

Assistive Technology: Common Sense & Imagination

by Eric Minton

They come from battlefields where pilots flying supersonic jets guide missiles to their targets merely by watching them. They come from laboratories where computer engineers create machines that instantly do the bidding of a human's voice. They also come from your local electronics store, office supply warehouse, or hardware catalog.

Assistive technology for people with disabilities evolves from many disciplines outside the rehabilitation and medical vectors, and many of the devices that allow people with disabilities to thrive in mainstream employment are not even intended as assistive technology. For example, at the Job Accommodations Network, a free advisory service of the President's Committee on Employment of People With Disabilities, counselors call McMaster-Carr's hardware catalog "the bible." It earns that title because so many of its tools, from battery-powered screwdrivers to giant tweezers, end up being ideal job accommodations.

Imagination is the most valuable tool for providing "reasonable accommodations," the term used in the Americans with Disabilities Act (ADA), which prohibits employment discrimination on the basis of disability and requires employers to accommodate otherwise qualified workers. "It's the little things you do that make all the difference," says Barney Fleming, a rehabilitation engineer at the University of Kentucky. Many of his biggest success stories have nothing to do with high-tech solutions, though the breakthroughs were no less brilliant. "A



lot of it is just repositioning stuff." One person with a traumatic brain injury couldn't steady his hands, so using a mouse became impossible. "The obvious thing was [to use] a track ball, but that wasn't working so well either. The person has so much shakiness." When Fleming realized that reaching for the track ball contributed to the shakiness, he moved the track ball from the desk to the man's lap tray. Job accommodated.

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When the ADA was signed into law in 1990, it heralded a spurt of advancement in assistive technology for the many people with disabilities who could use the law's protections to further their job opportunities. Today, if an individual can blink, he or she can use a computer and, through the computer, access the Internet. Using the laser-guided missile technology developed by the U.S. military, a wheelchair can now follow the direction of its user's gaze.

Because of such technology, it is rare that a job cannot be accessed by a person with any kind of disability, as long as that person has the essential skills to do the work. NCR Corporation in Dayton, Ohio, employs auditors and graphic designers who are legally blind; they use screen magnifiers to see their math and do their drawings. Fleming has helped an individual who is blind work as a receptionist, despite the need to manage a phone console that has lighted indicators. "That's easy," Fleming says of the accommodation. He provided the individual a pen-shaped light detector hooked to a beeper. The individual scans the



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console with the detector which elicits a tone for a steady light and beeps for blinking lights.

What's easy to an engineer might seem inconceivable to the layperson. But Fleming stresses that the technology he uses for accommodations usually comes from a local Radio Shack, not the secret laboratories of military scientists. For instance, NCR Corporation develops and builds high-tech business equipment and has been honored by the World Institute on Disability. Yet, when it comes to accommodating its own employees with disabilities, NCR usually goes to an office supply vendor, says Steve Jacobs, senior technology consultant.

Wheelchair users hitch small portable cabinets to their chairs, pull them to meetings and open them to form a desk containing files and writing instruments. "They call it a puppy," Jacobs says. Other accommodations include a teardrop table on wheels with which a person can slide books and documents off one desk and transfer them to another; an electronically controlled desk in the company's resource center that employees using wheelchairs can raise to make working there more comfortable; and a telephone that an employee dials by voice. "Unless she has a cold, then it malfunctions," Jacobs says.



Though the ADA may have spurred technological advances, a more notable trend since the law's implementation is that the simpler the accommodation, the better. "Some of this stuff is so high-tech that it is expense-prohibitive and difficult for the

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person to use," Fleming says. "Sometimes it makes the person stand out as being a lot different, and that's difficult for some people, especially younger people. Integrating into the workplace, I think that's important."

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According to Job Accommodation Network surveys through September of 1997, 70 percent of accommodations made after JAN consultations cost less than \$500, and 21 percent cost nothing. Jacobs says he has hired five people with disabilities who needed accommodations and the most expensive was \$200.

Another important revelation has emerged from the ADA-inspired movement to accommodate people with disabilities in the workplace: a solution for the person with disabilities can be a solution for others, both inside and outside the company. Presenting accommodations in this light, individuals with disabilities become a valuable agent to improve production or broaden markets.

Voice recognition technology makes computers accessible to people with disabilities who cannot easily input commands with a keyboard or mouse. The technology usually gets introduced to workplaces as a reasonable accommodation but quickly



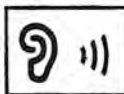
takes on a larger value. "The neat thing about voice recognition is it never makes a typo," Fleming says, homophones aside. "It's not so much a speed issue, it's an accuracy issue. As soon as people learn about that, it's suddenly worth \$100 or \$150 for the software because it benefits everybody."

At Tomark Industries Inc., a soft drink dispenser hose manufacturer in Spartanburg, S.C., the work gets intricate, especially for the employees who assemble rubber and thermo-plastic tubes. The company hired two workers through the South Carolina Commission for the Blind and installed lighted magnifiers at their stations. Their work turned out to be superior because they could actually see better than other assembly line workers, so the company gave each station a lighted magnifier, improving quality and reducing complaints of eye strain.

Voice Assisted Sewing Technology, a voice-command program that allows operators with paraplegia or other lower extremity disabilities to run sewing machines, was added to riveting machines at a Levi Strauss plant to alleviate repetitive motion syndrome caused by repeated pedal pushing.

A telephone company technician with a hearing impairment had trouble using a portable test phone to check lines because the ear piece interfered with his hearing aids. The company purchased an audio speaker for the test set which other technicians started using, too.

Because assistive technology for people with disabilities can have wide applications, some companies'



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accommodations beef up their bottom lines, rather than cut into them. NCR embraces this goal with IDEAL, the Individuals with Disabilities Enabling Advocacy Link, a business resource group that helps make accommodating people with disabilities integral to the corporate culture. As part of the program, Dennis Roberson, NCR's chief technology officer, financed the IDEAL Center, a showcase of all the technical solutions the company provides business customers to accommodate employees with low vision, hearing loss, speech impairments, mobility issues and cognitive disabilities.

"The center is also designed to enable our technical people to come in and take a look at ways disability technologies could be incorporated into the mainstream, to add competitive advantage to our products," says Jacobs. This is especially important as NCR expands its global presence and focuses on the five big emerging markets the company calls the "CIBIR marketplace of the future," drawing the

acronym from the first letters of the five nations involved: China, India, Brazil, Indonesia and Russia. A large part of these country's populations lack high-tech job skills. "The technologies that enable one of our employees who is blind to use a PC could be used in some shape or form to accommodate a person who is unable to read," Jacobs says.

Though diversity and inclusion have been part of NCR's philosophy since John Patterson founded the company more than a century ago, that philosophy derives from business sense, not charity. "The company culture sees competitive advantage in incorporating features in the products and services we sell to be able to capture the business from 385 million people over the age of 65 who don't see as well, hear as well, think as well," says Jacobs. "They would rather use telephones than get on the Web to do banking transactions. That's a big market driver for us."



Job Accommodations Resource List

The following resources provide information on assistive technology and job accommodations.

ABLEDATA, (800) 227-0216, is a federal database that lists equipment available for people with disabilities, the only single source covering all assistive technology.

CAMA (Communication Aid Manufacturers' Association), (800) 441-CAMA, is an organization of more than 20 communication and computer access manufacturers that offers a free packet of catalogs and runs a series of workshops around the country.

Job Accommodation Network, (800) 526-7234 (voice and TDD), is a free consulting service of the President's Committee on Employment of People with Disabilities that provides information and advice on job accommodations and the ADA.

National Institute on Disability and Rehabilitation Research, (800) 949-4232 (voice and TDD), is an umbrella agency for 10 regional Disability and Business Technical Assistance Centers. Calls to the main number automatically route to a regional center where you can get information, referrals, training and technical assistance.

Philips Consumer Communication Special Needs Center, (800) 233-1222, TDD (800) 896-9032, helps solve telecommunications issues.

Rehabilitation Engineering Research Center on Augmentative Communication, (302) 651-6830, part of the Applied Science and Engineering Labs at the University of Delaware/E.I. duPont Institute, specializes in augmentative communication equipment.

Trace Research & Development, (608) 262-6966, has a database on computer access technology.

United Cerebral Palsy, (800) USA-5UCP, sponsors a number of technology centers at many of their branches.

— E.M.

"When you factor in the number of people with disabilities worldwide, you're talking about literally billions of people who could use the systems that information technology companies sell, if those products are designed to accommodate them. I refer to it as a demand pull. Supply push is telling somebody you have to do this because the person is blind. While that's the law and the right thing to do, there's a much more powerful force here wanting to do these things. Not many people see it that way, which we like because it's a competitive advantage for us."

This points to an effective strategy for winning over prospective employers to make reasonable accommodations for disabilities. While more and more companies have made diversity part of their corporate culture, at many more firms the charitable notion of "hiring the handicapped" still dominates their approach to placing people with disabilities in jobs. The phrase "assistive technology" conjures up dollar signs in the minds of management, and "reasonable accommodation" is synonymous with "special treatment" among resistant supervisors.

So, if you're a person with a disability, go into an employment search armed with information, not legal threats. Explore the resources available to you and employers (see the list on page 19) that can help

formulate accommodations. When companies learn they can get free consulting services from the Job Accommodation Network, for example, they tend to be more receptive. Put together a short list of possible accommodations for a variety of jobs and present these as opportunities for a company rather than requirements for the individual. Coming up with accommodations should be a team effort that includes the individual employee, his or her supervisor, a rehabilitation engineer or consultant (such as the Job Accommodation Network) and the company's own engineer or systems analyst. This maximizes buy-in from the employer and helps arrive at solutions that not only let the individual do the job, but are the most cost-effective for the company.

Of course, assistive technology does not make up for essential job skills and work ethic, but with technological resources ranging from warfare capability to hardware catalogs, if you have the will all you need to do is find out the way. "Read those job descriptions and think about it," Fleming says, "but don't ever say never." **EEO**

Eric Minton is a free-lance writer based in Warner Robins, Ga.

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