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PROVIDING CUTTING-EDGE KNOWLEDGE TO GOVERNMENT LEADERS

Bridging the Digital Divide for Hard-to-Reach Groups

E-Government Series

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IBM Center for The Business of Government

2007

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Cover photo, upper left: Group of seniors sharing their experiences of e-mail at the Leicestershire CareOnLine project. © 2007 Leicestershire County Council, United Kingdom.

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FOREWORD

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, "Bridging the Digital Divide for Hard-to-Reach Groups," by Heike Boeltzig and Doria Pilling.

Albert Morales

The Internet revolution is transforming and connecting the world—in the ways that business is conducted, government works, and people interact. However, even in highly connected countries, such as the United States and the United Kingdom, there are millions of "unconnected" people—some by choice, but many because of other circumstances. While sheer access to computers remains a major challenge for many hard-to-reach groups, another critical barrier to Internet use for people with disabilities, older users, and non-native language speakers is accessibility. This report examines a dozen case studies from both countries of efforts to bridge this digital divide and concludes with recommendations on extending the lessons learned.

Frances West

People with disabilities constitute approximately 20 percent of the global population and statistics indicate a rapidly aging population worldwide. Seventy million people in the United States will be over 65 by the year 2030; 50 percent of the workforce will be over 55 by the year 2020. And with aging comes many of the limitations associated with disabilities, such as reduced hearing, sight, and mobility. Simply providing Internet access to these groups is inconsequential unless the Internet applications and websites they are accessing conform to accessibility standards and support appropriate "assistive technologies," technologies used to extend the accessibility of commonly available operating systems and applications.

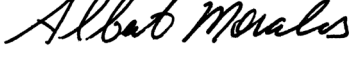
IBM has a long-standing interest in innovation related to increasing accessibility, including its role in inventing many of the early examples of assistive technologies, such as a remote control keyboard in the 1950s, a talking typewriter in the 1960s, and a Braille printer in the 1970s. However, increased interest in accessibility occurred in the

1990s, driven partly by intensified legislation and standards development that required applications, services, and hardware to meet guidelines for access. The focus shifted from merely providing assistive technologies to providing standards-conforming technology infrastructures that supported assistive technologies or in some cases obviated them entirely.

Boeltzig and Pilling identified specific groups of people who typically are not connected to the Internet and examined the circumstances of each—rural, poor, disabled, seniors, and ethnic minorities. They focused on how these groups of people, such as homebound individuals, could benefit most from using online government services. They also identified technical as well as social barriers that limit access. Their recommendations are aimed at both increasing *access* for these targeted groups and increasing *use* by individuals in the targeted groups. They also provide valuable recommendations aimed at service or application providers who have a major role in increasing both access and accessibility.

The case studies resulted in insights and lessons that are broadly applicable. Based on the case studies, the authors offer recommendations that are practical and serve as useful guides to practitioners and policy makers at all levels of government. For example, the case studies indicate that project participants should be involved from the beginning in the design of the training and use of the programs and that continuous feedback should be collected to ensure the programs are effective.

We hope that the case studies, insights, and recommendations will inspire public managers to take steps to reach out and make a difference in the lives of the unconnected in their communities. The Internet revolution should not leave anyone behind.



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EXECUTIVE SUMMARY

In both the United States and the United Kingdom, considerable emphasis has been placed on government information and services being online, and increasingly on the possibility of carrying out online transactions (e-government). The intention has been to deliver better quality, more convenient services to individuals, and also to increase efficiency and cut costs. While both countries are well on the way to Internet delivery of government services, this does not necessarily mean that all citizens are equally able to access them. *In both countries, those who have most to gain from e-government may have least access to it*—people on low incomes, older people, people with disabilities—thus providing evidence of a continuing digital divide.

Additionally, in both countries, the rate of growth of home Internet access has slowed in the last few years, indicating that universal home access is far from becoming a reality. However, both countries have a commitment to provide information about government services online and to enable transactions with the government to take place in this way.

In both countries, a number of initiatives have been set up that are intended to address the disadvantage of being "unconnected" for people with the most potential gain from e-government. The barriers include lack of Internet access, affordability, lack of basic technology skills, fear of technology, and lack of perceived need for Internet access. And in the case of some people with disabilities, these barriers include the lack of assistive devices to use computers and problems in accessing websites using such devices.

While there are many descriptions of these initiatives, there have been few detailed analyses of how effective they are and what makes them effective.

This study has set out to identify effective approaches for encouraging Internet access for selected groups and use of e-government services and to disseminate information about them across the two countries. The objective of this six-month study was to identify initiatives for which there is some evidence of effectiveness and conduct case studies to highlight their key features.

In each country we started the identification process by conducting a World Wide Web search, and by requesting information through electronic mailing lists and website advertisements, and from individuals working in the area of digital inclusion. Using criteria pre-determined from previous research, and based on documentary evidence, we selected six initiatives in each country that appeared successful in encouraging people who might otherwise be excluded to use the Internet, and which, preferably, also had an element of encouraging use of e-government services. Based on data collected through documentary research and detailed telephone interviews with program managers, we developed summary profiles for these 12 initiatives.

From these 12 initiatives, we selected six initiatives for case studies (three initiatives in each country) based on criteria developed with the assistance of the advisory board we recruited for the study. The selection process placed particular emphasis on initiatives overcoming barriers to digital inclusion, involving users in developments so that they fulfilled their needs more exactly, making efforts to raise awareness and to educate users about online government services, and having some evaluative evidence of their effectiveness. The six initiatives that were selected for case studies fulfilled these criteria to the greatest extent.

As part of the case studies, we conducted site visits to four of these initiatives, and interviewed staff members and program users, in person or by telephone. Based on these interviews and other data collected, we developed the case studies presented in this report. The initiatives for which we did not have the capacity to conduct such an in-depth study also had effective and instructive strategies for encouraging Internet access, and thus our recommendations are drawn from across all of the 12 initiatives researched in this study.

Through this research, we developed 10 recommendations that we believe will be effective in encouraging Internet access and use of e-government services.

Recommendations Aimed at Increasing *Access* to Targeted Groups:

1. Offer free computer and Internet access to targeted groups.
2. Provide long-term support to organizations seeking to reach targeted groups.
3. Create partnerships with other organizations to share resources and expertise.
4. Create strategies for long-term project sustainability.

Recommendations Aimed at Increasing *Use* by Individuals in Targeted Groups:

5. Engage individuals in targeted groups by starting with what interests and concerns them.
6. Raise awareness of the benefits and encourage use of e-government services among targeted users.
7. Improve usability of the Internet and e-government services to targeted individuals and groups.
8. Improve computer and Internet "accessibility" for people in targeted groups.
9. Create a comfortable learning environment and provide informal training opportunities to targeted users.
10. Involve targeted users by constant consultation.

The recommendations, with some best practice advice, are aimed at both practitioners and policy makers, with the goal of moving forward with developing e-government services that meet the needs of *all* citizens.

Increasing Access to and Use of the Internet and E-Government Services

Introduction: The Problem

In both the United States and the United Kingdom, considerable emphasis has been placed on government information and services being online, and increasingly on the possibility of carrying out online transactions (e-government). The intention has been to deliver better quality, more convenient services to individuals, and also to increase efficiency and cut costs. While both countries are well on the way to Internet delivery of government services, this does not necessarily mean that all citizens are equally able to access them. *In both countries, those who have most to gain from e-government may have least access to it*—people on low incomes, older people, people with disabilities—thus providing evidence of a continuing digital divide.

This was acknowledged by the UK government in a report in 2002 (e-Envoy and e-Minister, 2002): "While the market has successfully delivered Internet access to most citizens, take-up among the most disadvantaged groups in society—those on low incomes, the elderly, and people with disabilities—is lower. These groups are traditionally heavy users of public services and potentially have most to gain from convenient, customer-focused channels of electronic delivery. […] but without access to the Internet or the skills to use it confidently, these groups may face further social exclusion." This view was reiterated in the prime minister's strategy document in 2005: "take-up of e-services remains an issue particularly for some groups who have most to gain."

This report is based on our study of 12 initiatives for several target user groups, six of which were studied in depth. The recommendations contained in the next section are based on the authors' analysis of these initiatives.

Progress of E-Government

There have been a number of laws and policy initiatives in the United States designed to increase the delivery of online government services. The Government Paperwork Elimination Act (GPEA) of 1998 mandated federal agencies to enable the public to interact with them electronically, whenever possible, by October 2003. This legislation has played a critical role in developing e-government in the United States. This was followed by the E-Government Act signed into law by President George W. Bush on December 17, 2002, extending the government's commitment to online government services. There is evidence that progress has been made over the last five years. The U.S. Office of Management and Budget (2006) reported that as of September 2006, 25 of 28 major federal agencies had mutually accepted e-government implementation plans and that 87 percent of the milestones set out by Congress had been met. In the United Kingdom, the government's aim announced by the prime minister in March 2000 was for 100 percent of government information services and transactions to be online by 2005.

A survey by Accenture (2005) of online national government services in 22 countries including the United States and Britain—across 12 major service sectors that included human services and education—found that goals had largely been achieved in the two countries, with 99 percent of government services being online in the United States and 92 percent in the United Kingdom. However, on "service maturity depth" (the level of completeness with which the service is offered) scores were lower: 76 percent for the United States and 63 percent for the United Kingdom (average, 62 percent) (see also West, 2006).

The Continuing Digital Divide

In both the United States and the United Kingdom, there is evidence of a continuing digital divide. In the United States in December 2006, according to the Pew Internet & American Life Project (2007), 70 percent of adults used the Internet. Figures were much lower for those aged 65 and older (33 percent), for those with low incomes (less than $30,000 a year) (49 percent), and for African Americans (58 percent). A survey using data from the Current Population Survey (CPS) collected in October 2003[1] (Dobransky and Hargittai, 2006) found that people with disabilities (31 percent) were only half as likely to use the Internet as those without disabilities (64 percent).

In the UK, according to the Office of National Statistics Omnibus Survey (ONS, 2006a), 60 percent of adults had used the Internet in the three months before being interviewed between January and April 2006. Use decreased dramatically with age for those aged 65 and older. Eighty-three percent of the 16-to-24 age group accessed the Internet in the three months prior to being interviewed, compared with 15 percent of the 65+ age group. Use was also strongly related to income. Ninety-three percent with an income of £36,400 or more had used the Internet in the three months prior to the interview, more than twice the proportion (43 percent) of those earning £10,400 or less.

Information on Internet usage by people with disabilities in the UK is hard to come by, but a study by Ofcom (2006a), the communications regulator, found that home Internet access was somewhat lower for people with disabilities under the age of 65 (50 percent) than for all UK adults in this age group (62 percent), and that it was lower for those over 65 with a disability (15 percent), than for those without a disability (27 percent) (Ofcom, 2006b). Ofcom (2006c) also found that home Internet access, as well as weekly use anywhere, was, unlike the situation in the U.S., higher for people from ethnic minority groups than for the adult UK population; but this is probably due to the younger age profile of people from ethnic minority groups.

A recent study for the University for Industry in the southwest of England found that people with "social needs" (using as indicators receipt of benefits, poor health, living in a council [affordable] house, looking for a job, having disabilities) which would make online contact with government useful, were less likely to have Internet access at home, work, or college (Simpson Carpenter and Regeneris, 2006).

In both the United States and the United Kingdom, there is evidence of a recent slowing in the growth of home Internet access, indicating that unequal access is not disappearing. The 2005 Pew Internet survey project found that 22 percent of Americans were "truly disconnected," having never used the Internet and living in households without access, a figure that was virtually unchanged from the 23 percent found in 2002 (Fox, 2005). The same picture emerged in the United Kingdom. A national survey of over 2,000 households in the United Kingdom carried out by the Oxford Internet Institute (Dutton et al., 2005) found little change in home Internet access over the period 2003 to 2005 (from 58 to 61 percent).

Reasons for Non-Use of the Internet

The main reasons for non-use of the Internet, according to the 2002 Pew report (Lenhart et al., 2003), were lack of interest (52 percent), fears about security/pornography (42 percent), cost (30 percent), lack of time (29 percent), too complicated (27 percent), and lack of a computer (11 percent). Moreover, 22 percent of non-users with disabilities said that their disability made it difficult or impossible for them to go online. The report points out problems that make it particularly difficult for people with disabilities to use the Internet. Compared with other non-users, more people with disabilities found it difficult to get to a place where there is Internet access in the community (24 percent compared with 15 percent); did not know where there is access in the neighborhood; thought the Internet hard to use (21 percent compared with 9 percent); and thought it too expensive (25 percent compared with 18 percent).

The 2002 Pew report and the Dobransky and Hargittai (2006) survey also note the high cost of assistive technologies needed by some people with disabilities to use the Internet, in addition to the costs of a computer and online access, which are particularly significant as people with disabilities and older people generally have low incomes (see also RTC Rural, 2006). Additionally, computers at public locations may not be adapted to their needs. These findings of costs, particularly of assistive

technologies, of access outside the home, and of the need for assistance in starting to use the Internet are remarkably similar to those of a study of the Internet and people with disabilities in the United Kingdom (Pilling et al., 2004) carried out by one of the researchers of this project.

Use of E-Government Services

A survey by Mori/Microsoft of 990 people in the UK early in 2006 confirms that usage of online public services is lower for groups who may have the most need. Sixty-four percent of those surveyed said that they never use public services online, this rising to 77 percent for those not working and 86 percent for those over 65—both groups that are more likely to use public services (Guardian Unlimited, 2006). Of non-users, 39 percent said this was due to lack of Internet access and 24 percent preferred other ways of making contact. There is also some evidence that people from low-income groups, those with lower education levels, and older people not only use the Internet less, but that Internet users from these groups are less likely to use it to access government websites than other Internet users (Larsen and Rainie, 2002; Thomas and Streib, 2003). In the Dobransky and Hargittai (2006) survey, Internet users with disabilities sought information on government websites more often than those without disabilities, but they were less likely to use these sites to complete transactions.

Web Accessibility

For many people previously unfamiliar with the Internet, particularly those with disabilities or low literacy skills, problems do not end when they start to use the Internet. This is despite commitments of both the U.S. and UK governments for websites to be accessible to people with disabilities, and the existence of relevant legislation in both countries (in the U.S., the Americans with Disabilities Act of 1990, the Telecommunications Act of 1996, the 1998 Amendment to Section 508 of the Rehabilitation Act; in the UK, the Disability Discrimination Act of 1995). Section 508 most clearly applies to federal websites, stipulating that the federal government must make electronic and information technology accessible to federal employees with disabilities and the general public, unless this creates an unreasonable burden.

How Accessible and User-Friendly Are Government Websites?

Despite this commitment, there is evidence that government websites are far from meeting the requirements of all people with disabilities, even with the use of various assistive technologies to help them access a computer and the Internet. In the United States, Ellison (2004), using an automated tool called "Bobby," which tests compliance with Web Accessibility Initiative guidelines[2] up to level AAA, found that 42 percent of federal home pages met Section 508 accessibility standards. However, this is likely to be an over estimate since automated tools do not necessarily detect all problems. Likewise, a study of 1,000 websites commissioned by the Disability Rights Commission (2004) in the United Kingdom found that government websites performed better than others, but only 32 percent reached the level "that a developer must satisfy otherwise some groups of people will be unable to access information on a site" (level A on *Web Content Accessibility Guidelines, 1.0* [WAI, 1999]).

More recent surveys suggest that there is some improvement but still a long way to go. West (2006), using Bobby 5.0, an updated version of the automated tool, found that in the summer of 2006, 54 percent of U.S. federal government websites tested were assessed at the lowest level of accessibility, level A, compared with 75 percent of UK government websites. A survey of 28 UK central government websites in November 2004 (Nomensa, 2005) also indicated some improvement, with 78 percent reaching level A of the *Web Content Accessibility Guidelines* using an automated Bobby test or the "Cynthia Says" checker. However, manual tests had mixed findings. Although most images had labels (needed for those using screen readers and other speech output or voice recognition software), 50 percent did not have informative content. Results were poor for some tests, including almost two-thirds having links that did not make sense out of context, also causing difficulty for screen reader users. New UK research by a panel of users with various disabilities showed that there were problems even with the 20 local government sites rated best by the Society for Information Technology Management. While testers with disabilities were able to perform a simple task (to find the local government's switchboard number) on 95 percent of sites, they were able to carry out a more complex

task such as reporting on an abandoned car on only 35 percent, and all sites had accessibility or usability problems for at least one user (SOCITM, 2006).

Existing research has shown that Internet delivery of government services can cut costs and free staff to provide better personal service to customers where this is needed (Cohen and Eimicke, 2001). However, usability and accessibility are vital if people who use most services, including those with disabilities, are to benefit from using e-government, and continued monitoring is necessary to ensure this happens.

Future Action

The groups of non-Internet users with whom we are particularly concerned in this study—those who could benefit most from using online government services—face many hurdles in having access to and using the Internet. In the United States and the United Kingdom there have been many initiatives, both by government and other organizations, to encourage people on low incomes, older people, and people with disabilities, among other groups, to use the Internet and online government services. The slow increase in the uptake of Internet access suggests that considerably more still needs to be done.

In the United States, the Neighborhood Networks Program is a key initiative of the federal government, intended to provide computer and Internet access to people living in low-income, government-subsidized housing. The goal is to increase access to healthcare and social services as well as employment opportunities. Between 1994 and 2004, the Technology Opportunities Program (TOP), another federal initiative, provided 610 demonstration grants to state, local, and tribal governments; heathcare providers; schools; libraries; police departments; and community organizations for improving public service delivery to communities, especially those underserved, by encouraging use of new telecommunications and information technologies. Evaluative evidence suggests that the majority of these initiatives have made an impact, and continue to do so, in terms of increasing access to and use of the Internet, including government services.[3]

The UK online centers, the key government initiative in the United Kingdom for increasing Internet access and promoting e-government to those without home, work, or college access, have been shown to serve their users well (Simpson Carpenter and Regeneris, 2006; SQW/Mori, 2005; Countryside Agency, 2003; Hall Aitken, 2002; 2003), but a significant proportion of their service is provided for people who already have Internet access. Hall Aitken (2003) also notes that inexpensive local Internet access will not in itself overcome the digital divide, because the Internet is particularly useful for quick access, and such centers are unlikely to be the solution for those with mobility problems.

While there are many initiatives in both countries, there are few detailed accounts of what makes an initiative successful. Internet access in itself may not mean that those who could benefit most from government online services will use them. A UK survey of local e-government initiatives in 2005 concluded that most services were provided for "a generic, predominantly literate, and able-bodied audience" (Foley et al., 2005), and went on to suggest that e-government strategies rarely considered the needs of marginalized groups of people.

West (2003), in a review of government websites in which he intended to investigate how government departments and agencies are responding to the challenge of making their online services accessible and relevant to all people, regardless of their abilities, skills, or economic situation, concludes that "the average [U.S.] government website is designed to address the needs of well-educated, relatively affluent, English-speaking citizens lacking disabilities."

Despite the numerous initiatives, knowledge of what works and why is not very well disseminated. Thus, there is a need for improved project evaluation and the sharing of good practice within and across the two countries. With this study, we have endeavored to make a contribution. We have searched for initiatives that have made an impact, particularly if they have an element of introducing people to e-government. We have tried to identify the approaches that enabled them to make the impact, and we are sharing information between two countries that are among the foremost in promoting e-government services.

Recommendations to Improve Access and Use

Introduction

The purpose of this report is to provide comparative information that will contribute to a better understanding of the efforts that are currently being made to encourage certain groups of people—people on low incomes, older people, and people with disabilities—to use the Internet, and online government services in particular. Highlighted in this report are 12 initiatives, six from the United States and six from the United Kingdom, that have been effective in terms of engaging targeted non-users in Internet use and, to some extent, online government services.

We conducted in-depth case studies of three initiatives in each country. In the United States, these were the Computers for Homebound and Isolated Persons (CHIPS) Program in Knoxville, Tennessee; eRutherford in Rutherford County, North Carolina; and the Foundation for Successful Solutions–Project T.E.C.H. in Los Angeles, California. The initiatives in the United Kingdom were CareOnLine in Leicestershire; Leeds Libraries IT Learning; and the Leicester Disability Information Network (LDICN). These projects particularly targeted efforts at certain groups of people, as described in Table 1.

Information on the other initiatives was obtained by interviews with program managers and documentary research. In the United States, these initiatives were Computers for Families (CFF) in Santa Barbara, California; Digital Sisters in Washington, D.C.; and Housing Works in Boston, Massachusetts. In the United Kingdom, they were Carpenters Connect RegenTV, London Borough of Newham; Cascade, Nottingham; and Community Heritage Store, West Norfolk (see Appendix II for summaries of these initiatives).

The in-depth studies were selected using criteria developed with the assistance of the project's

Table 1: Summary of the Six Case Study Initiatives

Initiative	Target User Groups
United States	
Computers for Homebound and Isolated Persons (CHIPS), Knoxville, Tennessee	People with disabilities, older people, and their caregivers
eRutherford, Rutherford County, North Carolina	Unemployed people, low-income families, older people, people with disabilities, and those living in rural areas
Foundation for Successful Solutions–Project T.E.C.H., Los Angeles, California	Ethnic minorities, older people, and people with disabilities
United Kingdom	
CareOnLine, Leicestershire	People with disabilities, older people, and their caregivers
Leeds Libraries IT Learning, Leeds	Older people, people with disabilities, people living in deprived areas
Leicester Disability Information Network, Leicester	People with disabilities and their caregivers; people from ethnic minority groups

advisory board (see Appendix I). The selection process placed particular emphasis on initiatives overcoming barriers to digital inclusion, involving users in development so that they fulfilled their needs more exactly, making efforts to raise awareness and to educate users about online government services, and having some evaluative evidence of their effectiveness. However, all of the 12 initiatives had distinctive and interesting ways of encouraging non-users to use the Internet. We thus included all of them in identifying 10 recommendations regarding approaches for which there is some evaluative evidence that they are effective in increasing access to and use of the Internet, and potentially e-government.

While we consider that all the initiatives researched used effective strategies, and that much can be learned from them, no claim is made that they are the most effective or successful initiatives in the two countries. Many initiatives in both countries are successfully endeavoring to encourage underserved groups of people to discover and share in the benefits of using the Internet and online government services.

Following is a description of each recommendation. The recommendations are divided into two clusters:

- Recommendations aimed at increasing *access* to targeted groups
- Recommendations aimed at increasing *use* by individuals in targeted groups

Examples and illustrations are drawn from the 12 initiatives studied for this research project. Recommendations are aimed at practitioners and policy makers who are committed to increasing *access* to and *use* of the Internet and online government services.

Recommendations Aimed at Increasing *Access* to Targeted Groups

Recommendation 1: Offer free computer and Internet access to targeted groups.
In the United Kingdom, according to the Office of National Statistics, the cost of equipment and online access were the third (14 percent) and fourth (11 percent) most common reasons for not having home Internet access (ONS, 2006a). Cost is likely to be an even greater issue for the groups with which this study is most concerned—all of which are likely to be on low incomes. In a study of older adults with disabilities in the United States, over 50 percent of non-computer users cited cost as a major factor (Mann et al., 2005). Program staff interviewed in this study said there continues to be a digital divide and identified barriers to digital inclusion such as the affordability of computers, the lack of Internet access in some areas

Recommendations Aimed at Increasing *Access* to Targeted Groups

1. Offer free computer and Internet access to targeted groups.
2. Provide long-term support to organizations seeking to reach targeted groups.
3. Create partnerships with other organizations to share resources and expertise.
4. Create strategies for long-term project sustainability.

Recommendations Aimed at Increasing *Use* by Individuals in Targeted Groups

5. Engage individuals in targeted groups by starting with what interests and concerns them.
6. Raise awareness of the benefits and encourage use of e-government services among targeted users.
7. Improve usability of the Internet and e-government services to targeted individuals and groups.
8. Improve computer and Internet "accessibility" for people in targeted groups.
9. Create a comfortable learning environment and provide informal training opportunities to targeted users.
10. Involve targeted users by constant consultation.

Client Perspective I

"It [the project] has been a lifesaver for him and me," said a female caregiver who also worked as a mentor to a senior who needed to use a wheelchair due to a stroke that had affected his mobility. She had helped him to research information about his medical condition and medical aids. Researching government websites was another activity that the two engaged in. "Mostly the reason we went to the government websites was because the Medicaid Part D Program was really confusing and we were just going onto the website to find something that would help us better understand it." The mentor said that they used the information and resources about Medicaid Part D that they obtained from the Internet to create flyers and distributed them in the community; they also shared the information through various e-mail group lists. She not only helped him select the right prescription drug coverage plan but also to apply for veterans' benefits using the Internet. In return, he helped her and her family file taxes online using his previous work experience as a tax accountant.

(especially rural areas), the high cost of Internet services, and the increasing sophistication and complexity of the Internet, which does not lend itself to dial-up Internet access.

All of the initiatives identified in this study provided an Internet connection of some type (dial-up, cable, DSL, satellite) for varying lengths of time. The CHIPS program and CareOnLine provided computers in people's own homes if they could not afford one, the CHIPS program paying for a dial-up Internet connection for a minimum six months. CareOnLine paid for Internet connections for the first two years of the project when it had sufficient funding. The Computers for Families program in Santa Barbara, California, provided refurbished computers and discounted Internet access for home use to fourth-grade students from low-income families living in south Santa Barbara County. The UK initiative, Carpenters Connect, made available free Internet access through digital TV in people's homes at a disadvantaged housing estate in East London.

Other projects in both countries have offered free or affordable Internet access in the community. In the United Kingdom, Leeds Libraries provided up to two hours a day of free Internet access in local libraries. Leicester Disability Information Network (LDICN) supplied up-to-date computer suites to day centers for people with disabilities in the area, which give free access to day center users. The project also provided free public access to the Internet, including the local government website, through touch-screen kiosks dotted around the city, particularly in locations likely to be used by people with disabilities. The eRutherford project in North Carolina, whose purpose was to improve Internet and e-government access to residents of the county, worked with local Internet service providers not only on issues related to expanding Internet connectivity to very remote areas of the county but also on issues around affordability.

Many initiatives stressed the importance of having computer and Internet access in locations with which people are familiar. This is obviously happening when computers are placed in people's homes, or in day centers that people attend, as in the examples given earlier. Project T.E.C.H. in Los Angeles was based in two community centers. People found out about it mainly by word of mouth, and they were encouraged to use it by the program staff, with whom they were familiar. Cascade is a project that provided computer training to people with disabilities in Nottingham, United Kingdom. The initiative also provided a laptop and training in tutoring to other groups with which these people were familiar, namely, those catering to people with disabilities in the area. Knowing that some residents would not use public libraries or would not feel comfortable going to a community college, the eRutherford initiative convinced a local coffee shop, a restaurant, and three fast-food chain restaurants to open up public access sites on their premises. The goal was to go where the people are to meet their needs.

Program staff across the two countries recognized that the majority of participants did not have computer and Internet access when they first registered for training and/or related supports and that this was a barrier in not being able to practice or apply what they had learned in the training. Home access to computer and Internet technology is even more important for people with disabilities and older people, especially those with mobility issues, who may be less likely to use an Internet public site access.

Promoting home as well as public site access was also a recommendation of Hall Aitken (2003) in their evaluation of UK online centers. Those researchers found that many users of these centers considered the skills and knowledge they had acquired were of little use without home access. The Internet is useful for many things, including ordering goods and services, communicating with others, and obtaining information quickly. If people have to travel to an Internet public access site that has limited hours, and possibly a charge, many of these benefits disappear. The researchers concluded that "new initiatives to promote home access and make it easier to achieve should be introduced alongside UK online centres" (Hall Aitken, 2003, p. 61).

Best practice advice to practitioners. Projects should take into account people's needs for long-term computer and Internet access if new users' interest and use is to be sustained. The full benefits of Internet access cannot be realized without home access, and this is particularly the case for older people and people with disabilities. Projects that offer only short-term access should try to ensure that the benefits are not lost by making partnerships with and educating program users about other projects.

Best practice advice to policy makers. Policy makers should consider various options for providing free or affordable Internet access to low-income groups, older people, and people with disabilities.

Recommendation 2: Provide long-term support to organizations seeking to reach targeted groups.

Program staff across the two countries highlighted the importance of providing help with Internet access and support on a long-term basis as a means of encouraging participants to use the Internet and possibly online government services. Initiatives that provided computers to people at home usually did so on a long-term basis. Both the CHIPS program and CareOnLine also had a support helpline. Project participants who have completed their training can telephone if they experience technical problems, advice being provided over the telephone or by a personal visit if necessary. Likewise, the Computers for Families program in Santa Barbara provided long-term technical assistance to fourth-graders and their families who had received a computer through the project.

The UK initiative Carpenters Connect provided free Internet access on a long-term basis through digital TV in people's homes at a disadvantaged housing estate in East London. Project staff of the Leicester Disability Information Network were available if day center staff experienced technical problems or needed training in new software for day center users. Leeds Libraries provided learning sessions as people required them. Sessions were sometimes used to complement training courses elsewhere, while the free computing facilities provided long-term free Internet access.

Moreover, continued support also involved helping participants identify opportunities (e.g., internship, employment, another program) where they could apply the skills and knowledge they had gained through the program once they had completed the program. "You've got to be able to continue it.… so what we try to figure out, when they leave our program—where could they go? Finding ways to help them move on or helping them get a job that makes them use their skills more. So we try to find ways to progress, but we also stay here and help them. What we are trying to do is not leave them. If they still need us, they can still come back to us and get help from us," said one staff member of the Digital Sisters project.

Best practice advice to practitioners: Projects should help users plan their next steps after completing the training. Providing long-term access and support increases participants' confidence, is likely to assist them in increasing the range of their Internet activities, and often has a positive impact on their learning progress.

Best practice advice to policy makers: Getting more people—especially those with low incomes, older people, and people with disabilities—to use the Internet and possibly online government services requires long-term policy commitment and support.

Recommendation 3: Create partnerships with other organizations to share resources and expertise.

Program staff across the two countries highlighted the importance of building partnerships to share resources and expertise and to exchange information and experiences. In the case of Project T.E.C.H., a partnership with departments of the city of Los

Client Perspective II

One program user who was interviewed in this study talked about how gaining computer and Internet skills at the age of 70 had helped him to be more efficient in his community work. "It's been an experience … money is not the object here; it's priceless. To take somebody my age with the knowledge that I have and coming out of the community that I am coming out of that could be able to learn the computer and then invest it back into the community—that is what [this] project has done for me … it has opened up a new world." He had been using the computer which he received from the project in many ways including researching local government websites and disseminating the information and resources in his community.

Angeles meant that free use of space is provided in two community centers, as well as furniture and equipment in one of them.

The CHIPS project is a partnership of four organizations, which all serve different functions for the initiative. The Knox County government provides funding and community donations, the Office on Aging provides the initial home assessment, the University of Tennessee provides free dial-up Internet access for six months, and the East Tennessee Technology Access Center provides assessments of those likely to need assistive technology.

The Computers for Families (CFF) project used refurbished computers, doing significant outreach for computer donations via advertisements and articles in local papers. It has partnered with the County Probation Department, and young offenders are involved in the refurbishment and upgrading of computers. CFF has also partnered with a local cable company, which provides families with highly discounted broadband for three years.

The main partner for Leeds Libraries is the Adult Community Learning Services (ACLS). This has helped to streamline the group learning sessions so that there is continuity in the sessions across all libraries, but to still allow flexibility in the one-to-one teaching. ACLS contracts out their courses, so there are regular meetings where the providers get together; this improves referrals between services and raises Leeds Libraries information technology learning profile in the city. The funding obtained from ACLS is used to improve future learning.

In addition to the benefits already mentioned, initiatives that collaborated with other entities found that partnering increased their attractiveness to potential funders and that that was important especially in a time of scarce resources and limited funds. Moreover, existing research provides evidence that community and voluntary organizations are effective in reaching marginalized groups of people (Hall Aitken, 2003) who are more likely to use public services.

Given the nonprofit sector's capacity to reach those groups of people, government managers should partner with these organizations and help build their capacity to educate their communities about the benefits of online government services. "If the government agencies that are about to launch a service online, an e-service, had a plan for community outreach and sought out regional community technology groups or individual community technology centers and programs to assist them or partner with them on doing this outreach, this would be a more effective method and reach groups that are traditionally underserved and thus forgotten," said one U.S. program staff person.

Best practice advice to practitioners: Projects should build partnerships with other organizations to share expertise and resources and to provide complementary activities. Projects should reach out to and build relationships with government departments with the goal of becoming more informed about online government services and better connecting residents with those resources.

***Best practice advice to policy makers*:** Fostering a closer relationship between government organizations that offer technology access and training is one way in which policy makers can promote access to the Internet and to e-government particularly (see U.S. Office of Management and Budget, 2005). In addition, they could provide incentives to government organizations to partner with community and voluntary organizations to more effectively reach the groups to which e-government services are targeted.

Recommendation 4: Create strategies for long-term project sustainability.
However effective initiative strategies are, and however successful they are in encouraging marginalized people to use the Internet and online government services, this can make only a limited impact if the initiative is not sustained. Almost all the initiatives studied in this research have had problems of sustainability; they have had to put much effort into this and often into obtaining funding from a variety of sources. Because of funding issues, there was constant pressure on program staff to figure out how to incorporate customized training in a way that did not sacrifice one course for another.

Diversifying funding sources was one approach that all of the initiatives included in this study used for building capacity over the long term. Initiatives like CareOnLine and the Leicester Disability Information Network have managed to become incorporated into local government as a way to obtain stable and sustained funding for their efforts. Both initiatives were initially funded by Invest to Save Budget (ISB), a joint Treasury/Cabinet Office initiative with an aim of encouraging innovation and partnership in public services and improving quality and cost effectiveness. CareOnLine managed to obtain some funding for one year; it was then fully adopted by the local government's social services and is now maintained as a core part of social care. To assist in obtaining additional funding, the project tries to maintain a high profile, and conferences are attended and awards entered to this end. Likewise, LDICN has been mainstreamed, the local government picking up the core staffing costs. The project is also income generating through the multimedia CDs it produces and sells.

From 1998 to 2002, the CHIPS program was operating under a grant from the U.S. Department of Commerce Technology Opportunities Program (TOP), placing new computers into homes of adults, aged 21 or older, who were homebound and isolated. With the expiration of the grant in 2002, CHIPS staff had to rethink their approach in order to sustain their program. The local government (Knox County, Tennessee) provided funding to revamp the program. Rather than focusing on all adults, the new version of the program specifically targeted homebound seniors and their caregivers. Instead of placing new and expensive computers into participants' homes, program staff developed a process whereby they would solicit donations of computers and then refurbish them for use by seniors. Program staff also said that using refurbished computers as well as volunteers for the technical support and training was really what made the program sustainable.

As part of implementing the eRutherford initiative, staff received training and technical assistance related to grant seeking and writing from the statewide e-NC program. When selecting the locations for the Internet public access sites, staff strategically decided to co-locate the computer and Internet access sites within already existing venues such as public libraries, senior centers, coffee shops, and restaurants, with the goal of being better able to sustain these places. Partnering with other organizations was another approach that initiatives across the two countries used in order to leverage existing resources and to join forces when applying to funders.

Best practice advice to practitioners: Projects should build in strategies for project sustainability from the beginning. In addition to diversifying funding sources, the examples listed above illustrate many ways in which resources—both financial and in-kind—can be leveraged to build project capacity and help sustain efforts over the long term.

Best practice advice to policy makers and funders: Policy makers and other grant-giving bodies should rethink their strategies so that obtaining funds for continuing successful projects is not more difficult than for starting up new, innovative ones. Funding should be made available both on the basis of track record and on the basis of need.

Recommendations Aimed at Increasing *Use* by Individuals in Targeted Groups

Recommendation 5: Engage individuals in targeted groups by starting with what interests and concerns them.
Lack of motivation is often cited as the major reason for people not being Internet users. Findings from the Pew Internet & American Life survey project carried out in the United States (Lenhart et al., 2003) and from the UK Office of National Statistics (ONS, 2006b) indicate lack of desire, interest, and need as the main reasons people give for not accessing the

Client Perspective III

An elderly woman who received a lung transplant four years ago said the computer and the Internet had been very useful for researching information about her condition and sharing it with the lung transplant online support group. She had created her own website as a means to share not only her experience but also resources with other people. "I am a person who likes to learn—the more I learn the better off I feel I am doing … I use the Internet for that. I can go in and learn what's expected, what's going to be coming at me." Her son and other family members had been mentoring her on how to use a computer and the Internet. Like many other program users interviewed in this study, she used government websites to research about Social Security, particularly Medicaid Part D. She talked about how she discussed the different coverage options and related issues with her lung transplant online support group and how helpful that was.

Internet. Our study suggests that this is an oversimplification, and that lack of interest and lack of *perceived* need are often due to lack of awareness of what the Internet can offer. The projects we have reported on have tried to overcome barriers such as affordability and lack of digital literacy and skills, but also *perception of need*.

Most of the initiatives included in our study made great efforts to engage people in learning computer and Internet skills by starting with people's interests and concerns. In both countries, initiatives that provided computers and training for isolated and housebound people at home—the CHIPS program in Knoxville, Tennessee and CareOnLine in Leicestershire—emphasized the importance of exploring at an early stage people's interests and concerns. One CareOnLine staff member said: "[We] very quickly found out that the thing that motivates people to learn is finding something that interests them...." Being able to communicate with family members and relatives was often the primary reason that attracted people to the computer.

The UK initiative Community Heritage Store (CHS), in West Norfolk, aiming to "bridge the digital divide" for people aged 55 and over living in rural areas, gained seniors' interest initially by providing them with the opportunity to preserve their memories and to share their stories with the community, that is, to celebrate local heritage. Following initial local publicity about the project, it provided interlinked individual and community websites through which photographs, letters, stories, and other aspects of local heritage could be shared with the larger community. Program staff said that the project had sparked sustained interest in the Internet.

Asking participants what *they* wanted to learn through participation in the program often had an empowering effect on people. Using technology to empower people to learn new skills was part of the program philosophy of the Digital Sisters program in Washington D.C., which provides technology education to predominantly single and teenage mothers and young girls. "The beginning of empowerment is when we come in and not say we have the answer for you [participant]. We come in saying, 'What is it that you're looking for?' Then maybe we can find the answers for you," said one instructor. The goal was to give people control over the learning process, thereby taking away some of the fears and anxieties related to computers and the Internet.

Best practice advice to practitioners: Projects aimed at encouraging non-Internet users to use the Internet should gear publicity or organize events to the interests and concerns of particular groups, rather than simply focusing on the availability of Internet facilities or training.

***Best practice advice to policy makers*:** Policy makers should continue efforts to bridge the digital divide by increasing awareness of the Internet's benefits to non-users, as well as taking measures to overcome barriers for specific groups.

Recommendation 6: Raise awareness of the benefits and encourage use of e-government services among targeted users.

The whole basis for the research project reported here is that those who could benefit most from using government online services are less likely to use these services. A recent UK study (Simpson Carpenter and Regeneris, 2006) has shown that people with more "social needs" (e.g., receiving benefits, living

Client Perspective IV

One program user—an older man—who was interviewed in this study talked about how the Internet class had taught him how to research government websites. The knowledge and skills he gained helped him to find out about disability benefits and to apply for government assistance. "You can do things on the website that saves you a trip to the office." In addition, the experience of participating in technology training encouraged him to go back to college and take more advanced digital photography classes. He then was able to get a grant from the college to buy a digital camera and to set up his own digital photography business.

in a council [affordable] house, being in poor health, looking for a job, having disabilities) are less likely to have Internet access at home, work, or college than those without "social needs." Lower use of e-government by older people and those on low incomes is partly due to their being less likely to be Internet users, but there is also some evidence of lower use of online government even when they are Internet users (Larsen and Rainie, 2002; Thomas and Streib, 2003). Among people with disabilities the situation seems to be different, Internet usage being half of what it is for people without disabilities but visits to government websites for information among users being more frequent (Dobransky and Hargittai, 2006).

Our study findings suggest that people initially use the Internet for what particularly interests them, and that they may not use it beyond this self-created limit unless it is seen as particularly advantageous. Program staff have stressed that simply talking to people about e-government has little significance for them. What is needed is to show the relevance of using online services for people's needs—and that online services can be easier and more convenient than other methods of obtaining services. So, for example, Leeds Libraries in the UK in their Internet training classes show people that reporting online a broken streetlight or failure of garbage collection was much quicker than a trip to the local government offices or being kept on hold while trying to report by telephone. Project T.E.C.H., which provides computer and Internet access and training to community residents, mainly African American and Latinos, introduces participants to the city of Los Angeles website in their Internet training classes, showing them the resources available. Through this some have become comfortable with searching city government websites on their own and paying utility bills online.

A campaign to increase the use of local government websites, launched in the UK in May 2006, used this method of demonstrating concrete benefits (Communities and Local Government, 2006). Services were advertised in the national and local print press, on radio, and online, the campaign being directed at existing Internet users. Users could link through the advertised Directgov/mycouncil website to a number of local government services in their area.

Such a campaign, directed at groups who do not currently have easy Internet access and dealing with subjects of concern to them, could have considerable potential, particularly if the advertisements are both relevant and lively. The use of UK online centers to encourage use of online government services is discussed in recommendation 7 below. Entertaining promotional material on CDs could be one way of encouraging use in the online centers and in other organizations providing Internet access or training.

Best practice advice to practitioners: Projects should find ways of publicizing the concrete benefits of using e-government services in terms of convenience—time saved, 24/7 availability—for services that are relevant to particular groups of people.

Best practice advice to policy makers: Initiate campaigns through the media demonstrating the concrete benefits of using online government services directed toward non-users. Provide promotional materials on CDs or other appropriate forms to organizations providing Internet access or training.

Recommendation 7: Improve usability of the Internet and e-government services to targeted individuals and groups.

Governments in the United States and the United Kingdom have spent much time, effort, and resources to determine how to improve people's use and the effectiveness of e-government services. However, the design and implementation of these

online resources have often been developed without consulting citizens. Thus, it is not surprising that government websites continue to be less user-friendly and publicly accessible than they ought to be (Vernon and Lynch, 2003; Ellison, 2004; Disability Rights Commission, 2004; Foley et al., 2005; West, 2006).

In the pilot study using UK online centers to promote e-government mentioned earlier (Simpson Carpenter and Regeneris, 2006), the authors pointed out that consumers and center managers identified that the e-services being tested were not always designed with the needs of the socially or digitally excluded consumers in mind, and suggested that online centers could be used to facilitate testing and ensure that government websites do meet these needs. Similar suggestions were made by program staff of U.S. initiatives interviewed for this study. Government officials should actively involve consumers, or different groups of consumers, from the beginning in the design and implementation of government websites, thereby ensuring that the websites meet diverse needs (Vernon and Lynch, 2003). This is the first step toward increasing both the usability and utilization of e-government among consumers of public services.

Government websites may be particularly difficult to use for people whose first language is not English and for people with literacy problems or learning disabilities. Thus, issues such as language diversity, literacy, and cultural sensitivity need to be taken into account when developing and implementing e-government (Vernon and Lynch, 2003). Providing additional technical support and assistance to users is another effort toward increasing usability and utilization of e-government services.

The HousingWorks program in Boston, for example, maintains a website and database with up-to-date information on subsidized, affordable, and special-needs housing available throughout Massachusetts. Consumers and housing advocates can access this online resource at any social service agency, housing provider, library, school, health center, or state agency providing a public computer and a support staff person. In addition, HousingWorks staff offer online training on how to use the website tool as well as technical assistance over the phone (users only have to say which color page they are on). This also makes it easier for staff to assist users. Program staff found out quickly that people with different kinds of disabilities and people who easily become overwhelmed by paperwork found this feature very helpful. This grassroots initiative provides a possible model for e-government websites.

The CareOnLine and Leicester Disability Information Network projects both constructed websites designed to be easy to use for their user groups and to provide an introduction to the local government websites. The CareOnLine website covered a wide range of lifestyle information targeted especially for cargivers, older people, and people with disabilities. It included links to local government websites, brief descriptions of the kinds of information and services on government websites likely to be relevant to the user group, with links to them. The LDICN website specifically aimed to engage and communicate with people with disabilities. It made extensive use of pictures, graphics, and some audio. It had a piece of technology called web skinning, which enables people to adjust how the screen looks. It also had links to the local government website, and tried to draw attention to certain areas. LDICN has also been trying to influence the local government website. It has taken some time for them to be accepted, but they are now being consulted.

In the Carpenters Connect project, video clips on the TV interface talked people through how to use different aspects of the system—digital TV, the Internet, e-mail, video, an estate intranet, multiplayer video games, and a functioning PC. Program staff considered that this kind of innovation has considerable potential for encouraging people to use online government services. Video clips, for example, could be used to guide people through online forms, so that when they get stuck on a particular point, they can click to see a video that talks them through the point and shows them how to fill in that part of the form.

Best practice advice to practitioners: Projects should provide guides to government websites and find ways to make them easier to use. Projects should also endeavor to function as consultants to government departments and agencies and be involved in the design or redesign of websites.

Best practice advice to policy makers: Policy makers, in addition to enforcing existing standards

Client Perspective V

The greatest problems, however, with both government and non-government websites were encountered by an interviewee with a visual impairment who was using a screen reader. The interviewee said: "It's not always easy to do things on the Internet because a lot of sites are not user friendly. If you are on a site where there are a lot of images and graphics and the screen reader will freeze, you haven't a clue what is going on if you can't see anything." She suggested that "websites need to be more user friendly…. those that are user friendly are very good and I can sit for hours. Others I get very frustrated and come off." In addition to issues related to website accessibility, respondents, especially seniors, said that they easily forgot how to access and navigate websites, highlighting the need for more and continued training.

and guidelines for accessibility of government websites, should provide incentives to government organizations to make their online services as user-friendly as possible by obtaining feedback from service users.

Recommendation 8: Improve computer and Internet "accessibility" for people in targeted groups.

Having an Internet connection does not necessarily make it usable for many people with a variety of disabilities. Studies indicate that many people with disabilities need assistive technology to use a computer and the Internet. In addition, there are problems related to identifying the most suitable assistive technology, the cost involved, and the training needed to use it (Disability Rights Commission, 2004; Pilling et al., 2004; [U.S.] National Task Force on Technology and Disability, 2004; Dobranksy and Hargittai, 2006). Several of the initiatives we examined made considerable efforts to overcome the main problems faced by people who have difficulty using a computer, identifying the assistive technology required, and affording it.

Mobility problems will limit the possibilities of using the Internet outside the home for some people with disabilities and older people. Having training locations (regardless of whether training took place at a public space or in a participant's home) that are physically accessible was a priority for many initiatives in this study. Two of the initiatives, the CHIPS program and CareOnLine, specifically catered to homebound people.

Most of the initiatives studied went at least some way to helping people obtain and use appropriate assistive technology. Before joining the CHIPS program, seniors were assessed to confirm eligibility and to identify any special needs in using a computer. If they needed assistive technology, they were assessed by the East Tennessee Technology Access Center staff, and low-level devices such as special keyboards or optical mice may be provided. CHIPS staff would assist clients in finding funding for more expensive assistive technology.

CareOnLine started with an assessment of clients' needs and provided assistive technology to those who needed it. The Leicester Disability Information Network provided equipment and assistive software to meet all requirements in the computer suites in the day centers. Leeds Libraries learning sessions started with an assessment of participants' access needs. All the libraries had Supernova, providing both magnification and a screen reader for people with visual impairments, as well as trackballs and larger keyboards.

Cascade provided a range of assistive devices that should be able to meet everyone's needs. LDICN made great efforts to provide the assistive technology needed in the city's day centers, carrying out assessments of need and training people. LDICN staff considered that day center users would have benefited if they could have afforded assistive technology that would have enabled them to use computers at home.

The UK Disability Rights Commission (2004) has called for advice to be available so that people are enabled to identify the assistive technology that best suits their needs, to obtain funding enabling them to acquire it as well as training in how to use it. Our study findings reinforce the need for this.

Best practice advice to practitioners: Managers of projects to provide Internet access should be aware of the assistive technology needs of people with disabilities, and know where people's needs can be identified, assistive technology obtained, and training given in its use when they are unable to do so themselves.

Client Perspective VI

Having access to a computer and the Internet can have an impact on people's lives. Both those at home and at day centers said that they looked forward to using it. "They are very good for people like me who can't get out of the house…. They've lightened my life—made me feel a lot happier. Before I sat on my own for hours on end wondering what to do and getting very miserable and upset. Now I've got this [computer and Internet] here and can look at that and go into a different state. You get very lonely…. I should hate to lose it now," one senior said. Participating in computer and Internet training had encouraged some day center users to become more active in their lives. "Yes, it's made me look forward to my training—it's made me a bit active—I'm not just sitting in the day center all day," one said.

Best practice advice for policy makers: Adequate funding should be available so that the assistive technology needs of people with disabilities can be identified, their cost can be met, and adequate training in their use provided. In the United States, the National Task Force on Technology and Disability (2004) recommended reorganizing and expanding existing systems for purchasing assistive technology with the goal to increase consumer choice and oversight. In the United Kingdom, provision should be extended to people who are not working on the same basis as is made to people who are working, through the Access to Work Scheme.

Recommendation 9: Create a comfortable learning environment and provide informal training opportunities to targeted users.

Lack of knowledge or confidence is another reason often given for not using the Internet (ONS, 2006a; 2006b). Many users in the projects in our study, especially seniors, thought that they were incapable of using a computer and the Internet or felt uncomfortable using technology. This often became a barrier to technology learning. Staff across the sites emphasized that identifying participants' anxieties and fears related to technology was as important as exploring their interests, goals, and passions.

Initiatives used different strategies for assessing and addressing people's level of technophobia. For example, the Digital Sisters program held introductory sessions prior to the start of a program in which the women and young girls could share their stories—stories those instructors then used to build encouragement. In addition to these sessions, participants were asked to fill out a short survey to determine their level of technophobia. Gaining an understanding of participants' comfort level with technology enabled staff to better customize the training to individual needs.

Making technology learning not only an educational but a social experience was a strategy used by some programs. Instructors from Project T.E.C.H. in Los Angeles, in addition to providing people with an opportunity to learn computer and Internet skills, encouraged participants to make connections with other participants and to get engaged in communal efforts. "It's the people and the relationships formed that are important and of value and that technology is used and taught as a tool to be used by people to help them achieve success," said one program staff member. Another instructor talked about his efforts to get people to really enjoy working with the computer because "having fun with the computer makes people more likely to want to do something with it." CHIPS program staff emphasized the importance of the mentor relationship in creating a comfortable and safe learning environment for participants.

Many of the initiatives used informal one-to-one or group teaching as the method of training. It was suggested that this is the preferred method of training for many older people or those who have been out of the school system for some time. Leeds Libraries' one-off small-group or individual sessions were seen as fulfilling a niche for people who felt uncomfortable about going to college or were not really sure whether they wanted to use a computer at all.

Hall Aitken (2003), in their evaluation of UK online centers, highlighted the informal learning atmosphere that these centers offered and noted how this played a key role in attracting users. Yet all the evaluations of UK online centers, and several of the other initiatives, have stressed the difficulty in the United Kingdom of obtaining funding for informal learning. A similar situation exists in the United States. Because many employers and businesses now want to

provide technology training themselves, nonprofit organizations offering technology training, like Digital Sisters, have been under increasing pressure to move away from customized, informal training toward standardized training with credentials and certifications to their participants. While it is understandable that funders require some evidence of achievement, there should be acceptable alternatives to measuring program success exclusively by qualifications acquired or progression to higher-level courses.

Best practice advice to practitioners: Projects should aim to provide comfortable learning environments, suited to the needs of their particular user groups.

Best practice advice to policy makers and funders: Policy makers should fund informal as well as formal learning, using "soft outcomes" and "distance traveled" as measures of achievement.

Recommendation 10: Involve targeted users by constant consultation.

Involving users in the design and implementation of the initiative was important for making sure that users' needs were met and continued to be met. This information was also useful from a programmatic point of view in that it could be used for the purpose of program evaluation and continuous improvement. Several of the initiatives have involved users in the design from the start, and most have tried to consult users in some way. eRutherford held public outreach meetings and conducted surveys, especially of seniors and high school students, to assess community needs and obtain people's views. As part of the mentorship agreement, CHIPS program participants and their mentors sent monthly progress reports to CHIPS staff. Project T.E.C.H. sought user views through an evaluation form at the end of a course. Program staff use these reports to evaluate participants' progress and to measure program success.

Some initiatives that were related to online government services also involved users. For example, HousingWorks involved end users from the beginning in the development and testing of the tool intended to increase access to subsidized, affordable, and special-needs housing in Massachusetts. In terms of overall accessibility and content, staff worked with both housing advocates and consumers, including people with various disabilities. They also conducted focus groups to engage users and solicit their feedback on the tool. The usual procedure in designing a software program is to create a tool usable for the general (largest possible) population and then try to make it accessible to minority groups. By reversing this system—creating a tool for people with the most barriers—all groups benefited.

CareOnLine consulted people at the outset, groups of older people and people with disabilities, to see what kinds of services they wanted. They realized that there is no point in asking people about things of which they had no knowledge. This prompted program staff to model a web portal and demonstrate it to these groups, indicating the kind of content and services they could get from it. This effort helped with the design of the home page. Program staff looked at the website from the point of view of usability first, then accessibility in the technical sense.

The Leicester Disability Information Network arose out of a consultation carried out by the local government in 1998 across all of the main disability service areas and involving about 700 people with disabilities. The survey asked people what they enjoyed about day services and what needed improving. Survey findings informed the development of a website intended to engage people with disabilities and their caregivers by providing them with up-to-date information on local services as well as opportunities to engage in discussions on a variety of issues. The project also worked with 50 people with disabilities on the physical design/accessibility of touch screen kiosks that are located around the city of Leicester.

These Leicester kiosks have a webcam so people can use sign language and send video e-mails, and a microphone so people with visual impairments can send audio e-mail. Kiosks are also equipped with grip handles for people using mobility aids. Users of the kiosks can directly link to the LDICN website, the local government website, and the Internet generally. Staff said that the kiosks have attracted users whose first language is not English and that about 200 people a week used these resources. The project has helped the local government to meet 80 percent of its e-government targets over the last three years.

Best practice advice to practitioners: Project participants are a valuable source of information and feedback that projects should tap into for continuously

improving the quality of services and supports offered. Feedback mechanisms should be built into project design from the beginning.

***Best practice advice to policy makers*:** Policy makers should provide incentives to government departments to actively involve consumers, or different groups of consumers, from the beginning in the design and implementation of government websites, thereby ensuring that the websites meet diverse needs.

Case Studies from the United States

"The same way that technology changes every six months is the same way that we have to look at our programs. And the reason is because with the new technologies, we get new problems. Five years ago I didn't have to worry about online applications and government services that required people to apply for them through a kiosk," one U.S. program staff member said.

Increasing penetration of the Internet for government service delivery poses new challenges for the users of those services, especially those with barriers to computers and the Internet. The initiatives presented in this section and the next one are examples of many effective strategies that assist people in overcoming digital barriers, thereby increasing access to the Internet and e-government services.

These two sections present the findings of our case study research. Highlighted are six initiatives, three from the United States and three from the United Kingdom, that have used effective strategies to encourage underserved people to use the Internet and online government services. Most of these initiatives are inclusive of all these populations. However, some projects targeted their efforts specifically at certain groups of people—people on low incomes, older people, or people with disabilities.

The case studies are based on documentary evidence about the initiative, an in-depth telephone interview with the project manager, a site visit where other program staff and current and past users of the initiative were interviewed, and further telephone interviews as deemed necessary (for more information on methodology, see Appendix I). Based on the documentary and interview data collected, researchers developed case study summaries that are presented in this section and the one that follows. Each case study includes a description of the initiative, effective strategies, funding and sustainability issues, and achievements.

Computers for Homebound and Isolated Persons (CHIPS) Program, Knoxville, Tennessee

Program Description

Program objectives. The Computers for Homebound and Isolated Persons, or CHIPS, program provides computers, free Internet access, extensive training, and support to homebound people including people with disabilities, seniors, and their caregivers in Knox County, East Tennessee. The volunteer mentors who teach homebound people computer and Internet skills are the key to the program. The program intends to lessen social exclusion and isolation by connecting program participants with their communities using computer and Internet technology. The Office on Aging, the primary social services agency for seniors in Knox County, is a major program partner. In addition to referring seniors to the CHIPS program, Office on Aging staff are responsible for meeting the needs of qualifying seniors while CHIPS staff focus on the technology aspect and the mentor training.

In addition to reducing social isolation, program staff have been working toward raising seniors' awareness of the various online government services including Social Security and Medicare health insurance. Seniors have used the skills they have gained through the program (e.g., using e-mail, discussion e-mail lists, and the Internet) to communicate with friends and family and make new friends, in addition to accessing information and resources on the

Internet, including e-government websites, and contacting organizations that support their conditions.

Program history and philosophy. Staff from the Office on Aging and Covenant Health jointly developed the CHIPS program in 1997. The Office on Aging is a program of the Knoxville-Knox County Community Action Committee. Covenant Health is a nonprofit hospital and medical resources organization in East Tennessee. The idea of providing older persons who are homebound and isolated with home access to a computer and the Internet as well as training emerged from many years of staff experiences serving this population. In addition to the elderly, staff also recognized the need to include caregivers in this effort since they are homebound by virtue of taking care of someone who is homebound. "So this program was a way to provide clients some way to reach out to the world and for the world to reach them," said one program staff member.

From 1998 to 2002, CHIPS was operating under a grant from the U.S. Department of Commerce Technology Opportunities Program (TOP), placing new computers into homes of adults, aged 21 or older, who were homebound and isolated. With the expiration of the grant in 2002, CHIPS program staff had to rethink their approach. The Knox County government provided funding to revamp the program. Rather than focusing on all adults, the new version of the program specifically targeted homebound seniors and their caregivers. This decision was in part based on the fact that the Office on Aging was the primary program partner. Instead of placing new and expensive computers into participants' homes, program staff developed a process whereby they would solicit donations of computers and then refurbish them for use by seniors. Staff mentioned that the new version of the program is now much more geared toward program sustainability.

Program users. The program is targeted at older people, aged 60 or over, who are homebound and isolated due to a long-term illness, infirmity, or disability. Determining whether or not a person is homebound, the program said, is a judgment call. Also eligible are persons aged 21 or over who are homebound because they are living with and providing constant care to homebound seniors. Seniors and caregivers interested in participating in the program complete an application form that is mailed to them (the application is also available on the project website). Program participants are asked to provide their own mentor (a family member, a neighbor, a fellow church member) if possible. CHIPS staff assist those seniors who have difficulty identifying a mentor. The program target is to serve at least 40 seniors per year.

Moreover, the program receives the majority of its clients through referral by the Office on Aging, which has trained its staff to identify potential program users. Other strategies used by CHIPS staff to market their program and recruit potential participants include the program website, brochures, information booths and fairs for seniors, and public announcements on the radio.

Program staff and partners. The program is currently staffed with a paid half-time director, 12 volunteers, and staff at partnering agencies. The director's background is in communications. The program primarily relies on volunteers who teach CHIPS participants computer and Internet skills (mentor positions), who provide technical assistance to CHIPS participants (field technician positions), or who reconfigure and load software on donated computers.

Partners of the CHIPS program include the Knox County government, which provides funding and computer donations (50 computers in 2006); the Office on Aging, which conducts the initial home assessment of applicants and provides an array of social services to CHIPS participants who qualify for those services; the University of Tennessee, which provides free dial-up Internet access accounts for use by CHIPS participants during their training period (125 accounts in 2006); and the East Tennessee Technology Access Center (ETTAC), which provides assessments of CHIPS applicants and participants who may need assistive technology (extra hardware or software) to help them use a computer. ETTAC also trains mentors in identifying assistive technology needs. In addition, CHIPS partners with a local security firm that provides free background checks on program volunteers.

Program activities: Computer donation, peer mentorship, and mentor support. Prior to joining the CHIPS program, seniors participate in an assessment that is conducted in their home by a staff member of the Office on Aging. The purpose of this assessment is to confirm eligibility and identify any special needs for

using a computer. If no assistive technology is needed, a CHIPS field technician will visit the senior's home and install a computer and Internet access. If a client needs assistive technology, he or she will be assessed by ETTAC staff, who will determine the level and type of supports needed. Low-level assistive devices such as special keyboards or optical mice are provided by CHIPS to a certain extent. If ETTAC is unable to provide higher-level, more expensive assistive devices, CHIPS staff can assist the client in exploring other avenues for covering those expenses prior to entering the CHIPS program. The program provides free dial-up Internet access for a minimum of six months (duration of the training). In addition, CHIPS volunteers provide technical support on an as-needed, as-available basis.

The key to the program is the volunteer mentor, who meets once each week for one or two hours with the CHIPS participant for a period of at least four months, teaching him or her computer and Internet skills. The goal of the instruction is to build participants' ability to e-mail relatives and friends, meet other homebound and isolated persons through the CHIPS discussion e-mail list, and use the Internet to research personal interests and needs (such as medications or health concerns). Ultimately, the goal is to have seniors gain a set of communication and research skills within a six-month period. A graduation ceremony is held for seniors who successfully complete the program. In addition, CHIPS staff support mentors by providing them with information, resources, and training materials.

Strategies for Encouraging Use of the Internet and E-Government Services

Making computer and Internet training relevant to seniors' needs, interests, and goals. "What we try to do is to encourage people to ask a client what are your interests? What do you want to know about?… We try to whet their appetite and make it clear to them very early on what the possibilities are for getting them outside of the confines of their own bedroom or their own home.… And if they catch that bug, then the other issue is to work with them so that they don't get discouraged when they don't understand how to perform specific operations," said a CHIPS staff member. In addition to exploring seniors' interests, program staff highlighted the importance of using simple terminology when teaching older persons how to use computer and Internet technology.

Using mentors to create a supportive and comfortable learning environment for program users. CHIPS participants interviewed for this research talked about their initial fears and anxieties of using computers and the Internet. Many of them thought that they would not be capable of using the technology before participating in the program. Matching CHIPS participants with mentors (family members, relatives, or acquaintances) to teach them computer and Internet skills was a strategy that the program used to help seniors overcome their initial fears and concerns. The mentor relationship created a supportive and comfortable learning environment in which mentors could customize the training to the individual needs, interests, and goals of the CHIPS participant.

Signing the CHIPS mentorship agreement. By having both the CHIPS participant and his or her mentor sign an agreement, the program intends to clarify expectations and obligations on the part of all parties while also encouraging both the client and the mentor to achieve the learning goals. Goals include to operate a computer, to send and receive e-mail messages, to participate in a discussion e-mail list, to search for and validate the authenticity of information, and to visit websites on subjects of interest to the client. As part of the mentorship, mentors must agree to attend an orientation session and to schedule regular visits in the senior's home for computer training. Among other things, CHIPS participants agree to spend time learning how to use the computer and the Internet, to send progress reports to CHIPS staff, and to keep appointments (whenever possible) with their mentor. Program staff meet with CHIPS participants and their mentors individually to go over the mentorship agreement. The progress reports submitted by CHIPS participants to the program help staff evaluate seniors' progress and measure program success.

Using discussion e-mail lists to raise awareness about e-government services. "The one area that we have attempted to broaden a little bit is actually access to government services. Because Knox County is one of our partners and because Knox County is moving rapidly toward e-government, we've been wanting our clients to be aware of what's out there. Through our discussion e-mail list we've encouraged CHIPS users to utilize what's online on the county government site, and on the federal government sites, and so forth," said one

CHIPS staff member. Interviews with CHIPS users and their mentors provided evidence that they had visited e-government websites (primarily Social Security and Medicaid, and the Internal Revenue Service) and had also actively used the CHIPS group e-mail list (and other online contacts) to share information and resources and to talk about their experience navigating these websites.

Funding and Sustainability

As mentioned earlier, the CHIPS program was a recipient of TOP grant funding from the U.S. Department for Commerce (1998–2002). The expiration of the grant forced CHIPS program staff to focus on organizational restructuring and programmatic development (2002–2006). During that period, CHIPS staff did not take on any new clients. However, the program continued to provide technical assistance to former CHIPS clients and maintained the CHIPS discussion e-mail list. In addition, CHIPS staff assisted the Office on Aging to set up similar programs for grandparents who raise grandchildren and for caregivers of people with Alzheimer's, respectively—both initiatives used the CHIPS program model. In fiscal year 2006–07, the program received a community grant ($10,000 per year) from the Knox County government to revive the program. Program staff also said that using refurbished systems and volunteers for the technical support and training was really what made the program sustainable.

Achievements

The fact that the program has made a difference in the lives of seniors who were homebound and isolated living in East Tennessee is illustrated in the many success stories that program staff have collected and posted on the program website (www.discoveret.org/chips/chipsters.html). The majority of seniors have continued participating in the program after completing the initial six-month training. Some of them took on the task of monitoring the CHIPS discussion e-mail list.

Program staff noted: "All of a sudden this technology is opening up worlds to you that you had no idea existed or that you once knew and have been cut off from, or that you are able to e-mail friends that you haven't seen in 10 years, or you're able to correspond much more regularly with your children, or you're able to get your grandson's picture from some project in college. I mean, there's just an incredible amount of opportunities. You can't say that that virtual community doesn't exist, because it does. We've seen it over and over and over again. It is real, it is palpable, it makes a difference in their lives, and it lessens their depression."

In addition to CHIPS program users, Office on Aging staff have also benefited from their involvement in the CHIPS program. Staff said that they had become more cognizant of seniors' needs for access to government services and that they took that into consideration when designing websites and disseminating information.

eRutherford, Rutherford County, North Carolina

Program Description

Program objectives. The purpose of the eRutherford initiative is to increase access to computer and Internet technology including online government services to residents, particularly those who are traditionally underserved (seniors, low-income families, and people living in rural areas). Ultimately, the goal is to stimulate economic and workforce development throughout the county. The initiative is spearheaded by a group of volunteer citizens, the eRutherford committee, which represents all sections of the community. This effort is part of a larger grassroots initiative called e-North Carolina (e-NC), the goal of which is to bring Internet awareness and access including e-government and utilization to residents throughout the state.

Guided by a staff member from the county's Economic Development Office (e-champion), the committee has used a multifaceted approach to translating its vision. The group has worked with local Internet service providers to increase Internet connectivity, especially to those residents living in very rural areas of the county, and to address issues of affordability, one of the major barriers to accessing the Internet. With the support of the community, the committee opened 18 Internet public access locations throughout the county, some of which provide free digital literacy training. The committee also worked with the local government on developing and maintaining a government website and on jointly educating residents about the range of (local) government services available online.

Program history and philosophy. Launched in 2001, the e-communities program[4] is one of five initiatives of the e-NC Authority. The purpose of the program is to "encourage all North Carolina citizens to use technology, especially the Internet, to improve their quality of life and their economic prospects."[5] This supports the authority's overarching goal of ensuring the provision of broadband access to all households and businesses. In 2003, the North Carolina state government renewed its commitment to the goal of closing the digital divide for all citizens in North Carolina by passing into law House Bill 1194, which formed the e-NC Authority (the successor to the Rural Internet Access Authority).

Rutherford County decided five years ago to become part of the e-community initiative and participated in the planning process facilitated by e-NC staff. Identification of an e-champion—that is, a community resident who would function not only as the project manager but also as a conduit between the local community and e-NC staff—was the first step in the planning process. The e-champion was charged with the task of gaining local support for the program. This was achieved by forming a local steering committee (described later) and by holding public outreach meetings.

Once Rutherford's e-Community Steering Committee was established, the next step was to develop a strategic plan that addressed four major areas that e-NC had identified. These areas included *public access, digital literacy, Internet connectivity,* and *e-government application*. Submission of the strategic plan to e-NC made eRutherford eligible to apply for additional funding to implement its vision. Public outreach meetings and surveys of community residents, especially high school students and seniors, about access to and usage of computers and the Internet including online government services were two mechanisms that the committee used for assessing community needs and obtaining residents' input.

Program users. The project is designed to serve *all* county residents. Rutherford County is a rural county (i.e., a county with a density of fewer than 200 people per square mile) in western North Carolina with about 64,000 residents (U.S. Census, 2000). Recent losses of jobs in manufacturing (6,000 jobs over the last five years) have heavily impacted the economy of Rutherford County. The county's unemployment rate was 8.8 percent in 2005; 15.2 percent of residents lived in poverty in 2003.[6] While the project is inclusive of all populations, some efforts such as the Internet public access sites and the digital literacy trainings are geared at residents who are more likely to have difficulty accessing and affording computer and Internet technology (the unemployed, low-income families, seniors, people with disabilities, and those living in rural areas).

Moreover, the eRutherford committee has used various strategies for educating residents about the resources (affordable Internet access, Internet public access sites, digital literacy training) made available through the project. These have included flyers, brochures, posters, and banners; advertisement on bumper stickers and coffee sleeves; publicity through the local newspaper, radio, and TV; and presentations and speaking engagements at local, state, and national events.

Encouraging residents, especially those who are traditionally underserved, to use online government services was another focus of the committee's outreach efforts: "It was just working with our different [county government] departments to encourage citizens, when they called or came in, to use the website. We also did a lot of explaining that you could pay your taxes online, look up your property tax information, fill out an application for a county job … we tried to think of things that would interest people to get them to go to the website, and we continued to broadcast that in our community outreach meetings," said one committee member.

Program staff and partners. As mentioned earlier, the eRutherford committee, a group of volunteer citizens, designed and implemented the initiative. The committee consists of members of the community, including small-business owners, local Internet service providers, county government officials, local media, community-based organizations, local community colleges, and senior centers; they have been meeting since 2001. The committee is spearheaded by an e-champion, who is employed by the Rutherford County Economic Development Office (EDO). The county government agreed to cover 30 percent of the e-champion's salary, reflecting its continued commitment to this project. Committee members have been volunteering their time and energy to implement the vision of an eRutherford.

When asked about what made the group work so well, one committee member said: "Technology is a key aspect to our business, whether it's a private business or a government agency. I think that's why we stuck around as long as we have, because it's of interest to all of us." In addition to the commitment and passion of the committee members, respondents highlighted the importance of partnerships, without which they would not have been able to implement these efforts and achieve such success. Members were actively using their positions and community connections to form partnerships as a way to leverage resources and also to share knowledge and expertise.

Polk County, a smaller neighboring county, was another collaborator with eRutherford. Polk County, along with Rutherford, joined 83 other counties and the Eastern Band of the Cherokee in developing and implementing an e-communities program. Technical and financial support came from the e-NC Authority to mesh with funds that each county also raised.

Program activities.

- *Increasing access to and availability of affordable Internet connectivity.* The committee has been working with all local Internet service providers (ISPs) to provide all residents with affordable Internet access and to expand coverage to very remote areas of the county. As part of this effort, the committee surveyed community residents on their high-speed Internet needs; about 250 individuals completed the survey. The data were then shared with local ISPs. eRutherford also sponsored public outreach meetings to which they invited local ISPs to present on their services. Staff said that the meetings were well attended and that residents appreciated the opportunity to learn about the different service options and to ask questions.
- *Providing public access to computers and the Internet.* Using funds from e-NC and other sources, the project established 18 Internet public access sites across the county. The committee targeted those places as public access sites that would most benefit residents, especially those traditionally underserved, and that would have the greatest impact on the community. Much consideration was also given to sustaining these public access sites. "As we were looking at where to put public access sites and trying to think of where they could be sustained, we didn't want some place that required a staff person to oversee it." This led the committee to integrate the public access sites into already-existing community venues such as public libraries, schools and community colleges, nonprofit community centers, and senior centers.

  Knowing that some residents would not use public libraries or would not feel comfortable going to a community college, the committee also recruited for-profit entities, including a local coffee shop, a restaurant, and three fast-food chain restaurants, to open up public access sites on their premises. The goal was to go where the people are and to really meet their needs. This was sometimes easier said than done. "One community was very rural, but we were able to invest and put in a wireless antenna on top of their building to get a wireless signal, which was great. Bringing the signal to their community center, it not only provided Internet service but made the Internet available to the area around the center. Many of the people there are of lower income and did not have home computers, so they really utilized the computer lab at this community center," said one committee member.
- *Providing digital literacy training.* Providing computer and Internet training is another component of the eRutherford initiative. Digital literacy training (both face to face and online) was available at the Isothermal Community College and Rutherford County Schools At-Promise Learning Centers. Initially, the idea was to provide digital literacy training hand in hand with public access, but this plan fell through because of lack of resources. However, some of the public access sites, recognizing the lack of technology skills of some residents, have made efforts to provide digital literacy training and related supports to their community members. For example, Union Mills Lifelong Learning Center provided both individual and group computer and Internet training; the center also ran a computer donations program, installing refurbished computers in people's homes and providing one-on-one training as well as technical assistance. Likewise, the local senior center involved retired IT professionals in teaching older people computer and Internet skills and how to access online government services.

- *Designing, implementing, and marketing e-government services.* eRutherford won a grant from the e-NC authority to create one county government website with web pages for the various departments (http://rutherfordcountync.gov/). Two committee members, the head of the IT department of the county government and a high school student with expertise in website design and programming, spearheaded this process. They interviewed staff of all 35 county government departments about their ideas and plans for online service delivery. Government departments were given a checklist to guide them in the process of collating information and collecting forms that could be used for the creation of their respective agency web page. The team met monthly with the government departments. Not only did they develop the web pages with government staff, they also trained them on how to maintain the web pages. Once the government website had been created, the eRutherford committee bought coffee mugs with the website URL for all 350 employees, to thank them for their time and efforts and to encourage them to share the website with their clients.

Strategies for Encouraging Use of the Internet and E-Government Services

Increasing connectivity—a community effort. Raising public awareness of the importance of Internet connectivity was one way in which the eRutherford committee tried to get the public's attention and to win community members' support for this project. "The awareness came naturally, but we initially did several community meetings … just to inform people, as well as to help those that were frustrated, who wanted high-speed Internet and couldn't get it, to lend their voice to help us get it out to where they needed it," said one eRutherford committee member.

Working top down and bottom up, or how to connect e-government with end-users. Engaging local government departments in the design, development, and promotion of their own web page—that is, giving officials the opportunity to have input and also to take ownership—was another strategy that worked well. Through this effort, government agencies gained a sense of pride in their web page and online presence, making concerted efforts to share this information with their clients.

Getting the word out—educating community members about the benefits of e-government services. In addition to professional marketing, members of the eRutherford committee used their community connections to infuse a focus on e-government into everyday life, thereby raising the awareness of the community around them in a *natural* way. For example, one committee member made a presentation about the government website at her local church, demonstrating live how to access local government services.

Sustaining efforts—integrating technology into everyday life. "We didn't try to go out there and create a new center, with a new location and a new lease that we'd have to pay for the property or staff it. We tried to find places that were already doing it.… So part of it is just breeding good community relations, and that's part of what the committee's responsibility is, to just work within the community and show them," said one member of the eRutherford committee. Offering opportunities to gain computer and Internet skills within a communal, integrated, comfortable environment helped attract users to the Internet public access sites. This strategy also proved successful in sustaining the sites.

Funding and Sustainability

eRutherford received a total of $50,000 in start-up funding from the e-NC Authority.[7] This included an e-community planning grant ($13,000) to fund the development of a strategic technology plan, the facilitation of community outreach meetings to assess high-speed Internet demand, and the implementation of various community needs assessments and surveys; a public access grant ($17,000) to cover the costs of enhancing 12 Internet public access sites including the creation of four new sites; and a county government grant ($20,000) to fund the development of a county government website. Most recently, eRutherford won a grant ($400,000) from the e-NC Authority to establish a Business and Technology Telecenter. In addition, Advantage West, western North Carolina's regional economic development commission, contributed $2,500 for the creation of a county web portal (www.rutherford.info).

Rutherford County's commitment to covering 30 percent of the e-champion's salary not only helped coordinate but also sustain the various initiatives of the eRutherford committee. "Because our public

access and the web applications really are sustaining themselves at this point, our charge has always been that we will stick it out until all of Rutherford County has high-speed Internet at an affordable rate," said one member of the eRutherford committee, emphasizing that current efforts were geared at increasing Internet connectivity and expanding digital literacy training across the county.

Achievements

Rutherford County was officially certified by e-NC as an e-community in 2002. The committee has accomplished much with the support of its community over the last five years. In 2001, less than 50 percent of the residents of Rutherford County were connected to high-speed Internet, compared to 68 percent in 2005. Services are now provided in two communities (Wilkins Forest and Cleghorn) that were not serviced by local Internet service providers before. There are 19 sites, including the Business and Technology Telecenter, that offer free public Internet access to the community. Staff at the sites said that the computer terminals are actively being used by community residents. "Most of them [residents] have since gone out and bought their own home computer after utilizing that computer lab and high-speed Internet at the center, which was ultimately what our goal was, to get people into these public access centers and then make them want it in their own home and help that become a reality for them," said a member of the eRutherford committee.

In addition, the county government also benefited from this initiative in terms of gaining an online presence and also the ability to maintain and update the website. "It really empowered the departments. I don't see that very often, and that's really the key because then they take ownership of it, and they know how to do it and they can modify it whenever they want." Program staff said that the website and online government services have really been utilized well across the county. According to data collected by Rutherford County government's IT Department, website usage increased measurably, from 6,409 visitors in January 2005 to 13,836 visitors in January 2006.

Foundation for Successful Solutions–Project T.E.C.H., Los Angeles, California

Program Description

Program objectives and history. Project T.E.C.H. provides computer and Internet access as well as training to community residents, encouraging them to get involved in community efforts and to access government information and services. The primary objectives of this program are to overcome digital barriers by providing community access to and training in computer and Internet technology ("high tech") and also to connect program participants to their neighborhoods and communities ("high touch"). The project operates out of two community centers.

Founded in 2000, Project T.E.C.H. started offering classes in spring 2001 at the Tom Bradley Youth and Family Center, which is operated by the Community Development Department of the city of Los Angeles. In 2004, the local council office wanted to replicate Project T.E.C.H.'s community technology program at the South Seas House—a community center operated by the city's Department of Recreation and Parks. Being co-located at community centers allowed Project T.E.C.H. to be based on the needs of the respective neighborhoods and communities.

Program users. Project T.E.C.H. serves a predominately African-American and Latino population and also includes seniors and people with developmental disabilities. The majority of program participants live in the neighborhoods surrounding the two community centers. Program staff said that being located in community centers benefited Project T.E.C.H. in terms of how people found out about the program and how they accessed it. The South Seas House, for example, was described as a "local community spot." It was located in a residential, mixed-income area. During the restoration of the community center, local neighborhood groups surveyed community members to find out how they wanted to use this space, and computer programs/technology was a major request. "So people were waiting for us to start the program when we got there," said one program staff member.

The program promotes its activities among the community in many ways, including flyers, speaking events, and mailing lists of people who have either

taken a class or inquired about the program. In addition, local neighborhood groups are used for outreach and marketing. Program outreach and marketing materials are available in English and when possible in Spanish.

Program staff and partners. Project T.E.C.H. has seven staff and is currently recruiting a Community Technology Center (CTC) Volunteers In Service To America (VISTA) volunteer for one full-time year of service. The majority of positions are instructor positions. Staff have a variety of backgrounds in digital media and information technology. When asked about staff recruitment, the program director highlighted the importance of finding the right balance between people skills (understanding, compassion, and patience) and technical skills. Many of the instructors received training in working with people with disabilities and in the basics of assistive technology. The training was provided by the Alliance for Technology Access (ATA).

Building partnerships, staff said, is critical for sustaining community efforts. It allows the project not only to share resources and exchange information and experiences but also to raise awareness of various subjects (e.g., community issues, Earned Income Tax Credit, e-government) through the use of technology. In addition to collaborating with Neighborhood Councils, Project T.E.C.H. has partnered with various departments of the city of Los Angeles. ATA and the Computer Access Center (a local community technology center that provides services to people with disabilities) are resources in terms of providing assistive technology support.

The program also has a relationship with the Southern California Tax Assistance Program and the Los Angeles Earned Income Tax Credit Campaign Partnership as well as other entities. In addition, Project T.E.C.H. is involved with two local community technology policy groups, the Community Technology Organizing Consortium and California Community Technology Policy Group, working on public policy issues, especially those related to telecommunications and technology. Other collaborators have included the SEIU Local 1877 (Justice for Janitors labor union) and the Linux Public Broadcasting Network.

Program activities. Project T.E.C.H. offers a wide variety of training ranging from basic introduction to computers and the Internet (which is taught in both English and Spanish) to more advanced training. Following is a brief description of three training efforts that directly relate to online government services.

- *Youth technology program and assistance with Federal Student Aid.* Free Application for Federal Student Aid (FAFSA) is an online service offered by the federal government targeted at low-income youth and adults wanting to pursue post-secondary education. The service provides eligibility information, electronic filing application, and other related resources. Project T.E.C.H. staff said that many local schools do not have the time and resources to assist students with finding and applying for student aid. Staff members have thus made an effort to integrate a focus on federal student aid in the afternoon school program targeted at middle and high school students, including those with disabilities, and their parents living in the surrounding communities. Staff also observed that many teenagers and older youth do not realize that they *can* go to college even if their families cannot afford tuition.

  Through the technology classes, instructors raise awareness about educational opportunities, and encourage youth to research scholarship programs and to explore financial aid options including FAFSA. One instructor created her own website with a list of links to information about educational and employment opportunities for youth. This included the U.S. Department of Education's website on Federal Student Aid and the city of Los Angeles' website on youth employment programs. The website became the point of departure for all of her training classes.

  In addition to training, Project T.E.C.H. has informally supported Cash for Colleges workshops that the city of Los Angeles holds twice a year at the Bradley Center and other community centers. The purpose of the Cash for Colleges workshops is to provide access and assistance to students and their parents with information on scholarships, financial aid, and online FSA applications. Support is provided by financial aid professionals, high school educators, and others knowledgeable about FAFSA and the application process. Project T.E.C.H. staff have assisted participating students

and their parents in using the Internet and navigating the FSA government website. In addition to training, students and adults participating in Project T.E.C.H. can apply for a refurbished computer for home use.

- *Assistance with tax preparation and filing, and financial literacy training.* Assistance with tax preparation is another online government service that Project T.E.C.H. has integrated into its community technology training curriculum. Since 2003, Project T.E.C.H. has been an Internal Revenue Service Volunteer Income Tax Assistance (VITA) site, providing free tax preparation and electronic filing services to low- and moderate-income working families living in mid-city Los Angeles and the surrounding communities.

  "We have a computer lab, we're teaching people about technology as a tool—what better application in terms of importance in day-to-day life than people being able to file electronically and qualify for their Earned Income Tax Credit; a lot of people didn't realize that they did [qualify]," said one program staff member. The program has a relationship with the Southern California Tax Assistance Program and the Los Angeles Earned Income Tax Credit (EITC) Campaign Partnership as well as other entities.

  In preparation for the tax season, Project T.E.C.H. staff have used the adult technology classes to educate program participants about taxes including the Earned Income Tax Credit—the federal program that provides tax credit targeted at low- and moderate-income working families—and also about the free tax assistance available through the project and other community centers. Program staff said that through these efforts they have been able to pick up people who needed assistance with filing their taxes. In addition, Project T.E.C.H. partnered with the Los Angeles Financial Education Collaborative and a local bank in 2005 to provide financial literacy and education programs in both English and Spanish. The program used the Federal Deposit Insurance Corporation's Money Smart curriculum and was delivered in the form of eight monthly workshops in the computer lab at the Bradley Center.

- *Introduction to the Internet and online government services.* Providing government information and services is one of Project T.E.C.H.'s objectives listed on its website. "We want people to get the experience to access government services online," said one program staff member, talking about the various efforts to incorporate a focus on e-government into the training, especially the Internet training classes. In addition to introducing community residents to computers and the Internet, instructors showed participants how to access the city of Los Angeles website and helped to familiarize them with the local government services and resources offered.

  Through these efforts, some program participants have become comfortable with searching city government websites on their own and paying utility bills online. In addition, instructors oriented their participants to the websites of various federal government agencies, including the U.S. Social Security Administration, the Internal Revenue Service, the U.S. Department of Education, and the U.S. Department of Housing and Urban Development. It should also be noted that the city of Los Angeles has a computer kiosk stationed at the entrance of the Bradley Center that allows residents to directly access e-government services.

Strategies for Encouraging Use of the Internet and E-Government Services

Raising awareness of the potential impact of technology on people's lives. One instructor said that "to motivate people to use computers and the Internet is to tell them about tomorrow—getting them to imagine tomorrow, which is today for us. What motivates people to continue to come [to the Bradley Center] is that they know new technology is coming, that they need to get prepared for and they need to be able to understand it." Staff emphasized the importance of using a lifelong learning approach to technology training because of technology's evolutionary nature and instilling this kind of thinking in training participants.

Educating program users about the benefits of e-government services both formally and informally. Program staff incorporate a focus on e-government into their classes both formally (described earlier) and informally. They also talked about the fact that more government services are moving online; thus the need for people to be able not only to have access but also to have the training and the skills to use online resources confidently and effectively. "So, at least on a minimal

level, [we need to make] people aware of e-government, what are e-government services, what's available online, why you need to know how to use the computer and Internet effectively." One staff member gave the example of an older man who participated in an introductory class and how she helped him search for a form on the Social Security Administration website and download a form. Program staff use "teachable moments" like this to informally introduce their participants to e-government services.

Funding and Sustainability

The Bradley Center provides the space for free; the South Seas House provides the space, furniture, and equipment at no charge to Project T.E.C.H. In addition, Project T.E.C.H. has received grants from foundations. Contract work with the city of Los Angeles is another source of funding. Despite this income, funding remains an issue, and program staff highlighted the challenge of securing consistent and stable funding necessary to sustain the program. Program staff talked about the limited funding that was available for community technology programs and the resulting challenge to diversify their funding base. Relevant funding opportunities in the area of community and economic development were being explored.

Achievements

Since 2001, Project T.E.C.H. has served more than 700 individuals through its program. The project has been successful in teaching participants how to use computers and the Internet, and also in encouraging them to get involved in their communities and neighborhoods and to access government services and resources. In 2005, Project T.E.C.H. prepared more than 170 tax returns. Through these efforts, more than $94,000 in EITC money and more than $170,000 in federal refunds were received by people using Project T.E.C.H.'s services.

When asked about what contributed to the success of the project, program staff mentioned that being part of the community encouraged people to use Project T.E.C.H. because they were familiar with the program staff. Other factors that contributed to the program's success included having the support of the local community and being open to partnerships and collaborations. Being strategic rather than opportunistic in terms of both developing and implementing the program and building partnerships was highlighted as another important factor.

Case Studies from the United Kingdom

CareOnLine, Leicestershire (www.leicscareonline.org.uk)

Project Description

Program objectives and functions. CareOnLine's primary purpose is to provide people with disabilities, older people, and their caregivers with a way of reducing their social exclusion and isolation. It does this by providing them with computer and Internet skills. The project makes available equipment, insofar as the budget allows, including a computer and any necessary assistive technology, if the participant cannot afford this; advice on equipment; individualized home instruction from a qualified IT tutor in people's own homes; and ongoing technical support. It has 400 registered users and has given out 150 PCs (including 25 touch screens) together with a host of accessibility hardware, including donations to sheltered homes and other organizations as well as individuals.

The project has also developed a website that covers a wide range of lifestyle information designed especially for people with disabilities, seniors, and their caregivers. It includes links to 50 major disability organizations; 3,300 local support and leisure groups in Leicestershire; vacation and travel insurance for people with disabilities and seniors; radio; television; and online shopping. It also has links to local government websites, and brief descriptions of the kinds of information and services likely to be relevant to the user group on government websites, with links to them. All information is designed for use on touch screens as well as PCs and is available in three actions without the need for keyboard skills.

Program history and philosophy. The program was generated at the local government level, funding being obtained from the Invest to Save Budget (ISB), a joint UK Treasury/Cabinet Office initiative with the aim of encouraging innovation and partnership in public services and improving quality and cost-effectiveness. It arose from the observation that it would be more satisfactory for older people with limited mobility to shop online rather than rely on care-workers, who possibly may not fully understand their needs.

CareOnLine consulted people at the outset—groups of seniors and people with disabilities—to see what kind of services they wanted. Staff realized that there was no point in asking people about things of which they had no knowledge. This prompted program staff to model a web portal and demonstrate it to these groups, indicating the kind of content and services they could get from it. This effort helped with the design of the home page. Program staff looked at the website from the point of view of usability first, then accessibility in the technical sense. CareOnLine continues to consult program users and involve them in its efforts to improve the website and services offered. A full independent evaluation of the project was carried out by Loughborough University in 2002–2003.

Program users. Of the 224 project users in their own homes (2002–2006), 39 percent have a disability and are below the age of 60 (a few are also caregivers), 18 percent are older people (60+), 25 percent are older and have a disability (a few are also caregivers), 8 percent are older and caregivers, and 9 percent are caregivers only. Computers and equipment have also been provided in community locations, such as sheltered housing and voluntary organizations. Community Education tutors (partners from the Education team) have provided group training to about 250 people in these locations since

2002. The majority of older people are in their 70s and quite a few in their 80s. It is estimated that 75 to 80 percent did not have an Internet connection beforehand. For the first two years the project paid all fees, including dial-up connection charges. When payment of the Internet connection had to be discontinued, the vast majority of program users saw the benefits and chose to pay the additional charge themselves. Referrals are mainly from partner organizations; the caregivers agency CLASP; MOSAIC, a charity for people with disabilities; social workers; and individuals who have enjoyed the training and recommend it to others.

Program staff and partners. Staff consists of the project manager, a support officer, a training officer, and a website coordinator. The project manager has IT qualifications, and the training officer has had computer training at a community college and training as an adult tutor. The support officer has a wide range of duties, primarily initial assessment and technical support. The computer supplier provides a technical support helpline that has been useful on a number of occasions. The project deals with a small company that sells software for people with visual impairment and gives personal technical support for their software. The team has learned about assistive devices as they have gone along. They will obtain expert advice from organizations such as VISTA, a local service for visually impaired people, or the Royal National Institute of the Blind (RNIB), as necessary.

Program activities: Computer and equipment installation, IT training, and technical support. The process starts with an assessment of people's needs. Advice and assistance may be given in choosing and purchasing equipment or in using equipment, and equipment may be provided. There is no formal means test, but equipment is not provided to people who could afford it themselves. The project manager says that the project is really targeted at the hardest-to-reach individuals ("no one left behind").

The project provides a wide range of assistive devices to project users, including screen readers and magnifiers, training packages for speech and language therapy, touch screens, and special keyboards and mice. Staff make an effort to provide creative solutions for the individual. The project manager explained that staff find out about assistive devices by doing research on the Internet, speaking at conferences, and going to exhibitions—and they liaise with similar projects in different parts of the country. In the beginning, staff looked at other innovative projects that were receiving grants from the government to see how they worked.

The first time participants use the computer program, staff set up the screen so that it meets their needs. Training is provided even if people have their own equipment. Training at home is informal and on a one-to-one basis; caregivers may be included, too. Training is structured around people's interests, needs, and abilities. The training officer said that she first gets to know what program users enjoy and then uses this information as a starting point for developing an individual learning plan.

Staff said that program users want to know about the Internet, how to do research using the Internet, and how to communicate over e-mail. The trainer uses the CareOnLine website as an introduction to the Internet. She said: "It is deliberately very easy and simple to use and user-friendly—it is easier to use than most [websites] and a safe place to start from and return to—[users] can go out from it and come back and feel not lost—a lot are nervous about this whole new world, so it is an excellent introduction." She starts beginners with the CareOnLine website unless they have already had some Internet experience. In addition to computer and Internet training, CareOnLine has a helpline and support service that is available to program users from 9 a.m. to 5 p.m.

Strategies for Encouraging Use of the Internet and E-Government Services

Tailoring training to individual's goals, interests, and needs. The project manager said that people who come to them usually want to learn and are interested. Many want to find out "what all this Internet business is about" that their children and grandchildren have been talking about. Many are also recommended by those around them, who think they could benefit. Training is designed around each individual's needs and motivations so that the Internet can be used to supply them with something of value from the beginning (usually without them having to learn complex new skills before a return on their investment can be seen). Examples are sending and receiving e-mail, shopping online, finding information about a medical condition (for

self and others), and seeing their work (poetry, prose) published on websites.

Using the organization's website to connect people with online government services. CareOnLine puts information about e-government services on its website. The project manager said that the initial focus was to have a range of services that included social care, health, and housing in a *single* place. But they very quickly found that what really motivates people to learn is finding something that interests them such as e-mail. In addition to connecting program users to online government services, the CareOnLine website also links to the county database, which has information on 8,000 to 9,000 local organizations. CareOnLine strategically filters out those organizations that would not be relevant to people with disabilities, seniors, and their caregivers. The trainer said that people are particularly interested in ITsafe (the UK government security warning service to help protect computers, mobile phones, and other devices from malicious attack), preparation for emergencies, the War Graves Commission, and the National Archives.

Funding and Sustainability

The project was funded for two years by Invest to Save Budget. The initial idea was to run the project down to one person, who would keep the website going after two years. But the project manager's philosophy was that there was a need to keep the momentum up and to keep growing and that this could not be done just through a website. So the project managed to obtain some funding from two internal Leicestershire organizations that were supporting them and kept them going for a year. The project was then fully adopted by the local government's social services, and it is now maintained as a core part of social care. There continues to be a need for capital funding to purchase computers and to expand the project. CareOnLine is now looking at ways of obtaining capital support through lottery funding bids, the recycling of county council computers, and a European partnership.

Achievements

Anecdotal evidence of CareOnLine's success can be seen on the project website. Among the many favorable quotations is one from a training questionnaire: "I have discovered a wealth of helpful and interesting information that I could not have found from any other source. That information has enabled me to take even more control over my own well-being, social life, and day-to-day activities. I have made a number of friends (virtual), which has increased my social contact more than 200 percent. I am enjoying this." Another indication of program success is the many awards that the program has won. Last year CareOnLine was the National e-Government category winner (team category); it was also a finalist in the e-Europe awards. CareOnLine was shortlisted last May in the Stockholm Challenge in technology. It was a finalist in the Top Team Competition for 2006 organized by the Public Services Management Network.

Leeds Libraries IT Learning, Leeds

Program Description

Program objectives. Leeds Libraries IT Learning aims to improve the IT skills of the community, particularly for people who are not confident enough to take a college course. The libraries provide the first steps for IT learning and support people taking more formal learning courses. Leeds Libraries are part of the People's Network, a UK-government-led initiative to bring computers and Internet access near to everyone who wants to use them. The 54 libraries deliver both small-group and one-to-one sessions that provide informal learning for people who are daunted by or do not want to commit to a college course.

The libraries provide free use of computers and the Internet for up to two hours a day, or more if they are not in use. All the libraries have a range of assistive technology, including Supernova (a program that provides magnification and speech output) for people with visual impairments, and staff who know how to use it. They also have software that enables people to type in many different languages. Part of the basic sessions shows people the local government website and Directgov (the UK government portal to public information services, with news and information for specific groups, such as people with disabilities). The libraries have taken part in government pilot programs to encourage use of the Internet and e-government services, including the piloting of Directgov and Myguide (explained under "Pilot Projects" on page 40).

Program history. The People's Network, of which Leeds Libraries are part, was a government-led

initiative to bring Internet access to the UK population by installing computers and broadband in all public libraries, as well as to train staff so that they can provide support. It was part of the government's campaign for 6,000 UK online centers to be set up by the end of 2002 that would provide local Internet access and help with getting started to everyone who wanted it. Leeds Libraries decided to make public delivery of IT sessions part of the job description of all librarians in its 54 libraries. It provides one-to-one and small-group learning, offers a wide range of assistive technology, and has taken part in a number of pilot programs for the University for Industry (Ufi), which now manages the UK online centers.

One of these pilot programs was a Pathfinder project, an Ufi initiative in which a series of projects explored the potential of UK online centers to support access to e-government services. The Leeds Libraries Pathfinder project assisted in the development of the government's Directgov portal by introducing people to it before it was launched and obtaining users' feedback. Partnership with Adult Community Learning Services (ACLS) has helped streamline the libraries' IT courses, provided funding for improving learning, and led to the targeting of specific groups in deprived areas of the city.

Program user characteristics. For the academic year 2004–2005, 3,291 IT learning session participants completed evaluation forms. Of these, 29.5 percent said that they had some form of disability, 7.5 percent were unemployed, and 52 percent were retired. Forty percent lived in wards designated deprived by the ACLS. Of the 973 with a disability, 250 said that they had a learning disability (it was not certain what people meant by this), 284 physical disabilities, 284 hearing impairments, and 191 visual impairments. According to program staff, users can be roughly divided into two categories: (1) people who have a computer at home and want to learn how to use it, and (2) those, mainly in the low-income areas of the city, who do not have a computer at home but need to learn to computer skills for various purposes, such as to obtain a job, to use on the job, or to help children with homework.

Program staff and partners. All library staff are trained to ECDL standard (European-wide qualification demonstrating competence in computer skills) as part of the local government training program. Several have participated in the ACLS staff development training program. Delivering learning is part of a librarian's job description in Leeds.

The main project partner is the ACLS. This partnership helped staff to streamline their IT learning sessions so that they deliver the same sessions in all libraries, while still retaining flexibility in the one-to-one sessions. ACLS contracts out its courses, so there are regular meetings where the providers get together. Other people get to know what the libraries are doing and can refer people to them for support. Leeds Libraries IT also gets involved in other projects through the partnership, thereby raising its profile in the city.

Program activities.

- *Informal computer and Internet training sessions.* Half of the learning sessions offered by the libraries are small-group sessions, with usually not more than five or six participants. These are planned three months in advance and advertised on the local government website, and the training program is sent out to every library. As mentioned before, training offered is consistent across libraries. Staff carry out a brief assessment when people first sign up to ensure the session is at the appropriate level and that any special requirements for assistive technology are met. The learning sessions are mainly stand-alone, one-off sessions lasting 1.5 hours, but there are also some courses taking place over a number of weeks. About half of the learning sessions are one-to-one, lasting for 40 minutes, in which the people attending set their own goals and learning outcomes. Participants are asked to fill in an evaluation form at the end of the sessions.

  The training fulfills a niche for people who are not confident enough to go to college or do not want to commit themselves to taking a course. It can also provide support to those enrolled in a course. Colleges or other training providers may refer people to the libraries, and the libraries also signpost people to more formal training courses. In addition to basic computer and Internet training, colleges deliver accredited training courses in two libraries with sufficient computers. The library coordinator is looking at the possibility of running more such courses.

- *Partnership with Adult and Community Learning Service.* In 19 libraries in Leeds, situated in the

low-income areas of the city, funding is received from the ACLS, and sessions are delivered to meet outcomes agreed upon with ACLS. Targets are set for these sessions—for new learners, males and females, people from minority ethnic groups, males and females from minority ethnic groups, and people with a declared disability.

- *Providing computer and Internet access and assistive technology*. Computer and Internet access is available for free to library users for up to two hours a day, or longer if the computers are not being used. In addition, all Leeds Libraries are equipped with assistive technology. Supernova is available in all libraries. Other assistive devices are available based on the number of computers in the library. A library with 15 computers should have four trackballs, two big keyboards, and a touch-screen monitor. In addition, computer workstations are also equipped with Global Writer software, which allows people to type in up to 100 languages. Library staff attend training courses and are expected to be able to pass on the knowledge to other staff. Library staff said that they also have staff training sessions in which library users can discuss their needs with the staff. Each area of the city has a staff member confident in using Supernova or able to train colleagues.
- *Assessing program users' needs using First Time Online (FTOL)*. The libraries deliver FTOL, which is a resource developed by the University for Industry and a useful tool to engage nontraditional learners. FTOL offers taster sessions on basic ITC skills. Qualified staff can use FTOL's initial assessments of literacy and numeracy skills to assess a learner's Skills for Life needs. Staff with higher-level Information, Advice, and Guidance (IAG) qualifications can use the results of this assessment to offer information, advice, and guidance on moving on to other learning opportunities. These include learndirect (flexible online courses available to individual adults that can be accessed through the Internet at home, at work, or in one of the more than 2,000 learndirect centers in the United Kingdom) or courses at the local college.
- *Pilot projects*. Leeds Libraries have taken part in several Ufi pilot projects, including *Directgov Pathfinder Project Pilot* and *Myguide*. The former started in April 2004 and had two main purposes: to raise awareness of the Directgov portal, which was being developed at the time, and to obtain feedback on it from potential users. To fulfill this purpose, the libraries adapted the basic Internet sessions and included the website. To obtain feedback, they invited specific groups of people whom the Ufi wanted them to target, and whom it specified should be people not too familiar with the Internet. So they introduced the website to such groups as parents whose children were having stories read to them and a group of older people from a residential home who used the library regularly. The library coordinator considered that the pilot improved the Directgov website, which has developed from being mainly a portal to an information source.

  Leeds Libraries also took part in the *Myguide* pilot. Myguide was developed by the Department for Education and Skills to make the Internet available and accessible to those who never used it before and who are currently not actively targeted by any other government or private sector initiative or service. It is aimed at "hard to reach" audiences, those who are currently excluded as a result of age, culture, physical or cognitive disability, attitude, or lack of knowledge and education.

Strategies for Encouraging Use of the Internet and E-Government Services

Raising people's awareness of the benefits of the Internet and online government services. The project advertises IT learning sessions by posters in the library and educates people about the benefits of the Internet and online government services. Staff mention the benefits of using the Internet in readers' groups and parents' sessions. Program staff said that the majority of people attending the IT learning sessions had not used the Internet and online government services before. The sessions provide a flavor of the World Wide Web's resources—showing people the BBC website, the Leeds City Council website, and Directgov, and how to use the Google search engine. In a typical session, people are shown something of specific civic interest on the local government website—for example, how to report a broken streetlight or that garbage was not collected. Staff encourage users in taking next steps, applying the skills they obtained in the class in real life. If there is something

in which they are really interested on the Internet, they can book a one-to-one session to explore it further. Program staff stressed that talking about e-government in abstract terms could put people off. They needed to be shown the real-life benefits of using online government.

Funding and Sustainability

Initial funding, which lasted for one year, was obtained from the New Opportunities Fund for the People's Network. Since then, Leeds Libraries IT has been receiving core funding from the local government. Funding is used to cover staffing costs and also for upgrading 100 computers a year including assistive technology, thereby ensuring that they are never out of date. In addition to internal funding, external funding has been obtained. For example, Ufi has been a funding source for specific projects (e.g., funding for an IT suite in the central library).

Achievements

Feedback from the evaluation forms indicates that learners have a high level of satisfaction. The ACLS also observes sessions and talks to learners as part of this process, and feedback is always very positive. The ACLS said that the service is very useful for them, as the training and support sessions they fund are delivered in areas that learners are most comfortable in and familiar with. They fund training in the most deprived neighborhoods and in the city center, as these sessions can be accessed by most people by public transport.

Library staff mentioned that they had nominated three people for the Gladys Roberts Award for Older Learners in Leeds (which is part of the Older People's Lifelong Learning Network). The learners had started with IT learning sessions in the libraries—one was 84 and another was 68 with bad arthritis—and they are now independent, regular users, helping others.

Leicester Disability Information Network (LDICN), Leicester (www.ldicn.org.uk)

Program Description

Program objectives. The project's purpose is to establish an innovative information and consultation network for people with learning disabilities and people with physical and sensory impairments in Leicester. The project provides computer suites with all necessary assistive devices and Internet access for people with disabilities attending day centers in Leicester; touch-screen kiosks providing e-mail and Internet access in locations convenient for people with disabilities; a website that aims to be as informative and user-friendly as possible and to encourage feedback and communication. The website uses easy language, pictures and graphics, and some audio output on CDs that the project creates and puts on the website. It focuses on topics of concern to people with disabilities. It provides links to the local and central government websites as well as others. The website is also useful for caregivers and professionals.

Program history and philosophy. In 1998 the Leicester city government consulted with clients in its main disability areas, asking people what they enjoyed about day services and what needed improving. It was a comprehensive survey involving 600 to 700 people with disabilities. However, at the end there was no real opportunity to correlate the findings properly or to assess feedback. A few officers and people with disabilities and the current project co-coordinator got together and agreed that they needed a different way of informing and consulting with people, and that an electronic way might be effective and efficient. In partnership with the health and voluntary sectors, a successful bid was made to the Invest to Save Budget. The project co-coordinator joined in January 2002, and the project was launched in July 2003.

Program users. The project started with people with disabilities but now has a wider coverage, including people from ethnic minority groups. It is also useful to caregivers, professionals, and voluntary organizations.

Program staff and partners. The team consists of the project manager, two IT development officers delivering training and maintaining computers, and a full-time information systems officer who maintains the website, forums, and online consultation, and makes multimedia CDs. A speech and language therapist is also employed two days a week to ensure language is appropriate and as accessible as possible. The project has had the same team for four years. The development officers had considerable previous IT experience. One has an M.Sc. degree

in science, as has the information systems officer. Communication skills were seen as important as technical skills in selecting team members. The manager previously worked as an advocate and team manager for a non-profit disability foundation.

Partners are the Primary Care Trust, Leicester Partnership Trust, a mental health and learning disability trust, the local area health authority and voluntary-sector organizations, the Centre for Deaf people, VISTA (an organization for visually impaired people), a caregivers organization, Leicestershire Centre for Integrated Living, Voluntary Action Leicester, and user groups.

Program activities.

- *Equipping day centers with computer suites.* The project installed computer suites in all day centers in the area, a respite hostel, and two voluntary-sector bases in Leicester. There are seven sites and 26 computers plus laptops. Each computer suite had to meet governmental Health and Safety requirements. LDICN purchased height-adjustable desks and all the adaptations they could obtain for IT, such as keyboards, mice, head pointers, and assistive software. The project paid for the printers, scanners, and digital cameras. Initially, the project paid for the Internet connection so the centers could offer a broader range of services. Subsequently, the centers picked up the costs of the Internet connection.
- *Development of a project website targeted at people with disabilities.* The website specifically aimed to engage and communicate with people with disabilities. It makes extensive use of pictures and graphics and also uses some audio. It has a piece of technology called web skinning, which enables people to adjust how the screen looks; there are eight display options. The website includes:
  - — *Information.* Topics are selected to be of interest to people with disabilities, including links to local government and other websites.
  - — *A "What's New" section.* This includes a Housing and Support Information pack CD using symbols and audio output. The aim is to empower people to access information on their own. It contains everything that the Housing Department has generated, rewritten to make it simple and structured so people can move in any way they want. Similar CDs are being developed on hearing and eye tests, which may be frightening to some people with disabilities who have not had these before.
  - — *Survey forms.* These use images as well as text.
  - — *Forums.* These provide the opportunity for discussion on a variety of issues. Participants have to register and IP addresses are logged. Anyone deemed to be guilty of offensive behavior has his or her membership terminated.
  - — *Events.* Local events are advertised.
- *Installing touch-screen kiosks in the city.* Kiosks are dotted around the city in locations used by people with disabilities. It took a year for the project to get them functioning properly. LDICN worked with 50 people with disabilities on the physical design/accessibility of the touch-screen kiosks that are located around the city of Leicester. Kiosks are equipped with a webcam so people can use sign language and send video e-mails and with a microphone so people with visual impairments can send audio e-mail. They also have grip handles for people using mobility aids. Through these kiosks, users have direct access to the LDICN website, the local government website, and the Internet generally. Staff said that the kiosks have attracted users whose first language is not English and that about 200 people a week used these kiosks. The project has helped the local government to meet 80 percent of its e-government targets over the last three years.
- *Providing computer and Internet training in day centers.* The project staff trained staff in day centers so that they became comfortable with the technology. LDICN then trained service users individually according to their needs, first on the basics and then on applications and the Internet. LDICN staff may train staff and users together if adaptations need to be set up. Now that the day center staff are more confident, they themselves run sessions for center users and can give help and support on an individual

basis. If care staff run into any technology-related issues, they have the option of calling LDICN for help and advice. The training offered is mostly informal. In addition to LDICN, Leicester College is sending tutors into the day centers.

- *Offering advice to the local government and other programs*. In addition to training and support, LDICN gives advice internally to the local government and services provided by it, such as the libraries (all of which are being equipped with adaptive technology). LDICN staff also provide guidance to individuals wanting to participate in Access to Work (a national program through which people with disabilities can receive potentially wide-ranging types of assistance for work purposes). The project manager is a member of the Council Information Systems Support Group, and the project is now able to have a major impact on the local government website.

Strategies for Encouraging Use of the Internet and E-Government Services

Raising awareness of the project and its website. The project manager goes to events, even if they are unrelated to IT, and promotes the project and its services including the website.

Making computer and Internet usage relevant to people's interests. The project provides state-of-the-art computers and assistive technology to day centers and other locations used by people with disabilities, and initially paid for the Internet connection. Project staff also trained day center staff to overcome their fears of technology. People with disabilities in the day centers are encouraged to use computers, starting with whatever they are interested in and not assuming that anyone is incapable of using a computer. The touch-screen kiosks enable people to surf the World Wide Web and send e-mails, and are placed in locations people with disabilities are likely to use such as medical centers.

Providing a website that is informative and accessible. The LDICN website provides information and opportunities for consultation and discussion in ways that are easy to use. The project tries to adapt what they do rather than make people with disabilities change. The website provides a channel to the local and central government websites.

Funding and Sustainability

A grant from the Invest to Save Budget paid for the first three years. A period of considerable uncertainty and anxiety ensued about what was to happen when this grant ended. It had been envisaged that the IT support and development work associated with the project would be mainstreamed into the local government's IT services. As the project progressed, staff realized that because of the project's innovative complexity, the level of skill required to support the advanced technology was beyond that existing in the local government's IT Department. This resulted in the local government picking up the core costs for staffing, as well as mainstreaming and maintaining the project. The project is also income-generating through the multimedia CDs it produces and sells.

Achievements

There is much anecdotal evidence of success, particularly for people with learning disabilities and challenging behavior. The project provides a technological medium that is easy to use and enables people to undertake activities that previously were not possible or were too difficult. Using digital photography and Internet searches, people with disabilities can create "life stories," publish newsletters, and contribute to their own personal care plan. Their ability to communicate with others is widened and more under their own control.

A year after it was launched, each month an average of 808,165 requests were handled by the website, with an average of 31,602 pages being sent. Between January and September 2006, there was an average of 7,349.87 page views per day, compared with 2,154.94 for the local government. (A page view is a request to the web server by the visitor's browser for any web page.)

The project was highly commended in the Local Government IT Excellence Awards 2003; was runner-up in the Best Partnership category in the Government Computing BT Syntegra Awards for Innovation 2004; commended in the UK eWell-Being Awards 2004; and has been highly commended for its eye-test CD in the Care Services Improvement Partnership, Positive Practice Awards 2006.

Conclusion

E-government is becoming the new face of governments in the United States and the United Kingdom. There is evidence that the Internet can improve government service delivery, making it more effective, efficient, and responsive to peoples' needs. Yet there is considerable evidence that those who are most reliant on government services, and could benefit most from the convenience of online services—people on low incomes, older people, and people with disabilities—are less likely to use them. There is no indication that this situation is substantially changing.

In this project we identified a number of initiatives in both countries that have found effective ways of addressing and, to a certain extent, overcoming barriers to Internet and e-government usage by these groups. We then clustered those strategies that were common to many of the initiatives into 10 recommendations. We described and illustrated these recommendations, and suggested ways in which policy makers can assist the development and maintenance of such initiatives.

One of the main barriers tackled by these initiatives is convincing people that the Internet, particularly online government, is relevant to their needs and concerns. Overcoming people's fears that they lack the skills and confidence to use the Internet was another obstacle that the initiatives tried to address by providing informal training in an environment in which people feel comfortable. Another barrier is affordability, particularly for some people with disabilities who need assistive technology to use a computer and the Internet. All the initiatives identified provided free or affordable Internet access for varying lengths of time, and many tried to meet people's assistive technology needs.

The other major barriers are the websites themselves. They often not only present problems for people with disabilities and those using various assistive technologies, but also are complex and difficult to navigate, and may not contain the content people most want. Several of the initiatives tried in different ways to provide guidance to make the Internet easier to use, with some working with local governments to improve the user-friendliness of their websites. Engaging users in the design and implementation of the initiative was likely to make it more effective.

We hope that the 10 recommendations identified in this research and the best practice advice will guide practitioners and policy makers in their efforts to increase access to and use of the Internet and online government services.

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Mary Lester, Executive Director, Alliance for Technology Access

Debra Ruh, President and CEO, TecAccess

Cynthia Waddell, J.D., Executive Director, International Center for Disability Resources on the Internet (ICDRI)

Kate Williams, Ph.D., Research Investigator, School of Information, University of Michigan

Advisory Board members from the United Kingdom:

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Leela Damodoran, Ph.D., Professor of Participative Design & Change Management, Department of Information Science, Loughborough University

Simon Hills, Programme Manager, SustainIT

David Sinclair, Senior Policy Manager, Help the Aged

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Appendix I: Study Methodology

A multiple case study approach (Yin, 1984) was used to explore initiatives designed to encourage underserved people to use the Internet including online government services. Specifically, the methodology for this pilot study consisted of six steps:

1. Identification of initiatives
2. Recruitment of an advisory board
3. Selection of initiatives and development of a brief summary of each initiative
4. Review of selection criteria and initiative summaries
5. Selection of initiatives for further study and case study research
6. Data analysis and development of draft report

1. Identification of initiatives

Soliciting nominations of initiatives that would fulfill the objectives of this research was the first step in engineering this study. This was mainly achieved through web searches, electronic mailing lists, and advertisement on our project website.[8] We also contacted those working in the field of digital inclusion, asking them about effective initiatives that would be relevant to this research. Through these efforts, we identified about 20 potential initiatives in each country.

2. Recruitment of an advisory board

The recruitment of an advisory board was a key component of this research designed to encourage participation from as many stakeholders as possible. We recruited a total of nine individuals to join a transnational and cross-disciplinary group of advisors (five from the United States and four from the United Kingdom). The board membership was drawn from academia, research groups, think tanks, business/industry, nonprofit organizations, and advocacy groups. Advisory board members were given the opportunity to meet twice through a web conference.

3. Selection of initiatives and development of a brief summary of each initiative

Based on a preliminary review of existing research (e.g., Hall Aitken, 2003, 2002; Countryside Agency, 2003; Foley et al., 2005), the researchers developed a list of pre-defined selection criteria that would function as a set of indicators of effective practices. The researchers created a matrix listing the identified initiatives on the horizontal axis and the selection criteria on the vertical axis. Based on the initiatives' scores, 12 of the 40 initiatives (six in each country) were selected for further study. Detailed information about each of the 12 initiatives was collected by means of documentary research and interviews with program managers. The researchers summarized the information and developed a five-to-six-page report for each initiative.

4. Review of selection criteria and initiative summaries

The list of pre-defined selection criteria and a rating sheet were sent to all advisory board members with the request to evaluate the usefulness of the criteria and to provide additional comments. It is important to note that these criteria, while helpful in the process of selecting initiatives, continued to evolve during the research process. Put differently, this pilot study provided an opportunity to identify effective initiatives and also to develop and field test a list of indicators of "best practices" in the digital inclusion field that could be used in future research studies.

The review process, including the feedback obtained from the advisory board, resulted in some modifications to the list of selection criteria (see Table A.1 on page 48 for the final set of selection criteria).

5. Selection of initiatives for further study and case study research

Based on the matrix, the three initiatives that scored highest in each country were selected for further study. At least one of the three initiatives selected had to be targeted specifically at people with disabilities, to comply with project aims as set out in the proposal. Selection of initiatives for in-depth case study not only was based on scores but also was driven by the consideration to represent the variety of initiatives and the strategies that they have used. As part of the case study, the researchers conducted one- or two-day site visits to each of the initiative program sites with the exception of the CHIPS program and Leeds Libraries. The goal of the site visits was to gain a better understanding of the programs, specifically the strategies used for encouraging people who might not have had the opportunity to use the Internet and particularly online government services.

Researchers interviewed four or five past and current users, people who have participated in the initiative. The researchers had a contact person at each site (usually a program staff member) who assisted with identifying and recruiting potential respondents. A total of 25 staff and 21 program users were interviewed in the United States and the United Kingdom. Interviews were conducted in person or by telephone (especially in the case of the CHIPS program and Leeds Libraries); they lasted for about an hour and were digitally recorded with the permission of each interviewee. In order to guide the interview process, researchers developed an interview protocol for program staff (see Table A.2 on page 48) and another one for program users (and their mentors). While meant as a guide, the questions and process developed allowed for and encouraged wide-ranging and free-flowing conversation, and were not used as formal interview queries. Thus the discussions had different emphases based on local conditions and the type of staff interviewed at the site.

6. Data analysis and development of draft report

Qualitative data analysis consists of three interrelated sets of activities: data reduction, data display, and conclusion drawing/verification (Miles and Huberman, 1984). Data reduction refers to the process in which researchers prepare their raw data for data analysis. Research staff in this study used two techniques of data reduction, *coding* (attaching meaningful labels that denote concepts, actions, or recurrent themes to data or pieces of data) and *memo-writing* (systematic writings and musings of the researchers that occur during the coding process), to condense the collected (interview and documentary) data. Data was then organized into categories and emerging themes (data display) that provided the main direction and clarified missing links in the data analysis.

The researchers met online on a regular basis to compare specific incidents, refine concepts, and explore relationships (conclusion-drawing). Conclusion-drawing is intricately connected with verification, which was achieved by discussing findings with respondents. Program managers of all 12 initiatives were given an opportunity to comment on the draft of the research findings and to provide feedback. Drafts of the study findings were compiled using the themes organized during the memo-writing process. In this way, the memos served as an outline for the results that are presented in this report.

Table A.1: Final List of Selection Criteria

1	**The initiative is inclusive of or targeted at underserved populations.** (e.g., people who are educationally and/or economically disadvantaged, unemployed people, single mothers, people with disabilities and/or long-term health conditions, older people, and people from ethno-racial groups).
2	**The initiative addresses barriers to using computers and the Internet.** a. Basic skills (e.g., basic literacy, technology/digital literacy) b. Cost of technology including computers, assistive technology (AT), Internet connection c. Physical accessibility d. Access to assistive technology (e.g., identifying AT needs and knowledge of how to use it) e. Infrastructure (e.g., lack broadband) f. Other barriers (e.g., language, technophobia, gender, culture barriers, motivation barriers)
3	**The initiative offers (formal/informal) support on a long- term basis.** a. Within the program b. Information about or referral to other programs and opportunities to progress
4	**The initiative encourages use of the Internet/e-government services.** a. Provides assistance in how to use the Internet b. Has some means of indicating what is available on the Internet/e-government websites c. Actively promotes the use of e-government websites d. Is involved in developing content/design for websites including e-government websites
5	**The initiative makes concerted efforts to identify and meet *all* users' needs.** a. By involving users in the (initial) design/development of the initiative/program b. By engaging users in the implementation of the initiative/program c. By actively seeking feedback from users (e.g., customer feedback—both formal and informal, program evaluations/reports
6	**The initiative benefits/impacts users.** a. At an individual level (i.e., users gain new skills and capabilities, ranging from greater independence to employability and self-sufficiency) b. At a community level
7	**The initiative has developed mechanisms to sustain itself.**

Table A.2: Interview Questions

Program Staff Questions
Please describe your role and responsibilities related to/involvement in this initiative? How long have you been involved?
What did you find most useful/effective in terms of encouraging people to use (a) the Internet and (b) e-government websites?
What do you think discourages people from using (a) the Internet and (b) e-government websites?
In what ways has this initiative been successful? Please describe to me how each factor contributed to the initiative's success?
Has this initiative been successful for particular group/s?
What impact did the initiative have on users (a) at an individual level and (b) at a community level?
What problems did you/your initiative encounter and what steps did you/your organization take to overcome these obstacles?
What efforts have you made to sustain this initiative/success?
What have been the challenges to sustaining this success, and how were they overcome?
What lessons did you learn that could be passed on to other national/international initiatives?

Appendix II: Abstracts of Initiatives

Appendix II provides a list of abstracts of the six initiatives of which we obtained full accounts from project managers but did not undertake an in-depth case study. However, we have included references to these initiatives in the Recommendations section because they have used a number of strategies that we considered very effective in encouraging people—especially people on low incomes, seniors, and people with disabilities—to use the Internet and possibly e-government services.

Initiatives in the United States

Computers for Families (CFF) Program, Santa Barbara, California

The Computers for Families program provides refurbished computers and discounted Internet access for home use by fourth-grade students of low-income families living in south Santa Barbara County. Families receive basic training on computers and the Internet including technical support. Extensive training and support are available for teachers whose students have received computers through the program. By providing home access to computer and Internet technology, the program intends to lessen the digital divide for children and their families and also to overcome a major barrier to student achievement. In addition, CFF partners with the County Probation Department, involving young offenders in the refurbishment and upgrading of donated computers and teaching families how to use technology at distribution events.

The initiative is a partnership between Santa Barbara Partners in Education and the Santa Barbara County Education Office. Partners in Education is a nonprofit organization that consists of community leaders (business, industry, government, schools) who are committed to making a difference in education and the community at large. This includes the superintendents of all the school districts in the immediate area.

Digital Sisters, Washington, District of Columbia

Digital Sisters Inc. is a nonprofit technology social services agency that promotes and provides self-sufficiency skills to women and children who are traditionally underserved through technology tools. A goal of the organization is to close the gender gap in technology literacy and education. Increased opportunities through technology are the key to individuals gaining or improving self-sufficiency as a result of the program. Digital Sisters helps participants build life skills through participation in various types of technology-based training while also raising awareness of gender equity and promoting opportunities for women and girls in technology. The program predominantly targets low-income families, particularly single and young mothers and their children.

Participants have also included survivors of domestic violence, ex-offenders, and people with disabilities. Half of the training classes are offered to women and girls only. However, some classes are also open to men and boys. Training activities include hands-on experiences in the computer lab, guest speakers, and field trips. Training content is customized to the needs and skills of the participants. In addition to job training, Digital Sisters provides classes on financial literacy and technical assistance.

HousingWorks (www.housingworks.net), Boston, Massachusetts

The HousingWorks website and database provide information on affordable housing, which is housing

for low-income households, available throughout Massachusetts as well as other housing resources to consumers and housing advocates. The goal is to reduce or eliminate barriers to subsidized, affordable, and special-needs housing. Consumers can access the website and database at any social service agency, housing provider, library, school, health center, or state agency providing a public computer and a support staff person. In addition to providing a comprehensive and up-to-date list of affordable housing and related resources, HousingWorks staff offer online training in how to use the website tool as well as technical assistance over the phone. The tool also benefits providers of affordable housing, who can use it to advertise available units.

Public policy and planning bodies benefit from this initiative in that they know what to build and where. The project is run by paid staff and volunteers, but the system is designed so that consumers and providers maintain the information as they use it for their own purposes. As a result, the project's attention is entirely devoted to maintenance of the hardware and product development/simplification. The initiative is based on a model that places state and federal oversight agencies, for-profit management companies, housing authorities, housing advocates, and homeless people in a position to render each other indispensable services.

Initiatives in the United Kingdom

Carpenters Connect RegenTV, London Borough of Newham

This is a project in which digital TV channels, local community videos, the Internet, e-mail, an estate intranet, multiplayer video games, and a fully functioning set of PC applications are delivered to the TV sets of residents of a disadvantaged council (affordable housing) estate over broadband via an Internet protocol set-top box. The project has given residents the opportunity to make video films dealing with issues of local concern, consult more effectively with the local government about the state of the buildings, and get to know other residents better. It has also encouraged use of interactive TV, the Internet, and e-mail.

The project allows people access to online information, services, and communication through equipment with which they are familiar and which is an accepted part of almost all homes. Short videos were made to show how the different parts of the system work that could be accessed via the Electronic Programme Guide (EPG). The program developers see great potential in the delivery of e-government services through the use of multimedia, such as video clips showing people how to fill in online forms. The project, which was initially funded by the Office of the Deputy Prime Minister's e-innovations program, is a partnership led by the London Borough of Newham. The hardware, software, and community development know-how achieved as a result of this program have been put together into an easily deployable and fully scalable product.

Cascade, Nottingham

This project was set up by a partnership of three voluntary organizations—Nottingham Council for Voluntary Service (NCVS), Nottinghamshire Deaf Society (NDS), and Nottinghamshire Royal Society for the Blind (NRSB)—to overcome the barriers to ICT training for people with disabilities, particularly those living in deprived areas. The project offered informal and accredited training by qualified tutors, with assistive devices as appropriate to people with a wide range of disabilities.

In addition to paid tutors at the three main centers, volunteers were trained to assist. The project also provided a computer and training for a tutor at other organizations catering to people with disabilities in the Nottingham area. Eighteen Cascade Learning sites in and around Nottingham were set up. Some sites addressed particular communication and learning needs, while others focused on alternatives to conventional equipment, keyboards, and mice. At the NDS, the tutor developed special resources and was able to teach in British Sign Language.

Community Heritage Store (CHS), West Norfolk (www.localchs.co.uk)

This project aims to "bridge the digital divide" and is targeted at older people (aged 55+) in rural communities in Norfolk. It uses older people's desire to preserve local heritage as a means of sparking their interest in the Internet and results in the preservation of stories, photos, letters, and other memorabilia that would probably otherwise be lost. Starting with very targeted local publicity to attract people to the initial launch and five local workshops, five community

groups were established, with the objective of encouraging the use of the Internet and the localchs.co.uk website. Participants receive informal training from peers. All who participate have access to their own Community Heritage Store website, which acts as a personal store. With their permission, their store contributes content to the local community CHS, which again is shared with neighboring communities. It is now part of the job description of Borough Council development officers to support these groups. A train-the-trainer course is being started that intends to help spread the project throughout Norfolk. The localchs.co.uk website is available to be used and contributed to by everyone in Norfolk. The project is a public-private partnership between the Borough Council of King's Lynn and West Norfolk and UKVillages.co.uk. It has developed a product now available for national rollout that is winning major UK and European awards.

Full descriptions of the initiatives can be found on our project website at: http://158.121.240.7/ici/project.php?project_id=44

Appendix III: Glossary

Accessibility
The ability of goods, services, and locations to be obtained, used, or reached by all people with different individual needs and preferences. This report highlights issues of accessibility concerning computer operation and Internet-deliverable services for people with disabilities. However, accessibility is important to all people, whether or not they have disabilities. The same accessibility features often provide varying benefits to more than one group of people: One group may gain in convenience or ease of use, for example, while another group may find such features essential for basic use of the product or service (see also *Universal design*).

Access to Work (AtW)
A UK government program that provides advice, information, and grants toward any extra employment costs that result from disability. It can help to pay for a support worker, special aids and equipment (that would include assistive devices to enable an employee to use a computer), and adaptations to existing premises and equipment. Help is obtainable by contacting the nearest AtW Business Center.

Americans with Disabilities Act of 1990 (ADA)
A wide-ranging civil rights law that prohibits discrimination based on disability. Signed into law on July 26, 1990, by President George H. W. Bush, the ADA provides civil rights protection of and guarantees equal opportunities for individuals with disabilities in the areas of public accommodations (Title III), employment (Title I), transportation, state and local government services (Title II), and telecommunications.

AmeriCorps*VISTA (Volunteers in Service to America)
A community service program administered by the Corporation for National and Community Service, an independent agency of the U.S. government. The program provides full-time members to community and faith-based organizations and to public agencies to create and expand programs and services intended to improve the situation of low-income individuals and communities.

Assistive device
An item of equipment or a software program that serves to increase or maintain a person's functional abilities in order to use a personal computer or services obtainable through the computer (such as on the Internet).

Assistive Technology (AT)
An umbrella term that is inclusive of assistive and adaptive devices, intended to increase or maintain a person's functional abilities in order to use a personal computer or services obtainable through the computer (such as on the Internet). The term also includes the process of selecting appropriate technology and using it.

Bobby accessibility checking tool
A tool with which to assess an Internet website's level of accessibility—see www.cast.org/bobby.

Broadband Internet access
A form of Internet access characterized by a high rate of data transmission. It is often shortened to "broadband Internet" or "broadband."

Community technology programs/centers
Programs or centers that provide technology access and education/training to communities, especially those who are underserved. In the United States, Community Technology Centers' Network (CTCNet) is a large national network of community technology centers (CTCs) with more than 1,000 members—see www.ctcnet.org.

Dial-up Internet access
A form of data access (mainly used for Internet access) in which a person uses a modem to connect a computer to a telephone line. It is often shortened to "dial-up."

Digital divide
The gap between those who have access to computers and the Internet and those who do not have access for various reasons (e.g., cost of technology/affordability, lack of basic skills/digital literacy, lack of access to assistive technology, infrastructure barriers).

Digital literacy
A person's ability to understand, evaluate, and create information in many formats using a computer and the Internet. The terms "digital literacy" and "computer literacy" are often used synonymously.

Digital literacy training
Training to improve a person's ability to use a computer and the Internet.

Directgov
The portal to public service information from the UK government, including directories, online services, news, and information of relevance to specific groups.

Disability Rights Commission
An independent body (established by the United Kingdom Parliament in 1999) to eliminate discrimination against people with disabilities and promote equality of opportunity. Its specific tasks include advice and information service for people with disabilities, employers, and service providers; problem solving by negotiation and the Disability Conciliation Service; events, conferences, and campaigns to raise public awareness of disability issues; policy statements and research on issues that affect people with disabilities.

Discussion e-mail list
See definition of *electronic mailing list*.

Earned Income Tax Credit (EITC)
A program of the U.S. government that provides tax credit to people who work and earn low to moderate wages. Enacted in 1975, the program is administered by the Internal Revenue Service.

E-Government
The delivery of government services over the Internet. The terms "digital government," "electronic government," and "online government services" are often used synonymously with e-government.

Electronic mailing list
A type of Internet forum in which e-mail is used to distribute information to a list of Internet users whose e-mail addresses are known. Electronic mailing lists are also referred to as group e-mail lists.

E-mail
A system of sending and receiving messages between Internet-connected parties by means of special software. E-mail is closely analogous to sending and receiving communications by mail, but accomplished electronically. E-mail is not "live" but consists of recorded messages sent between computers.

Federal Student Aid (FSA)
A program of the U.S. government that provides financial assistance to students wanting to pursue post-secondary education who could not otherwise afford it. The program is administered by the Federal Student Aid office of the U.S. Department of Education.

Free Application for Federal Student Aid (FAFSA)
A form that must be filled out (in hard copy format or online) by students in the United States to determine their eligibility for Federal Student Aid (see above).

Home page
The entry point of an Internet website; the starting point of the website's information from which other content of the website can be located.

Information and communications technology/ technologies (ICT)
An umbrella term that is inclusive of any communication device (e.g., radio, television, cellular phones, computer and network hardware/software) and also the applications of those devices (e.g., videoconferencing, web conferencing, distance learning).

Information technology (IT)
The use of technology in managing and processing information, especially in large organizations.

Internet
The international communal system of connectedness between computers by which data is available for sending and receiving, subject to computer programs' ability to facilitate the connections to commercially controlled access points to connect to the network.

Internet protocol set-top box
The Internet protocol is the method or protocol by which data is sent from one computer to another on the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet. The same principle applies to set-top boxes that use IP to transport television and interactive services over telecoms or cable networks.

Internet public access site
A location where computers with Internet access are available at no cost or low cost to the public. The locations include Internet cafes on shopping streets, public libraries, colleges, community centers, or anywhere else available to the public.

Medicare
A health insurance program administered by the U.S. government that covers people who are either aged 65 and over or who meet other special criteria.

Medicare Part D
A program administered by the U.S. government that subsidizes the costs of prescription drugs for Medicare beneficiaries in the United States. The program was enacted as part of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA). The benefit started on January 1, 2006.

Navigation
The pursuit of a particular route or course through Internet websites (as opposed to "browsing" or "surfing," which are undetermined wanderings through Internet websites).

Ofcom
The independent regulator and competition authority for the UK communications industries, with responsibilities across television, radio, telecommunications, and wireless communications services.

Online
Being connected to the Internet.

Screen reader
A software program that enables a computer user to listen to a synthetic voice description of screen displays of text or images and icons (provided they have text descriptions when designed). Mostly used by visually impaired people, screen readers also typically perform organizing or reformatting tasks when working on website pages in order to convert complicated visual material into a navigable vocal form.

Speech recognition/voice recognition/voice activation
Software that works in conjunction with a microphone connected to a computer equipped with a sound card to enable a computer user to generate written text directly from speaking the words (instead of typing the words on a keyboard) or to operate the computer in various ways (such as moving between programs or working on files).

Supernova
A commercial product name for software that magnifies computer screens, generates speech for computer operation, or helps (with additional equipment) to generate Braille versions of visual information; available from Dolphin Computer Access Ltd.

Trackball
Basically, an upside-down mouse. Rather than moving the mouse on the tabletop, the trackball remains in one place, with the ball on the top being moved using fingers, thumbs, or palms. A trackball is useful for people who have difficulty gripping or moving a standard mouse. Larger trackballs are often suitable for use with the feet. Because the trackball does not move, it requires much less space.

UK online center
A location where computers with Internet access are available at low cost to enable people to use or train on "new technology" skills and equipment. The locations include Internet cafes on shopping streets, public libraries, colleges, community centers, or anywhere else available to the public. UK online centers are a government initiative intended to meet the needs of local people who have low or no ICT skills (skills in information and communication technology). Training assistance, assistive devices, and physical access to the UK online centers vary across the country.

Universal design
The design of products and environments to be usable by all people, to the greatest extent possible, without the need for individual adaptation or specialization. The desired result is that universal design benefits all users of products and environments, irrespective of some people being identified as having minority or special needs.

User interface
The way in which a system presents itself to, and interacts with, a human user.

Volunteer Income Tax Assistance (VITA) site
A site where volunteers, trained by the Internal Revenue Service, provide free assistance with tax preparation and electronic filing to low- and moderate-income working families. VITA sites are typically located in community centers such as libraries, churches, shopping malls, and other public places.

W3C—World Wide Web Consortium
An international Internet and computing industry consortium founded in 1994 to develop common protocols and promote the web's evolution, ensuring that newly developing web capabilities can be accessed and used on all different types of computers.

WAI—Web Accessibility Initiative
A set of policy actions by W3C (see above), following collaboration with disability organizations, research centers, and governments, which has resulted in widely accepted guidelines to improve website accessibility for people with disabilities.

Web conference/conferencing
A method for holding group meetings or giving live presentations/training over the Internet.

Web page
A resource/piece of information that is suitable for the World Wide Web and can be accessed through the Internet/web browser.

Website
A collection of web pages; the World Wide Web is made up of all publicly accessible websites.

Windows
The commercial brand name of an operating system produced by Microsoft Corporation, which dominates the personal computer market. The operating system is the main operating program of a computer—it manages and interacts with all the other application programs on a computer, which carry out specific tasks.

Endnotes

1. Administered by the U.S. Bureau of Labor Statistics and the Bureau of the Census.

2. The Web Accessibility Initiative is a set of policy actions by the World Wide Web Consortium (W3C), an international Internet and industry consortium. Following collaboration with disability and research organizations and governments, it has produced widely accepted guidelines to improve accessibility for disabled people. Each guideline has between one and 10 checkpoints that interpret and specify the application of the guideline in website design. The 65 checkpoints are graded between three priority levels, giving an increasing standard of accessibility. "Single-A" includes Priority 1 checkpoints, "Double-A" includes Priority levels 1 and 2, and "Triple-A" levels include 1, 2, and 3. The guidelines can be accessed at: http://www.w3.org/WAI/intro/wcag.php#whatis. Retrieved February 10, 2007.

3. Source: http://www.ntia.doc.gov/TOP/research/research.htm. Retrieved February 10, 2007.

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Heike Boeltzig is a Research Associate at the Institute for Community Inclusion (ICI) and a PhD candidate at the John W. McCormack Graduate School of Policy Studies at the University of Massachusetts–Boston, United States. Her key research interests center on disability and employment issues and, more recently, information communications technology.

Most recently, Boeltzig participated in a project funded by the U.S. Department of Labor Office of Disability Employment Policy that identified effective practices, barriers, successful strategies, and policy recommendations to better serve persons with psychiatric disabilities through the workforce development system. In addition, she is a lead researcher in a multi-year comparative policy study of One-Stop Career Centers and Workforce Investment Boards identified as providing exemplary services to customers, including those with disabilities. The research is part of the National Center on Workforce and Disability/Adult, which is funded by the U.S. Department of Labor. Boeltzig is also involved in survey research as the project lead on the National Survey of Community Rehabilitation Providers funded by the Administration on Developmental Disabilities in the U.S. Department of Health and Human Services.

Before joining the ICI, Boeltzig conducted cross-national comparative research on disability and employment policy at the Center for Comparative Research in Social Welfare at the University of Stirling in Scotland. She also participated as a "national reporter" on German disability employment policy in a 13-country research project that was funded by the European Commission.

A graduate of the University of Stirling, Boeltzig has a bachelor's degree in sociology and Japanese, and a Master of Science degree in applied social research.

Doria Pilling is currently a Visiting Senior Research Fellow at the Rehabilitation Resource Centre (RRC), Health Care Research Unit, City University, London, United Kingdom (UK). Her key research interests focus on issues related to disability, employment, and information communications technology. She recently completed a project commissioned by Ofcom, the UK communications regulator, in which she led a team investigating the feasibility of implementing additional relay services for people who are deaf/hearing impaired whose needs are currently
not met (available online at: www.ofcom.org.uk/research/telecoms/reports/relayservices/relayreport.pdf). Other studies include the text communication needs and preferences of deaf/hearing impaired people who do not use ordinary voice telephones.

In a study funded by the Joseph Rowntree Foundation, Pilling carried out the only UK research that has given people with disabilities an opportunity to express their views on using the Internet (available online at: www.jrf.org.uk/bookshop/details.asp?pubID=597). As a follow-up to this study, she organized two seminars entitled *2005: e-Access for all. Can e-communication ever be fully inclusive?* and *2006: e-Access for All—Advance or Retreat?* A third on *Social Inclusion and ICT* was held at the end of November 2006. Seminars involved speakers from government, academic, and voluntary organizations, including those concerned with disability and promoting digital inclusion.

At the RRC, she has done a number of evaluations of innovative projects that increase the employment opportunities of people with disabilities. Most recently, Pilling led an evaluation of a large government-funded regeneration project in the East of England aiming to increase employability of disadvantaged groups of people, including people with disabilities. Previously, at the National Children's Bureau, she carried out a major study of factors that enable children growing up in disadvantaged circumstances to succeed in adulthood, using the National Child Development Study, a longitudinal study of some 17,000 people born in 1958.

Ms. Pilling has a B.A. and M.A. in sociology from the University of Leeds.

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