

Digital Aids for an Aging Society

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1 As a result of twentieth century advances in medi-
2 cine and standard of living there is a dramatic
3 increase in the number of older people in the U.S.
4 and most developed countries of world. Currently,
5 people aged 65 years and older represent approxi-
6 mately 13% of the population and this number is
7 expected to increase to 22% by 2030. Moreover, the
8 fastest-growing subgroup within the older cohort is
9 the “oldest old” (85 years and older) [4].

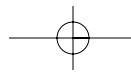
10 The aging of the population has vast implications
11 for designers of information systems. Currently, use of
12 computer technology has become an integral compo-
13 nent of work, education, communication, and enter-
14 tainment. Technology is also being increasingly used
15 within the health care realm for service delivery, in-
16 home monitoring, interactive communication (such
17 as between patient and physician), transfer of health
18 information, and peer support. To function independ-
19 dently and successfully interact with the environ-
20 ment, people of all ages must interact with some form
21 of technology on a regular basis.

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23 **Use of Technology by Older People**

24 Although older adults in the U.S. are increasingly
25 receptive to using technology, studies indicate they
26 typically have more difficulty than younger people
27 learning to use and operate current technologies
28 such as computers and the Internet, VCRs, auto-
29 matic teller machines, and telephone menu systems
30 [3]. Furthermore, although older adults represent
31 one of the fastest-growing groups of Internet users,
32 there is still a digital divide, especially for lower
33 socioeconomic status older adults or those with
34 physical impairments. In 2004, only 25% of people
35 aged 65 and older used the Internet as compared to
36 60% of people aged 50–64 years and 74% of those
37 aged 30–49 years [5]. Not being able to use tech-
38 nology puts older adults at a disadvantage in terms
39 of their ability to live and function independently





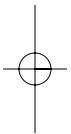
40 and to successfully negotiate modern environments.
41 For example, in today's work environments most
42 workers must interact with computers simply to per-
43 form their jobs. This is an important issue as the
44 number of workers aged 55 years and older, and espe-
45 cially those over 65, is expected to increase over the
46 next decade in most developed countries [2]. Thus,
47 one important issue that needs to be addressed is the
48 adaptation of information systems, including collab-
49 orative work systems, for older workers.

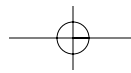
50 Technology also holds great potential for improv-
51 ing the quality of life for older people. For example,
52 technology and telemedicine/e-health applications
53 clearly offer the possibility of increasing the physical
54 and emotional well-being of older people and allow-
55 ing them to remain at home longer. With expansions
56 in the 85 and older population, of whom approxi-
57 mately half require assistance with everyday activities,
58 we will need information systems designed to help
59 the aging to maintain their independence and meet
60 their social, health, and other needs. Technology can
61 be used to monitor people with chronic illnesses.
62 Videoconferencing applications may also make it
63 possible for physicians to "visit" or counsel patients,
64 particularly those with impaired mobility, minimiz-
65 ing the need for travel. The Internet also affords
66 patients access to a vast array of health-related infor-
67 mation. It can also be used to facilitate communica-
68 tion between the patient and a provider, other family
69 members, or people who have the same illness or dis-
70 ease (via online support groups). Finally, reminder
71 systems such as automated messaging can be used to
72 remind patients of medication regimes or medical
73 appointments.

74 Use of technology can also enable older people to
75 remain connected to family and friends, especially
76 those who are distant. For example, Plaisant et al. [6]
77 describe the use a system that facilitates the sharing of
78 calendar information between remotely located,
79 multigenerational family members. Online commu-
80 nities may expand social opportunities for older peo-
81 ple and provide a mechanism for social interaction,
82 and online courses expand educational options.

83 84 **Conclusion**

85 Computer technology has enormous potential for
86 improving the quality of life for older adults and their
87 families. However, for the full potential of technology
88 to be realized for these populations the needs and
89 abilities of older adults must be considered in system
90 design. Unfortunately to date, designers of most sys-
91 tems have not considered older adults as active users
92 of technology and thus many interfaces are designed
93 without accommodating the needs of this population
94 [1]. Usability problems relate to screen design, input
95 device design, complex commands and operating
96 procedures, and inadequate training and instruc-
97 tional support. Ensuring that older people are able to
98 adapt successfully to technology requires detailed
99 information on user preferences and needs, problems
100 with existing systems, and the efficacy of design solu-
101 tions. Designers must become aware of the character-
102 istics of older adults and ensure that systems are





103 designed with the capabilities and limitations of the
 104 older user in mind. For example, careful attention
 105 must be paid to the design of the display screen,
 106 choice of input device, and the design of instructional
 107 materials and technical support systems (such as help
 108 functions). Given age-related changes in cognition,
 109 careful consideration also must be given to the orga-
 110 nization of and quality of information displays. A
 111 one-size-fits-all approach does not meet the needs
 112 and preferences of most older people. In sum, the
 113 “graying” of post-industrial societies will require
 114 changes in both the usability features and the nature
 115 of information systems.

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118 References

119 1. Czaja, S.J. and Lee, C.C. Designing computer
 120 systems for older adults. In J. Jacko and A. Sears,
 121 Eds. *Handbook of Human-Computer Interaction*.
 122 Lawrence Erlbaum and Associates, NY, 2003,
 123 413–428.

124

125 2. Czaja, S.J. and Moen, P. Technology and employ-
 126 ment. In R. Pew and S. Van Hamel, Eds., *Technol-
 127 ogy and Adaptive Aging*, National Research Council,
 128 Washington, DC, 2004, 150–178.

129

130 3. Czaja, S.J., Sharit, J., Ownby, R., Roth, D., and
 131 Nair, S. Examining age differences in performance
 132 of a complex information search and retrieval task.
 133 *Psychological and Aging* 16 (2001), 564–579.

134

135 4. Federal Interagency Forum on Aging Related Sta-
 136 tistics. *Older Americans 2000: Key Indicators of Well-
 137 Being*. Washington, DC, 2000.

138

139 5. Pew Internet and American Life. *Older Americans
 140 and the Internet*. Pew Internet and American Life
 141 Project, 2004.

142

143 6. Plaisant, C., Bederson, B.B., Clamage, A.,
 144 Browne-Hutchinson, H., and Druin, A. Shared
 145 family calendars: Promoting symmetry and accessi-
 146 bility. *ACM Transactions on Computer-Human Inter-
 147 action*. Forthcoming.

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