

Workplace personal assistance service and assistive technology

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Abstract. This paper examines how assistive technology can be utilized in conjunction with personal assistance services in the workplace. Through case examples, the authors show how assistive technology can assist an individual with a disability to become more independent and productive in the workplace. The impact of disability and environment on assistive technology is discussed. In addition, the authors review factors influencing the selection and utilization of assistive technology at the workplace and demonstrate how the use of assistive technology can lessen an individual's dependence on a personal assistant while at work.

Keywords: Assistive technology, job site accommodations, personal assistant, personal assistance services, significant disabilities

1. Introduction

Independence and efficiency are important factors in today's workplace. Many of the accommodations made on the job are aimed at increasing autonomy and productivity. For many people with disabilities, workplace personal assistant services (PAS) are a valuable accommodation in performing job tasks. However, PAS alone may not always be the most practical solution. Assistive technology (AT) is a viable complement and/or alternative to a personal assistant for many who are seeking to become more efficient and independent in completing their job requirements. While assistive technology certainly will not replace the personal assistant, it can sometimes serve to reduce the number of hours that the personal assistant is needed on the job site.

The following is an example of how assistive technology can complement the workplace personal assistant. John works for a heat exchange manufacturing plant and is responsible for assembling three types of sales

binders. The material used for the binders was located on an eight-foot high shelving unit and was arranged in no particular order. Because it was stacked above his reach, John, who uses a wheelchair, was unable to access much of the material on his own. To rectify this problem, John asked his personal assistant to aid him in identifying the most frequently used material. This information was placed on a "lazy Susan" file added to the corner of John's desk. Less frequently used material was placed within his reach on the shelving unit; infrequently used material was placed on the higher shelves. John could now perform many of the functions of the binding task independent of the assistance of his PA. In this situation, John utilized his personal assistant on the job and a simple assistive accommodation (the lazy Susan) to increase his autonomy and productivity on the job. John continued to use his personal assistant for other job tasks.

John had a distinct choice in this situation: continue to depend on a personal assistant or seek technology that could reduce costs to his employer, increase his independence, and improve his efficiency. Potentially, prospective assistive technology (AT) users will

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be presented with similar choices in their jobs. The choices that individuals make will vary depending on their knowledge of AT services. In order to make an informed choice over how best to complete job tasks, the prospective AT user must develop some competencies regarding the options available. Important competencies of potential users of assistive technology include:

- Awareness of Technology: Gather information on the types and features of AT.
- Awareness of Disability: Identify the strengths you can capitalize on and the limitations for which you need to compensate.
- Awareness of Job Tasks: Identify the essential functions of the job and the tasks AT will need to assist you in accomplishing.
- Awareness of Training: Determine how the device operates and who can instruct both the user and co-workers.
- Awareness of Maintenance Options: Gather information on the AT to be implemented and evaluate its durability, maintenance, and repair schedules.
- Awareness of Funding Options: Determine who is responsible for paying for a device and identify potential sources of funds for the purchase of AT.

A potential AT user must consider the environment in which the assistive technology will be used. Small differences, such as variations in the noise level at the job site, can have a large impact on the effectiveness of technology. If office equipment is shared amongst co-workers, the changes made for one person cannot adversely impact another's ability to perform the job. Therefore, it is imperative that supervisors be consulted on the AT interventions that will be applied. Also, cost is sometimes an issue in obtaining AT for work. As a result, a prospective AT user should be aware of potential funding sources. In addition, one must also consider the training, maintenance, and repair of AT implemented on a job site. This paper will discuss these and other critical issues related to the application of assistive technology in the workplace.

2. Application of assistive technology to a work environment

The potential user must have an understanding of AT to apply it effectively in the workplace. The legal definition of AT is "any device, piece of equipment, or product system, whether acquired commercially or off the shelf, modified or customized, that is used to in-

crease, maintain, or improve functional capabilities of individuals with disabilities (Technology-Related Assistance for Individuals with Disabilities Act of 1988, PL 100-407 [2(b)(1)]).” This broad definition is appropriate because of the varied nature of AT applications. Assistive technology can be “high tech”, which refers to equipment that is expensive and frequently has a computer component. Examples of such equipment include a voice activated software system, an augmentative communication device, and an electric wheelchair. “Low technology” is generally more easily obtained and less expensive. [2]. The range of low-tech devices includes everything from Velcro to an electric stapler.

As consumers of assistive technology, it is important to have an idea of the types of equipment that are available in today's marketplace. Often times, creativity plays a large role in the equipment selected for any given situation. Sometimes the simplest interventions can make a world of difference. For example, Andy, who was responsible for opening mail and entering billing information into a computer, found it extremely difficult to turn on his equipment in the morning. To turn on an electric letter opener, a computer, and a monitor took him about 10 minutes. The simple solution identified was to plug all the devices in to a power strip. The power strip was fastened with Velcro inside the top drawer of the desk; Andy only had to pull open the drawer and flip one switch, reducing the time for completing this task from 10 minutes to 1. Thinking outside of the box allowed Andy to become more efficient and effective in this seemingly simple task for the cost of about \$10.

Researching assistive technology is an important step in the identification of the right piece of assistive technology. In any given situation where a technological intervention may be beneficial, there may be many solutions. If the prospective user has a clear understanding of the options available, he/she is able to choose the device(s) that best fits the situation. Perceived stigmas associated with using AT may play a lead role in guiding a person's decision. A user must be comfortable with the technology selected, or it will be abandoned [6].

3. Impact of disability and environment on assistive technology

The type of assistive technology used in a situation will vary greatly depending on the nature of a person's disability. An evaluator or prospective AT should take into account the individual's skills that can be maxi-

mized through the use of technology. For example, a person whose only consistently reliable movement should be given a wheelchair that can be operated using that appendage. Would this be effective for everyone? No, but in this person's case, it is the most effective method of for controlling the wheelchair. In a job situation, a similar foot activated switch could be used to select letters on an on-screen keyboard or to control a mouse.

Environment also plays a key role in the identification of AT. Assistive technology is situation-specific. Technology should be prescribed at the job site where the AT will be used, not in a medical or rehabilitation setting away from the job site. For example, during a training period in a rehabilitation facility, Alice is taught to use a speakerphone to answer calls. It is quiet in the facility and people tend to offer her privacy when she is on the phone. When she returns to work, her office is a three-walled cubicle with numerous co-workers working and conversing nearby. A speakerphone would make it difficult to impossible to have private conversations. While the speakerphone is functional, it is not practical for Alice's work setting. This example illustrates that if too little consideration is given to the environment in which it will be used, assistive technology will most likely be ineffective.

A visit to the work environment will not only provide the information necessary to ensure that the technology will best meet a person's needs, it will also provide other valuable information. For example, a visit to Randy's work site at a bookstore revealed options for AT devices that neither he nor his coworkers had previously recognized. Randy has worked for 3 years as a cashier. Recently, his responsibilities were increased to include work in the office, phoning customers to let them know their orders had arrived. His job coach visited the job site and noticed that Randy was having trouble holding the phone receiver. She suggested that he try an adapted receiver that had a hook on the back of the receiver. The hook made lifting and holding the receiver easier. An alternative adaptation was a headset that only required him to push a button to answer a phone, leaving his hands free.

AT should be introduced in a way that will not adversely affect the performance of others in the work place. In many offices, equipment is shared. Therefore, the technology must either be optional or functional for everyone performing a particular job function. An example is a data room at a research agency. Here, an employee with a disability uses an Intellikeys keyboard at a shared workstation. This device is a keyboard that

uses enlarged print overlays. Its function, in this case, is to provide a bigger target area for the keys. Because it is substantially different from a traditional keyboard, some co-workers do not find it easy or comfortable to use. To accommodate the co-workers, a riser with a sliding tray is used to store a traditional keyboard. To use the standard keyboard, the co-worker simply pulls out the tray.

Other people in the office may frequently utilize the technology introduced for an employee with a disability. For example, a money counter is introduced to a work setting that requires a person with poor motor control to count from a cash register drawer containing approximately \$300. This task took an extraordinary amount of time for the person with a disability to complete. The machine introduced allowed her to count stacks of bills using the feeder, as opposed to counting bills individually. Use of this device allows for a significant increase in the speed of this task for both the person with a disability and for everyone else in the office. Another example involves Sarah, who works for a university taking pictures for identification cards. For her to use the camera and computer, she needs to use a mouse. A standard mouse is hard for her to manipulate, so a trackball mouse is introduced, resulting in Sarah being much faster in navigating the computer screen. Her supervisor found that the trackball mouse worked better for all of the office employees and therefore purchased a trackball mouse for each workstation.

4. Selecting and utilizing assistive technology at the workplace

On a job site, it is also important to consider the supervisor's approval for a piece of assistive technology. An employer, in considering a recommendation for AT, must analyze the implications of that AT application on the overall operation of the business. In one case, Julie, who is unable to move her arms, needs to take messages. A recording system for the phone would require no effort on Julie's part to use. When this AT intervention is suggested to Julie's employer, Ms. Thomas, she voices concerns regarding the privacy of her customers and the legality of recording conversations. Unfortunately, Julie and the rehabilitation specialist had failed to consider the employer's concerns in suggesting the recording system. As an alternative, a tape recorder is suggested on which Julie can verbally record the information she needs to retain. The information is gathered

in a traditional message format in which the caller provides the information and Julie repeats it onto the tape recorder. The cost for this low-tech device is minimal, as is the effort needed to implement it. Also, customers have been impressed with Julie's conscientiousness in getting the correct information. Most importantly, the employer feels that her concerns were addressed appropriately and that Julie is performing her job effectively and efficiently.

The durability of a piece of technology is also an important consideration when implementing AT on the job site. If a piece of equipment is to be used on a regular basis, it must be durable. The durability of a device can be determined in a number of ways. The most effective source of this information is often talking to other people who are using the same or similar devices. What problems have they had with the AT? When repairs were needed, did a technician come to the job site? If yes, how long did it take? Was a loaner provided during the repair period? Also, an AT user must consider what regular maintenance a device will require. If maintenance is required on a regular basis, can a schedule be devised so that other work tasks can be scheduled during this period?

The cost of Assistive Technology must also be addressed. Cost can be a major factor in determining what type of AT will be implemented on a job site. According to a survey done by the Job Accommodation Network (2000), 80% of accommodations cost less than \$500. Therefore, the majority of accommodations are relatively inexpensive. The Americans with Disabilities Act [1] mandates that employers with more than 25 employees pay for reasonable accommodations [7]. In the event that an employer is unable or not required to pay for AT as an accommodation, other options may be considered. If an accommodation is considered durable medical equipment, such as a wheelchair or a scooter, either private insurance or Medicaid may provide funding. Also, the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (PL 100-407) has established Technical Assistance Projects that are operated throughout the country; some offer loan programs for assistive technology. Information on these programs can be obtained from the Rehabilitation Engineering Society of North America [4].

Other funding sources for AT include Social Security Work Incentives, Vocational Rehabilitation agencies, and private foundations. The government offers tax credit to small business, known as the Disabled Access Tax Credit (IR Code Section 44), that allows small businesses who earned \$1 million or less in gross re-

ceipts in the previous year or had 30 or fewer full-time employees to deduct a variety of disability related costs, including the purchase of adaptive equipment [7]. The Assistive Technology Resource information provided at the end of this paper contains information that can be helpful in the acquisition of assistive technology.

Training on AT devices is essential to their successful use. The employee utilizing the AT requires training on the device in order to complete job tasks as independently as possible. Co-workers and personal assistants should also be trained in the event that regular maintenance or troubleshooting is required. Co-workers must understand how the device is used in the event that they are asked to use the device when the primary user is not available. Training on use of AT can be provided by an assistive technology vendor, a rehabilitation engineer, an occupational therapist, a physical therapist, a speech therapist, a job coach, an assistive technology practitioner, or a co-worker who is familiar with the operation of an AT device. In order for an AT user to truly benefit from the devices introduced, training must be comprehensive and readily available. The example of Julie's use of a tape recorder to dictate messages was discussed earlier. Julie also needs to input addresses in to a mailing list database. In order to perform this task, Julie's job coach installed Dragon Dictate, which is voice recognition software, onto her computer and worked with Julie to train her on how to use the software effectively.

5. Summary

A potential user of assistive technology should have a working knowledge of the types of AT that may be beneficial. This knowledge can be gained through the Internet, talking with other AT users, shopping at an office supply or computer store, or talking with professionals. For example, the Job Accommodation Network (JAN) offers support over the phone to AT users and employers who would like advice on what technology may be effective for a given situation in the workplace.

It is imperative that a prospective AT user has a working knowledge of the AT system and an in-depth knowledge of the job duties that will be performed. This information will empower a prospective AT user to have an intelligent conversation about what technology might be beneficial and what device would be the most effective for the job tasks. Also, a piece of technology does not have to be high tech to be effective. Inexpen-

sive, low-tech items are often the most practical and easily applied solutions.

While technology offers many effective options to assist a person with job tasks, it cannot complete a job for a person with a disability. The employee must be qualified for a position and be able to perform the essential functions of the job duties with or without accommodation, including the possible use of a personal assistant at the workplace as a reasonable accommodation. Essential job functions are those primary duties that a person must be capable of performing, with reasonable accommodations if required. AT can supplement and reinforce the current skills and abilities of a user and can complement other accommodations.

Assistive technology resources

Web sites

<http://janweb.icdi.wvu.edu/> – The Job Accommodation Network (JAN) is not a job placement service, but an international toll-free consulting service that provides information about job accommodations and the employability of people with disabilities.

<http://www.resna.org/> – Rehabilitation Engineering and Assistive Technology Society of North America [4] is an interdisciplinary association for the advancement of rehabilitation and assistive technologies (AT).

<http://codi.buffalo.edu/assistiv.htm> – Cornucopia of Disability Information (CODI) serves as a community resource for consumers and professionals by providing disability information in a wide variety of areas. This website provides a variety of links to assistive technology resource web pages.

<http://www.latech.edu/tech/dss/dsstech.html> – Louisiana Tech University Center for Biomedical Engineering and Rehabilitation Science assistive technology web links

http://trace.wisc.edu/world/computer_access/ - (please note underscore in address) The Trace Center is currently working on ways to make standard information technologies and telecommunications systems more accessible and usable by people with disabilities. This web page lists accessible computer and software features provided by a variety of manufacturers.

<http://www.ataccess.org/> – Provides location information for the Alliance for Technology Access regional centers. The Alliance assists individuals with disabilities access technology, mainly through computer resources.

<http://www.abledata.com> – A national database of information on more than 17,000 products that is currently available for people with disabilities.

<http://www.atlfa.org/> – Assistive Technology Loan Fund Authority - The ATLFA makes loans and loan guarantees to people with disabilities for equipment and technology that increase independence, quality of life and employment opportunities.

<http://www.vcu.edu/rrtcweb/techlink/iandr/links/art/assis.html> – Transition from School to Work: Facilitating Employment Using Assistive Technology and Supports (on-line document). This article describes one strategy for facilitating competitive employment by providing community-based training experiences, assistive technology, and other workplace supports in real work environments within the student's education program.

<http://www.blvd.com/> – The Boulevard is a resource directory of disability products and services for the disabled, elderly, care giver and healthcare professional.

<http://www.vats.org> – Virginia Assistive Technology System (VATS) is a statewide systems change project committed to improving the quality of life for all Virginians by increasing awareness and accessibility.

<http://www.staples.com/> – Staples Office Supply home page lists a variety of products that can increase an individuals productivity and effectiveness in their work environment.

<http://www.officemax.com> – Office Max home page lists a variety of products that can increase an individuals productivity and effectiveness in their work environment.

<http://www.closingthegap.com> – Closing The Gap, Inc. is an organization that focuses on computer technology for people with special needs through its bi-monthly newspaper, annual international conference and extensive web site.

Books

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