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VOICE BASED NAVIGATION SYSTEM FOR VISUALLY IMPAIRED USING RFID AND ZIGBEE TECHNOLOGY

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ABSTRACT

Blindness deprives humans of their most important sense and the primary source of information about the Environment. Worldwide, between 300 million and 400 million people are visually impaired due to various causes. Approximately 50 million people are totally blind. Eighty percent of blindness occurs in people over 50 years old. There are a numerous technical aids that have been developed through recent decades that make the lives of the blind easier. This project is built to aid the blind so that they may walk easily in urban areas and avoid obstacles using special detection sensors. The project which is implementing innovative ideas and also integrating the advantages of various technologies for outdoor navigation. The RFID tags will be placed in the areas where the blind visits regularly LDR is the light dependent resister which is used to detect day and night and many sensors are used to detect obstacles, fire ,water..

Keywords*: *RFID tags, LDR Sensor, RFID Reader, infrared sensor.

1.INTRODUCTION

Vision is the most important part of human physiology as 83% of information human being gets from environment is via sight. The 2011 statistics by the World Health Organization (WHO) estimates that there are 285 billion people in world with visual impairment, 39 billion of which are blind and 246 with low vision. Campus navigation system for blind with voice narration. The project is used to give voice messages reading the campus details and current location of the campus to visually impaired person using RF communication. The device is actually a special attachment that works in any area and relies on two major components. The voice guiding system and the specially designed RF communication. Using Radio Frequency Identification tags is a new way of giving location information to users those are called as RFID tags. Due to its passive communication circuit, RFID tags can be embedded almost anywhere without an energy source. The tags stores location information and gives it to any reader that is within a proximity range which can be up to 10-15 meters for RFID systems. RFID based system for navigation in a building for blind people or visually impaired. The system relies on the location information on the tag, a user's destination and a routing server where the shortest route from the user's current location to the destination.

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2.PROPOSED SYSTEM

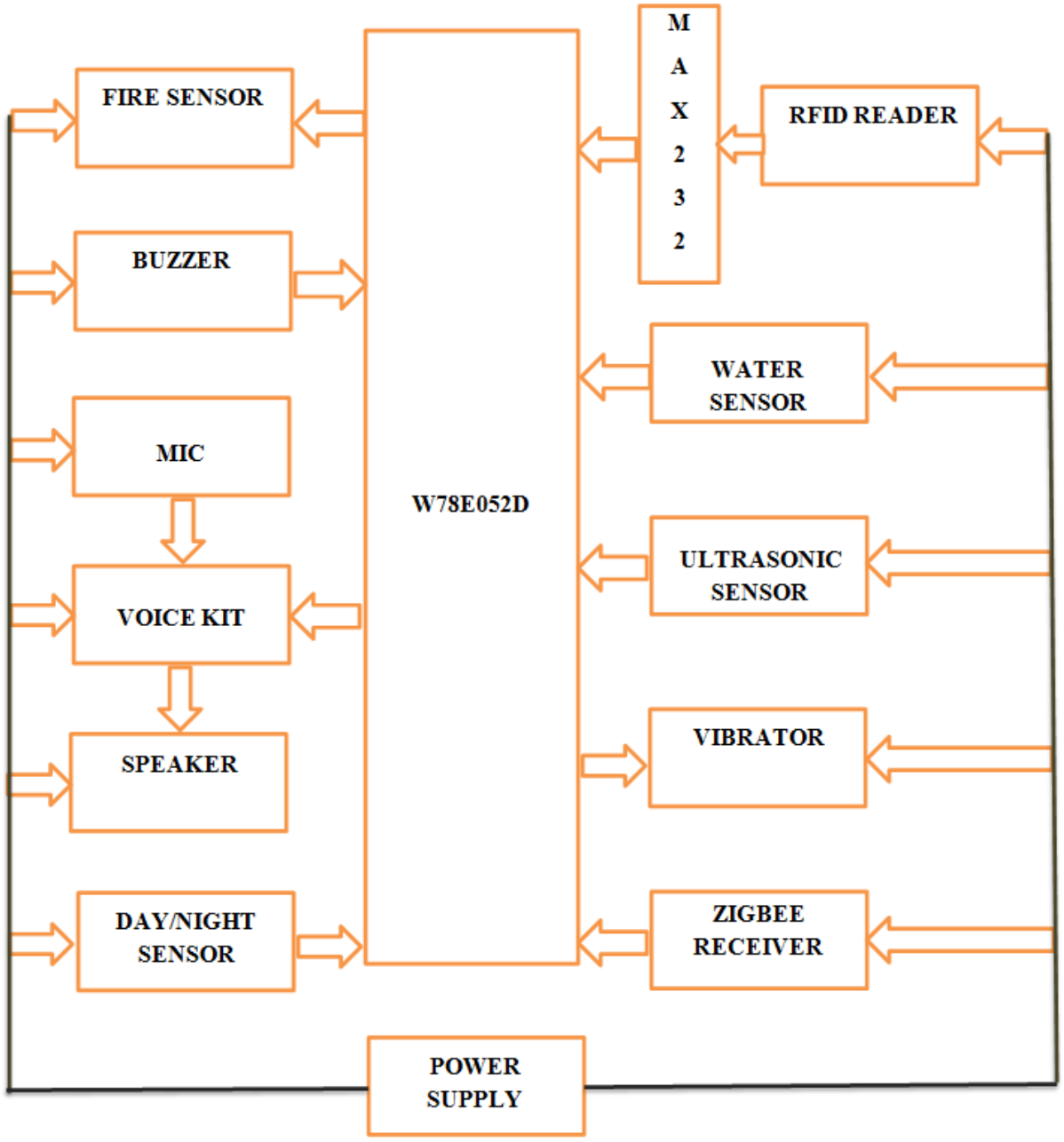

Figure 1: BLOCK DIAGRAM OF BLIND NAVIGATION SYSTEM

2.2 WORKING

This project is built to aid the blind so that they may walk easily in urban areas and avoid obstacles using special detection sensors. This system uses a microcontroller coupled with an output buzzer to alert the concerned. The

system will be fitted with an infrared sensor and also three ultrasonic sensors. The system guides and alerts the blind person of walking route and also alerts others about the blind person at night through led's fitted with it. LED lets other people and vehicles aware about the blind person in the dark. A microcontroller does all the work of detecting ultrasonic signals and sending back respective messages to the blind person. Thus the system provides complete guidance and protection to a blind person under various circumstances. Zigbee technology will be used so that the blind person can hear the bus numbers and travel to his destination required. The zigbee transmitter and receiver is used in the navigation process where the transmitter is kept in the bus and receiver is used in the system provided to the blind person. The output is given in the form of voice which is stored. The ultrasonic sensors fitted with the system provides obstacle data to the blind person through voice message so that he/she may avoid them. The LDR circuit coupled with RFID blind navigation is developed for blind people. Ultrasonic sensor will find the obstacle on the way and send the signal to micro controller. Voice kit will enable and give the audible output to the blind person. Water sensor is interfaced to know the presence of water on ground. Fire sensor is interfaced to sense the presence of fire on way, system will detect the fire and inform the person through body vibrator and voice system. LDR is used to sense the day and night. We are interfacing the RFID reader to know the area information. Each area placed with RFID tags, which contains area information.

The sensors which is used is as follows:

2.2.1 FIRE SENSOR

The system will detect the fire and inform the person through voice system. The fire sensor circuit is too sensitive and can detect a rise in temperature in its vicinity. The fire sensor module consists of IR sensor, comparator and LED. It has got three pins GND, VCC and output. Whenever fire is detected by IR sensor LED glows, and out pin is set high. The out pin can be given s input to the controller and can be used for any fire detection applications.

Whenever the LED is ON it indicates that fire is detected. Whenever fire is detected by IR sensor LED glows, and output pin is set high. The out pin can be given input to the controller and can be used for any fire detection applications. Whenever the LED is ON it indicates that fire is detected. When out pin of fire sensor module is set high i.e, ON

2.2.2 WATER SENSOR

Water sensor is used to detect the water when visually impaired people navigating in path. It is a sensor in which gets the information about the water. Water is acts as a conductor which is not pure conductor and it acts as open circuit B before dipping into the water.

Fig.2.1 Water sensor

2.2.3 LDR(light dependent resistor)

It is used to sense day and night.

It consists of a photo resistor decreases with increasing incident light intensity.

When the LDR is in darkness, it can be used to turn on light and when the LDR is in light then turn off the light using switch. LDR works that they are made up of many semiconductive materials with high resistance. The reason they have high resistance is that are very few electrons that are free and able to move because they are held in a crystal lattice and are unable to move.

Fig.2.2 LDR SENSOR

2.2.4 INFRARED SENSOR

It will find the obstacle on the way and send the signal to the microcontroller. Voice kit will enable and give the audible output to the blind person.

An IR Sensor can measure the heat of an object as detects the motion.

A passive infrared sensor measures the infrared light radiation from objects in its field of view. They are most often used in PIR-based motion detectors.

Fig.2.3 INFRARED SENSOR

The microcontroller does all the work of detecting the signals and sending back respective messages to the blind person. The RFID technology is used to detect the locations with the help of RFID tags. Voice kit will enable and give the audible output to the blind person. The zigbee technology is used to detect the bus numbers and give an audible output to the blind person through voice and help the blind person to travel to the particular location. The zigbee transmitter and receiver is shown Fig.2.4.

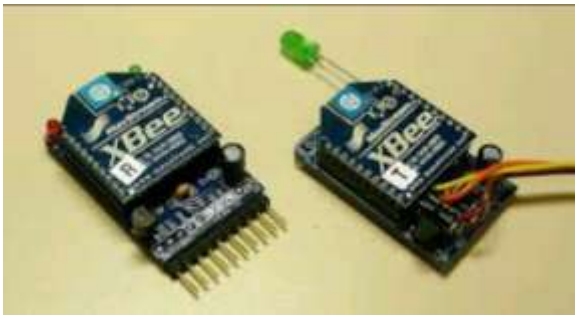

Fig.2.4 Zigbee Transmitter and Receiver

3. ADVANTAGES

- It will help the blind person to walk easily in urban areas.
- It will guide the blind person to overcome obstacles
- It will help the blind person to detect the environment changes like fire.

4. CONCLUSION

The ultimate aim of this project is to solve the problem faced by the blind people in their daily life. The system also takes measures to ensure their safety. Helping blind people to lead an independent life is the main motivation. The system shows good results in detecting blind locations and in communicating with them in a clear and operative way. It offers innovative solutions in order to replace the conventional methods of guiding visually impaired person.

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