From Universal Design by Edward Steinfeld + Jordana Maisel

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Defining Universal Design

Introduction

All new ideas are born and develop in a historic and cultural context. In Chapter 1, we described how universal design emerged from the disability rights movement. Here we examine the cultural context surrounding the birth of the idea. Doing so will help to put universal design into perspective with respect to the history of design. By identifying current design issues related to universal design, we can also speculate intelligently on how universal design will evolve as it becomes more mainstream and intersects with other design initiatives and contemporary cultural trends.

Although this book is targeted at the design professions, the concepts underlying universal design are of value to other professionals as well. In fact, at the time of this writing, two books have been published on universal design in education and public health professionals in different parts of the world have started to adopt the universal design philosophy. Just as sustainability extends beyond the world of design professionals, universal design also has a broader constituency. The range of interest groups that see value in universal design will be very important for increasing adoption of the philosophy.

Emergence of Universal Design

Over the last 40-plus years, a great deal of effort has been devoted to making the built environment accessible. Accessibility laws, such as the Architectural Barriers Act (1968), Section 504 of the Rehabilitation Act of 1973, the Fair Housing Act Amendments (1988), and the Americans with Disabilities Act (1990) specify minimum requirements to ensure that the built environment does not discriminate against people with disabilities. Experience with accessibility laws led Ron Mace, Ruth Hall Lusher, and others (Bednar 1977; Lusher and Mace 1989; Welch 1995) to recognize the need for a different approach to design of the built environment, which they termed "universal design." The premise for this new approach was that the environment could be much more accessible than laws could realistically mandate

on the basis of nondiscrimination. If more attention was given to improving function for a broad range of people, they argued, a usable world for people with disabilities would become the norm.

Universal design increases the potential for developing a better quality of life for a wide range of individuals (Russell 1999; Stineman et al. 2003). However, it does not eliminate the need for standards that define the legal baseline for minimum accessibility. It creates products, places, and systems that reduce the need for special accommodations and many expensive, hard-to-find assistive devices. It also reduces stigma by putting people with disabilities on an equal playing field with the able bodied population. It provides benefits not only to people with functional limitations but also to society as a whole (Danford and Maurer 2005). Universal design supports people in being more self-reliant and socially engaged. It does not substitute for assistive technology, but it makes such technology easier to use by providing appropriate support. For businesses and government, it reduces the economic burden of special programs and services designed to assist individual citizens, clients, and customers. Although we should not forget the origins of this design philosophy, as we shall see throughout this book, it no longer should be identified solely with disability.

Definition

The most common definition of universal design is:

> The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.
>
> —*Mace (1985)*

Experts and those with experience in the field understand this definition, but it leaves something to be desired in terms of explaining the concept to the uninitiated. What do the terms "all people," "greatest extent possible," and "without the need for adaptation and specialized design" really mean in practice? Imrie and Hall (2001), for example, argue that the definition, by the lack of explicit attention to disability, seems to promote the abandonment of special accommodations for people with disabilities. Moreover, if taken literally, the definition seems unrealistic. Everyone knows, for example, that there will always be someone who will not be able to use a particular product or environment.

Other terms have been used for the same concept. For example, the term "design for all" is used in Europe:

> . . . design for human diversity, social inclusion, and equality.
>
> —*Design for All Europe (2008)*

> [T]he intervention on environments, products, and services with the aim that everyone, including future generations, regardless of age, gender, capabilities, or cultural background, can enjoy participating in the construction of our society, with equal opportunities participating in economic,

> social, cultural, recreational, and entertainment activities while also being able to access, use, and understand whatever part of the environment with as much independence as possible.
>
> —*Design for All Foundation (n.d.)*

In the United Kingdom, the term "inclusive design" is popular:

> The design of mainstream products and/or services that is accessible to, and usable by, as many people as reasonably possible . . . without the need for special adaptation or specialized design.
>
> —*British Standards Institute (2005)*

Clearly, we are still in a time of transition regarding the definition of universal design, but there seems to be a developing consensus. The similarity in concepts is clear from the definitions. Some definitions are explicit about the outcomes for universal design practice that helps to clarify its purpose: social inclusion, equality, and independence. Others explicitly mention the concept of diversity beyond design for disability. An essential idea incorporated in all the definitions is that it will benefit a broader population than conventional practices—inclusion is the ultimate goal and design for inclusion results in benefits for all.

But there are still problems with all the definitions. Most also include a caveat on the need to be reasonable in pursuing that goal. This seems contradictory, a sort of cop-out. Imrie and Hall (2001), in criticizing the Mace definition of universal design, argue that the concept is too utopian and does not reflect the political nature of the process of inclusion. They point out that presenting design for inclusion in this way raises false hopes with an emphasis on technical solutions rather than process and leads to solutions that, in practice, do not really address all the needs of the population, particularly people with disabilities. Steinfeld and Tauke (2003) also reflect on the pitfalls of utopian thinking, particularly with respect to encouraging adoption by contemporary design educators who dismiss utopian and reformist ideas as a vestige of modernist thought that misled people into thinking that design alone could change the world. They point out, however, that idealism is not necessarily a bad thing and is attractive to both students and educators alike. According to Steinfeld and Tauke, the term "universal designing" may characterize the concept better than the noun form, as it reflects a constant evolutionary process leading to more and more inclusion over time.

In light of these critiques, we propose this improved definition:

> Universal design is a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation.

In short, universal design makes life easier, healthier, and friendlier. This process involves continuous improvement, based on the resources available, toward the ultimate goal of full inclusion. Thus, universal design should recognize the context in which design takes place rather than imposing an absolute standard to every situation. The definition frames universal design as both an idealistic approach in the long term and a realistic approach in the short term. It specifically addresses the outcomes of the process, including the often neglected outcomes of improved health and social participation. In addition, it recognizes that inclusion must address the full diversity of

the population. Finally, it does not focus design on the physical environment alone, recognizing that the concept is equally useful in the virtual world of information and in delivery of services.

Some critics have objected to the word "universal" because it implies that there is one design solution for everyone, but we believe that this word is essential to communicate the ultimate goal of design for inclusion. The word "universal" should be understood as it is used in terms like "universal suffrage" or "universal healthcare." The goal is universal access to the resources and benefits provided by civilized societies.

Origins

To put universal design into historical context, we need to go back to the origins of the design professions. In the first century BCE, Vitruvius, a Roman architect and engineer, wrote a treatise on architecture, *De Architectura* (*Ten Books on Architecture*, as it is known in English). This is the only book on architecture from the classical era of Western architecture that survives today. Vitruvius advanced the idea that good architecture must have three qualities: "firmness, commodity, and delight." In modern terms, we would call these qualities (structural) strength, usefulness, and character. This same credo can be applied to other design domains. Usefulness is the quality that underlies the concept of universal design. Clearly, it has been a recognized aspect of good design since the origins of the profession. However, the emphasis placed on usefulness has varied with the times and, with respect to this goal, the results often have left much to be desired. It is important to realize that there are many aspects to usefulness, from ease of construction to comfort, pleasure, and public benefit.

Vernacular buildings and products are usually constructed by the people who use them. Sometimes local craftspeople do some or all of the work, but they are still part of the same social world as their clients. Vernacular buildings and products are designed according to traditional patterns that change very little over time. In some societies, their forms have stayed pretty much the same for thousands of years. Usefulness plays a major role in the design of vernacular buildings and products (Williams and Williams 1974). Over time and through lived experience, vernacular building forms and tools were developed that closely fit the patterns of the inhabitants' lives, the availability of materials and knowledge, the local environment (e.g., climate and topography), and societal goals and values, the latter of which usually were derived from religion (Rapoport 1969). Some scholars have argued that vernacular designs are better than the work of professionals because of this close "fit" (Alexander 1964).

Most of the written histories of Western architecture and design, from the Renaissance on, have focused on the work of professional designers and ignored the vernacular. Since design professionals need to be paid for their work, only the upper classes and large institutions, such as governments and religious organizations, can usually afford to hire them. Although usefulness was important in architecture and urban design, between the Renaissance and the Industrial Revolution, it generally took a backseat to character in the professional ranks.

"Character" refers to the meaning of a place or object—its significance. It is important to note that character is not solely about aesthetics. Very practical things and ugly things have character as well as beautiful things designed primarily for aesthetic value. For the most part, professional designers were hired to create works that would enhance the positive meaning of places and objects to their clients or to the public. For example, a Gothic cathedral and the objects in it provide a place of enormous religious and cultural significance to the citizens of a

city, particularly since its construction might span several lifetimes and involve the congregants in fundraising, daily appreciation, and even volunteer effort.

Aesthetic expression uses formal manipulations to elicit emotional response. In design, aesthetic expression contributes to character, but it also has many useful purposes. It can be used to personalize a territory by distinguishing it from neighbors or to attract or repel people to or from a place or an object. It is often used to connote status. In a landmark book called *Theory of the Leisure Class*, the American sociologist and economist Thorstein Veblen (1994 [1899]) demonstrated how the process of consumption involves identity behavior. "Good taste" and fashion cycles can be understood as a means through which people communicate their superiority and power by demonstrating their ability to spend large amounts of money on "useless" things, meaning things of no practical value; in other words, if you can afford to buy useless things, you demonstrate wealth by doing so. The result of this "conspicuous consumption" is that prestigious homes are much larger in scale than the households really need, and luxury automobiles use more gasoline than necessary in order to provide more power to propel a larger vehicle at greater speeds than a neighbor's car. Wearing rare jewels, which are just rare rocks, is a great way to demonstrate wealth. Veblen's most intriguing example is the manicured lawn, which not only has no intrinsic value but is created by essentially pouring money into the ground, something only really wealthy people could afford to do. Although none of these things have any practical purpose, if one wishes to communicate superiority, then they are useful in a social sense, such as signs and labels. Thus, before we label certain features "useless," we have to define what we mean by the term. Often, usefulness is defined by the culture and changes over time.

Modernism and the Modernist Style

After the Industrial Revolution, and especially after World War I, usefulness in architecture became more important in the architectural profession. The advances of technology, science, and social justice that emerged during the 100 years spanning the middle of the nineteenth century to the middle of the twentieth century brought "function" to the foreground of design. After World War I, avant-garde designers who created what came to be known as the modernist style, in particular, put great emphasis on usefulness, although their success in reaching their goals is debatable. In discussing the "modern era," it is important to distinguish between modernism as a worldview, in which science and technology are viewed as the means toward progress in human civilization, and the modernist style, which is a formal language associated with modernism, but not necessarily the only manifestation of modernism in architecture.

Many other design professionals, building owners, and land developers were also motivated by modernist thinking as a worldview but did not necessarily adopt the same style in their products. For example, the phrase "form follows function," coined by Louis Sullivan, an architect who practiced in Chicago at the turn of the twentieth century and considered by some to be the "father of modernism," is often quoted as a maxim of modernist architecture. However, Sullivan never abandoned ornament, and the character of his work owed a debt to neoclassical traditions. Yet he did adopt new building technologies and incorporated a new way of thinking about building interiors and form as well as program in response to the mercantile society of his era. Over the course of twentieth century, the modernist worldview led to the widespread adoption of many new technologies, including indoor plumbing, central heating, steel frame and reinforced concrete construction, elevators, electricity, telecommunications, air conditioning labor-saving

appliances, and high-strength glass. These advances radically changed the built environment. Further, the use of new space planning concepts more suited to the nature of work and domestic life in an industrialized society improved productivity, comfort, and health.

The new approaches to architecture of the early twentieth century emerged at a time when social reformers and politicians viewed industrialization as an opportunity to eliminate the oppression of ruling elites and improve the welfare of the lower classes. Some architects in Europe, who were often overtly political in their goals, viewed industrialization as a means for social reform. They sought to develop housing types that would provide decent homes for the middle and lower classes and inspiring for all citizens of the new industrial states (Le Corbusier [1923] 1985). However, completed projects that addressed these goals were rare since, as mentioned, only wealthy individuals and large organizations could afford to pay architects to design their homes, and commercial and government clients tended to have conservative views about building design.

Modernist urban designers and planners needed to solve the problem of congestion, water distribution, and waste removal, which was impeding the utility of the city as a commercial and business tool, but they were also interested in solving the social problems of cities such as poverty, alcoholism, and communicable diseases, which were attributed to slums and substandard housing. They believed that their work should serve all citizens by providing affordable housing, efficient transportation, and healthy environments for all. This egalitarian idea led to experiments in social responsibility, such as Le Corbusier's housing for workers in Pessac, France, and his highly influential concept for a new urban paradigm, Ville Radieuse, a city of skyscrapers tied together with high-speed motorways that left vast areas of landscape open for use as recreation space (Le Corbusier 1985 [1923]).

After World War II, these ideas were put into practice on a grand scale to rebuild the devastated cities of Europe and accommodate the expanding populations of the postwar baby boom. Throughout Europe, the bombed-out cities and new suburban districts were planned using variations of the Ville Radieuse model. It was also used to replace inner city "slum" housing in North America under the rubric of "urban renewal." This could theoretically increase overall density and result in more economical construction than traditional low-rise, high-density housing, such as row houses and walk-ups as long as parking could be located underground or in garages. In practice, the modernists' concept for high-rise, high-density housing resulted in worse conditions than in earlier low-rise high-density neighborhoods. High-rise living proved to be dangerous and difficult to police, not suitable for low-income families with many children (see, e.g., Rainwater 1966).

In industrial design, modernist ideas were applied extensively in many different ways. One early trend of practice was the celebration of industrial materials and form. A second trend, which started in the early twentieth century but accelerated after World War II, incorporated rapidly emerging new technology, especially mechanization and electronics. New features were continuously introduced into manufactured products as each producer vied to attract market share. A third trend, which fueled the transition toward a consumer-oriented society, was the adoption of advanced technology and management practices to increase productivity in manufacturing itself. Intense competition on price inevitably led to the adoption of simple basic forms with limited variety, easy to manufacture in vast quantities at extremely low prices.

The consumption-driven marketplace is seen most significantly in the mass marketing of low-cost goods with short design-production cycles that introduce a dizzying array of innovative features every year. Today the product development cycle is, in some industries, less than six months. This practice gives the average citizen of industrialized countries access to a wide range of inexpensive products and tools that improve the quality of their lives immensely. Thus, from

the perspective of affordability, product design after World War II has certainly benefited the average person in highly developed countries through the introduction of labor-saving devices, prepared foods, and other time-savers. However, these products are often poorly designed for comfort, health, and convenience, are prone to failure, and have a short useful life due to the emphasis on competitive pricing, fashion cycles, and planned obsolescence.

In Europe, America, and Asia, housing is now constructed just like mass-marketed products, with the goal of providing decent housing for the masses of middle- and working-class people. American builders, in particular, developed an economical method after World War II to build affordable single-family dwellings for the middle classes in the growing suburbs. They did this by adapting a vernacular form of wood construction based on the inexpensive lumber available in the huge American forests. They also used rapid construction techniques to build community infrastructure, such as roads, bridges, and civic and commercial buildings. In the United States, federal policy stimulated new home construction. The building of homes was viewed as an economic stimulus because new housing had to be furnished and equipped, which drove the development of markets for furniture, appliances, and other manufactured goods (Hayden 2003).

In the public sphere, as the modern era advanced, buildings were stripped of expensive ornaments and money was invested in air conditioning, larger windows, electric lighting, signs, parking lots, and other features. Larger stores, often owned by corporate interests, emerged, enabled by the automobile-oriented transportation system, which increased the catchment area for each business. The workplace was transformed into large sprawling factories and corporate offices in efficient high-rise buildings and corporate office parks. The modernist style included design practices that were well suited to corporate clients once the construction technology was up to speed: efficiency, mass production, and application of technological know-how. Thus, elements of the new style were used to manage the public identity of corporate entities, a form of branding. Leading architects and designers such as Albert Kahn, Skidmore Owens and Merrill, Victor Gruen, Raymond Loewy, and Henry Dreyfus adopted formal principles from the modernist style in service of corporate clients. Eventually, the style became associated with corporate power.

The significance of late-twentieth-century commercial architecture in North America can be understood in its close relationship to mass-marketed consumer products (Gottdiener 1997). Large suburban shopping centers and big-box stores are efficient delivery systems that feed desire stoked by marketing through mass media. The sprawling economy of the suburbs is dependent on the ability of residents to get from place to place inexpensively and quickly. American innovations in merchandizing were imported by other wealthy countries. Today the global design culture is driven mostly by consumerism. This theme is evident in all of material culture, including agriculture, manufactured goods, housing, and settlement patterns. It reflects the social transition from an industrial economy to a consumer-oriented economy and the emergence, within 50 short years, of a huge urbanized population that does not have the means or the time to sustain a vernacular crafts-based design tradition.

Critiques of Modernist Style

Contemporary critics of post–World War II development argue that modernism threw the baby out with the bathwater (Duany, Plater-Zyberk, and Speck 2001). They argue that post–World War II suburban architecture and town planning rejected principles of design that had been developed over centuries. New buildings, settlements, and products lost the good qualities of

traditional urban development and artistry. It has become obvious that the material culture of the late twentieth century will not be sustainable for long due to its impact on the environment. Ironically, some of the blame for this situation can be assigned to the practitioners of the modernist style who were so sanctimonious in their missionary efforts, who controlled the leading design schools, and who had the ear of design critics.

Despite the claims of its adherents, the modernist style often was not very functional at all and not very inclusive in its perspective. For example, the residents of Pessac, the prototypical housing project designed by Le Corbusier, reacted to the difficulties of living in modernist-style buildings by radically transforming the original flat-roofed, unadorned houses into a quaint pastiche of traditionally inspired cottages with peaked roofs, decorative trim, and shutters (Boudon 1972). Social scientists studying social housing built using the principles of the modernist style discovered that, when urban redevelopment schemes and affordable housing concepts inspired by modernist ideas were applied to house low-income populations, they dislocated families, bred crime and alienation, and perpetuated the stigma of being poor (Gans 1962; Rainwater 1966).

Commercial interests and government policy makers produced architecture and urban development that was a successful adaptation to the social transition occurring, but, like early mass-manufactured products, also had some serious flaws. Such critics as Jane Jacobs (1961), Andres Duany (Duany et al. 2001) and Ellen Dunham-Jones and June Williamson (2009) argue that features of suburban development, such as single-use zoning and automobile-oriented traffic engineering practices, led to the construction of communities that are dysfunctional and perhaps antisocial. More recent research demonstrates that the low-density sprawl that makes up most urban areas in North America is even unhealthy due to air pollution and automobile dependency (Frumkin 2006; Marshall, Brauer, and Frank 2009; Schweitzer and Zhou, 2010).

Return to Human-Centered Design

The problems with modernism in architecture and urban development became evident as early as the late 1960s. At that time, architects, planners, and social scientists, often laboring in obscurity, began advancing the idea that design could be human-centered and truly dedicated to usefulness. This refocus on usefulness was motivated by a deep sense of social responsibility.

These designers were dedicated to advancing the cause of people who had been underserved by mainstream professionals, and often needed strong advocates with technical knowledge to ensure that building and community development projects were more consistent with the priorities, expectations, and values of end users. These designers sought to change professional practices by incorporating methods of practice that involve the end users and knowledge from the social sciences of psychology, anthropology, and sociology. In particular, they adopted the new social priorities that emerged in the 1960s and 1970s: affordable housing, urban revitalization, mental health, aging, and early childhood education. Several threads of human-centered design thinking were started during those years and continue today, often in separate communities of practice, all of which are now converging to frame the project of universal design.

One group of design professionals, the Community Design Center movement, focuses on changing the methods used in design practice to give more power to end users. These professionals found ways to provide free design services on a not-for-profit basis (Sanoff 2000). Another group developed methodologies for citizen participation in mass housing design like

the SAR group in the Netherlands that developed methods for designing housing to enable participation of end users (Habraken 1973) and the cohousing movement in Denmark, which is based on forming a community prior to construction that then takes control of the design and development process from private firms and government (McCamant and Durrett 1994). The neighborhood preservation movement, inspired by Jane Jacobs, sought to relearn and update approaches to urban planning and architecture that had proven successful in the past and had been abandoned as modernism took hold (Gratz 2010).

Another group of design professionals, often in collaboration with research scientists, focused on changing the utilization of knowledge in design practice. Working with human factors and ergonomics (HFE) researchers, they started applying to building design problems scientific research on human performance that had been developed to improve productivity and safety in the workplace and in transportation (Wolski, Dembsey, and Meacham 2000). This thread of work continues to this day within the HFE field. The human factors researcher and design critic Donald Norman, a psychologist (2004) has been extremely influential in promoting a human-centered approach to product design, especially by demonstrating the role of the emotional aspect of design (aesthetics) in usability.

Another group of design professionals began working with social scientists to understand more about the relationship between the physical environment and human behavior and translating that knowledge into design tools (Hall 1969; Sommer 1969, 1974). In the late 1960s, this group formed the Environmental Design Research Association (EDRA), which still serves as an interdisciplinary forum for human-centered design. Still another research-oriented group, often overlapping with the EDRA group, emerged within the field of gerontology (the study of aging) through the Gerontological Society. These researchers focused on the importance of the physical environment to quality-of-life issues in old age (Lawton and Nahemow 1973). Today, design for aging, which used to be an exclusive concern of researchers and a few practitioners, has emerged as a major community of practice within mainline design professional organizations such as the American Institute of Architects.

The research community has embraced the development of evidence-based design guidelines as an efficient way to bridge the gap between research and practice. Guidelines can have a broader impact than discrete knowledge transfer activities within the context of a design project. In the United States during the 1970s, three government agencies were influential in sponsoring the development of such guidelines: the Center for Building Technology (CBT) at the National Bureau of Standards, the National Institute for Mental Health, and the Department of Defense. The Ford Foundation's Educational Facilities Laboratory also played an important role in sponsoring research related to educational environments (Marks 2009). CBT's influence was significant because most of its projects supported government-sponsored construction programs, and CBT leaders were key theorists in the study of "building performance" (Eberhard 2009). The performance concept for building design extended beyond user requirements to the full range of design issues. The performance concept was implemented through the "systems approach" that had been developed during wartime and the space race by operations researchers (Churchman 1968).

Even before these developments in the design professions, however, advocacy organizations for people with disabilities were organizing campaigns to make the public, the government, and the building industry aware of environmental barriers to independence and social participation. The barrier-free design movement actually began in the late 1950s in the United States as advocacy groups found that universities were not accessible to returning war veterans and young

adults who had contracted polio during the postwar epidemic. These advocacy groups developed consensus standards, began public awareness campaigns, wrote white papers, and worked with the government to develop legislation and regulations. The Easter Seals Society and the President's Committee for Employment of the Handicapped were leaders in this effort. The civil rights movement of the 1950s and 1960s was used as a model to ensure that civil rights were extended to people with disabilities. The barrier-free design movement eventually intersected the other threads of human-centered design.

Today, design culture is changing once again. Many new issues have captured the attention of design professionals and their colleagues in related professions. Those issues with a close relationship to universal design include sustainability, design for healthcare, aging in place, health promotion, homelessness, and social justice. Universal design has much to contribute to solving any social problem in which usability, health and wellness, and social participation play a major role in design response. Some examples for each of these problems are listed next.

Examples of Fields Related to Universal Design

Sustainability

Sustainable products used in buildings need to be designed to be operable by people with limited function in order to comply with accessibility laws, but they also have to be usable for the broader population or they will not be effective in practice. Due to their novelty, they often present usability issues for end users. Take the example of a waterless urinal. Every men's restroom requires at least one lower urinal. Most urinals are designed for the higher, traditional position. Although they can be installed at a lower height, the shape of the bowl is not designed to accommodate the lower position. The arc of a flow of liquid expands with distance from the source; thus, the bowl of a low urinal should be wider and protrude out farther. Conventional applications overlook this, and the maintenance problems that can result could negatively affect the acceptance of waterless urinals (see Figure 2–1) since the odor from spray on the floor and walls may be attributed to the urinal technology. Furthermore, some waterless urinals require use of special products to maintain a seal over the water in the drain and have traps that need to be replaced periodically. Some require special cleansers to protect the finish and special tools and procedures to change the trap filter. If not properly maintained, the urinals will cease to function, start smelling, and anger building occupants and owners. Bad experiences like this can result in replacing the product and even abandoning the goal of sustainability. Acceptance of innovative sustainable products can be enhanced through universal design.

Design for Healthcare

The adoption of evidence-based design has become an important trend in the design of healthcare facilities. For example, research has demonstrated that spread of infection is a primary factor in length of stay at acute care facilities. Creating products and design strategies that can reduce infection in such facilities requires a universal design approach that recognizes the diversity of healthcare professional staff, including language, size, physical ability, and other factors. The strategies used to control infection also reduce employee fatigue and

Figure 2–1: Waterless urinal. This is a waterless urinal at the EPA Region 8 Headquarters. While such urinals have benefits for the environment, they can present maintenance problems when not properly designed to make them easy to use and service.

increase their ability to pay attention to infection control procedures. For example, designing nursing units in hospitals to reduce trips from one place to another is an important method for reducing the spread of infection. In addition, some successful strategies, such as providing only single rooms in acute care facilities, improve the overall environment of healthcare facilities for the patients (Figure 2–2).

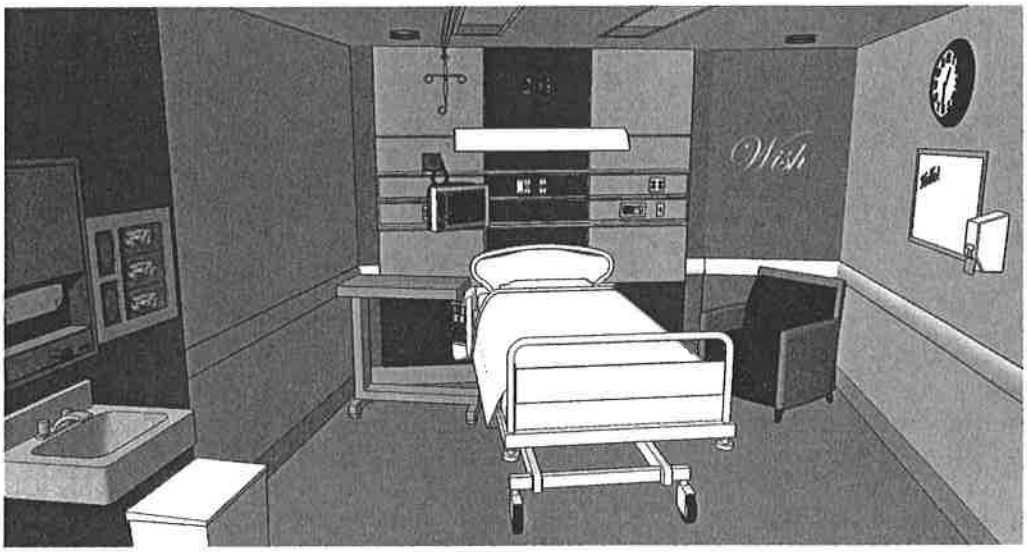

Figure 2–2: Single-patient recovery room. Single-patient rooms in healthcare facilities provide privacy without curtains and help prevent the spread of infections.

Source: Image courtesy of Smith + Associates Architects

Aging in Place

A large majority of individuals want to age where they currently live. However, at this time, only age-restricted housing for elderly persons can usually accommodate the health and social problems typically associated with aging. To remain in their own homes while aging, people need housing designs that can be adapted to a wider range of health conditions than traditional designs allow. Encouraging housing producers to adopt universal design features is a key aspect of design for aging in place. This includes a no-step entry, bathrooms on an accessible floor level, potential for a sleeping space on an accessible level, good lighting, efficient space planning, and other features that reduce effort and accommodate short-term and chronic disabilities (Figure 2–3).

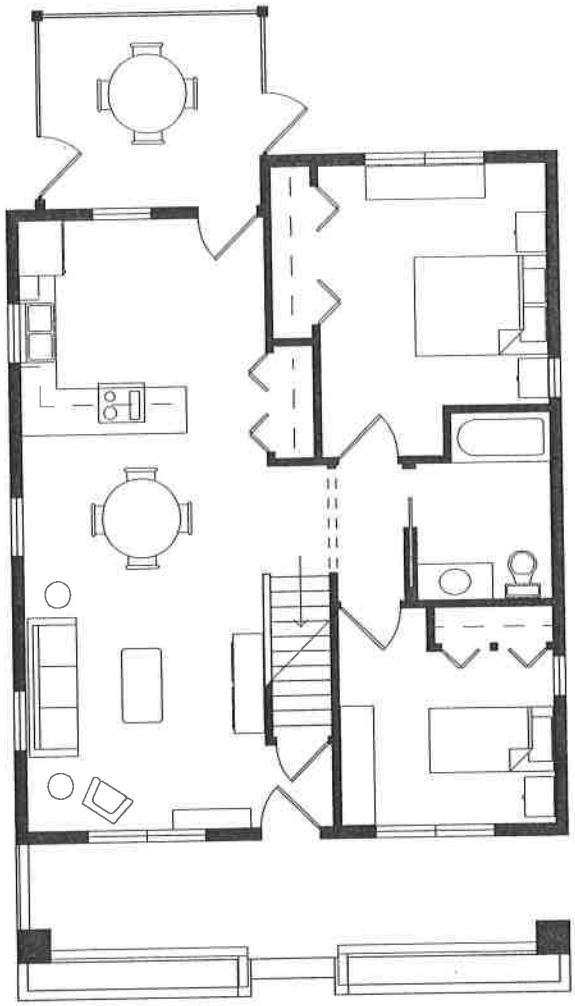

Figure 2–3: Home plan for aging in place. This plan has no-step entries at the front and rear. It has first-floor bedrooms, kitchen, and laundry facilities, and the tub can be easily replaced with a roll-in shower if needed. This home has a first-floor interior footprint of only 930 square feet, which demonstrates that homes can be small and affordable while still allowing aging in place.

Source: From Inclusive Housing: A Pattern Book Design for Diversity and Equality by The Center for Inclusive Design and Environmental Access. Copyright © 2010 by Edward Steinfeld and Jonathan White. Used by permission of W.W. Norton & Company, Inc.

Health Promotion

Environmental design is now recognized as a major component of health promotion. Nowhere is this more evident than in supporting active living to reduce obesity. Older people and those with disabilities have higher rates of obesity than the population at large. Thus, they are a major target group for such interventions. In addition, reducing obesity and inactivity in children is an important step in reducing disability rates in the future. Locating services within a half-mile radius of all residences is known to increase walking rates significantly. However, older adults, people with disabilities, and young children need a shorter distance to services to make them usable. Older persons and individuals with disabilities may also need additional public transportation options to maintain active lifestyles. Moreover, safe and accessible street crossings and good security are particularly important to encourage walking for all three groups. Active living interventions can benefit from applying universal design to land use planning, zoning, and accessible housing policy to increase choices of housing types and provide mixed-use centers that reduce travel distances and encourage walking (Figure 2–4).

Figure 2–4: Mizner Park, Boca Raton, FL. This mixed-use center in a popular retirement area includes residential, retail, entertainment, civic, and outdoor recreation facilities. Some on-street parking is provided. Additional parking is located in garages behind the commercial and residential buildings. Mixed uses promote active living because walking destinations are close to residences

Homelessness

Displacement from one's home is a frequent occurrence throughout the world. Lately it seems that each season brings another natural disaster or political upheaval with mass dislocations, even in highly developed countries. In low-income countries, chronic homelessness is a major social problem. Homeless people have disproportionately high rates of disability, especially mental health conditions. Women and children are particularly vulnerable to violence and exploitation when they are displaced, as in refugee camps. Applying universal design to this severe problem should be an important goal of humanitarian efforts. Such an initiative would involve rethinking everything from emergency response policy to product design. One example is the development of policy initiatives in emergency camps to protect vulnerable groups at shared sanitary facilities. Another is the design of water containers that reduce the number of trips members of a household have to make to obtain water for a day (Figure 2–5).

Social Justice

Throughout the world, designers with a sense of social responsibility are concerned that good design, like many other resources of society, is a commodity that many cannot afford. Although initially focused on disability rights, universal design can focus on any civil rights issue because ultimately design for diversity is concerned with social justice for all. Thus, universal design should give attention to supporting access to housing, education, healthcare,

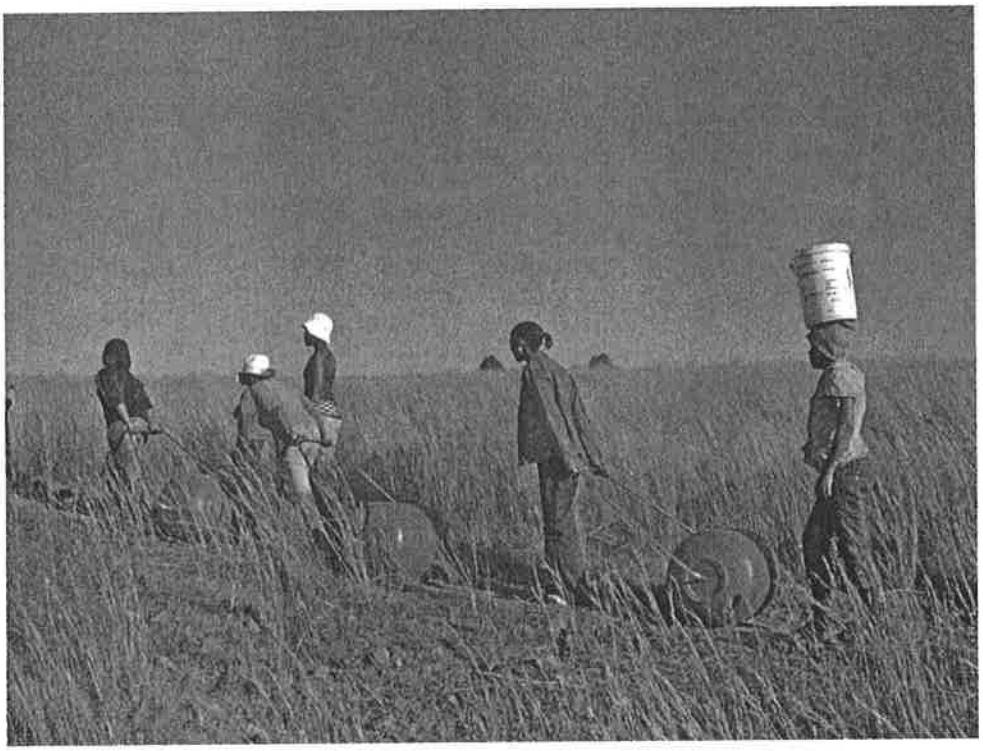

Figure 2–5: Hippo Water Roller. This design, inspired by a lawn roller, reduces the need for lifting and carrying and allows an individual to carry more water at one time (hipporoller.org).

Source: Image courtesy of Grant Gibbs

transportation, and other resources in society for all those groups that have been excluded from full participation. Universal design is particularly appropriate in the context of design for low-income minority groups, which often have higher rates of disability than the general population (Figure 2–6).

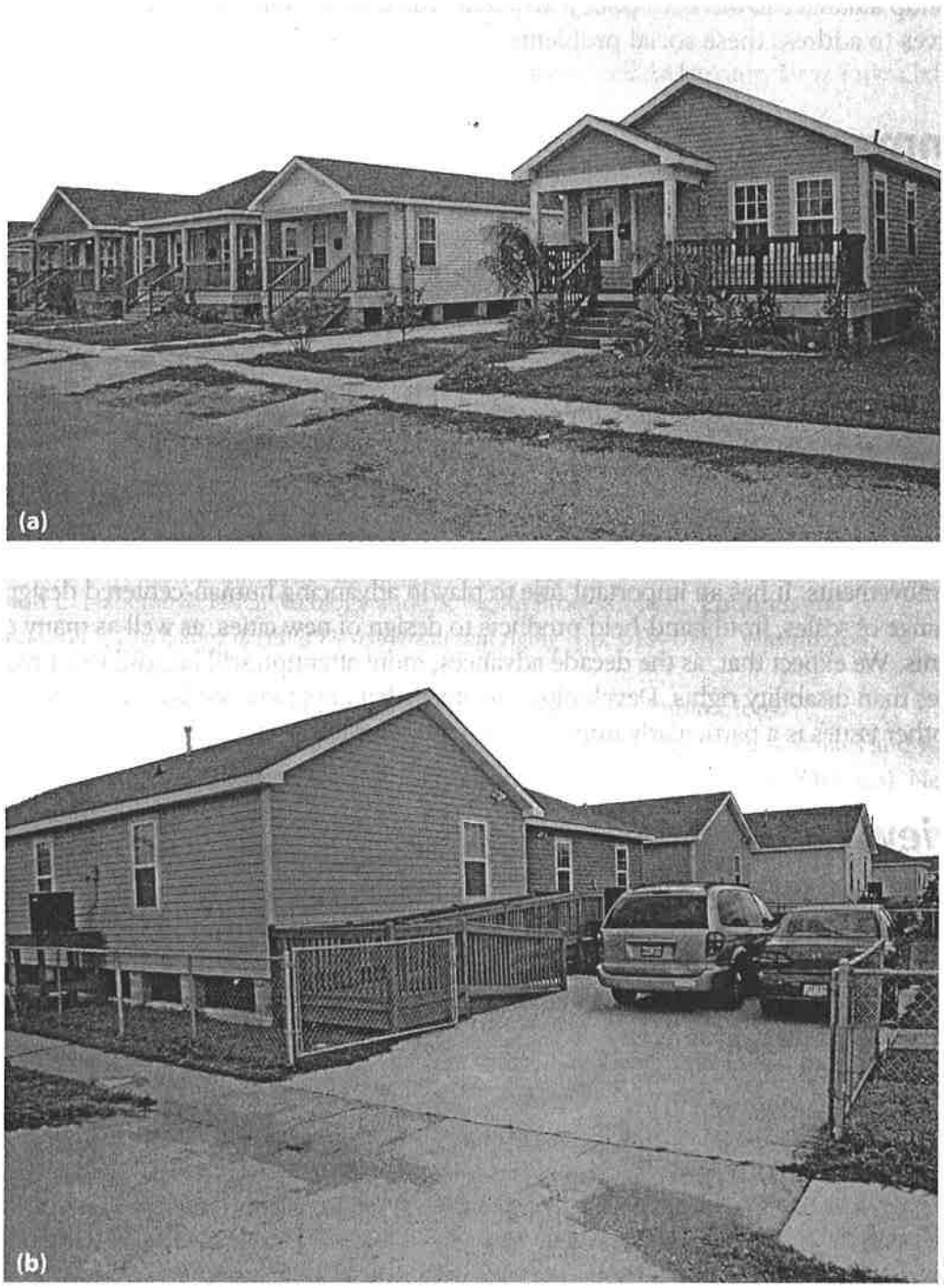

Figure 2–6: Musician's Village, New Orleans, LA. Habitat for Humanity is building a village for low-income musicians complete with a music school where residents can give lessons and concerts. (a) Street view of houses. (b) Accessible home.

The examples just presented demonstrate the potential of universal design to solve contemporary social problems and the range of applications that are possible. Although universal design emerged as a response to the needs of people with disabilities, it is clear that the philosophy has much to contribute at an even broader scale. Increasing adoption of universal design in these other fields will provide greater resources to help practitioners, including more publications, design tools, and research. Thus, it is mutually beneficial for universal designers to develop alliances to advance policy, articulate the intersections to practice, and develop joint initiatives to address these social problems.

Summary

Usefulness has been an important part of design practice since the first principles of design practice were written. It was an important aspect of modernism, and it continues to have significance. Critics of both the modernist style and our contemporary consumer-oriented urban culture often focus on the need for more human-centered design, in everything from consumer electronics to urban planning.

The concept of human-centered design was formulated over 50 years ago, in the 1960s. Since that time, it has taken many forms. Many disciplines are involved in the various threads of human-centered design practice, including design professionals, industrial and biomedical engineers, behavioral scientists, rehabilitation scientists and therapists, physicians, nurses, and public health professionals.

Universal design married the ideals of human-centered design with the social goals of the civil rights movements. It has an important role to play in advancing human-centered design across a wide range of scales, from hand-held products to design of new cities, as well as many different social problems. We expect that, as the decade advances, more attention will be paid to a broader range of issues than disability rights. Developing initiatives that apply knowledge from universal design to these other issues is a particularly important direction for the continued evolution of the field.

Review Topics

1. Describe the history of "usefulness" in design and explain why it is becoming more important.
2. What are some critiques of modernism? How is universal design related to yet different from modernism?
3. What other contemporary design issues have a relationship to universal design? Explain the relationships using examples.

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