

Investigating the Issues of Blind People and Implementing the IoT in their Day-To-Day life

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Abstract:- Visual impairment has traditionally been considered a barrier to human functioning, particularly in the domains of participation & economic production. However, with the development of Braille and other assistive technologies, losing one's sight is no longer a barrier to obtaining both an education and a lucrative job. Due to the fact that these people with disabilities participate in society, it is crucial that we understand the challenges they experience when ambulating, using public transportation, or working in the organized sector.

Humans with visual impairments frequently require outside assistance, which can come in the form of humans, trained dogs, or amazing technical devices acting as emotionally supportive networks for dynamics. The underlying problem with confused people is how to figure out how to get where they need to go. This paper aims to help those who are blind or visually handicapped overcome their blindness by using other senses like sound and touch.

I. INTRODUCTION

The word "blind" is a very broad term. You may find it interesting to ponder how blind people see and perceive information from the world around them. People who are blind, for instance, may be able to absorb certain information via signals other than visual ones, such as sound or vibration. Do not forget that not everyone will experience this. Many persons who have visual problems lack the other sensory skills necessary to make up for their vision loss. A small 2009 study found that some people with severe vision impairment may use parts of their brain that sighted people use to process vision. The visually impaired people may use these "vision" areas to process.

In one recent survey, a sample of Americans rated going blind as worse than losing memory, speech, hearing, or a limb. In another, a majority of respondents said losing one's freedom is a consequence of getting blind. Loss of vision does result in some restrictions; for example, blind persons are unable to operate a vehicle or an aircraft. They are nonetheless capable of leading full, independent lives on par with their sighted colleagues, despite this. The broad definition of visual impairment in India, as adopted in the Persons with

Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995, and under the National Programme for Control of Blindness (NPCB), refers to a condition where a person suffers from any of the following: the total absence of sight; visual acuity not exceeding 6/60 or 20/200 (Snellen) in the better eye even with correction lenses.

II. METHODOLOGY

- Study Design: Survey-based retrospective
- Sample Size: 10 Subjects
- Study Subjects: Visually Impaired subjects in Srimati Kamla Mehta Dadar School for the Blind (SKMDSB).

A. Procedure

A self-drafted questionnaire was validated by two teachers and students. The study was conducted by the face-to-face method. Modifications were made to the questionnaire as per the suggestions from teachers and students.

B. Data Representation & Analysis

A total of 10 subjects were enrolled in the study. Data were collected on standardized forms and encoded for computerized analysis. Descriptive analysis of the data was done using Excel and PowerBI. Tables were made using Microsoft Office Excel and figures were also plotted using Microsoft Office Excel.

C. Demographic Details

70% of the study subjects are males and 30% are females. Age.

D. Analysis of problems associated with Ambulation

The data analysis revealed that none of the 10 subjects utilized a cane or stick while moving about the school (comfortable environment). However, when moving about outside of the home or school (a dynamic external environment), all 10 subjects used a cane or stick.

The review of 10 subject is mentioned below:

1	NAME	UNEVEN SURFACE	VENDOR	CROWD	PARKED CARS	OPEN GUTTERS	POLES	OTHER
2	ANSARI ATHAR JAVED ABIDA	0	1	1	1	0	1	0
3	GANJAM POORNIMA RAJU PUSHPALATHA	1	1	0	1	1	0	1
4	JAYANT YESH ARVIND MITHLESH	0	1	0	0	1	1	1
5	KALYANI SOHAIL CHAND KHATIJA	1	0	1	0	0	1	0
6	MOHAMMED KUMAIL WAHID NOORJAHAN	1	0	0	1	1	0	1
7	MOMIN MUSKAN JAHANGIR SHAHEEN	0	1	0	1	0	1	0
8	MONDAL ASHISH BISHWANTH MANJU	1	0	1	0	0	0	1
9	MUKADAM TAISEER NASAR SABIHA	0	1	0	1	0	1	0
10	MUKADDAM ZUHEB HAFIZ SHAMA	1	0	0	1	1	0	1
11	PANDEY SHAILAJA MANOJ KANCHAN	0	1	1	0	0	1	0

Fig 1 Data of 10 Subjects

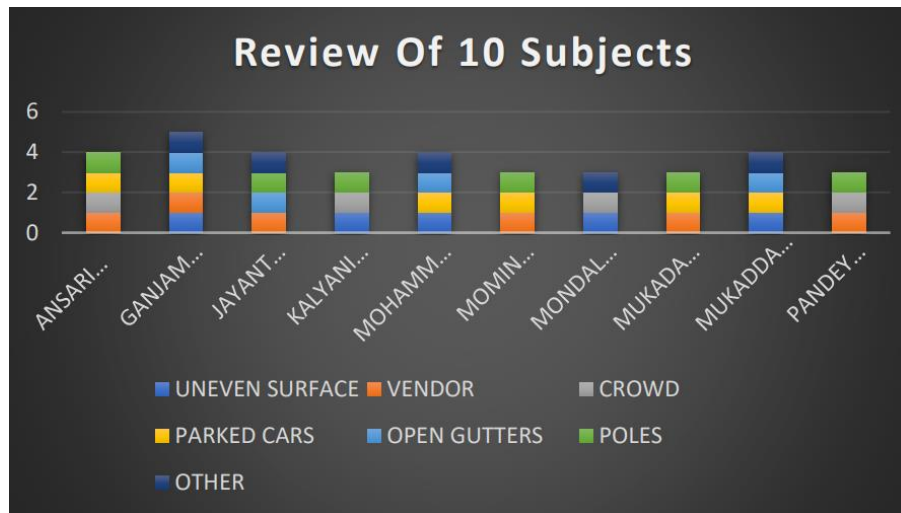


Fig 2 Graphical Representation of 10 Subjects

III. CASE STUDY

Basically, this entire research paper is based on the people who suffer from Blindness and how IoT can help to change their life in a better way. We have seen many blind people who travel in local trains and they use a red white color stick for their guidance to walk on the road. Living with blindness may be both difficult and inspiring. A variety of factors, such as inherited problems, illnesses, accidents, or age, can lead to blindness. Blindness has an impact on a person's life in numerous ways, from mobility and education to employment and daily living, regardless of the source.

Mobility is one of the main issues for blind people. It can be challenging to independently navigate the environment without the capacity to see. Blind persons frequently use white canes or guide dogs to aid in mobility, although they may still require assistance from others in strange surroundings. They may occasionally use public transportation to travel to their place of employment or other destinations.

Another area where blind people have particular difficulties is in education. Children who are blind may attend schools that cater to their needs and have staff members who have received special training to work with blind students. As an alternative, kids might enroll in regular schools with the aid of technology and teachers. In order for blind students to have the same educational opportunities as their sighted colleagues, accommodations like braille displays, screen readers, and adaptive software may be needed.

For blind people, finding and retaining a job can be particularly challenging.

Because they believe that hiring blind employees will impair their ability to complete job duties, many businesses are unwilling to do so. However, many blind persons may work in a number of areas thanks to accommodations including assistive technology and workplace adaptations. Lawyers, musicians, computer programmers, and many other occupations are all open to blind individuals. They can yet still experience prejudice and other employment difficulties.

The Internet of Things (IoT), especially for blind or visually impaired people, has the power to completely transform their life. For those who have trouble seeing, using smart gadgets and the internet together can offer a number of advantages that can help them become more independent and improve their quality of life.

The capacity to acquire information about their environment in real-time is one of the most important benefits of IoT for the blind. For instance, a smart cane with sensors and a GPS unit can tell the user where they are in relation to local landmarks and any hazards.

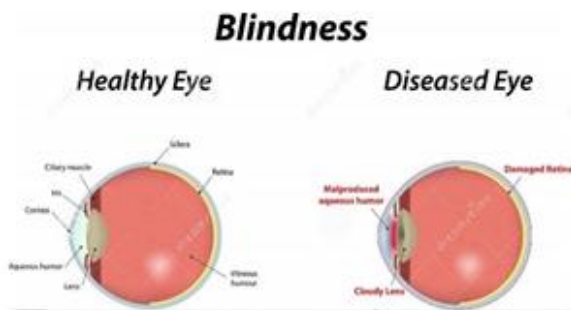


Fig 3 Healthy Eye VS Blind Eye

IoT devices can similarly offer audio descriptions of visual content, such as pictures or films, allowing those who are blind to more fully appreciate and understand these experiences. The adoption of voice-activated thermostats and smart speakers can assist the blind navigate and manage their home environment more conveniently.

Increased social engagement and communication is another important benefit of IoT for blind people. With the use of speech and text-based interfaces provided by smart devices, people with visual impairments can interact with others more successfully and effortlessly. Additionally, IoT devices can offer social cues that can help users stay in touch with friends and family, including alerting them when someone is at the door or when a message has been received.



Fig 4 Use of IoT for Normal people as well as blind people

IV. PROPOSED SYSTEM

In order to create a good, trustworthy, and effective system for blind or visually impaired persons to detect obstacles and warn or alert them at dangerous spots or barriers, research has been done on new gadgets and technology. It was challenging for the user to distinguish between the noises for obstructed and free travel directions.

There have frequently been advancements in wearable devices for the blind. A different Visual Impairment Aid utilises a related idea. We have made an effort to improve upon this current sensing stick with sound module by making it simpler and more readily producible so that it can be offered widely.

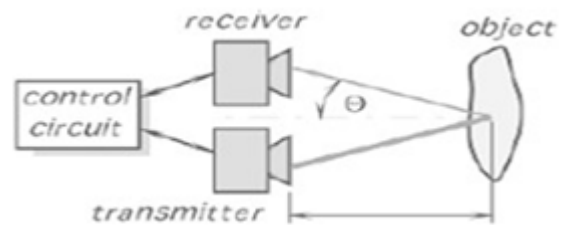


Fig 5 Basic System Design

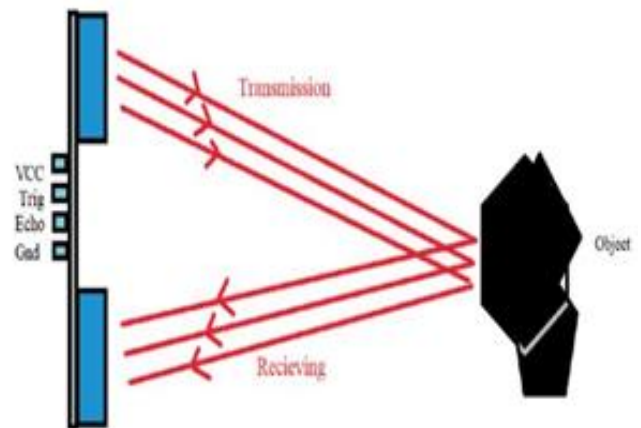


Fig 6 Sensor Design

V. CONCLUSION

In conclusion, the Internet of Things (IoT) is a potent instrument that has the potential to greatly enhance the lives of those who are blind or visually impaired. IoT technology can promote independence and safety while enabling voice descriptions of visual content, real-time information about the environment, and communication by utilising smart devices and the internet. IoT technology is the greatest choice for improving the quality of life of persons with visual impairments, even though there are still obstacles to be solved, such as accessibility and affordability. We may anticipate seeing even bigger advances in the lives of persons with

disabilities as we continue to innovate and broaden IoT capabilities.

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