.

## History

Yahoo! is one of the big successes of the Internet revolution. Founded in 1994, Yahoo! has grown from its beginnings as a pioneering search engine to become one of the most popular portals on the Internet. Working with hundreds of partners around the world, Yahoo! is today the face of the Internet for 500 million people.

# The evolution of design at Yahoo!

**Yahoo!'s current design process has evolved in response to the need to continue a rapid pace of innovation and new product development in a business that has grown rapidly from entrepreneurial roots into a global service provider.**

## Design process evolution

Yahoo! clearly acknowledges the fast pace of change in its industry, and recognises that the company's rapid growth in this context must be sustained. This has required Yahoo! to understand its internal working patterns and processes.

When it comes to a design process, Joseph O'Sullivan, Senior Design Director, does acknowledge that this normally covers three key stages of inspiration, ideation and execution. However, he maintains that Yahoo! is not wedded to having a formalised design process. Rather, it is deemed more important to strike a balance between formalised tools and methods and the allowance for designers to be creative while communicating effectively with other teams.

Consequently, in 2006 O'Sullivan set about identifying and capturing best practice in design. This was not about standardising and formalising processes, but about defining success. 'Nobody's going to want to talk about process, but what they will talk about is success,' says O'Sullivan.

The result has been the use of business and project management tools, such as the Agile development process, to set the direction and guide the activities for product development. In parallel, O'Sullivan is also ensuring that design finds its place in this process, and is spearheading an initiative to capture design methods and encouraging multi-disciplinary working.

## Organisational position and influence

While design and user research have always had a key role within the development of Yahoo!'s products, the introduction of project management tools like Agile have enhanced the role of design in the process. 'Design has had the opportunity to step forward and say "Here's what we think we should do and should be doing." Now there is an official place for design within a given process,' says O'Sullivan.

Luke Wroblewski, Senior Design Principal for Yahoo! Search, says that design's role is to paint the vision. 'It can communicate the long term vision for the corporation and the impact of data, technology and what it means to the customer.'

## Capability building

While it has traditionally relied on the recruitment of highly experienced staff, Yahoo! has more recently established a Design Innovation Team in San Francisco. Top designers spend three or six month sabbaticals at the studio, where they are free from the need to work on production projects and can devote time to creative experimentation. A spell in the Design Innovation Team is also part of the development process for newly hired designers, and it serves to increase Yahoo!'s desirability as a destination for top talent. O'Sullivan notes, 'It's a way to bring in really good designers, bring them into the fold slowly, and let them experiment through this space, and then come to Yahoo! and start working on projects.'

Business focus, says O'Sullivan, is one of the most powerful things that designers learn during a career at Yahoo!. 'They've become supercharged designers by the time they leave,' he says. 'Because the numbers are so ingrained: you know what you are doing and how it has an effect on the business.'

## In more depth

Find out how other companies in our study hire designers who demonstrate a wider skill set including: multi-disciplinary working, business acumen and strategic thinking. And see how to manage and plan the design process

## Market

Today, Yahoo! is much more than a search engine. It offers a broad range of services to its customers; acting as an on-line marketplace, a broad news and information portal and source of diverse entertainment offerings such as music downloads.

Increasingly, the company is positioning itself as a core element of the online life of its customer base, delivering email and other communication services to customers on a broad variety of platforms including PCs, PDAs and mobile telephones.

Yahoo!'s popularity and its broad user demographic also make it an extremely valuable advertising platform. Advertising on its Internet 'properties' accounts for a significant and growing proportion of its revenues today.

Where some Internet businesses have sought success through specialisation, targeting particular user and customer groups with increasing precision, Yahoo! remains steadfastly a mainstream player, offering its services to millions of customers worldwide. This focus makes the usability of Yahoo!'s services a key element in their design. Its customer population is typically not formed of highly skilled enthusiasts, indeed Yahoo! services may be users' first experience of Internet technologies.

# The Yahoo! design process

**Design activities at Yahoo! are kicked-off at the business unit level, but are closely tied into the business and innovation objectives set by the CEO.**

Needs identification is carried out by product managers in association with the marketing department. New needs can be identified as a result of user feedback, through the identification of an emerging trend or by the acquisition or development of a new technology. The company's product teams also look externally for development opportunities, studying emerging trends and frequently acquiring promising technologies from other organisations.

In cases where the Agile development process is used, this requires a Product Requirements Document (PRD) to be completed, which captures insights from the research, presents likely product features and business goals. This is signed off by the General Manager of the relevant business unit, and leads to the establishment of a project team, including designers, user interaction researchers and software engineers.

In reality, says O'Sullivan, there are variety of ways in which projects are initiated and signed off.

**In more depth**
Read more about  project development and initial ideas generation

**Roadmaps**
Product lines have their own roadmap for the expansion and implementation of new technologies. Historically, such roadmaps were developed looking a year or more into the future, but such is the pace and unpredictability of change in Yahoo!'s industry that

today managers typically develop a roadmap for a shorter time period. Design representatives usually collaborate in the roadmap development process.

## Definition and expansion

Initial dialogue involving the designers and the project team will be used to explore and stretch the project goals, to identify other opportunities that can be exploited during the project and to define any user evaluation and research needs or technology developments required to deliver the project.

Sometimes, the project definition phase can take unusual forms. Yahoo!'s Local team, which is responsible for maps, were developing their local information service. In doing so, the entire product development team spent a day walking around a specific local area and spoke to business owners to get a flavour of their daily activities. Their objective then became the replication of this rich information gathering experience in the software product. Naturally, such activities also have the benefit of building team cohesion at an early stage.

The Agile process operates as a stage gate mechanism for the development of products, and is one of the main tools used internally at Yahoo! It enables all those involved to understand where they are and where they are going at any one time. Agile also enables designers to feed into the process at the most timely and constructive junctions without restricting the creative process.

For example, the Agile process makes extensive use of rapid, highly visual techniques (cartoons, story boards etc.) to build the initial product requirements. The adoption of techniques like this, says O'Sullivan, has made the input from the design team highly visible at the early stage of the project.

Design teams at Yahoo! are co-located which, according to O'Sullivan, provides an important creative environment for designers. However, the team adhere to tight project and time management principles, and are responsible for communicating back to the project team with information about their activities and outputs at regular intervals. Designers themselves have a daily morning meeting, and regularly engage in scrums with the project team of engineers, product managers, and user researchers.

The Agile process requires regular review meetings and the teams have to demonstrate a functional product wherever possible. An RSS feed alerts all team members to any project document updates. This keeps the designers' input closely aligned with the overall progress of the project.

Yahoo! has made particularly strenuous efforts to align the activities of its user research teams to the Agile development process. The extremely short development loops of the Agile process are incompatible with longer timescales required for traditional usability research. To avoid research findings failing to keep up with the requirements of the project team, researchers have altered their methods, running more, smaller studies to produce specific answers for the design and engineering teams.

At the same time, emphasises O'Sullivan, user interaction research is valuable because even in quite brief studies it often throws up findings that lay outside their original scope. Such findings are absorbed into existing projects wherever possible, or retained for future use. This approach was applied during the development of Yahoo! Personal, when initial ethnography revealed results so surprising that they eventually resulted in a fundamental shift in the product roadmap and level of complexity involved.

The Agile methodology has been readily adopted by the project teams, including designers. 'What's fascinating about this is that everyone hated it at first and now the teams that do it love it. One of the reasons is that people work more closely and the collaboration that comes with that,' says O'Sullivan.

**In more depth**
Find out how other companies use a [double diamond](#) to help them manage the design process

**Status**
The size and pace of growth of Yahoo! is quite startling. The company's revenues in 2005 were some US$5.3billion. In the same year revenues grew by 47 per cent. Today the company employs just less than 10,000 people worldwide.

# Yahoo! case study: Yahoo! Local / Maps

**The development of the Local / Maps section of the Yahoo! website gives a snap-shot of how a structured design process helps Yahoo! manage different projects. After every project is completed, the company agrees evaluation is key to ensuring the process keeps running smoothly.**

Tom Wailes, Design Director in Yahoo! Local / Maps & Travel, gave us an example of the design process within Local / Maps. He said the key points in the process are:

— **Customer insights** – once the target audiences are identified, ethnography and other user research methods are  used to uncover needs, issues and opportunities. Key tools used as part of this stage include video cameras
— **Brainstorming** – designers generate a wide variety of ideas that could address the needs raised during the research. This engages the entire team early on in the process
— **Concept visualisation** – loosely called the 'show me' process, at this stage core concepts from the brainstorming sessions are developed and communicated through cartoon storyboards, concept simulations and video. This involves discussions and decision-making, and early customer reactions are sought. Tools used at this stage include Flash, Photoshop/Illustrator, paper and pencil, digital camera and video
— **Prototyping** – interactive prototypes and simulations are completed around the key ideas from the concept visualisation stage. Again, initial customer feedback is sought, and rapid iteration ensues. Flash, AJAX and sketching are commonly used
— **Design documentation** – depending on project needs, formal wireframes, flow diagrams and other documentation is generated to ensure that the interactions and information architecture is clear. According to Wailes, this is the more typical "tell me" process of detailed, textual requirements, documents and static design specifications. In some cases the requirements of Concept visualisation and Prototyping have already fulfilled the project documentation needs.

## Visual project management

Visual project management tools are used extensively to support the development process, with wall charts demonstrating project schedules, progress to date and examples of current design iterations. These areas provide an opportunity for team members to comment and feedback on each others' work in between project meetings and allow outsiders to gain a rapid understanding of the project status.

For the future, O'Sullivan sees embedding the use of the case study library and planned methods library more firmly into corporate culture as a key challenge. Just as the Agile development process has now become well-liked by all that use it, so he expects the adoption of best practices in the design environment to become well accepted too.

**In more depth**
Find out more about what visual project management  lessons other companies in our study have learnt

## Evaluation

Project evaluation is quite complex at Yahoo!. While every project begins with a business case against which it is measured, the company also carries out extensive user satisfaction research.  Also, they make use of the information gathering possibilities offered by the Internet to collect data on a wider range of parameters, such as the

duration of visits to particular sites, spend in certain areas and the likelihood of customers recommending services to friends and colleagues.

# Tools, techniques and tips

**The provision of enabling tools for designers is a key part of Yahoo!'s design strategy. 'No-one wants a process, they want methods, fluid methods that enable them to be successful,' says O'Sullivan**

In order to drive home the message about design's ability to add value and enable success, O'Sullivan oversaw the development of an electronic case study library, where the outcomes of design and user research activities are documented using a wide variety of simple, accessible methods, such as online video clips. O'Sullivan emphasises that these are not seen as definitions of best practice, but as examples of good practice upon which designers are encouraged to build based on their experience.

In the future, O'Sullivan hopes to complement the case study library with a methods library. Drawing on the 'proof of success with design' illustrated in the case studies, the methods library could include a variety of techniques, such as rapid product prototyping, and, addressing an area that designers can find challenging, simple models for product scheduling. Tools and techniques used during the product definition phase, such as card sorting, videoing users, storytelling from user research, cartoons and storyboard production, could also be held in the methods library.

The overall objective with these tools, says O'Sullivan, is to balance process with creative freedom. This is thought to maximise the chance of a successful cost-effective project without overly constraining the design team.

**In more depth**
Read more about the tools of the trade other companies from our study use to manage design

**Pattern Library**
Another key tool used in Yahoo! is the Pattern Library. The company experienced that different design solutions were being developed to address similar problems, potentially weakening the corporate brand. It was thought that this stemmed in part from the decentralisation of user experience teams in Yahoo!. One way of addressing this was to develop an accessible tool that would effectively capture the standards for interaction design within Yahoo!.

The Pattern Library serves as the basis of a body of standards for Yahoo! user experience design and contains information on a wide range of user experience

elements. It is also searchable in different ways to enable designers to quickly access possible solutions for key problems. Each element in the library, for example the 'narrowing history' technique for browsing complex product categories, is given a single 'importance of adherence' score, which indicates to designers how important the use of particular patterns is to 'The Yahoo! way.'

While the Pattern Library was intended primarily for internal use at Yahoo!, web developers have drawn on the model of the Pattern Library and created the Yahoo User Interface Library. This will function as a site where code-sharing and best practice will be exchanged on an open-source basis.

**In more depth**
A history of the development of the Yahoo! Pattern Library is available as a
downloadable PDF
Learn more about formal design process management and visual management techniques from other companies in our study

## Agile software development principles
Overall, Yahoo! believes that there is not one process that fits all projects, and therefore internal teams use a variety of methods and tools. However, there is an internal cultural shift towards using the Agile process for product development, and the corporation provides training and materials for its use internally. Indeed, designers and other experts often find that Agile principles are equivalent to their own ways of working, and have adopted the methodology over time.

Agile is a software engineering philosophy devised in the late 1990s. It is based on the assumption that project specifications are likely to change during the product development cycle. Therefore, rather than creating a comprehensive specification upfront and engineering a product to fulfil it, the Agile process treats product development as a series of short iterative loops, lasting only days or weeks. The process aims to deliver a functioning product at the end of each and every one of these loops, with additional functionality being added or modified as the result of the review processes that take place at the end of each iteration.

Agile processes help designers, software engineers, product managers and user representatives to work closely together, since the interests of all must be considered at each product iteration. In many cases these groups are co-located for the duration of the project in order to foster the maximum amount of cross-functional collaboration and communication.

A key element of the Agile process is that ongoing changes to the product specification are actively encouraged, with participants rapidly assimilating new ideas and incorporating them in the next iteration of the product. For designers, this environment

demands an ability to work quickly and flexibly in order to change their ongoing work as a result of shifts in project requirements or inputs from other team members.

**In more depth**
Find out more about how user research can benefit the design process

## Demo or die

The Agile process means that functional product prototypes are delivered continually and repeatedly during the design process. Yahoo! has, says O'Sullivan, a culture of 'demo or die' and prototype code is subject to acceptance testing at every review.

Advances in Internet technology are assisting this process, however, with modern development environments such as AJAX and Flash making the production of functional prototypes quicker and less costly than ever before.

**In more depth**
Read more about the importance of setting targets for evaluation

# With thanks to Yahoo!

For the purposes of the design process study, we spoke to Joseph O'Sullivan, Senior Design Director with Yahoo! and based in Sunnyvale, California. Telephone interviews were also held with Tom Wales, Design Director Local/Maps & Travel, Luke Wroblewski, Senior Design Principal for Search, and Matte Scheinker, Director of User Experience, Real-time Communication Products.

To find out more about Yahoo!, visit info.yahoo.com

**Please note**