



REINVENTING  
BRITISH  
MANNERS THE  
POST-IT WAY

He designed the first laptop, but today IDEO's Bill Moggridge solves bigger problems. So WIRED asked his team to use 'design thinking' to tackle urban rage

By BEN HAMMERSLEY  
Photography SØREN STARBIRD

IDEO'S 'DESIGN THINKING'

IT'S THE HOT DESIGN COMPANY HIRED BY APPLE TO CREATE ITS FIRST MOUSE (AND BY MICROSOFT TO CREATE ITS SECOND),

lem-solving. Designing products, yes, but also designing new businesses, new strategies, even new additions to society. Tim Brown, IDEO's president, calls it "a way of describing a set of principles that can be applied by diverse people to a wide range of problems".

Practically speaking, the approach isn't complicated. In stages, it goes like this: firstly, immersion, whereby the designers research the problem by plunging themselves into it - talking to the people they're trying to help, working with them, interviewing experts. Secondly, synthesis - whereby they gather together their findings and look for patterns. Third, ideation - brainstorming solutions to the real problems identified by stage two. Then comes prototyping, making mock-ups of solutions to try out against the problem. After that comes the product. Only at the end, at the prototyping stage, are judgments made; until then, all ideas are given equal weight.

This methodology is radical in that it differs from traditional approaches to business strategy in two key ways. Whereas in many companies the concept for a new product may have already been based on, say, an idea from the marketing department with a designer later brought in to make it look pretty, design thinking places the designer at the heart of the innovation process. Secondly, the methodology gives a firm framework within which a wider team can

work. It takes the cliché of the lone creative mind being struck with genius, and replaces it with a process that a whole team can follow. Creativity, therefore, isn't a thing that magically appears, but a process you work through.

And work through it they have. IDEO was founded in 1991, through the merger of four companies: David Kelley Design, ID Two, Matrix, and Moggridge Associates. That year, it won 15 awards, 12 of them IDEA awards (perhaps the most prestigious international design competition). By 2009 it had won more IDEA awards than any other company. *Fast Company* magazine named it tenth in its top 25 list of innovative companies; by some reports, IDEO has worked for the other 24. *Fortune* placed it 15th in its list of companies most popular with MBA students. *BusinessWeek*, too, named it one of the world's most innovative companies.

It's the open-minded approach to ideas and innovation that defines design thinking - a term made famous by founder David Kelley. The methodology has led to a distinctive feature of IDEO offices around the world: walls full of Post-It notes, intended to help teams share their suggestions. In group brain-storming sessions, every idea, every observation is written or preferably sketched on to one of the sticky sheets and then displayed. During four months of WIRED's visits this summer to IDEO's London office - an open-plan loft-like space in Clerkenwell - the areas set aside for each of its current projects ebbed and flowed in the form of the sticky notes. Research was written, sorted and synthesised with them; brainstorming sessions, where every member of

staff is invited to contribute their input to a project, produced walls full of the things; prototypes even more so.

But there's no better way to understand how creative people work than to be part of the process. So WIRED commissioned the London office to tackle a problem as if we were commercial clients (see the blue panel, right). The brief, we decided, would be unlike any conventional design project. It would be to resolve one of the UK's most pressing social problems: urban rage.

Bill Moggridge, the twinkly-eyed grey-bearded British co-founder of IDEO, a Royal Designer for Industry and the designer of the world's first laptop, explains how IDEO, design thinking and his own ideas came about. "I think in the early days, in an industrial-design consultancy, people probably came to us because they thought we could do cool-looking stuff," he says. "The difference was that I always insisted on trying to understand what people would think and what they would want. The simplest way of doing that was to make sure that we saw the real world. So, for example, one of the earliest projects John Stoddard, who still works with us in San Francisco, worked on was for a Danish marine radio. We sent him to Hull and got him to go on a fishing trip up to Iceland so he could see what it was really like.

HOW TO TACKLE URBAN RAGE

When WIRED first approached IDEO, we were seeking a few bold ideas for a wider feature (in next month's issue) on how to upgrade government in Britain. We thought the design firm responsible for the Apple mouse, the Palm V and countless other products and services would creatively address such a wide brief without too much prompting.

Perhaps they would give us ideas for education or health - they work in both fields in real life, after all, designing insulin pens for Eli Lilly, for example (see the next page), and primary-school syllabuses for the Kellogg Foundation. Yet as we got to understand how the firm works, and became inspired by its approach to innovation, we had our own breakthrough idea. Why didn't IDEO create something unique for WIRED readers - something new and useful?

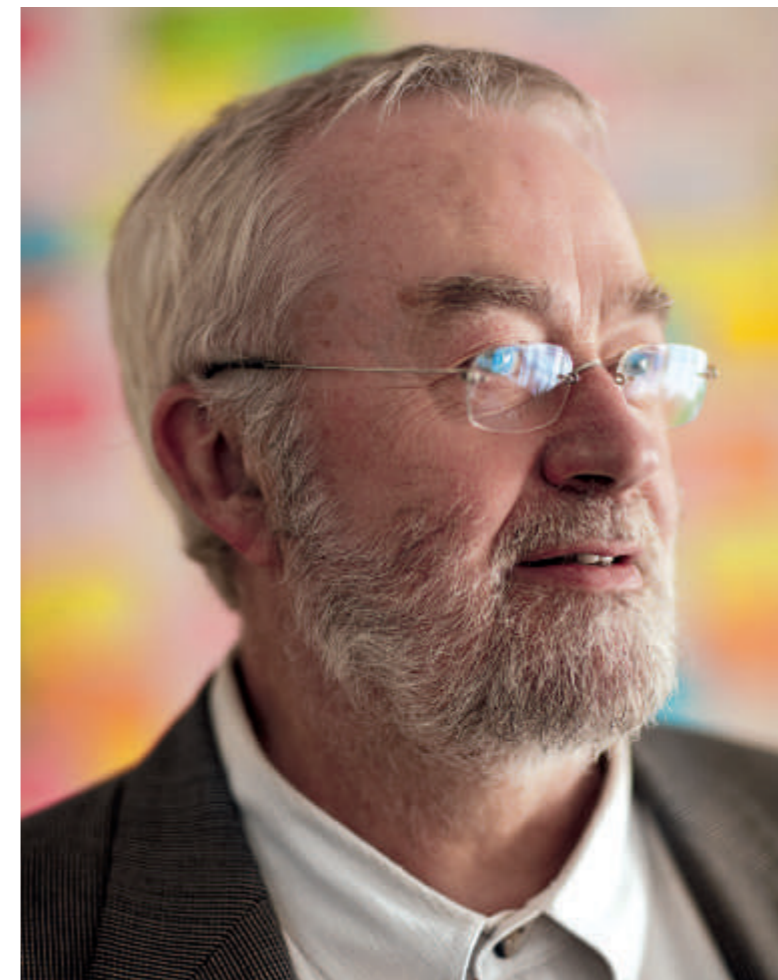
Not a problem, said IDEO, we actually already have an idea of the problem we want to solve. Urban rage, they said. We would like to try to solve the problem of rage. The multidisciplinary team, which comprised Lydia Howland, Mike Albers and Ben Forman (photographed on the final page of this story) followed the classic IDEO pattern of immersion, synthesis, ideation and, finally, prototyping.

Their research took them in many directions: they met an anger-management therapist and a white-collar boxing coach; they undertook sessions of brainstorming with their colleagues; and Mike Albers took a four-day course that would qualify him to work as a nightclub bouncer. This preliminary work done, the team found that one of the major causes of urban rage was queuing. The traditional British skill of standing in line is a matter of pride to many urbanites, but the stresses caused by fellow citizens holding up the queue, jumping the queue, or simply being annoying nearby, were said to be enough to drive many of our sample interviewees crazy.

But the team couldn't re-engineer all of the shops and services in the UK in order to reduce all of their queues; nor could they resolve the problem of all shops and banks and post offices employing too few staff. But by changing the psychology of how we feel when we're queuing, the team thought, we can reduce the amount of stress that we have learnt to feel, and so

NAMED NUMBER TEN OF THE 25 MOST INNOVATIVE FIRMS, IDEO WORKS FOR THE OTHER 24

Bill Moggridge: "Get out there"



by the Post Office to rework the postbox, by Muji to create its wall-mounted CD player and by Procter & Gamble to reinvent toothpaste tubes. It made the Nokia N-gage, the Palm V and the Head Airflow tennis racquet.

Now IDEO is being retained by Barack Obama's White House to help to reinvigorate the American civil service; by the government of Iceland to help the country to innovate its way out of financial crisis; and by the Kellogg Foundation to reinvent education.

It might seem bizarre that a company used to designing products is now solving country-sized problems, but it all comes down to the technique it pioneered and preached to its clients. It calls this philosophy "design thinking".

Design thinking defines the practical way in which IDEO approaches its problems, but as a phrase it also allows design to be talked about in a meaningful way by non-designers. After all, what is a designer? In the popular mind, it's the person who lends his or her name to a range of sunglasses or shoes - beret-sporting chaps who add several noughts to price tags. Or it's the engineer surrounded by technical drawings, making machines. Either way, for most people - and most companies - the idea of the designer does not involve solving problems that don't involve making a product. But proponents of design thinking say that they can extend this creative mindset to address all forms of prob-

reduce our rage when we're waiting. By queuing, they proposed, we should be able to do some form of good. Then the longer we queue, the better we can be made to feel about it.

They developed a teaser campaign to promote the strategy, with posters positioned wherever people are likely to be queuing or waiting: the bus stop, the post office, traffic black spots. It reads: "Queue Britain – the longer you queue, the better Britain gets!"

Visitors to a website address given on the poster and advertised in the media are invited to register for a Queue Britain card, which is then sent to them by post. Like a Tesco Clubcard, this is individual to the queue-frequenter and allows them to earn Queue Minutes. And indeed it doesn't have to be a card – it could be anything that can hold a barcode. IDEO also produced a prototype key ring (see bottom right of the opposite page).

These Queue Minutes, the team posits, could be earned from any of the partners in a Queue Britain alliance. The member company, such as the Post Office, will then pledge to award Queue Minutes to all participating people who have had to queue in their stores. Reach the front of a queue, and the shop assistant will add some Minutes to your account. This might vary – you might perhaps get Minutes from the moment you enter the line, or only after a certain annoyance threshold has been reached; but either way, the longer you endure this inconvenience, the more Minutes you accrue. This is a good thing.

Minutes can also be earned in virtual queues, too; members of the Queue Britain alliance can advise their call-centre staff when it's appropriate to award Queue Minutes to those who have been kept on hold for a long time, or whenever the website has been down. But whichever way you earn the points, the clever aspect of the proposal happens here: once a cardholder has accrued more than a set number of Queue Minutes – and they can check their balance via the website – they can donate those Minutes to the charity of their choice.

So if you find that you've spent 15 hours in line in Tesco over the past few months – not an unlikely number – and if Tesco is a participating member of the Queue Britain alliance, then you can donate those Minutes to charity, and Tesco will fulfil those 15 hours either by making its staff available for community work, or by creating paid opportunities for public volunteers to help out. And now a few hours of your time spent standing in a queue is worth, say, a few hours of Tesco staff helping out at a soup kitchen.

The time you spend queuing, therefore, isn't wasted time any longer. The more you queue, the more opportunities you have to donate other people's time to your favourite cause. Keeping this in mind as you stand annoyed in the post office, the team believes, will go a long way towards reducing ambient levels of rage in the city.

Furthermore, this system makes the really annoying transgressions – queue-jumping – into something even more socially unacceptable. Jumping the queue, of course, means you are not earning Queue Minutes,

If you don't get out there and see what it's like, then you couldn't really design it right. That was my basic thinking. I remember doing something for bone surgery, when we were first starting to do artificial joints. So I put on the wellies and green gown and went into the operating theatre and watched what the surgeons did as they were carving people's legs up. It was pretty nasty, but very informative."

Increasingly, as products become more sophisticated, consultancies such as IDEO are focusing less on individual devices and thinking more about designing systems. The iPod, for example, is a design classic because it is part of a system that includes iTunes, its music store, its packaging, even the real-world Apple store, and the way in which the music you buy is charged to the credit card attached to your account. It's a product, yes, and a system too, but also a service.

Another example is the work IDEO did for Bank of America. Asked to help attract new customers from a specific target market – middle-aged women with children – the firm, along with a team from the bank, conducted interviews with potential customers across the US.

They observed that some of them rounded up their bill payments for speed and ease of mental arithmetic: if an electricity bill came in at \$42.23, they found that many would pay, for example, \$45, knowing the difference would go towards the next bill. It meant household accounts were simplified, and also that the customer's psychological relationship with the utility company was subtly changed. Other potential customers they met had difficulty saving. These insights led the IDEO team to develop not an advertising campaign nor a set of branding guidelines, but instead a whole new bank account: one in which any money spent on the accompanying debit card is rounded up to the nearest dollar, and the difference automatically placed into a separate savings account.

Since its launch in 2005, the Keep The Change account, based on observation and developed through design thinking, has brought Bank of America up to ten million new customers, and has resulted in \$1.8 billion of savings.

Today's new technologies, of course, do not necessarily add any

THOUGHTFULLY DESIGNED BY IDEO

**INSULIN PEN**

IDEO's project for Eli Lilly in 2005, the HumaPen Luxura insulin pen, was developed to allow those with certain complications associated with diabetes (impaired sight and a reduced sense of touch) to inject themselves accurately and discreetly. The end product was styled like a fountain pen.



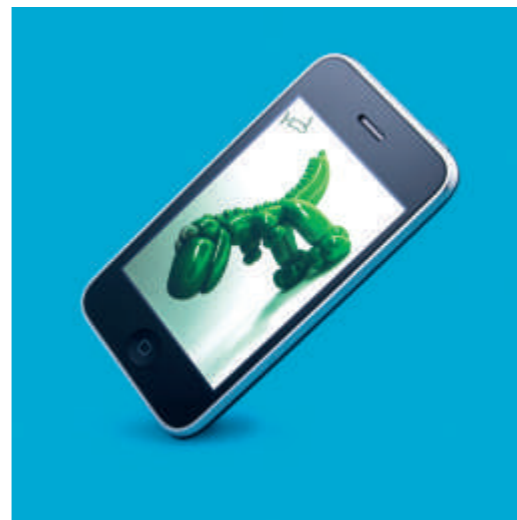
**LAPTOP**

The GRiD Compass was the world's first clamshell-case laptop. Designed by IDEO's Bill Moggridge, it had an 8086 processor, a 320x200-pixel (CGA) display, 340k of memory and a 1,200 bit/s modem. It was the first laptop to be used in space and the first to be used by US Special Forces. It weighed only five kilos, cost US\$8,000 and ran its own OS.



**IPHONE APP**

Produced in 2009 as an experiment by IDEO's Toy Lab, the Balloonimals iPhone app allows the user to create and play with balloon animals on the screen. Blow into the phone's microphone to inflate the balloon, then shake the phone to turn it into a creature. Touch the screen to interact with it. WIRED's favourite? The Tyrannosaur.



**MONITOR**

Details, the US-based office-equipment manufacturer, approached IDEO to design and engineer an adjustable LCD screen support with a low manufacturing cost. The FYI monitor arm supports solitary and group work with 180° rotation at the base, 360° rotation around the lower arm, 160° pan movement, 20° of backward tilt and 30° of forward tilt.



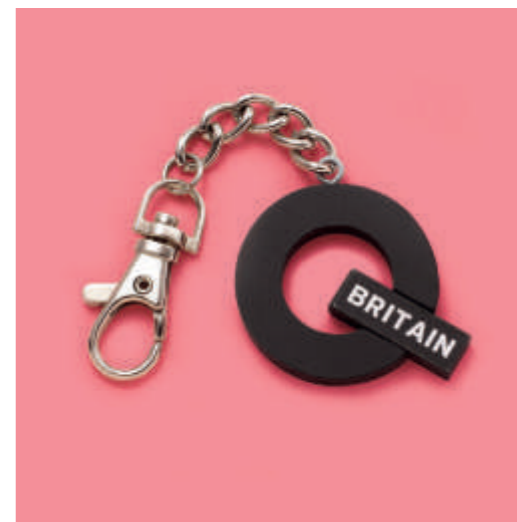
**TAG**

IDEO worked with Oxfam to resolve the problem of encouraging people who leave donations to sign up to Gift Aid – the scheme that provides tax relief on donations, including donations of goods. By building a replica store in the IDEO offices, the design team was able to develop a solution that works both for donors and Oxfam volunteers.



**QUEUE BRITAIN**

The WIRED project was delivered with physical prototypes, including this key-ring with scannable barcode. Prototypes, no matter how rough, are key to "design thinking" methodology – they force you to put your ideas in the open and try them out for an immediate reaction, something IDEO designers call "flinch testing".



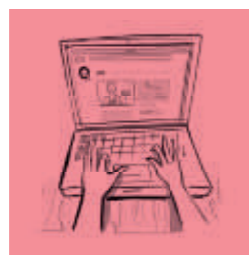
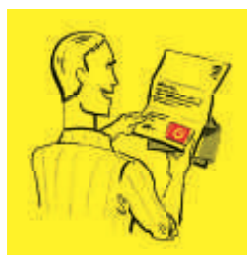
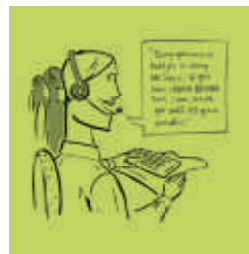
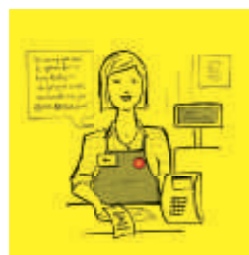
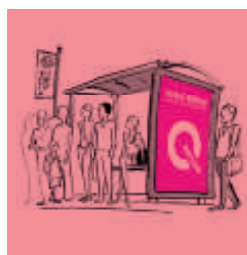
and you are therefore actively choosing not to do good. Being a little rude is one matter, but actively choosing not to do good is quite another.

The side effects on the companies involved in such an alliance are also interesting. The corporate-social-responsibility movement is ever-more powerful – and the larger companies with queue-forming habits are exactly the same companies that would most benefit from being seen to be doing something positive and beneficial within the so-called “third sector”.

Of course, a company might decide to pay out Queue Minutes as a cheaper option than reducing its queues through employing more staff. But would anyone seriously mind if Tesco were to do nothing about the length of time that you had to wait in its lines, if you knew that the missing till operator was instead out doing something charitable?

This final product design from IDEO is not a device, nor a business, nor even a service. It's not really even a product as such. As an amalgam of an advertising campaign, a technological system, and a concept based around the psychologies of the individual, society at large and big companies, Queue Britain is an idea that exemplifies the “design thinking” that IDEO is helping to introduce into the mainstream. Designers are looking at solving the problems on an ever wider scale – from personal products, right up to focusing on changing wider society, and then the world.

From teaser campaigns to “Queue Britain Minutes”, IDEO’s project for WIRED makes waiting good for the country



complexity to designing a system or a service over designing a single device. The lines have become blurred. As more devices are made to connect to the internet, to communicate between themselves as well as with their users, and to interact with the ever-more complicated new systems that make up modern life, their design becomes hugely more complex. Bill Moggridge offers the example of traditional telephone design.

“In the old days, you’d go into the hall and you’d pick up this thing and stick it to your ear and wind the handle, and then you’d speak to another human being. There was a bit of design for the infrastructure, which was an engineering thing connecting you, and there was a very simple piece of exchange that the operator did, and there was a very simple piece of product design – the instrument – but nothing challenging about it. The really interesting challenges were human-to-human. The operator had to be trained to learn how to deal with rude people or to know the addresses of two Mrs Smiths. Human intelligence was simply relied on, and businesses would think of this as a training opportunity or problem, rather than as a design opportunity or problem.

“Contrast that with today,” he continues. “You take the telephone, and now you’ve got human-to-machine first, then machine-to-machine, and finally machine-to-human, so there are design challenges all the way because of the process – because you can’t rely on human intelligence to do the interpretation. The thing becomes a design opportunity and need.

“Then you add all this other stuff like SMS and email and internet access, and you have a whole other set of design challenges and opportunities. Which means there is this very sophisticated object which is pretty intimate – you put it up to your face like a wine glass – with all sorts of interactions going on with tiny screens, controls that are too small to be easy to use, and there’s this range of things you can do with it, all of which you have to try to align. It becomes a very difficult, complicated system with lots of layers and a hierarchy of complexity, but every one of those layers has to do with design, as opposed to training.”

Here, then, is a third new field of design: interaction design, which considers how humans interact with devices and systems – in a way more involved than simple ergonomics. Moggridge may be most famous for the GRiD Compass, widely seen as the first laptop. But his most lasting contribution may come from having pioneered this field of interaction design – again, the study of how we use technologies, not just how they look or how they’re built.

The two go together, though, as Moggridge recalls:

“I had my first prototype [laptop] in 1981. I took it home and I started thinking, ‘Now I have a chance to use this myself.’ I sat down to work, trying to understand what was happening in this little electroluminescent screen. And within about five minutes I’d forgotten everything about the physical form of the product, I was so focused on that interaction with the software – I found that I was sort of sucked through the screen into this virtual world. Occasionally I’d remember, ‘Oh yeah, I designed this physical thing,’ but beyond that, the important aspect – the interface – was something that I didn’t yet know how to do. And so I decided to learn how.”

That decision – to leave behind industrial design – was

Our IDEO project team: Mike Albers, Ben Forman and Lydia Howland – in multiple poses



WHY IDEO BUILT AN INTERNAL ‘FACEBOOK’

“IDEO began a few years ago by asking how it could be better at helping its teams learn from one another,” says Gentry Underwood, head of knowledge sharing. That’s why IDEO developed its own intranet, the Tube (see right), to share information internally. The Tube, he says, “has succeeded where most other internal knowledge-sharing initiatives have usually failed.” Underwood offers five secrets for collaborative working online:

**1 Build pointers to people** “Instead of putting everything that someone knows into a database, we focus on identifying people’s experience, expertise and interests.”  
**2 Build rewarding systems** “If a system needs altruism to succeed, it won’t.”  
**3 Demand intuitive interfaces** “There’s an inverse relationship between the friction in software and the potential rate of adoption: remove all unnecessary steps.”

**4 Take the road more travelled** “If people have to go out of their way to use your system, you’ll have an uphill battle; so integrate new tools into the systems they’re using.”  
**5 Iterate early and often** “Rather than pushing out a system and being done, think of this as ongoing. Software development should ideally place heavy emphasis on gathering social feedback, ie: ‘Is the tool enabling/supporting the right kind of features?’”



ILLUSTRATION: MARTIN KAY

a fateful one; it led Moggridge to become a trustee of the Design Museum, a visiting professor in interaction design at London’s Royal College of Art, a lecturer in design at the London Business School, and a founder of the short-lived but hugely influential Interaction Design Institute in Ivrea, Italy. Today at IDEO he helps 550 staff (roughly equally split between men and women) and ever-more unusual clientele to “create impact through design”, as the firm’s mission states.

Impact is key. Indeed, Moggridge sees the designer’s job as embracing not just the person, but the entire planet. “You can think of design as three concentric circles. You have the person in the centre, and then you have the environment they live in, and then you have the world as a whole. For the person, we can also think of health and welfare – so you’re designing actual improvements in the way people exist in their relationship to the world in a holistic sense.

“The larger version of that is just a holistic look at the planet... and that becomes political. It’s no good just thinking about CO<sub>2</sub> emissions in one country, it really has to be a global thing in order to have an effect. So the design of political systems that enable greater sustainability and that really will have an active effect is a much better problem outcome than looking at nice materials to make packaging or something.

“I think that the smaller circles are still always there, but you’ve got this bigger one surrounding them as well.”

Somewhere there’s a new pack of Post-it notes ready to tackle it. ■

*Ben Hammersley is associate editor of WIRED. He wrote about biohacking in our 09.09 issue*