PROJECT DIARY
1200 words

Ben gets obsessed with things sometimes. That's how this all began. Back in 2001 when he first saw the 'Baby' replica in the Museum of Science of Industry in Manchester and wanted to know how it worked (the 'Baby' is the name given in the late 1950's to the first modern computer built at the University of Manchester). Seeing it, Ben had an idea to build a Star Trek-style tricorder that would allow him to scan the machine and tell him how it worked as though it was alien technology, which in a way it was. He realized many other people had built similar devices but if you wanted your own you had to build it yourself, just like if you wanted a computer in 1950, you had to build it yourself.

Fairly early on he met Professor Hilary Kahn who, along with her husband Professor Brian Napper, know everything there is to know about computing in Manchester (at least, we think they do). Ben and Kris (we—the ones writing this chapter, and the people behind the "we" from here on) met at The Banff Centre, Canada and began to work together not long after. Our projects often begin with Ben's obsessions:

Ben: 'How about Captain Scott?'
Kris: 'Too macho.'
Ben: 'Sir John Franklin?'
Kris: 'What is it with you and old arctic explorers? How about the fall of Slobodan Milosevic and the idea of popular revolution?'
Ben: 'How about the whole Balkan war? Too big? Too war? Too Balkan? How about early computing?'

Then there were many grant applications, and almost as many rejections.

Eventually we wrote an application for ITEM and FACT. 'What about a technology partner?' they wanted to know. 'What about a technology?'

'Hilary Kahn at the University of Manchester?'. 'She was practically there at the invention of the world's first computer,' we exaggerated.

Hilary, in her own work, had just started talking to Intellident. Lucky for us. She mentioned this. How about Intellident as technology partners? And so it was.

Thus, we welcomed: Intellident, our new technology partner. Intellident would enable us to build the tricorder. Using their Radio Frequency Identification (RFID) tags, and their expertise and generosity with it, we could embed stories in objects, or appear to do so. An early conversation with Phillip Sykes from Intellident was promising. He knew a lot. He had interesting things to say as we worked to integrate RFID tags into our thinking.

This is probably an important point to make about arts and technology research: in our project, a subject matter (early computing) and a set of interests and our collaborative relationship came first. Then a technology (RFID tags) was introduced. Then our interests and subject got re-shaped, to a certain extent, around the work of testing that technology. This order of events would influence how the project proceeded and what it produced.

Phase 1: Stating and Re-Stating the Case

Our first action was to give a presentation about our ITEM research to the University of Manchester Curators' Forum, chaired by Sam Alberti on 30th March 2004. The goal was to alert people whose own work overlapped with our project that the ITEM research was happening—at the very least, to get 'buy-in,' as they say; but ideally, to enlist supporters.

Hilary's attitude towards us and the project, at this tender stage, is nicely expressed in her introduction to the Forum: 'I don't know what the hell they are going to do.' Fair enough. We weren't her typical project partners, and while she had no good reason not to trust us, neither did she have reason to trust us. Yet.

But on that occasion, we kind of blew it. We spoke about the technology too much. Perhaps this is an occupational hazard in an arts and technology grant. We would learn that the work (between art and technology) needs to be a negotiation: between the interests of the project partners, the needs of the subject itself, and the needs and capabilities and potentials of the technology. We couldn't ignore the technology, but neither could we build a project around it.

We presented our project again on 16th April to the other ITEM awardees, and then one last time, in its inchoate form, on 1st May at the Banff New Media Institute (a conference called Simulations and Other Re-enactments: Modeling the Unseen, http://www.banffcentre.ca/bnmi/programs/archives/2004/simulation/). Each of these talks helped us to re-formulate our initial interests in negotiation with our technology partners and our technology.

Phase 2: Research Research Research

First things first: we had to learn everything about the history of early computing—and not just at Manchester, but everywhere (one of our partners was a professor, after all. What if we got tested?) We read what was available to be read. We reported our findings intermittently to Hilary, who almost-patiently, almost-gently, always-unflaggingly corrected us, point by point. Our frequent errors weren't simply attributable to being neophytes; they affirmed something that has been a point of departure for many of our collaborative projects, viz. that books present a very particular kind of knowledge, and that other kinds of knowledge are available through other means and other media. Following this line of thinking, we began to conduct interviews with some of the early computer pioneers from Manchester.

We talked at length to Dai Edwards, who was one of the two students hired in 1948 to work on Manchester's second important computer.

We also talked at length and on tape to:

- Prof. Brian Napper, who did important early work on compilers and who has more recently written a compendious history of computing at Manchester (www.manchester50.org);

- Hilary Kahn, our project partner;

- Joyce Bowker, a first-generation computer operator;

- Dr. Mary Almond, who taught computer science at Manchester in the 50's, and who had, even at that time, been working in computing for many years.

- Chris Burton, one of Ferranti's early computing engineers, who recently did a most extraordinary thing: he led the project to rebuild the "Baby" (Manchester's, and arguably the world's, first modern computer) at the Manchester Museum of Science and Industry.

We videotaped all of the interviews, planning to edit and use them as content in the system prototype. We took detailed notes after each interview and have since watched and coded all of the videotapes.

These interviews form one of the most important and most accessible primary sources for the history of early computing in Manchester. They will be an important resource long after our project is complete, and we still plan to interview pioneers who we have so far failed to meet.

Phase 3: Analysis, or, Thinking through Doing

In good social scientific fashion (recall that Kris works in a sociology department), we started to work with the interviews as data. For us, they became the important foil to everything we learned from books (which, by the way, we found to be unanimously obsessed with two things: which institution built the first computer and Alan Turing—not that these aren't deserving subjects, but we felt there was more).

We hosted a seminar on 19th August 2004 to test some of our ideas about what was important, and how to present this history to a public. It was attended by Hilary Kahn, Brian Napper, Chris Burton, and Mary Almond, all of whom you've been introduced to. It was also attended by Jenny Whetton, curator of the computer collection at the Museum of Science and Industry; Sam Alberti, chair of the Curators Forum and a fellow of the Centre for Museology; Jeff Horsley, Exhibitions Manager at the Manchester Museum; Louise Sutherland, Science for Life Development Officer at Manchester Museum; James Sumner, fellow of the Centre for History of Technology and Medicine with responsibility for the National Computer Archive; and Rob McBride and Kit, both of whom did software development for our project. The 6-hour seminar went extremely well (and it was Ben's birthday, which meant that we had cake). Given the atomised state of computer history artefacts and the history of computing in the UK, it was a significant outcome of the project simply to get this important group of people in the same room. They represent most of the key centres of this history, and their collective enthusiasm and input both encouraged us and significantly improved the story we wanted to tell. Our favourite quote of the day came from one of the assembled authorities: 'I'm surprised. For people who started out knowing nothing, they've done ok.' We'll take that.

We then started the process of translating our research, and the feedback we had just received, into content for the prototype system—stories that would be delivered through the RFID system. These were small pieces of text, short video clips from interviews, and explanatory animations which translated what we had learned into content suitable for a handheld device, and content suitable for different types of audience. We produced these clips for a handheld computing device with a bizarrely proportioned 640 x 240 pixel screen. The system is run off of Internet Explorer, so all the files have to be HTML.

We videotaped ourselves a lot, because the prototype would need an introduction and someone had to introduce it. We did a lot of video editing. Video clips don't have to be very long to be awfully large for delivery through a wireless network.

At the time of this writing, we are still working on the system content. Long runs of text are not going to be the way forward. Why do you need an RFID system to deliver a type of content that wall text can deliver faster and easier? Our work now is to best take advantage of the technological capacities of the RFID-and-handheld-device system. Next week, we are going to make more video of ourselves and see where that takes us.

Obviously, the project continues, so we end our project diary with a kind of excuse for why the project itself hasn't ended. It is nearly a truism in a small part of the small world that Kris belongs to that, as Bruno Latour puts it, 'technologies betray our most imperious desires.' Anyone who works with technologies knows this. In other words, we control technology no more effectively than it controls us. Working with technology (just like, let us not forget, working with humans) inevitably leads to surprises, troubling consequences, delightful consequences, disappointments, and just far more work than you ever think it will in the naive beginnings of it all.

PROJECT OBJECTIVES
Our objectives, as we set them out in the original proposal, are reproduced below.

To research and prototype an information delivery system comprising of RFID tags and receivers, a computer based database, and a handheld PDA.

To explore appropriate content for such a system that takes into account the level of user knowledge.

To research the feasibility, desirability and management of user feedback and participation.

We will discuss each in turn.

Introduction

We are telling the story of computing in Manchester from 1946 until about 1962, an incredibly fertile moment of innovation for computer science, indeed the moment when computer science blossomed. We are basing our work on five objects belonging to the Computer Science Department of the University of Manchester.

These objects are, a Post Office rack purporting to be from the Baby (the world's first stored program computer), a variable speed tape deck from Mercury, a logic bay from Atlas, the control desk from Atlas and the read only memory from Atlas.

These five objects are windows into our discussions about computing history and lead to our first principal; that objects are more interesting and engaging for how they fit into networks of ideas and human stories than being of intrinsic interest themselves although they can be that too.

Rather than produce large quantities of text and paste it up beside the five objects we decided to use an information delivery system based around a handheld device to carry the interpretation. As far as the visitor is concerned this would comprise of a screen on which clips of information would appear.

At the time of this writing, the project hasn't panned out as we expected. We have succeeded in researching this kind of system but we have not succeeded in prototyping it. We have a good plan, which is ready to be implemented but it may well superceded by other projects other relationships before it is fulfilled.

Is the technology a chimera? Is technology a chimera?

You'd think that a project which began with a specific technology in mind would run the higher risk of techno-determinism, of letting the technology dictate the solution or believing that technology was, itself, the solution. In the absence of any technology at all we have ended up with a whole string of actions that are actually rather satisfying in their scope and content. We can say a few things about our working process more generally, about collaboration, and about working on arts and technology research projects.

We have come to the realization that the Museum of Zeroes and Ones is not a physical space.

It is not a set of technology trying to assert an interpretation over another set. It has no materiality at all. The Museum of Zeroes and Ones is us, talking, discussing, and presenting. We have a strategic view of this project as part of a much longer-term commitment to working on how to tell histories.

However there are some specific issues relating to telling the history of computing that we think are unique and intrinsic to that history.

Computer design from the very earliest days has sought to hide its workings from the user. Very quickly it became possible to use a computer without knowing how it works.

The Technology
To research and prototype an information delivery system comprising of RFID tags and receivers, a computer based database, and a handheld PDA.

We are less interested a specific technology than in a system which has the result of putting in the hands of visitors a device that can tell them more.

Having almost dismissed the technology it has had significant influence on our ideas, with its materiality, its embedded design decisions, its capacities and affordances, its limitations. It was a powerful force to be reckoned with. It enabled us to conceptualise in quite specific ways about what we wanted from such a system.

We want visitors to be able to pick up clips of information from objects, without submersing the object in text and other data. We want to be able to reveal context. As that context is invisible it seems appropriate to use a system that is in itself largely invisible. As we are talking about technology a technological solution seems appropriate.

We wanted to be able to tell what people had been looking at, how long they had been looking at objects and the pattern of their looking. This data is normally quite difficult and laborious to gather as it requires watching the way visitors move around a gallery.

As a corollary to the above we want visitors to be able to take away a record of what they have seen. People like this and it allows them to take the experience of the museum home with them, moving towards an integrated experience of actual visit, and then at home notes on the visit and delving into web based links and extensions.

We have a notion that the system should be mutable according to its circumstance. So that people to can feed in to a database, that automatically tags their postings and sorts them by subject.

We wanted people to be able to choose what they looked at
To know what they are going to see.

A combination of active RFID tags (used to track large objects like people) and passive RFID tags (used to track small objects like 1MB video clips) systems, coupled with an appropriate server and database, in theory at least, gives us these features.

However there are questions that remain unanswered.

What kind of experience would visitors actually get?
How would the story telling work on such a tiny screen?
Would ‘trees’ of information work best or did each piece of information need to be discrete?
How would the wireless network work in practice?
Could a museum actually take this system and scale it up?

So we have a lot of promise but not much hard data. Some things are clear though.

The information has to be packaged in digestible chunks in relation to the size of the screen. They can be subtle but not too densely overlaid.

The danger with the system is that the quantity of content spirals out of control and that the ‘trees’ become interdependent so that changing one necessitates changing them all.

With computing there is so much to explain about electronics and obsolete solutions to problems that it is really hard to find a stopping place in the ‘trees’. There are always more questions because most of the information is not common knowledge.

Choices for visitors to delve in museums are presented by putting

We've already said a lot about this...about you. It's difficult to say more until we actually get to play with somesuch system, so back off already. But if you want some predictions, here are some predictions. If what we're doing is building a prototype of a museum system—and it's not entirely clear that this is what we're doing—then there will be problems with the fragility and abscondability of the handheld devices. We predict the wireless network is going to be frustratingly slow at downloading clips of our brilliant and not-to-be-changed-or-reduced-in-size-or-any-other-dimension clips. So, Objective 1, you've in fact been no end of trouble so far, but it's been productive trouble. You force us to reckon with our content in creative, adaptive ways, attending to size and dimension of the clips, and dealing with the practicalities of teaching such a system to the uninitiated (which includes, conspicuously, us at this point).

2. To explore appropriate content for such a system that takes into account the level of user knowledge.

actually, we'll capitulate when we figure out how to do it without resorting to tired old techniques like the museum texts "for kids" which stack computers or bunsen burners or computer scientists end to end until they reach the moon or some impressively distant heavenly body, which technique strikes us as irrelevant, distracting and condescending. But more on this in the next section.

We had identified the fault line in traditional histories of computing, the failure to sustain a dual focus on technical and social findings, to let these two types of knowing inform each other. We knew that the hook for audiences was going to be stories about people not stories about machines. We hoped that by telling stories about the people, audiences would become interested in the machines.

We really, deeply dislike you. You're imperious and officious and very probably right. Damn you. You force us to consider writing each of the hard-won scripts two or three times, and

differently each time. You make us confront cliche and generally unsavoury past attempts to adapt a story for different audiences. You've flummoxed us thus far, but we have an escape plan. Because this is only a prototype system, one important thing to do is simply to test whether, technically, we can deliver alternative stories for the same device, while members of various types of audiences stand in front of that device. To this end, ipsum dolorum works as well as actual content. But we'll not give up so easily. This is still be a worthy goal, but the way to achieve it may not be to write content which separately addresses specific audiences, but to build the possibility of different audiences into the informational structure of the system.

3. To research the feasibility, desirability and management of user feedback and participation.

Oh. We'd forgotten about you. Well, we suppose you'll want due consideration like the rest of them. We haven't thought very much about you because you seem contingent on there being some working system...and there isn't one...yet. Hilary, you hear? Yet. There will be. Don't you worry. Actually, this is still important to us, as a goal. And we have talked about it. We've discussed using chalk or white board and letting visitors literally leave their thoughts on the wall. We've talked about similar capabilities to be built electronically into the handheld device. But the serious thinking on this, on you, will come once we have a system that works.

Which we're confident will happen before this book is published.

ENDNOTES

(1) Which, because we haven't mentioned it yet, you might as well envision as existing in some kind of museum of computing history; this isn't the only place it might work, but, despite the fact that we were working for no museum, this was sort of the image we carried with us as well.

(2) Latour, B. (2002) 'Morality and Technology: The End of the Means', Theory, Culture and Society 19 (5/6): 19, 251.

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