

IOT based Digital Notice Board

Rhutik Dhanawade¹, Abhishek Sasne², Vishal Patole³, Bhawana Patil⁴, Ajinkya Patil⁵

U.G.Student, Department of Electrical Engineering, NMCOE, Peth, Maharashtra, India¹

U.G.Student, Department of Electrical Engineering, NMCOE, Peth, Maharashtra, India²

U.G.Student, Department of Electrical Engineering, NMCOE, Peth, Maharashtra, India³

U.G.Student, Department of Electrical Engineering, NMCOE, Peth, Maharashtra, India⁴

Assistant Professor, Department of Electrical Engineering, NMCOE, Peth, Maharashtra, India⁵

Abstract

This paper aims to present a technology based online notice board using Internet of Things (IOT). Down the years Display boards constituted one of the major role in mass communication medium. In order to reduce paper work, time and man power, the proposed model introduces an online digital notice board using IOT. IOT Connects things to the internet .So, we can access the Notice board from anywhere across the world through internet. The notice board is interfaced with the Ethernet module to provide internet access to the board. The Ethernet module which is installed at the digital notice board receives the message from designated user and gets presented on the notice board. From our proposed model the authorized admin enables to post the message from any corner and this message can be portrayed on the Led Display. The proposed model funds with multiple applications like help desks in transporting stations like railway, airways and bus stations which offers travellers to have up to date/updated info. It has a better impact in jammed regions as in supermarket to provide a hike and decremental cost prices. This directs the people/students in completely unfamiliar areas. Lesser to the infinity each remote areas of the world can be portrayed on the screen with the updated news and it can be possible only by the IOT.

KEYWORDS: *Digital Notice Board , Internet of things , Microcontroller, Ethernet Module.etc.*

1. Introduction

The Internet of Things (IOT) is the network of physical objects or devices, vehicles, buildings, and other items embedded with electronics, software, sensor and network connectivity that enables these objects to collect and exchange data. Mobile phone and other related technologies are becoming more and more famous. So that communication with every person has become easy and smart. Another technology used is Global System for Mobile Communication (GSM) for sending message anytime and anywhere. Notice board plays a vital role in today's world. It is commonly used in places like school, colleges, railway stations and other various institutes. But changing notices day to day is a difficult task. So to overcome such things this paper focuses on a digital notice board. The main objective of this paper is to develop a notice board using IOT that replaces the currently used electronic display. A digital notice board can be replaced in place of an conventional notice board which reduces manpower and resources. The digital notice board uses digital technology and electronic components. It is implemented to display notices or messages from anywhere or at anytime. A Smart Notice Board [1] designed and developed using Internet of Things. It uses an Mobile App that send message that is to be displayed on the notice board. This uses an Wi-Fi module which limits the distance from which the message is to be sent. A Digital Notice Board [2] is mainly consists of Raspberry Pi in which there is an android application that is connected to the LCD display. This project needs a continuous internet connection that too with registered network. A survey paper on The Android Controlled Smart Notice Board using IOT [3] has been implemented an Android Controlled Smart Notice Board using IOT which uses the Raspberry Pi and IOT. The drawback of this project is that it uses a specific App which is again to be developed for the same and it also requires continuous internet connection. Implementation of Digital Notice Board using Raspberry Pi and IOT [4] in which PC is used for sending information and Raspberry Pi is connected to internet at the receiving side. The need of continuous internet connection is one of the drawbacks of the system. A survey paper on Voice Over Wi-Fi based Smart Wireless Notice

Board [5]. It is a system to wirelessly transmit short notice using Wi-Fi. This system uses Raspberry Pi for the Transfer of the information. Zigbee based Electronic Notice [6] Board. In this project the wireless notice board is developed with the help of ZigBee and GSM Technology. The software developed at the personal computer is to assist the user to send the notices to the students through emails through mobiles and to display the notices at the notice board. The drawback of this system is that it needs continuous internet connectivity to transfer information that is to be displayed through e-mails. In this paper a digital notice board is proposed which can be controlled/operated by authorized person from anywhere without any distance issue. The normal messaging app of an android mobile phone is used for transfer of notices/messages in this system to make it more user friendly. The resources, manpower, time consumption generally required for conventional notice board is reduced with the use of this system. It is also cost effective over the conventional notice board.

2. METHODOLOGY

The main function of the proposed system is to develop a Digital notice board that display message sent from the user through mobile phone (SMS) and to design a simple, user friendly system, which can receive and display message/information in a particular manner with respect to date and time which will help the user to easily keep the track of notice board every day and each time he uses the system. System consist of two section called as sender and receiver. Sender is responsible for sending valuable information through the GSM protocol. In order to access Digital notice board the sender must enter into the corresponding mobile number [3]. When the user enter correct mobile number, the message can be typed and get space for the information transmission. To make the proposed system more user friendly we make an android application .By using this application sender can directly enter the message. In receiver section, PIC microcontroller is connected on GSM module for accessing the sim card. It is a capable little device that enables people of all ages to explore radio waves transmission and reception. We use here embedded C language and GSM protocol as the basic working principle.

3. SYSTEM REQUIREMENT

Hardware is a physical outlook of any field which is interlinked to computerization in Information Technology. It is comprised of various elements which results in a suitable output. In this paper the few hardware elements which are embedded are as follows:

A. Transformer: In this wireless electronic notice board the transformer, which consists of two winding's primary and secondary is used for converting the 220V to 24V ac because this system is directly connected to the power supply.

B. Voltage Regulator: The voltage regulator is used for providing the fix 12 volts, DC to the microcontroller and LCD display. In the absence of voltage regulator, the higher voltage may be damage the LED Matrix display or microcontroller and in this system these two components are too much important.

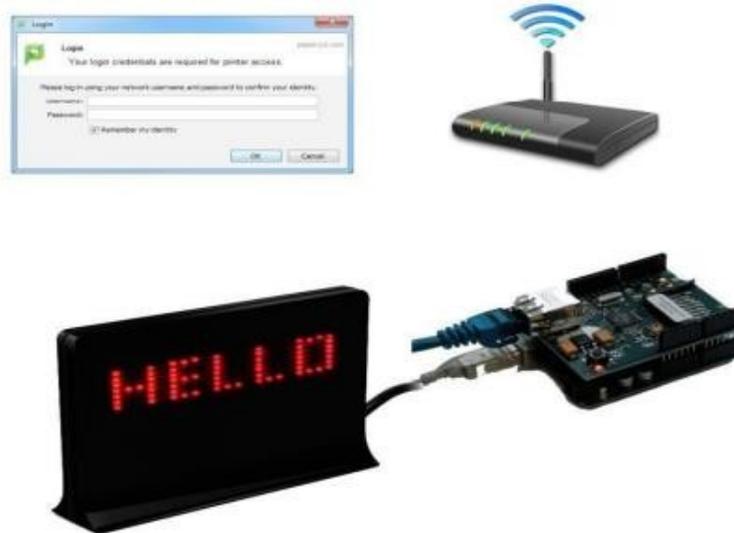
C. MAX232: The problem is occurred when we communicate between TTL logic and CMOS logic because, here in wireless electronic notice board we are communicating between GSM modem and microcontroller therefore the problem would be occurred. For solving this problem, the max 232 is used in this specific wireless electronic notice board.

D. GSM Modem: GSM modem is a wireless modem as shown in Fig. 1. It works on wireless network. This modem works like a dialup modem and sim is required for communication. In dialup modem the data is send or received through the fix telephonic line but in GSM modem data is send or received though the radio waves.

E. Arduino: Microcontroller is referred as the chief functioning element which holds a mechanism of every element with a few interlinks between them. There are many microcontrollers in existence out of which we are preferring "arduino" microcontroller in our innovation. The main reason to opt arduino as our microcontroller is because of its simple characteristics as it enables the beginner to grasp the content quickly. It is possible to interact with the basic programming as it contains many inbuilt functions with an own compiler and a quick accessibility between the components is possible, it is eco-friendly and also cost-friendly. Referring to the merits of arduino, we chose to operate our module with this particular microcontroller.

F. Digital Notice Board: The Digital Notice Board consists of some special registers to store the messages given by the user and it displays sequentially. The Arduino + Ethernet module controls the display system in the digital notice board through online. This Large, bright 512 LED matrix panel has on board controller circuitry designed to make it easy to use straight from your board. Its brightness level is upto 3500nits to 4500nits. one plate requires 3.5A current and 5V voltage .

HARDWARE BLOCK DIAGRAM



4. SOFTWARE DESCRIPTION

Hosting: Hosting maintains clients websites on its systems and provides related service. The services may include leasing of hard disk space, stability of hardware and software, securing with a backup, unique content provision with high speed web access. In our proposed module it helps us to provide the authentication details which gets stored in database that can be accessed from any corner of world. In this point of view, hosting has key role in the IOT based digital notice Board.

4.1 Need of Scripts to develop the module:

PHP: Personal home page is an HTML-embedded, serverside scripting language designed for web development. It generally works on a web server.

JSON (Java Script Object Notation): JSON is a data structure format .The data is considered as objects with properties .This formalism is close enough to XML and java script.

SQL: My SQL is a relational database management system. (RDBMS). It is distributed under a dual GPL and proprietary license. It is one of the database management softwares mostly used in the world.

URL: Uniform resource locator is the basic network identification to specify addresses on the web. Arduino

Programming to interface with Ethernet: Arduino has some inbuilt function which enables the user to script the programming. SPI.h and Ethernet.h are inbuilt functions to interface with Arduino microcontroller. Arduino has several versions such as ATmega ,UNO and Mega .Every version has capability to interface with ethernet.

5.MECHANISM

The Ethernet Module comes preceding by the factor to automatically obtain an Internet Protocol address from the Dynamic Host Configuration Protocol (DHCP) server on the Ethernet network or other compatible device. Therefore, since a DHCP server sets the initial IP address, to connect to the Ethernet Module one must discover the IP address the DHCP server has assigned the device. It is possible to configure the module to a static IP address, but doing so can create an IP address conflict during commissioning, so this is not a typical default. Once a connection is established with the Ethernet Module via the web browser interface a static IP address may be assigned. In order to quickly locate the assigned IP address of the interface every Ethernet Module has a Media Access Control Address (MAC) that is provided by manufacturer. The MAC address is in a format 0050C2 - 4A5xxx where xxx can be any combination of numbers 0-9 or letters A-F. After knowing the IP address of a particular Ethernet module, it is to be browsed by commanding to the uniform resource link (URL) .If everything is correct, you should get a window asking you for UserName and Password. After connecting to the Ethernet Module, the data transfers from the Arduino to the Digital notice board through Ethernet module. The Digital notice board mainly consists of row column scanning method. Initially the program code

gets debugged in the Arduino microcontroller. All ASCII values, numerical values and special characters given in the binary form are displayed on the Digital Notice board after conversion with the help of microcontrollers.

6.APPLICATIONS

This system can be implemented for commercial purpose as well as for individual use. Further modification in the system can also led to reminder system, in which an event can be scheduled using the date and time and accordingly the system will alert you with appropriate information about the event. Generally it can be can be used in classrooms, schools, seminar halls to updates.

7.CONCLUSION

This paper gives a clear description of both hardware and software of IOT Based Digital Notice Board. Retrieving the advantages of Internet of Things (IOT),it is one of the useful technologized commodity. Digital Notice board is a systematic alignment of portraying desired information that directs through a proper channel, helps the user to reach their destinations that may be in any area .Designing of notice board may be a simple task but compiling it with a high-level language will charge a bit brilliance. With the help of Arduino Board a developed web application is provided with a well secured system. In this paper we proposed a model which monitors the crowdie area. When compared to the past, where paper notices were crucial, we endowed this digital notice board due to vexation of paper work. I surely expect that this kind of Display board rules the forward decades and keeps a good sound in technology.

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