iJRASET
International Journal For Research in Applied Science and Engineering Technology

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

**Volume:** 11 **Issue:** XI **Month of publication:** November 2023

**DOI:** https://doi.org/10.22214/ijraset.2023.56654

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538*
*Volume 11 Issue XI Nov 2023- Available at www.ijraset.com*

# IOT E-Circular Notification for Students Using a WIFI-Based LED Advertising Board

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***Abstract:*** ***Scrolling display board is a common sight today. Advertisement is going digital. The use of led scrolling display board at big shops, shopping centers, railway station, bus stands and educational institutes is becoming an effective mode of communication in providing information to the people as notice board. But these off-the-shelf units are somewhat inflexible in terms of updating the message instantly. If the user wants to change the message it needs to be done using a computer and hence the person needs to be present at the location of the display board. It means the message cannot be changed from wherever or whenever. Also the display board cannot be placed anywhere because of complex and delicate wiring. 'GSM based LED Scrolling Display Board' is a model for displaying notices/messages at places that require real-time noticing, by sending messages in the form of SMS through mobile[1-3]. It is a system wherein the display board need not be reprogrammed to display a new message because it is wireless. The project aims to develop a moving sign board which empowers the user to change the scrolling message using application in our mobile phone service instantaneously unlike a desk bound device such as PC or laptop. The user can update it even from a Wi-Fi distant. The system can be edited any time anywhere within the Wi- Fi range[4].***

***Index Terms: Wi-Fi, Display, Board, Microcontroller, Scrolling, Program***

## I. INTRODUCTION

The importance of placing notice boards in institutions or organizations and public utility places like airports, bus stations and railway stations to display and pass information can never be overemphasized. However, day-to-day changing of notices in these places is a difficult task. Wireless Electronic Notice Board is used for transmission of text data through wireless GSM interfaced with microcontroller It displays online message on public places. The system consists of a GSM receiver and a display unit which can be messages GSM Based Wireless Electronic Board helps in passing messages almost immediately by sending SMS which is better and more reliable than the old traditional way of pasting messages on notice board. It is used in enhancing the security system and also to make awareness of the emergency situations and avoid many dangers in industries. The main aim of this paper is to design SMS driven automatic display board which can replace the currently used conventional wooden notice boards in most universities. The notice board displays messages sent from the user's mobile. When a user sends a message from his mobile phone, it is received by a SIM loaded GSM modem at the receiver unit[5]. The GSM modem is interfaced to the control unit to receive messages from the user. The message received is sent to the microcontroller that further displays it on electronic notice board which is equipped with a display unit interfaced to a microcontroller. This paper is within the scope of wireless communication (GSM wireless communication)[6]. Global System for Mobile communication (GSM) is a digital mobile telephony system which is widely used in many parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) which is the most widely used of the three digital wireless telephony technologies (TDMA, GSM and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1800 MHz frequency band [7] This model is applicable in Public utility places like bus stations, railway stations, parks, airports etc. Educational institutions and organizations, Traffic management, Advertisements, Stadia Wireless electronic notice board can also be Android- Bluetooth based or PC based. In Android-Bluetooth Based Wireless Electronic Notice Board, an electronic display notice board is interfaced to an android device through Bluetooth connectivity. While the user sends the message from the android application device, it is received by the Bluetooth device at the display unit. It is then sent to the microcontroller that further displays the notice sent from the user on to the LCD or LED display of the notice board[8]. In PC Based Wireless Electronic Notice Board, the message sent from the computer's keyboard is transmitted through radio frequency (RF) transmitter. RF receiver is fixed to the display panel at the receiving unit. The receiver receives the data coming from the transmitter and the same data will be received by the microcontroller at the receiver end.

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The microcontroller sends this data to the display unit and thus the message given by the user at the transmitter end will be displayed. GSM and Android-Bluetooth based notice boards are more portable than PC based but GSM based is better than the rest because of its portability and ability to send messages over long distances of wireless network coverage[9].

## II. LITERATURE REVIEW

This is a literature review on a research on wireless digital notice board using wi-fi. The author states that as old means of conventional notice boards are outdated as it requires a huge amount of time, resources and manpower. Hence, using digital noticeboard through wireless communication can interconnect the people easily in a less amount of time and using wifi network gives a wide area network that permits to transfer the information into text message through LED display that will act as a notice board[10-12]. As stated in the research the main propose is to develop a wireless notice board that display message or the information sent from the user through a simple interface and which displays it on LED screen. To originate a Wi-Fi driven automatic display Board which can replace the presently used paper based notice board and conventional notice boards. So this document gives us clear idea of how to change the contents of Digital display using Wi-Fi. So for that we use some Embedded as well as communication idea and using Arduino board we try to implement our system[13].

## III. COMPONENTS

1) Node MCU ESP8266 Board
2) 8-in-1 MAX7219 Dot Matrix LED Display
3) Jumper wires
4) Bread board
5) micro-USB data cable

### A. *Arduino*

Arduino is an open source, computer hardware and software company, project, There are various types of arduinos. all the type of arduinos we are using

Fig1. Arduino board

NodeMCU10 in this project. This Node arduino consist of 12pins.It also has an in-built wiFi module in it.It has a storage of 32kb of memory.

### B. *NodeMCU10*

NodeMCU is an open source IoT platform. It includes rmware which runs on the ESP8266 Wi-Fi The term " NodeMCU & quot; by default refers to the ESP8266 is Wi-Fi enabled system on chip (SoC) module developed by Espress if system. It is mostly used for development of IoT (Internet of Things) embedded applications[14-16].

Fig2, NodeMCU10

*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538*
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### *C. Dot Matrix*

LED dot matrix display is used to display any messages that are key-in by user. The LED dot matrix that is used in this project consists of 2 blocks and 8X8 matrixes. The position of the least signi cant bit (LSB) and most signi cant bit (MSB) of the display need to be initialized[17].

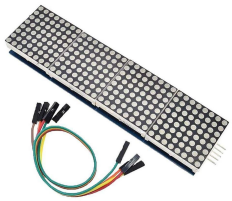

Fig3. Dot Matrix

## IV. WORKING

In our project, the ESP8266 Wi-Fi Module can be interfaced with an 8-in-1 MAX7219 Dot Matrix LED Display. The ESP8266 connects to a Wi-Fi Network and generates a Web page. We can access the web page using the local IP Address of Node MCU ESP8266. Using the Web Dashboard, we can send any message and display it on Dot Matrix LED Display[18].

Before moving ahead you can check some of our previous post to get started with Dot Matrix LED Display:
8×8 Dot Matrix LED Guide
8×32 LED Dot Matrix Scrolling Effects

### *A. Dot Matrix LED Display*

LED matrices are available in different styles like single colour, dual colour, multi-colour, or RGB LED matrix. They are also available in different dimensions like 5 x 7, 8 x 8, 16 x 16, 8 x 32, 32 x 32 etc.

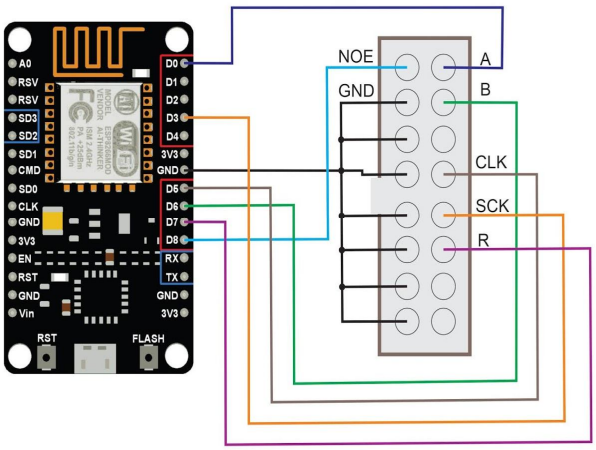


Fig4, Dot Matrix LED Display

The left side of the display is basically for the input port which is connected to any GPIO pins of a Microcontroller. Similarly, the right side of the display is the output port which is used for expanding or adding additional LED Display[19].
From the left side, connect the VCC, GND of Dot Matrix Display to 3.3V & GND of Node MCU Board. The default SPI GPIO pins of ESP8266 are being used to connect with each of the remaining SPI terminals of the MAX7219 module. Therefore, connect the DIN, CS, and CLK pin to the Node MCU D7, D8 & D5 Pin.
The program for the Smart Notice Board is taken from the library example a code is used for the Smart Notice Board connect a Micro-USB Cable to your Node MCU ESP8266 Board and upload the code to it[20].

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## V. BLOCK DIAGRAM

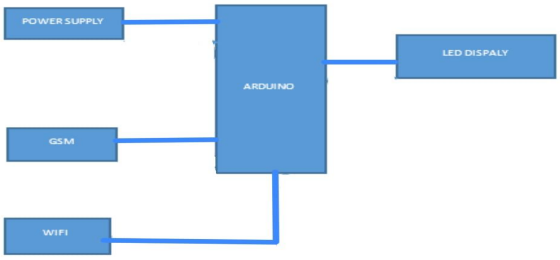


Fig5. Block Diagram

## VI. OPERATIVE BENEFITS

*1)* Secured wireless communication
*2)* It Automatic update display on New file transfer to the Hornet
*3)* It display messages in a quick efficient manner for one, and it also allows you the flexibility in the messages that can be displayed. Simple and less human effort is required.
*4)* Easy to operate.
*5)* Low Cost.

## VII. RESULT

The results can be shown in figure 6 below. From the results we can conclude that this paper can be very beneficial for the society and general public benefits because of simple structure strong practicability and wide application hold. By adding wire les technology to this system we have made this systems flexible. Now is easy to change the message from a remote place. Two major thing that are necessary for sending the files are FTP server and internet connection This system is less complex in nature as if wireless. So in short, this system is very beneficial for the public because in today's digital ape people can see any message from a large distance became this LED da play is more cache in nature and to read from it[21].

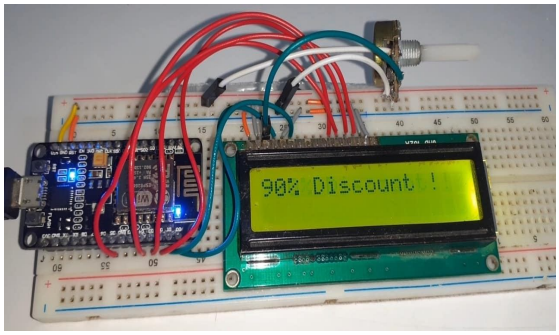


Fig 6. Results display

## VIII. CONCLUSION

In conclusion we can say that this display can be easily integrated with all general-purpose display board thus proving its mobility. The message is transferred using wireless technology and is eventually obtained on the LED matrix.

## IX. FUTURE SCOPE

Future display systems can show more than one message at a time. In our system we are sending messages vise FTP Server and displaying on a LED by utilizing FTP commands. The same principle can be applied to control electrical appliances at a distant location.There is some security issues in FTP but we can resolve it by using SSH protocol along with FTP or we can perform tunneling or in order for more security we can create VPN networks in order to transfer files in between the two systems. Robots can be controlled in a similar fashion by sending the commands to the robots. This can be used for spy robots at distant locations, utilized by the military to monitor movement of enemy troops.

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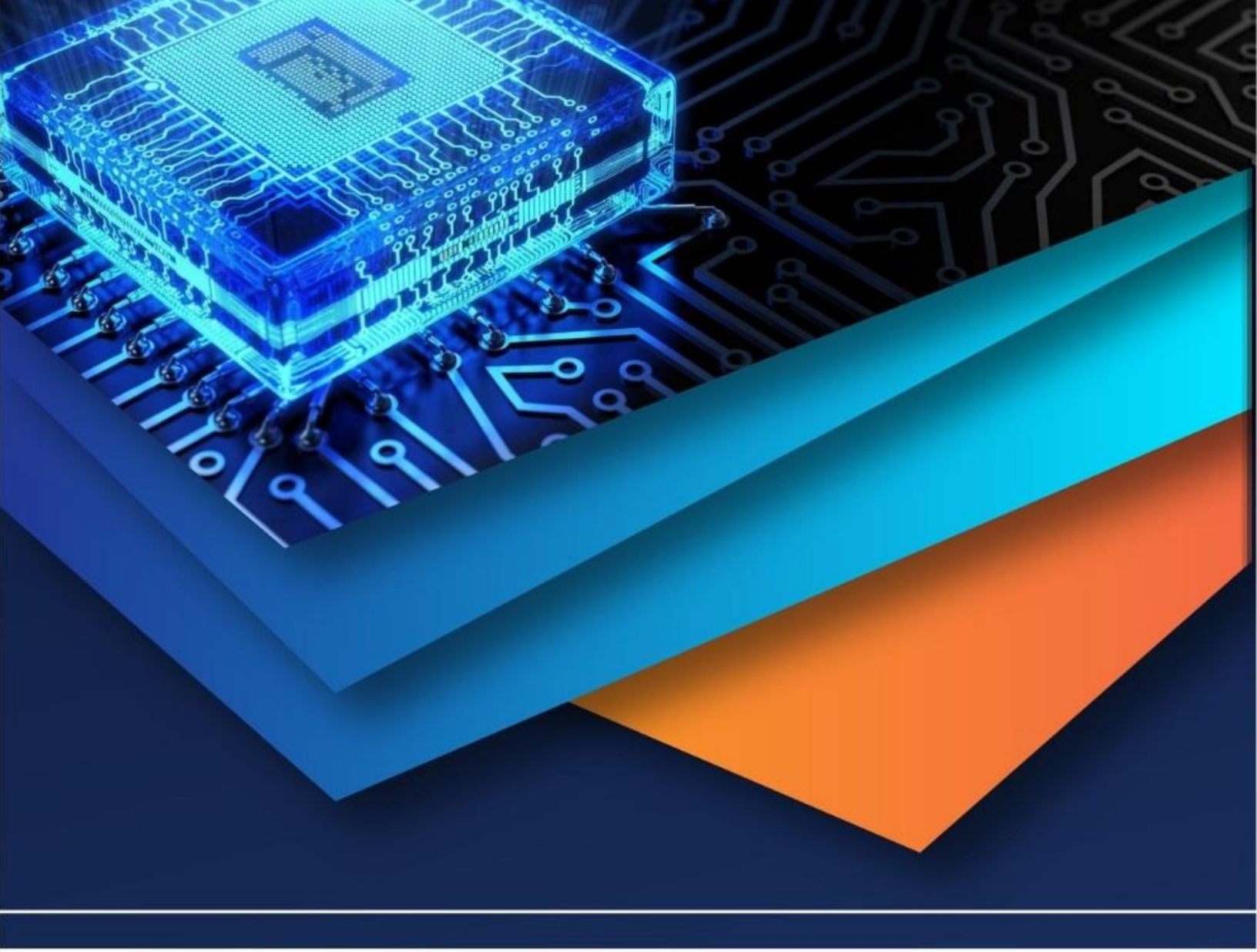

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