

IOT Based Visually Impaired Public Transport System

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Abstract:- The internet of things (IOT) is a state of art model makes the electronic components to assemble in current atmosphere. Generally, the IOT is mounting the sensors such as radio frequency identification (RFID), infrared (IR) and so on. Additionally, integrating those sensors in web protocols for exchanging the data information, to achieve smart recognition, tracking the location, organizing and managing. In this paper, the IOT based smart public transport system for blind people to identify the bus stop number and get in to the bus. The proposed design is implemented with Arduino UNO, RFID reader, RFID tags, liquid crystal display (LCD), IR sensors, global positioning system (GPS), Wi-Fi and voice module. This system provides the information about the bus stop number, vacant seats and destination to reach are displayed on LCD when the RFID tag is placed on the reader. Moreover, the status of the passenger arriving in bus is alerted through message in the mobile phone. To acquire these requirements the C program is dumped in Arduino IDE which is a platform to write the software programs. The proposed work recognize the IOT potential, describes the various challenges and improve the intangible solution to resolute them.

Keywords:- IOT; Public Transport System; Arduino UNO; GPS

I. INTRODUCTION

In recent times, the wireless sensor networks (WSN) have significantly plays an major role for the improvement of IOT. The utilization of IOT can be implemented in almost all fields such as transport systems, home, hospitals, agriculture, roads, and so on. The identification of buses is important concern in today's busy world. The public transport system is a very important now-a-days, especially for the blind people due to their difficult to identify the buses and its information. In many metropolitan cities, blind peoples are not aware of bus location and its information. Hence, in this paper, we implemented a smart public transport system for easy identification of the buses and bus information using IOT.

In the proposed system, the bus information can be acquired through the RFID reader when it detects the RFID tag. The GPS provides the current location of the bus utilizing the Google maps. The Arduino UNO has been

utilized as platform to proposed work. In our paper, the coordinates of location are sending to the server through via Wi-Fi module utilizing Arduino. In our proposed system, the LCD displays the information such as destination, bus stop number, and vacant seats. The two IR sensors are used in the proposed system where one IR is placed at the entry in order to note the passenger number while other IR sensor is placed at the exit provides number of passengers departed from the bus. The voice module in the design system used to record and play back the information. Additionally, the speaker is integrated for high volume.

A. Motivation

The inspiration of the project to avoid the difficulties and problems faced with bus transport system in metropolitan cities due rapid increment in population. Due to these problems, the blind people cannot identify the bus stop numbers and its information. Our, motivation is to develop the smart IOT based public transport system for blind people to provide the information such as bus stop number, vacant seats and location.

B. Literature Survey

In previous works [1], Rishabh et.al., proposed a smart bus tracking and management system utilizing the various electronic components such as Arduino UNO, Wi-Fi module, Router and GPS. This system is designed to the waiting time of bus passengers and track the bus location. All the data is stored in the server and is retrieved to the passengers through mobile application. The IOT based smart local bus transport management system is presented in [2]. This system helps the users to reach the destination with short time. Moreover, the proposed also provides the current location of bus. In [3], Jay et. al., has described the IOT based scalable tracking system. In this work, the proposed system is implemented to show the effectiveness in terms of low bandwidth consumption over the system developed with the hyper text transfer protocol (HTTP). Based on these literature, we implemented the smart public transport system for blind people to identify the information bus.

II. PROPOSED SYSTEM

The effective public transport system using IOT technique for blind people is presented in this paper. The design for the proposed system is shown in Fig. 1. This architecture consists various components likewise Arduino, RFID, IR, GPS, LCD, Wi-Fi, Voice module.

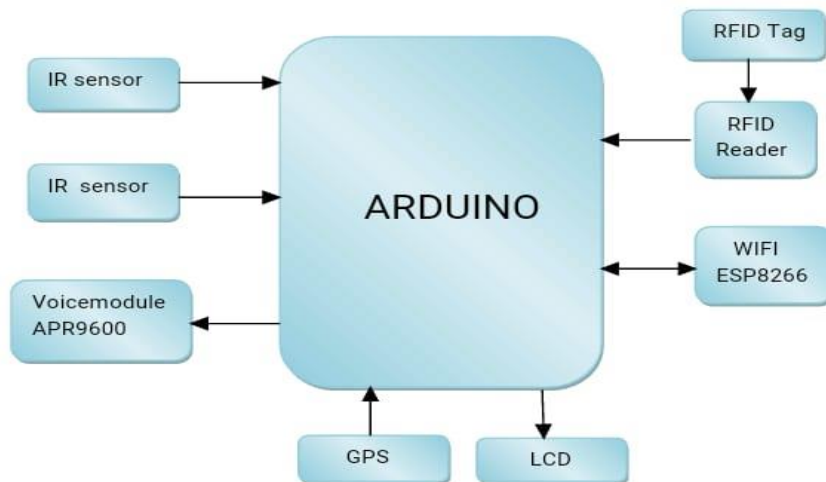


Fig. 1:- Block Diagram of Proposed System

The Arduino UNO (ATmega328) is a microcontroller has 14 digital input and output pins, 6 analog pins, 16 MHZ ceramic based resonator, USB port, power port, ICSP along with reset port. This Arduino acts as simple computer that

run one program at a time. In our work, the Arduino is operated at 5V to detect the bus stop number using the other integrated component RFID reader. The pictorial representation of Arduino UNO is shown in Fig. 2.



Fig 2

The RFID internally has radio transmitter and receiver which is called also as interrogator. The RFID reader read the at 10cm distance to provide the information when RFID tag in range area. This happens due to the electromagnetic

induction. The figure of RFID reader and tag is shown in Fig. 3. The IR sensors is operated at 5V ranges up to 20cm to detect the motion of the surroundings. The architecture of the IR sensor is shown in Fig. 4.



(a)



(b)

Fig. 3:- (A) RFID Reader (B) RFID Tag

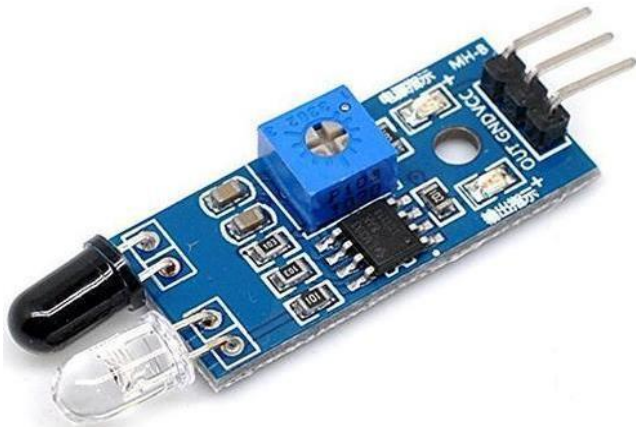
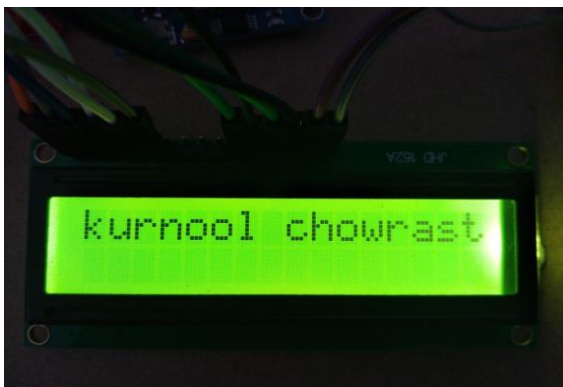


Fig 4:- IR Sensor

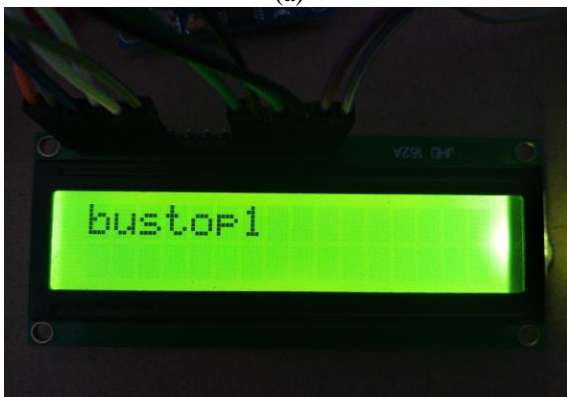
The GPS of the proposed system tracks the location where the Wi-Fi, supply with 3.3V, 512kb flash memory which used for network connection. The LCD is used to display the information which has 3 control lines, RS, 2 rows, 16 columns, R/W, EN and 8 data pins. This LCD is voltages in between 3 to 12 V and life time with 50,000 hours. Additionally, the voice and speaker are used in order to give the recorded voice and playback.

III. RESULTS

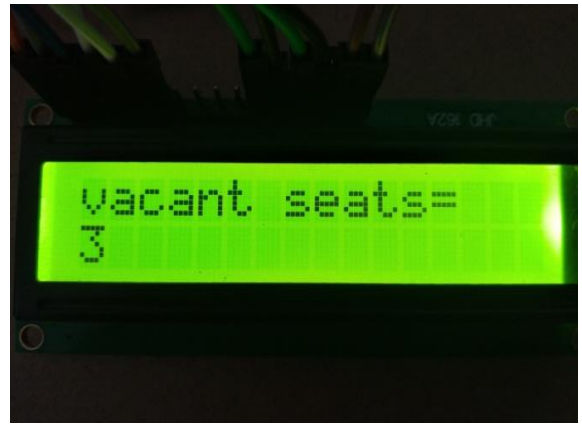
The results of the proposed system can be obtained by C programming code dumped in the Arduino IDE. The information such as location, bus stop number and vacant seat of our system is displayed on LCD screen. The obtained results are shown in Fig. 5.



(a)



(b)



(c)

Fig. 5:- Results (a) Location (b) Bus stop number and (c) Vacant seats

IV. CONCLUSIONS

In this paper, the bus identifying system is presented for blind people to provide convenient service. The results such as location i.e., kurnool chowrast, bus stop number 1, vacant seats 3 are displayed on the LCD screen. This system also announces about the status of bus (i.e., source, current location and destination) to passengers. The model of proposed design is successfully implemented on hardware and verified practically. From the observations, it is indicated that the proposed design can be helpful to blind people in realtime.

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