



SMART INTERNET  
TECHNOLOGY CRC

**Research Report**

**No. 1**

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**SITCRC User Needs Project – Phase 1 Overview**

**Principal Authors**

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# Smart Internet and User Needs Project: Phase 1

The Smart Internet and User Needs project is a foundation project in the User Environment Program of the Smart Internet Technology CRC. The project seeks to answer the key question: **How can the intended outcomes of the technology programs best meet user needs?** An outline of the approach taken in Phase 1 is contained in the *Overview Report*. The following Research Reports and Working Papers relate to key elements of methodology and its implementation in this Phase:

## **Overview:**

*SITCRC User Needs Project – Phase 1 Report: Overview (Research Report 1)*

## **Re Methodology:**

*User-Centred Design of Smart Internet Technologies: A Best Practice Guide for the Discovery Phase of the Design Process (Working Paper 1)*

*Developing Methodologies and Processes for User-Centred Design of Smart Internet Technology (Working Paper 2)*

## **Re Users' Perspective:**

*Smart Internet Technologies and SMEs (Research Report 2)*

*Smart Internet Technologies and Young People (Research Report 3)*

*Smart Internet Technologies and People with Disabilities (Research Report 4)*

*Intelligent Home Environments: A users' perspective (Research Report 5)*

## **Re Technologists' Perspective:**

*Natural Adaptive User Interface: The Users' Perspective (Working Paper for NAUI program)*

*Smart Personal Agents: The Users' Perspective (Working Paper 3)*

*Computer scientists as designers and users of Smart Personal Agents (Research Report for SPA Program)*

## **Re Design Process/Meeting Place:**

*Scenarios of Possible SIT Use (Working Paper 4)*

*Avoidance of Early Stage Project Failure (Working Paper 5)*

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## Summary

The User Needs project is a foundation project of the SITCRC. As a component of the User Environment program it contributes to the user focus of the CRC, seeking to answer the question: How can the intended outcomes of the technology programs best meet user needs?

In the first phase of the project we have established a methodology aligned with the philosophy and principles of the emerging field of user-centred design (UCD). In contrast to the corporate context, where the techniques of UCD have largely been developed, our challenge in the CRC is to move this user focus into the discovery phase of technical research, where products and markets, and even technologies, are yet to be defined.

A core element of our methodology is the establishment of a “meeting place” where user researchers, technology researchers and industry partners can engage about the design and directions of CRC projects.

This meeting place is supported by research and interaction with the technology programs and research with user groups (in the first instance, small and medium sized enterprises, young people, and people with disabilities). This user research seeks to identify situations in which the Smart Internet technologies can add value through providing users with:

- options in the way they interact with technology through a variety of interchangeable modes (voice, text, graphics);
- the choice to automate certain tasks subject to situation;
- the ability to control context and location sensitivity with technology.

A range of scenarios of possible uses of the Smart Internet technologies have been developed for consideration. These scenarios need to be further assessed for value to users, the technology programs and the industry partners to determine which should be taken forward and developed as demonstrator proposals by inter-disciplinary teams across the CRC.

The first phase has established the grounds for an effective “meeting place” and for the extension to demonstrator projects. The next phase needs to strengthen the cross-CRC engagement and establish a culture of User-Centred Design throughout the discovery phase of the technology research.

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# 1 Methodology

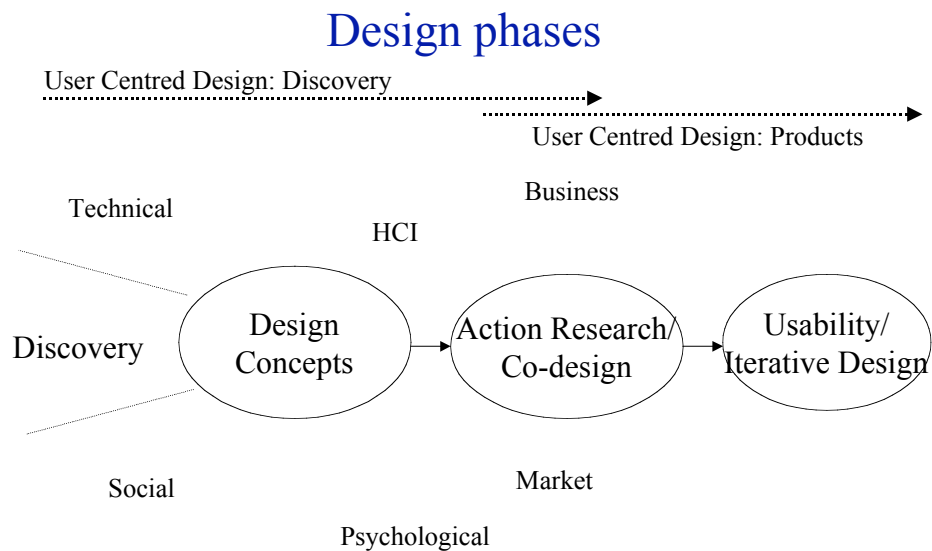
## 1.1 User-centred design in the discovery phase of technical research

Our methodology is aligned with the philosophy and principles of the emerging field of user-centred design (UCD). However, the techniques of UCD have largely been developed in the corporate context where there is some initial definition of the product.

Our challenge in the CRC is to move this user focus into the discovery phase of technical research, where products and markets, and even technologies, are yet to be defined. Further, the academic and corporate research mix in the CRC provides a different culture from the corporate environment.

The UCD approach in this discovery phase of design emphasises a shift in thinking from a technical to a users' perspective. Connecting with the users' perspective means the acceptance of a multi-disciplinary perspective and a different process of research and design. It also means being able to work with a plurality of stories, while moving from data to theory. Fundamentally, it requires effective engagement between technical and user researchers.

An important reference is *User-Centered Design: An Integrated Approach* (Vredenburg et al, 2002). This text outlines the approach to be taken in establishing a demonstrator to product cycle. It has given a reference point to position our approach in the CRC in the earlier Discovery phase.



## 1.2 Why do UCD?

User-centred design places users and their activities at the centre, at all stages of the design process. Users' activities are examined within their social and cultural context to see how new technologies can fit with accepted ways of doing things. In the process new technologies can also change the way the activity is conducted. In the product development phase, this user-centred approach to design has also been conceived as usability, interaction design, computer-human interaction and human-computer interaction.

Measurable benefits of using UCD for software design include increased sales, reduced development time, time saved on redesign, reducing the costs of help desks and user productivity and satisfaction.

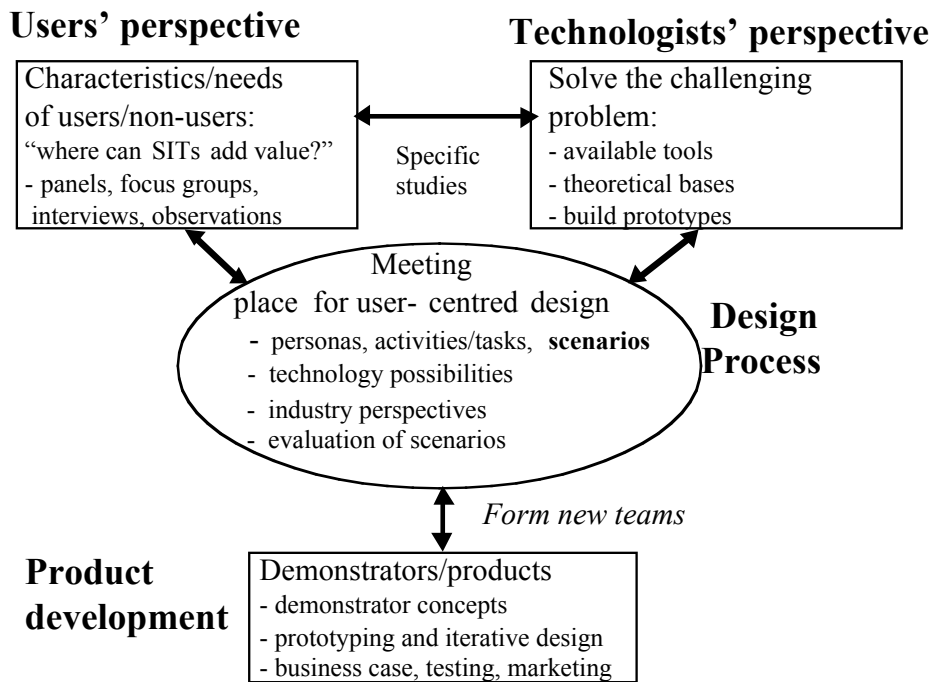
- An investment in usability engineering can produce a return on investment in the range of 3:1 to 100:1 ((Nielsen, 2002)
- Usability engineering has demonstrated reductions in the product-development cycle by over 33-50 per cent. Sixty three per cent of all software projects overrun their budgetary estimates, with the top four reasons all related to unforeseen usability problems (Rhodes, 2001).
- Design changes due to usability work at IBM resulted in an average reduction of 9.6 minutes per task, with projected internal savings at IBM of \$6.8 Million in 1991 alone (Karat, 1990).
- Help desk calls are estimated to cost between \$US30-\$US100 a call, depending on the complexity of the software. More than half the calls are due to poor usability (Nielsen 2000)

Our task is to build the design foresight into the earlier discovery phase as well.

## 1.3 Elements of UCD: Discovery

The methodology we are developing is a set of approaches to answering the question: "How can the intended outcomes of the technology programs best meet user needs?" We engage with technology projects to influence future directions. We also try to effect practical outcomes through initiating demonstrators leading to potential products.

We have portrayed the elements in this developing methodology of UCD in the Discovery phase in the following schema. A focus on each of the components of this schema provides the structure for this report.



- These processes are still developing. Their core is in the Design Process/Meeting Place where we hope to have direct engagement between UCD researchers, technology researchers and industry partners. In this meeting place, we consider user studies of different groups of users and their activities. More targeted studies can be planned using a variety of qualitative methods.
- Stories that convey the immediacy of the users' worlds and engage people with different perspectives. These stories are complex and ambiguous, told in the language of users.
- Personas and scenarios which help bring these stories to life. The scenarios of everyday tasks become more complex as the design of the proposed technology progresses.
- Ways of dealing with future technologies and new ways of conducting everyday activities.

This process of Discovery is not linear but highly iterative, requiring interaction between users, researchers, and industry partners to formulate research problems and directions.

## 1.4 Supporting UCD

It is clearly important, from an examination of existing processes of conducting UCD in corporates, to have support for the UCD process across the organisation, emanating from the senior executives. This support has to be backed by institutionalising UCD into processes of project formulation, funding and implementation. Without this kind of support, it is very likely we will revert to traditional ways of designing technologies.

There also needs to be a quality assurance process in place that:

- Records that the UCD process was undertaken at each step of the design process;
  - Ensures that UCD processes are evaluated in terms of resources and time taken.

## **1.5 Relevant Project Reports and Working Papers**

*User-Centred Design of Smart Internet Technologies: A Best Practice Guide for the Discovery Phase of the Design Process (Working Paper 1)*

Introduces the issues and approaches in UCD in the Discovery phase to the broad range of researchers and other stakeholders in the SITCRC.

*Developing Methodologies and Processes for User-Centred Design of Smart Internet Technology (Working Paper 2)*

Outlines the elements in the above process, the experience of this approach, and references to related approaches. Intended to develop as a continuing guide to methodology for researchers in the User Needs project and others with close interest.

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## 2 User Research

The on-going aims of this project are to: directly influence the design and implementation of the outputs from the technology programs; to assist the focus of demonstrators and to contribute to the identification of products with commercial potential. As part of this approach a focus on specific user segments was identified as an appropriate method for generating insights to feed into the Smart Internet Technology development process.

In examining users' activities within specific segments, the aim is to generate insights into user needs. This user segment focus initially<sup>1</sup> was on selected SMEs (including professionals and e-lancers), young people (YP), and people with disabilities and other special needs (PWD). This user segment selection was based on their commercial relevance, the likely applicability of Smart Internet Technologies (SIT), and the particular design issues they raise. It was also considered advantageous to leverage the existing research experience with these segments amongst the user needs researchers. More specifically:

- SMEs: form a large section of the business community. There are more than 1 million SMEs in Australia constituting 95% of all businesses and 50%+ of private sector employment.
- YP: 36% of the Australian Population is under 24 years. They are strong users of new technologies.
- PWD: Ensuring sensitivity to issues of accessibility and universal design has frequently led to innovations applicable to mainstream users.

In parallel with this user segment focus, research is being conducted into the user's perspective on the cross-cutting issues of identity, authentication, trust, security and privacy. This cross-cutting research has generated additional insights with design implications for the technology research programs.

### 2.1 Studies of user groups

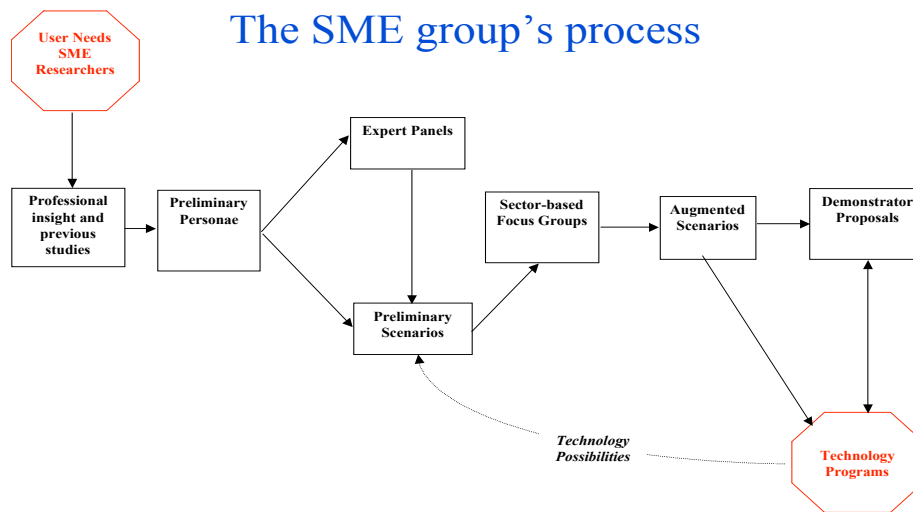
Within the context of the evolving User Needs methodology, the approach adopted to operationalise this research, involved selecting SMEs as a priority segment with YP and PWD lagging slightly behind<sup>2</sup>. The diagram (below) illustrates the method deployed by the user needs team in conducting this research within the Discovery UCD methodology. As the diagram illustrates the first step in the process involves leveraging insights from the literature and user needs researchers' experience with the user segment. This lead to the generation of six preliminary personas representing SME users described in terms of their attributes, activities and technology requirements. These personas were utilised as part of the expert panels and in the process of developing preliminary scenarios. The expert panels were utilised

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<sup>1</sup> It is anticipated that other user segments including corporates, governments and residential users will be approached in future research conducted by the CRC. Future research will also explore a focus on activity areas including e-learning, e-health, financial services and leisure/entertainment.

<sup>2</sup> This staggered approach was both a practical decision based on limited resources and a methodologically decision, as researchers working with YP and PWD would have the benefit of observing the effectiveness of the approach and be able to make modifications/refinements as appropriate.

## Implementing Discovery UCD with SMEs



to obtain detailed information on SMEs for the development of meaningful scenarios that had been validated with users and that could be used to engage with the technology programs (Greenbaum, 1993; Rubin, 1994; Von Hippel, 1988, Templeton, 1998). The expert panels involved both collective discussion on SME and SITs followed by individual discussions with expert panel participants. These processes have led to a detailed consideration of SME needs and the development of the scenarios that will be used as preliminary vehicles for communication/negotiation with the technology programs in the Meeting place for user-centred design.

### Scenarios and Scenario Development

“.. scenarios provide... a stable foundation for action-oriented reflection (in design teams). By being both concrete and rough, they make explicit the design goal of specifying tasks and functions in greater detail” (Carroll, 2000).

Scenarios encourage people to think about how one might navigate successfully through the developmental processes that lead to the production and marketing of new user-focused Internet technology products (Institute for Alternative Futures, 2001). From a user needs perspective the preliminary scenarios emphasize user's understandings and inputs into the design process because they are orientated towards the activities that users wish to engage in rather than on the specific merits of a particular technology (Nielsen, 1993). A key next step will involve in-depth engagement with these scenarios by the technology programs and CRC industry partners. To aid in this process the user needs group has provided both scenario summaries and complete scenario descriptions.

## 2.2 Adding value to users with SITs

As a result of the on-going research into these user segments a number of insights into potential ways that SITs may add value to users have emerged. These can be examined at two levels: generic and segment specific:

## **Generic Insights**

To add value SITs must be **'useful'** in terms of supporting user's needs to engage in particular activities. If SITs fulfil these criteria, then our research suggests that other additional criteria including ease of use, psychological acceptability, social acceptability and cost effectiveness will, subject to context, have differential impacts on adoption and uptake of a technology.

Insights from the user needs research also reveal that the criteria of 'Usefulness' can be explored further in relation to SITs potential functionality. Specifically supporting user's needs in a manner that accommodates the differing characteristics of situations in which their activities are undertaken provides SITs a real opportunity to add value by:

- Providing users with options in the way they interact with technology. By offering a variety of interchangeable modes (voice, text, graphics) for interacting with technology, SITs can add value;
- Providing users the choice to automate certain tasks subject to situation;
- Providing users with the ability to control context and location sensitivity with technology. By enhancing users' ability to decide the nature of location information flows, SITs can add value.

## **Specific Insights from the User Segments**

### ***SMEs***

- SME users face challenges with legacy systems. SITs addressing these platform/interoperability issues in narrowband environments can add value;
- SME users tend to be time poor and need assistance to address their 'always on' business cycle to restore work-life balance;
- SME user face management challenges in 4 areas: managing knowledge, relationships, time/resources and logistics;

### ***Young people***

- Young people have a high usage of communication technology;
- Predominance of communication, entertainment/leisure and information seeking/advice as activity areas for young people using the communication technologies;
- Mobile phone as the favoured form of communication technology. It is both a symbol and function of growing independence and interdependence, as well as fragmentation;
- Security is emerging as a dominant issue influencing the ways in which young people use mobile phones and chat, including the screening and blocking of calls, caller identification, opt in rules, desire for control, and the importance of portability and mobility to the use of ICS;
- Control of the media through content creation, choice of channels and communication styles are important issues for young people.

### ***People with Disabilities***

Many people with disabilities rely on technology. Examples are:

- People with quadriplegia or cerebral palsy often use environmental control units to control functions in their homes such as TVs, radios, doors, curtains.
- Blind people can obtain information without an intermediary, using screen-reading programs to interact with the Internet
- Technological solutions found for people with disabilities have later become mainstream products. Examples are: Scanner (originally the Kurzweil reading machine for blind people)
- Speech recognition (originally for people with severe mobility impairments unable to use a keyboard. An early product was Dragon Dictate)
- International changes in legislation and regulation mean that there is an increased requirement to develop accessible products. Examples are: Section 508 in USA stipulates that the US federal government will only purchase IT&T products which meet accessibility guidelines; development of official standards in Japan for accessible IT&T products; and development of IT&T accessibility guidelines in European countries such as Ireland and Sweden which may be taken up by national governments.

## **2.3 Cross-cutting Issues**

Cross-cutting issues are issues that cover a wide range of user groups and inhibit the uptake of a technology or product. These issues are generic in nature and are currently typically addressed after the release of the product resulting in a high rate of customer dissatisfaction. Considering these issues before the design is completed, can completely eliminate these barriers to market, cheaply and effectively.

An initial set of cross-cutting issues have been identified as a set of end user psychological factors.

- Security: A user must feel that the dimensions of secrecy, integrity and availability have been met.
- Privacy: A user's privacy must be preserved by controlling the accuracy and reporting of time, location and identity. The choice of relative and absolute values can also protect privacy.
- Ownership: The ownership of data can solve a number of legal and technical difficulties.

These issues have been identified and incorporated into scenarios and our approaches to user research. These issues are now being explored in the context of the user groups.

## **2.4 Relevant Project Reports and Working Papers**

*Smart Internet Technologies and SMEs (Research Report 2)*

*Smart Internet Technologies and Young People (Research Report 3)*

*Smart Internet Technologies and People with Disabilities (Research Report 4)*

*Intelligent Home Environments: A users' perspective (Research Report 5)*

*Avoidance of Early Stage Project Failure (Working Paper 5)*

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## **3 The Meeting Place**

The meeting place is where the products of social research and the technology programs and partners are brought together. From the meeting place emerge new concepts, new multi-disciplinary teams and existing research. Production concepts are enhanced to improve their chances of success in the marketplace. This place is formed through a two-way information flow between the User Needs project and the technical programs. The User Needs researchers bring the products of User group research in the form of scenarios and through links to the technology programs. The technical programs bring their scenarios, knowledge, skills and interests. The meeting place enhances the value of existing concepts by ensuring they address genuine human needs. It also produces concepts of value in collaboration with the technology programs.

### **3.1 Linking with Technology Programs**

The other streams in the User Needs project are directed at understanding the requirements of users in general and the specific needs of our target groups. The technology programs (SPA, NAUI, IE and SN) are directed at bringing technology into existence. The task of the linkage stream is two-fold:

- A. to bridge understandings and approaches from the user's perspective (social research) with the technological possibilities yielded by the technology programs, and hence inputting to development of Demonstrators and other user-centred technologies.
- B. to facilitate communication between the research programs of the CRC.

Both these tasks are vital to the success of the CRC as a producer of technologies and as an organisation.

A further aspect of the linkage program is to ensure that cross-cutting issues are identified and managed. Cross-cutting issues are issues which have both a social and a technical component and typically affect the uptake of a technology by the community. The core cross-cutting issues under consideration are security, privacy, trust and location. These issues will be examined both as independent entities and in the context of specific user groups.

### **3.2 Work done in Technology Programs**

Links have been established with the Intelligent Environment Pelican project, the Natural Adaptive User Interface Program and the Smart Personal Assistant program. The linkages have all had different characters, but have been successful in fostering greater collaboration between the projects and User Needs.

All the linkages described below are currently running and have resulted in a greater understanding by the User Needs project of the technologies on offer. Furthermore, it has allowed the User Needs project to inject key attitudes and understandings into the design process to help improve user acceptance of potential product offerings.

### **3.2.1 Natural Adaptive User Interface**

Links have been made with the NAUI Program by reviewing the research activities and approaches being taken by the User Needs project and NAUI Program and then communicating these to both stakeholder groups through a working paper, and via telephone and e-mail interactions with the NAUI Program leader. User Needs researchers are consequently oriented to issues of natural user interfaces (e.g. through the possibilities with Probot) in the course of their empirical research and are working towards Demonstrators that test these issues. And, working back the other way, the NAUI Program will be building understandings of the needs of user groups (young people, SMEs and people with disabilities in the first instance) into their natural interfaces.

### **3.2.2 Smart Personal Assistant**

A member of the User Needs group has been allocated to the SPA program. She participated in the project development that took place in the first round, and took part in follow-up workshops and tele-conferences. This participation resulted in a qualitative project investigating the user constructs in the minds of academic computer scientists who are designing SPAs. The project has led to personal links. The computer scientists were also more likely to reflect on their own use of technology.

### **3.2.3 Intelligent Environment**

The model pursued for the Pelican project was to second part of the time of a member of the User Needs project to the Pelican team. Direct involvement in their development process has been used to ensure that the critical cross-cutting issues of security and privacy are at the forefront of the group's thinking. The work within the group exposed location as a major cross-cutting issue which is now being followed up within the User Needs project.

### **3.2.4 Smart Networks**

The interaction with Smart Networks has been limited but has consisted of meetings with key researchers in the program. The pausing of Geographical Information Systems Centre in Adelaide's (GISCA) interaction on the CentreLink proposal has temporarily reduced the quality of the communications that had existed.

## **3.3 Linking to industry partners/SME alliance**

The User Needs project has linked to a number of Industry partners. The form of the linkage has varied significantly depending on the willingness of the partners to commit resources and the form of the outcome sought by the partner.

Telstra has actively participated in the User Needs project by contributing 2 members of its TRL human factors staff – Penny Roberts and Amanda Borg – to attend meetings and give their insights into the type of outcomes being sought by their organisation.

Motorola has maintained a watching brief looking at the outcomes of the project. Contacts within Motorola's Human Factors Laboratory has lead to useful insights into the final stages of User Centred Design within a company and on a product line. This interaction allowed us

to clearly define the differences between the innovative work being conducted within the CRC and the codified work that is carried out in industry.

Two SMEs have engaged with the User Needs project, Performance Technologies Group (PTG) and Agent Oriented Software (AOS). We are exploring areas of mutual benefit.

This component of the project has been in its infancy while techniques have been developed to allow better quality communication in the methodology stream. The emergence of scenarios as a method of two-way communication between technically based and focused organisations and user experts will allow this component to provide both a greater number of interactions and a more meaningful dialogue.

### **3.4 Scenarios**

There are several processes used to generate scenarios. In the User Needs project a persona is used as a representative of a user group. An examination of the activities of this typical member of the user group is documented as a scenario. From this activity based analysis, product, service and research concepts are extracted. The technology groups have also used scenarios to present their concepts for discussion. Often these concepts are driven by an interesting technological observation or direction. Regardless of how the scenarios are created, a process of augmentation and assessment is carried out in the meeting place.

Scenarios are augmented with information about the user, their motivations and the market. This is then evaluated against a set of assessment criteria. These criteria include Newstead's Success Factors. O'Brien's Non-Functional attributes are used to ensure that critical factors – which are independent of the functionality of the product – to the success of the project in the market place are not overlooked.

After augmentation the new scenarios are subject to validation. The scenarios are validated against the user population: Assumptions of market size can be examined, motivations tested, detailed social research conducted.

When satisfied that the scenario captures a real user group's desires then some scenarios are selected for further development. The criteria for selecting from the Augmented Scenarios come from:

- user needs researchers
- technologists
- industry partners

At the completion of this process some of the scenarios will be discarded. Others will be used in the generation of new scenarios and new demonstrators and/or products will be identified.

In addition to identifying opportunities, the core of a product or demonstrator team will be identified. This multi-disciplinary team will draw from the people involved in the scenario process – from both the social and the technical sides – to carry the concept forward into either a demonstrator or a product.

Currently the User Needs Project has a preliminary set of scenarios under development that are applicable to small business, education, young people, people with disabilities, government and medicine. These are available as a starting point for discussion and development.

### **Scenarios for SMEs**

SME1	Farm-based Possibilities for Smart Internet Use
SME2	Agricultural Auctions and Smart Internet Use
SME3	Smart Credit Unions and Smart Internet Technology
SME4	Real Estate Sales and Smart Internet Technology
SME5	Supporting Restaurants with Smart Internet Use
SME6	Medical Emergencies and Smart Internet Use
SME7	Fishing the Tasmanian Rock Lobster
SME8	Hotel Customer Service
SME9	Surfing Small Business
SME10	Networked Project Management Possibilities
SME11	Assisted Accounting
SME12	Transport Logistics with Smart Internet technology
SME13	Aquaculture with Smart Internet technology
SME14	Teleconference meeting possibilities

### **Scenarios for Young People**

YP1	Multimedia imaging in a multichannel environment
YP2	Embodied conversational agents in a chat environment
YP3	Mobile conferencing call
YP4	Story listening Teddy Bears

### **Scenarios for People with Disabilities**

PWD1	Safety monitoring in an intelligent home
PWD2	A housewife with vision impairment wakes up to a new day
PWD3	International sign language communication

### **Application Area Scenarios**

VLC1	VLC Demonstrator
GOV1	ESD Where do I pay my rates?
MED1	Exploring Location (MedAssist – Supporting Hospital Staff)

## **3.5 Training**

Supriya Singh in conjunction with the training manager is developing both internal and external courses devoted to User Centred Design. These courses will teach both the state of the art as applied in an industrial setting and function as a technology transfer vehicle for the methodologies developed by the User Needs Project.

## **3.6 Relevant Project Reports and Working Papers**

### *Scenarios of Possible SIT Use (Working Paper 4)*

First attempt to consolidate a portfolio of scenario summaries for evaluation by the technology programs and industry partners

*Avoidance of Early Stage Project Failure (Working Paper 5)*

Draws consideration of cross-cutting issues together with other user perspectives on project development.

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## 4 Developing Demonstrator Concepts and Multi-Disciplinary Teams

The processes of developing demonstrator concepts and /projects have been explored through the development of a proposal for a Virtual Learning Community (VLC) Demonstrator, as an early trial of methodology. It involved:

- (i) Identification of the “virtual learning community” - the online community of students, teachers, and administrators, which, through interaction and information flow (formal and informal), enables learning to occur - as an application area of interest
- (ii) Formation of a multi-disciplinary team of social scientists, software engineers, computer scientists and educators
- (iii) Creation of a number of personas of staff and students
- (iv) Identification of the range of activities these personas would conduct and their requirements against each of the activities.
- (v) Assessment of potential relevance of the SITs to each of these activities
- (vi) Identification of priority activities of interaction/communication and formation of collaborative groups
- (vii) Outline of an approach of conversational agents and discourse analysis to support these activities
- (viii) Identification of a co-design group of staff and students, and a viable pilot environment
- (ix) Structuring a project proposal

Shortcuts were taken in the methodology as part of the learning and project development process, with important omissions including:

- Bypassing the detailed scenario development process with full evaluation from the various perspectives, and consequent articulation of a demonstrator concept about which there was shared understanding of value
- Detailed engagement with the technology programs to form a new team to develop the demonstrator concept

Nevertheless, the process was highly illustrative of the steps to be taken in developing demonstrator concepts and proposals. It also showed the merit of the demonstrator objectives in establishing informative interaction in the “meeting place” between user and technology researchers.

After discussion with the technology program leaders, it appeared that the most immediately demonstrable function was that of a domain-constrained natural language conversational agent. The ProBot under development through the NAUI program could be implemented in some form immediately - and the demonstrator project potentially contribute to the development of improvements, possibly in the form of learning scripts. A first application of the conversational agent was proposed as a synthetic participant in a chat environment, who is both an expert on the environment and an expert on who is in the system, where the users are and what they are doing.

It was envisaged that the ProBot would be utilised to enable a conversational querying approach to be developed for a Business IT subject. The intensive activity in structuring this

conversational agent is the development of the underlying scripts, which were to be developed by students.

Although the proposal did not proceed as outlined, the exploration of script development for a conversational agent by students did. This led to a beginning understanding of the requirements for authoring conversational scripts in dialogue contexts, and hence to a multi-disciplinary team project proposal for further action research on the applications of conversational agents – identifying appropriate contexts, and seeking to apply an agent in an action research mode to the interfaces to government websites. This action research may lead to a more refined demonstrator proposal, though in a different application context.

#### **4.1 Relevant Project Reports and Working Papers**

*Virtual Learning Community Demonstrator*

Proposal presented to RAC meeting March 2002.

*Conversational Agents in Context*

Project proposal being developed between NAUI and User Needs project.

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## 5 Next steps: Establishing a culture of UCD: Discovery

The fundamental issue in developing approaches to UCD in the Discovery Phase is to gain CRC-wide endorsement, support and engagement. The methodology proposed can only be implemented with the effective engagement of technology researchers and industry partners.

The first priority in Phase 2 of the User Needs project should be to ensure that the “meeting place” is effectively established

### 5.1 Establishing the Meeting Place

It is proposed that this activity be strongly resourced over the next six months, to

- test the viability of the scenario approach as a means to sustain interaction in the “meeting place”
- refine the structure of scenarios
- agree on criteria for evaluation, and
- form teams for the development of agreed demonstrator concepts.

The meeting place development should be resourced with

- Allocation of researchers from the User Environment projects, technology projects and industry partners (and members of SME Alliance where possible) to:
  - facilitate contacts
  - review material
  - attend workshops
- Two 2-day workshops as primary focus – in August and November.
  - August
    - Training in UCD Discovery
    - Working through existing scenarios
    - Generation of new scenarios
    - Review of evaluation criteria
  - November
    - Returning with evaluations of scenarios as tested with users, technology programs, and industry
    - Focusing on demonstrator projects
      - Outline demonstrator concepts
      - Implications for technology projects
      - Formation of new teams
    - Identifying other new common projects
- Effective online communication, via teleconference and common Intranet platform
- Establishing joint deliverables across disciplines in common projects wherever possible
- Building a UCD perspective into all technology project proposals through the engagement of UCD researchers.

## **5.2 Methodology and Training**

Methodology development and training are closely linked. We will build on and test the work done in the methodology project to deliver training in user-centred design (UCD). This training will be selectively delivered in-house to the UCD team and externally to CRC corporate and university partners. This approach will ensure that the training produced is useful to CRC stakeholders. It will also be developed and co-designed with users in a supportive environment and thus will have a greater chance of being generalisable across the design environment.

The training will deal with the theory and practice of UCD within a particular organisational context. It will reflect our ongoing reflection on working within the UCD team, with the technology programs and our experience of Demonstrator Projects. The training workshops will cover:

- Introducing User-Centred Design;
- Working with users and iterative design;
- Developing a paper-based prototype; and
- Usability testing

## **5.3 User Research**

The focus on SMEs, young people and people with disabilities will be maintained in the next phase of the project. For each group it will be critical to establish the meeting place for user-centred design to ensure that interaction can be mediated between users needs and technical possibilities. The intensive and iterative engagement envisaged for the meeting place will facilitate the emergence of new teams and the transition from scenarios to demonstrator concepts and on into the full product development process.

Phase 2 will be seeking to further clarify the pathways for ensuring that user needs research can directly contribute to the design of user-centred Smart Internet Technologies, through a focus on several activity streams:

- Continued engagement with user groups for validation and further development of scenarios;
- Continued engagement with Technology Programs and CRC industry partners to assist design and testing of program outputs; and
- Leveraging of scenarios to engage specific high value sectors to participate in the development and evolution of demonstrators/products.

## **5.4 Demonstrator Concepts**

A primary objective of the second phase will continue to be the development of demonstrator concepts, leading to the formation of inter-disciplinary teams across the CRC to take forward into practical demonstrator and product development with value for each of the key stakeholders.

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