

**Engineering, technology and design can support people with dementia in many different ways. The design of buildings and neighbourhoods, devices to support independent living and technologies to support creativity were all covered in this workshop.**

The event brought together researchers, practitioners working in dementia care and people with dementia and their carers. During the day the needs of people with dementia and their carers were discussed along with exciting research which is considering how those needs might be met through technology and engineering. Leading researchers presented their latest findings. The workshop was attended by practitioners and policy makers, health and social care practitioners, employers, charitable and government bodies concerned with the needs of older and disabled people, as well as researchers and academics from a variety of disciplines. A highlight of the day was the group singing over lunchtime with Singing for the Brain organised by the Alzheimer's Society.

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## Indoor and outdoor design

**The design of support settings for people with dementia**

Judith Torrington, University of Sheffield

**Meeting needs through the design of the built environment**

Lynne Mitchell, University of Warwick

**The Alzheimer's Safe Return Programme**

Rupert McShane, Oxfordshire and Buckinghamshire Mental Health NHS

Foundation Trust

Although Judith Torrington's talk was mostly on the design of housing and Lynne Mitchell's on outdoor environments, there was much commonality in the research findings presented. Both discussed the need to promote active participation in enjoyable activities for people with dementia (PWD). For instance, Judith Torrington discussed the design of communal rooms in care home and how they are poor at promoting social interaction - looking at how pubs are designed with their more cosily divided spaces could inspire better design. And Lynne Mitchell emphasised the importance of enabling people to get around their neighbourhood to prevent them getting housebound.

Both speakers discussed the importance of people getting outdoors to provide physical and mental exercise, stimulation and autonomy. There is a risk that security concerns in care homes prevent people from accessing gardens, whereas contact with the natural world is important for well being as it reduces stress and other health problems. If buildings are designed with an overly-strong emphasis on safety and security, there is a risk that quality of life suffers.

The viewpoint that the constant walking by PwD is to be discouraged was challenged, instead it was suggested that this should be seen as an enjoyable activity to support. For this, easy, familiar, navigatable environments are needed. Places outdoors and spaces indoors need to be easy to interpret with landmarks that help navigation and places to sit and rest. Endless identical corridors in care homes are easy to get lost in, whereas better designs allow in natural light and have clear visual prompts for navigation. Some designers create indoor 'streets'.

Whether indoors or outdoors, distinctive features at junctions, obvious and inviting entrances, familiar and legible fixtures and fittings (such as seats), and a clear hierarchy of spaces (communal vs private, main road vs residential street) can aid navigation. The deterioration in senses that accompanies old age also causes problems: highly polished floors can create glare and a lack of colour contrast can create problems with paving. The need to make care homes wipe clean and tidy can result in a sterile environment in terms of tactile stimulation.

One method for improving designs is to use checklists and guides. One example concerned the promotion of enjoyable activity for people with dementia ([www.atdementia.org.uk](http://www.atdementia.org.uk)). Another was to enable the evaluation of older people's living environments (<http://www.dhcarenetworks.org.uk/IndependentLivingChoices/Housing/Topics/type/>

[resource/?cid=7997](#)). And Lynne Mitchell provided 17 key design features in her talk (<http://kt-equal.org.uk/uploads/dementiajan2011/lynne.pdf>)

These discussions of built environment design naturally led into Rupert McShane's talk on the problems of PwD getting lost. When PwD get lost, the chances of them getting institutionalised increase greatly (3.9 fold). Reducing the prevalence of PwD getting lost would help people to remain independent and reduce expenditure on institutionalisation.

Rupert McShane proposed a system to help the safe return of lost PwD. Using a network of good citizens such as faith groups and neighbourhood watch; relatives; domiciliary carers; public sector workers, and emergency staff from St John's Ambulance, Association of Lowland Search and Rescue and special constabulary to carry out the search.

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## Assistive technologies

### inTouch: social inclusion and dementia care technology work

Hazel Boyd, Bath Institute of Medical Engineering

### Supporting people with dementia using pervasive health technologies

Mark Donnelly, University of Ulster

Two projects which hoped to increase the amount of time a PwD can remain living independently in their own home were presented.

Hazel Boyd outlined a project which is in its early stages. A significant number of PwD spend long periods alone and can become socially isolated. Improved social interaction can extend the time that someone can live independently at home, and improve their quality of life. inTouch is developing a video link system to enable a PwD to interact remotely with their relatives. The inTouch system will provide a wide view of the family member's home, giving the feel of a immersive "visit" rather than just a video phone call.

Although internet conferencing technologies are widely and cheaply available, and some PwD can hold telephone conversations, diminishing working memory, which progressively reduces their ability to initiate familiar tasks and learn new ones,

causes problems. Simply providing "helpful" technology to a person with dementia is no guarantee that it can be used independently. The technology must therefore be completely intuitive to use, requiring no learning or recollection of previous use. PwD must be able to operate the system themselves, by using appropriately designed audio and visual cues and touch screen interfaces. Early research has shown that a photograph and a repeating recorded message of a familiar voice was best for getting people to touch a screen to initiate a call. Subtleties of language are also important - "press the screen" is different from "touch the screen".

Mark Donnelly looked at the move away from desktop computing to more pervasive technologies. He concentrated on the MPVS (mobile phone-based video streaming) project which uses mobile devices to provide a range of memory cues to improve independence and quality of life for PwD - <http://www.mpvs.org/>.

The project uses every day technology to deliver reminders in form of a short video of a familiar informal carer. The PwD not only gets a reminder, but also the feeling of being in contact with their caregiver such as a daughter, son or partner.

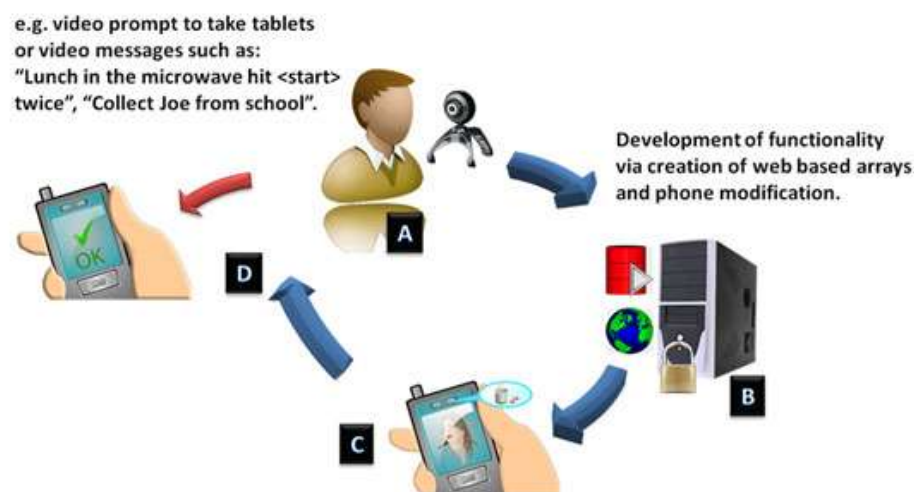


Figure 1 from [http://scm.ulster.ac.uk/~etacweb/img/mpvs\\_explanation.jpg](http://scm.ulster.ac.uk/~etacweb/img/mpvs_explanation.jpg)

The technology works as follows:

1. A carer records a video message onto the central server using a computer or by a mobile phone, and sets the time(s) for the reminder message.
2. At the defined time an alert on a mobile device worn by the PwD prompts them to view the reminder message using the device. The device is a mobile phone with a protective covering and a single button on the front.

3. The patient acknowledges receipt of the message.

Work is on-going looking to improve the technology and acceptability.

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## Creative technologies

### Using technology in creative ways with people with dementia

Claire Craig, Sheffield Hallam University

### Designing for personhood in dementia

Jayne Wallace, University of Newcastle, [www.digitaljewellery.com](http://www.digitaljewellery.com)

Jayne Wallace involves people with dementia (PwD) and carers in a co-creative design process to make digital jewellery objects for the PwD and people close to him/her. The objects help support the maintenance of self and personhood both internally and socially.

Ten stimuli objects were created that allow the PwD and people close to them to express themselves and share with Jayne things that are meaningful to them. These included: a seed packet with blank plant labels that asked the PwD to consider *If she could turn some of her qualities, personality traits or idiosyncrasies into seeds that could be planted and grown, what would these be?* This required the PwD to talk about her chosen qualities, what she valued about herself, what the seeds would bloom into and what impact this would conceptually have; a model home to be decorated to express what *home* means, and a preserving jar asking the PwD to consider *If she could capture anything (for instance any moment, sound, song, smell, view, object, place...) and preserve it in this jar for her to relive what would she choose?* The stimuli began a rich, co-creative, empathic design engagement between Jayne and her participants in which the PwD was deeply involved in the design process. From the responses and the many conversations and biographical recollections that the stimuli led to Jayne made digital jewellery artefacts that could mesh with these meanings and potentially act to support the PwD's sense of self and relationships with people close to her.

Completed designs included: (i) A silver locket with a small digital photoframe inside as a way for the PwD to view photographs from her life and a fresh reason for the PwD and her family members to take new photographs to place in the locket. The locket can hold one image, or a great number of images as felt appropriate to the

PwD. Simply opening the locket caused an image to be displayed and by closing and reopening images could be scrolled through. (ii) A small 'cloud watcher' necklace which tapped into the PwD's sense of humour. (iii) A set of brooches made from the PwD's old dress fabrics, which used electronic tags to enable sounds associated with the dresses (such as music that the PwD remembers from the holiday when she first wore the dress or family conversations and reminiscences related to the dress) to be recorded and played back from a small jewellery box.

Claire Craig examined current technologies available today: camera, digital picture frames, blogs, wikis, digital scrapbooking, video portraits, digital stories, YouTube and social networking. Blogs offer an outlet for PwD to speak about their lives and condition: giving a voice to people with dementia. Photography and digital scrapbooks can be way for expressing feelings when it is difficult to find the words, keeping mentally active and having a sense of creative achievement. Photographs can be the starting points for story telling and reminiscing.

Jayne Wallace involves PwD and carers in a co-creative design process to make digital jewellery objects for the PwD and people close to him/her. The objects help support the maintenance of self and personhood both internally and socially.

Ten objects were created that allow the PwD and people close to them to express themselves. These included: a seed packet with blank plant labels for filling in with a person's qualities, traits and idiosyncrasies; a model home to be decorated to express what *home* means, and a preserving jar to be labelled with something to be captured and re-lived.

Completed designs included: (i) A locket with a small digital photoframe inside as a way to communicate with other places, people and times while having an element of surprise as the picture changed. (ii) A small 'cloud catcher' sculpture which tapped into the PwD's sense of humour. (iii) A set of broaches made from old dress fabrics which used electronic tags to enable sounds associated with the dresses to be recorded and played back from a small dress box.