

A Reflection on Translation Issues in User-Centred Design

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Abstract. We reflect on our experience in the first six months of a project, of moving from a user study to design and business implications. Our experience has been shaped by the realization we are at the ‘discovery’ phase of designing a mobile device that allows people to control and manage their personal digital information and identities in a variety of day-to-day activities and contexts. *Scenario prototypes*, a combination of a scenario and a prototype have been useful communication tools in the development and presentation of viable design solutions. They have helped move us from social science findings to user problems, design and business implications.

Keywords. User-centred design, Privacy, Mobile devices, Translation process.

1. Introduction

This paper describes the process through which user studies and perspectives are translated into commercialisable design concepts. The focus on translation is important for studies of use do not necessarily lead to viable design concepts. As Beyer and Holtzblatt (1998) say, “A clear understanding of the customer doesn’t *guarantee* any kind of useful system gets designed and delivered. Design depends on being able to see the implications of data”.

This opaqueness between user data, design, and business value is because of three reasons. Firstly, users do not always know what they want. Karen Holtzblatt tells how she wanted windows in her den. But what she really wanted was a lot of light to see the garden (Beyer and Holtzblatt, 1998). The second reason for the lack of seamlessness in the process is that there is often a division of labour – the user study being done by social scientists while the design concepts are in the hands of the technologists (Button, 2003). The business dimension often comes later. The third difficulty of translating user data into design is the “socio-technical gap” (Ackerman, 2002). Ackerman says one of the challenges of Human Computer Interaction (HCI) is to build technical systems that support the social world in all its nuances and contexts.

In this paper, we reflect on our experience of this translation process in the “User Centered Secure Identity Management” project. Our aim is to design mobile devices that allow users to control their digital personal information and manage their identities. As much of the writing on privacy and identity has been from the technological and legal perspectives, we are conducting a qualitative and quantitative user study to ascertain user attitudes, behaviour and needs in this area.

Our project is part of the Smart Internet Technology Cooperative Research Centre (SITCRC) in Australia. The SITCRC brings together 12 Australian universities and three significant corporate partners. The research program

comprises four technical streams focusing on smart personal agents, natural adaptive user interfaces, intelligent environments and smart virtual networks. The User Environment Program overlays these technical streams to ensure that the user is at the center of the design from the very beginning. The aim is to develop useful and commercialisable technologies. Hence in SITCRC, we work at the intersections of the social, technological and business perspectives.

In the second section we address the importance of reflecting on the translation process in the early phases of design. In the third section, we talk of the formation of a multidisciplinary team. In the fourth section we describe the shift in the user studies from theory to user problems, design and business implications. We conclude with a representation of our methodology as we are experiencing it at present.

2. Reflecting on the Translation Process

We are still at the early stages of design. A mock-up of a possible design is still to be constructed. The extensive qualitative and quantitative user study initiated for this project is yet to be completed. So as yet, we cannot say whether our methods will lead to a commercialisable product/service or whether they will lead to a repeatable methodology. We think that reflecting on the design process from the very beginning will serve important purposes. Though all design projects are distinctive, our project differs from those usually described in the UCD literature in two ways. Firstly, we are working outside a single organizational context, with our members drawn from academia and industry in two Australian cities. It has made possible a more extensive user study than is usually found in strictly commercial projects. However, there has been a sharper division of labour than we would have liked, between the UCD and technical people of our project. In this context, reflection aids the process of team formation. This is also important within the UCD team which comprises a social

anthropologist, a psychologist and a communications researcher. In the UCD team we have worked closely with one of our business partners who is also a psychologist.

Secondly, we are considering issues like “privacy” and “identity” which go beyond the organizational boundaries implicit in much of UCD and Human Computer Interaction (HCI) literature, particularly in the area of computer supported cooperative work (CSCW). The social and cultural context becomes an important framework for the analysis of attitudes and behaviour. So in working out a methodology that has relevance for design, we need to be participant observers of our own project.

3. Forming a Multidisciplinary Team

Communication problems within multidisciplinary teams are commonplace, but remain difficult. As Brown (1997) says,

To do things differently, we must learn to see things differently. Seeing differently means learning to question the conceptual lenses though (sic) which we view and frame the world, our businesses, our core competencies, our competitive advantage, and our business models (Brown, 1997, p. 10).

We appreciate that to develop new intellectual constructs, we need to be able to live in the “in-between” spaces of the disciplines, to live with not-knowing. It is similar to the migrant experience of living “in-between” cultures (Bhabha, 1994). It means getting “lost in translation” (Hoffman, 1989) and then discovering another kind of groundedness.

Particularly valid to any discussion of virtual team processes is the issue of trust. Lipnack and Stamps (1997) say “... boundary-crossing teams overall need more trust than do collocated teams. Without daily face-to-face cues, it is at once both harder to attain and easier to lose” (Lipnack and Stamps, 1997).

3.1. Our challenges

Our challenges are to produce a multidisciplinary design team over distance, across organizations while bridging academic and corporate perspectives. We are at the discovery stage of UCD, that is, we are discovering the service and product to be designed (Singh et al., 2003). We have the advantage however of coming together wanting to design with the user at the center.

Our first challenge was to describe the project in an understandable way. Initial project workshops led to changing the “Nymity” Project to the “User Centered Secure Identity Management” Project. The computer engineers in our team were using “nymity” as understood by Goldberg (2000). It is a concept about the control of personal information and identity, ranging from complete anonymity to verifiable identity. “Nymity” however was a difficult concept for user research. The focus thus shifted to relating notions of privacy and identity within changing social and cultural contexts. Yet it is important to note that within our group we still call it the “Nymity project”, using “nymity” as an accepted shorthand.

3.2. Graphic representations

Frequent face-to-face workshops have been vital to maintaining the connection. When we meet, we find it useful

to capture the socio-cultural, business and technical perspectives through the common language of diagrams. At the very least, they graphically represent the difference in positions as a first step to coming to a joint perspective.

Within six months we have come to understand that control of personal information and identity is not simply about managing the “name” that we go by in a particular situation (Goldberg, 2000). Identity is not unique, but defined *relative* to a particular context. Context is described in terms of socio-cultural factors such as activities and relationships with other people or businesses. Context is also defined in technical dimensions, such as the time-of-day and location. These are perspectives that have informed the user study and been validated by it.

Expressing some of the findings of the user research, we found that one of the main differences of our user research from previous literature. In our user study, we have related issues of identity and privacy. Though this relationship is not new in sociology or cultural studies, it is a relationship that has not been the focus of study in policy and technology. The relationship is presented in Figure 1 below.

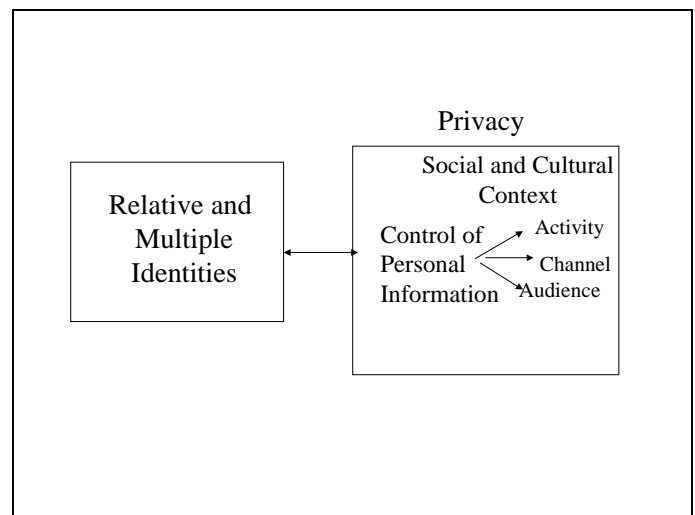


Figure 1. Relative identity and privacy

3.3. The scenario prototype

We also used scenarios to bridge the different perspectives. Scenarios told stories of users’ activities within their social and cultural context. In our work we found it useful to link stories of use with possible design solutions in a *scenario prototype*, for it helped make the linkage transparent.

Scenarios are stories enabling communication and building trust (Gershon and Page, 2001). Scenarios based on previous user studies and personal experiences in five different fields were useful to begin communication. Attention focused on the scenario of young people using mobile phones, based on a recent user study. It was closest to the needs of the designers of privacy services in mobile devices. Young people also represent a large growing market.

As Carroll (2000) says, scenarios are presented to answer five technical challenges. They help reflection on design work; help designers manage the fluidity of the solutions; offer different perspectives of an interaction; allow designers to re-use technical generalizations; and finally they “promote work-oriented communication among stakeholders”

(p. 43). We find these technical challenges sometimes come in different phases of design and sometimes together.

Our first use of scenarios in this project was to “promote work-oriented communication among stakeholders”. But as the discussions and the design process continued, the scenario of young people using mobile phones – initially entitled ‘The Nomad’ – developed into ‘The Swarm’. It also moved from the scenario as a story about young users’ communication to a *scenario prototype (SP)*. The scenario prototype presents a user interacting with an imagined ideal mobile device to achieve day-to-day goals. The scenario prototype in this sense is a hybrid of a scenario and a prototype because it is design-solution specific.

At this level, the scenario fulfils three other functions that Carroll describes. It helps the team reflect on design work. It allows the team to manage the fluidity of the solutions and it offers different perspectives of an interaction.

Going back to the users; workshops within the UCD group; and with the technologists helped clarify and modify the SP (Satchell and Singh, 2004). In this process, the scenario prototype “The Swarm” became a ‘boundary object’ (Star and Griesemer, 1989), a tool for social scientists and technologists to come to a shared understanding of user needs.

At the same time as the UCD team was presenting broad scenarios of use and design, the technological design team was presenting design scenarios. One of these was based on “The Swarm”. These design scenarios assumed the presence of smart Internet technologies such as an Intelligent Environment and Smart Personal Agents. As such, they reused the technological understandings of the wider SITCRC team. The Swarm-based scenario focused on the task of tailoring interaction with associates in the context of a dinner date, and a business organization.

The challenge that remains is to minimize ‘conceptual drift’ (Satchell and Singh, 2004) – to keep the broader context of social and cultural use while at the same time providing a bridge to the design. We also need to go back to the users to see how the design will change the nature of the activity and communication.

4. User Studies – From Theory to Viable Design

There have been few user studies concentrating on how people want to deal with personal information and manage their identities. The existing studies are from a technological or legal perspective, focused on people’s attitudes to privacy or on technologies relating to privacy. Our qualitative and quantitative study of users’ control of personal information and identity thus adds a needed perspective.

4.1. The user study

The user study comprises a qualitative study of 18 persons and a quantitative study of more than 1000 persons. As the quantitative study is still in process, this paper concentrates on the qualitative study.

The UCD team and one of our business partners conducted 17 open-ended one- to two-hour interviews with people at home or at work. For the main part, the interviews were conducted by the UCD team. It is a convenience sample drawing on our varied personal and professional networks. The sample includes men and women from different educational backgrounds and occupations. The people interviewed cover a wide age spectrum. Half the people

interviewed are Anglo-Celtic in ancestry, the other half being a mixture of people from other backgrounds.

We have been sensitive to the technological initiatives relating to privacy and identity because of early discussions with the members of the design team. The focus of the user study is however broader than eliciting user reactions to possible digital design.

Our experience with other user studies shows it is important to place the users’ activities at the center of the investigation. It is important to have the activity focus in plain view, for continuous interactions with technologists often means that the UCD group also begins to be comfortable with the language of technology. Our focus on activities is patently within the social and cultural context. But it shares much with “activity theory” which has its origins in psychology [1] have the same emphasis on a “web of activities” (Bertalanffy and Bødker, 2003, p. 315), rather than assume a linear, sequential structure. We also draw on studies of the social shaping of technology to investigate how technologies shape and are shaped by social relations and cultural values.

Hence in the user study, we investigate privacy and identity in the context of different activities within their social and cultural context. We focus on people’s attitudes and behaviour in relation to privacy and identity in the digital and non-digital worlds, emphasizing the meaning and use of communication channels. We discover how people present and manage their identities by controlling the kind and extent of information they share with people at different points in their “circle of care”.

We face two challenges in producing user understandings that can lead to viable design. The first is working a balance between deliverables and rigour. The second is moving from theoretical understandings valued in social science to those that are useful for design and business.

4.2. Rigour and deliverables

There has been an unstated tension between the academic need for rigour and the technologists’ and business partners’ desire to have more immediate outcomes. This tension is perhaps not as great as in a commercial project. The academic culture of SITCRC allowed us the time and resources to conduct an extensive user study to investigate issues that related to, but were broader than the envisaged design. This most likely would not have been possible in a corporate context.

This tension meant that the initial design has been based on previous user studies, as has been the case with the design based on the Swarm scenario. The “Nymity” user study has confirmed the findings of the previous Young People’s study. At the same time, the Nymity user study has been rich in painting a picture of the way people choose to deal with personal information and identity in the fields of health and financial management. These emerging interim findings also need to be communicated to the business organizations in the SITCRC.

The user study is framed as an academic user study, with accompanying standards of rigour. It is a grounded study in that we worked towards emerging theory, ensuring a fit between data and theory (Strauss and Corbin, 1990). We use N6, a computer program for the analysis of qualitative data, to enable us to check what was said and what was not said. The initial broad coding is summarized into matrices. It is at the matrix level that the data is being finely coded, so that our

findings fit the data. The design team, within the constraints of time and distance, are being given part of the matrices, so that they can walk through the data with the UCD team. But this immersion in user data is less than that detailed in contextual design methodology (Beyer and Holtzblatt, 1998).

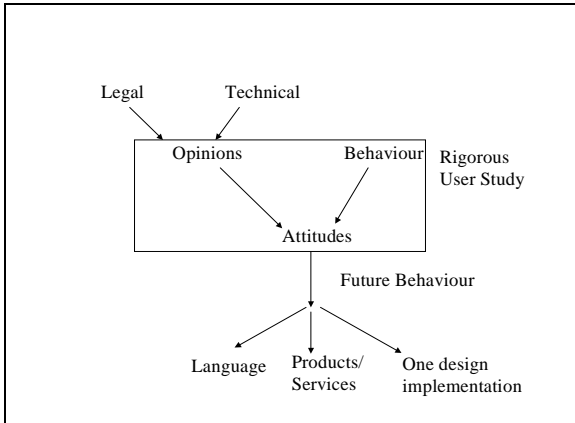


Figure 2. Business value of a rigorous user study



It is interesting that in project workshops, it is the rigour of the study which in the end will provide one of the most tangible business outcomes. Previous works on privacy and identity have been based mainly on the opinions of lawyers and technologists. So with this study of users’ management of personal information and identity, businesses have a surer way of predicting future behaviour and designing profitable products and services. This will be strengthened with the completion and analysis of the quantitative study. The design team thus in business terms, is seen as implementing one of the possibilities. This business value, as seen by one of our business team members is depicted in Figure 2.

4.3. Moving from theory to design and business outputs

The second challenge is moving from emerging theory to user problems and viable design and business implications. The aim of sociological qualitative studies is to arrive at rigorous theory which can explain a social phenomenon. Moreover, in social anthropology there is a colonial bias against telling people how they should live. This robust theory however needs to be translated, so that its importance for design and business is evident. This translation has to be learnt for it is not necessarily valued within the academic social science traditions.

Let us illustrate how we are making the move. Our emerging theory is based on coding and matrix analysis. We find that people want to control their personal information in terms of channel, audience, content, and context. Personal communication, finance and health are particularly sensitive areas in Anglo-Celtic Australia. So control of personal information is at the centre of privacy and relative identity in different contexts. In terms of channel, the telephone is seen as the most private digital device with the Web being the least private.

These conclusions are too broad and general for design or business. It is an important background perspective, but not a business or design outcome. We need to dig narrower to answer the unasked “So what?” question.

Our first idea  to place the emerging findings in one column of the table  and side by side present the design and business implications. But we found we needed to re-cast the scope of the findings to come to usable starting points. The scenario prototype discussed in the previous section, not only worked as a communication tool, but also as a mode of translation. This is because the scenario prototype presents the persona, the context and the way an activity is performed. It then extracts the user problem, and suggests a possible design approach.

This approach had been honed with the development of the Swarm scenario prototype based on the Young People’s study. We tested the process again in the Nymity user study, focusing on the scenario of Joe, 65, who pays his bills via the phone. We kept in mind the kind of design envisaged, that is, one which incorporated mobile devices, an intelligent environment and smart personal agents.

In constructing this scenario prototype, we first narrow the scope of the activity to payments and money management. It is important to have this “web of activities” for the success of a payments technology often depends on its success for money management. Secondly, we focus on paying by phone, for this is pertinent to our technological and business partners. Thirdly, we articulate the user problem that paying bills by phone is repetitive and time consuming. Fourthly, we put forward the design suggestion that the customer number and credit card details relevant for specified merchants be stored, to automate part of the process. We note that to ensure control, the user needs to confirm the transaction for it to be valid. We also suggest that an e-mail be sent so that a paper record is possible. The format of this record should be compatible with personal financial management programs.

The scenario prototype captures only one part of the user study and its conclusions. But in capturing the specifics of one persona and activity, elucidating the user problem, and suggesting an acceptable design solution – the user study becomes relevant for designers and businesses. The breadth of the user study means we will have something equally relevant to say about health, personal communication and entertainment.

Emerging Findings	- Relative Identity and Privacy are related - Importance of Activity, Audience and Channels - Control is important
User Problems	Focus at a time on one persona and a ‘web of activities’.
Design suggestions	-Ensure that the design is consistent with users’ need for control. -Take into account the implications of the suggested solution on related activities

Figure 3. Translating from findings to problems and design

This scenario prototype will have to go back to the users and to the project team to be further developed. We will need to ensure it has sufficient detail; that it is not duplicating other inventions. Is there the relevant technology to back the design? Will there be a sufficient demand for such a service? Is there a champion within the organization? Can the design

be commercialized within three months? Many questions remain to be explored. However, it is a step in the right direction to make user findings relevant to design and business. The failure to do this translation at the user study level, has been one of the principal points of failure.

5. Conclusion

In this paper we have reflected our experience in the first six months of the “Nymity” project, of moving from a user study to design and business implications. We find this reflection is important for our project differs from many described in the UCD and HCI literature. We are designing technologies in a mixed academic and corporate environment, outside any single organizational boundary. We are also at the “discovery” phase of UCD, where the device and service to be designed is still being identified. Moreover, identity and privacy, which are at the center of our concerns, need to be examined at the personal, social and cultural levels, rather than confined within an organization. So “participant observation” on our own methodology is important so that we can articulate and test it with different projects.

Our experience shows that the construction and testing of scenario prototypes have played a central role. They have been important in multidisciplinary group communication and the translation of user studies to design and business outcomes. This is because the scenario prototype can convert a broad user study into discrete stories of a “web of activities” that can be presented to the business and technological teams. At the same time, the design and business outcomes that are suggested get their validity from the broad themes emerging from a rigorous user study.

Our approach still has to be tested in the laboratories and the marketplace. It is important however for the UCD team to be in the intersections of design and business, so that their work can influence the creation of useful and viable technologies.

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