

<b>Institution: Middlesex University</b>
<b>Unit of Assessment: 11 – Computer Science and Informatics</b>
<b>Title of case study: ICT Inclusion and Design for All</b>
<p><b>1. Summary of the impact</b></p> <p>The case described shows that work reported in the 2008 RAE exploring the information seeking strategies of older users is currently having a direct and significant impact on government policy in respect of the broad area of digital inclusion. Impact has been influential in two primary areas: advice and guidance to policy making bodies and training needs for organisations so that design can accommodate industrial needs. Specifically there have been invited contributions and provision of expert advice to Government policy making forums and to lead on training for designing for all especially in the area of standardisation in Europe and worldwide, including under EU Mandate 376, which is in the process of establishing EU wide rules to ensure accessibility to information and communication technologies (ICT) products and services. The visible impact of these activities is the publication of several important reports and the use of the research to support the call for European Directive on the accessibility of public sector bodies' websites and the selection to work with the United Nations Committee on the Rights of Persons with Disabilities.</p>
<p><b>2. Underpinning research</b></p> <p>The ageing of the population means that the designers of computing products and systems need to have a detailed understanding of the often complex requirements of older people. As information is increasingly delivered through a digital infrastructure, the requirement for inclusion of this community increases. The research team that worked on the European Design for All initiative (<a href="http://www.designforalleurope.org/Design-for-All/">http://www.designforalleurope.org/Design-for-All/</a>) carried out research on information seeking strategies for older people that was previously reported in RAE2008.</p> <p>Gill Whitney and Judy Wilson in collaboration with Prof. Paul Curzon from Queen Mary, University of London, performed three user experiments using several representative groups from the target community of older people [2, 3] as part of an on-going programme of research aimed at discovering how to design computing systems and products for older and disabled people and how to transmit that knowledge successfully to technical professionals. The research has involved mixed teams of researchers, administrators and disabled and elderly volunteers working together on 10 funded research projects (including 3 with European funding) to identify the full range of factors that determine successful information system design.</p> <p>The experiments utilised real world example tasks that were both relevant and non-trivial. These tasks concerned information seeking for subsequent use in the real world and included: finding housing benefit information, planning a route, and searching for ferry information as part of planning the route. The chosen tasks represented anticipated lifestyle changes as people age.</p> <p>The studies identified important usability requirements for older people. Older and disabled people are a non-homogeneous group and human communication is a much richer social experience than a 'one-way information to user' system. Systems need to reinforce notions of boundaries and interactive use of representations of landmarks. Design of new systems should not aim to replace existing information sources but to complement them, building on the unique affordances of the new media. Ultimately this will lead to designs that are of more use to all.</p> <p>This research also identified issues around sensory impairment and how that is compensated by additional information coming from memory or previous experiences. The research explored how different ways of working can acknowledge different experiences of people with differing sensory impairments [6].</p> <p>Further research focused on identification and characterisation of older car drivers to aid the</p>

design process [4]. This research was supported by an EPSRC/SPARC funded research project: Investigation into the advanced technology desires, needs and requirements of older drivers [1]. Work in area of 'DesignForAll' is ongoing and the later work has been funded by (amongst others): EPSRC/SPARC, the European Commission Framework 6 programme, the ESRC/joint RCUK New Dynamics of Ageing programme and ANEC (the European Association for the Co-ordination of Consumer Representation in Standardisation [5, 7].

### 3. References to the research

This research was based on competitively funded projects, with robust peer review systems. The outcomes from the research were published in leading peer review journals and conferences in the field.

1. Bradley, M. D., S. Keith, I. Kolar, C. Wicks and R. Goodwin (2008). What do older drivers want from new technologies? <http://www.SPARC.ac.uk>.
2. Curzon, P., S. Keith, J. Wilson and G. Whitney (2004). Strategies for finding government information by older people. *User-Centered Interaction Paradigms for Universal Access in the Information Society*, Springer: 34-41.
3. Curzon, P., J. Wilson and G. Whitney (2005). "Successful strategies of older people for finding information." *Interacting with computers* **17**(6): 660-671.
4. Keith, S., M. Bradley, I. Kolar, G. Whitney and J. Wilson (2007). "Identifying and characterising diversity of the older car driver." *Contemporary Ergonomics* **2007**: 363.
5. Keith, S. and G. Whitney (2011). "Mainstreaming accessibility? Multidisciplinary problems or technical solutions." *International Journal of Knowledge and Web Intelligence* **2**(1): 53-63.
6. Whitney, G. (2006). "Enabling people with sensory impairments to participate effectively in research." *Universal Access in the information Society* **5**(3): 287-291.
7. Whitney, G., S. Keith, C. Bühler, S. Hewer, L. Lhotska, K. Miesenberger, F. E. Sandnes, C. Stephanidis and C. A. Velasco (2011). "Twenty five years of Training and Education in ICT Design for All and Assistive Technology." *Technology and Disability* **23**(3): 163-170.

### 4. Details of the impact

The experiments from the underpinning research identified and confirmed the need to address the digital needs of potentially marginalised groups and in particular the need to devise design approaches that could mitigate against the possibilities of digital exclusion of marginalised groups such as older people. The impacts arising from the research have been broadly centred around influencing policy making to support standardisation, standardisation requirements on industrial design and addressing the training needs for those tasked with ensuring accessibility of web sites and other industrial design outputs.

**Policy influence:** The underpinning work and participation in the European Design for All initiative has contributed to policy making in the UK and EU. For example, Gill Whitney and colleagues have engaged with a range of national and European policy and regulatory bodies:

- In 2011 Gill Whitney provided advice to the UK Governments Department for Culture Media and Sport, E-accessibility forum.
- In 2011 she was invited to a meeting at the Department of Work and Pensions to meet Professor Hajime Yamada of Toyo University to discuss the use of accessibility standards in Japan, the UK and worldwide.
- In 2009 Gill Whitney was invited to comment on the UK government's action plan 'Delivering Digital Inclusion: An Action Plan for Consultation' [S3].

- Provision of expert advice to the House of Commons for the Internet Service Provider Association's Annual Parliamentary Advisory Forum on Harmful Content in the Internet on the 4<sup>th</sup> February 2008.
- In 2008, Gill Whitney and Suzette Keith were asked to and provided input on behalf of Middlesex University to the Consultation on EU Proposals for a Revised Regulatory Framework for Electronic Communications Networks and Services [S4].

In addition Gill Whitney has provided expert advice to (amongst others) the European Commission Framework 7 Cardiac project and ANEC (the European Association for the Co-ordination of Consumer Representation in Standardisation). Her research contributions have led to her participation in National and International Standardisation initiatives. She is currently task force leader for the ISO Technical Advisory Group for the revision of ISO/IEC Guide 71 (Guidelines for standards developers to address the needs of older persons and persons with disabilities) [S5].

The ongoing research on the needs of older and disabled people resulted in both further research in this area (funded by ANEC) [S6] and the launch of a campaign based on this research by ANEC and the European Disability Forum (EDF) who called on the European Commission to propose a Directive on web accessibility [S7]. The proposal for a European Directive on the accessibility of public sector bodies' websites was then presented to European Council in December 2012. The goal is to have EU public sector websites accessible to all by 2015.

**Training needs:** All those tasked with the design of systems/web sites and other artefacts should be aware of the importance of designing for all types of users. This idea has resulted in Middlesex's participation in projects designed to identify ways in which information can be transmitted via education, for example Middlesex led the training work-package in the DFA@eInclusion (<http://www.dfaei.org>) European Commission Framework 6 project which steered the creation of Design for All In ICT: Curriculum Guidelines [S8]. In addition expertise was provided to the Stand4All project which was funded by the European Commission to include people with disabilities and elderly people, not only in the content of standards, but also in the standardisation process [S9]. Gill Whitney contributed to the leadership of workshops at two Stand4All (Standardization for All people) events in Madrid and in London. These workshops drew directly on the underpinning research described above.

#### **Influencing Industrial Design:**

In 2012, the expert knowledge of the information seeking skills of digitally excluded communities acquired from the underpinning research led to the invitation from the Office of the High Commissioner for Human Rights (OHCHR) and the United Nations Committee on the Rights of Persons with Disabilities to carry out research in conjunction with Microsoft, and Ability Net to assess the accessibility of the OHCHR information systems. This work produced a report which was accepted in April 2013 by the UN.

Within the broader context of the Interaction Design Centre located at Middlesex, a doctoral study examining online information seeking behaviours of low literacy users of the Citizens Advice Bureau, identified significant differences compared to high literacy users in their information seeking strategies, behaviour models and mental models. This research led IBM Research Lab in India inviting the team to share our experience and expertise with the product development team of the Spoken Web [S1]. Since then we have worked with IBM India organising two workshops focusing on Intelligent User Interfaces for the Developing Regions (IUI4DR) [S2]. Thus the research on the need to address digital inclusion needs has had impact on product development elsewhere.

#### **5. Sources to corroborate the impact**

S1. Letter of invitation from IBM India for collaboration.

S2. The 2011 workshop was at the Stanford University (<http://research.ihost.com/iui4dr/>), and the

second was at Santa Monica (<http://www.eis.mdx.ac.uk/research/idc/UI4DR/>) in 2013.

- S3. 2008: Delivering Digital Inclusion: An Action Plan for Consultation: <http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/documents/communities/pdf/1001077.pdf>
- S4. <http://tna.europarchive.org/20081112130309/http://www.berr.gov.uk/files/file46498.doc> (see p65 - MU named in list of individuals/organisations consulted)
- S5. Confirmed minutes of the first meeting of the ISO/IEC JTAG for the revision of ISO/IEC Guide 71 26 - 28 September 2011, Geneva (Switzerland)  
<http://www.cix.co.uk/~bpechey/q26/T09-SG16-111121-TD-PLen-0393!!MSW-E.doc>
- S6. AGE-ANEC-EBU and EDF - Joint campaign on web-accessibility, Details of this campaign followed on from Suzette's work on the project Declaring conformance on Web Accessibility – see 2.c on the attached form. The press release at [www.anec.eu/attachments/ANEC-PR-2011-PRL-010.pdf](http://www.anec.eu/attachments/ANEC-PR-2011-PRL-010.pdf) refers to this work.
- S7. Information on the campaign can be found at; <http://www.age-platform.eu/en/age-policy-work/accessibility/age-position-statements/1341-age-anec-ebu-and-edf-joint-campaign-on-web-accessibility>
- S8. Design for All In ICT: Curriculum Guidelines, <http://www.dfaei.org/curricula.html>
- S9. Standards training: STAND4All: [http://www.usem-net.eu/index.php?view=article&catid=40%3Anews2008&id=113%3Astand4all-training-recruitment-started&Itemid=70&option=com\\_content](http://www.usem-net.eu/index.php?view=article&catid=40%3Anews2008&id=113%3Astand4all-training-recruitment-started&Itemid=70&option=com_content)