design is
the differentiator

the changing role
of
industrial design

THE COW SHED HYDE HALL FARM
BUCKLAND HERTFORDSHIRE SG9 0RU
UNITED KINGDOM

T   +44 (0) 1763 274 156
F   +44 (0) 1763 275 840
W   www.quadro-consult.com
E   phil@quadro-consult.com

Change is everywhere

The rate of change is accelerating. Everyday we are experiencing change fuelled by an appetite for enjoying the good things of life! Our expectations are increasing and mediocrity is no longer acceptable – only excellence will do. When we buy a new product we have so many choices and now we can buy in different ways – online, in store, mail order. What makes you buy? Is it just the price? Probably not. It's likely to be a combination of things; the brand, the design, the performance, the influence of others, the sheer pleasure of ownership.

Not surprisingly then, the way products are designed is changing too and so are we, the designers responsible for creating new products. As design becomes a key differentiator so our role as designers is changing. Gone are the days of the reactive service playing a supporting role. Now design is becoming a vital strategic tool in a business with the challenge to innovate and create the future. This new, highly responsible strategic role requires a more demanding designer; passionate about the end user, custodian of consumer interest, innovator and co-ordinator with a conviction and drive to make it happen. Our creative talents challenge the status quo, provoke new thinking, create solutions and convert them into tangible products or services.
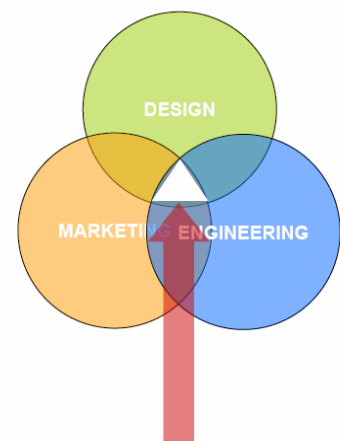
Total product design

We are taking a much keener interest in the execution of the total product design. The 'devil is in the detail' and when we take the responsibility to 'police' a design right through the development process the products are invariably a success. Pushing the engineering and manufacturing envelope is part of the innovative process; finding new, better and cheaper ways to make a product, choosing new materials, changing paradigms and traditions.

Where else is the next highly competitive product innovation likely to come from? The most creative resource in the business!
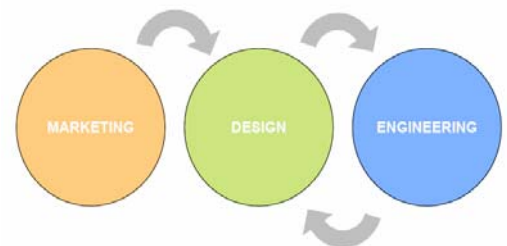
over the wall development

product design – the focus of attention

Many global corporates have recognized this in the last decade and have increased the number of designers on their teams as well as using external agencies to ensure the constant refreshment of ideas. In South Korea both Samsung and LG dramatically increased their design resource and set up studios around the world to gain the essential insights into different cultures, habits and behaviours of consumers. In the late 80's Sony built its brand around its design quality and recently Nono Ohga, Chairman and CEO was very clear that design **is** the differentiator. He said,

"At Sony we assume all products of our competition will have basically the same technology, price, performance and features. DESIGN is the only thing that differentiates one product from another in the market place."

The resurgence of Apple and its transformation from a computer company to a media mogul has been dominated by its product design. Design under the leadership of Jonathan Ive has created the coolest brand on the planet; there are other MP3 players, there are other mobile phones, laptops and personal computers. Little doubt that the case is proven – design matters, its no longer just the appearance/look of a product, it's about designing the total consumer experience.

Design is everywhere. Just think about your own buying experience. The power of presentation in retail stores, enticing you to purchase with visually exciting window displays, novel point of sale stands and high quality packaging. All this before you even think about the product! Today the consumer has choice but increasingly in future the choosing will not be between different product features but will be more between different emotional worlds – the 'softer' issues; desire, status, ownership, service. A blurring of the boundaries between brand, design, function, performance, service.

Not surprisingly in many categories corporations that have a

high regard for good design are market leaders – also important is that they are typically not the cheapest. But in most cases this means they are delivering real value by having the right balance of performance, price and appeal.

The evolution of the designers toolbox

For centuries great designers and engineers had a single means of communicating their thinking – a drawing implement and a flat sheet of material – pen and parchment, pencil and paper. Ideas were sketched to develop their thoughts and provide a means of communicating their thinking to others. Drawing evolved with the engineer developing precise methods to allow parts to made and assembled, whilst the designer continued to develop drawing skills to present the look of a design. Alongside this came models and prototypes to explore the size, scale and proportions of the design. Physical models and prototypes will remain a fundamental part of the design process. We like to explore ideas and will use whatever tools are available to discover! After all, designing is a discovery process – its about creating new things!

Technology has always had a big influence on how we are able express our ideas. The art of rendering developed rapidly from the painstaking techniques of air brushing with the invention of the Magic Marker. It also liberated us from creating the 'artists impression' to conveying character and emotion in a design. Of course the introduction of PCs and drawing programs provided the platform for the CAD revolution. The ability to visualise a concept, albeit in 2D, with all the graphics, colour and finishes, communicated clear design intent and speeded up the decision making process.

There was an explosion of software all targeted at the design and engineering community that essentially mechanised the process of design. Market pressures were forcing companies to reduce product design and development timescales and these tools provided the first opportunity – design concepts
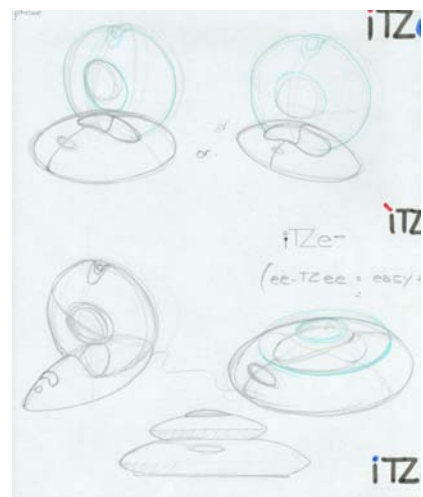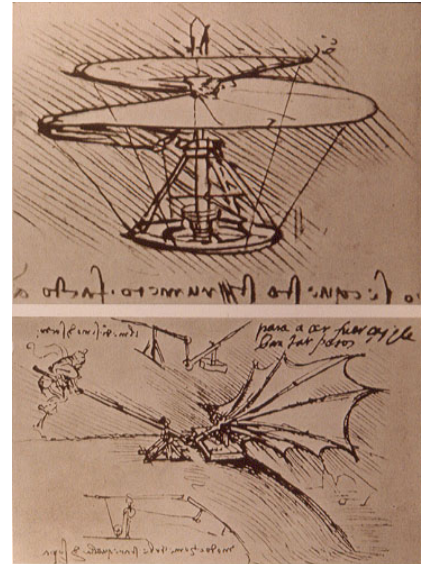
could be presented in several configurations with different versions in different colours and finishes in a few hours.

The birth of 3D CAD

In the early 80's the 'third dimension' was developed and kicked off the next revolution. I bought my first 3D CAD system in 1988 – Euclid. 3D CAD was primarily targeted at the engineering market and took time to penetrate the industrial design world and when it did it was all about 3D visualisation.

But there were other benefits. Rapid prototype technology sprung out of 3D CAD and we were able to maintain our keen interest in physical models.

There has always been a certain amount of tension between industrial designers and engineers and the emergence of sophisticated 3D CAD tools has further blurred the roles and responsibilities of each. In many instances the designer has erred more towards the visualisation tools because the ultimate decision makers in a business want to know as soon as possible how their next generation product will look. But sometimes this can isolate the designer and leave the engineer to 'sort out' the practical implementation of a design.

Interestingly this is where some of the technology has got ahead of the users! To embrace the technology requires a high degree of collaborative working and in order to collaborate people have to want to work together to share their knowledge and experience. Business is demanding improved time to market and right first time projects but technology alone will not deliver this. It requires a change to the structure of new product development. It is a great pity that reluctance to change prevents companies benefiting from the technology. Those companies that invest in changing the way they work and adopt this technology will be the leaders of tomorrow.

The way forward

The designers and other creatives in a business are now

major players on the 'new product development' stage. So attitudes need to change to really embrace the power that is now available so that the key business objectives can be met in a timely and cost effective way.

Strategic design

As design becomes an increasingly significant strategic component in business we are the innovators and interpreters of consumer needs into tangible desirable products. The ability to explore, discover and create ideas very quickly, discuss them with stakeholders, modify them, make models, test and re-model before finally presenting a finished solution are no longer 'nice to haves' but essential. Thus the PLM solution (Product Life Cycle Management) has evolved - technology that can be used throughout the life cycle of a product development project and beyond. PLM solution providers have had to compete at all stages, from creation through to manufacturing simulation, against niche software specifically aimed at one discipline, for example, rendering or finite element analysis.

Designers have embraced high quality visualization, 3D surfacing and modeling but often only to satisfy their own needs. Indeed, most of the time the data created is not moved through the development process. This non use of data is a waste of effort in the overall process and does not help build the bridges between the different skills needed to develop products.

Imagine the future

It would be a dream to imagine that we would use tools with sufficient accuracy and quality to allow our designs to provide the perfect platform for engineering development (without the need to re-work the files!).

There will never be a genuine substitute for a physical model, but simulation of all the senses in a virtual world is coming and will give us an even greater opportunity to explore and discover.

By definition we are risk takers. We are tasked with creating the future. As we reach further into understanding consumers aspirations we will want to experiment more with concepts – not just shapes and forms and ease of use but challenging every aspect of life. Increasingly 'design thinking' is being used by major corporations to drive strategy and innovation – so tools that exploit creative thinking and rapidly communicate ideas will be in great demand. This can be done now, but in future, engaging the consumer in the whole innovation and discovery process will be essential – in a user friendly and intuitive way. Being able to experience the emotional responses to ideas and measure their acceptance will allow even more experimentation with alternative ideas. Making the virtual world available to end users so they can share in a concept experience is the goal. It has been achieved in some areas; automotive, aerospace and, to some extent, architecture but usually to explore the visual attributes of ideas – not all the senses and certainly not the emotions.

Putting on head sets and gloves really doesn't give a natural feel and skews any experimental results. But extending and developing the quality of simulation achieved in the aerospace industry would be very exciting – sitting in the pilots seat in an aircraft simulator and experiencing the 'feel' of the runway; its unevenness and the rumble as speed is gained. Or being able to drive an F1 circuit on a rolling road and practice without ever leaving the garage are examples where these industries have pioneered the virtual technology.

Its exploitation and extension into everyday experiences will undoubtedly happen and it will provide the springboard for many innovative ideas as companies strive to compete. Time consuming research techniques will be replaced by these virtual tools.

The Dassault Systèmes solution

Our world demands tools that are simple to use by anyone; safe, reliable that get the job done! In the design world there was never anything simpler than a pencil and piece of paper.
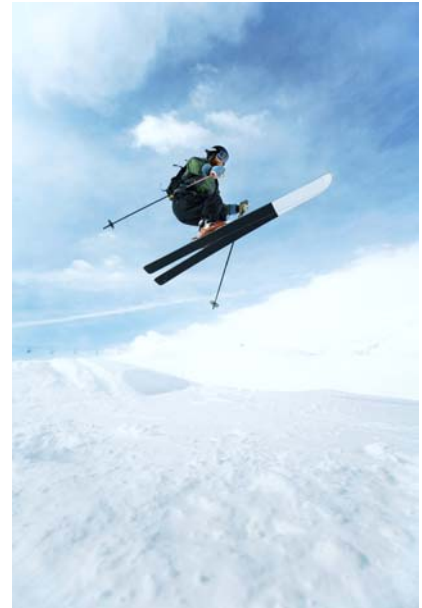
So any new tools have to be as simple otherwise there will no desire to adopt them.

Massive strides have been made in developing software to accelerate the product development process and to embrace the creative industrial design 'front end'. Dassault Systèmes pioneered PLM and work closely with both the aerospace and automotive industry where the demands of 'time to market', the management and sharing of information are essential in these highly competitive businesses. The Dassault Systèmes solutions have become the de facto standard in these industries. Whilst initial focus was on engineering design and development and the translation of data into manufacture, more recently a much greater emphasis has been placed on product creation and the consumer experience. In fact DS has recognized the changing role of the designer and is increasing its investment in product creation and tools to involve consumers so they can participate in the process. This is a key differentiator in the market.
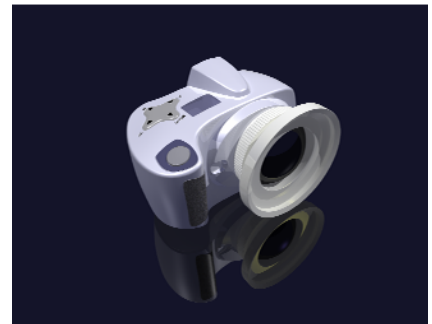
Understanding the needs of designers requires different types of tools with much greater emphasis on the speed to create concepts with an intuitive interface that requires minimum training – we are impatient and will always want to be in control! And any tool must be able to deliver high quality visualisation. The incorporation of these imaginative and creative solutions into the CATIA family makes for a seamless design and development platform with many very positive benefits. Not only can the designer create many concepts very quickly, he can also share, discuss and debate his ideas with engineers, cost estimators, manufacturing specialists and marketing and sales people very early in a project for comment, evaluation and approval. In fact DS has itself demonstrated high levels of creativity in developing these new products. It has adapted technology from other creative industries outside the main stream engineering world and is prepared to change its approach to ensure it is both satisfying customer needs and demonstrating high levels of innovation.
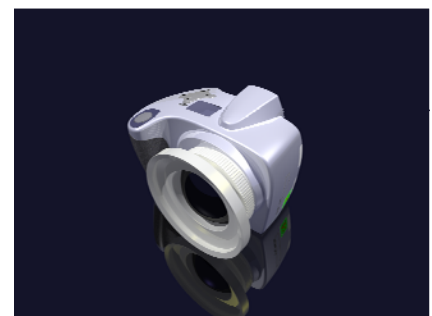
This is best illustrated by the creation of 3DVIA. Recognising that it is no longer acceptable to design a product without involving the consumer in the experience DS has created 3DVIA, a DS' brand for online lifelike experiences. With 3DVIA, it is possible to allow consumers to play a role in product creation to realise their 'perfect' products. It establishes 3D as a mass media for consumer and professional communities, and allows anyone to imagine, create, play and experience consumer products and services used in our daily lives through online services. It opens the door to the world we imagine. The desire is to create a virtual world that enables the physical world to be improved. A dream come true!

In this situation all the participants benefit, but the biggest 'winner' is the business. However, these benefits can only be realised if we, the designers, are able to adopt these creative tools and take a positive team role in the new product development process.

Design as the agent for change

This also has implications for organisational structures. The silo structure of departments is no longer appropriate when the whole design, development and manufacturing platform is now a seamless process running across all departments. Design and the PLM solution becomes the major business 'change agent'.

As the role of design takes on a much higher profile and becomes a critical part of business success it's exciting to know that there is a well thought through solution that allows us to express our creativity, explore, experiment and be able to visualise as quickly as the thought process itself. Allowing the risk takers to take risks, and to encourage this, is indeed a big step forward and underpins the importance of creativity and innovation in business. Simple to use tools make it easier to focus on 'design thinking' and product creation – the lifeblood of any business.

Philip Gray is the co-founder and Managing Director of Quadro Design Associates and a Visiting Professor at Middlesex University, London. He has 37 years professional practice in Product Design having worked with many blue chip companies around the world. In the last 10 years his focus has been on 'using DESIGN as a strategic business tool' and encouraging clients to understand the creation of value through his 'design thinking' methodology.