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Voice Controlled Wireless Electronic Notice Board using Arduino

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ABSTRACT

This paper introduces an IoT-based smart notice board designed to provide fast and reliable dissemination of information. The main objective is to create an automatic, self-enabled notice board accessible from anywhere in the world. The system incorporates a display connected to the cloud, continuously awaiting messages from users.

Users can upload messages to the notice board using two methods: voice-based input via mobile devices and manual text entry. By leveraging technologies such as NodeMCU ESP8266and Atmega328, users can upload messages to the LED display by accessing the Thingspeak IoT cloud platform. This dual input method ensures flexibility and ease of use for a diverse range of users.

The integration of voice-based input enables users to dictate messages directly from their mobile devices, offering a convenient alternative to manual text entry. This feature enhances accessibility and user experience, particularly for individuals who prefer or require hands-free interaction.

By providing real-time access to the notice board from any location, the system reduces the time required to update information and efficiently transfers data to end-users. This capability enhances communication and information dissemination processes in various environments, including offices, schools, and public spaces.

Key words: Arduino, Voice Arduino control, P10 matrix display, Bluetooth module, Notice board

1. INTRODUCTION

We are living in an era where technology changes day by day, where technology increases rapidly, where we want everything in smart way. So, we engineers proposed a smart notice board in which neither use of paper and nor a wooden frame for attaching the notices. We will used digital notice board where user can control the notice board by own. Simply user needs to install an android application in his/her android phone/tablet. We come across situations where we need to urgently need to display notices on a screen. For areas like railway stations and other such busy facilities the station master/announcer need not have to type in every announcement message manually on the screen. So here we offer an innovative Android based notice display system which allows the user to display the notice without typing manually. Here the announcer/administrator may speak out the message through his/her android phone, the message is then transferred wirelessly and displayed on the screen. To demonstrate this concept, we here use an LCD screen to display messages. The LCD is interfaced with an

Arduino. We use a Bluetooth receiver to receive Android transmitted messages, send them to the Arduino for decode and further into the process. The Arduino then displays the message on the LCD screen. Use of this notice board system can be used in various places including railway stations, schools, colleges, offices to display emergency announcements on screen instantly, instead of typing the message at all times. So that voice-based notice board project is very useful in different organizations. The system is a low-cost wireless Machine and Cloud based note board system that includes a Wi- Fi transceiver circuit interfaced with a low-cost micro controller to transmit the requested information to the display board instantly. For data transmission using the accompanying transceiver circuit and micro - controller, the communication mode, i.e., Wi-Fi module, is chosen. The application can be accessed remotely via a URL, and any authorized person can log in and review the Notices shown.

Objective of this project:

• Main objective behind Voice operated electronic notice board using display is to show messages and to control them by using our own voice.

• It is the time to change old style notice board to smart digital notice board. For that we proposed voice control notice board. It gives us more comfort and a better user interface.

• We use a Bluetooth receiver to receive Android-transmitted messages, send them to the microcontroller for decode and further into the process. The microcontroller then displays the message on the LCD screen.

• Use of this notice board system can be used in various places including railway stations, schools, colleges, offices to display emergency announcements on screen instantly, instead of typing the message at all times.

2. REVIEW OF LITERATURE:

From 20th century voice control notice board playing an important role in many organisations and institutions and also in railway station, bus station. Neeraj Khera and Divya Shukla IEEE 2016[2] has developed an Android-based wireless notice board that seems to be simple and low-cost. Bluetooth or Wi- Fi-based wireless serial data communication has been used in their proposed framework.

Android-based software applications for Bluetooth and Wi-Fi communication between Android based personal digital assistant devices and the remote wireless display board are used for this purpose.

S. Rubin Bose and J. Jasper Prem IJRIER 2017[4] developed a GSM modem that uses asynchronous communication to communicate with the microcontroller and displays the message on a GSM-based LED scrolling display system. The microcontroller sends out AT commands to read the message sent by the user, and the smart notice board provides wireless transmission of information over the network to display the messages quickly.

This system is easy, effective, that can be used in real interactions by anyone, everywhere, with fewer mistakes and maintenance. Multiple LED notice boards are managed by multiple transmissions and message feeds on only one receiver, due to ZIGBEE Technology.

To enhance the messaging pattern, the controller sends many LEDs. The range of wireless communication is limited in this region, and this method can be used. This system proposes a GSM based system with far more display functionality than a programmable system.

Arun Mishra G. Lavanya P. Monika IJCAT 2017[5] developed a system that used a Raspberry Pi 2 as the central server. The Notice boards can only be accessed by using correct credentials on the Raspberry server throughout this system. A Raspberry Pi 2 is in charge of this electronic Notice board system. It should have a valid IP address and also is it should be connected to the internet

3. PROPOSED SYSTEM

By looking at the above it will become clear that, there is a need for an electronic notification board that creates an effective way for the user to display the notification. With a view to increasing the cohesion of the electrical systems, it is necessary to connect two or more systems together. This paper is mainly for an introduction to the idea of wireless communication between a mobile phone and an Arduino controller devices. For this project, we must build an embedded system that includes a P10 matrix display unit and a sound device that uses wireless technology. The display unit contains any type of display that can be connected to a microcontroller. The audio device is a microcontroller-controlled speaker that converts the Converter-To-Speech (TTS) converter.

The system can be used in colleges, schools, offices, train and commercial stations as well as in public areas and also in hospitals for alerting the security in case of emergency.

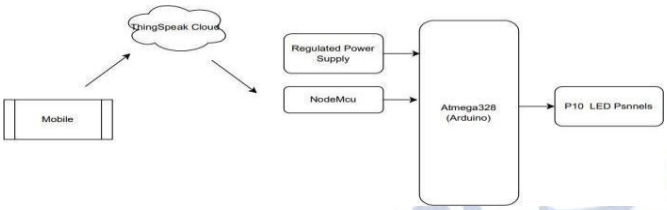

Fig. 1. Block diagram

About Block Diagram

There is a need for an electronic notice board that allows an effective user to display the notification. With a view to increasing of the cohesion of electrical systems, it is necessary to connect two or more systems together. This program is the implementation of the concept of wireless communication between the cell phone and the ATmega328 controller.. The display unit contains an LED indicator that can be connected to the ATmega328 microcontroller. Bluetooth is an open wireless protocol for data exchange at short distances from mobile devices, creating personal area networks (PANs). It was originally named as the wireless alternative to RS232 data cables. It can be connect several devices, overcoming the sync issues. Bluetooth will receive the signals sent by the Android device (mobile phone), and then send these signals to a small controller. To use this application, we need to use an Android application that can perform the following functions: Convert voice data to text. Send this text to a microcontroller via Bluetooth for display on the notice board. The HC-05 module is an easy-to-use Bluetooth SPP (Serial Port Protocol) module, designed for transparent serial setting. Used to transfer data from android device to microcontroller ATmega32 In 28 pin IC. We can design our system using other controls as well but with the use of Atmega328 system size can be greatly reduced. Input from android is sent via a small Bluetooth controller to display it on the bulletin board. In this PIN program. 2 & 3 is used for the purpose of transmission and receipt. Buzzer is used when a notification is about to be displayed, used for public attention. As at bus and train stations used in the hospital. The P10 LED Display Module is well suited to design any size of outdoor or indoor LED display board. This panel has a total of 512 high-intensity LED lights mounted on a plastic housing designed for the best display results. Any number of such panels can be integrated into any row and column frames to create an attractive LED signature board. The size of 32 * 16 modules means that there are 32 LEDs in each row and 16 LEDs in each column. So there is a total of 512 numbers of LEDs present in each module unit. Arduino software application is used to voice control. It is basically used to control arduino by sending voice commands. will be inbuilt with the ability to convert text into text conversion when the text is sent sequentially to the arduino you are processing. It will be available in the play store. we can download easily

B. Working Principle

Working operation is very simple, we have Android application and Bluetooth module, in order to successfully connect with the Bluetooth module, you need to pair the HC-05 module with the android app. Once connected, we can send the message we want to display, once the message has been sent, Arduino will process the cable and convert it into a signal that the 74HC595 shift resistor can detect, after the data has been sent to the shift. resistor, ready to display. Arduino is the heart of the circuit. processes all data sent by the Bluetooth module. The p10 module is widely used in day-to-day operations and is used in professional activities such as in stores for advertising purposes, and in shopping malls to inform the safety and management system of parking spaces and hospitals to alert safety in emergencies.

C. Software tools

1. *Arduino:* Arduino is an open source software and mainly used for editing Arduino system. Arduino is designed to perform electronics are easily accessible to artists, designers, hobbyists and anyone interested in creating collaborations objects or places.
2. *Arduino voice control APP:* By using this app you can transfer numbers, letters or strings using your voice. Click on the Bluetooth icon to connect with one of the paired devices. After a successful connection, you can click on the microphone icon to speak a word or phrase. You can use the following program in Arduino to read the phrase found in the serial monitor

D. About Flow chart

Initially the Bluetooth terminal is turned on and it should be connected to the device by entering the correct password. If the password is correct then the initial message will be displayed which we written in the code. After that the user has to send his/her voice commands through the android app. This app will convert voice to text and sends the data serially. If numbers of characters are less than 100 then the message will be displayed on the P10 LED matrix display panel. As it is Notice so the message will be Scrolling. If the number of character are greater than 100 then the previous or old message will be displayed

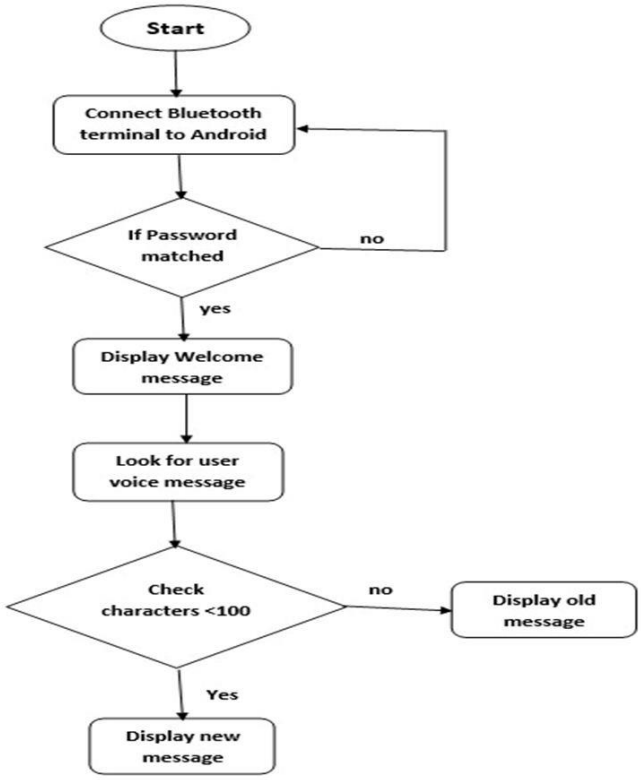

Fig. 2. Flow Chart

4. RESULTS

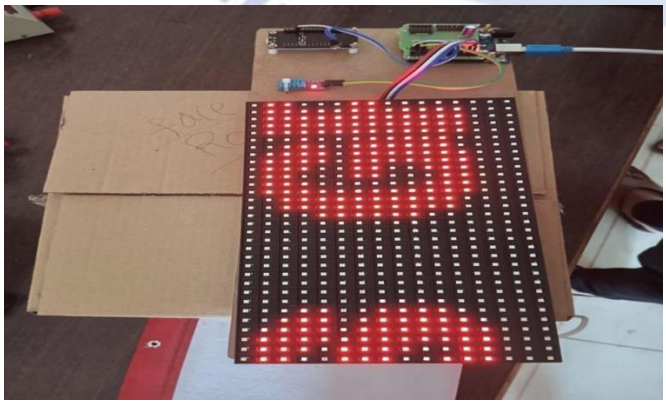

Fig. output of LED board

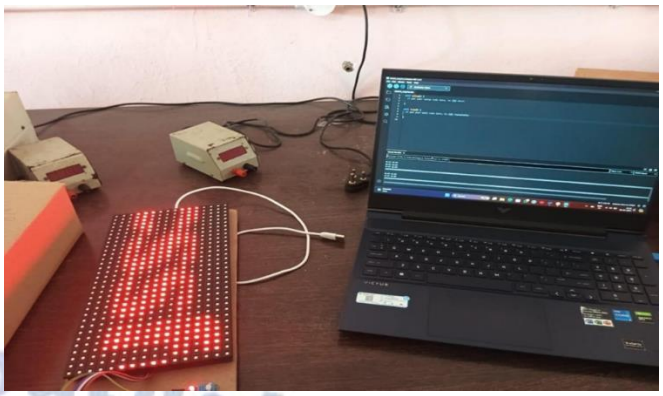

Fig. software code display

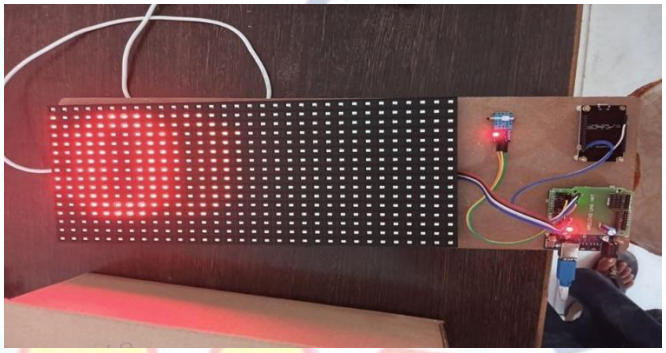

Fig. Led,Temperature Sensor,Wifi Module And Arduino

5. CONCLUSION

Conclusion In this modern era of technology is helping us to reduce human work. The proposed project can decrease work load and human dependency. It is proposed to design display toolkit which can be used from an authorized app. The display boards are one of the most important media for transferring information to the maximum number of end users. With the advancement in technology the display board systems are migrating from normal hand-written display to digital display. A user can send a message from anywhere in the world. Being user friendly, long range and speedy mean of conveying information are major characteristics of this system

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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