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Literature Review: Information Communication

Technologies and Older People

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Abstract

This paper cites current literature relating to older people and their use of information communication technologies, for example, the Internet and email. It explores certain characteristics associated with advancing years and includes research on the implications that social, economic and cultural values may have on the integration of older people and new technologies. This document encompasses a wide variety of topics associated with information communication technologies and older people. The purpose of this document is to create a summary of current literature in order to identify possible, more focused leads for further research.

With only six years remaining before pensioners exceed the number of children under 16 in the UK (Better Government for Older People, 2000) public services and information technologies are facing a totally new challenge. At the same time, access to Internet technology throughout society is increasing. More home computers are purchased and initiatives established by public sector organisations have achieved greater access for UK citizens (Cabinet Office, 2001).

Although there are 4.6 million computer users over the age of 50 in Great Britain (Age Concern & Microsoft, 2000) Internet access and computer ownership by older people has been considerably slower than that of any other age group. Information and communication technologies have the potential to provide amazing opportunities for the elderly. The opportunities may include encouraging greater participation in society, learning a new skill, retaining contact with friends and family, researching topics and acquiring new interests. The possibilities are immense.

Nielsen (2000) considers the main influential factors on Internet access to be education and age. However, the paper 'Accessibility and Usability of Information Technology' by the Elderly, Browne (2000) suggests the two most serious barriers to the Internet for the elderly are income and education. Research by Seniornet (1998) shows that older users in the US with discretionary incomes sufficient to purchase hardware and software are achieving computer literacy at the same rate of younger adults. At present low Internet usage by the elderly does not look encouraging. However, current research shows that age is not an isolated factor for influencing the popularity of new technologies but it is the social, economic and cultural aspects associated with ageing that need to be examined (Beckwith &

Trieber, 1998; World Health Organisation, 1999). This paper will investigate these aspects in

order to identify areas for further research.

What is Old?

The expressions, 'old people' and 'seniors' are both general and stereotypical phrases that refer to a range of people from fifty-year-olds that are completely healthy and physically competent to elderly people who rely on residential care. Older people, like the rest of society, differ greatly in degrees of age, fitness, and education. There are also external factors that contribute to the immense diversity of older people. These include living environments, backgrounds, health, income and current social networks (Beckwith & Treiber, 1998; World Health Organisation, 1999).

Many researchers divide older people into categories, segregating by either age or degree of dependency. Dee and Bowen (1986, as cited in Blake 1998) distinguish between people who are older and unemployed, retirees, housebound elders living alone, old elders and old elders who live in sheltered accommodation. Beckwith and Treiber (1998) split the elderly into three groups separating them by dependency. Firstly, newly retired people who still have all their faculties are described as 'third age'. 'Fourth age' describes older people who have developed a small degree of dependency, and finally 'fifth age' is used in term of people who have a high dependency due to a disability. Other researchers divide the elderly into three distinct groups by age, 'young old' (60 – 75), 'old old' (75 – 85) and 'very old' (over 85) (Blake, 1998).

This paper addresses each age group, although research has been focused on the people of pensionable age and above. The wide scope has been intentional in order to accumulate a diverse collection of research that can be accessed for future projects.

Society

The number of elderly people in Great Britain is increasing. There are now 10.7 million individuals of pensionable age in the UK. This figure comprises 7 million women over the age of 60, 5.5 million over 65, and nearly 4 million men over the age of 65 (Age Concern, 2000). Age Concern predicts that the proportion of elderly people in the UK will double over the next 50 years and by 2031 almost 23 percent of the population will be of pensionable age.

This growing proportion of society will inevitably develop a high dependency on a decreasing workforce; that is, they will put high demands on hospitals, residential care and state financial support schemes (Dundee University, 2001). The financial implications of this growth make immediate action essential. The most practical and desirable way to meet this challenge is to enable older people to continue living independently. Information technology has the potential to increase active participation in society and reduce the economic burden on the workforce (Beckwith & Triber, 1998; Dundee University, 2001).

Current Usage

4.6 million computer users over the age of 50 in Great Britain illustrate that older people are slowly picking up on the Information Technology revolution and joining the online experience (Age Concern, 2000). Older users are slowly becoming accepted as serious consumers, this is evident by the phrase 'Silver Surfers' which has become common terminology for describing Internet users over the age of 50. However, figures from the Office for National Statistics and other institutions illustrate that the proportions of adult Internet use decrease steadily with age. 87 percent of 16 to 24 year old young adults use the Internet (Office for National Statistics, 2001). This compares to around 11 percent of users aged 65 and over (Age Concern, 2001; KPMG Consulting, 2000; Office for National

Statistics, 2001). This current literature also reveals statistics that claim Internet access has risen by around 51 percent for the population as a whole and while there has been little change for users aged 65 and above, only 2 percent of users within this age bracket have tried the Internet (Seniors and the Internet, 2000). Rabbitt and Carmichael (1994) (as cited in James, 1996) suggest that low technology use is the result of low enthusiasm due to lack of experience and exposure rather than age.

How the Elderly are Perceived within Society

Information technology is changing the way information and services are delivered. One of the most influential factors for the dissemination of information via new technology is the potential to make information universally accessible. Information distributed via communication technologies has the potential to reach people who have, in the past, been excluded by other information delivery channels. Consequently the acquisition of computer literacy is becoming a necessity for all areas of society including older people.

Over the past ten years hardware and software application design, has become user centred to enable manufacturers to appeal to a larger market (James, 1996). More recently, as a result of campaigning groups and organisations like the Word Wide Web Consortium (W3C), we have seen accessible and usable design successfully implemented into many of the worlds' largest web sites. However, for older people technology and design is only one potential barrier. Culture has a far greater ability to exclude by afflicting stereotypes and labelling seniors as technophobes (Cabinet Office, 2001; Darcy, 1999; Seniornet, 1998; World health Organisation, 1999). At present, services are organised and information is designed predominantly by people who work within the information design and delivery business, largely people who have not yet reached retirement age. As a consequence the older

generation is not given the prominence they deserve (D'arcy, 1999). Older people have to be considered at the concept stage of information delivery to enable them to access content and diminish the misconceptions that have become associated with increasing years (Beckwith & Treiber, 1998; D'arcy, 1999).

Education and Income

Many researchers imply that one of the main influencing factors on the uptake of new technology by society and specifically older people is education (Browne, 2000; James, 1996; Swindell, 2000; Tweed & Quigley, 1999; Neilson, 2000). A large percentage of older working class people would have been forced to leave mainstream education after just one or two years of high school due to the post war depression (Swindell, 2000). Generally this decision would have been compulsory to enable them to find employment to support a family. People from a middle class background may have been given the opportunity to continue into further education. As a result of this lack of early education the people of this generation were generally employed in manual jobs, both skilled and unskilled (Cabinet Office, 2001). Consequently, research by the Cabinet Office (2001) has found that low skills are more prevalent among older people and this lack of basic education has affected their confidence and willingness to learn. This could easily be confused with a resistance to change and lack of ambition contributing to society's negative opinion of older people (Blake, 1997; Cabinet Office, 2001; Seniornet, 1998).

The majority of the elderly population grew up in poverty stricken post war Britain; this has become a major influencing factor on the way the elderly evaluate their lives and choose to mange their finances (D'arcy, 1999). With 71 percent of all pensioner households relying on state benefits for at least 50 percent of their income, many old people are among the

poorest in the community (Age Concern, 2000). Consequently, the financial implications of buying a computer and software coupled with training cost, technical support and telephone expenses means financial issues deny access for many older people (Aldridge, 2001; D'arcy 1999).

How Older People Use IT to Contribute to Society

The Institute of Human Ageing conducts research into the ageing process with the intention of improving the quality of life by delaying physical and mental decline and improving care and awareness of the needs of older people. The Institute, which was established by Liverpool University, runs a programme called The Age to Age Project. The aim of the project is to encourage older people to become more involved in society by recording their lifestyles, attitudes and aspirations (Institute of Human Ageing, n.d). Although not specifically web based the nature of this project lends itself very well to be a web deliverable assignment. The government is working in association with Age Concern and Help the Aged to devise a similar scheme, thus allowing older people to share their talents and experiences in their own communities (A Better Society for Older People, 2000). These types of projects promotes active social involvement and encourages the use of information technology to compile reference material with the focus being on end goals rather than on the technology itself; this is essential to translate technology into everyday life (Beckwith & Treiber, 1998; James, 1996; Seniornet, 1998).

One of the hardest things for older people to come to terms with after retirement is the loss of an identity and the transition from an active participant to the nation's economy, to a dependent of the state (Beckwith & Treiber, 1998; Haddon & Silverstone, 1996). Many older people retire reluctantly, pressured into leaving work as a result of our ageist society (World

Health Organisation, 1999). Opinions posted onto online forums by older people themselves

clearly display the frustration of age discrimination in employment, one example can be

found on Hairnet's forum about employment. This prejudice is estimated to cost the economy

£16 billion a year and £3-5 billion in benefit payments and lost taxes (The Cabinet Office,

2001). The World Health Organisation (1999) suggests that there is no economic or

biological reason why people should retire at a fixed age, in fact, in countries where

economics are dominated by agriculture older people work until they are physically unable to

carry out the job.

Employment and voluntary work allows older people the opportunity to remain part of a

respected social group and distances the evolution to a culturally disregarded pensioner. It is

society that has generated this culture; by employing older people society is changing

negative cultural traditions, positively lengthening the ageing process and reducing the

burden on society. Subsequently older people will have the opportunity to extend social

networks and retain cognitive stimulation, all the right attributes for delaying the ageing

process (Beckwith & Treiber, 1998; Swindell, 2000).

Many firms now realise that older workers bring experience and expertise to

organisations that employ them. However, bureaucracy and cultural barriers have stopped

older people from continuing in employment. Today, Britain's economy simply cannot afford

to discriminate against older people, as a consequence, the Government is encouraging older

people back to work. The Government has proposed a series of measures to reduce age

discrimination within the work environment. They have published a Code of Practice for Age

Diversity in Employment to promote the employment of people of all ages. They have also

introduced training schemes to allow older people to retrain, and they will allow members of

occupational pension schemes to take partial retirement (Department for Work and Pensions, n.d). These government strategies have been made accessible to all citizens through the implementation of the New Deal and Age Positive web sites. These sites can be accessed at http://www.newdeal.gov.uk and http://www.agepositive.gov.uk. In the future the government are looking at continuing to promote these strategies as well as implementing Third age Apprenticeships to provide work and training for people aged 50 and over (A better Society for Over 50, 2000).

Information technology skills acquired by older people during post retirement leisure time or as part of a retraining scheme can now be integrated back into society, thus challenging stereotypes and creating an awareness of the potential of older people (Darcy, 1999). Even though employment and voluntary opportunities may not always be computer related, IT does give older people the capability to research information, prepare documentation and preserve effective communication. This is particularly essential for people who may be suffering from disabilities associated with the ageing process (Beckwith & Treiber, 1998). IT allows users of all abilities and age groups to access information and services, there by creating equal opportunities for all participants. Attaining IT skills and knowledge of information communication technologies will provide older people with the self-belief to enable them to apply for employment and voluntary work without the fear that technology has overtaken them (Beckwith & Treiber, 1998, Cabinet Office, 2001). In fact, Tweed and Quigley's research estimates that 25 percent of older computer users currently use technology to perform voluntary work (Tweed & Quigley, 1999).

Concerns that information and communication technologies can increase social exclusion (Nielsen, 2000; Kraut as cited in Swindell, 2000) are challenged by the result of a

survey conducted by Microsoft and Age Concern. Nielsen and Kraut both raise concerns that as online activity increases an individual's participation in society may reduce, thus increasing the risk of depression and isolation. Nielsen refers to a study by the Stanford Institute for the Quantitative Study of Society, they found that the more time people spent on the Internet the less time they spent communicating in a real environment. Similarly, (Stanley, 2000) raises concerns that residents within sheltered accommodation may retire to computers within their own rooms reducing their interaction with other residents.

The Age Concern and Microsoft survey highlights the potential of the Internet for restoring and maintaining social networks. The results of the survey found the Internet to have a positive effect on the lives of the elderly, 64% of users believe that a computer has made a great difference to their lives. With 59 percent, or 2.7 million users, email was discovered to be the principal technology for keeping in close contact with family and friends (Age Concern & Microsoft, 2000).

Haddon and Silverstone (1996) raise the point that the introduction of the telephone and television has already had a major impact on the lives of the elderly. It could be implied that these technologies have had negative implications on the participation of older people in society by offering a substitute for other forms of activities. However, with 29 percent of men and 59 percent of women over the age of 75 living alone in the UK (Age Concern, 2000) a wide range of options for social contact is not available to many people (Swindell, 2000). The Internet has the potential to enrich and even change the lives of these individuals.

Haddon and Silverstone (1996) also enumerate the importance of considering the negative implications of society's reliance on technology. They point out the necessities for ensuring information technology does not create a dependence that may result in a decline in

human contact for citizens that are already deprived and isolated. For example, Beckwith and Treiber (1998) suggest that this is already occurring, they argue that cash machines and on-line banking facilities are replacing the traditional high street branch, therefore, lessening human interaction in everyday life. Nevertheless, a number of older people do experience mobility problems due to the ageing process, so, online facilities can offer these citizens greater independence and choice.

<div align="center">Information Needs</div>

Older people will greatly benefit from accessing information via communication technologies to participate in leisure activities and retain social networks. The independence to access this material without relying on family, friends or social services will contribute to a sense of personal enrichment (Beckwith & Treiber, 1998). To enable older people to pursue these activities they need access to appropriate information sources. Information technologies will allow older people to carry out these tasks without the barriers of traditional information delivery systems. This is particularly true for users with reduced mobility and without the support of family and friends. New technology will improve the speed, efficiency and convenience of access to this information for all older people (Cabinet Office, 2000).

The sheer diversity of the older generation has huge implications on the type of information required (D'arcy, 1999). For the newly retired or people who have been made redundant the requirements may be for information that will assist with the challenge of moving out of the social working environment. This may involve taking the initiative to search for information on social, leisure and community activities, alternative paid work or volunteering, all of which would involve alternative social networks. The information needs

of people who are of post retirement age may relate more to health and social care (Beckwith & Treiber; 1998). However, for all age ranges information must be available to allow older people to pursue their interest, education and create new pass times and social networks (Rowe as cited in Blake, 1998).

Mullings, (as cited in Blake, 1998) argues that age is not a major influencing factor when it comes to the information needs of older people. Mullings and Van Fleet (Mullings, Van Feet, as cited in Blake, 1998) both suggest that their needs are primarily the same as those of other adults with specific topics being of primary concern. However, D'arcy (1999) believes that although older people should be perceived in the same way as any other adult their areas of interest are far narrower. D'arcy's opinion could be explained by Troupe's research (1985, as cited in Blake, 1998). Troupe points to potential problems that can contaminate the identification of needs for older people. Troupe demonstrates that older people have a limited knowledge of the options available to them. This can create discrepancies between the information older people think they would like to access and the choices they might consider if they were aware of the options available.

Research conducted by Seniornet (1998) illustrates that information orientated towards social networks and common interests are more beneficial to users than simple information retrieval. These facilities enable users to participate in online social communities where participants have common interests rather than simply being related by age (Seniornet, 1998). However, Tweed and Quigley (1999) warn that relationships established via online forums and newsgroups are weak with short life spans due to a lack of face to face interaction.

The World Health Organisation points out the importance of information related to health care. Although people do not have control over early life experiences and other factors

such as poverty or low education, actions taken during the remaining life course can greatly affect health in later life (Word Health Organisation, 1999). Troupe, (as cited in Blake, 1998) has found that older people do not rate information on health as a requirement. As a consequence Rowe feels that information about healthy lifestyles need to be promoted, including the importance of a balanced, healthy diet, adequate exercise, the avoidance of smoking and excessive alcohol consumption (Rowe, 1984 as cited in Blake, 1998).

Statistics provided by Jupiter MMXI Internet research shows that although government web sites are not the most popular user destination there use is steadily increasing. The research also illustrates that it is older citizens who access government sites most frequently. 25 percent of men and 20 percent of women aged 45-54 visited a government site during December 2000, as opposed to only 7.8 percent of men and 8 percent of women aged 15-24. Both men and women over the age of 55 spent twice as long browsing government sites than the rest of the population (Addison, 2001). This illustrates the importance of information about society and welfare for this younger age group of older citizens.

Research conducted by Packard Bell (as cited in Tweed & Quigley, 1999) and Seniornet (Avolas, as cited in Tweed & Quigley, 1999) provide statistics to illustrate the tasks older people carry out using computers. This information does not provide a comprehensive list of accessed information, however it does offer research to suggest the types of information that should be made available to enable older users to perform these activities. The seven categories are:

- Personal correspondence (72 percent)

- Research (59 percent)

- News (53 percent)

- Games, CD-ROM's and puzzles (52 percent)

- Research into travel and holidays (47 percent)

- Weather information (43 percent)

- Volunteer work (25 percent)

Rowe (as cited in Blake, 1998) suggests that the information needs of the elderly can be categorised into five broad topics. Some of the categories contradict those mentioned in Tweed & Quigley paper. Neither Blake nor Rowe provide evidence to suggest why this categorisation is favoured. The five suggested categories are:

- Educational opportunities

- Leisure activities and retirement

- Welfare and benefits

- Information providers, for example Citizens Advice and legal services

- Skills that benefit the community

Available Information

There is a large resource of information that can be accessed via the Internet specifically aimed at older computer users. These services offer a wide variety of information that ranges from ageing and health to discussions about social issues and leisure activities. This section presents samples of web sites that are specifically aimed at an older audience. The examples do not provide a comprehensive analysis they simply show examples of the wealth of information available to older Internet users.

Age Concern

http://www.ageconcern.org.uk

The Age Concern website is an information-based reference site as opposed to an online community portal. Their campaigns are heavily promoted encouraging older people to interact with the site and have their say on relevant issues. Interaction and community participation is made simple with links to HTML forms for the user to complete. Age Concern then pass the campaign information to the relevant authority or media group via email. The site also hosts information on government policies, press releases, facts on aging and useful statistics about older people.

Elderweb

http://www.elderweb.org

ElderWeb is an online community for older adult computer users. It covers computer related topics and includes daily updates of international news, weather, travel and a host of subjects includes humour, leisure, home and garden, letters to the editor, health issues and reminiscences.

SeniorNet

http://www.seniornet.org

Seniornet is probably one of the best known web sites aimed at older people. Dr Mary Furlong, from the University of San Francisco, started the site as a research project in 1986 to determine if information communication technologies could enhance the lives of the elderly. In 1990 it was established as a non-profit making organisation with the mission to provide older adults with the knowledge of computer technologies to enable them to share their knowledge and wisdom. The organisation now has 39,000 members world-wide and has established 220 learning centres in the United States.

The web site features discussion forums on the military, books, gardening, reviews, divorce, widows and widowers, collecting, languages, travel and much more. It also hosts a lot of practical information, statistics and research on a number of topics including computers, community, social issues and health matters.

Baby Boom Bistro

http://www.bbb.org.uk

The Baby Boom Bistro is a UK chat site aimed at people over the age of 50. The site was established by Age Resource who are part of Age Concern's Active Age Unit. The intention of the site is to enable house bound older people to continue their social life through online chat sessions. The site also hosts more serious events to enable older people to participate in effective debates with politicians, policy makers and professionals (Age Concern, 2001).

Hairnet

http://www.hairnet.org

Hairnet is a training provider specialising in IT skills for people over the age of 50. They offer one to one tuition and classroom courses run from their training centres and they present customers with the option of learning from their own home. Hairnet also conduct training and consultancy services for corporate organisations. Their online forums allow users to share views on a wide variety of relevant subjects, for example, employment, travel, health, art and family. Hairnet positively encourages interaction with the site by emphasising that the site is 'people-powered'. Therefore, users create content for other users establishing a pool of information relevant to the requirements of older people rather than presumptions of

what they might like. The site easily creates a sense of identity and community by referring to users of the site as 'hairnetters'.

Search Engines

In addition there are many search engines that provide portals for older Internet users. They offer the same access to information as any other search engine. However, information is specifically tailored to the needs of older surfers.

Educating Older People

Research conducted by The People's Panel, a national group who inform Government about what people really think about public services, shows that although new technology will improve the speed, efficiency, and convenience of public services, older people are nervous about using it (Cabinet Office, 2001). Additional research shows that attitudes can change when older people are educated in the possibilities of new technologies and shown how they can be integrated into everyday life (Cabinet Office, 2000; Blake, 1998; Seniornet, 1998; James, 1996; Celebrating Older Learners, 2000).

Many researchers suggest that later life adult education can contribute to a number of social and health benefits. Social benefits include, increased self-confidence, a feeling of health and well-being, and increased community engagement (Beckwith & Treiber, 1999). Swindell's (2000) research reports a number of health benefits associated with learning, some of which include the ability to reverse the process of intellectual decline and an increased ability to cope with the stress of ageing.

Contradictory to common, yet unjust opinion, James (1996) points out that there is no current evidence to suggest that age has any influence on our interest to learn new skills. He

suggests that a thirst for education may actually grow with advancing years. However, the National Adult Learning Survey reports that an interest in learning does actually lessen with age. The percentage of people who are not interested in learning new skills in the 40-49 age group was reported to be 12 percent, this number rises to 30 percent for users age 60-69 (Celebrating Older Learning, 2000). Conversely, the Survey also reports that a positive 67 percent of people aged 50-59 and 47 percent aged 60-69 are active learners.

Older people can lack confidence and the willingness to participate in IT training schemes (Sussex University, 2000). James (1996) explains this is due to lack of exposure and knowledge of the possibilities of IT as well as no knowledge of funding. In fact, learning is one of the major barriers to post compulsory learning for older adults (Celebrating Older Learners, 2001). Many researchers, including Beckwith and Treiber (1998) and Swindell (2000) suggest that a lack of previous education contributes to negative attitudes towards training later in life. However, Swindell also suggests that training schemes may prove attractive to older people who were denied formal education earlier in life.

Once older people are actively involved in computer training schemes their commitment has been recorded as high. D'arcy, (1999) proposes that this is achieved because participants make an active decision to learn. Additionally, high commitment could be attributed to the social experience of working within a classroom environment. A paper produced by Sussex University (2000) concentrating on the use of information and communication technologies in sheltered accommodation reports that training schemes become the focus of social activity for many participants. However, James (1996) believes that there is evidence to suggest that older people prefer to learn outside of the traditional classroom environment. One-to-one

teaching is often preferred, as students do not have the anxiety of inconveniencing other members of the group and shaming themselves (Sussex University, 2000).

Evidence collected by some researchers suggests that trainers should be of a similar age to participants. Older trainers are considered to have the ability to anticipate problems and to be sympathetic to the needs of students (D'arcy, 1999; Sussex University, 2000). Similarly, all trainees should be of a similar age. This will minimise the problems of varying learning abilities, increasing the overall confidence of the group. Bourdelais (as cited in Blake, 1997) points out that older trainees would require about twice as long as younger participants due to the cognitive and physical decline associated with ageing.

There are numerous schemes in the UK that specialise in training and providing access to information and communication technologies for older people. This section gives a general overview of the most well know initiatives.

Government Initiatives

The Government has responded to citizens' demands for flexible and affordable learning opportunities and access to computers by establishing Information and Communication Technology Learning Centres. The centres target disadvantaged older people offering access and training, and providing some citizens over the age of 60 access to low cost reconditioned computers. By 2002 the government aims to have all public libraries offering Internet training sessions specifically designed for older students. Learndirect and UK online centres and training schemes will offer all citizens easy access to government services online. In addition, local authorities already run adult training schemes that benefit almost three million trainees a year (A Better Society for Older People, 2000).

Age Concern's Mobile IT Training Sessions

Age Concern has developed a training programme for older adults. The outreach programme involves taking computer and Internet training into day centres, residential care homes and sheltered housing. The scheme begins by creating enthusiasm through taster session. These sessions offer older adults the opportunity to be shown the possibilities of using information and communication technologies.

Hairnet

Hairnet run computer and Internet training courses specifically tailored for people over the age of 50. They offer one to one or group training sessions either at the participant's home or other suitable venue. Hairnet has a large network of trainers all over the UK, all of whom are over the age of 50.

Physical and Cognitive Implications

Ageist attitudes are typically directed towards to the minority of elderly people who develop severe cognitive and physical limitations, disabilities or chronic illness through old age (Beckwith & Treiber, 1998). However, only 23 percent of people aged 65 and over would consider themselves as not in good health (Age Concern, 2000). There is an abundance of research that deals with the psychological and physical effects of ageing. However, this research usually appears in the form of background information for broader research topics.

Cognitive Research

An eventual decline in memory is inevitable with increasing age, however, some individuals can suffer severe memory loss while others will appear largely unaffected. This is another example of the diversity of older people. Bucar, Renold and Henke (as cited by Browne, 2000) point out that in general, once older users become regular operators of

information technology systems, their competencies do not greatly vary from any other age group. James (1996) explains how this occurs. He subdivides the memory into two distinct areas in order to illustrate how memory is effected by age and provide suggestions on how this would interfere, if at all, with the ability for older people to learn computer technology. The two main areas are procedural memory and declarative memory.

Procedural memory is associated with any skills that are so well learnt they become practised subconsciously, for example, walking and speaking. These skills are largely unaffected by age. This knowledge is particularly relevant as it illustrates how once older users become competent with new technology, and the processes of achieving tasks become automatic, their performance is not impaired by any decline in procedural memory.

James makes recommendations for new technology and training courses from this evidence. He suggests that trainers should use familiar terms and techniques so procedural memories can be exploited. An example of this is the analogy between a real desk top and the graphical interface. James suspects that older users may find the traditional QWERTY keyboard difficult to use because of the lack of familiarity. An alphabetical keyboard would exploit the vastly over learnt alphabet. Cremer (as cited in James, 1996) comments that transfer of knowledge is facilitated when new concepts extend on existing knowledge.

Declarative memory can be described as stores of information and/or information associated with the world. It consists of two elements; semantic memory and episode memory. Semantic memory is concerned with general principles, for example the knowledge of maths and words. Episode memory is concerned with specific events remembered by context, time and place. Episode memory is almost always found to deteriorate with age. Semantic memory is similar to procedural memory in that is over-learnt and is rarely affected

by age. The result of semantic memory being unaffected by age is that older people remember too much. This makes the process of new tasks becoming semantic and procedural memory more difficult.

James concludes by emphasising that although older learners may be slower at acquiring new skills the end result will be an equal to that of younger learners. This is true providing the technology and training takes into consideration the unique requirement of older learners.

Physical Issues

The Internet has an evident advantage as an information delivery system as it is able to provide universal access, that is, access to information regardless of disability or ability. However, Stephanidid (as cited in Blake, 1998) points out that technology can also introduce new barriers if the needs of the users are not given serious consideration. This section considers research on the physical disabilities acquired through age.

The most common physical impairment to occur with age is reduced vision (Blake, 1998). Nearly 3 million people in the UK are registered with some form of visual impairment (Royal National Institute for the Blind, 2001). Although not all elderly, Davis (as cited in Blake, 1998) suggests that approximately nine out of ten visually impaired individuals will be over the age of sixty. Older users with a visual impairment may feel as though computers have become yet another form of technology that is inaccessible. However, unlike other forms of technology and information distribution systems computer interfaces can be easily modified for older users through access technologies like screen magnification software. Other access technologies for visual disabilities include Braille pads and screen readers. For Internet users, these technologies enable a site to be accessed effectively by users with little

or no sight, providing the site has been designed appropriately (Royal National Institute for the Blind, 2001).

Information delivered via the Internet must take into consideration the needs of users with disabilities and design their sites accordingly. Flexibility is one of the key principles for designing an accessible web site. The needs of people with poor vision vary considerably depending on how their eye condition affects their vision. So, to enable individuals to access a site comfortably the design must permit users to manipulate the design to suite their specific requirements. If the site has been design appropriately browser settings can be changed to adjust the text and colour to suit the user's own particular needs and circumstances. (Royal National Institute for the Blind, 2001)

An older person may find using a mouse, and in some instances a keyboard, difficult. During Blake's research (1998) it was discovered arthritic limbs were a common problem for older computer users. Users commonly kept their fingers on the keys for too long and found the use of a mouse, in particular double clicking, very difficult to master. Access technologies have been developed to help with these difficulties, for example, large mice and tracking balls. With careful consideration web sites can be constructed to enable users to navigate freely without relying on the use of a mouse at all. Arthritis is a condition that causes conscious barriers for older people, for example, letter writing becomes impossible as holding a pen is so difficult. Computers have the ability to corrode these barriers, with perseverance older users can regain the ability to conduct everyday tasks that have become too difficult simply because of age.

The physical impairments associated with ageing have obvious implications on the ability of older users to interact successfully with computers. The Royal National Institute for

the Blind works in accordance with the World Wide Web Consortium (W3c) to campaigning

for appropriate guidelines and the evolution of Hypertext Mark up Language (HTML) to

influence accessible design. (Royal National Institute for the Blind, 2001)

Summary

Current research on older people and information and communication technologies covers a broad range of age and abilities. This is a consequence of the sheer diversity of older people. Concentrating future studies on a particular background, social environment or age range would enable any future research to focus on particular characteristics and abilities of a comparable range of older people, without studying the diversity of age itself.

There is some debate about the possible social benefits of information communication technologies. It seems that current social interaction, health, ability and environments influence the uptake and patterns of technology use. Therefore, the benefits can only be attributed to an individual. There is no simple resolution to these opposing opinions. However, there seems to be little anxiety among some researchers over the health benefits of interacting with new technology.

There does not seem to be any conclusive evidence that suggests which information would best benefit the needs of older users. However, there is evidence to suggest that the information needs of older users are no different than the needs of any other adult, that is, older people use the Internet to complete the same tasks. Many researchers believe that information orientated around virtual communities rather than information retrieval would benefit older users the most.

The diversity of older people is further confirmed when looking into the cognitive and physical deterioration of older people. It appears that the inevitable deterioration of memory has an initial impact on the ability of older people to master the skills of interacting with a PC. Once the skills have been mastered there should be no further cognitive limitation. Physical and visual disabilities have a huge impact on how systems and interfaces should be

designed to enable older people to interact successfully. The World Wide Web Consortium

(W3C) and other influential organisations have produced guidelines for designing universal

web sites, that is, designed for all users regardless of ability.

Suggested areas for further study

- The effect of surrounding environments and relationships on the uptake of new technology by older people.

- How previous education standards effect the uptake of information communication technologies by the older people.

- The effects of new technology on the social interaction of older people.

- How information and communication technologies can benefit users with age related disabilities.

- New information delivery channels and older people.

References

A Better Society for Older People, (2000) *Life Begins at 50.* A better Society for Older
People. Department of Social Security.

Age Concern, (2000). *Older people and IT Fact Card.* Retrieved November 16, 2001 from,
http://www.ageconcern.org.uk/sitearchitek/news.nsf/322bdba384116a0041256648005
0a932/7ac410797ec2ab618025693e00481f1d!OpenDocument

Age Concern & Microsoft, (2000). *IT and Older People* Age Concern/Microsoft Survey.
Retrieved November 27, 2001 from,
http://www.ageconcern.org.uk/SiteArchitek/about.nsf/a3628437873d564480256ad80
05b7ab2/9aa1419160e7074a80256ad8005d2367!OpenDocument

Aldridge, E. (2001). *Bridging the Digital Divide: Age and ICT's*. Age Concern. Prepared for
the Party Conference.

S. Beckwith & Treiber, H. (1998). *Learning to Live in the Information Society as an Older
Person: Final Workshop Study.* European Parliament: Directorate General for
Research. Workshop Paper, Working Document for the STOA.

Better Government for Older People (2000). *All Our Futures.* The Report of the Steering
Committee of the Better Government for Older people Programme. Retrieved
November 16, 2001 from,
http://www.bettergovernmentforolderpeople.gov.uk/reference/pub161.htm

Blake, M. (1998). *The Internet and Older People.* British Library Research and Innovation.

Browne, H. (2000). *Accessibility and Usability of Information technology by the Elderly.*
Retrieved November 27, 2001, from University of Maryland, Department of
Computer Science Web site: http://www.otal.umd.edu/uuguide/hbrowne/

Cabinet Office, (2000). *All Our Futures.* The Report of the Steering Committee of the Better
     Government for Older People Programme. Retrieved December 12, 2001 from,
     http://www.bettergovernmentforolderpeople.gov.uk/reference/pub161.htm

Celebrating Older Learners (2001). *Celebrating Older Learners Seminar Report*. Retrieved
     December 12, 2001 from, http://lifelonglearning.co.uk/cols/col02.htm

D'arcy, C. (1999). *Older People Online Ensuring Accessibility in the Information Age.* Bull
     Information Systems.

Department for Work and Pension, (n.d) *New deal for 50 Plus.* Retrieved, December 11,
     2001, from http://www.newdeal.gov.uk/english/fiftyplus/

Dundee University (2001). *Visionary Millennium.* Retrieved November 19, 2000 from,
     University of Dundee, GC Magazine Web site:
     http://www.dundee.ac.uk/pressoffice/gcmagazine/gc2001/vision.htm

Haddon, L. & Silverstone, R, (1996*). Information and Communication Technologies and the
     Young Elderly.* University of Sussex, Science Policy Research Unit.

Institute of Human Ageing, (n.d). *The Age to Age Project.* Retrieved, December 11, 2001
     from, Liverpool University, Institute of Human Ageing. Web site:
     http://www.liv.ac.uk/HumanAgeing/agetoage.htm

James, D. (1996). *Learning about New Technology in Later Life: Some Implications of the
     Cognitive Psychology of Ageing.* In proceedings of: Older People and New
     Technology, First European Network Meeting, Eurolink Age, Pages 21-30.

KPMG Consulting (2000). *Silver Surfers: The Power of Older People Online.* Retrieved
     November 27, 2001, from http://www.kpmgconsulting.co.uk

Neilson, J. (2000). *Does the Internet Make Us Lonely?* Retrieved November 27, 2001, from,
http://useit.mondosearch.com/cgi-
bin/MsmGo.exe?grab_id=2673320&EXTRA_ARG=&h

Office for National Statistics (2001). *UK Internet Access Household and Individuals*.
Retrieved December 18, 2001, from http://www.statistics.gov.uk/

Royal National Institute for the Blind, (2001). *Older People with a Visual Impairment.*
Retrieved December 18, 2001, from,
http://www.rnib.org.uk/wesupply/fctsheet/older.htm

Royal National Institute for the Blind, (2001). *Accessible Web Design.* Retrieved December
18, 2001, from, http://www.rnib.org.uk/digital/hints.htm

Seniornet, (1998). *Broadening Access: Research for Diverse Network Communities,*
Retrieved December 11, 2000 from,
http://www.seniornet.org/php/default.php?PageID=5473&Version=0&Font=0

Sussex University (2000*). Information and Communication Technology and Residents of
Sheltered Housing.* Sussex Gerontology Network.

Swindell, R. (2000). *A U3A Without Walls: Using the Internet to Reach Out to Isolated Older
People.* Education and Ageing, Volume 15, Number 2, Pages 251-263.

Tweed, C. & Quigley, G. (1999). *Added Value Services from the Installation of Assertive
Technologies for the Elderly.* Research report, School of Architecture, The Queen's
University of Belfast.

World Health Organisation, (1999). *World Health Day*. Retrieved, December 11, 2001 from
http://www.who.int/hpr/ageing/index.htm