Better Designs, Better Outcomes:
The Role of Product Designers in Assistive Technology Research
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Abstract
By collaborating with designers, assistive technology (AT) researchers can improve their odds for success. The ethnographic, user-centered approach and corresponding research methods used by design researchers are a valuable complement to the quantitative approach and methods commonly used for AT research. A design research methodology is particularly useful at moving beyond existing solutions, and uncovering the "unarticulated needs" of AT consumers. The resulting devices and services can better meet the needs, wants, and desires of AT consumers, therefore improving consumer satisfaction and decreasing the likelihood of device abandonment.

AT Consumers in the Twenty-first Century
Faced with increasing political and economic pressures, developers and providers of assistive technology (AT) are being forced to improve AT outcomes while using fewer resources (1, 2). These pressures will only increase as the Baby Boomers now begin to retire, creating a "demographic tidal wave" (3). And the users of AT are applying their own pressure to the industry. In the twenty-first century "experience economy," (4) the commoditization of goods and services has placed the consumer in a position of greater power. Successful businesses can no longer merely deliver goods and services on time for a fair price-they are now expected to provide customers with "memorable experiences." Consider how Starbucks has transformed the coffee "experience" in this country. Is the AT industry ready for the experience economy? Much of the AT literature suggests that the answer is "no." Rather than focus on research outcomes, therefore, I would instead like to focus on how we might better *approach* AT research.

The AT marketplace is considerable. ABLEDATA, the AT product database sponsored by the National Institute on Disability and Rehabilitation Research, lists more than 32,000 different AT and rehabilitation devices available to consumers (5). However, approximately one third of all assistive technology devices are eventually abandoned by users (6). Research indicates that this high rate of AT abandonment would be decreased if consumers were involved in both the design and development process (7), and the eventual selection process (6, 8). Clearly, AT consumers are too often being left out of the equation. Indeed, it has been suggested, "most [AT] providers focus just on functional and clinical status with little or no appreciation for other important factors such as customer satisfaction, value, quality, or cost" (2). Even functional AT devices may be rejected by increasingly demanding consumers. As Pape, Kim, and Weiner have suggested, "the effectiveness of [assistive technology] in reducing environmental obstacles is not. The sole determinant of whether devices are used or abandoned" (9). In their study of mobile arm supports, Yasuda, Bowman, and Hsu (10) had similar findings. They note that, "although patients may meet the physical criteria and the therapists may identify functional goals, a need *identified by the patient* is the basic indicator of success."

Studies also show that the appearance of a particular device *does* influence initial acceptance, regardless of its functional capabilities (10, 11). And "personal factors" (9), such as social stigma and personal identity, also need to be carefully considered. Developers and providers of AT devices, therefore, need to approach AT much as they would any other consumer products, shifting "from a medical approach to a social approach, where end-users tend to regard themselves no longer as *patients*, but as *consumers*" (8). One of the most effective ways by which AT researchers can make this shift is by collaborating with product designers—who have, in recent years, begun using innovative methods to conduct "consumer research."

Designers and Design Research
Many industries and professions have been affected by the experience economy. News stories abound of jobs being outsourced and "offshored" (12). The product design profession has been hard hit, but has also

responded better than most. According to *BusinessWeek* editor Bruce Nussbaum, "the design profession shifted its core competencies from drawing to thinking, from styling to innovating, from shaping things to visualizing new business paradigms" (13).

When the product design profession first took root in the U.S., during the 1920s and 1930s, designers were commissioned primarily to put a "pretty face" on something developed by engineering departments. However, beginning in the 1950s, designers began conducting "fieldwork" (14) to gain a better understanding of consumers. During the 1980s, the concept of user-centered design (UCD) became popular, largely from the writings of Donald Norman, who describes UCD simply as "a philosophy based on the needs and interests of the user, with an emphasis on making products usable and understandable" (15). These days, stiff global competition has forced designers to search for new ways of making products not merely "usable and understandable," but *meaningful* too.

Twenty-first century designers need to *understand* consumers of products and services, rather than merely *identify* them (16). Toward that end, designers have borrowed extensively from the field of anthropology, adopting and adapting the ethnographic approach to field research (17-21). Like anthropologists, designers study human behavior and "culture"—those "practices, artifacts, sensibilities and ideas that constitute and inform our daily lives" (22). But, whereas the anthropologist's study of cultures tends to be an end in itself, designers study cultures as a means to an end. According to Stephen Wilcox, a principal at Design Science, "[designers] should be concerned with the study of culture for one central reason: it is the primary determinant of what people buy and how they like it" (23).

The Ethnographic Approach to Consumer Research

Designers use ethnography to probe deeply into the daily lives of consumers, and uncover insights that lead to truly innovative products and services (19, 20, 24-26). Because the resulting design concepts are based on human behavior (rather than technology, for example), they are more likely to meet the (often unarticulated) needs, wants, and desires of consumers. Consider the many benefits such an approach brings to AT research. AT designs based on solid design research would likely see increased levels of user satisfaction and decreased rates of abandonment. Perhaps cost can be reduced as well, as "many bells and whistles [not really important to consumers] may be able to be eliminated, thereby freeing up funds for *key* technology functions and features" (6).

Most important, however, is the innovation that comes from such an approach. Often, people cannot articulate what they would like in a new product-AT or otherwise. Although "traditional" research methods—surveys, focus groups, and the like—provide useful demographic information, they simply cannot uncover "unarticulated needs." As Brenda Laurel has noted, "If you had asked any number of people in 1957 what they would like to play with, none would have suggested a plastic hoop that they could rotate around their hips" (20). These "unarticulated needs"—those things we never knew we couldn't live without—have been the source of many successful product designs (25-27). Which is why many companies today—including industry-leading giants like Microsoft and Procter and Gamble—employ design researchers who use an ethnographic approach (19, 24, 27, 28).

Collaboration: The Key to Success

In her 2002 editorial/introduction to a special AT issue of *Disability and Rehabilitation*, Marcia J. Scherer describes the many benefits of "a partnership of rehabilitation professional and consumer" (6). What I am suggesting is that this partnership needs to include designers as well, armed with their unique methods for understanding consumers. Without the design research component, AT developers and providers will fall short of their innovation potential. As an article in *Harvard Business Review* notes, "all companies have capabilities they are failing to tap in their quest to create innovative products and services because those who know what *can* be done are not generally in direct contact with those who *need* something done" (27).

In fact, collaboration and innovation go hand in hand. According to a recent article in *Design Management Journal,* "much of the current thinking and research dealing with innovation and new product development holds that a multidisciplinary approach should be used when developing new products" (29). Fortunately, trends in industry and academia support such an approach. Many research initiatives now feature multiple

disciplines and different modes of thinking as common elements to address increasingly complex problems. In part, this is simply a result of U.S. federal funding agencies increasing their support for teamwork. "After years in which federal research funds focused largely on discipline-specific projects," notes an article in the *Chronicle of Higher Education* (30), "government agencies are increasingly encouraging collaboration, and appear to be providing a growing amount of money for interdisciplinary research." The numbers are substantial: "federal funding for interdisciplinary research and development at U.S. universities climbed to $675 million in 2002, more than double the $330 million in 1997" (31). Even more impressive, the National Institutes of Health has specifically earmarked $2.1 billion over five years for interdisciplinary initiatives (31).

Better Design, Better Experiences, Better Outcomes

A collaborative approach to AT development—one in which product designers play a critical role—is beneficial to everybody involved. The results of such a synergistic approach—AT devices and services that are better designed, and therefore more desirable to consumers—mean increased business opportunities for developers and providers. Product designers benefit by expanding into the growing and largely untapped AT industry. But of course, the consumers of AT have the most to gain. The greater selection of highly innovative products that will be available will reduce the likelihood of abandonment and improve outcomes. In other words, they will have the same sort of "consumer power" that we've all come to expect in the twenty-first century. And in the end, we'll all benefit from the "experience."

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