Impact of Leisure Internet use on Takeup of e-Government Services by Older People

J.D.Kneller and A.D.Phippen

Network Research Group, University of Plymouth, Plymouth, United Kingdom
e-mail: info@cscan.org

Abstract

Considerable resources have been invested in the development of e-government services, including online facilities, in the UK. However, there is debate as to the effectiveness of such provision and in particular there is concern that uptake is not consistent amongst all demographic groups.
This paper discusses research carried out in conjunction with a District Authority in south-west England into attitudes and usage of the Internet in general and whether leisure use of online facilities has an impact on uptake on e-government services. Contrary to expectations based on the uptake distribution of general Internet use, analysis results were mixed and no overall significant difference between the rate of uptake of e-Government services amongst older people and other age groups was found. The most significant impact of leisure use on awareness of e-government is in users in the middle age group (45-64), rather than in the 65+ age group. However, in many areas additional statistical analysis will be required to further investigate the differences between leisure effects in each age group.

Keywords

Citizen engagement; e-government; technology adoption; citizen survey; older people

1 Introduction

There is increasing evidence that the uptake of Internet services is less amongst older people than amongst other demographic groups (Office of Communications, 2007). In the light of recent UK government initiatives to increase the volume and range of local and central government services available on-line, this research aimed to investigate whether, in reality, there is a significant gap in uptake of e-government services amongst older people in comparison with other age groups, and whether the rate of uptake is influenced by involvement in other on-line activities such as genealogy or local history.

What do we mean by the term “older people?” Hawthorn (2000) says that the ‘effects of age become noticeable from the mid forties onward’ but this research used the more common definition of 65 years and older (Eastman and Iyer, 2004; Fox, 2004).

The term e-government includes a very wide range of electronic governmental services including electronic transactions between government departments and from governments to supplier or customer businesses as well as interaction between authority and citizen. This research concentrates on the aspects of e-government that provide opportunities for interaction and transaction between central and local government organisations and citizens via facilities offered over the Internet.

2 Previous Studies into age disparity in IT use

Studies into Internet usage consistently show variations in uptake based on age. Table 1 summarises results from three studies across the globe.

Study	Young Users		Older Users	
UK, 2007, (Office of Communications, 2007)	18-24 years	65%	65+ years	16%
US, 2004, (Fox, 2004)	18-29 years	77%	65+ years	22%
China, 2000, Tan and Clark (2000)	21-30	51.3%	50+ years	1.6%

Table 1: Comparison of studies into Internet usage by age group

A large variety of reasons have been suggested for this disparity in usage and studies often produce contradictory evidence. There are four primary themes that run through the literature:

- Physical or Accessibility barriers
- Social or Domestic Barriers
- Personal Attitudes and Concerns
- Usability and Training Needs

2.1 Physical or Accessibility Barriers

Much of the research carried out in the 1980s and early 1990s into the use of computers by older people focussed on the physical barriers which they might encounter. Sourbati (2004), suggests that the mouse is a particular difficulty for some older people, and suggests that a heavier mouse might assist some users. The keyboard was also highlighted as a problem for patients with arthritis in their hands.

2.2 Social or Domestic Barriers

Many authors suggest that demographic factors have a strong influence on the uptake of regular Internet use amongst the older age groups. Morell et al., (2000) propose that education is a strong predictor of Internet usage amongst older people. Household income also seems to be closely related to Internet uptake (Eastman and Iyer, 2004) - the higher the household income, the more likely older people are to be Internet users. Other authors (Fox, 2004 and Sourbati, 2004) suggest that previous experience of computers can have both positive and negative impacts – positive first

experiences can increase future use, but a perception of computers as being a part of business life can have a negative impact amongst retired citizens.

2.3 Personal Attitudes and Concerns

Age Concern (2002) commissioned a report on the uptake and use of computers in a group of people aged 55+ in the UK. Their findings support the theory that, once using computers, most older people see a benefit to their lives – 55% of those using IT said the 'Internet had a positive effect on their lives'; only 2% said it had a 'negative impact'. However, the report still highlights a lack of interest in using the Internet amongst non-users - 41% of non-users said they were not interested and 8% 'expressed fear of modern technology and said they lacked the confidence to use IT'. This report reflects many others in that it shows the most common activities as contacting family and friends and referencing information about hobbies.

2.4 Usability and Training Needs

There seems to be a consistent theme running through all the literature that, given sufficient motivation, older people make regular use of personal computers and the Internet. However, in order for them to feel both competent and comfortable with the new technology, they must receive training tailored to their learning needs. (Eastman and Iyer, 2004). This means that the training must generally be at a slower pace than for younger learners, with plenty of time for repetition to reinforce the learning.

Thus, the factors influencing older people's uptake of IT generally and, specifically, Internet usage are complex.

3 E-government in the UK and the need for research

Services to the citizen are provided by public sector organisations at all levels of UK government – from central government departments, through government agencies to smaller local authorities. There has been a significant push towards alternatives to conventional face-to-face service delivery. The strategy for the move towards e-government in the UK was set out by the UK Government's Performance and Innovation Unit (2000) stating that "government's online activities must be driven by levels of use and by citizen preferences". Thus it was recognised early in the project that e-government could only be successful if it was accepted by the public. Since then the UK government has devoted huge resources to the development of on-line services but there seems to have been very little Government-sponsored investigation into differences of uptake between different demographics groups and the reasons behind this.

The Varney report on Service Transformation (Varney, 2006) identified areas of success in service provision and set out recommendations for future development of all aspects including e-government. However, it goes on to state that citizens will naturally compare e-government services with similar services provided by private sector organisations and consequently success will, in part, depend on the quality of

such services and the perceived benefit that the citizen gains from using e-government services rather than more conventional access channels. In turn, understanding the citizens' perspective is essential.

In order that all the resources put into their e-government services are not wasted, it is vital that local and central government understand what factors influence their citizens to use or not use the services they provide.

4 Experimental Design and Method

From the review of previous studies described above, two research hypotheses were defined:

H1: There is a significant difference between the rate of uptake of e-government services amongst older people and other demographic groups.

H2: Non-IT-focussed use of the Internet influences the uptake of e-government services amongst older people.

In order to gather data to inform research into the above objectives, the researcher decided to conduct a survey of citizens aged over 16 who might reasonably be expected to use a variety of services offered by local and central government. The research study was carried out in Devon, in the south-west of the UK. County-level government is provided by Devon County Council. This is divided in a number of District Authorities and Unitary Authorities including Teignbridge District Council which has a mix of small towns and rural areas, including parts of the Dartmoor National Park.

The average age in Teignbridge is 42.84 years, with people aged 65+ years making up 21.91% of the population (National Statistics Online, 2006). This shows a considerable difference from the UK average age of 38.6 years (65+ years: 15.89%), and so form a prime target population for studies of older people. Furthermore, Teignbridge District Council (T.D.C) is unusual in that the Council hosts two web sites - the official www.teignbridge.gov.uk Council web site (T.D.C. website, 2007) and www.teignbridge.info (Teignbridge.info website, 2007) which is a site hosted and content managed by T.D.C. but with most content contributed by local residents.

In order to inform research to fulfill the project objectives, the researcher specifically needed to the capture the views of and awareness information from non-Internet users as much as those of users. Therefore an Internet-based survey was not an option. Thus the most practical alternative approach was to distribute a postal survey. The Council agreed to issue the survey, on behalf of the researcher, to a sample of 1033 of the existing T.D.C "Citizen's Voice" Customer Panel and Youth Council.

The survey instrument investigated e-government uptake in a variety of ways. Firstly it offered respondents a selection of eight online government services and were asked to indicate which they were aware of and which they had used. The list was chosen

to be likely to appeal to a range of age groups, and to include a mix of transactional and informational services and central and local government responsibilities. The proffered options were: renew your passport, buy a fishing licence, tax your vehicle, submit income tax returns, find a doctor, register to vote, submit a planning application, check your local library account and an "Other" option was added. As a second level of investigation, respondents were asked which of the following government websites they were aware of and which had used: Teignbridge District Council website (2007), Teignbridge.info community site (2007), Devon County Council (D.C.C.) website (2007) and DirectGov (2007).

As a measure of their leisure use of the Internet, respondents who were Internet users were asked to indicate which of a list of online hobby activities they participated in (and how often). The list was chosen to appeal to wide range of age groups: Genealogy/Family History, Local History, Gardening Tips, Routes for walking etc, Education (e.g. University of the Third Age), Food and recipes, Making travel plans, Reading online newspapers, Booking theatre/cinema tickets, Online games (plus an "Other" option). Results for each respondent were combined to give a Variety score (how many of the activities they participated in) and a "Average frequency" score (a measure of the how often they participated in these activities). These two new variables were created to give a (somewhat subjective) estimate of the relative "sophistication" of the individual's Internet use.

5 Results

From the sample of 1033, 611 valid responses were received. Data was analysed using the SPSS statistical package and Chi-squared goodness of fit tests used to analyse the categorical data produced from the survey instrument. In order to get statistically valid results from the Chi-squared technique, results were condensed into three age groups: 16-44 years; 45-64 years; 65+ years.

A large number of different tests were carried out. For each test a null hypothesis was constructed that there was no statistically significant relationship between the two variables. The results are given in Table 2. Results were considered statistically significant and the null hypothesis rejected at SPSS significance less than 0.05. A number of tests did not meet the assumptions necessary for the Chi-squared test to be valid. These are marked as Invalid tests. The Cramer's V statistic was used to indicate the strength of association between variables. Cramer's V has a range of 0 to1, with 1 indicating a perfect association.

6 Discussion of results

The research set out to investigate the two hypotheses stated at Section 4. Null hypotheses were constructed as follows:

Null H1: There is no significant difference between the rate of uptake of e-government services amongst older people and other demographic groups.

Null H2: Non-IT-focussed use of the Internet has no impact on the uptake of e-government services amongst older people.

H1 was tested in two ways: by looking at the awareness and usage of 8 generic e-government services; and by looking at the awareness and usage of four selected e-government websites. As shown in Table 2, no statistically significant relationships were found between Age and Awareness of the 8 general e-government services; or Age and Usage of the 8 general e-government services (although the relationship is significant at lesser levels of confidence, $0.1<p<0.05$). Significant relationships were found between Age and Awareness of Teignbridge.gov.uk; and Age and Awareness of Devon County Council website. Furthermore significant relationships were found between Age and usage of all four specified sites.

Thus overall, it is suggested that there are some effects of age on both awareness and usage when considering individual websites. However, for the 8 general e-government services listed, initial results on the relationship between age and awareness are negative and additional research must be done to further investigate the suggested relationship between age and usage. Overall, **Null H1** cannot be conclusively rejected and it must be assumed that there is no significant difference between the rate of uptake of e-government services amongst older people and other demographic groups.

H2 was tested by looking at the impact of leisure usage and variety on awareness and usage of the generic e-government services and selected e-government websites above. Statistically significant relationships were found between both Age and Variety of leisure use and Age and Average Frequency of Leisure Use (when banded into low and high levels of usage).

Finally the number of generic e-government services were banded into low, medium and high awareness and usage, and the differences between leisure effects on e-government awareness and usage in each age group were investigated. All tests for both Usage and Frequency of leisure use were invalid based on the constraints of the Chi-squared test, and further more sensitive tests would need to be applied to investigate such effects. However, some valid results were achieved from the tests between Awareness and Variety of leisure usage. Although, the test was invalid for the 16-44 age group, it was valid for the 45-64 and 65+ age groups. The null hypothesis, **Null H2**, could not be rejected at the 0.05 significance level for the 65+ age group, but could be rejected for the 45-64 age group.

Thus there is an apparent impact of leisure use on awareness of e-government in the middle age group (45-64), but there is no such effect in the 65+ age group. The effect is such that where high levels of leisure use exist, the awareness of e-government sites is higher than might be expected by chance.

However, for results, the values of Cramer's V are relatively small and suggest that even where there are statistically significant effects, the size of the effect is not particularly large i.e. there may be more significant factors impacting usage.

7 Conclusion

Contrary to expectations based on uptake of the Internet generally, there is no overall significant difference between the rate of uptake of e-government services amongst older people and other age groups, although there may be some relationships indicated for individual websites. The most significant impact of leisure use on awareness of e-government is in users in the middle age group (45-64), rather than in the 65+ age group. However, in many areas the research has been inconclusive, and additional statistical analysis will be required to further investigate the differences between leisure effects in each age group. Furthermore, given the low values of Cramer's V, further research is required to investigate other factors that might impact awareness and usage of e-government sites.

Test	χ^2 (df)	Significance value from SPSS	Cramer's V	Comment
Age*LeisureVariety	23.129 (6)	0.001	0.160	Valid test – significant result
Age*AverageLeisureFrequency (4-Banded)				Invalid test
Age*AverageLeisureFrequency (2-Banded)	1.090 (2)	0.580	0.050	Valid test – not significant
Age*TDC.gov.ukAwareness	16.782 (2)	0.000	0.175	Valid test – significant result
Age*TDC.infoAwareness	0.776 (2)	0.678	0.038	Valid test – not significant
Age*DCCAwareness	14.575 (2)	0.001	0.163	Valid test – significant result
Age*DirectGovAwareness	3.710 (2)	0.156	0.082	Valid test – not significant
Age*4SiteAwareness	5.784 (2)	0.671	0.082	Valid test – not significant
Age*TDC.gov.ukUsage	27.497 (2)	0.000	0.245	Valid test – significant result
Age*TDC.infoUsage	7.308 (2)	0.026	0.145	Valid test – significant result
Age*DCCUsage	29.914 (2)	0.000	0.261	Valid test – significant result
Age*DirectGovUsage	12.805 (2)	0.002	0.194	Valid test – significant result
Age*4SiteUsage				Invalid test

Age*8-type egovAwareness	3.709 (4)	0.447	0.065	Valid test – not significant
Age*8-type egovUsage	8.226 (4)	0.082	0.132	Valid test – not significant
Age (16-44)*egovAwareness*LeisureVariety				Invalid test
Age (45-64)*egovAwareness*LeisureVariety	8.028 (2)	0.018	0.271	Valid test – significant result
Age (65+)*egovAwareness*LeisureVariety	1.941	0.379	0.159	Valid test – not significant t

Table 2: Results of statistical analysis of Teignbridge survey data

8 References

Age Concern (2002) *Management Summary: IT, Internet and Older People* Available HTTP: http://www.ageconcern.org.uk/AgeConcern/media/Quant_exec_report_ext.pdf (Accessed 28 Nov 2004)

Devon County Council (2007), http://www.devon.gov.uk/ (Accessed 3 February 2007)

DirectGov website (2007), ttp://www.direct.gov.uk/en/index.htm (Accessed 3 February 2007)

Eastman, J.K. and Iyer, R. (2004) 'The elderly's uses and attitudes towards the Internet' *Journal of Consumer Marketing*, 21 (3): 208-220

Fox, S. (2004) *Older Americans and the Internet* Pew Internet and American Life Project. Available HTTP: http://www.pewinternet.org/pdfs/PIP_Seniors_Online_2004.pdf (Accessed 13 Dec 2004)

Hawthorn, D. (2000) 'Possible implications of aging for interface designers' *Interacting with Computers*, 12 (5): 507-528

Morrell, R., Mayhorn, C. and Bennett, J. (2000) 'A survey of the World Wide Web used in middle-aged and older adults' *Human Factors*, 42 (2): 175-182

National Statistics Online (2006) *Key Statistics for local authorities in England and Wales Part 1* Available: http://www.statistics.gov.uk/downloads/census2001/KS_LA_E&W_part1.pdf (Accessed 18 March 2006)

Office of Communications (2007), Communications Market Report, Available http://www.ofcom.org.uk/research/cm/cmr07/cm07_print/ (Accessed 23 August 2007)

Performance and Innovation Unit (2000) *e.gov: Electronic Government Services for the 21st Century* Available HTTP: http://www.strategy.gov.uk/downloads/su/delivery/e-gov.pdf (Accessed 27 Oct 2006)

Sourbati, M. (2004) *Internet use in sheltered housing. Older people's access to new media and online service delivery* For the Joseph Rowntree Foundation. Available HTTP:http://www.jrf.org.uk/bookshop/eBooks/1859351697.pdf (Accessed 28 Nov 2004)

Tan, X. and Clark, T.H.K. (2000) *Internet as a Mainstream Communication Medium – An Empirical Study of User Demographics* Available: http://www.its2000.org.ar/conference/zixiang_clark.pdf (Accessed 13 Dec 2004)

Teignbridge District Council website (2007), http://www.teignbridge.gov.uk/ (Accessed 3 February 2007)

Teignbridge.info website (2007), http://www.teignbridge.info/ (Accessed 3 February 2007)

Varney, D, (2006) *Service transformation: A better service for citizens and businesses, a better deal for the taxpayer* Available http://www.hm-treasury.gov.uk/media/4/F/pbr06_varney_review.pdf (Accessed 3 August 2007)