



# Technology for Assisted Living

Centre for Applied Internet Research

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## First multi-disciplinary workshop sets the scene for future links

NEWI's Centre for Applied Internet Research (CAIR) welcomed participants from a rich array of backgrounds for its inaugural workshop on Technology for Assisted Living on September 27th.

Dr. Rich Picking, organiser of the workshop, introduced the Director of CAIR, Dr. Vic Grout, who made a brief presentation of the Easyline+ research project, which aims to produce affordable 'intelligent' white goods.

The workshop itself focused on wider issues including telecare, homes for life, smart home technologies, and technology to support vulnerable people with a range of needs.

Whilst most of the discussion concentrated on the needs of elderly people, there was still valuable consideration of the requirements for disabled people.

There was lots of entertaining and lively debate, and all participants expressed an interest to continue the links made on the day. This newsletter is the first step towards building such links.

## Official: Rich Picking has not 'lost his marbles'

There was a certain amount of skepticism and surprise when Rich Picking recounted his youthful memories of watching the 'Bedtime Routine' TV public information film during one of his workshop presentations in the Gallery at NEWI.

When it transpired that no-one else had heard of it, one or two more cynical CAIR members were known to utter that perhaps Rich had been hallucinating, or worse, had completely lost his marbles.

Inside this first issue are summaries of each of the six workshop breakout discussions, which concentrated on the following topics:

1. Sensory impairment
2. Cognitive needs
3. Well-being
4. Physical disabilities
5. Telecare
6. Everyday living

This is the first of hopefully many publications to keep the group informed of further developments of our collaborative work to produce affordable technology for assisted living.

We will also communicate regular updates of progress on the Easyline+ project, and announcements of events at NEWI which readers may be interested in.

If you would like to make a contribution to the newsletter, please contact us by phone or e-mail.

[http://uk.youtube.com/watch?v=AT-Wga\\_7wvl](http://uk.youtube.com/watch?v=AT-Wga_7wvl)

How's YOUR bedtime routine?

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## Introduction to the workshop notes

Over the next few pages, you will find summaries of discussions which took place in the six areas covered in our workshop.

They have been transcribed from the flipchart points made, from memory, and from notes made during the post breakout group presentations.

We hope they reflect all participants recollection of

what was said!

It was really valuable to hear such diverse experiences, views and observations. The general feeling of everyone present was that technology **must** play a vital role for the future well-being of not only vulnerable people in society, but for society as a whole. Hopefully we will be able to make a meaningful contribution to progress in this area.



Only 2% of visually impaired people read braille

## Workshop notes: Sensory impairment

The group discussing sensory impairment issues focused on visual and auditory impairment.

Some interesting statistics were presented: 1 in 12 people over 65 has a visual impairment, and this increases to 1 in 6 over 75. However, only 2% of visually impaired people read braille. Perhaps then, sound is a better form of communication than braille for assistive technology?

'Task closure' was seen to be a real issue for those with visual impairments e.g. putting things away after using them, closing doors, switching things off etc. Locating messaging devices in appropriate places to remind people about such things was discussed e.g. by the bed, on the fridge door etc.

Some novel ideas were also discussed—technology to advise on selecting clothes to wear, vibrating

pillows for smoke detection, direction guidance in emergency evacuation scenarios, using digital photoframes to communicate information to those with hearing difficulties.

More obvious forms of communication were also discussed, such as interactive television and radio.

The Intel Hub was mentioned as something to consider for integration of telecare and home-based assistive living, as was the Internet in general.

The notion of disability stigma is something we need to be sensitive about, however. Another potential issue is that generally people don't like devices that associate them with a disability, or vulnerability, such as the wearing of pendants. Everyday devices that have been modified are much better—promoting further support for 'ambient' or 'disappearing' technologies.

*"1 in 12 people over 65 has a visual impairment, and this increases to 1 in 6 over 75."*

## Workshop notes: Cognitive needs

This was a wide-ranging discussion which considered a number of points, including. The first discussion concerned different levels of (dis)ability. It was clear that technology could only be of use to those people with up to a certain level of problem – at least so far as allowing them to live independently was concerned.

**Simplicity** was considered a key feature of any system, device or apparatus designed for use by the cognitively impaired. They would have to be easy to read and use. **Safety** was also paramount, as was **choice**.

The group discussed **security** as being a big concern and something that we could make a useful contribution to.

A perceived problem was a possible reluctance to change habits or practices. So far as possible, the technology should be as unobtrusive as possible. There would be a resistance to major changes to

lifestyle. Any necessary changes would have to be made with the consent of the person concerned. In a similar vein, homes have to be adapted to suit individual needs. There is probably no scope for a 'one size fits all' approach.

Automating the 'use-by' dates on food was considered a good idea as this could be automatically monitored by an intelligent system or a carer.

Often the changes that would have the most benefit could be non-technical. Design of accommodation with (say) doors opening the right way can make a lot of difference.

Probably a review of current practices and infrastructure would be necessary in most organisations.



## Workshop Notes: Well-being

The group was asked to consider the effect of technology on loneliness and depression. It was agreed that technology was never either exclusively good or bad but it often tends to remove human interaction and create confusion by offering too much choice. We considered the pros and cons of some well-known technologies.

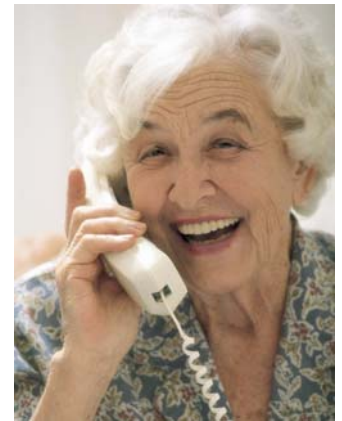
We looked first at a very old technology – the telephone. The telephone was considered very beneficial for maintaining long-distance contact between friends and relatives, and maintaining local contact for the immobile. It provides easy access to services in the event of an emergency. On the other hand, it can often be intrusive and it can prevent face-to-face interaction. The group discussed mobile phones. These were seen to be sometimes alienating for older people...they are not intuitive to use, they are expensive and older people do not always understand the jargon or texting language. There are worries about the health effect of prolonged use.

Computers and the Internet were considered next. It was agreed that these were very beneficial to some people, particularly the disabled. They facilitate employment opportunities and enable people to take up new hobbies. E-commerce and online banking make it much easier to conduct day-to-day transactions. Email, chat rooms, e-learning, game-playing and other online group activities all help to reduce the sense of isolation. Against these benefits are all the well-known problems with the Internet that older people worry about even if they are not directly affected – hacking, fraud, spam, gambling, shopping and e-bay addiction. Older people are

concerned about the effects on family life – children spending too much time at the keyboard leading to breakdown of family life and a resulting lack of social skills. One member of the group expressed concern that grandchildren tend not to visit much – they consider that the sending of an email now and again as their family duty done.

For many years, TV and radio have been the lifeline that keeps older and disabled people in touch with the rest of the world. They provide news and entertainment, prevent loneliness, engender well-being and make people aware of important safety issues. Radio is considered to be particularly important as it is more accessible to those with visual impairment and is more trusted as a source of information than other channels. It is not clear whether the preference for radio is a generation issue. The only undesirable side-effects of radio and TV that were identified were arguments over who has the controller and some paranoia resulting from worrying news and documentary programmes. There was also some concern that advertising would encourage people to get into debt.

The final issue considered was that of technology to aid mobility. It was agreed that recent legislation to provide universal access to shops and other public buildings has had a very beneficial effect. It has made the use of electric scooters and wheelchairs much more popular which in turn has reduced their cost. Although there have been many more accidents involving these devices, they have enabled very many people to get out of their homes and interact with society.



Telephones offer lifelines for maintaining contact with friends and relatives

*“For many years, TV and radio have been the lifeline that keeps older and disabled people in touch with the rest of the world.”*

## Workshop Notes: Telecare

The discussion began by considering the beneficiaries of telecare. However, it was quickly recognised that everyone potentially could benefit. Any system that could allow (for example) remote monitoring of health could be useful to anyone. Telecare offers 24-hour monitoring that would be hugely expensive if provided in person.

The group then narrowed the scope of telecare down to that of *managing risk*, more likely to apply to the elderly or disabled. The basic concept was to increase independence without increased risk. It was noted that telecare also offered the possibility of *monitoring behaviour* and that this potentially had ethical/privacy considerations. However, it was felt throughout the discussion that the benefits generally outweighed the moral drawbacks – with the right

safeguards in place. Systems need to be **adaptable**.

Telecare can also be seen as a *Community Information Portal*, allowing users to access key information, advice or guidance. Consultation could take place remotely for example.

It was reported that a telecare scheme would be active in Wrexham from early 2008 and results would be analysed.

It was noted that telecare technology might not be cheap but that cost savings for the NHS, GP, pharmacists, etc. would easily make such systems worthwhile in time.



## Workshop notes: Physical disabilities

We started by agreeing that it was necessary to concentrate upon the needs of the client/user group, particularly the provision of universal access...access to buildings and the environment; access to information; access to tools and equipment. The aim of providing generic and universal access should be the norm and individual needs could be met by ensuring that provision is always simple but adaptable.

It was agreed that acceptance of technology is frequently dependent upon how it is presented to the user in the first instance and how easy it is to get help and instructions afterwards. In both cases, human to human communication by trained individuals is essential.

Important physical attributes identified by the group included:

Mobility – the ability to access places

Dexterity and grip strength – for using controls

Stamina and tolerance- the ability for example to stand for long periods

Range of movement – are things easily within reach?

Very important features of technological solutions were seen as:

Reliability – things need to work all the time and in the same way. If 100% cannot be achieved, then things should fail safely.

Economy – if it is too expensive, people will not consider technological assistance or it will not be bought for them. Sometimes economies of scale kick in – an example was quoted of battery-operated scooters which became very popular as the price dropped from a couple of thousand pounds to a few hundred.

The group compiled a list of activities that elderly and physically disabled people had particular problems with:

Stairs and steps

Bathing and toilet

Dressing

Getting out of bed

Opening windows

Using a chest freezer

Using kitchen implements

Operating controls of all kinds

The list was not by any means exhaustive.

Finally, one member of the group recommended the use of Assistance Dogs as an alternative to technological solutions for physically disabled people.



Mobility is key to independent living

*“acceptance of technology is frequently dependent upon how it is presented to the user in the first instance and how easy it is to get help and instructions afterwards.”*

## Workshop notes: Assistive technologies for everyday living

The group discussed a wide range of issues, and it was clear that there are huge challenges to support people in their daily lives. Access to the home, remote control doors and CCTV supporting privacy and dignity for the vulnerable individual.

Bathrooms are problem areas—showers and baths need better access. Technological devices offer communication and support lifelines, yet they can be difficult to use. The group discussed whether multiple devices for separate functions (TV, video, security etc.) would be best, or whether a single device controlling everything would be better. Unanimously, the latter was preferred, but such a solution

would need to be carefully designed for ease of use and be adaptable to varying needs.

As technology becomes more pervasive in the home, it must be reliable, quick to respond, and maintain confidence in terms of privacy and security. Another consideration is what happens in the event of a power cut, and finally, what does this all mean for a ‘greener’ society?



## Inside Story: The EASYLINE+ project

It is a simple fact that, as people get older, they find it harder to carry out the basic domestic activities they would have found easy at an earlier stage in their lives. It may be no more than reduced mobility, dexterity, sight or hearing that causes this or it may be the effects of some more precise disability; the outcome is the same: it becomes harder for elderly people to maintain their independence as the years go by. Surely, however, rather than allow our senior citizens to lose this independence, it is not unreasonable, in this technological age, to expect technology to come to the rescue?

This is the belief behind the EASY LINE+ project; a new venture funded by the European Union. The total value of the project is over 2.1 million Euros. The academic and industrial consortium partners emanate from Spain, UK, and Germany. The aim of the project is to develop a range of advanced white goods, near to market, to support elderly persons, with or without disabilities in maintaining a longer independent life by compensating for their loss of physical or cognitive abilities. The requirements of such products are:

- Security and reliability: This must be 100% as they have a direct bearing on a person's health and safety,
- Intelligence: They must be able to learn from their environment and the changing level of ability of the user,
- Interconnection and interoperability: The devices must communicate with each other and the outside world – not just in terms of their own basic functionality, but also, through the use of sensors, as an alarm system in case of emergency.

It is proposed that items being used in conjunction with these devices will be tagged (ID chips, for example) and the devices will handle them with intelligence. In particular, the devices will work in conjunction with an 'e-Servant' system, which will recognise and adapt to changing needs as the user grows older. Some examples of advanced white goods planned and their projected functionalities are:

- REFRIGERATOR+: This will keep track of food and drink put in or taken out. It will identify expired goods and give notification of loss of cooling, through a power-cut, for example,
- DISHWASHER+: This will identify and alert if non-dishwasher-safe items are entered and automatically calculate the correct amount of washing powder, etc.,
- WASHING MACHINE+: Identify and give warning of inappropriate (clothes) load combinations. Calculate correct programme, temperature, level of powder and softener,
- COOKER/OVEN+: Identify sudden, unaccounted changes in temperature. Detect overflow and the presence of a pot or pan (not to turn on if there is no pan present for example to prevent accidental use of wrong hob).

CAIR and NEWI's share of the project grant is the largest of the consortium at approximately £250,000. CAIR's role is to develop the user-interfaces for these advanced devices. At present, the intended target population is not at all involved with newer technology in the main so the requirements of these interfaces, in this environment, are very precise:

- They will have to be very simple to use: intuitive and welcoming – not complex and intimidating,
- They will have to be capable of adapting to the different levels of ability or disability of a range of users,
- They should, so far as possible, be common across a range of devices. Differences in functionality or operation should be kept to a minimum,
- They should strike a balance between speed of use and ensuring correct operation,
- They must conform to all relevant standards.



The 'e-servant' will recognise and adapt to changing needs as the user grows older.

*“... to develop a range of advanced white goods, near to market, to support elderly persons, with or without disabilities in maintaining a longer independent life by compensating for their loss of physical or cognitive abilities.”*



Is this vision of an Internet fridge linked to your television the sign of things to come?



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## Forthcoming events at CAIR

**When?** 1-2pm Wednesday, 17th October 2007

**Where?** B128 NEWI

**What?** "Ethics Special" - including "Ethics Visualisation" and "Ethical Geometry"

**Who?** Denise Oram (assisted by John McGinn and Vic Grout)

**When?** 1-2pm Wednesday, 21st November 2007

**Where?** B128 NEWI

**What?** Ambient Intelligence for Assisted Living (EU EASY LINE+ project)

**Who?** Alexia Robinet, Armando Roy, John McGinn, Rich Picking & Vic Grout (The Easyline+ team)

## Back page story: Vic inspired by Assisted Living keynote speech

CAIR's recent successful conference (Internet Technologies and Applications) ITA'07 witnessed an inspiring presentation by one of the UK's leading telecare specialists, Dr Kevin Doughty.

Dr Doughty, from the Centre for Useable Home Technology at the University of York, demonstrated a wide range of innovations designed to improve quality of life, independent living and healthcare provision.

Some amazing technologies were shown to be relatively affordable, and when he introduced the 'robot vacuum cleaner' (available for as little as £50), a certain Director of CAIR's ears pricked up.

It didn't take long for Vic to find this vacuum cleaning technology on the world wide web, and within days, a new addition to the CAIR offices was witnessed busily covering the floor space.

Following a successful trial, the little robot (now

known as Reg) has become a firmly established member of the Grout household, and has no objection to patiently cleaning rooms when everyone else is at work or school.

Mrs Grout is particularly impressed, and has asked Vic to look out for more technology to assist in their living.

However, one furry member of the family is not so keen on the idea .....



Robot vacuum cleaner (viewed from above)