

An Investigation of IoT Technique Based Potential Application to Improve the Standards of Life for Individuals with Disabilities (CR specifically those who with physical, Hearing, Or Visually Challenges).

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Abstract:

The Internet of Things (IoT) connects everything, creating a dynamic network. It allows communication between people, objects, and the environment, enhancing lives for people with disabilities. This article examines living conditions of individuals with sensory and physical disabilities and how IoT can help overcome challenges

Keywords — **RFID, Network of objects, Invalidity, Sensation, Physically.**

1. BACKGROUND

A physical, cognitive, mental, sensory, emotional, developmental, or a mix of these impairments can result in disability. A person may be born with a disability or develop one at some point in their life [1]. Disability-causing conditions are classified by the medical community into three categories:

The conditions can be either inherited (genetically transmitted); congenital (caused by the mother's infection or another disease during pregnancy), acquired (such as conditions resulting from illness or injury of unknown origin), or embryonic [2] or fetal developmental abnormalities.

Different categories of persons can be classified as physically, intellectually, sensory, peripatetic, or psychologically impaired. This essay primarily addresses individuals with physical and sensory [3] (hearing and vision) disabilities.

1.1 Physical Disability

Physical disabilities include significant weakness, missing limbs, speech difficulty, paralysis (total or partial), and control interference [4]. Cerebral palsy, spinal cord injuries, traumatic brain injuries (including stroke), diseases or injuries leading to amputation [5], ALS (Lou Gehrig's disease), or other disorders like arthritis, etc. are some of its causes. Physical disabilities can lead to a variety of limitations, such as decreased muscle control [6], weariness and tiredness, pain or weakness-related sensing or grasping, trouble speaking,

vision problems, trouble reaching objects[7], and trouble accomplishing.

Sophisticated or compound operations (such as push and turn). When it comes to most manipulations and activities, people with spinal[8] cord injuries may not be able to move their limbs and may need to utilize mouth tools. Movement-impaired people could find it challenging to respond to programs that ask for a response within a set amount of time, especially if that time is brief. Those who are unable to move freely or who require a mouth or head stick find it challenging to operate pointing devices. Programs that lack a keyboard control option and need the usage of a mouse or other pointing device[9]. Pressing two keys at once is challenging for people who can only use one hand or who use an ahead stick or mouth stick to operate the keyboard.

1.2 Visual disability

Functional Limitations Caused by Visual Disability[10] are increased sensitivity to glare, viewing the world as through a yellowed lens, no central vision, no peripheral vision, loss of visual Acuity or focus, reduced color distinction ability, poor night vision or general haziness of all vision. Main difficulties using computers and software are that they have the greatest problem with information displayed on the screen. Mandatory use of amusers other pointing device requiring g eye-hand co-ordination is also a problem. Special programs exist to provide individuals with the capability to enlarge the screen image. There are also programs which allow the individual to have the contents of the screen read out loud. However, application programs sometimes do things in ways that make it difficult or impossible for these special programs to work well or at all. Individuals with low vision may also miss messages which pop up at different points on the screen, since their attention is usually focused on only a small area of the display screen at any time. Access to Documentation problems are written operating instructions and other documentation may also be inaccessible, if they are not provided an electronic or alternate form, e.g., audio or Braille and even then people may have difficulty accessing graph or pictorial information included in documentation. Because many people with visual disability still have some visual ability, many of them can read with the assistance of magnifiers, bright lighting (for printed text), and glare reducers. Many are helped extremely by use of larger lettering, sans-serif typefaces, and high contrast coloring. Top strategies for those who are blind or have severe

visual impairments include the use of Braille, large raised characters or raised line drawings, Braille and audio. Note, however, that Braille is preferred by only about 10% of people who are blind and include those blind from early in life. Those who use Braille, however, usually have strong preferences for it, especially for shorter documents. Raised lettering must be large and is therefore better for providing simple labels on raised line drawings than for extensive text.

1.3 Hearing Impairment

One of the most prevalent types of chronic disabilities is hearing loss. Four types of functional limitations can be attributed to hearing impairments.

- If auditory information is not provided loudly enough in relation to surrounding noise, people might not be able to hear it.
- As voice input becomes increasingly common, many deaf people will also have difficulties understanding information that is solely delivered in aural form.
- Individuals who are deaf or who have more severe hearing disabilities will not receive any information.
- American Sign Language is the primary form of communication for many deaf people. However, keep in mind that this language is completely distinct from English. As a result, deaf persons who predominantly use American Sign Language might not be as proficient because they only understand English as a second language.

2. Introduction

2.1 Internet of Things (IoT)

The Internet of Things (IoT) connects various objects to the internet, enabling the exchange of data and providing users with secure information. Cisco estimates that IoT will consist of 50 billion devices connected to the internet by 2020. The term was coined by British entrepreneur Kevin Ashton in 1999 and is expected to offer advanced connectivity across various protocols, domains, and applications. IoT devices can include heart monitoring implants, biochip transponders, electric alarms, automobiles with built-in sensors, and field operation devices. Applications of IoT include manufacturing, energy management, infrastructure management, medical and healthcare, building automation, transportation, and large-scale deployment. The IoT has the potential to significantly impact healthcare, especially in helping disabled people interact,

communicate, and possess physical controls through mobile devices.

3. Related Work

IoT technology is revolutionizing the living style of disabled people, enabling them to lead their lives and overcome limitations. RFID technology can be introduced and applied to different cases to improve their lifestyle.

3.1 RFID

The Internet of Things (IoT) requires components like RFID tags to enable communication between devices and objects. RFID tags are wireless microchips used for tagging objects for automated identification. They can communicate wirelessly to objects that are not in line of sight, and can read and measure data. RFID tags come in passive, semi-passive, and active types. RFID technology can assist disabled people in various areas, such as helping them reach specific destinations or purchasing from malls.

3.2 Solutions of IOT to Visually disabled – Differently bled people

Internet-enabled assistive devices are being developed for visually, hearing, and physically impaired individuals. These devices can use cameras, image processing systems, and sensors to detect objects and obstacles. Ultrasonic sensors are used in walky, a cane that uses a camera to track distance between itself and obstacles, based on the time-of-flight method.

3.3.Deaf-Differently able people

The communication between a deaf and a listener poses to be a serious problem compared to communication between blind and normal people. There are many IoT devices which are available and research is on-going for a perfect solution for deaf and dumb. The new technologies are vibering and hand talk.

3.3 Vibering

The Vibe ring system consists of a wristwatch and two rings worn on both hands, designed to act as the deaf's ears. The rings listen for sounds from behind, find distance, and vibrate according to source. The wristwatch displays the sound wave and is programmed to listen for key phrases and car noises, aiding the deaf's mobility.

3.5 Talk by Hand

Five flex sensors are included in a setup data glove. These sensors are designed to be fastened on each finger of the glove in order to monitor and sense static movements of the hand's fingers. There are two ways for the user to initiate communication: via a hand gesture or the device's keypad. A microcontroller is used in the processing of this text input. Additionally, the APR9600 speech chip has memory for commonly spoken words, which can be readily recovered with the use of hotkeys. People who are deaf can hear the speaker, while those who are dumb may read the LCD's output. This gadget facilitates communication when connected to both the 3.4 People with physical disabilities who are differently able

People with physical disabilities typically struggle with mobility because of their restrictions. Hence their primary mode of transportation is a wheelchair. For those with physical disabilities, researchers are creating wheelchairs with internet integration. People with physical disabilities can now move independently and carry out their daily activities thanks to internet-connected wheelchairs, or IoT. Future wheelchairs will be equipped with sensors that can identify the shortest path when the user wants to go somewhere. Unwanted events, such as accidents or emergencies, will also be handled by the wheelchair by automatically alerting the user's caregiver—a caregiver who may be a relative or doctor. Bions are a type of injectable, wireless sensor that can assist those with physical disabilities; they are sturdy, adaptable, and reasonably priced.

4. Conclusion

Internet of things is a new state of art technology which if used carefully, can help in improving the lifestyle of everyone. If we think one step ahead and decide the concept, it can be the greatest help to the differently bled people. In this article, the authors have tried to gather information regarding the different Types of disabilities of people, which make their lives monotonous. If we can use IoT to assist in the way they live, they may be able to catch up with their dreams. It can help the physically disabled move around, visually disabled people to reach their destination with the help of warnings and guidelines, the deaf and dumb people to communicate in better way so that the speaker and listener may be comfortable with each other. The future worlds will surely bring light into the lives of differently bled people.

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