Smart Device for Hall Reservation and Occupants Monitoring System

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***Abstract*- In most of the seminar hall reserving methodology, the reservation is done manually by the respective staff in-charge. However, in some situations there arises a clash between the user who approaches first. In this paper, we've got proposed a Hall reservation and occupant monitoring system, a web application from which user can easily manage reservation details, booking details, and occupancy details. It aims to produce an efficient and convenient way for booking hall in an institute. The system stores records of hall bookings together with associated event details and user contacts in an exceedingly well maintained database. The administrator can easily check the seminar hall bookings and timings within the system GUI. This system is predicated on infrared sensor for counting multiple people pass through a door ways. It is implemented with two IR sensor modules designed using commercial sensing circuit and a microcontroller module. Based on the installed module the information will be stored within the database.**

***Index terms*- Infrared sensor, online booking system, GUI, people counting**

I.INTRODUCTION

Hall reservation and monitoring system is an online application from which user can easily manage student database. The main concept behind this project is to counter which measures the amount of people entering the hall. Each in-charge will have the user name and password to book the halls for their needs.

Through this they can view the particular seminar hall availability and also the facility in user friendly environment while booking the seminar hall.

The acceptance and rejection can be viewed by the user through the login or even by the mail-id. In seminar halls, the person has to check with the respective in-charges and has to enquire the Availability of the Hall. There arises a conflict, when he/she wants to use in the same time. Manual counting of persons in seminar hall is quiet difficult. Demand for availability of seats in seminar hall on time is highly increasing. The main idea in this project is to reduce the work forces involved in maintaining a database. Since, computerized data can be more accurate than manual data.

To overcome the problems of manual system, online hall reservation and maintaining system is proposed. The main objective of this project is to provide online facilities for booking and maintaining it. Occupants of seats and its record can be monitored. The number of persons in and out can be calculated. Updates the seats available.

The hall can be booked from anywhere through IOT.

It tracks all the details about booking, occupants of hall and seats. Booking can be done in website in an easier manner. In and out of the people are calculated. Hence, this project reduces man force and congestion in seminar hall.

II. PROPOSED SYSTEM

A. Hardware Section

On the hardware section, this project is designed with two set of IR transmitter and receiver, signal conditioning unit, micro controller and IOT module. IR transmitter is a category of LED which emits infrared rays generally called IR transmitter.

IR Transmitter and Receiver:

The important note is that both IR transmitter and receiver are placed in a linear to each other.

One pair of IR Transmitter and receiver is placed in one side of the entrance door another pair is placed on the other side of the door at a distance to the first one. Initially when power supply is on, both the pair

of IR transmitter will transmit infrared rays to the receiver.

Person Counter:

When any one person entered inside the door, the first ray is broken and then second IR rays, the corresponding signal is given to micro controller through signal conditioning unit.

Now the count value is incremented to one by the micro controller. When any one person goes out from the seminar hall the second rays is broken and then first IR rays.

Now the count value is decremented by one. The corresponding count value is updated and displayed on the LCD display, Depends upon the number of people, micro controller activate the driver circuit and the corresponding count will be updated on the web application.

Through this way number of persons attending the seminar will be calculated automatically.

BLOCK DIAGRAM:

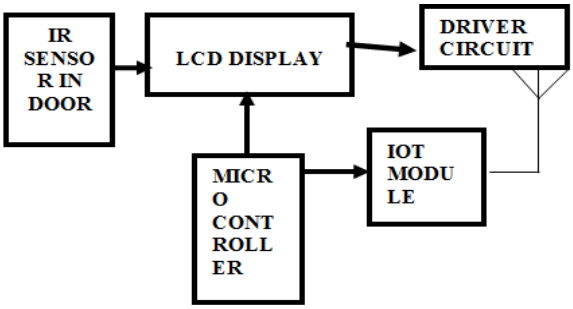

Fig. 1 Block Diagram of hardware Section

B. Software Section

Software section contains 3 modules as admin module, communication module and user module.

Admin Module:

This module is used by the admin for creating all available hall and adding the department in the database. This module will also have an interface to create new user details in the database. The admin can confirm or cancel any registration.

User Module:

This module will provide user interface to the user for login page and entries for booking hall. The reservation status of the user will be shown in this module. The user can check the hall details along with content detail for any dates.

Communication Module:

This module is used to communicate with the central database. The module is used to update the new entries and communicate with the user.

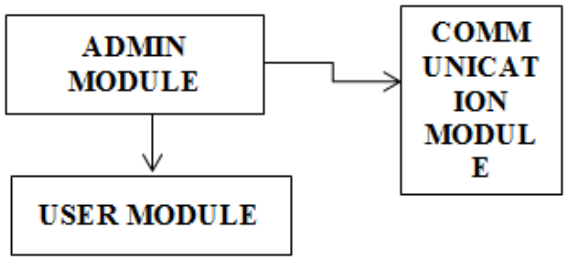

Fig.2 Block diagram of software section

III. COMPONENTS USED

Taking about this proposed system, it is clearly shown that it has several components which helps to build a hall reservation of occupants and monitoring system.

A. GSM module

GSM modem sends the total consumption to the consumer via SMS. GSM stands for Global System for Mobile Communication. A GSM modem can be used to make a computer or any other processor communicate over a network. A GSM module needs a SIM card to send messages to the consumer. It operates over a network range subscribed by the network operator.

Fig 3 GSM module

B. LCD Display

LCD stands for Liquid Crystal Display which uses the properties of liquid crystal combined with the polarizers. LCD screen display works on the principle of Blocking Light and it requires Backlight. LCD display is mainly used to display the information details. Many LCD display monitors are powered by 12V power supply. Most of the LCD

screens are designed with LED backlight. LCD provides the excellent contrast.

Fig. 4 LCD display

C. IR SENSOR

IR sensor means the Infrared sensor which measures the heat of an object and also detects the motion. It measures only the radiation of infrared. All the object in the infrared spectrum radiate in form of thermal radiation. The infrared sensor is a light sensitive component.

Fig. 5 IR Sensor

D. MICRO CONTROLLER

The PIC microcontroller AT89S52 is used in this system. The term PIC denotes peripheral interface controller. The coding or programming of this controller is easier. It can able to write-erase as many times as possible because it uses FLASH memory technology. It is an 8 bit CMOS Microcontroller and has 32 I/O pins. It has five ports starting from Port A to Port E. PIC microcontroller is an IC. It includes CPU, RAM, ROM, timers, counters and protocols like SPI, UART and CAN which are used for interfacing with other peripherals.

Fig. 6 PIC Microcontroller

E. POWER SUPPLY

Power supply supplies the electric power and the function of a power supply is to convert the electric current. Power supply is referred as electric power current.

A power supply provides with the electric power. Power supply input voltage switch can be set depending upon the geographical location and also uses a switched mode power supply which changes current to the voltage.

IV. METHODOLOGY

The user can login the webpage and checks the hall availability based on date and time. The user credentials are stored in the database based on departments. Then they can view the hall availability and book the hall for a particular time period.

If they don't want to book they can cancel the booked one. Multiple users cannot book the hall for the same time period.

Using this we are able to see the particular date and time according to the seats filled. The number of persons inside the hall is counted using an IR sensor and stored it in the database. The seat availability will be displayed outside the hall using LCD.

The count will be increased by one if a person leaves the hall and decreased by one if a person enters the hall.

This data is also available in the webpage. According to the seat availability of person can occupy the hall.

V. EXPERIMENTAL RESULTS

In this section, the logic is already stored in the microcontroller to act accordingly. Using this we are able to see the particular date and time according to the seats filled. The updating of required time can be done by booking it. The sensors which are placed parallel at the two ends of a door detect the object and increase or decrease the count accordingly.

Fig. 7 Booking Application

The username to access the web page is assigned based on departments and admin can also log into it.

With the password given we are able to login to the Web page.

	Logdate	LogTime
D_SEATS:_099_	03/04/2020	19:52:07
	03/04/2020	19:52:22
	03/04/2020	19:52:30
	03/04/2020	19:52:43
	03/04/2020	19:52:57
	03/04/2020	19:53:06
	03/04/2020	19:53:16
	03/04/2020	19:53:31
	03/04/2020	19:54:54
	03/04/2020	19:56:40
	03/04/2020	19:56:43

Fig. 8 Webpage database of date and time.

The count is calculated through the IR sensor in which the availability of seats will be displayed.

Fig. 9 LCD display of persons OUT

Fig 10 and Fig 11 shows the count of persons which is received by the sensor detection if any human interruption seems to occur. Fig 10 shows the count of seat occupied and fig 11 shows the count when the person leaves the hall.

Fig. 10 LCD display of persons OUT

VI. CONCLUSION

In this paper, a prototype for hall reservation and monitoring system using IOT is presented. 8051 microcontroller is used for this purpose. The collected records are sent to the cloud server.

This reservation and monitoring system can be implemented for any type of halls. Since records are stored in the database, records can be viewed and verified at any time.

The necessity of separate hall supervisors to monitor the hall can be reduced effectively. This paper provides an effective method to reserve the halls and monitor the occupants. This ensures that the hall user is well informed about the availability.

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