

The Assistive Technology Program



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1 Introduction

2 Terms and Definitions

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- Assistive Technology Devices
 - Physical Disability
 - Sensory Disability
 - Motor Neuron Diseases
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- Assistive Technology Services
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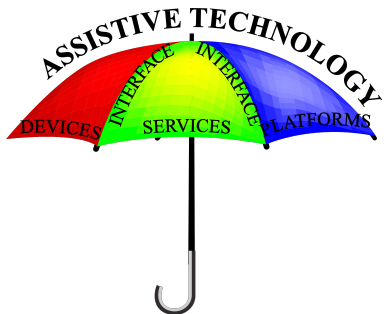
Technology that assists in making things turn



Media: Nichols is 5 years old. He has Cerebral palsy^[1]



How is it defined?



Definition

Assistive technology refers to any device, service or platform that enables individuals with disabilities to participate more fully in all aspects of life (home, school, work, community).

Who benefits from it?



- Individuals
 - **Physical disability**;
 - **Sensory disability** (Hearing impairment/Deafness, Visual impairment/Blindness);
 - **Motor neuron diseases** including speaking, walking, swallowing, and general movement of the body (for example, Cerebral Palsy) ;
 - **Pervasive development disorders (PDD)**, characterized by delays in development incl. learning, understanding language, socialization, communication, regulating behaviors and emotions (for example, Autism, Asperger's syndrom, Rett syndrom, Children disintegrative disorder;

Assistive Technology Devices



Definition

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Exception

The term does not include a medical device that is surgically implanted (by a physician) or the replacement of such device (e.g. a cochlear implant)^[2].

Physical Disability



- Daily organization



Figure: Button hook

Physical Disability



- Daily organization



Figure: Button hook



Figure: Zipper pull

Physical Disability



- Daily organization



Figure: Zipper pull



Figure: Door knob extender

Physical Disability



- Daily organization



Figure: Door knob extender

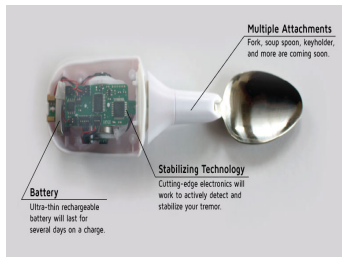


Figure: Anti-tremor spoon^[3]

Physical Disability



- Daily organization

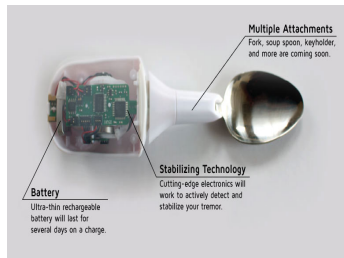


Figure: Anti-tremor spoon^[3]

Figure: meal support robot^[4]

Physical Disability



- Daily organization



Figure: meal support robot^[4]

Physical Disability



- Daily organization
- Mobility Impairment



Figure: Pediatric stander

Physical Disability



- Mobility Impairment



Figure: Pediatric stander



Figure: Hospital-style bed

Physical Disability



- Mobility Impairment



Figure: Hospital-style bed



Figure: Assistive car seat

Physical Disability



- Mobility Impairment



Figure: Regular walker

Physical Disability



- Mobility Impairment



Figure: Regular walker



Figure: Regular wheelchair

Physical Disability



- Mobility Impairment



Figure: Regular wheelchair



Figure: Robotic wheelchair

Physical Disability



- Mobility Impairment



Figure: Robotic wheelchair



Figure: iBOT - Robotic stair climbing wheelchair^[5]

Sensory Disability



- Hearing Impairment

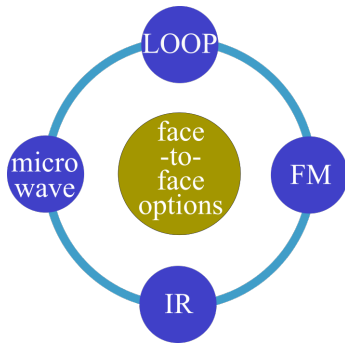


Figure: Wireless assistive listen technology

Sensory Disability



- Hearing Impairment

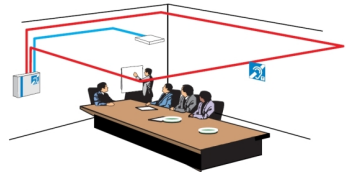
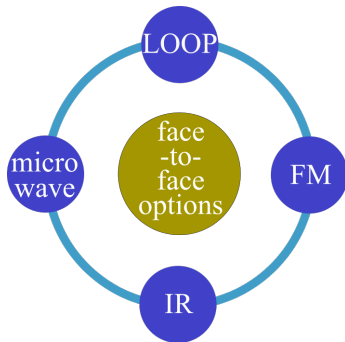


Figure: Hearing loop (TX)

Figure: Wireless assistive listen technology

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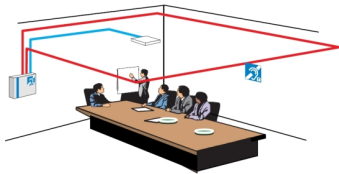


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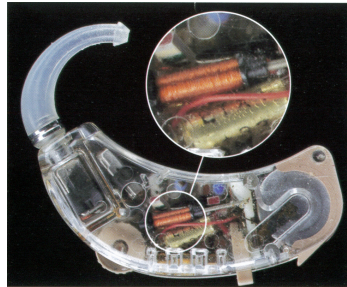


Figure: Hearing loop (RX)

Sensory Disability



- Hearing Impairment
- Vision Impairment: Seeing, Reading

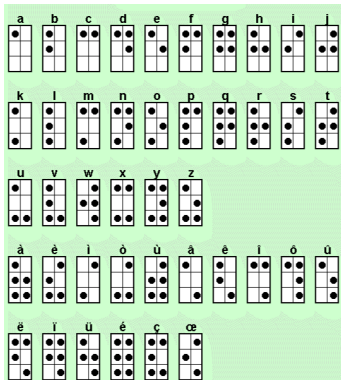


Figure: Braille letters

Sensory Disability



- Vision Impairment: Seeing, Reading

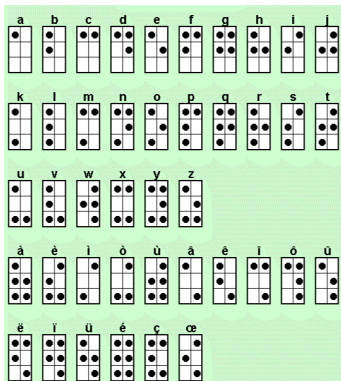


Figure: Braille letters

Braille technology

- Refreshable braille display
- (Mobile) Braille notetaker
- Braille embosser (printer)
- Braille writer (Input: braille, Output: text)

Sensory Disability



- Vision Impairment: Seeing, Reading



Figure: Optical character recognition - The reading pen



Figure: OCR - Camera

Sensory Disability



- Vision Impairment: Seeing, Reading



Figure: Brailler

Sensory Disability



- Vision Impairment: Seeing, **Reading**



Figure: Brailier

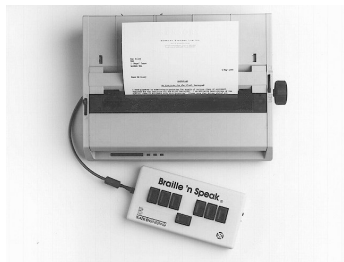


Figure: Braille-to-text with reading rehearsal

Sensory Disability



- Vision Impairment: Seeing, **Reading**



Figure: Braille-to-voice encoder

Motor Neuron Diseases

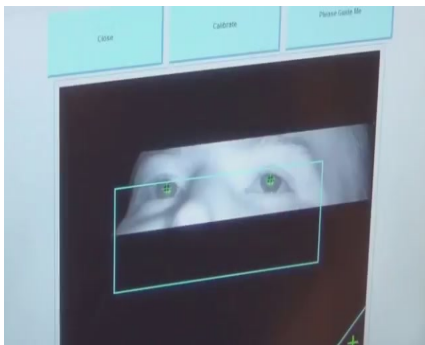


Figure: Alternative and Augmentative Communication - DynaVox®

Pervasive Development Disorders



a group of development disabilities.



Figure: (Online) Text-to-speech converter

Assistive Technology Services



Success of assistive technology depends on supports or service.

Assistive Technology Services



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Definition

refers to any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device^[2].

Assistive Technology Services (cont'd)



Assistive Technology supports and services include^[6]:

- 1 the evaluation of the needs;

Assistive Technology Services (cont'd)



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- 2 purchasing, leasing, or otherwise providing for the acquisition of AT devices;
- 3 selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing AT devices;

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- 4 coordinating and using other therapies, interventions, or AT services;

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- 3 selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing AT devices;
- 4 coordinating and using other therapies, interventions, or AT services;
- 5 training or technical assistance.

Assistive Technology Related Services



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- 2 developmental services (addressing development delays and disabilities throughout an individual's lifespan);

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- 3 corrective services (educational training for offenders);
- 4 supportive services (medical therapy and recreation, lending devices or money).

Assistive Technology Service Provider



helps individuals with disabilities acquire and use appr. AT.

Empirical identification of AT job roles^[7] in the U.S. yielded

- 1 Direct services to the client (see Slide-12)

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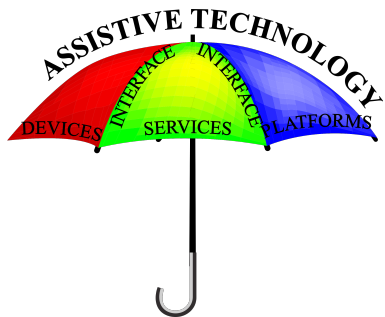
Empirical identification of AT job roles^[7] in the U.S. yielded

- 1 Direct services to the client (see Slide-12)
- 2 Dissemination of information on AT activities
- 3 Administration activities
- 4 Product development activities

Assistive Technology Platforms



Interoperability among AT device (HW and/or SW), operating system and its applications is crucial for the AT device to function.



Definition

Assistive Technology Platform defines a framework around which a system can be developed.

Assistive Technology Platforms (cont'd)



Example

- 1 **Tobii Communicator**: alternative and augmentative communication AAC platform. Functionality can be extended by the user.
- 2 **VoiceOver (Apple Inc.)**: screen reader platform with Braille support for more than 40 USB and wireless Braille displays.
- 3 **Assistive Technology rapid integration and construction set (AsTeRICS - openSource)**: It allows the creation of flexible solutions for people with disabilities using a large set of sensors and actuators.

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Assistive Technology Platforms (cont'd)



Example

- 4 **Universal Ambient Assisted Living (UniversAAL - openSource)**: helps connect heterogeneous technical devices to a single unified platform; and the user may control this system

Assistive Technology Interface



Definition

AT interface is a shared boundary across which two separate components of AT exchange information (device, service, and platform).

Example

Q: An Interface between Alternative and Augmentative Communication device and food delivery service?

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AT interface is a shared boundary across which two separate components of AT exchange information (device, service, and platform).

Example

Q: An Interface between Alternative and Augmentative Communication device and food delivery service?

A: The deli store (i.e. an AT-Service Provider)

References



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