

Social Digital Objects for Grandparents

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Abstract

This paper describes a collaboration between the University of Dundee and Microsoft Research in which product design and interaction design students were asked to design digital products for older users.

The project offered an introduction to inclusive design for the students. Rather than approach this in terms of designing for the whole population, they each designed with and for a particular grandparent. And rather than consider the accessibility of an existing product, they used this perspective to catalyse radical thoughts of future roles for digital technology.

The various stages of the project are described, from initial user research through prototyping to final presentation at Microsoft's Design Expo in Redmond. Reflections are included from the audience at this event, the students, their tutors and our industrial partners.

The paper ends with a short consideration of the role of digital technology in our everyday social interactions. At Microsoft this is part of *Socio-Digital Systems* research and at Dundee we have started to call this *Social Digital*.

Keywords

Inclusive design, interaction design, product design, design education, socio-digital.



Figure 1: the networked miniature sewing machines of *Social Sewing*

context

Microsoft Design Expo

Each year Microsoft sponsors a semester-long class at several interdisciplinary design schools worldwide. This is followed by an invitation to present the best class projects at *Design Expo*, an event that forms part of Microsoft's annual research *Faculty Summit*. The rationale is to keep connected to current design thinking among new designers and their tutors, to increase the profile of Microsoft in the design community, and to give their own design teams a chance to step back from their projects and think afresh about some of the issues raised. A loose brief is chosen in the hope that it will give students room to surprise while providing enough focus to relate the student's work to Microsoft's own current commercial concerns. In 2008, the brief was *Learning and education*; in 2009 it was *The future of working*.

interaction design and product design at Dundee

In 2008 and 2009, the invited courses included, collaboratively, Product Design and Digital Interaction Design (previously known as Interactive Media Design) at the University of Dundee. Microsoft were aware of their growing reputation for design work that was both sensitive and technically accomplished, often realised through prototypes that actually work.

It is worth noting that these courses are undergraduate programmes, which is unusual for Design Expo, in which most of the courses are (post-)graduate. Also that each is inherently interdisciplinary, even before collaboration, Digital Interaction Design being run jointly between the School of Computing and Duncan of Jordanstone College of Art & Design (DJCAD), Product Design between DJCAD and Engineering.

themes

networked objects for grandpeople

As tutors, we chose to further focus each project on interactions between the generations, which is why we believe this project might be of interest within inclusive design.

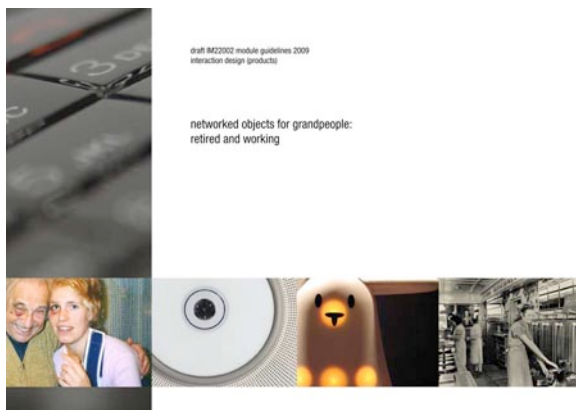


Figure 2: module guidelines for *Networked Objects for Grandpeople*

We have found that a starting point as generously open as 'learning and education' can be overwhelming to undergraduates. Quite tight constraints can play a positive role and help them find a focus.

So we decided to set a 'brief within a brief'—*Networked Objects for Grandpeople*—by which the students were asked to design internet-enabled objects for their grandparents. The overlap between these briefs was thought-provoking. In the case of *The future of working* it implied the possibility of working, in some way, after official retirement.

introducing inclusive design

Each student was initially asked to collaborate with just one of their grandparents (or with another person of the same generation). They were required to spend time over their Christmas holidays talking to this 'grandperson' about their life and experiences, past and present. In the case of the first brief, *Learning and education*, this often focussed on collections of objects, such as of photographs, recordings, notebooks or correspondence, whether related to leisure, hobbies or a vocation. In the case of the second, *The future of working*, the research revolved around the grandparents' working lives and what they missed about no longer working—and what experience and wisdom they felt that they might still like to contribute.

Having students work with their own grandparents helped to navigate some of the ethical issues associated with students as young as 18 years old. But this pragmatism also allowed the module to be more ambitious: our students were designing for a generation not only more likely to be unfamiliar with digital technology, but also unused to experimental design work. By working with their grandchildren however, within the bond that existed, their grandparents could more easily engage with this exploration.

grandparents as extraordinary users

This relationship is crucial. The first *Learning and education* brief became about the giving of knowledge between grandparent and grandchild, of designing for a cross-generational relationship rather than for an older demographic. The role the grandparents are playing here is not as vulnerable and excluded users, but as remarkable individuals with extraordinary lifetimes of experience (as we shall see) beyond those of their grandchildren designers. Grandparents as potential pioneers of digital technology, not laggards.

And, without accepting the stereotype of being 'set in their ways', the degree to which the grandparents had some established routines was useful. We often aspire to technology fitting around people and not the other way around—perhaps a little less flexibility on the part of the people helped our young designers to appreciate the challenge of this aspiration.

inclusive design? bespoke design

Later on in the project, the students joined together to form teams, sharing the roles of designing and building the interface and object. But rather than amalgamate their researched users into a persona, they chose a single individual to continue to design for.

Inclusive design has of course been defined as "design for the whole population" [1]. This project both embraces and challenges this: considering an age group not always in

mind when digital products are conceived, but at the same time deliberately designing for an individual not a whole population. This is not just a case of adopting an ethnographic approach to the initial user research, but continuing to engage with the tastes and preferences of individual users—preferences that might not be shared by other older people.

inclusive design? exquisite design

The aspirations of inclusive design are to influence design in general. But for true convergence, not only must design become more inclusive, but we believe that inclusive design should become more, well, 'designerly' [2]. Because removing barriers to accessibility is one thing; designing socially, culturally, aesthetically and emotionally appropriate interactions is quite another. As tutors we have to be explicit about this because accessibility alone can be so demanding.

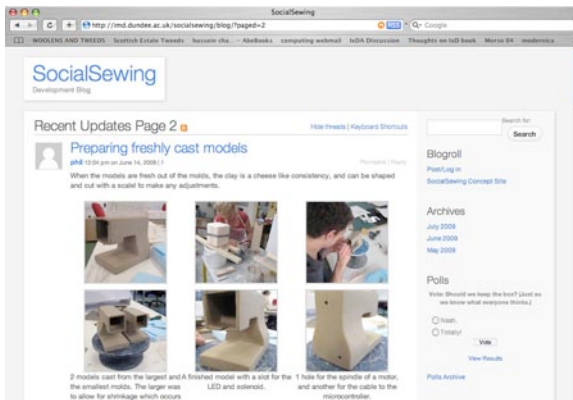


Figure 3: the students' blog, agonising over how to best slip-cast the ceramic sewing machines

design thinking through doing

Our students made working prototypes of their design concepts. This is not really about user testing in the traditional sense—the ideas are too speculative and the prototypes not robust enough for genuine adoption by a grandparent. We have found that it is often only by making something however, that students identify and confront the core issues. The act of design does not descend into detail, rather the details are often where the most profound issues reside. This echoes Charles Eames's variously-quoted but influential assertion that the details, far from being mere details, are the design. And in the work of Tim Brown's most influential exemplars of design thinking, this thought is inseparable from design practice [3].

Our students learn to make working prototypes using simple, credit card-sized *Arduinos* [4]. These can be programmed to respond to inputs (from switches and sensors) by controlling outputs (such as lights, speakers and motors) and information exchange (via wireless or mobile network). But these prototypes are not technical demonstrators, rather experience prototypes used to explore and inform design decisions [5].

Working prototypes can encourage expansive thoughts by provoking reflection and discussion, inviting a response in a way that a drawing may not (although we also

encourage our students to sketch). In this sense, the project is as much a piece of critical design as inclusive design, asking questions as much as suggesting solutions—a valuable role in a complex and evolving area as inclusive design [6].

choosing the concept

By the end of the taught semester, each team had advanced their concept to the level of working cardboard prototypes with embedded electronics. They had also encapsulated their concept and the research that underpinned it in a short video. It was at this stage that the two industry partners come in for more formal day of presentations and evaluation. There was a lot at stake: only one team could be chosen to be flown out to Redmond in order to present their idea. As each team presented their work they were questioned by each of the partners, who then retired to choose their preferred project. The process used was to rank a top three and then to compare this to the tutors' own rankings to ensure that there was no uncomfortable miss-match of educational messages (in fact these internal and external shortlists were identical each year).



Figure 4: the students presenting their concepts to the industrial partners

two chosen concepts

Neil and Donald...

In the first year, the chosen concept was *Storymaker, Storyteller* by Neil Dawson, Natalie Montgomery, Lee Murray and Jo Montgomery.

Neil's grandfather Donald worked as a teacher in Iran in the 1970s, where he had many remarkable experiences. He took hundreds of photographs, but these are hidden away in shoe-boxes in his attic. Donald and Neil are both aware that when Donald is gone, and with him the stories that lie behind these images, any detailed narrative of this episode from the family's history will be all but lost.

... and Storymaker, Storyteller

Storymaker, *Storyteller* applies digital recording and communication to encourage the passing on of these stories. It is a system of two separate products that work together, one for grandfather and one for grandson.

The *Storymaker* is an enhanced (hand-held) slide-viewer for Donald: he can view his photographs and at any time press a 'Record' button and dictate the story behind a particular slide. When he is happy with this explanation, he can press the only other button, 'Send', and the slide will be scanned and sent via the internet, along with the accompanying voice recording.

Neil has the *Storyteller*, which receives, archives and displays these transmissions. It is a projector, because projecting the images in a darkened room is part of the atmosphere of a slide-show. A simple rotary dial allows Neil to scan through the pictures. He can set a whole sequence of images playing, or choose to hear the story behind a particular image.

Mike and Despina...

In 2009, the chosen concept was *Social Sewing* created by an international team of six students: Mike Vanis (Switzerland), Ruth Tullis (Scotland), Anna Rendhal (Sweden), Brian Matanda (Zimbabwe), Philip Gordon (Northern Ireland) and Christopher McNicholl (Scotland).

Mike's grandmother Despina lives outside Athens, and still works as a seamstress. She used to share a workshop with other seamstresses, but now that they are in their seventies and eighties, each sews alone in her own home. They all say that they miss the companionship of working in each other's company, and because sewing is less rewarding, many are considering giving it up—which could lead to further social isolation.

... and Social Sewing

The concept, *Social Sewing*, uses dedicated internet-enabled products to restore just something of the connection that the women had when working in the same room. The four women each have three miniature sewing machines on a shelf above their cutting table. Each of these miniature sewing machines corresponds to the sewing machine of one of their friends, and mimics its behaviour: when the original sewing machine turns, little motors in the miniature model rotate its wheel and move its needle up and down, accompanied by the sound of the proper sewing machine playing through a loudspeaker in the shelf. There is a peripheral sense, in movement and sound, of the other women's sewing machines, which may just be companionable, but could be interpreted as an indication of how busy they are or even what kind of stitching (curtain hems? button-holes?) they are working on. The miniature sewing machines mimic the activity of sewing, chattering away all day in the background.

reflections

feedback from Microsoft

The highlight of the *Design Expo* is when the student groups present to the audience of Microsoft researchers who are gathered for the *Faculty Summit*. Carefully

choreographed by Lili Cheng, the students are put through a rigorous schedule of rehearsals to practice and refine their presentations to a professional standard. Each team has 15 minutes to present to the audience, which includes a panel of invited experts who offer reflections on each project.



Figure 5: Anna, Mike and Ruth introducing Despina as part of the story of *Social Sewing*

Commenting on *Storymaker, Storyteller*, Bill Buxton, Microsoft's Principal Researcher commented that "It bridges the generations of people, but actually I think it was just as elegant how it bridged the generations of technologies: [your grandfather] speaks in the technology of his day and you view in the technology of your day and it's seamless—that's elegant and I've not seen that before... so thank you". And there followed a rich discussion between the expert panel and the students and amongst the panel.

Reaction to *Social Sewing* in 2009 was if anything more extreme: Chris Pratley declared himself rendered "speechless" by the concept—later explaining that this was because it was such an unexpected response to the brief of 'the future of working'. Unexpectedly lacking a screen or GUI (Graphical User Interface) and unexpectedly focussing on retired people to cast new light on the future of working.

student experiences

Neil says that just undertaking *Storymaker, Storyteller*, he learnt more about his grandfather's time in Iran that he had known before. He felt this to be all the more enlightening, given the often negative political perceptions of Iran prevalent during his own lifetime.

For another student, Pablo de la Pena, the notion of more physical interactions with digital technology has had a lasting impact on the way he sees his future as an interaction designer. "I realised that the future is not going to be lived in a web-browser". For Calum Pringle, the lessons lay in employing design ethnography and participatory design, techniques that are just as appropriate to niche products as to universal. Here is inclusive design as a provocative influence on design as a whole, influencing new directions in digital products rather than fixing existing but excluding applications. Perhaps this potential is obvious to those focussed on inclusive design, but these two young designers (New Designers Best Interaction Designer 2010 and Design Week Rising Star of Interaction Design 2010 respectively) are amongst the future pioneers of interaction design itself.

educational reflection

As module leaders, we feel that our students' experiences of this project, which involves so many profound—and the risk is sometimes intangible—issues, have benefitted enormously from being grounded in at least three ways:

by co-designing with their grandparents, the students gain an understanding of the importance of reconciling individual people's perspectives with broader perspectives of inclusive design;

by building working prototypes, they learn of the importance of details in effecting inclusive design—of the difference in aspiring to inclusivity in principle and delivering it in practice;

by being mentored and critiqued by such respected industry partners, our students now realise that inclusive design will be part of all of their future careers in some way.

research reflection

A theme that emerged in both chosen concepts is the application of interaction design to spoken communication. Another esteemed member of the expert panel, Joy Mountford, applauded *Storymaker, Storyteller* for its choice of such an evocative medium. In *Social Sewing*, the miniature sewing machines act as an intercom system, transmitting not only sewing activity but also an open channel of backchat—but with the profound qualification that nothing need necessarily be said. Considering a specific group of older users has opened up approaches that could have much more widespread relevance.

Interaction design, so long associated with screen-based media and graphical user interfaces, has much to contribute. At its most profound, this can include providing a voice to people who cannot speak (or otherwise have complex communication needs, a field known as Augmentative and Alternative Communication) [7].

industry reflection

In both years the projects had a big impact. There was something about the work that distanced and distinguished it from the projects by the other design schools taking part in *Design Expo*. It is hard to be sure why this difference comes to the fore. Is it that British design schools take a more conceptual approach to design work? Is it because the other schools placed their *Design Expo* class inside interaction design and so missed the physical muse that product design implies? Is it that the class deliberately mixed student teams from two different courses? Or is it because the other design schools' students were masters level, not younger undergraduates?

In any case the projects were startling. Many of the panellists chosen to give expert critique after each student presentation were left speechless, but on the internal designer mailing lists discussion ensued around the nature of such bespoke design. In the 2008 *Design Expo* presentation one student was asked if the design would work as well for their grandmother instead of the grandfather for whom it was designed. The student looked a little flustered and replied that it would not, since she was dead. Within Microsoft we focus design effort on actual users, either studied in the field or brought in to experience product prototypes in usability lab settings. These real user experiences are often narrated into personas to ensure that our development teams have real

customers in mind when making design decisions. But the charmingly personal and thus deeply nuanced approach of the students gave us something to reflect on.

social and digital

Two of the authors are part of Microsoft's Socio-Digital Systems research group. Under the tagline "Elegant technologies for complex lives", its stated aims are "to use an understanding of human values to help to change the technological landscape in the 21st century. Beyond making us all more productive and efficient, we ask how we can build technology to help us be more expressive, creative, and reflective in our daily lives." [8]

In academia too, the role of digital technology within society is receiving attention, for example through the Research Councils UK Digital Economy Programme. At the University of Dundee, we recognise an intellectual territory shared by Product Design and Interaction Design and further illuminated by Design Ethnography, in terms of the design-led application of digital technology to social contexts. In other words connecting people with technology by design. Perhaps what makes this distinct from the increasing role of digital technology in almost every other discipline as well is our belief that the everyday—even mundane—instances of digital technology woven deep into the fabric of our everyday lives can be as profound as its more specialist roles. We have started to articulate this focus as *Social Digital*.

Storymaker, *Storyteller* and *Social Sewing*, although undergraduate projects, illustrate this overlap between the social and the digital—an overlap that is increasingly important in inclusive design.

subtle and digital

But we are a little nervous of being misunderstood. When we reach for the word 'social', we do not mean it to necessarily imply communal action or direct collaboration. We feel it important to stress the subtlety that might be involved.

One of the strengths of *Social Sewing* is its lightness of touch. As Mike reflects on the *Design Expo* video, "sometimes [my grandma and her colleagues] just concentrated on their work and the rumbling rhythmic sound of [each other's] sewing machines was just enough social interaction for them".

And we end on a final reflection on *Storymaker*, *Storyteller* from Neil:

"I think the project was strengthened by my Granpa's charisma, story and input but I have wondered how it would have been received without as much involvement on his part; was it the solution people liked, or was it him? It's difficult (and most likely wrong to try) to disentangle the two, both from my thoughts and memories of the time and the project itself."

How self-deprecating—but how appropriate.

acknowledgements

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weblinks

Videos of the student presentations are online:

Storymaker, Storyteller

<http://research.microsoft.com/en-us/UM/redmond/events/MSRNVideoContent/FacSum08/16247/lecture.htm>

Social Sewing

<http://research.microsoft.com/en-us/UM/redmond/events/fs2009/videos/17447/lecture.htm>

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