

HCI Remix & Redux

Exclusive interview
with Donald Norman

Q & A
with Elizabeth Shove

Cutting edge HCI
Harold Thimbleby

The Design of Everyday Life
book review



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www.jnd.org



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Authors should please provide a 70–80-word biography and a high resolution head and shoulders original digital photo. Photographers' credits will be printed if provided.

Send to John Knight, John.Knight@intiuo.com; 34a Hackford Road, London, SW9 0RF.

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Nearly one year on from Liverpool and what a year it's been with everything from newly nationalised banks and railways to riots. It's almost as if time is going backwards and certainly everyone feels the uncertainty of the present climate if they have not been personally affected by it themselves. In this climate celebrating at all and particularly people and technology may seem out of place. Technology is often the villain in society and as for people – we seem to live in a time of accelerated atomisation even though we are better connected than ever before. And the intersection of people and technology seems particularly bad and a cause of the financial meltdown itself no less.

In this context, rather than despair, it starts to make perfect sense to tackle ethical issues as well as inclusion and development. We should also not lose sight of the opportunities presented by the current climate. In particular we are in a good position to finally make an impact on professionalism and employability, to develop links with the wider design community and bring our communication capabilities up to date. Progressing these will be quite a challenge but I really believe that despite all the doom and gloom we are in a fantastic position to celebrate 25 years of Interaction this time next year.

John Knight

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View from the chair

On theme ...

Russell Beale

Unlike The Archers, which, despite being a contemporary radio programme, singularly failed to notice that the UK had gone to war in Iraq, here at Interaction HQ we have noticed some of the recent events that have happened.

The first is the recession, and the potential impact on HCI. For commercial organisations, the recession is clearly an issue, and costs have to be cut and economies made. Yet there are still opportunities for excellent HCI – consumers are no longer consuming any old rubbish, but are becoming choosy about how and where they spend their money – and so exceptional goods and services stand more chance of being taken up. Ditto web sites – more effort needs to be put into attracting, encouraging and retaining customers, and so a smooth, effective user experience pays dividends.

There are other impacts too – some of my more able students have developed a much greater social conscience than a commercial appetite, and have ventured into enterprises that aim to change the world for the better – and if they are successful, then some good will have come from the crass gambles of financial regulators and banks.

One of the interesting discussions I had this last week was to note that there are many areas in which there is a public appetite for change – politics and politicians; reckless and autonomous financial institutions – and both of these are amenable to technological interventions to support new social ways of creating these institutions.

For researchers in HCI, the challenge is to be able to attract funding for revolutionary ideas whilst at the same time providing

significant evolutionary benefits, which, being nearer market, should attract resources that sustain the vitality, efficacy and impact of the group. But this can be hard...

The second is closer to home – the BCS is changing (again). I'll not repeat the briefings and presentations here, and will instead let you receive the full impact of them when they happen, and you can decide quite where it is actually positioned and what it stands for.

One of the consequences of this has been major changes and difficulties for the exec over the past year or two; dealing with office staff centrally who have little concept of the needs, requirements and expectations of the volunteers who run specialist groups, or with management who fail to recognise the benefits that SGs afford.

Our purpose within Interaction has been the same – we aim to represent the views, needs, visions and skills of the HCI community (academic, commercial, entrepreneurial, student, etc.), to ensure that HCI has as great an impact on policy, products, research, people and society as it can do. We have been offering our skills and expertise where relevant, and arguing for appropriate support for our activities when we need to. I think it is working – though it's clear to me that, at the moment, we are less efficient than we were when we were more independent and autonomous. Time will tell.

The above covers one of the themes of this issue: reflections. As for remixes and greatest hits of British HCI, one development is that my efforts to connect the greatest hits in the academic sphere with the wider world are paying off – HCI proceedings for 2006, 2007 and 2008 are in the

ACM Digital Library now, 2009 will be there post-conference, and we are working on getting earlier editions in also. This should increase the accessibility and visibility of our research internationally, which can only be a good thing for the conference.

Talking of which, this year's conference has pioneered a different approach, so we expect it to be a bit different and of interest to a wide range of people. One of the main benefits of a conference is to provide a place for researchers and organisations to meet, exchange ideas, catch up on news, create new friendships, business partnerships and suchlike – and this year's conference aims to support this in the fullest way possible. But it only works if you (yes, you) come along to participate – to see, be seen, to chat, to inspire or be inspired. I hope to see you there!



Russell Beale leads the Advanced Interaction Group in the School of Computer Science at the University of Birmingham. His research focus is on using intelligence to support user interaction. Before returning full time to academia and research in 2003, he co-founded, ran, or worked for various internet-related companies.

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The Interfaces interview

Donald Norman

Changes

In twenty years, much has changed in the world of design. Designing for people has become paramount, even if still neglected by many. Whether this is called "User-Centred," "Human-Centred", or even "Empathic Design", the emphasis on designing for the people who use the products or services is finally taken as normal.

It is still surprising, however, that appropriate procedures are still not widely known. Traditional marketing and engineering still dominate, so that featuritis and poor design still dominate. Nonetheless, our products and services have definitely improved: things are far better today than they were a decade or two ago.

Terms (words)

When words become popular, they lose their meaning. I certainly have found this to be true of the few words that I have coined or (in the case of affordance) introduced to the design community: cognitive engineering, user-centred design, human-centred design, affordance, and user experience.

All have become popular, all have radically changed their meaning, so much so that I hesitate to employ them.

User experience now means anything. Affordance, a term that describes what actions are possible by a person upon an object, is so badly misused that I am trying to substitute "signifier" to indicate that what is important is the communicative power of the design. I have even heard the word "ethnography" used to describe any aspect of design or marketing that touches a real person – passing out surveys is now called ethnography. Shudder.

What is interaction design? What isn't? To me, the most interesting part of design is the interaction between the design and people, or in some cases, between the design and society. I push, it responds. It moves, I respond. It is all about interaction.

The design of services is pure interaction design. It is a delicate negotiation between service provider and service receiver, whether the provider is a machine (such as one that delivers tickets or money) or a person. With products, the critical parts are all about understanding and communication, about the nature of the interaction, and about the benefits (or not) that are received. And above all, it is about the quality of the experience, ideally about pleasure and joy, beauty and excitement, but often instead about disappointment and frustration, irritation and annoyance.

Input devices

Long live the body, the physical world, reality. The world of computers led to an unfortunate diversion away from reality to the confining sterility of screens and keyboards, mice and other artificial animals. We lost touch with our bodies, lost touch with the real world. Cheers for the disappearance of this artificial emphasis on artificiality. We human beings have bodies. We evolved in a three-dimensional world with three-dimensional sounds, sights, objects and experiences. So hurrah for the return to the physical world, of gestures and touch, haptics. Of real objects, real movements. It's about time.

The challenges of design

The real challenge of design is to become a sustainable, legitimate field. Today, it barely exists in academia. It resides primarily in

art and architecture schools, and even in the few major universities that have design, the field is inside the humanities, or underneath architecture or art.

Hurrah for the return to the physical world, of gestures and touch, haptics. It's about time.

Design needs to have a strong basis in science, with repeatable, verifiable results that can help sustain a cumulative body of knowledge. Instead, design is mainly a trade or an art, where instead of cumulative knowledge we have independent works. This is the challenge. To become accepted as a true discipline, it must have a firm, solid basis.

Today, most of the science of design comes from human-computer interaction and from the area of engineering design. That is unfortunate, because although these two disciplines provide valuable knowledge, they often miss the essence of design, which is to solve unaskable, wicked questions, to get at root causes, and to find solutions that are economically viable, understandable by the target audience, and that deliver pleasure.

What will I do next?

I wish to help establish a science of design: to help develop a sustainable set of design principles. This is what will occupy my time in the near future. As for the far future, I never predict. I only know what I am doing after I have finished doing it. And once I am finished, I am no longer interested: I am attracted by the areas that I do not understand, by the questions I cannot yet formulate.

The cutting edge of HCI

Harold Thimbleby

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Meteorites were our first source of iron, thousands of years before the Iron Age when the strength, durability, sharpness, flexibility, and ductility of iron started to transform society on a large scale. Although knives and swords were immediate applications of the technology, it took another ten thousand years or so to refine the surgical scalpel, even though in principle everything was already in place to do so much earlier.

A scalpel is just an interactive lump of iron, but developing the full social context to make sense of it, to make the tools to make it, to make it work dependably, to make it a mature tool rather than a toy, to ensure users had the knowledge of germs and toxic contaminants, took the time; millennia, in fact. The build-up of social communication and shared knowledge so that enough people knew what scalpels were all about was part of the delay. Concepts like asepsis didn't have much use until surgery got going, and surgery didn't get going until it was successful on a big enough scale for enough people to see, learn and disseminate its basic concepts. Today scalpels are a small part of a large, intricate socio-technical system.

More complex uses of iron make the point even clearer. The car would be useless without a road network, and our pervasive road network pretty pointless without cars – in fact without lorries we couldn't have made the road network in the first place. Cars and lorries would be dangerous without a complex web of social conventions, which has taken at least a century to refine. Until roads meant that we could live far apart, we didn't want to travel so far; we certainly didn't need to commute.

Effective technology doesn't just happen. Scalpels are pretty good; now cars have a way to go; and computers, well ...

Emergency departments in hospitals use whiteboards to make notes about patients. In some hospitals these whiteboards have been computerised, but often with disappointing results. One of the iconic images of the disappointing failure of computerisation is a hospital room with ten scrubbed-up clinicians all standing around and using a conventional whiteboard, but with a computer screen opposite it, intended to replace it, being totally ignored.

It is not too far-fetched to see this new interactive computer technology being about as ineffective for today's clinicians as a scalpel would have been in Pompeii. A scalpel made then (around AD70) would have been a disappointing and misunderstood device: it would have been poorly designed, people would not know what it was, it would be dangerously fragile, and anyway, as used, it would have spread more disease than it cured.

It isn't such an extreme analogy.

To be effective, an ordinary whiteboard requires the supportive confluence of many factors: its users have to be able to read and write and understand the nature of permanent and temporary pens (and that some pens don't work at all on whiteboards); its designers have to understand that whiteboards must be smooth, robust, wipe-clean, sufficiently large, rigidly fixed on a wall. The physicality of the whiteboard has to match the task that it is being used for. There is a huge amount of tacit knowledge (such as the invention of colour codes to represent patient data) that is developed in concert with a deep understanding of the whiteboard/pen/writing/reading technology.

The point is that a whiteboard looks so easy to use, that surely a computer could only do the job better. Whiteboards are such primitive technology compared to computers! IT is, after

all, so much more flexible and modern! With IT, you could put the whiteboard on the Internet and a clinician could view it from the other side of the world; you could add all sorts of other useful information about patients, from allergies to religious issues. You could work out how much treatment was costing, or you could track waiting times. Wow. E-wow.

We forget that to use a whiteboard requires skills that take the best of us maybe a decade to learn, and even then a few people never read and write reliably. I, for one, was the despair of my teachers, who thought that I would grow up and be a break in the continuity of civilisation.

The skills the successful whiteboard manufacturer needs are even rarer and harder to define. And to create the social context where the whiteboard happens to work so well took centuries, if not millennia, to sort out. When a whiteboard "just appears" in a modern hospital emergency department, we easily overlook this entire tacit socio-technical baggage.

Why does an expensive computer system fail so magnificently compared to a cheap sheet of plastic stuck on some mixture of epoxy and recycled woodchips?

Why does the hope of interactive systems continue to triumph over frequent frustration and failure? Why did anyone want to spend thousands of pounds on a small, unreadable display that nobody knew how to use, that would cost thousands more in wiring, that needs technicians and a maintenance contract and a backup system to keep it working – when something perfectly adequate was already working for a fraction of the cost? If the computer system breaks down, as it will, everything will grind to a halt, but if the whiteboard broke down (even the very concept boggles the mind) anybody would know how to work around it.

Harold Thimbleby wrote Press On (MIT Press), which won the American Association of Publishers award for best book in information sciences.

They could write on the wall if somehow the whiteboard broke. Whiteboards don't even need rebooting, and if there is a power failure (and for whiteboards, it would only matter at night) a neat piece of technology discovered well before the Iron Age would get them working again.

Whiteboards look so simple that it must surely be simple to automate them. Indeed if you automated them properly you'd end up with something pretty much like a whiteboard, and there wouldn't be many advantages in that. If you don't automate them properly, you end up requiring a vast amount of unfamiliar tacit knowledge that nobody has.

Complex ways of failing are not the only problem with computerised whiteboards. They also can't be appropriated, extended, modified; it's not just that they don't fit in with deep social knowledge about use, they don't integrate with the many other technologies that do so well.

If not in hospitals, then, computers have been stunningly successful in some areas. Consider mobile phones, computer games, the Internet. Computers have also been stunningly successful in popular culture and in science fiction. They've even been successful in some mundane areas like payroll, although their success in finance seems to have been literally over-sold, as the reselling of complex financial instruments recently showed.

The point is: their stunning success in certain areas is no predictor of their success in other areas. In fact, it would be more truthful to call their "stunning success" anywhere an "accidental success". Mobile phones weren't planned to be so successful, and while text messaging became an unexpected success, many ideas failed terribly – but we can't recall what they were, as not many of us saw them in the first place! Fortunately, some things fail really quickly.

Not only are we excited and fooled by narrow success, it suits powerful interests to keep us excited and fooled. A whiteboard manufacturer doesn't have good profit margins and competes against plenty of other suppliers. In contrast, a "computerised whiteboard" supplier can sell an unfinished, unpolished bit of technology with huge margins and, moreover, lock the purchaser into a complex contract, to say nothing of paying for a training programme. Since anybody who can make computerised whiteboards can also make office information systems and lots of other stuff, they aren't going to fail quickly enough if they have one rubbish product. Badly designed whiteboards – badly designed interactive stuff – are going to be around for a long time.

You can look at a damaged conventional whiteboard and see at a glance if it won't work well; it's transparent, honest technology. But you can't assess a half-finished computer system and put a sensible price on it, predict how much its under-performance or errors will cost the people who try to use it, or even come up with reliable workarounds so you can stay working.

And this is where HCI comes in: to assess and understand how things work so that insights can go back to designers to improve the next generation of systems, and so that insights can go back to the rest of us who have to decide what to invest in to make our lives more effective, fun and worthwhile.

Some people in HCI have to cope with messes; there are indeed people studying hospital whiteboards, for example. Some hospitals need all the help they can get! But HCI must not confuse studying problems, fascinating as they may be, for the larger and more strategic responsibility of avoiding them in the first place. One hopes that HCI will do more than

understand or improve specific situations (for that is usability, not HCI) and be able to generalise insights into a transforming science. As the examples above made clear, the real contribution of HCI isn't knowing details like when voice input is better than a pie menu, it's contributing to the whole socio-technical context: helping designers use better processes, helping technical authors be honest, helping procurement choose wisely, helping managers hire competent programmers, etc. In short, helping everybody match the task and technology synergistically. I hope, putting more effort into defining good technology than studying the consequences of bad technology – how a whiteboard fails is much less useful knowledge than how to make a better one. That it failed is one thing; that anybody thought it would succeed is more interesting; that nobody (or not enough people) who developed it had been on an HCI course is a disaster. Good HCI wasn't there for the people who needed it.

It would be tempting to digress into the nature of reliable knowledge that HCI should aspire to so that it is effective in this undertaking, but that is a well-worn discussion (the philosophy of science) that is not about HCI, computers, human factors or users specifically.

Instead, the thought I want to leave you with is this: with computers, clearly, we can and have changed the world; with HCI we should be aiming to change it for the better, and, let's hope, doing so a good deal faster than those delaying interests that thought the most profitable use of iron was the sword and not the ploughshare or scalpel. Don't think that understanding usability problems is going to be as radical as strengthening the science behind HCI so that it has wider, faster and more reliable application.

Bringing user-centred design to manufacturing IT systems

Rob Knight and Paul Rouke



Rob Knight has been working in the software development field for nine years. Having worked with a variety of software design and development techniques, he has become a strong advocate of user-centred design in software development, having given public talks on the integration of user-centred design principles with modern software development methodologies and the challenges this presents to development teams. He is currently studying for an MSc with the University of Chester. robknight@prwd.co.uk



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C&O Powder Coatings is a family-owned and run firm based in St Helens, in Merseyside. They are in the paint coating business, and their core business activity is the coating of diverse shapes and types of metal in a wide range of very precise colour shades. Over the last decade, their industry has become more competitive, with a combination of turnaround time and reliability being their key differentiators.

However, despite investing in the latest paint spraying equipment – they were the first paint coater in the UK to use automatic paint sprayers – the administrative side of the business had a problem. Their internal organisation was still paper-based, requiring hand-written recording of goods arriving, hand-written copies of this taken for job cards and further hand-written copies of the same information for delivery notes and invoices. Paperwork often lagged behind the reality of the goods being coated on the shop floor; simply confirming the status of an order to a customer involved sorting through paperwork that might not be up to date; worst of all, sometimes jobs could be coated and dispatched without the requisite paperwork being completed.

This is where our involvement began. Our aim was to create a software solution that streamlined the process of handling orders, assisting the process from the moment the goods were checked in, through the coating process and to the creation of delivery notes to be sent out with the finished goods. But to do this, we needed to overcome some considerable scepticism and doubt from within the company, and to involve the stakeholders in creating a solution that supported how their processes work. The company management already had

a clear idea of the process changes that they wanted to make, so our scope was to design a system that realised those processes.

The early stage of the project involved an in-depth series of meetings in which we mapped out the current business processes and the changes that the management team wanted to make. All of these meetings were recorded, by agreement, using a simple voice recorder, which enabled us to listen to key explanations at later dates. The primary output of this process was a series of flow charts mapping the process of orders through the system, modelling the roles and decision points of the key individuals in this process. As well as giving us the knowledge to create the system, these meetings were also vital for building confidence with C&O; it would only be after we had fully understood their business that they would trust us to begin creating the software that would help to run it. C&O were particularly insistent that we understand their business, as they had observed many of their customers – often companies larger than themselves – suffer from the poor implementation of new IT systems. They were very aware of the negative consequences of a poorly designed or implemented system. They mentioned a specific example of a FTSE 100 company which had to resort to hand-written delivery notes when they were unable to get the correct output from their ERP system, provided by a major vendor.

Once we had a clear understanding of their business processes, we began the process of designing the software to support them. This meant introducing the concept of user-centred design to C&O's management. We aggressively sold the benefits of this approach for C&O, placing particular emphasis on improving

To have key staff members feel that the process was either a waste of time or, at worst, a threat to their job or their favoured working practices, would have made it difficult to get good and accurate feedback

productivity, explaining that a system that their staff found difficult to use would end up costing them time and money, not to mention training costs. We made it clear that our design process would have to involve consultation with ordinary members of staff, in order to understand their individual needs and capabilities. C&O's management were able to relate to this approach because of a poor past experience, where they had invited consultants in to discuss the implementation of an IT system. Barely an hour into the meeting, the consultants were making proposals for what software to put in, where to place computer terminals and how to re-train the staff. This failure to understand the business was something that we were determined to avoid.

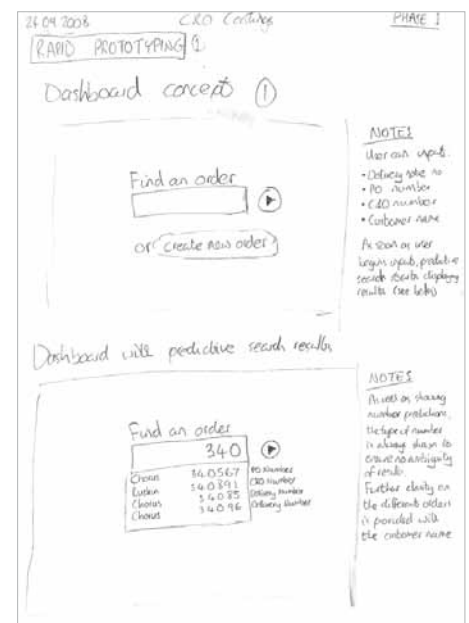
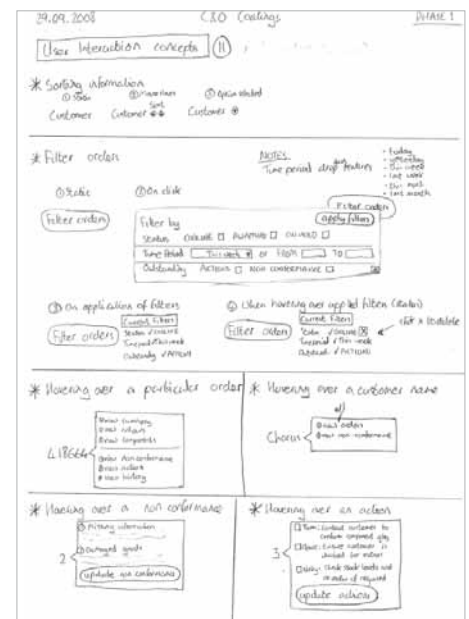
The first obstacle we had to overcome was the reluctance of the senior management of C&O to give us direct access to shop-floor staff and junior management personnel who would be making regular use of the system once in place. During the early phases, the senior management were very keen to ensure that the system matched their vision of how the company should operate, but we made it very clear that these outcomes could only be achieved if we were able to bring the users of the system into the design process. Eventually, after explaining the benefits of an inclusive process, we began interviews with key users to discover their personal requirements and how the system could best support them in their role.

However, these interviews turned up mixed feelings amongst the staff. Some were enthusiastic, immediately latching on to the possibility of being able to work more productively if certain problems could be tackled. Others were sceptical, doubting that the system would make

their lives any easier, and believing that it might simply be a waste of time and money – that no system could accurately reflect their business processes and thus yield benefits. In particular, one of the main sceptics was the shop-floor manager, whose job involves the day-to-day management of the factory, taking decisions about the order in which jobs are processed and solving problems that arise from mistakes or poorly informed decisions. His initial scepticism was based on the fact that he believed that using an IT system would be slower than the paper-based system already in place; that any new system put in place would be more complex and less suited to the task than their paper-based system that had been in operation for years.

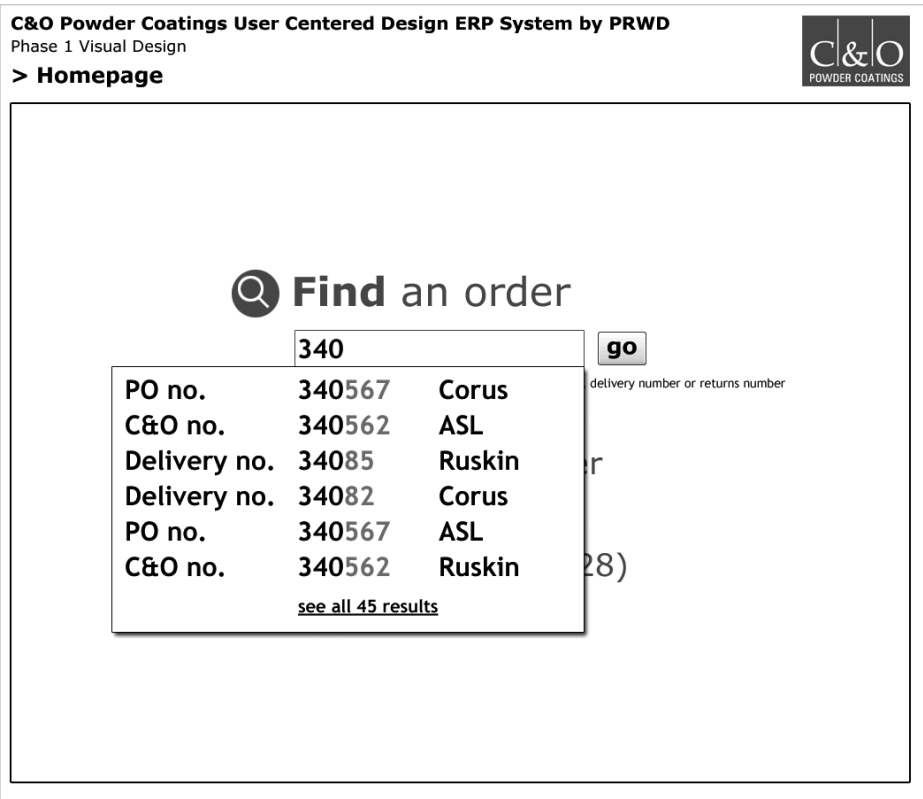
For us to create a system that met their needs, it was vitally important for us that all of C&O's staff members engaged with us and with the user-centred design process. To have key staff members feel that the process was either a waste of time or, at worst, a threat to their job or their favoured working practices, would have made it difficult to get good and accurate feedback. For this reason, we made it a priority to put C&O's personnel in the driving seat, letting them explain to us, at length, how they believed that the business could operate best.

Once we had amassed sufficient information about C&O's business and had completed a process of documenting our findings, we began to test early-stage prototype visuals. These were simple paper prototypes, sketching out the workflow of key business tasks such as order input, information retrieval and searching. The designs were intended to be easily understood by staff familiar with the existing paper-based system, but also to streamline the processes and provide quicker and easier ways for staff



Bringing user-centred design to manufacturing IT systems

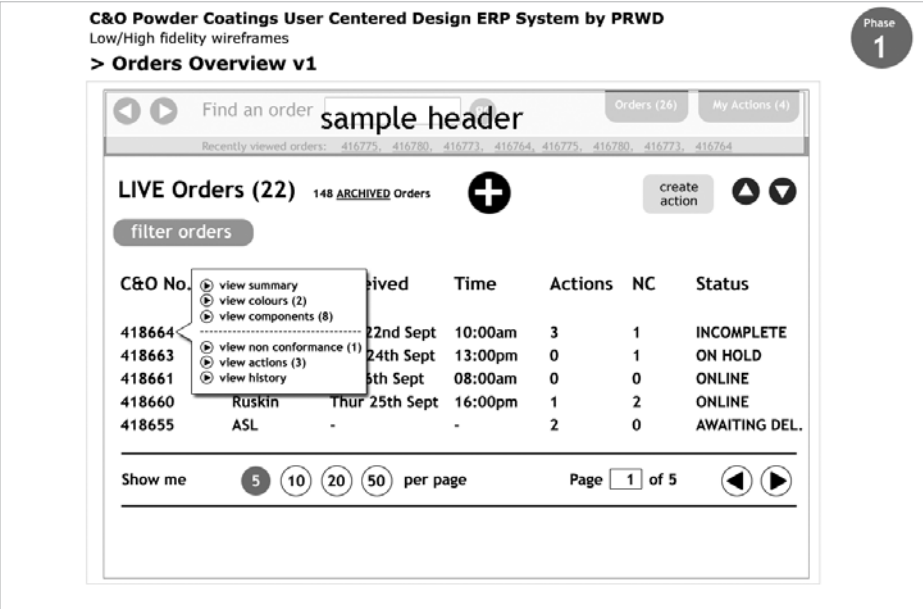
Rob Knight and Paul Rouke



to execute tasks. It was here that we faced a slight problem, in that we began to envisage features that were outside of the scope of the project budget. In presenting alternative designs and varying solutions to see what got the best response, our wireframe designs sometimes contained features which, at a later stage, it proved impossible to deliver within the timescale. The key lesson here is that it's easier to visualise something in a wireframe design than it is to deliver the software behind it!

We progressed rapidly through paper prototypes, low-fidelity and high-fidelity wireframes and then final visual designs, at each stage narrowing down to a design that closely resembled the finished product. At each stage, as the precision of the visuals improved, the quality of the feedback improved. In particular, we encouraged the participants to think in terms of interactions with the system, imagining what they expect to happen in response to input.

However, it was not until we had a working software prototype that we were able to get truly accurate feedback. Many revisions to the visuals were made after the prototype was introduced and issues that appeared to have been settled in earlier visual designs were revisited after questions were raised. It was not so much that there was anything more on the screen in the prototype version, but that the mere existence of an interactive prototype prompted much more serious thought about interactions. User feedback became a lot more critical (although in a constructive manner) once an interactive prototype was in place. A key lesson for us is that users still find it difficult to relate properly to static wireframes and in future projects it would be beneficial to reach the prototype stage earlier,



or to use software tools to create 'interactive wireframes' that more accurately simulate a working system.

Another double-edged sword here was our championing of a flexible, 'agile' development process. We made it clear from the beginning that feedback from C&O would be the driving force behind the project, but we did not place any clear limits or cut-off points in place. This created an expectation that there would always be the flexibility to make changes, even after technical implementation began. This expectation may also explain why so much of the most valuable feedback was relatively late; from their perspective, it was sensible to wait until the last minute before passing judgement. In retrospect, we could have placed limits on the quantity and scope of changes after certain key milestones, in order to focus attention on the most important points earlier in the design process.

One of the most pleasant experiences on this project was the extent to which the entire user-base, even those who had earlier been sceptical, came to support the project. In particular, the shop-floor manager who had, early on, been dismissive of the project came to be its greatest champion. Once we reached the stage of producing visual designs, he had grasped the potential for productivity gains and became very anxious to see the project deployed as soon as possible. His enthusiasm was very encouraging to us, as it proved that we were on the right track. Similar sentiments were reflected by other users.

When the system was finally deployed, some six months after the original design process began, we saw much of the success that we anticipated. There was no need for lengthy training as all of the users were

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already familiar with the system from the design and prototype phases. And when we began to measure the performance of the system in a live environment, we found that the time taken for certain key tasks – in particular, order input – had fallen dramatically compared to the earlier paper-based system. The reduction in administrative overhead was clear and unambiguous.

Even more important to us was the fact that the process had been largely painless and that everyone who took part felt positively about the experience. C&O's management were pleased enough with the project that they happily filmed video testimonials talking about the project and paying particular attention to the strength of the user-centred design process. As one person said, "It's like you're part of the design team".

Key lessons from the project

- Don't over-promise during the early stages of the design process – it's a lot easier to wireframe a concept than to deliver it.
- Although wireframes are useful, the sooner clickable prototypes can be developed, the sooner the client will provide valuable feedback.
- Ensure that the client understands that a UCD process isn't a blank cheque for feature development. Any features added, especially later in the process, must be feasible within the project timescale and budget.
- To build trust with users, it's important that they don't feel that their role is under threat from the system being developed.
- Keep it simple and don't try to solve every perceived problem a user has – focus on the problems that really matter.
- Don't let initial scepticism distract you from following the user-centred design process. Once it's underway, users will respond positively.
- Avoid usability jargon when describing the process. Show example outputs from past processes rather than telling people what the project's stages will be.

DSL self-installation

From impossibility to ubiquity

Philip Kortum, Rice University Rebecca A. Grier, US Navy

Marc Sullivan, AT&T Labs

Ten years ago, broadband Internet was something primarily found in businesses, with most homes connecting using dial-up modem services. Connecting to the Internet over a phone modem was as simple as plugging a phone line into the computer. Conversely, the DSL installation process was sufficiently complicated that the telephone company would dispatch a service technician to the customer's house in order to perform the installation. Although the vast majority of DSL installations with technicians went smoothly, there were several reasons why it was not the ideal solution.

First, the economics of the procedure were untenable. When there were very few individuals in need of the installation, the number of trained technicians needed was low. However, as more and more people wanted DSL (over 90% of Internet users in the US currently access the Internet using some form of broadband connection (PEW Internet, 2008)), more trained technicians were required. With the rapid increase in demand for DSL, it simply became impractical to find, train and field a sufficient number of service technicians in a cost effective manner.

A second reason the situation was not ideal was customer satisfaction. While sending a technician to the home to perform the installation always resulted in a successful installation (which made customers happy), it also meant that the customer was at the mercy of the service call and had to be home in order for it to occur. As more people wanted DSL, appointment times for when the installation could take place were moved further and further away from the time of the order. The requirement to accommodate an appointment time for the

installation, especially one that was weeks after the order, led to lower satisfaction levels. This was further aggravated if multiple visits were required.

The obvious solution was to move to a self-service model: the customer would order DSL, and a self-installation kit would be sent so they could perform the installation at their leisure. A win-win – a technician would no longer need to be dispatched, and the customer could self-schedule the installation. By successive iterations and user testing, DSL self-installation became a significant business and customer success. The move from technician installation to the award-winning customer self-installation process has been estimated to save over \$100 million per year. These savings have allowed the price of DSL to drop significantly and become very affordable for a wide range of consumers.

The DSL self-installation design process

The DSL self-installation kit began by taking the kit and process that had been used by our technicians and making it work for the average customer. The kits that were being installed by technicians required a piece of hardware to be installed in the telephone junction box on the outside of the customer's home. Because of the way DSL works, the DSL signal must be kept separate from the part of the line that carries the voice signal. The early process did this by physically separating the signals using a splitter in the network interface device outside the customer's house. Clearly, the average consumer was going to have great difficulty performing this kind of 'surgery' on their telephone network terminal, and our first tests of the self-installation kit confirmed that.

The advent of a new piece of technology, the DSL filter, changed all that and allowed DSL to be installed without requiring the network interface splitter. The DSL filter allowed the customer to separate the DSL and voice signal by simply installing a special filter on each of the phone jacks in the home. With the advent of this technology, a true user-centred DSL self-installation kit development process was underway.

The very first DSL self-installation kit was shipped in early 2000 and essentially mirrored the kit that the technicians had carried with them in the field, with the addition of the new splitterless filters. It consisted of multiple components (the network interface card, the modem, the filters and the Internet service provider software), each with instructions and software installation disks from the vendors who produced them. Predictably, there were conflicting instructions and software conflicts, and the resulting installation success rates were low. Over the course of the next iterations of the kit, installation success rates in the lab and the field rose to over 95%.

How did we achieve this remarkable change? Most importantly, we reduced the installation instructions from over 100+ pages (spread out over five manuals) to a single page. That single page simply tells the customer to insert the single CD (reduced from four) into the computer. This single CD moved the entire instructional load from paper to a wizard-like application that kept the customer focused on the right task at the right time.

As we iterated through the process, more and more of the functions were automated so that the user was left with only the physical task of setting up the filters and the modem. Further, this automation allowed us

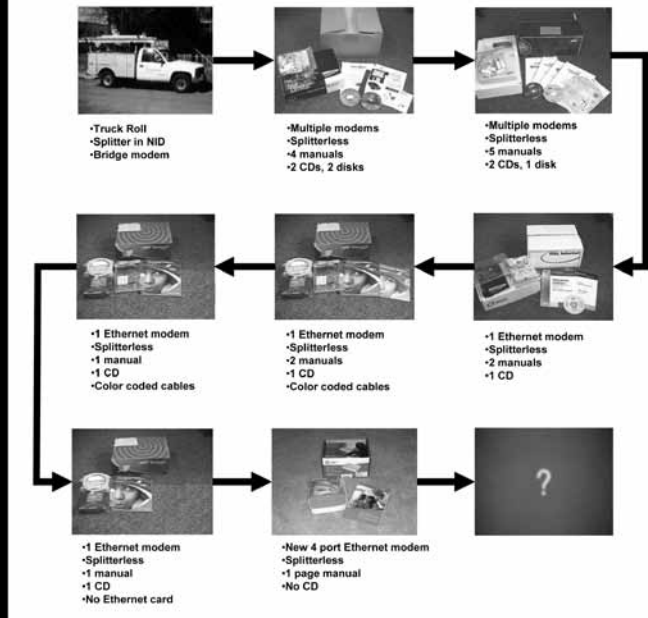


Figure 1 The evolution of the AT&T DSL installation process, from technician initiated installs in the beginning to the current streamlined self-installation kit. The last box in the chain indicates that the kit is still undergoing continuous improvements

to integrate troubleshooting into the flow so that it was not a special unexpected event but appeared to be part of the regular process. Recently, even the CD has been replaced by an online process that is automatically initiated when a web browser is opened. Printed instructions are used only for establishing a physical connection.

Along the way, we made several technology choices that continued to simplify the installation process. Early kits allowed the user to pick among several different DSL modems, each with unique operational and connectivity properties. While choice always seems like a good idea in customer-based applications, in the self-installation world it can cause significant difficulties.

By moving to a single modem of our own patented design (key portions of which were accepted by the DSL Forum as standard for DSL modems), we were able to optimise the process and incorporate several user-centred design principles. Among these are status lights with user-understandable labels that progress from left to right as the modem connects, the color matching of the cables and ports on the modem and the migration of connectivity software from the customer's desktop to the modem, so that the DSL connection handshake process was invisible.

As broadband became more and more common, PC manufacturers began to make Ethernet ports standard on their computers, and we eventually eliminated the inclusion of an Ethernet card installation from the kit, further simplifying the process (although by this point in the kit evolution, Ethernet card installation success rates were in the high 90% range). We also redesigned the kit so that the parts were physically placed in the box in the order

in which customers would need them. Figure 1 shows the evolution of the kit.

Were any of these iterative design changes groundbreaking in their technology or implementation? Probably not. However, the continued, repeated application of the user-centred iterative design process resulted in an out-of-the-box experience that was simple for the customer, and more importantly, resulted in high consumer success in the field. Over the course of the iterative design process we tested over 1000 users in the laboratory, visited countless homes to observe installations, rode on many, many technician service rolls to see and visit with customers who were having difficulties, and scanned tens of thousands of inbound customer service calls, letters and web posts to understand the process at its most intimate level from the vantage point of the customer.

As one measure of our success, we employed a usability metric to measure our progress. The System Usability Scale (SUS) (Brookes, 1986) is a simple, robust metric that allows us to track how usable a design is over the course of many iterations. The chart on page 14 (Figure 2) shows the SUS score (on a scale of 0–100, where higher scores are better) across a number of iterations. As can be clearly seen, the process is one of continued vigilance: as new hardware, software and back-end processes are introduced, usability gains made in previous iterations must be won back through testing and careful development. In the end, a stable kit with SUS scores above 90 was fielded. This is an exceptionally high SUS score, given that the average score on over 3000 SUS administrations over a wide variety of products and services has been reported to be 70 (Bangor, Kortum and Miller, 2009).

Lessons learned

The testing we conducted with the DSL self-installation kit taught us a number of important lessons about out-of-the-box designs. The first of these lessons is that users will most certainly not think of your product and its installation flow in the same way you and your design team do. It is imperative to gather data on what your customers' mental models of your product and process are in order for you to make good design decisions. In the case of DSL, customers' mental models of what an installation would entail were significantly *simpler* than the actual process. Most believed that, like their high-speed work connection, you could simply plug it in and begin to surf.

Data collected to understand these models should come not only from rigorous controlled usability studies in the laboratory, but also from field studies where you can observe your users in their native environments to see what difficulties they encounter. After the product has been launched, be sure to avail yourself of all the data that is going to flow in through your customer care channels – your users are talking to you through these channels – you just need to listen!

As an example, reports from the customer care channels indicated that there was great confusion over the two connection cables included in the kit; one was an Ethernet cable to attach the modem to the PC, and the other was a data cable using a regular phone connector that connected the modem to the phone jack in the house. While the difference is clear to computer professionals, many consumers had never been exposed to Ethernet, and reported that the provided cables would not fit in their home phone jack. By colour coding the

DSL self-installation

Philip Kortum, Rebecca A. Grier & Marc Sullivan

When you are designing for out-of-the-box, make sure to try to think outside of it too.

cables and the modem ports, we were able to make this problem disappear.

The Internet has also afforded customers another way to communicate with you: blogs, reviews, and support forums. Used in conjunction with the data you get from research studies and customer care, it is easier than ever to discover the real problems your customers are having and take steps to rectify those issues.

The second lesson is that with any product that is advancing technologically, change is inevitable. Embrace it and use it to your advantage. In the most classic form of iterative design, the developer keeps testing and refining the product until all (or most) of the design flaws have been identified and fixed. This assumes that the product is static throughout the process.

While this sounds like the most efficient way to build a product, the reality is that the product is likely to change as the iterative process is ongoing. This means that new flaws are being introduced as fast as you fix the old ones. It also means that there are likely to be new interactions that you may not have anticipated; the fix you just implemented for an existing design deficiency may actually cause another issue to emerge from a newly implemented feature.

Be aware of these potential interactions, and design testing protocols that help you identify them. Designing in such a dynamic environment can be difficult, but it also ensures that the resulting product still implements the best and newest technology and features. DSL endured the introduction of many such changes. Some were technological, such as the introduction of the DSL filters and the ability to integrate the connection software into the modem. Others were organisational, as when Yahoo was added as the email and portal provider. Although some changes were more difficult than others, in the end, each change was successfully integrated into the kit.

The final point that bears mentioning is that it is important to make sure that the out-of-the-box experience is as simple as possible. Although this sounds like the most obvious advice, many design decisions are based on the structure of the company, or its underlying data/organisational lines, or the limitations of the technology itself. While designing this way may be the most expedient, it rarely results in the optimal user interface for the end customer.

As the designer, you need to be especially self-critical and think of ways to create the

easiest possible experience for your users.

Think of what the process would look like if there were no constraints, and then either remove the barriers that are preventing you from actually doing it that way, or figure out ways to mask the complexity in the final design.

Because of the organisational complexity of DSL in the telephone company, the process involved having the kit communicate with the servers of what were essentially three separate companies to complete the connection. Although we could not change this organisational complexity, we created a shell program that made these connections, shared the collected data and made the server swaps invisible to the customer. The end solution was not particularly pretty from a coding standpoint, but from the end customer's view, it was nearly seamless.

If you work hard to simplify the process, your customers and your company will thank you for it. We had a saying as we worked on the DSL kit over the years: when you are designing for out-of-the-box, make sure to try to think outside of it too.

References

- Horrigan, J.B. (2008) Home Broadband Adoption 2008. Washington DC : Pew Internet and American Life Project. Available online at http://www.pewinternet.org/~media/Files/Reports/2008/PIP_Broadband_2008.pdf
- Bangor, A., Kortum, P. and Miller, J.A. (2009). Determining what individual SUS scores mean: adding an adjective rating scale. *Journal of Usability Studies*, 4:3.
- Brooke, J. (1996). SUS: a "quick and dirty" usability scale. In P.W.Jordan, B. Thomas, B.A. Weerdmeester, and I.L. McClelland (Eds.) *Usability Evaluation in Industry*, 189–194. London: Taylor and Francis.

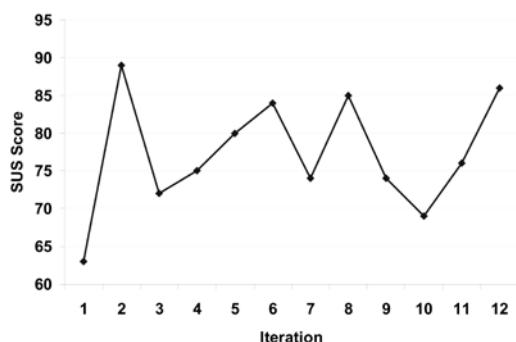


Figure 2 SUS scores for 12 different iterations of the DSL self-installation kit. SUS scores measure overall usability and can vary from 0–100, where higher scores are better. The average SUS score reported over a wide range of products is 70 (Bangor, Kortum and Miller, 2009). Note the decline in scores at iteration 3 – this was the introduction of a new set of modems, which caused several usability difficulties. Over the course of the next several iterations, these hardware issues were systematically resolved until scores had climbed back into the mid-80s.

Time vampires

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Comedians have made excellent use of frustrating technology. One of Peter Kay's routines recalls how noisy early video recorders were:

If you were a lad, you couldn't watch a bit o' blue in t'middle of night, 'cause everybody could hear it fast-forwardin' about three streets away. So I've 'eard, anyway. You know? (Kay, 2003)

The computer itself has also made excellent stand-up fodder as in Eddie Izzard's routine:

Control P Print, Control P Print, CONTROL P PRINT ... cannot access printer? It's here!! [...] Control P Print! Control P Print! Control P Print! And it's as if the computer's going – I'm not sure what you're trying to do. I'm trying to print! Control P Print, . Ah but there's something you haven't done. What? Tell me what it is? I'll do it? Oh I can't tell you that. (Izzard, 1997)

Wittgenstein once said that a philosophical work could be written entirely in jokes, so could a usability report and indeed, it has.

The Onion News features a video introduced by the sombre anchor Brandon Armstrong who reports that

Tech Savvy consumers are lining up today to be the first to purchase [some] brand new stupid piece of s*** that doesn't do the god-damned thing it's f***** supposed to. (Onion News, 2009)

Another reporter gives further details of its wide variety of frustrating functions such as

"flashing random words and numbers on its display screen".

A vox pop segment quotes a local man who can't wait to spend his "entire evening trying to figure the god damned thing out". A company executive explains:

We listened hard to what our customers said they wanted the most ... and then we pumped out this impossible to use f***** piece of s***,

and also suggests you invite your friends over to figure out this "time vampire" but pretty much guarantee you will have no chance. Back in the studio Brandon Armstrong adds the news that the company will upgrade this device next year once you've figured out the remote control to this, the report ruefully concludes: "it never ends, this s***".

Clearly many of the comic effects here are achieved by the collision of current affairs news formats with swearing but the parody also resonates with people's real life experiences, as evidenced by the frequency with which the piece has been forwarded and the comments it has prompted that focus on how funny the swearing is but also its truth of the reality of poor usability.

Of course, the swearing is a reflection of the frustrations users face when trying to set up and configure electronic devices. But that's not the only time we swear about technology: we also do so when we are mad with desire for the latest and greatest from the Wii™ to the iPhone™. Such anticipatory cursing is represented in the Onion piece by the man in the parking lot holding the still bagged, still boxed product ("I love b***** like this. Basically, I'll buy any goddamned thing I see in an ad")

and the slickly produced techno-aesthetic urban billboards and posters that read, "What the f*** is this?" and "Just buy this s***."

The Onion piece calls attention to the diverse ways that technology renders us inarticulate. It also offers the observation that we express ourselves in linguistically similar ways throughout our love-hate affairs with technological fetish objects, and this seems to happen without regard for anything in particular about the object itself (hence the story's utter refusal to say what the thing is).

Web sites like YouTube™, The Onion®, and Amazon® offer interesting sources of data for studies of HCI. Wit, cursing, misspellings, and dubious reasoning aside, these users can be described as engaged in informal usability testing. A given individual contribution may come across as low quality but the collective contributions are quite rich, not just in their delivery of the straight data but also in the local colour and folklore that emerges surrounding these objects. These data can offer (albeit exaggerated) illustrations of usability problems and user experience.

References

- Izzard, E. (1997). *Glorious*. Vision Video Ltd. http://www.youtube.com/watch?v=k6C_HjWr3Nk. Accessed 06 July 2009.
- Kay, P. (2005). *Live at the Manchester Arena*. Universal Pictures UK.
- Moggridge, B. (2007). *Designing Interactions*. Massachusetts: MIT Press.
- The Onion News (2009). *Sony Releases New Piece of S*** that Doesn't F***** Work* http://www.youtube.com/watch?v=8AyVh1_vWYQ. Accessed 06 July 2009.

How relevant is this?

Overview of a recently completed project at the Department of Experimental Psychology, University of Bristol

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The PARIS (Parsing and Automatic Relevancy of Information Sets) project

If a common theme in the forecasts of futurologists can be identified, it is that perceived information overload will only increase in the developed world. The current widespread adoption of using short message services ('texting') on mobile phones, blogs (personal web diaries) to comment on current affairs, and Wikis (web pages any user can edit) to share information, only adds to the swirl of information being circulated, and the opportunities for overload.

Locating relevant material becomes more difficult as the reservoir of information increases in size. Thus, the need for support with this sifting task becomes apparent. Further, it is recognised that humans are poor at finding information in a variety of sources (Jenkins, Corritore, & Wiedenbeck, 2003; Schacter, Chung, & Dorr, 1998; Shneiderman, 1997; Smith, Newman, & Parks, 1997). The PARIS project was concerned with providing computational support for information-rich applications where a large amount of information needs to be searched in order to locate relevant material.

Relevancy

The PARIS project was concerned with the design of an automatic relevancy filter that uses an algorithm similar to a human task approach. In the past, we have designed and empirically tested a psychological model of relevancy information in dialogues (Groen, 2002, 2004, 2005; Groen, Noyes, & Verstraten, in press). One of the assumptions in the model is that dialogue partners

exploit word-like markers to present (from the speaker's perspective) and locate (from the listener's perspective) task objective-related information. This assumption has been extensively empirically tested by the researchers at Bristol.

We have found that people do indeed orient on a limited set of markers, which we called *relevancy markers*, to locate relevant information. The most frequent of these are the words, 'so', 'well', and 'but'. The speaker will use these words to signal that relevant information will follow. Accordingly, the listener, upon hearing (or indeed, reading) these relevancy marker words, will note that information of relevance is about to follow. We have found that they are consistently used by humans for indicating that relevant material follows, irrespective of their domain of work, language used (i.e. English, Mandarin-Chinese and Dutch) and the topic of the dialogue.

The results of this earlier work by the researchers at Bristol were used in the PARIS project to inform the development of computational support aimed at supporting personnel to discern relevant from extraneous information. Support of this nature does not currently exist, but given our research findings to date, we anticipate such a development to be both feasible and beneficial.

PARIS

The project had three primary objectives: one, the development of a computational model; two, the integration of it into a suitable task/interface; three, evaluation by human participants.

The model

Based on the relevancy marker concept, a computational model of the relevant information search process was developed. This was programmed in Prolog and aimed to imitate the 'processing steps' that humans go through when they locate relevant information in task settings.

The task

The model was integrated into a task which was concerned with the identification of relevancy markers in actual telephone conversations (as supplied by the TRAINS corpus available at: <http://www.cs.rochester.edu/research/cisd/resources/93dialogs/>).

The evaluation

The computational model was evaluated against the performance of five humans carrying out the same task. Results showed that the model significantly outperforms the humans when executing the same task. In terms of accuracy of detection, the model achieved a perfect score of 1 in contrast to the mean accuracy score of 0.34 for the human. Thus, humans were only achieving a third of the accuracy of the automated system, see Figure 1. All human participants scored significantly lower than the computational model, $t(4) = 2.78, p < .05$.

This metric was attained with a relatively small sample size; analysis of a larger data set over a longer period of time is likely to lead to an even lower accuracy level by humans as they become affected by fatigue, boredom, distractions, etc. A machine, in contrast, has the capability to maintain high, if not perfect, levels of accuracy for whatever length of time is required.



Conclusions

It is perhaps unsurprising that the computational model was able to achieve a perfect score as it is designed specifically to spot relevancy. However, it was unexpected that the humans performed so poorly.

This result underscores the promise of the computational model and the extent to which it can support humans by addressing the variability in human performance on relevant information search tasks. Adoption of the computer model should lead to increased reliability of tasks that involve searching for relevant material. This is particularly likely to be the case with large information sets where other factors such as tiredness and inability to sustain attention, etc., will begin to impinge on the performance of humans. In contrast, the computational model will have the capability of working at the same high level of efficiency for as many hours as needed. The implications of this are enormous, namely, the development of a system that could highlight relevant information in human dialogues (from emails, telephone conversations, text messages, Internet sites, etc.) and with little need to be limited by the size of the search space.

Admittedly, only a small-scale evaluation has been conducted, but the effect size and level of significance suggests that a similar result would have been attained with a larger scale study. It is apparent that the computational model potentially removes the individual variability in the ability to locate task relevant information. This is a very promising result as the computational model represents a low cost and low tech solution, which could readily be scaled to cope with large data/information sets, and could prove to be very useful

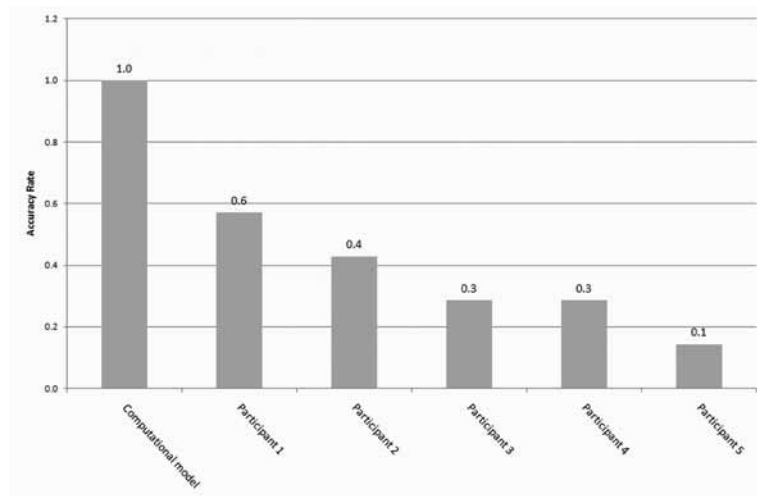


Figure 1
Proportional accuracy score of five human participants compared to the performance of the computational model

in contexts when sophisticated technology is not always available or desired. Further, no other automated relevancy detection systems currently exist, and in this respect, PARIS is a first.

Acknowledgements

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References

- Groen, M. (2002). Treating dialogues with customers as sources of knowledge. *Paper presented at the ES2002: the 22nd Annual International Conference of the British Computer Society's Specialist Group on Artificial Intelligence*.
- Groen, M. (2004). Using dialogues with customers as sources of knowledge. *Intelligent Systems in Accounting, Finance & Management*, 12:4, 291–296.
- Groen, M. (2005). *Realising goals through dialogue. Larger purposes and their markers as navigational tools*. Unpublished doctoral dissertation, Nyenrode Business Universiteit & Universiteit Utrecht, Breukelen, The Netherlands.
- Groen, M., Noyes, J. M., & Verstraten, F. (in press). The effect of substituting discourse markers on their role in dialogue. *Discourse Processes*.
- Jenkins, C., Corritore, C.L., & Wiedenbeck, S. (2003). Patterns of information seeking on the Web: A qualitative study of domain expertise and Web expertise. *IT & Society*, 1:3, 64–89.
- Noyes, J.M., Groen, M., & Dixon, T.D. (2007). Parsing and Automatic Relevancy of Information Sets (PARIS). Poster presented at the *DIF DTC 2007 Annual Conference Poster Presentation*, Cardiff, Wales: Cardiff University. Available at <http://human-factors.psy.bris.ac.uk/Pubs/MG/poster%2030907DIFDTC%20PARIS.pdf>
- Schacter, J., Chung, G.K.W.K., & Dorr, A. (1998). Children's Internet searching on complex problems: Performance and process analyses. *Journal of the American Society for Information Science*, 49:9, 840–849.
- Shneiderman, B. (1997). Designing information-abundant web sites: Issues and recommendations. *International Journal of Human Computer Studies*, 47:1, 5–29.
- Smith, P., Newman, I., & Parks, L. (1997). Virtual hierarchies and virtual networks: some lessons from hypermedia usability research applied to the World Wide Web. *International Journal of Human-Computer Studies*, 47:1, 67–95.

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Educational videos

Examining the issues older people have in using modern technology

Alan Newell, MBE, FRSE

Theatrical techniques have the power to capture people's attention, change attitudes and convey information in an engaging and powerful manner, and can therefore provide a very useful educational and research resource. In particular, the School of Computing at Dundee University has been using professional theatre, in the form of both live theatre and video, within HCI research for a number of years.

This format has been used to raise awareness of "Inclusive Design" issues with both IT students and designers of new technology, through facilitating discussion on the challenges faced by older people. The School of Computing has also used live theatre as part of Requirements Gathering exercises for novel technologies designed for older people and for awareness raising at international conferences.

The School of Computing has commissioned a number of professional narrative videos to illustrate the output of long-term research into the challenges older people find with new technologies. These have been produced as an educational tool for human interface engineers, software designers, managers and procurement executives. They are designed to provoke and facilitate discussion with both developers and potential users of technology about the needs and wants of older people. Although older users are represented in these videos, the lessons illustrated apply to many other groups of naïve users.

It should be emphasised that the videos are dramatisations of issues researchers have encountered. They are based on real events, conversations and observations, and are the amalgamation of many stories of older people's actual experiences with technology, and the situations that they have encountered.

These videos have been used with a range of professionals and university students, from whom they have received positive evaluations, and an indication of changed attitudes.

The UTOPIA Trilogy, produced in 2004, illustrates the difficulties older people can have with modern technology, in particular, mobile phones, webcams, and email. This video can be viewed at www.computing.dundee.ac.uk/projects/UTOPIA/.

In 2007, *Relative Confusion* was commissioned to show the challenges digital television can provide for older people, and, in 2009, *Relatively PC* focused on the effects of the move towards a Digital Economy and the challenges older people may have in accessing this technology. These videos can be viewed at the Inclusive Digital Economy Network web site www.iden.org.uk.

The videos are best viewed as an entity, presenting a complete storyline and giving context to the range of issues faced by older users. After showing *Relative Confusion* and *Relatively PC*, educators can use the DVD menu to jump to specific parts of the DVD to initiate discussion on particular issues or to convey specific messages concerning the technological challenges faced particularly by older people. A wide range of discussion points are illustrated in the videos, and can provide starters for further discussion and exploration of the issues with students.

Copies of CD-ROMs/DVDs for educational purposes can be obtained from Prof. Alan Newell, afn@computing.dundee.ac.uk, who will also negotiate commercial use of these videos.

Further reading

Carmichael, A., Newell, A. F., Dickinson, A. and Morgan, M (2005). Using theatre and film to represent user requirements. In *Proc. Include 2005*.

Carmichael, A., Newell, A.F., and Morgan, M (2007). The efficacy of narrative video for raising awareness in ICT designers about older users' requirements. *Interacting with Computers*, **19**, 587–596.

Dickinson, A., Eisma, R., Syme, A., and Gregor, P (2002). UTOPIA: Usable technology for older people: Inclusive and appropriate. *Proc. BCS HCI 2002*, 38–39.

Marquis-Faulkes, F., McKenna, S.J., Gregor P., and Newell, A.F. Gathering the requirements for a fall monitor using drama and video with older people. *Technology and Disability*, **17:4**, 227–236.

Morgan, M., and Newell, A (2007). Interface between two disciplines, the development of theatre as a research tool. *Lecture Notes in Computer Science 4550*. Springer, 184–193.

Morgan, M., Hanson, V., Martin, C., Hughes, J., Newell, A.F. (2008). "Accessibility Challenge – A game show investigating the accessibility of computer systems for disabled people". *CHI 2008*, Florence.

Newell, A.F., Carmichael, A., Morgan, M., and Dickinson, A. (2006). The use of theatre in requirements gathering and usability studies. *Interacting with Computers*, **18**, 996–1011.

Newell, A.F., Morgan M.E., Gregor P., and Carmichael, A. (2006). Theatre as an intermediary between users and CHI designers. In *Ext. Abstracts CHI 2006*. ACM Press, 111–116.

Rice, M., Newell, A.F., and Morgan, M (2007). Forum Theatre as a requirement gathering methodology in the design of a home telecommunication system for older adults. *Behaviour and Information Technology*, **26:4**, 323–332.

PDFs of these and other relevant papers can be found at www.computing.dundee.ac.uk/staff/afn, and www.computing.dundee.ac.uk/projects/UTOPIA/.

Acknowledgements

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The Utopia Trilogy

Peter and Jane Buy a Web Cam

Jane feels confident in using her son's old computer for email and word processing, but has decided to buy a web cam so she can talk to her daughter and grandchildren in Australia. She has some interesting experiences with trying to install this equipment and the associated "help line".

Sandy's Mobile Adventure

Sandy never uses the mobile phone his daughter has given him until he is locked out of the house – following this experience he develops a crib sheet, but he still remains less than confident in the use of mobile phones.

Email Experience

Peter is jealous of his wife's confidence in using a computer, and, while she is out, tries to use it with little success. He signs up to a computer class, but still finds great difficulties. He finally succeeds when using a piece of software which has been specially designed for simplicity, clarity and ease of use.

Relative Confusion

The example chosen is older people and digital television, but the lessons apply to many groups of naïve users and a range of new technologies.

When Jack and Tommy decided to surprise their sister Maureen with a digital TV system, the one thing they didn't reckon with was the minefield of bewildering new technology they were about to enter. One thing it won't be is... 'A PIECE OF CAKE'.

The following issues are illustrated by clips from the video:

- Users' ability to learn and their memory for new control methods
- The effects of poor eyesight and manual dexterity
- The interaction of poor eyesight and memory
- The primacy of learned conventions
- Modal errors and the effect of cognitive load
- Loss of control due to complex interaction techniques
- The consequences of jargon
- Knowledge of other requirements and functionality
- The ease (or otherwise) of installation
- The usability of manuals
- Complex interaction methods
- Interface design, labelling and colour coding
- Backwards compatibility
- The rate of learning new functionality
- Standardisation of interaction metaphors and methods
- Interface design, undo methods and operational anxiety
- Intergenerational differences

Relatively PC

What are the challenges the Digital Economy presents to older people?

How do you personalise your computer when you cannot even switch it on? What are the perils of online banking? And just what are you going to do with all that spam? Tommy, Jack and Maureen attempt to enter the digital age ... with a little help from Skippy!

Five vignettes from the video illustrate the following challenges:

The perils of Internet banking

Who needs a computer

Making an email

Upgrading software

Internet shopping

The full video illustrates a wide range of challenges presented to old people by Digital Technology, which can be used to promote discussion. These include (with start time codes):

- | | |
|------------------------------------|----------------------------------|
| New ways of working (145) | Remembering PIN numbers (235) |
| Icon Design (300) | Why have a computer (346) |
| Dangers in the digital world (400) | Reasons for technophobia (456) |
| Identity theft (625) | Visual distractions (900) |
| User Confusion (1025) | What does the user want ? (1100) |
| Too much choice (1120) | What is the "Internet" (1147) |
| Computer classes (1346) | Aesthetics of equipment (1425) |
| Visual problems (1500) | Patronising design (1510) |
| Stress (1600) | Language (1702) |
| Disastrous Functions (1722) | Incompatible systems (1830) |
| Warning messages (2032) | Language (2048) |
| Complexity (2220) | Metaphors (2250) |
| Adaptive systems (2234) | Feedback to user (2150) |
| Multiple methods (2543) | Highlighting information (2640) |
| Lack of understanding (2800) | |

My PhD

Where God and computers meet

Stephen Clough

Where I have come from – computing and theology

Sometimes I feel like a perpetual student. I suppose this comes from the fact that I am, but, I should point out, most of the time I have been part-time and working full-time alongside it. I started in a traditional way, getting my BSc in computing as a full time student, graduating and starting work. I thought that was likely to be the end of my academic study, especially as the degree was not as good as I had hoped! I was also bored with studying, and wanted to do something with my acquired knowledge, and earn some money.

However, several years later, I got “the itch” back, and started studying again. Because I wanted to do this for me, not for a job or a career, I wanted to look into an area completely removed from computing, so I started studying theology. Initially, I had no real plans to make it a degree, I just wanted some academic challenge – a challenge that 10 years later did (finally) result in a theology degree. And it was an academic challenge, but not a “purely” academic one, it also engaged what I was studying with real life, not least because I was studying part-time, and so the trials and traumas of the day at work would, quite naturally, feed into my evening study. It also showed me that I could write essays – logically thought through pieces of writing, something that I hadn’t done previously.

What stuck with me, as I studied a subject unrelated to my work, was how closely related to my work it actually was. A significant amount of what I “learned” in the degree was not the academic study of theology – although there was a reasonable amount of that – but

the relationship of a philosophical insight into people and their behaviour to my work. In particular, I started to see that the arrogant view of many IT departments (and developers) that they knew the best way of doing things was often wrong. I also started to realise that the people I was writing software for actually knew what it should do – and how it should do it – better than I did. My role was to make things happen, as invisibly as possible, but in the way that the end users of the software would find natural. One of the most significant aspects was that I finally had a consistent model with which to challenge some of the accepted thinking.

Where I want to go – how these combine

OK, so what do I do about that? While the theology gave me the philosophical insights into how things should be, and the technical developments made a far more flexible approach to the interface possible, I was still lacking an approach that would help me build better applications. And, at least in the commercial software development world, there was a distinct lack of ideas demonstrating why applications should be developed in a particular way. There were then, and there continue to be, many suggestions for ways that you can do things (technical processes), but the availability of advice on conceptual improvements was sadly lacking.

I realised that, if I was to scratch this new itch, I would have to do some work myself – I would have to engage in some research so that I could learn about this area beyond immediate commercial requirements and drives. If I wanted to develop a philosophical understand-

ing of conceptual software design then I was going to have to do this for myself, as there was nothing available that immediately related to my concerns.

So how do I draw up a proposal for research study that would both be academically acceptable within the field of computing and yet draw on my theological insights too? I realised that the broad topic of HCI, and, within that, something that dealt with the way that computer applications can be used to make a positive difference to people in a working environment, would be an interesting line to explore. I wanted “the working environment” to be included because I felt that this had not had as much focus as leisure environments, and yet the demands and requirements of an application that you work on all day are very different from one you use for 20 minutes. Also the potential and possibilities of a working environment from the perspective of co-operational working and feedback was radically different from one-off usage.

As a pertinent example to my current work, the design decisions to be made for a commerce web site, where customers will tend to hit-and-run, are very different from the back-office applications that the site owners need to manage and process the orders and support the web site. If an interaction study is done, it is likely to focus on the front end (because getting that right has direct commercial implications), whereas the back end is normally tested in terms of functionality, not long-term usability.

As I started my reading, it became clear that I was going to have to do some interesting cross-disciplinary work, not just across my disciplines, but also within the whole HCI-related arena. It quickly became clear that to study



I work for Snow Valley, writing e-commerce applications, and studying for my PhD in my spare time. Also occupying my spare time are my family – a wife and two children – and involvement in a local church. Occasionally I get a chance to sleep too.

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this topic, I would need to draw from designers like Edward Tufte (1990), people who try to explore the implications and impact of design decisions (not just software related) on finished products. I was going to have to draw from usability experts, like Norman (1988 and 2004), and their approaches to interaction with objects (again, not just software). And there was clearly going to be some psychological work to do, understanding how we behave and why some things work better for us – and I discovered Csikszentmihalyi (1997 and 2002), who has done some excellent work in this area relating to being productive and happy at the same time.

Happiness is a strange concept to include in software development, but in this context it involves not enjoyment, but what he calls “flow” – where a person is being very productive, because things work cleanly and obviously for them. This only occurs when people are treated like people, not just resource units, something that links clearly back to my original theological basis – however linking Csikszentmihalyi to a theological understanding of personhood and the value of people as people is going to be interesting!

Where I am going – the practical implications of my research.

So does any of this have any real substance behind it, or is it just waffle? One of the reasons for wanting to do the formal study of a PhD is to have an external, formal structure and authentication for what I was doing, to ensure that it was not just waffle, but had some scientific basis to it. So I will be talking to people, to ascertain the issues people actually

have with software that they use. Then, having found some areas to study, I will be looking at experimenting with various feedback mechanisms to provide some more objective perspectives on how people actually work.

The intention of these stages is to identify what forms of providing feedback can actually help in enabling people to work – help to get them into the flow experience. Because the experience of “flow”, as well as the perception of what is working well and what is not, is very subjective, the intention and requirement is to find what actually works, what means and facilities make the tasks that people are trying to do flow better. And a combination of the perceptions that people have, with the more objective timing of how tasks are achieved, should give some indications of what does work, and what doesn’t.

There is also another section of the experiments, which will be asking volunteers to perform specific tasks on existing web sites. So this may be to find a specific product on a site, or to register, having found tasks that present some challenge, or present some challenges for the volunteers. It may be that I will ask people to find a specific item that doesn’t exist, where the response is interesting or poor. The intention is to see if the volunteers can find the answers to the questions or problems – whether they can get feedback even if it isn’t obvious. I want to find out if people can use commercial web sites to do what they should be able to do.

Currently I work in writing e-commerce applications, which means that the lessons that I am learning, the ideas that I am picking up, and the progress and developments of them I can feed into the work I am doing. It also means that I can relate the practical and commercial requirements of the applications that

I write to the research work I am doing. The deliberate engagement of faith and work and study together mean that I always have some insight and some alternative view and perspective on my study. When studying the relationship of life and computers, then everything has an impact! But then what I am trying to do is provide a holistic understanding of what drives me, so that is good.

References

- Csikszentmihalyi, M. (1997). *Finding Flow*. New York: Basic Books.
- Csikszentmihalyi, M. (2002). *Flow – the Classic Work on How to Achieve Happiness*. London: Rider.
- Norman, D. (1988). *The Psychology of Everyday Things*. New York: Basic Books.
- Norman, D. (2004) *Emotional Design*. New York: Basic Books.
- Tufte, E (1990). *Envisioning Information*. Cheshire Conn: Graphics Press.

My PhD

If you are a PhD student just itching to tell the world about your research or if you’ve enjoyed reading about some of the emerging areas of research that the My PhD column has recently discussed then we would like to hear from you. We are currently accepting one to two page summaries from PhD students in the UK and across Europe with a focus on being open and accessible to everyone in the HCI community.

If you would like to submit or would just like more information please contact either Stephen Hassard or Eduardo Calvillo using the contact information contained below.

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On The Design of Everyday Life

Elizabeth Shove talks to John Knight

I was fortunate to interview Elizabeth Shove during the summer, just as I had given *The Design of Everyday Life* a quick first read. I was particularly interested in finding out how the book has been received, and its implications for design and research, and Elizabeth graciously agreed to give Interfaces a exclusive interview.

How has the book been received and where is your research going next?

The book has been a publisher's best seller and is becoming an increasingly standard reference in work addressing themes of materiality, consumption and everyday practices. Our research is now focusing on *The Dynamics of Social Practice*, this being the title of a book currently in preparation co-authored with Mika Pantzar. Another track is through linking the theoretical issues discussed in *The Design of Everyday Life* to broader questions of sustainability and social change, for instance through Elizabeth's ESRC Climate Change Fellowship and Matt's current work on product reuse and domestic energy use.

Is there a significant difference in how we understand computer-mediated consumption especially where it involves communication and social networks, or is it just more of the same that is seen in offline modes of consumption?

This is a massive issue which has not been core to our research. That said, the Internet inevitably affects the dynamics of practice from which patterns of consumption emerge, largely through facilitating specific forms of circulation and exchange of knowhow, materials and images. This happens in a range of ways. One of the most interesting in relation to the arguments we make in our book is that the Internet enables the propagation and reproduction of practices that are otherwise marginal or that exist in small localities; for example, individuals can locate sources of competence and evidence of

the relative normality of practices that might be strange for the people immediately around them.

It also matters for the availability of specialist or niche products – this has direct effect in DIY-related activity, where (relatively competent) practitioners can address a specific technical issue with an electric shower just by googling for the technical details and then finding the specialist part on eBay®. Some of these same dynamics affect the rapid development and speed of change in more mainstream practice, one trace of which is the adoption and churn rate of portable electronics. A further example might be how the Internet is enabling the circulation of secondhand goods – most obviously through eBay® but also through spatially local networks like Freecycle™ where these forms of exchange allow goods that are no longer of value to their current owner to find another sometimes very specific situation in which they are worth owning. We have not written about how these forms have a bearing on the wider dynamics of social practices but it is likely that there is some connection.

This question also points to the possibility that there are somehow different processes at stake in practices where computers are involved. This is an empirical question that it would be interesting to pursue further. This far, we can't see any real reason why the underlying dynamics of practice would be different – integrations of material, knowhow and image are still involved, but it may be that there are significant variations in how this plays out in the digital realm.

In HCI studies we often use immersive or shadowing techniques rather than verbal accounts to understand the product-person ecology. Is this something you think works or is interviewing a rich enough research method?

Interviewing, especially when combined with

observations, respondent-guided tours of spaces of the home, etc., can give fantastically rich data, but they are not sufficient for a comprehensive understanding of practices and the role of interactions between people and things within them, and interviews certainly cannot substitute for sustained observation of practices. At the same time, we don't believe that observation is the only way to study practices. In fact if the challenge is that of understanding how practices as entities travel and diffuse, secondary and even statistical data is likely to be at least as relevant. For instance, if we want to understand how daily showering has become normal we'd probably want to know about sales of relevant technology and patterns of water consumption as well as what individuals do behind the bathroom door. In other words a practice orientation has no necessary methodological consequences.

How representative do you think the design profession is (as surveyed in the book) of modes of production and are there significant differences in the role of, say, 'hidden designers' or a distributed model of design that includes users vs. the traditional creative?

We were more interested in capturing the views of a range of design professionals – concentrating especially on those working in larger and smaller organisations – and in finding out what these people thought about how they 'added value'. So no, our account is more of a dip stick than a survey and is definitely not intended to be representative. What was interesting was that we came across a relatively dominant discourse – shared by many of those we interviewed and repeated in the literature – despite our strategy of looking for variation. We didn't go on to include a more extended set of people who 'do' something like hidden design



during the course of using things or making them (e.g. the DIYers) in this part of our work, so it is hard to characterise other such roles. In the chapter on designers, we stuck to the task of trying to distil contrasting but coexisting concepts of what is entailed in adding value through (professional) design.

How do you think the conclusions of the book should best influence current design research and practice?

One answer is through extending, or perhaps making explicit, the range of social theory on which design research could draw. A second is by drawing attention to the point that innovations in products and services shape innovations in everyday practice. This takes debate about 'users' to a new level – and to a level that goes beyond more individualistic representations and deals instead with broader processes of social change. One implication is that designers have (a little) power and responsibility in reshaping everyday life and with it the shape of society. Another is that they do not do so alone. Figuring out what designers really 'do' is therefore a matter of thinking further about the relation between goods, services and everyday practice.

How far does the approach to material go in understanding less tangible stuff like software or is it very different?

We started with material objects, but the analysis we developed is probably applicable to the less tangible, particularly since few if any intangibles touch on lived experience without the mediation or at least implication of material things.

How does the Participatory Design and Co-design tradition fare in this analysis?

The difference is one of scope and scale. In writing about practices we are writing about (provisional) entities that endure beyond specific moments of performance. Involving a handful of

future users in design does not necessarily 'help' in anticipating the relation between product and practice in this wider sense, or over the longer term. This is partly because objects are in a sense never 'finished' – being part of ongoing and necessarily uncontrollable processes of integration in and into practice. We are often dealing with forms of material culture beyond the point of design.

We are also thinking about the processes involved in making 'new' practices (e.g. digital photography) and hence about forms of emergence that go beyond the normally narrower interpretations of participation (in something) or co-design (of something) in which there is a more or less ready-made focus or subject.

In the responses (e.g. the kitchen inquiry) there seemed to be consensus among couples, and I wondered if you thought that their views were an amalgamation or shared mental model of how things should be or whether there is more conflict and disagreement under the surface?

Couples sometimes did talk about differences of opinion – and debates about actual or possible material arrangements were often bound up with slightly or significantly different visions of how family life should be. There would be scope for interrogating these relations and conflicts through close analysis of the materiality of the home (see Jean Claude Kaufmann, *Dirty Linen: Couples as Seen Through Their Laundry*). However, we were more interested in the relation between having and doing as a means of conceptualising change than in the question of how specific situations were configured and negotiated.

What implications are there from the analysis for sustainable consumption and how do we understand the turnover of perfectly

functional products? Should or could products better support meaningful disposal?

One is that conventional explanations focused on consumer desire fail to engage with the wider dynamics of practice, dynamics which are partly generated and perpetuated by patterns of product innovation. With the kitchen, pursuit of the new was often related to changing images of appropriate family life. It was not about chasing after objects for their own sake.

Second, we are interested in how products and infrastructures sustain unsustainable ways of life – this is a bigger question than that of throughput, efficiency or disposal. There are, though, further questions to explore about the death of practices and the consequent 'fossilisation' or redundancy of bits of material culture. This is something we are writing about now.

Do social scientists not pay enough attention to human relationships with artefacts, and if so, why is this and what consequences has it for our understanding of design?

Historically, social science has tended to overlook relationships with artefacts, the main exception being anthropology. The reasons for this are of course complex, but largely come down to the way the social sciences carved out intellectual space for themselves in the 19th century; and more recently through particular attributes of the 'cultural turn' which swept the social sciences from the 1980s. In the last decade or so, artefacts and materiality have become common currency in many fields of the social sciences, thanks to progress in the theorisation of material culture coming from the anthropological traditions, and from scholars in the tradition of science and technology studies. So there is now a lot of attention to human relationships with artefacts, but it is our contention that this attention remains partial, often neglecting the part things play in shaping social action.

Interfaces reviews

Shailey Minocha

I just wanted to say thanks to Shailey for allowing me (John Knight) to hog the reviews section with just one book and an interview with one of the authors. So please keep the reviews coming to Shailey who will resume normal service for the next issue.

The Design of Everyday Life is potentially such an important book that it warrants special attention and it also poses many questions for us; which is why I thought I would seek answers to some of them from one of the authors. I could easily have written reams on this book and I had to decide whether to just summarise the contents or to describe the context it comes from and its possible implications. Taking the second approach has meant the review is perhaps more critical than the glowing recommendation I had wanted to give; but rather than disapproval it's in fact the opposite and, yes, you should really read it for yourself; whether to just get the general gist of it or to go deep into the detail.

The Design of Everyday Life

There is certainly an opportunity here for some Gladwell or Norman to popularise the thinking in this book, which gives you an inkling of its value and its relative accessibility. It has been produced with the support of the ESPRC and AHRC's 'Cultures of Consumption' Programme and has a good mix of designers and sociologists.

Cultures of Consumption has that rare distinction of sophisticated theory noodling with commercial acumen; where else would you get thoughtful and useful thinking about Formica (page 107) and Bruno Latour (page 6) as well as insights into day-to-day design practice?

Even though it's a couple of years old, *The Design of Everyday Life* is still critically relevant to our community's reflections on third wave HCI and the play on our own 'Psychology of Everyday Things' is no mere marketing ploy either; but rather frames everyday life as *the* focus of enquiry and cocks a snook at maybe even cognition itself.

The Design of Everyday Life reminds me a lot of *Technology as Experience* by McCarthy and Wright in its ambition and even down to its structure of empirical studies and theory. The scope of the book is sufficient to keep you interested without getting overwhelmed. The 200 A5 pages cover in detail 'the practices of daily life' (page 6) and 'stuff' (page 2), both of which the authors argue have fallen 'between the cracks' (page 2) of academic research. They go on to say that:

... we move the study of technology and

consumption forward by thinking more explicitly about the dynamic relation between complexes of material artefacts, conventions and competences, and hence about the ongoing and characteristically emergent dynamics of everyday practice (page 9)

... [and]... that practices are the fundamental unit of social existence: 'both social order and individuality' (page 12).

The main implications for us are that we should focus on doing rather than using, and think about the doability of interconnected stuff rather than the singular usability of single devices. And we should certainly not limit our enquiry to walk up and use studies and metrics or design single products interfaces without reference to their social impact.

But that *is* HCI, I hear you say. And we pretty much already know and do that. While there is a sense of déjà vu here it's more about working on a bigger canvas that marketers would call the customer journey and sociologists 'practice-as-entity' (page 13). In summary, consumption is an actionable area of inquiry for us and one that we can make operational, we just need to calibrate our current thinking and doing to a consumption orientation.

The book's audience must be sociologists and it's slightly discursive which is at odds with the simple world of usability and textbook delivery we like as designers but dislike as

humans. So it's not the easiest read but certainly essential for the HCI community; especially if we are to build a sustainable discipline that has relevance beyond usability. Indeed, the authors propose as much, stating that:

... theories of practice provide a useful and generative framework with which to integrate ... [different] ... perspectives (page 11).

The sociological focus of the book defines its adversaries, who include material culturists and anthropologists. They take a hit, as do semioticians, for focusing on fluff rather than stuff. Dislikes include that:

material objects consequently feature as semiotic intermediaries, carrying meanings and resources for the construction of individual or collective identities ... (page 4)

and

in sociology as in anthropology the common tendency is to privilege the semiotic over the material. (page 6).

Preying on sociological targets combined with a focus on the product end of design means that psychology is absent and the anti-cognition brigade appeared as

what distinguishes theories of practice from other[s] ... is their location of the social rather than existing in mental qualities.

I hope you enjoy the reviews and find them useful. Please contact me if you want to review a book, or have come across a book that you think should be reviewed, or if you have published a book yourself recently. I very much look forward to your comments, ideas and contributions. If you would like Interfaces to include reviews on a particular theme or domain, then please also let me know. Many thanks.

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The Design of Everyday Life
 Elizabeth Shove, Matthew Watson,
 Martin Hand and Jack Ingram
 Berg Publishers
 ISBN 978 184520 683 3
 2007

Reviewed by John Knight
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I have no problem with questioning semioticians or scary cognitivists and I am sold on the stuff of everyday life. But the more contentious result of the shift to practice is maybe an inadvertent reduction in the human side; doing, yes, but also being, emoting and sentience, etc. I hope the benefits that this book promises for HCI do not work on a one-in-one-out principle; and that we can accommodate semantics and physical doing and everything in between to enrich rather than impoverish design and, more importantly, everyday life.

It's also an important point to note that the empirical studies included in the book suggest that such cognitive concepts as skill and competence are central to practice (page 42) and indeed that these help explain patterns of consumption far better than just need and value (page 134). Any discussion on competence will have an HCI person shouting 'Activity Theory!' or 'Vygotsky!' or 'affordances!' or 'mental models' but these are yet to be added to the mix.

Alongside cognition, both the more science-oriented and the more frivolous-minded parts of design (e.g. fashion) are as much wallflowers as HCI is. The nearest we get to a look-in is user-centred design, defined as where

value is understood to reside in the relation between people and things rather in things alone
 (page 119).

And that 'human-machine interaction' (page 121) is predicated on when

consumer/users' needs, attributes and goals are taken to be stable and

therefore amenable to systematic analysis... (ibid).

While that statement might have been true in the distant past, it's patently unworkable and false today. On a more positive note, the importance of 'designing entire ecosystems of interacting artefacts' (page 135) is made strongly, all of which suggests the book is mainly a challenge to traditional design and misunderstanding of what we do (OK, we need to consider practice-as-entity and our name doesn't help). But as astonished as I would be to end up defending cognition, these gaps show the value in a dialogue between the sociologists and us, rather than a failing of the book.

The sociological research that underpins *The Design of Everyday Life* tackles three practices, comprising kitchen renewal, DIY and digital photography. A wealth of data is uncovered, which is then used to flesh out some of the theoretical stuff, for example that practice is not just scripted (page 143) and it's 'future oriented' (page 101), meaning that what we do in the present relates to what could happen as well as what is being done right now.

Compared to our ethnographic research, contextual studies and participatory prototyping, the research is remarkably agile, but it's the focus on practice rather than method that is important here and maybe we are often too narrowly focused on use. However, it's no big step to extend our studies to account for the whole relationship/journey/practice.

To conclude, I highly recommend this book as a start in grounding HCI in consumption rather than just use. But it's not a one-way



process and we need to keep sight of what already works with what is useful from the new. Just as it is risky to design something without accounting for different kinds of knowledge, so is it to attempt design without understanding what people do and how what they do will be affected by product. So, yes, go and buy the book, read it and most importantly start a dialogue with the sociologist out there.

My first favourite HCI paper

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It was 1985. The Alvey Programme was well established. I was a second year PhD student in the Alvey-funded Scottish HCI Centre. I presented my first paper at HCI'85, the first British HCI Conference.

Twenty-four years on, many of the authors are still going strong in HCI (e.g., Dix, Frohlich, Gray, Johnson, Sutcliffe, Thimbleby). Others have migrated to other areas of computing or psychology (e.g., Barnard, Cook, Edmondson, Fowler, Kidd, Maclean, Rector, Runciman, Siddiqi). Others have unsurprisingly (semi-) retired (e.g., Alty, Kilgour, Long, Spence).

A few papers from HCI'85 still stick in my mind. My favourite remains *Requirements for an Intelligent Form-Filling Interface* by the University of Surrey's D.M. Frohlich, L.P. Crossfield and G.N. Gilbert. The paper reported early work from the Alvey Large Scale Demonstrator for the DHSS, the government department then responsible for welfare benefits in the UK. Only David Frohlich remains active in HCI. Nigel Gilbert is a distinguished sociologist with a more diverse menu than HCI's lean ethnomethodology diet. As for Leo Peter Crossfield, Google picks up a residual interest in human-machine interaction [sic] and stronger interest in leisure activities.

This paper remains a favourite because it shows what was possible in the early days of HCI. Firstly, the paper reports on work in progress, on possibilities, rather than implemented and evaluated realities. Perversely for some, no doubt, this gives it more enduring value than the nailed down results that came to be the *sine qua non* of top HCI publications. An insightful reader with e-commerce or e-government interests could still find many 'implications for design' in this paper for on-line forms dialogues. Secondly, the paper covers

a broad range of disciplinary inputs, ranging from domain-specific secondary sources on form filling in benefits settings, through navigation and interaction design, pragmatic use of artificial intelligence techniques, and software design architectures. And all this within 14.2 pages including references (we had word limits, not page ones, back then, hence that wasted 0.8 page or indulgent large form diagrams, depending on how you see these things).

Thirdly, and of least significance, the authors had fancy workstations with desktop publishing software and laser writers (my paper had to be typed, as did most, onto special camera-ready copy sheets). Their state of the art typesetting caused both longing and envy.

Fourthly, and most important of all, David Frohlich delivered an even more enviable presentation in a style that became his hallmark: measured, restrained and well paced with key points well highlighted (i.e., polar opposites of my presentations). I still recall his pausing before empathically noting the difficulties for claimants reporting personal circumstances when a husband was in prison. Superficially, this raised issues of how to complete specific fields in a form, but more deeply, for me, it exposed the limitations of any mechanical user interface design solution to providing genuine support for people in difficult circumstances. It has taken over 20 years, with the emergence and consolidation of value-sensitive and socially responsible interaction design, for these sorts of issues to become ones that we can design for with confidence and genuine empathy. It took me over 20 years too to get here, moving with HCI beyond the psychological and the technical, through the social and contextual, to a full embrace of everything involved in being human, such as feelings, identity, relationships, treasures,

dreams, hopes, nightmares, obligations, activism, engagement, enchantment, fun and much more. David discreetly highlighted something that mattered in a way that saving keystrokes, balancing display layouts and signposting dialogues did not. These at best were means to ends, but often to irrelevant ends of limited real worth. Minimising the discomfort of having an incarcerated spouse is, of course, incommensurable with Taylorist tricks, but that won't stop most of us from making comparisons here, whether or not we can fully articulate them, or to the satisfaction of those in HCI whose calling has never extended beyond the cognitively optimal.

Fifthly (I'm not done yet), David's empathy here was not a response to the primary field data that for some has been the only empirical currency of worth in HCI. All of his examples came from existing government (HMSO) reports. Despite the copious funding of a large Alvey demonstrator project, the first move was not to embark on extensive field research. No doubt partner expertise in the DHSS Forms Unit helped considerably here, but reliance on domain experts remains too suspect to too many HCI researchers with a vested interest in doing their field work themselves their way. The relative inability to make good use of secondary domain expert sources in HCI has no doubt held back many projects. Reinventing the wheel is one thing, redrawing an existing one is a far worse waste of time.

History is the past in the present, and as such we unavoidably project the present onto the past, yet the above contains no anachronisms. Instead, the Surrey paper was a snapshot of HCI's potential, and its value will endure until this potential is more fully realised. However, if and when it is, such potential may not be demonstrated in a single publication.

Multi-disciplinary work such as what was reported here back in 1985 provides ever more reviewer fodder as a project moves from initial frameworks to detailed user research, system design and evaluation. More opportunities arise for disciplinary nitpicking once the flesh is put on the bones, which are generally picked off with relish [pun intended]. We are thus less likely to ever see the big picture in HCI away from the very rare 'book of the project'. Work gets salami sliced across conferences and journals to side step the disciplinary zealots who value epistemic cleansing over post-disciplinary pragmatism. The best views however, are always from the top of the mountain, and not from the crook of a glen. Nostalgia may not be what it used to be, but I long for the open spaces of early HCI, before the white settlers of one discipline after another rolled up and built their stockades.

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