

The Opportunities and Challenges of Assistive Technology for an Aging Population

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prepared by
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The Promise of Assistive Technology for Older Persons

Assistive technology is redefining what is possible for today's older persons. In many cases, assistive technology and modifications to the home can increase, maintain, and improve the functional capabilities of elders. Increasing functional capabilities leads to more independent and productive older persons who are better integrated into the mainstream of society and community life. According to LaPlante (1997):

“In 1990, more than 13.1 million Americans, about 5.3 percent of the population, were using assistive technology devices to accommodate physical impairments. Among that population of persons who use any assistive technology devices 52 percent are over 65 years in age, reflecting the higher rate of impairments in that demographic. Furthermore, the percent using assistive technology increases with age, from about 1 percent among persons less than 25 years of age to nearly 35 percent among persons 75 years of age and over.”

Policymakers, researchers, practitioners, and entrepreneurs in many fields are increasingly interested in how to use assistive technology and home modifications to support older persons and promote their health. This increase in interest is being generated by demographic, theoretical, market, and other considerations.

Demographics of Aging

The size of the population of people 65 and over has increased far more rapidly than the rest of the population during the 20th Century. In 1900, only 3.1 million Americans were aged 65 or older, comprising only 4 percent of the population. By 1990, the elderly population had increased tenfold to 31 million people or 12 percent of the total population. The number of older Americans in 1997 has been measured at 34.1 million, about one person in every eight.

The older population will continue to grow significantly in the future, specifically between the years 2010 and 2030. It is during this time that the baby boom generation is expected to reach retirement age. Consequently, by the year 2030, the elderly population is projected to double. The number of Americans 65 and over is expected to be about 70 million.

The most dramatic increase in the population of older Americans has been among the very old (those aged 75 and over). By 2010, those 75 and over may constitute more than 40 percent of the elderly population. For the “oldest old” (those aged 85 and over) the increase has been exceptional. Between 1960 and 1994, their numbers grew 274 percent. From 1995 to 2010, this population is expected to grow by 56 percent from 3.6 million in 1995 to 5.7 million in 2010. The increase in the population of the “oldest old” is expected to continue to 8.5 million in 2030 and to 18.2 million in 2050.

The present and future profile of the population 65 and older has ramifications on social and policy planning since older persons are at greater risk of disability and are more substantial users

of health, medical, and other services than the general population. This is especially significant for the older persons who live in rural areas where access to services such as health and social services is either limited or deficient.

Additionally, the proportion of the U.S. population with disabilities has risen. This is largely due to demographic increases in the elderly population. Data from the National Health Interview Survey (NHIS) denotes the disability rate for women 65 and older at 39 percent and at 38 percent for men. A limitation to the instrument was a change in the survey in the 1980s that ask about self-care activities rather than work or housekeeping in relation to disabilities within the elderly population. Therefore, the percentages can be perceived as being higher than reported when considering other activities of daily living. Consequently, an increase in the numbers of persons requiring special services, such as health, recreation, housing, nutrition, financial, transportation and other services, can be expected to be limited in rural areas.

Theoretical Basis for Using Assistive Technology and Environmental Inventions with Older Persons

Human factors engineering focuses on the study of the person-environment relationship and their effects on human performance. According to McCormick (1970), human factors engineering is based on the proposition that "human use of virtually any man-made thing can be enhanced, or, conversely, degraded by its design." Some recent work in human factors has focused on the human performance characteristics of older populations in the context of tasks and activities of daily living.

Many authors have suggested that the older person's inability to function in various settings can be traced to disparities between the demands for action implicit in the design and structure of a particular environment and the capacity of the older person to meet these demands (Gelwicks & Newcomer, 1974; Lawton, 1977; Lawton & Nahemow, 1973). Much of the work in barrier-free design and other approaches to supportive environments flow from the view that levels of functioning might be improved through changes in environmental features which better recognize the reduced capacities for actions often associated with advanced age.

Two models have been proposed that support a view of the elderly individual's functioning in activities of daily living as a person-environment problem. The first has concentrated on developments of person-environment models of adaptive behavior of elderly persons (Lawton, 1977). Lawton (1977) states, "Whether emphasizing fit, competence, or adaptation, these person-environment models have emphasized an interactional or transactional view of the older person and the environment"

The occupational therapy literature offers models for conceptualizing the environment as a component of the assessment process. Dunning (1972) discusses the interaction of space, people, and tasks - placing these on an "Environmental Grid," which also combine the variables of givens, possibility of change, and preferences. Barris (1982) developed an environmental model that includes four hierarchical concepts: objects, tasks, social groups, and culture, all of which impact task performance and social interaction. Altman (1973) describes the person-

environment relationship in terms of three orientations: orientation to place, orientation to psychological and social processes, and orientation to design and practice. A fourth dimension, orientation to environmental policy was proposed by Lawton, Altman, & Wohlwill in 1984. Lawton (1990) proposed a hierarchy of behavior competence for understanding the house behaviors of the aged that included five gross categories: health, functional health, cognition, time use, and social behavior.

The Assistive Technology Marketplace and Recent Legislation

There is an increase in the number of assistive technologies and home modification solutions available to older persons. Currently the marketplace offers consumers more than 20,000 assistive devices. Many of these devices offer the promise of increased independence for elders. These items range from basic mobility devices such as wheelchairs and walkers to sophisticated communication systems.

The number of health professionals assisting with assistive technology and home modification solutions has grown, despite the lack of a national assistive technology and home modification policy or program. Over 600 local programs were identified in a recent study. Centers providing technical assistance and resources are increasing in number and scope (Albarede & Vellas, 1985).

The interest of building contractors in assistive technology and home modifications has increased in part because of these trends. The American Institute of Architects estimates that 99 percent of the housing that will be in use in the year 2000 existed in 1985 (Remodeling the Future, *Interiors*, 145, p. 147, August 1985). As a result, many builders are beginning to become knowledgeable about assistive technology and home modifications.

Another national trend is the growing sophistication of older persons in using technology. This will be especially true for the baby boomers. The evolution of the computer as an essential tool in our society coincides with the aging of the baby boomer generation. This will create a strong expectation among baby boomers for using technology during their retirement years. The use of assistive technology and home modifications to prevent disability and increase functional independence is linked to recent trends in promoting physical and mental health (Steinfeld & Shea, 1993; West, 1991).

Lastly, recent public policies emphasize the importance of increased access to assistive technology, e.g., the Americans with Disabilities Act of 1989, the Assistive Technology Act of 1998, the Rehabilitation Act Amendments of 1991, and the Individuals with Disabilities Education Act as amended in 1996. These laws have contributed to advancements in and increased availability of assistive technologies.

II. Summary of Research

So what does the research tell us about the potential of assistive technology now and in the future? The short answer is that a vast majority of observers agree that AT is and will continue to assist older persons to have a higher quality of life. In general, recent research suggests that assistive technology increases the independence of older persons and can slow the loss of functional abilities among frail elders. Other findings indicate that AT improves the safety of elders by preventing injury and has proven to increase home security. Other studies have documented that assistive technology can help older persons who experience memory loss or confusion or who display other forms of dementia. Emerging research illustrates that AT has the potential to lessen the burden of informal and formal caregivers. Several recent studies have suggested that older persons are now the fastest growing segment of the population using the Internet. Lastly, using AT can slow the rapidly increasing cost of providing long-term health care to elders. These research findings suggest, that just as assistive technology has helped individuals with disabilities to be more independent for the past 25 years, there is no reason to believe that technology will not do the same for older persons.

III. Tech Act Projects

Funding made available under Title I of the Assistive Technology Act of 1998 supports State Assistive Technology Programs in 56 states and territories. The state grant program promotes access to assistive technology for people with disabilities and universal design of information technology so that people with disabilities will not be left out of the digital revolution. Together with the Protection and Advocacy services, these programs form a national infrastructure that ensures access to technology for people with disabilities. The state grant programs (also known as Tech Act Projects or AT Act projects) and the Protection and Advocacy Program offer an insurance policy so that people with disabilities will not be left on the wrong side of the digital divide.

The collective experiences of the 55 Tech Act projects have much to teach us about providing AT services to older persons. Even though these projects are mostly directed at serving individuals with disabilities, nearly every state conducts initiatives designed to promote the use of AT among older persons. For instance, the Idaho Assistive Technology Project provides statewide AT assessment services for older persons with complex technology-related needs. Most Tech Act projects operate alternative financing (loan) programs for the purchase of assistive technology. The loan program offers affordable financing to individuals with disabilities and older persons. Idaho and many other states operate equipment recycling programs that identify used assistive devices and advertise them statewide so that others might benefit from their use.

In North Dakota, the AT project has a contract with aging services to administer a program called

Senior AT Services. The purpose of the program is to get assistive devices to elders so they can continue to live in their own homes. North Dakota also has a program funded by the State Pharmacy Association that is designed to provide a wide range of automated medication dispensers to older persons who have problems managing their medications.

In Louisiana, people over 65 are able to get hearing aids through their telecommunications distribution program. Medicaid cuts have ended services in some states - Kansas no longer allows paying for eye glasses - a necessity for elders who have low vision. In a number of states, minimum building code requires visit-ability. In Missouri, Lifetime Home Bill allows \$5,000 grant for any home to make it accessible. Missouri also has adopted legislation that allows tax credits for expenses to make homes accessible.

IV. The Challenges of Assistive Technology for Older Persons

In spite of the exciting potential of assistive technology and home modifications for increasing the independence of older persons, there remain significant barriers to its use. According to LaPlante et al. (1997) 2.5 million persons have unmet needs for assistive technology. Of this total, 1.1 million people over the age of 65 have unmet needs for assistive technology, almost 45 percent of the total. Estimates of the magnitude of need for home modifications suggest that up to 12 percent, or over two million elderly households, require home adaptations to support the needs of a family member with health or mobility problem (Struky, 1988; Newman, Zais & Struky, 1984; Struky, Turner & Ueno, 1988). According to the findings of a Robert Wood Johnson Foundation project, up to 30 percent of elderly households desire dwelling-related repair and/or modifications. These numbers are expected to rise as the population continues to age. Currently, the need is greatest for persons over 75 years, for women, for people of color, and for rural and low income individuals. As outlined next, older persons face many systemic barriers when attempting to acquire assistive technology.

A lack of funding for assistive technology: All questions about assistive technology ultimately lead to the question of how to pay for it. Currently, there are restrictive policies governing the funding for assistive technology. For instance, this is a lack of coverage for equipment that could benefit older persons with cognitive impairments. For older persons who work, vocational rehabilitation programs often are reluctant to provide assistance to elderly workers. Both Medicare and Medicaid have restrictive funding policy for durable medical equipment and there is a lack of private insurance funding for needed devices.

Lack of quality assistive technology services: There is a lack of community-based assistive technology services for elders and those services that do exist are fragmented. In particular, there is a shortage of assistive technology assessment services. This is important because, in order to avoid high rates of technology abandonment, as some researchers have warned against, it is critical that qualified individuals conduct these AT assessments using best practice protocols. Too often, an assistive device that is inappropriate for an older person is purchased and ends up not being used. There is also a shortage of senior programs capable of delivering quality "related" services, e.g., training and other supports needed to ensure elders know how to appropriately use, maintain, modify, and repair their technology. Additionally, there is a severe shortage of vendors who sell assistive technology in many rural areas.

Lack of Awareness: There is general a lack of awareness among older persons, their families,

and professionals due to poor access to accurate and up-to-date information about assistive technology devices and services. Older persons frequently are not aware of what is available in the marketplace and don't know where to look.

Lack of Trained Professionals and Para-Professionals: There is a shortage of professionals and para-professionals working in the aging network who are capable of providing assistive technology services to elders. This includes a shortage of physical and occupational therapists, speech pathologists, physicians, nurses, aids, and other health professionals with the knowledge and skills needed to deliver quality assistive technology services. In part, this shortage of trained personnel is due to a lack of assistive technology training in the personnel preparation programs in our country's universities and community colleges.

Lack of Support for Family and Informal Caregivers: Assistive technology holds the promise of increasing opportunities for respite, reducing the physical and emotional strain of care giving, and decreasing the financial burden of providing care. Yet caregivers are not benefiting from its use because they do not have access to quality information about AT and often need help gaining access to AT services. Older persons who live in their own community and experience at least one limitation on their activities of daily living need a wide array of information and services, and so do their family and informal caregivers. This includes the provision of assistive technology devices and services.

V. Recommendations

A good first step toward addressing these barriers is to complete the re-authorization of the Assistive Technology Act of 1998. The Tech Act projects already provide an array of AT services to elders and Congress should do everything possible to increase their capacity to serve elders. Beyond this immediate step, information about the potential application of assistive technology for assisting older persons needs to be collected on a national level before action can be taken to address and ultimately eliminate these barriers. There is currently a paucity of comprehensive research findings with a nationwide scope to inform us about the potential of assistive technology for elders. To begin, the Senate Special Committee of Aging should implement the following three recommendations.

Recommendation One: Contact Senator Gregg, Chair of the Health, Education, Labor and Pensions (HELP) committee, and urge him to complete the re-authorization of the Assistive Technology Act of 1998.

Recommendation Two: Request that the General Accounting Office investigate the specific needs of older persons related to assistive technology.

Recommendation Three: As part of the GAO investigation, hold field hearings in order to gather information about the potential of AT for meeting the needs of older persons from practitioners, older persons and family members and other interested parties.

In conclusion, how older persons will be cared for with maximum independence, and at what cost, are two of the critical health care issues facing the country. Most observers now agree that assistive technology has an important role to play in the provision of long-term health care; however, it is still uncertain how this can be accomplished on a nationwide level and what the appropriate role of the federal government should be. By examining the potential *Opportunities and Challenges of Assistive Technology for an Aging Population*, the U.S. Senate has taken an important first step toward developing a national policy that will ultimately lead to more independent and productive older persons through the use of assistive technology.