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Technology and its Advancements Helping the Differently Abled People

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Abstract: ***Differently abled people are no different from normal people in using technology, if they are also considered as the end users. Not all humans are born same. Neither do they have the capability to do everything by their own. In the present scenario, there is a lot of distinction shown between normal and differently abled people. There are a lot of practices that are being followed to make everything possible, to be Universal. Providing a Barrier free built environment is taken as a major consideration these days. However, technology should act as an advantage for differently abled people by helping them mobilize things on their own. Using the present day technology, one should always see to provide maximum benefits to the differently abled people that may not be possible without these inventions. One needs to think Under the same criteria of how well and equally the differently abled people are being treated in the society by considering them as well, as the users of the innovations and technologies. This paper looks into understanding the need for Technological advancements that can benefit the differently abled people not only in assisting themselves, but also in accessing everything possible. This paper illustrates the significance of giving consideration to differently abled people while developing a new technology that would allow them to ultimately live a better life.***

Keywords: Technology, Differently abled, Way finding, Universal, Assistive technology, Adaptive technology, Impairments.

1. Introduction

Technological advancements have made lives easier and it would be a never ending process. One would even totally rely on technology in the near future. In this case it can benefit the differently abled user group in a much better way. Technology can help all kinds of user group irrespective of their ambulatory conditions or any other impairment. Normal people would just use it. Whereas, differently abled people will gain something out of it.

"The use of the term universal is unfortunate in that "nothing can be truly universal; there will always be people who cannot use an item no matter how thoughtfully it is designed. "
-Ron Mace
-Ron Mace
Source:(NC State University-College Design)

In contradiction to the above statement by Ron Mace who coined the term Universal Design, his enormous efforts in designing products and the spaces to be aesthetic, as well as usable to all types of user group regardless of their ability or status in life, marks as an example, in developing technology with the same criteria.

2. How technology can help various disabled groups?

2.1 Visual Impairments

Technology can help people with visual impairments to a greater extent by developing voice control navigation systems or smart voice recognizers such as Nuance' that converts text into speech that can help visually impaired people suffering from low vision or total blindness.

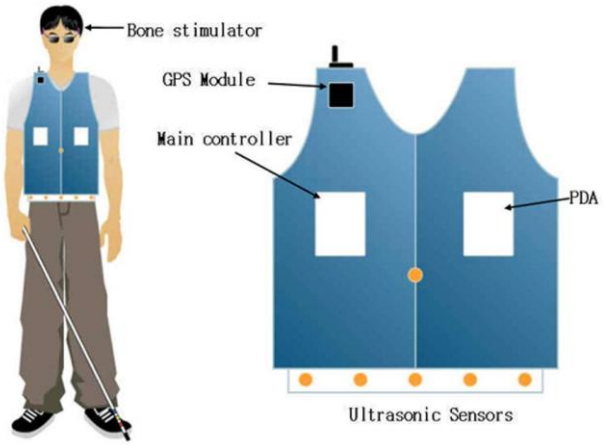

Figure 1 (a): Schematic diagram of a vest type walking guide device.

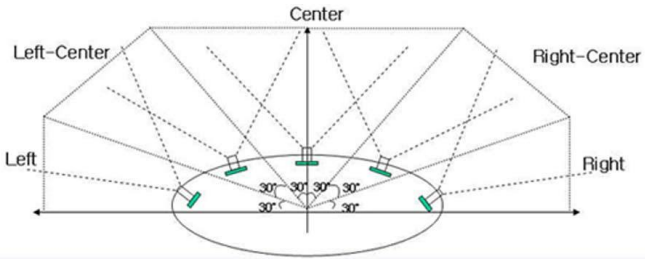

Figure 1 (b): The divided sections and angles for the front direction of the walking guide user (Byung-Seop SongPhD., 2007)
Source: (Byung-Seop SongPhD., 2007)

Visually impaired people are the ones who need maximum assistance. As and when the technology can serve as a solution to this, one can self assist themselves with the help of guiding tools like the sensors in the walking stick that can sense bumps or uneven levels or obstructions that can safeguard the one with low or no vision.

Figure 2 (a): The Light Stick designed by Wu Guanghao

The light stick is used for obstacle sensing and alerting. The detachable hand grip can convert the text messages to audio and that can be transmitted to the Bluetooth connected ear piece worn by the user. An emergency switch is located on the stick that can help in extreme situations.

2.2 Mobility Impairments

It isn't a new phenomenon to help people using technology from the advent of speech recognitions, to mobilize wheel chairs, to any hearing assistive technology. The use of adaptive technology can help providing mobility access to various places, plays a key role in creating a social status to those with semi ambulatory or ambulatory impairments.

Figure 3(a): An electric-powered wheelchairs to detect hazardous terrain. (Barb Ruppert, TATRC science and technology writer, 2015)

Figure 3(b): The advancement that helps one to change position of a person using a wheel chair (Global Accessibility News, 2011)

When a person on wheel chair had to move around a space, he needs navigation control, direction check, obstacles sensors, gripped breaks, ergonomic design of wheel chair. When all these are embedded in one wheel chair (Figure 3(a)(b), it would definitely help the persons with mobility impairments to have an easy and comfortable access without any self distinction.

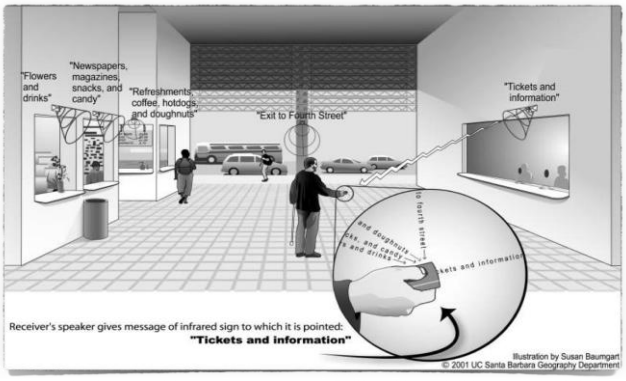

Figure 4: How technology can assist a visually impaired person with the help of assisting devices.

In the Figure 4 shown above it also helps the wheelchairs users to get information without actually going very close to the counters in crowded areas using assistive devices connected by infrared rays or Bluetooth.

2.3 Hearing/Speech Impairments

Amplified sound travels through the loop and creates an electromagnetic field that is picked up directly by a hearing loop receiver or a telecoil, a miniature wireless receiver that is built into many hearing aids. To receive the signal, a listener must be wearing the receiver and be within or near the loop. As the sound is taken up directly by the receiver, the sound is much clearer, without as much of the competing background noise associated with many listening spaces. Some loop systems are portable, making it accessible for people with hearing loss to improve their hearing environments, as required, as they proceed with their daily agenda's. A hearing loop can also be connected to a public service system, a television, or any other audio source that produces sound. Hearing aids with embedded systems of telecoils or portable loop receivers are also available that gives a choice of selection for the users.
(disorders., 2014 July 03)

Figure 5 (a): Hearing loop aid

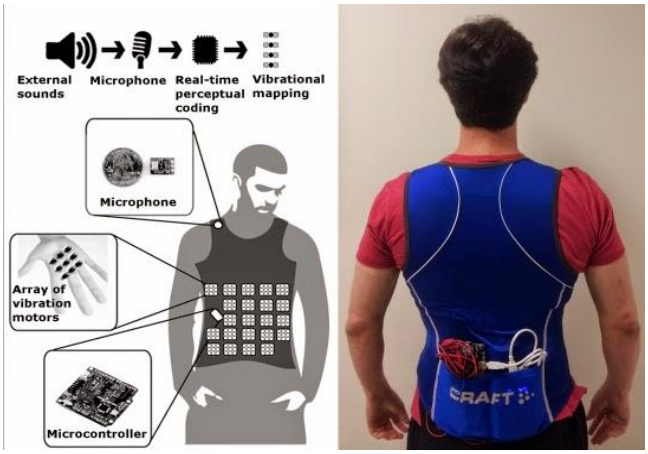

Figure 5 (a): Showing the advancement that helps one to hear by amplifying the sounds (Sheryl Burgstahler, 1992)

Versatile Extra-Sensory Transducer simply known as VEST that can capture the sounds through their mobile devices and transfer them to vibration motors and these vibrations or signals are direcly sent to brain where they can analyse or interpret the information. This type of technology helps in making things possible for deaf people that is merely not possible without the use of adaptive technology. (Assistive Technology Blog, 2014)

2.4 Speech Impairments

Persons with speech impairements are those who cannot convey information as they wish to due to multiple reasons. Language constraints or speech disability or insecureness in society. Technoloy can help people with speech imapirments by providing assisting tabs or gadgets that can act as a medium of conveying messages, assisting themselves in a building without the need for others reference. 3D way finder is another such technology that is adopted in alomost every new building that shows the 3-Dimensional view of floor plans by marking their current locations and showing path to reach their destinations. Sometimes a person's limited speech can convey the basic information if otherwise keyboards, Audio codings or touch screens may be used to communicate desired words. Some of the devices would have a display. The text display panel would typically face outward so that two people can exchange information while facing each other. Spelling and word prediction softwares are another helpful startegies to improve the accuracy. Further improvement in Speech-generating devices can translate words or pictures into verbal forms. Few products allow people to choose from several different voices, be it gender, age, or acccents. Few devices have a vocabulary of prerecorded words while others have an unlimited vocabulary. Software programs that can convert personal computers into speaking devices that acts as an aid for people with speech impairments are also available.

Figure 6: Showing An AAC user uses number coding on an eye gaze communication board

Advances in technology have led to the creation of specialized devices called augmentative and alternative communication (AAC) devices, that help make it possible for individuals with no speech, or poor speech, to overcome their speech problems.

3. Adoptive and Assistive Technology

Assistive technology refers to any type of product, design, information or modified versions of products that are used to improve functional capabilities of individuals with disabilities. While, adaptive technology is developed exclusively for the disabled that includes products or deisgn specifically designed for persons with disabilities. These technologies are used mainly for way finding and for overcoming their insecureness in society by being able to access everthing they need. When a person with disabilities is able to work out things by himself with out the need for external assistance, then it proves to show Universal consideration and provides an equal status of living in all possible forms.
(News, 2010)

4. Conclusions

Disability is a phase in everyone's life which can be a parent with a pram, a person with an injured leg, a child in his infant age, the elderly people or any disability by birth. Treating the problems of all and giving solutions to it in the form of technlogical innovations, it would tend to provide a platform for the disabled to feel normal. This particular aspect has to be ensured to make anything Universal. Developing technology that can help the people with disabilities means giving them a new life or a better life which they once lived.

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Author Profile

Vidyadhari Dandamudi, Student, 4th year, G.S.A. [GITAM School of Architecture], GITAM University, Visakhapatnam, Andhra Pradesh, India. Her primary focus is to eradicate the distinction between normal and differently abled people. Presently giving thesis on “Film City”, she aims at addressing every design issue from a barrier free perspective.