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Voice Controlled Notice Board through IOT

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Abstract

The Voice Controlled Notice Board is a computer controlled machine. This automated system can reduce the manual work. The construction of a simple and low-cost Voice Controlled Notice Board is addressed in this framework. The aim of this device is to create an automatic display board that is controlled by the Internet. This electronic machine is made up of both software and hardware components. The key goal of this device is to provide a remote notice board that faculty can use to post the most recent notices and announcements. The other goal is to improve contact speed while still saving time and money. It may also be used to increase the re - usability of existing designs and reduce the amount of space available, lowering costs. Wi-Fi-based cellular serial data networking is used in the proposed system. For Wi-Fi connectivity between an Android-based personal digital assistant and a remote wireless display screen, Android-based device applications are used. In this design, messages are sent through an Internet from an authorized transmitter and then message is transmitted to the Node MCU and the message is read and sent to digital display board.

Keywords: Voice Controlled Notice Board, Low-Cost, Wi-Fi, Personal Digital Assistant, Node MCU

1. Introduction

In our day-to-day life we would have come across many notice boards that is been displayed on schools/colleges and public places like Bus stations, Railways, Malls and Airports etc and realized in what way notice board is a primegadget. Traditionally, there were notice boards where any information or notice had to be stick daily. This traditional way of displaying becomes tedious, requires daily maintenance, and also produces lots of manual errors. So,we propose an ideathat is Voice based wireless smart notice board that displays notices, when a message is sent from the user's device through IOT assistant.ThisIOTprovide great efficiency with less work and time. The concept of this system is to design an Internet driven automatic display board. It is proposed to design receiver cum display board which should be programmed from an authorized mobile phone. In this system, a voice-based messageis sent through an Internet from an authorized transmitter and then the message is transmitted to the microcontroller and the message is read and sent to digital display board. 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
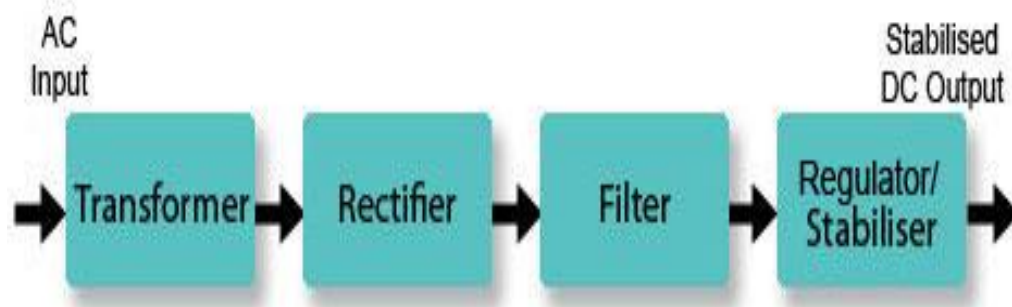
micro - controller, the communication mode, i.e. Wi-Fi module, is chosen. The application can be accessed remotely via a URL, and any authorized person can log in and review the Notices Shown.

2. Literature Survey

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. [1-5].

3. Hardware Components

3.1 Power Supply

Fig.1.Power Supply Block Diagram

In the power supply unit, there are four units that convert the AC power supply to DC power supply. They are

Transformer

In this system, we use step down transformer, where it receives the AC voltage power supply on the primary winding and produces different lower-level voltage on the secondary winding. The obtained DC voltage should be in accordance with the input AC voltage, where if we obtain the DC voltage of 14 volts, then the secondary winding must have not less than 10 volts, as the peak value for secondary Winding will be of Vp=1.41 x 10 =14.1volts, this peak value cannot be used as the

voltage drops at different stages, so we choose transformer of 14 volts,as thepeak voltage is Vp = 1.41 x 14 =19.74volts.

Bridge Rectifier Circuit

Followed by the electrical transformer, the produced output of the transformer is given as the input to the rectifier circuit, insystem we use Bridge Rectifier Circuit as it transforms the secondary winding AC voltage of the transformer in to pulsating DC voltage supply.

Filter

After pulsating DC voltage by Bridge Rectifier Circuit, we use filters which consists of one or more capacitors that is been charged to maximum voltage to eliminate the alternating current

produced by the rectifier and discharges during the disappearance of the pulsating DC voltage.

Voltage Regulator

Voltage Regulator is followed after the function of filter, these 7805 Voltage Regulator regulates the

3.2 Node MCU ESP8266

signal that is been produced by the filter into a constant Voltage, so that it can be used further. It mainly maintains the power supplyin a constant level.
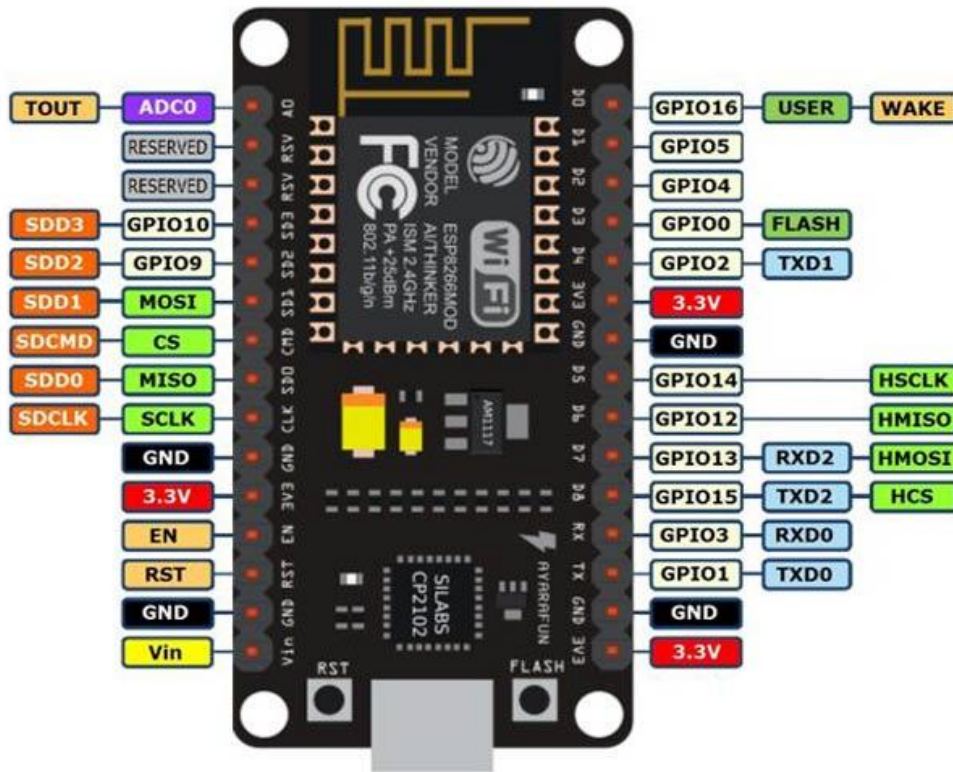
Fig.2.Pinout Diagram of Node MCU ESP8266

NodeMCU is an open-source hardware-based firmware that runs on the ESP8266 and it is a development boardmainly used fordeveloping IOT based Applications. It consists of I2C Pins. NodeMCU has I2C functionality support.

Pin Description

Power Pins

It has a Micro-USB, where the Node MCU can be worked by using the USB connector and also Controlled them .A voltage of 3.3V has been supplied to this pin in order to power up the chip .It also has a Ground pins (GND) and External Power Supply (VIN). The control pins EN, RST are used to reset the microcontroller. Analog pin (A0) that is used to calculate the Analog voltage in the range of 0-3.3V within the tool.

GPIO Pins

Node MCU has 16 general purpose input-output pins on its board, numbered from GPIO1 to GPIO16.

SPI Pins

For SPI communication, the Node MCU has four pins: SD1, CMD, SD0, and CLK.

UART Pins

UART0 (RXD0 & TXD0) and UART1 (RXD0 & TXD0) represent two UART interfaces here on Node MCU (RXD1 & TXD1). The code is loaded to the hardware using UART1.

3.3 I2C Display

Fig.3.Diagram ofI2C Display

I2C LCD is electronic display module device used to display the message in easy way and also reduces difficulties in displaying. It has only 4 pins

that interface where the connections are as,a ground pin (GND) should be connected to the ground of MCU, VCC supplies and Connect it to the 5V. It consists of an 8-bit quasi-bidirectional port as an input or output by using control signal and an I2C-bus interface.

4. Software Components

4.1 Arduino IDE

The Arduino IDE (Integrated Development Environment) is a free and open-source application that allows developers to write, compile, and transfer code to an Arduino UNO board. We use it because as it also runs on operating systems like MAC, Windows, Linux,and Java Platform and makes easier to code- one has a microcontroller on the board that is currently programmed as sketch called the main code, which creates a Hex File that is transferred and uploaded into the controller board. As it supports both C and C++ languages,we use embedded C language.

Fig.4.Ardunio IDE

4.2 Adafruit

Adafruit is a cloud-based database provider that allows users to store and access data by connecting to it from the internet anytime, they need it across the globe. It's used mostly for storing and retrieving data, but it can also be used for a number of different purposes, including any of the following is that Your data can be accessed in real time using an internet connection from any location.As our system is internet-connected Voice Controlled Notice Board, we use Adafruit database,it has the access to Facebook, RSS feeds, flood forecasts, and other web resources. Our computer is internet ready thanks to Adafruit. The transmission of a message to a notice board is monitored using Adafruit IO triggers.

In back end Adafruit function as a cloud database to store user data in Adafruit IO, so that they can retrieve their voice data for n number of times when they needed to display it.BySetup ESP8266 Support withAdafruit (AdafruitFeather HUZZAH ESP8266)

4.3IFTTT

IFTTT, also known as "if this, then that," is a service that enables users to customize responses to various types of incidents around the world, as well as a web platform that integrates a wide range of applications, devices, and services from various developers. We use IFTTT service in our system, in order to display messages through devices involving those apps and servicesaround the world. IFTTT allows the User to send and retrieve the message to Adafruit database. We useIFTTT serviceas an intermediator, mainly it is an automate web-application service, user can also post the any message from anywhere in the world throughpersonal assistant.

Fig.5.IFTTT

5. System Working

The user can able to access the display board through the android devices with personal assistant and an active internet.
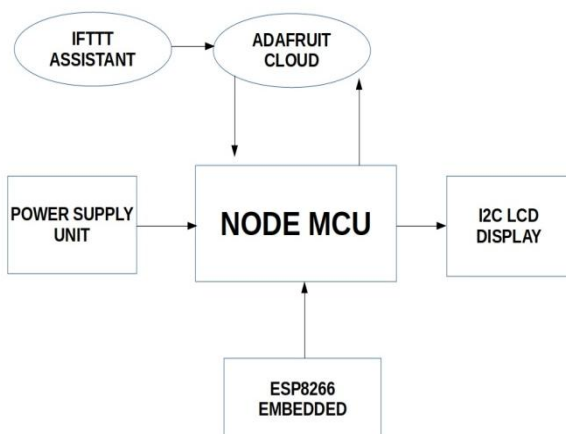

Fig.6.Block Diagram

Initially, the data which was fetched by the personal assistant transmitted with the help of IFTTT applet service tracked to the Adafruit IO. Data stored in the log in account of Adafruit cloud databaseand send to the Wi-Fi enabled Node MCU Module which works by the power supply unit and the information feed with the Arduino IDE. After receiving the data from the authorized server, the Node MCU Module will process the data and send the information to the display unit. Here, where I2C display shows the information which was given by the user through the personal assistant.

Advantages

- It is Simple, Low cost and user friendly.
- It also easy to store and retrieve the voice data in the Adafruit database can be reused multiple times.
- Desired message can be displayed on the notice Board instantly from anywhere at any time through an internet service.
- It reduces manual work, produces less error, and provides easy maintenance.

Conclusions

We can improve the efficiency and speed of our connectivity by using the principle of wireless technology in the communication field. This device can be used from anywhere in the world with an internet connection, so if a message has to be shown quickly, we can do so with less human error and with ease of maintenance. The technical paper linked above discusses how to use Wireless Technology and an IoT Assistant to view messages on a voice-based Notice Board. It also provides client validation, allowing them to keep a strategic distance from the potential misuse of the proposed system.

References

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