

# 15

## The role of technologies in the everyday lives of older people

*Caroline Holland*

Technology is all about applying scientific and experiential knowledge to using tools, techniques or systems in order to solve problems or make things easier to do. In general terms, humans have a long history of using technology, and in modern societies it is inescapable – even people who declare themselves to be technophobes use many and various technologies every day.

Technologies have sometimes been described as ‘high’, ‘medium’ or ‘low’, reflecting the extent to which highly advanced or specialised systems are involved. ‘Intermediate’ or ‘appropriate’ are terms generally applied to technologies adapted or designed for use in less developed countries where access to resources is limited. However, in the UK, current discussions about technological inclusion and exclusion, and the appointment in 2009 of a Digital Inclusion Champion, focus more specifically on ‘high tech’ information and communication technologies (ICT), where older people are repeatedly identified among technologically excluded groups

This chapter aims to investigate the nature of older people’s interactions with ICT, within the context of older people’s uses of technologies more generally and particularly within the environments where they live, and the potential for ICT products and services to enhance the everyday lives of older people.

Electronic computing as we understand it today emerged gradually from pre-20th century mechanical computing machines via incremental advances until it really started to take off after the Second World War, with innovations in electromechanics/electronics and programmability. The rate of development gathered pace through the latter part of the 20th century to the point where personal computers became a mass consumer product. ICT in one form or another is now ubiquitous with integrated circuits (computer chips) in a wide range of everyday products: from ATM (cash) machines to television remote controls, from barcode readers in shops to central heating systems in the home. In the seemingly relentless tide of innovation of recent years many people, including many older people, have at times felt swamped by new technologies. Yet it is unhelpful to position older people *per se* as particularly resistant to changes in technology. I am writing this chapter a few miles from Bletchley Park, where the

development of the Colossus electronic computing device played a significant role in the outcome of the Second World War. The women and men who developed, worked with and kept very quiet about that cutting-edge technology are now in their nineties. During their lifetime they and their contemporaries have developed and embraced the mass use of telephones, home electrical equipment such as washing machines, and a myriad of other kinds of domestic appliances, wireless radio and television. In addition older people have often fashioned impromptu devices for themselves to help with practical tasks, for example, to reach or to carry, and many devices that initially older people used rarely over time have gained more general acceptance.

Openness to new ways of doing things is not a simple matter of being youthful or aged, or indeed of belonging to a particular generation – a person's attitude to new technologies relates to their present circumstances, their general inclinations and attitudes to innovation, their previous experiences, work, education and knowledge and their past and current exposure to different technologies. To understand exactly why some older people are wary about new technologies, reluctant to use them or refuse to take on board what others see as useful technologies, requires a 'person-centred approach'. Research has shown that most older people are happy to try technologies that they think will be really useful to them and that are affordable and not difficult to service or maintain. On the other hand, faced with an apparently unending stream of new devices, some of which are costly, unproven and liable to be superseded in a short time, many older people are justifiably wary of committing time and resources to getting involved where they feel that the effort to learn the technology outweighs the probable benefit of using it; and they may well feel that they have more urgent things to spend their money on. Nor does everyone agree that technological advances are necessarily social advances. Some argue that using technologies can be deskilling for individuals, and older people may be particularly aware of skills such as mental arithmetic or map reading which, having learned as children, they do not want to lose through reliance on devices. It is vitally important that technologies are used to support and enhance rather than to replace or undermine existing skills. Furthermore, some people argue that technologies can all too easily be used to replace human contacts, whether socially or with carers, face to face.

As potential users of ICT, older people and people with disabilities have been particularly targeted in the development of telehealth/telecare systems and assistive technologies, some devised specifically for people with sensory, mobility or cognitive impairments. But older people and their requirements have in general been less well considered in the development

of the internet and in social media technologies, and with a few exceptions the marketing of these products has tended to ignore older consumers.

### **Telehealth, telecare and assistive technologies**

*Telemedicine* is an advanced form of *in absentia* medical care, where information is transferred between locations for the purposes of consulting, diagnosis or procedures: it has primarily been used by clinicians and other medical professionals. *Telehealth* is a more general extension of this idea, combining devices and services to enable people to self-monitor or be monitored by others, including health professionals. It allows continuous monitoring of specific physical measures such as blood pressure or blood glucose levels. Telehealth systems tend to be commissioned by providers of healthcare services from commercial companies that specialise in developing ‘ecosystems’ of different kinds of devices, with information management and data storage, in integrated systems. An older service user will typically be able to decide whether or not to use particular devices, but only from among those on offer from the organisation providing their care service package. *Telecare* takes this one step further to enable the monitoring of activities that might have an effect on the older person’s health or safety; examples include emergency alarms, motion sensors and fall detection devices. Telecare can include ‘the continuous, automatic and remote monitoring of real-time emergencies and lifestyle changes over time in order to manage the risks associated with independent living. Sensors around the home are linked via a telephone line to a call centre. The system monitors a person’s activities and, if a problem occurs, triggers an alarm to a relative, keyholder or call centre’ (Alzheimer’s Society, 2008). Generally speaking most of these technologies are designed to be used by older people, either actively or passively, as providers of information that will be recorded, assessed and acted on by others.

*Assistive technologies* have been defined as: ‘any device or system that allows an individual to perform a task that they would otherwise be unable to do, or increases the ease and safety with which the task can be performed’ (Royal Commission on Long-term Care, 1999). Assistive technologies can include telecare and telehealth, but also extend to a range of more familiar medium and low technology devices such as slip-resistant mats, cutlery and kitchenware designed for people with arthritis, or compartmented pill boxes to help people to take the right medicines at the right time. These technologies have often been designed with the focus on specific needs with the intention of supporting or extending independent living as far as possible. *Smart Homes* are domestic houses where there are a number of such technologies, usually combined with

accessibility features, to enhance independent living. The term ‘assistive technology’ can also include technologies designed for the more general population. Examples are the internet and the mobile global positioning system (GPS) used to support independence and well-being (Beech and Roberts, 2008); many common household technologies such as microwave ovens and washing machines can be regarded as assistive in helping people to maintain independence in everyday activities. One categorisation of assistive technology (Doughty, 2004) has described it as including:

- supportive technologies for helping individuals to perform tasks that they might otherwise find difficult;
- detection and reaction technologies to help individuals to manage risks and raise an alarm if necessary;
- prediction and intervention (preventative) technologies to help prevent dangerous situations from arising and raise an alarm if they do.

### **Technologies for specific health conditions and disabilities**

Some technologies have been identified as being particularly useful for people with specific health conditions, while others have been purposely developed or adapted with their needs in mind. Mobility, sensory and cognitive impairments are among the conditions where technological solutions have been proposed to help people to cope with everyday challenges; the examples discussed here are just a sample of those available with others continually being developed.

#### ***Mobility technologies***

Physical mobility aids tend to be either for indoor or outdoor use, with relatively few spanning both. Some of these technologies are long-standing and familiar, for example, stairlifts and walkers (‘zimmer frames’) that enable independent movement within the home. Others such as powered stairclimbers, which can be used where there is no fixed stair lift or elevator, are at an earlier stage of availability and use. Outdoors, mobility scooters and powered wheelchairs for use on and off roadways are a common sight in the UK, where there are regulations regarding their specifications and permitted use (Use of Invalid Carriages on the Highways Regulations, 1988). Alongside these aids to physical mobility, there is a growing market in devices and systems that aid navigation and wayfinding. These can range from the familiar signs and signals used to assist people with visual impairments (tactile surfaces, colour contrast equipment, audio signals), to satellite-based signalling systems such as GPS

used in car navigation and smart phones. In addition, older people are being encouraged in some places, including in care homes and community centres, to use products designed for leisure activities (at present, for example, Wii and Kinect consoles with sports/activity software) to maintain a degree of physical flexibility and stamina in a sociable context.

### *Sensory augmentation*

There is a long history of inventions and adaptations to mitigate the effects of sensory impairments. As with mobility aids, they have often been relatively familiar and understood – for example, magnifiers or hearing aids – but at the same time also often felt as labelling or even stigmatising. Consequently modern developments have tended to focus not only on increasing the efficacy of devices but also on improving their look, feel, usability and discretion. For example, over the years there have been progressively smaller, more discrete and more effective hearing aids, and lighter, thinner lenses for spectacles. The growth in ICT has brought with it new aids, including computer screen readers and voice recognition software for people with visual impairments or following stroke. More recently, developments in haptic technologies, using the sense of touch, offer new ways of enabling people with disabilities to navigate and manipulate their worlds (see, for example, Lévesque, 2005).

### *Cognitive support*

Various cognitive training software products have been developed and marketed to older people with the claim that regular use can help to prevent age-related cognitive decline. These often take the form of games to exercise memory, reasoning, focus, problem solving etc, either on hand-held devices or using television or computer monitors. To date there is no convincing evidence that such products are more effective than similar activities in more traditional forms (such as playing dominoes or doing crossword puzzles). A large-scale study by Owen et al (2010) reported in *Nature* found that the improvements that participants aged 18–60 gained in the context of ‘brain training’ tasks did not transfer to other tasks. Acceptance of these products does, however, point to the concerns that many people have about cognitive decline in later life and their willingness to take steps to protect themselves against it.

However, other technologies demonstrably benefit people who already have a degree of cognitive impairment, and the use of supportive technologies have been particularly welcomed in aspects of dementia care because of their potential for enabling people to live longer in their own

homes in the community. The Alzheimer's Society (2008) describes assistive technology as being potentially helpful for people with dementia and their carers by:

- increasing independence and choice, both for the person with dementia and those around them;
- reducing the risk of accidents in and around the home;
- reducing avoidable entry into residential and hospital care;
- reducing the stress on carers, improving their quality of life, and that of the person with dementia.

The Alzheimer's Society gives some examples of fairly simple devices that can provide low-key support for day-to-day independence. These include audio reminder messages to prompt the person to remember their door keys, be careful about who they let in or remember that day's appointments; clocks that also show visually whether it is evening or morning to help prevent disorientation; locator devices using a radio transmitter which can be attached to objects such as keys or glasses cases; and software to evoke memories and stimulate conversation, using familiar music, photographs, videos etc.

Clearly while some of the devices and systems described so far have been developed with the specific needs of older and disabled people in mind (whether or not they actually fit the bill for any given individual), many more are designed for general use by a much wider population. In the latter case some devices may need further development to meet specific needs – for example, bigger buttons, more accessible text – while others can be used straight 'out of the box'. This is important because the modern everyday environment is not primarily a world of purpose-designed assistive devices, but one dominated by ICT used for communication in many forms, and it is essential that older people are not excluded from this pervasive aspect of modern life. Thus it is vital to think about how older as well as younger people might use communication technologies.

## **The internet**

The development in the early 1990s of the World Wide Web signalled the start of a revolution in communication which, by 2010, has linked well over a billion people, and rising, across the planet. Needless to say, the quantity and speed of uptake has varied widely between and within populations. According to Ofcom, the UK's independent communication industries regulator, in 2009 the growth in internet take-up that year in the UK appeared for the first time to have been driven by those aged

over 55, for whom the use of email was particularly important (Ofcom, 2010). However, this concealed a more complex pattern of access by older users, and in 2010 it was still the case that 64 per cent of those individuals who had never accessed the internet were aged over 65 (ONS, 2010), indicating differences between those approaching retirement age or fairly recently retired, and much older cohorts. Older people who do not use the internet do not necessarily regard this as a problem and it varies as to whether they wish to get involved. The use of the internet in general is closely associated not just with age but also with other socioeconomic and demographic indicators, with people on lower incomes and with less education much less likely to have access. Governments internationally have identified this 'digital exclusion' as a problem and a form of social exclusion, because as use of the internet has become more and more ubiquitous, lack of access to it means that people may be cut off from ready sources of current information, access to lower tariffs for goods and services and convenient ways of maintaining social contacts as well as administrative tasks such as banking. As a result there have been many initiatives aimed at the digitally excluded. Just a few examples are an EU-wide 'Get Online' campaign, offering free courses sponsored by consortia of companies and organisations ([www.getonlineweek.com](http://www.getonlineweek.com)); projects to introduce older people and their families and carers to video conversations via webcam ([www.connectmk.com](http://www.connectmk.com)); and the establishment of an annual Silver Surfers' Day of activities and promotions.

## Social media

The internet has many uses, such as commercial purposes (business, buying and selling), education purposes (for example, the Open University provides open access courses through iTunes U), and many other purposes including research, leisure and gaming. Among these uses the rise of social media has been particularly striking, moving from the very first handful of emails between computer programmers in the early 1970s to mass use. In the spring of 2011, for example, Facebook, Twitter and other forms of blogging made a recognised contribution to fast communications during political upheaval in the Middle East and disaster relief in Japan. These kinds of media enable people to express themselves both personally and publicly, combining technologies with social interaction in ways that are quick, inexpensive and easy to learn compared to conventional media such as television and newspapers. But generally speaking these technologies, as they have developed, have been seen as the domain of the young, and typically not regarded as useful or relevant to older people. Notable exceptions have been fêted in online communities as bucking this trend.

For example, María Amelia López blogged regularly from when she was 95 until her death at 97 in 2009, and the centenarian Ivy Bean (@IvyBean104), until her death in 2010, regularly posted on Twitter from her care home, and said that she would be miserable without it. Both women had a mass following of people of all ages who communicated with them until the end of their lives.

Singh (2010) has suggested that the social web could help to reduce the social exclusion of older people by:

- enabling decision making;
- increasing self-reliance;
- helping people adjust to new circumstances;
- improving the quality of life in terms of social contact, entertainment and physical movement; and
- providing a means by which older people may be introduced to and eventually appropriate technological devices for their own interests.

## **Reflections**

A combination of ideas has prompted increasing interest in understanding older people's relationships with technology and in securing their input to design. These ideas include concerns about social/digital exclusion; propositions about the contributions that technologies can make to supporting independence while reducing demands on carers and potentially saving money; and an awareness of a largely under-served (or under-exploited) market of older consumers. Some older people have also encountered problems when their tried and trusted technologies have become obsolete, for example, non-digital cameras and audio and video equipment. Furthermore, where advertising, marketing and indeed campaigning have, so far, addressed older consumers, the tone and age-related labelling (such as 'silver surfer') has been regarded by some as patronising while not necessarily taking seriously older consumers' preferences.

This all rather begs the question of the relevance of age. Some disabling conditions that can affect the person-technology relationship, such as sight loss, hearing loss and mobility problems, become generally more prevalent in older populations, although some individual older people may not experience significant impairment until very late in life, if at all. Others may have had lifelong sensory impairments, with which they age. Here the question is whether ageing *per se* is relevant, over and above the condition. In addition to possible effects of the individual ageing process, the shared

experience of successive cohorts is relevant because of differing exposure to technologies, especially in the workplace.

Designers and developers sometimes aim to produce products and services of a universal good design that are accessible to all; one benefit is that the aesthetic look of a product for the general market is important, and labelling for age or disability is minimised. On the other hand, people sometimes need bespoke, individualised or exact-fit products to meet a precise need, and it is one of the features of advancing technology that the making of one-off products may become increasingly more cost-effective through computer-aided design (CAD) and manufacture. Will it become possible, through good design, to emphasise the kudos of 'exclusivity' above the stigma of 'special needs'?

Simulation exercises have been used for some time in helping medical and care staff, designers and others to get a 'feel' as well as an intellectual understanding of the effects of specific age-related impairments, aiming to produce empathy as well as understanding. At a very simple level this may involve, for example, wearing clothing that restricts movement or spending some time moving around in a wheelchair. Technological advances have enabled the development of more sophisticated simulations, and there is now a whole range of aids, from goggles that represent specific visual impairments to body suits that emulate arthritis or stroke-related disabilities. With the turn to user consultation as part of the design process, and a growing acknowledgement of the significance of individual biographical experiences, there is reason to be hopeful that older people's concerns will be taken more into account in designing products.

Yet information remains key to accessing both products and the means to acquire them, and as more and more products and indeed whole new technological approaches become available, many older people are turning to family, friends and carers for support in finding out about and getting to grips with technologies that might improve the quality of their lives. It is important that these intermediaries listen to the older person's aspirations rather than imposing their own prejudices about technology and what is or isn't suitable on account of age.

## References

- Alzheimer's Society (2008) 'Assistive technology' ([http://alzheimers.org.uk/site/scripts/documents\\_info.php?documentID=109](http://alzheimers.org.uk/site/scripts/documents_info.php?documentID=109)).
- Beech, R. and Roberts, D. (2008) *Assistive technology and older people*, SCIE Research Briefing 28, August, London: Social Care Institute for Excellence.
- Doughty, K. (2004) 'Supporting independence: the emerging role of technology', *Housing, Care and Support*, vol 7, no 1, pp 11-17.

- Lévesque, V. (2005) *Blindness, technology and haptics*, TR-CIM-05.08, Haptics Laboratory Centre for Intelligent Machines, Montréal, Canada: McGill University.
- Ofcom (2010) *Ofcom Communications Market Report 2010* available at <http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports>
- ONS (Office for National Statistics) (2010) *Internet access 2010, Households and individuals*, Statistical Bulletin, 27 August, London: ONS.
- Owen, A.M., Hampshire, A., Grahn, J.A., Stenton, R., Dajani, S., Burns, A.S., Howard, R.J. and Ballard, C.G. (2010) 'Putting brain training to the test', *Nature*, vol 465, pp 775-8.
- Royal Commission on Long-term Care (1999) *With respect to old age: Long-term care rights and responsibilities*, London: The Stationery Office.
- Singh, R. (2010) *In what ways might the social web reduce older people's experiences of social exclusion?*, London: UCL ([www.ucl.ac.uk/network-for-student-activism](http://www.ucl.ac.uk/network-for-student-activism)).