



# Chapter

## A Brief History of Universal Design



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Like a bean sprout that emerges only after its root is deep and strong, universal design has its beginnings in demographic, legislative, economic, and social changes among older adults and people with disabilities throughout the 20th century.

## Changing Demographics

At the beginning of the 20th century, older adults and people with disabilities were true minorities. The average human lifespan was only 47 years, and people who received spinal cord injuries had only a 10% chance of survival. Most people with chronic conditions lived in nursing institutions.

People are living longer today. The average lifespan has increased to 76, largely due to healthier living, better medicine, and vaccines and sanitation that have virtually eliminated many killer infectious diseases (*The Denver Post*, 1998). Nearly 80% of the population now lives past the age of 65. Projections based on U.S. Census Bureau estimates indicate that the number of persons ages 65 and over will grow to almost 40 million by the year 2010 (Jones and Sanford, 1996). Last year, 4 million people in the United States were over the age of 85 and about 60,000 topped age 100. By 2020, the Census Bureau estimates that 7 million to 8 million people will be over age 85 and 214,000 will be over age 100. By contrast, at the end of World War II, only 1 in 500 made it to age 100 (*The Denver Post*, 1998).

In addition, more people are now living with disability. Two world wars created a huge population of veterans with disabilities, and antibiotics and other medical advances enabled people to survive accidents and illnesses which were previously fatal. At the end of 1994, 53.9 million people in the United States (20.6% of the population) had some level of

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disability (Figure 1), and 26.0 million (9.9%) had a severe disability. It is estimated that among the population 6 years and over, 8.6 million people had difficulty with one or more activities of daily living (ADLs) and 4.1 million needed personal assistance of some kind (McNeil, 1997).

These demographic changes result in a population that is older and more disabled than many realize, and these trends continue. The limitations imposed by products and environments designed and built without regard to the needs and rights of all American citizens are significant but often unrecognized.

Public acknowledgment of people with disabilities and progress toward universal design has developed in the last few decades along three parallel tracks of activities: legislation fueled by the disability rights movement, the barrier-free design to universal design movement, and advances in rehabilitation engineering and assistive technology.

## Federal Legislation

The Civil Rights Movement of the 1960s inspired the subsequent Disability Rights Movement that greatly influenced the legislation of the 1970s, 1980s, and 1990s. These new laws prohibited discrimination against people with disabilities and provided access to education, places of public accommodation, telecommunications, and transportation.

The barrier-free movement in the 1950s began a process of change in public policies and design practices. The movement was established in response to demands by disabled veterans and advocates for people with disabilities to create opportunities in education and employment rather than institutionalized health care and maintenance. Physical barriers in the environment were recognized as a significant hindrance to people with mobility impairments.

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Efforts of the Veterans Administration, The President's Committee on Employment of the Handicapped, and the National Easter Seals Society, among others, resulted in development of national standards for "barrier-free" buildings. In 1961, the American Standards Association (later known as The American National Standards Institute, or ANSI), published the first accessibility standard titled, "A 117.1 – Making Buildings Accessible to and Usable by the Physically Handicapped." These standards were not enforceable, however, until adopted by state or local legislative entities.

A number of states responded with their own accessibility standards, and by 1966, 30 states had passed accessibility legislation; by 1973, the number was up to 49 states. Individual federal agencies attempted to provide minimum access through additional regulations and standards. This resulted in numerous, often differing accessibility guidelines. An attempt to "standardize" these federal guidelines occurred in 1984 when the ANSI specifications were incorporated into the Uniform Federal Accessibility Standard (UFAS).

Significant federal legislation began to be passed in the late 1960s, including the following:

The Architectural Barriers Act of 1968 mandated the removal of what was perceived to be the most significant obstacle to employment for people with disabilities: the physical design of the buildings and facilities they had to use on the job. The Act required all buildings designed, constructed, altered, or leased with federal funds to be made accessible.

Section 504 of the Rehabilitation Act of 1973 was the first civil rights law for people with disabilities. This Act made it illegal to discriminate on the basis of disability and applied to federal agencies, public universities, federal contractors, and any other institution or activity receiving federal funds. The promulgation of regulations was initially stalled by the U.S. Department of Health, Education and Welfare. In protest, disability rights advocates held numerous demonstrations. As a result, regulations were finally issued in 1977.

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The Education for Handicapped Children Act of 1975 (now called the Individuals with Disabilities Education Act, or IDEA) guaranteed a free, appropriate education for all children with disabilities. This Act had an effect on educational programs as well as on the facilities in which they were conducted.

The Fair Housing Amendments Act of 1988 expanded the coverage of the Civil Rights Act of 1968 to include families with children and people with disabilities. The Act required accessible units be created in all new multi-family housing with four or more units, both public and private, not just those that received federal funds. Accessibility Guidelines were issued by the U.S. Department of Housing and Urban Development in 1991 to facilitate compliance.

The Americans with Disabilities Act of 1990 (ADA) awakened widespread public awareness of the civil rights of people with disabilities. Discrimination in employment, access to places of public accommodation, services, programs, public transportation, and telecommunications is prohibited by this law. Physical barriers that impede access must be removed wherever they exist. The ADA has a uniform nationwide mandate that ensures accessibility regardless of local attitudes. The Architectural and Transportation Barriers Compliance Board (Access Board) issued Accessibility Guidelines for accessible design in 1991. These guidelines were adopted with modifications by the U.S. Department of Justice and became the enforceable ADA Standards for Accessible Design.

The Telecommunications Act of 1996 mandates that telecommunications services and equipment and customer premises equipment be “designed, developed, and fabricated to be accessible to and usable by individuals with disabilities, if readily achievable.” It applies to all types of telecommunications devices and services, from telephones to television programming to computers.

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Federal legislation began as requirements for minimum accessibility to small percentages of facilities and features, which lawmakers felt was sufficient. It has progressed to providing full access to public and private programs and facilities and has begun to affect devices and services in the home.

## Barrier-Free to Universal Design

Early on, advocates of barrier-free design and architectural accessibility recognized the legal, economic, and social power of a concept that addressed the common needs of people with and without disabilities. As architects began to wrestle with the implementation of standards, it became apparent that segregated accessible features were “special,” more expensive, and usually ugly. It also became apparent that many of the environmental changes needed to accommodate people with disabilities actually benefited everyone. Recognition that many such features could be commonly provided and thus less expensive, unlabeled, attractive, and even marketable, laid the foundation for the universal design movement.

## Rehabilitation Engineering and Assistive Technology

Rehabilitation engineering and assistive technology emerged in the middle of the 20th century. Efforts to improve prosthetics and orthotics intensified with the return of thousands of disabled veterans from World War II in the 1940s. During the 1950s, engineering research centers sponsored by the Veterans Administration and other federal organizations were established to address other technological problems of rehabilitation, including communication, mobility, and transportation. Rehabilitation engineering centers expanded during the 1960s and 1970s.

Rehabilitation engineering became a specialty that applied scientific principles and engineering methodologies to these problems. The label, “assistive technology,” was applied to devices for personal use created specifically to enhance the physical, sensory, and cognitive abilities of people with disabilities and to help them function more independently in environments oblivious to their needs.

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## Intersecting Paths

Though coming from quite different histories and directions, the purpose of universal design and assistive technology is the same: to reduce the physical and attitudinal barriers between people with and without disabilities.

Universal design strives to integrate people with disabilities into the mainstream and assistive technology attempts to meet the specific needs of individuals, but the two fields meet in the middle. In fact, the point at which they intersect is a gray zone in which products and environments are not clearly “universal” or “assistive,” but have characteristics of each type of design. A number of products have enjoyed crossover success, often starting as assistive devices and becoming mainstream products, such as the kitchen utensils with thick grips popularized by Oxo International in their “Good Grips” line. A few products have moved the other way, typically conceived as high-tech devices for small markets that find new application in the rehabilitation arena, such as voice recognition software.

The potential benefit of cooperation between professionals in both fields is exciting but mostly untapped. Commercial designers have much to learn from rehabilitation technologists familiar with the ergonomics of disability and aging. Rehabilitation technologists and their clients can benefit from designers’ expertise in creating products and environments that are functional, safe, attractive, and marketable for a wide diversity of users.

## Changing Economics

The economic downturn of the 1980s had a negative impact on funds for rehabilitation engineering research and the removal of environmental barriers. At the same time, product manufacturers were beginning to recognize the market-broadening potential of more accommodating products.

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In 1988, New York City's Museum of Modern Art exhibit, "Designs for Independent Living," featured products selected for their beauty as well as their consideration of the needs of older adults and people with disabilities. Selections included products from the United States, Denmark, England, Italy, Netherlands, and New Zealand. It was clear that the commercial world was beginning to acknowledge aging individuals and people with disabilities as viable customers.

In 1990, Oxo International introduced its Good Grips kitchen utensils for people who were limited by arthritis. These upscale products immediately found an enthusiastic audience, even though their advantages over utensils with oversized handles sold through assistive technology suppliers were primarily aesthetic. Oxo International grew at a 40% to 50% annual rate from 1990 to 1995, to \$20 million a year. Other companies quickly copied their approach.

Another emerging economic trend is the increasing "globalization" of the marketplace. Consumer businesses hoping to remain successful in the coming decades must recognize the opportunities and challenges inherent in global competition. While the size of potential customer markets is growing, the diversity of the consumer base is expanding at the same time to include differences in language and culture, customs, experiences, and historical design precedents. All of these increase the need for design that is sensitive to individual abilities and preferences.

Because reasonable cost is a fundamental issue in any design and production process, universal design has become a very marketable approach, since it addresses the diverse needs of a majority of consumers.

## Changing Social Climate

Throughout history, community attitudes and physical barriers in the built environment have prevented people with disabilities from fully participating in society. Access to education, employment, housing, recreation, cultural events, and transportation has been denied many people. Along with the growth in the disabled population, the quest for independence and equal rights has grown, as well.



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Buyers of assistive technology now demand that products be designed with concern for their impact on the image, as well as the function, of the user. Devices are expected to be appropriate for use at the office or school, at home, in the community, and on vacation.

Similarly, aging members of the baby-boom generation (those born between the years 1946 and 1964) have begun to see the usefulness of products conceived for people with limitations. In a 1990 issue of *Capturing Customers*, Peter Francese noted, “As more Americans age, products that offer youthfulness without denigrating aging will do well. These consumers are not like their parents – they don’t feel that older is ugly” (American Association of Retired Persons, 1992).

## The Future

At the end of the 20th century, the world is very different than 100 years ago. People are living longer and surviving better. Potential consumers of design who may be functionally limited by age or disability are increasing at a dramatic rate. These populations are no longer an insignificant or silent minority.

The current generation of children, baby boomers entering middle age, older adults, people with disabilities, and individuals inconvenienced by circumstance, constitute a market majority. All of these constituencies and indeed, all consumers, deserve to be recognized and respected. Facilities, devices, services, and programs must be designed to serve an increasingly diverse clientele.

The demographic, legislative, economic, and social changes that brought us to this point are increasing the momentum that will propel us into a 21st century that will need to be more accommodating of individual differences. Universal design provides a blueprint for maximum inclusion of all people.

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