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E-Notice Board Text and Voice Message Representation Using Andriod App

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ABSTRACT- That sounds like a very interesting project! Using an Android app to remotely control and display messages on an LED display board could be very useful in a variety of settings, such as offices, schools, and public spaces. The use of MQTT protocol and WiFi technology for communication allows for the system to be easily scalable and accessible from anywhere with an internet connection. It's also interesting to note that the system architecture includes a cloud-based MQTT broker, which can help facilitate communication between the Android application and the LED board more efficiently. This can help reduce energy consumption and improve system performance.

Overall, it seems like the proposed system could be a useful and practical solution for displaying messages on an LED notice board. It would be interesting to see how the system performs in real-world applications and how it could be further developed or optimized for different use cases.

KEYWORDS: IoT, LED notice board, Android application, MQTT protocol, ESP8266 Wi-Fi module, cloud-based broker, real-time display, user-friendly interface, scalability, energy efficiency.

I.INTRODUCTION

As technology improves, efficient, financially affordable and highly productive output becomes an absolute necessity, and this leads us to be more inclined towards using automated control systems. Human intervention, although it offers variety, adaptability and interactivity, could lead to errors, as it is a natural and inevitable result of this variability. Hence, automation of a system is an accepted means to minimize human error and its impact.

Applying this to the situation under scrutiny now, the traditional methods of writing typing the notice on paper, and having a man/woman deliver the notice to the respective groups, or having himher paste the notice on the notice board, is prone to errors. The person delivering could deliver it to the wrong group, or tamper with the information being sent, etc.

With the electronics industry moving at a fast pace, we are able to solve many such problems with digital replacements. Our project, Multi Electronic Notice Board, aims at eliminating the use of paper in offices, schools & colleges, and other institutions; also minimizing the risk of errors, by replacing paper with DOT MATRIX DISPLAY displays.

In this project, a hardware capable of displaying notices electronically using an android application has been built. In order to display notices, a user can use the android application to type a notice and click on the send button to get it displayed. The functionality can be used only if WiFi module and MQTT protocol is connected to hot spot of the host.

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The hardware consists of an ARM based microcontroller NODEMCU that communicates to the application through a WiFi module and MQTT protocol to receive messages. NODEMCU itself retrieves message and sends signal to switch on/off a device or display a notice.

II.LITERATURE SURVEY

Literature survey is mainly carried out in order to analyze the background of the current project which helps to find out flaws in the existing system and guides on which unsolved problems we can work out. So, the following topics not only illustrate the background of the project but also uncover the problems and flaws which motivated to propose solutions and work on this project.

GSM network is widely used today whether it is for calling or SMS. Also some of the places needs urgent notices like in college, railway stations share-market , and this notice should be in real-time , so we need a real-time notice [1]. This project is our experiment to give a start to the era of real-time noticing. This project is about writing the message which is to be displayed in mobile and send it as SMS to other side. This received message is fetched into Microcontroller and after authentication it is displayed on DOT MATRIX DISPLAY screen. Also by interfacing a voice data recording IC with Microcontroller we can also do announcements in real-time.

This paper is designed using ARM-NODEMCU interfaced with Graphical Display. At present, when information has to be updated in a notice board, it has to bedone manually. Also in present electronic systems, no matter how many displays are present, only a single notice can be sent to all of the notice boards irrespective of their places. In order to overcome this disadvantage, multiple displays along with a decoder are used to select a particular display and the corresponding information is sent through an ARM controller by using GSM technology [2]. The entries can be documented and a record may be maintained for future use by using visual basic. The controller has internal a real time clock used for synchronization of data. A resistive touch screen is used to access the previous notices and also progress details. The monitoring system consists of an image sensor which captures the images for the specified amount of time and the images can be transferred through an USB port toa PC for storage purposes.

This paper is developed a GSM based notice board display using ARM7 controller along with LED array. The microcontrollers provide all the functionality of the display notices and wireless control. The Display is obtained on a 7X96 Light Emitting Diode (LED) dot matrix display. A desired text message from a mobile phone is sent via a Global System for Mobile Communication (GSM) to the GSM module located at the receiving end [3]. The GSM modem is connected, through MAX 232 Integrated Circuit (MAX 32IC), to the ARM7 microcontroller. The message that is stored in the Electrically Erasable Programmable Read Only Memory (EEPROM) is then displayed on the LED dot matrix display. This hardware uses regulated 5V, 500mA power supply. A three-terminal LM7805 is employed for regulation of the voltage. A bridge type full-wave rectifier is used to rectify the AC output of the secondary of 230/12V step down transformer. The system was tested to work according to specification.

In the last couple of decades, communication technology has developed by leaps and bounds. The use of Embedded System in Communication has given rise to many interesting applications. One of such applications is public addressing system (PAS). Many companies are manufacturing audio / video systems like public announcement system, CCTV, programmable sign boards etc. But all these systems are generally hardwired, complex in nature and difficult to expand. So, by adding wireless communication interface such as GSM to these systems, we can overcome their limitations .Now a days LED Message Scrolling Displays are becoming very popular .These displays are used in shopping malls, theaters, public transportation, traffic signs, highways signs, etc.This paper describes the GSM based LED display [4].

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Now a days, Scrolling LED Displays are normally used in stationaries, railway stations, banks, etc. everywhere in the daily occupational life. This LEDs are preprogrammed in sense that they are already programmed to display a particular message; in case of editing or manipulating the message a person is needed around the display either by leased media or some kind of wireless media(within a limited area) which itself is an disadvantage because a the person cannot be always present at the location of the display board; a person might be at some other place and it is urgent for the person to display the message on the LED display board which is at a distant place, so this type of Scrolling LED Displays are not effective in all situations and also this display board cannot be placed anywhere because of complex and delicate wiring. GSM based LED Scrolling Display Board is a model for displaying notices or messages within any networked area through SMS which can be send by mobiles.

Everything around us is becoming smart such as smart phones, smart televisions, smart refrigerators, so why not smart displays boards for advertisements and notices. Display boards are primary thing in any institute, organization, public utility places like bus stops, railway stations, parks, shopping malls to display information regarding platforms, various advertisements about the products, or important notices. People are now adapted to the idea of the world at its fingertips. The old wired display boards are controlled by microcontroller. To change message, we need to change the microcontroller program code again and again. By adding GSM wireless communication interface, we can overcome these limitations [6]. It is a start to the era of smart and real-time displaying of messages on display boards. This paper explains the development of GSM based Smart LED Display Boards using Short Message Service(SMS).

III.PROBLEM STATEMENT

The idea behind this project is to provide its users with a simple, fast and reliable way to put up important notices in an DOT MATRIX DISPLAY where the user can send a message to be displayed in the DOT MATRIX DISPLAY . The message can be sent through an android application designed in this project.

IV.PROPOSED METHODOLOGY

The P10 LED Matrix Display is a popular and cost-effective display board that can be used to create LED display screens of various sizes. These displays are typically made up of a matrix of LEDs arranged in rows and columns. The P10 display modules use the HUB12 interface, which allows for easy interfacing with microcontrollers such as the Arduino.The P10 LED Matrix Display boards come in a variety of sizes, typically ranging from 16x32 to 32x64 pixels. Each pixel is made up of a red, green, and blue LED, allowing for full color display. These displays are usually controlled using shift registers, which allow the microcontroller to control the state of each LED in the matrix. To control a P10 LED Matrix Display using an Arduino, you will need a P10 LED display module, an Arduino board, and some jumper wires. The P10 display module should be connected to the Arduino using the following pins:

1 DATA pin of P10 module to pin 12 of Arduino

2 CLOCK pin of P10 module to pin 11 of Arduino

3 LATCH pin of P10 module to pin 10 of Arduino

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Once the connections are made, you can use a library such as the MD_Parola library to display text, graphics, and animations on the P10 LED Matrix Display. The library provides several functions to display text, including scrolling text across the display, setting the font size and style, and displaying custom characters and symbols. Overall, the P10 LED Matrix Display is a versatile and cost-effective display board that can be used for a variety of applications, including digital advertising, information displays, and notice boards. Its ease of use with microcontrollers like the Arduino makes it a popular choice for DIY projects and hobbyists.

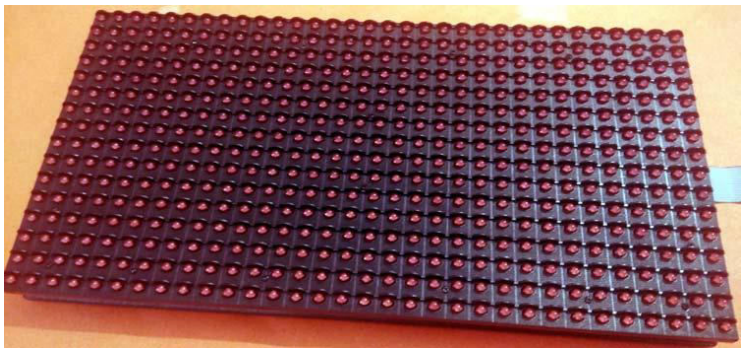

Fig1:LED

- CLK: This is the clock signal for data shifting.
- SCLK: This is the clock signal for latch signal generation.
- Data: This pin is used to send data to the shift register.
- GND: This is the ground pin of the module.
- VCC: This is the power input pin and requires a DC 5V supply.
- R1, G1, B1: These are the color input pins for the first pixel.
- R2, G2, B2: These are the color input pins for the second pixel and so on.
- Address: This pin is used to select different modules, by giving a high or low signal.

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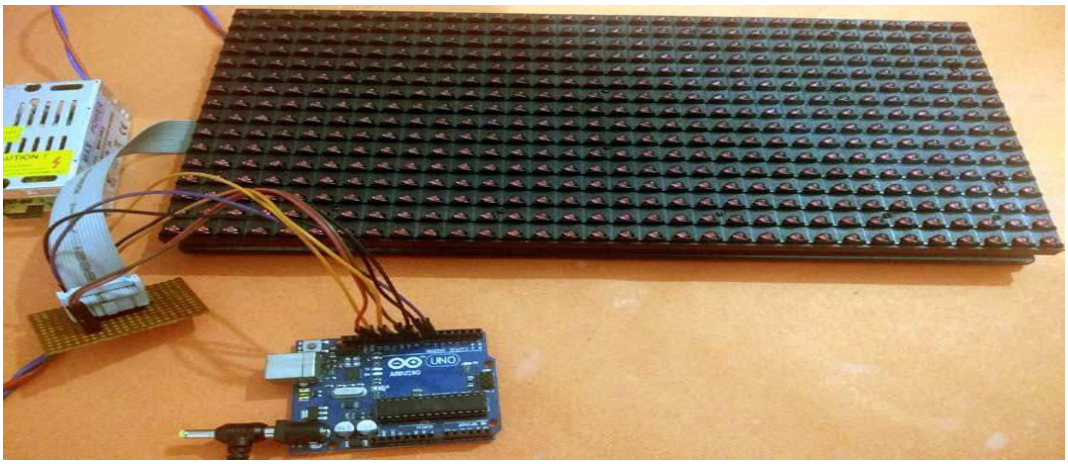

Fig1.1:Project working

A dot matrix is a 2-dimensional patterned array, used to represent characters, symbols and images. Every type of modern technology uses dot matrices for display of information, including cell phones, televisions, and printers. They are also used in textiles with sewing, knitting, and weaving. An alternate form of information display using lines and curves is known as a vector display, was used with early computing devices such as air traffic control radar displays and pen-based plotters but is no longer used. Electronic vector displays were typically monochrome only, and either don't fill in the interiors of closed vector shapes, or shape-filling is slow, time-consuming, and often non-uniform, as on pen-based plotters.

MQTT is designed to be lightweight and efficient, which makes it ideal for use in IoT devices with limited resources, such as low-power microcontrollers and sensors. The protocol uses a small amount of bandwidth and has a low overhead, which reduces the amount of power and data required for communication. This also makes it suitable for use in low-bandwidth and unreliable network environments.

MQTT supports three levels of Quality of Service (QoS) for message delivery: QoS 0, QoS 1, and QoS 2. QoS 0 is the lowest level of service and provides for a best-effort delivery, where messages may be lost or delivered more than once. QoS 1 provides for at least once delivery, where messages are guaranteed to be delivered, but may be delivered more than once. QoS 2 provides for exactly once delivery, where messages are guaranteed to be delivered only once, but may be delivered more slowly due to the additional overhead required for delivery confirmation.

MQTT also supports the use of Last Will and Testament (LWT) messages, which are sent by a client to the broker when the client disconnects unexpectedly. The LWT message allows the client to inform other clients of its status and to take appropriate action.

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Security is an important aspect of IoT communication, and MQTT supports several security mechanisms, including Transport Layer Security (TLS) for encryption of data in transit and authentication using username/passwords or client certificates. The use of security mechanisms can be configured on a per-connection basis, allowing for fine-grained control over security.

MQTT is supported by a wide range of programming languages and platforms, including C, Python, Java, Node.js, and many others. There are also a number of open-source MQTT brokers and client libraries available, which makes it easy to get started with MQTT.

In conclusion, MQTT is a lightweight, efficient, and reliable messaging protocol that is well-suited for IoT communication. Its use of the publish/subscribe model and support for multiple levels of QoS make it flexible and adaptable to a wide range of use cases. Its security features and support for a wide range of programming languages and platforms make it an attractive choice for IoT developers.

V.PROJECT PURPOSE

An Android app can be developed to represent E-Notice board text and voice messages. The app can have the following features:

1. User Authentication: The app can allow users to log in to their account to access the notice board messages.
2. Text Notice Board: The app can have a section where text notices can be displayed. Users can view the notices, and they can be marked as read when the user clicks on them.
3. Voice Notice Board: The app can have a section where voice notices can be played. Users can listen to the notices, and they can be marked as heard when the user plays them.
4. Notification: The app can send push notifications to users when a new notice is posted on the board.
5. Search: Users can search for specific notices using keywords or categories.
6. Admin Panel: The app can have an admin panel where the administrators can post notices to the board. They can also manage users, add/delete/edit notices, and view statistics.
7. Feedback: The app can allow users to provide feedback on the notices or the app.

VI.FUTURE ENHANCEMENT

The display unit can range from LED scrolling displays to DOT MATRIX DISPLAY monitors. The LED scrolling displays can be set up at public transport places such as bus stations, railway stations and airports. They can also be used in offices and similar organizations for sending notices. The DOT MATRIX DISPLAY monitors can be setup on school and college campuses for sending out notices. Also, as an extension to the current message displaying template, multiple messages can be displayed at a time, by dividing the screen to the required number of parts.

A commercial model can be able to display more than one message at a time. In our project we are sending messages via WI-FI network and displaying on a LED by utilizing AT-WF commands. The same principle can be applied to control electrical appliances at a distant location.

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Robots can be controlled in a similar fashion by sending the commands to the robots. These commands are read by using AT-WF commands and appropriate action is taken. This can be used for spy robots at distant locations, utilized by the military to monitor movement of enemy troops.

VII.CONCLUSION

The WI-FI based electronic notice board is a modern solution to replace traditional notice boards. With its mobility and wireless technology, it provides convenience and ease of use. The system is designed to receive messages from an Android app, which makes it even more user-friendly.The system can store and display one message at a time, and it validates the message before displaying it. The message is displayed on an 8x8 LED panel, and the system can be efficiently used for instant message transfer on campus.The smart electronic notice board system is designed to be efficient, robust, and portable, reducing the overall development cost and complexity. Overall, the system provides a smarter and more efficient way of displaying messages, making it an attractive solution for various applications.

REFERENCES

1 Darshankumar C. Dalwadi, NinadTrivedi , Amit Kasundra ,(2011) Wireless notice board our real-time solution, National Conference on Recent Trends in Engineering & Technology.

2 Nivetha S. R, Pujitha. R, Preethi Selvaraj &YashvanthiniS.M,(2012) SMS based Wireless Notice board with monitoring system ,International Journal of Advanced Electrical and Electronics Engineering, (IJAEEE) ISSN (Print) : 2278-8948, Volume-2, Issue-3, 2013.

3 Pawan Kumar, VikasBhrdwaj, Kiran Pal, Narayan Singh Rathor& Amit Mishra, (2012) GSMbased e-notice board: Wireless Communication, International Journal of Soft Computing and Engineering (IJSCE), ISSN: 2231-2307, Volume 2, Issue-3, pp 601-605.

4 Prachee U. Ketkar, Kunal P. Tayade, Akash P. Kulkarni &Rajkishor M. Tugnayat, (2013) GSM mobile phone based led scrolling message display system, International Journal of Scientific Engineering and Technology (ISSN : 2277-1581), Volume 2 Issue 3, pp 149.

5 Anuradha Mujumdar, Vaishali Niranjane& Deepika Sagne, (2014) Scrolling LED display using wireless transmission, International Journal of Engineering Development and Research (ISSN: 2321-9939), Volume 2, Issue 1, pp 475-478.

6 Bhawna Saini, Rachna Devi, Shilpi Dhankhar, Mohammad -ziaul-Haque and JagandeepKaur, (2014) Smart LED display boards, International Journal of Electronic and Electrical Engineering (ISSN0974-2174), Volume 7, Number 10, pp 1057-1067, International Research Publication House.

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