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Design of Wi-Fi Based Scrolling Digital Display with Voice Command Support by Google Assistant

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Abstract: ***The purpose of create this paperwork is that it represents the overall design of "Scrolling Digial Display" which has a capability to control the display over mobile phone using voice command. It also included various software like Adafruit MQTT and IFTTT and a platform for voice command we have to use Google assistant. If someone want to display message using Arduino, they can easily send by using this project. This paper deals with wireless board or a LED dot matrix display using any android phone using Wi-Fi module (Wireless fidelity basically it transfers message without using wire network or bulk machines. Schools, colleges, hospitals, traffic signal, Hotels, Railway station, Airport and various other places there is use of scrolling display to display the message at the receiver end and this tool kit can be programmed according to our need.***
Keywords: Adafruit, MQTT, IFTTT, LED dot matrix, Scrolling display, Wi-Fi module, VPA (Voice personal assistant).

I. INTRODUCTION

In his project, we can display various messages such as day, time, date, temperature, weather forecasting, place, etc using scrolling display and by using various sensor to sense temperature or used as wireless electronic notice board in this school. When a user sends any message from android phone it is received to SIM loaded GSM modem the received end. But the user has to pay double charges for the normal SMS messages[4]. Therefore this is the main drawback of to generate display board using GSM to dot matrix scrolling display board, which will charge money for every single message. We have to type a text for example 'GOOD MORNING' we will type the text in mobile phone and using Wi-Fi module it will send to scrolling display and we have to use various other software like Adafruit MTT and IFTTT and at hardware part we have to use Arduino uno board, Fig.1 Node MCU (CH340), LED Matrix display, Female to female connector wires then the Arduino board is allied with the receiver message and ha will be send to the display board then the message send from Arduino will be filtered and displayed on the Dot Matrix scrolling display Fig.2 . We have seen various projects using LED matrix scrolling display where some of them have a hard code sentences burned into another simple code while others have enable the Bluetooth but we have took this concept to another level which size is around a TV remote, having much wider coverage area almost from anywhere in the world we can use this and much more convenient way of changing messages just say OK Google, here is no pain no gain and work is already done.



Fig.1. Represents NodeMCU

II. RELATED WORK

Normally use a simple LED display to convey the message, we have to change message for every few instances when we want to display large data. Now scrolling display are using pre-programmed controller hence we can make LED display in scrolling way MTT is a messaging protocol standardized by OASIS. It is integrated with lot-based systems and is referred as Message Queue Telemetry Transport which is basically a Client/Server messaging protocol comprising publi9sh subscribe approach. It is basically used for linking of remove devices due to its small code footprint and minimum network bandwidth requirement and hence proved to be a lightweight message transport protocol. A wide range of industries including oil and gas, telecom, automotive, manufacturing, etc. Today are using MQTT. MQTT protocol consists of 2 networks entities.1.is a message broker 2. Number of clients.

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An MQTT broker is a server that receives all messages from the clients and then routes the messages to the appropriate destination clients. An MQTT client is any devices (a microcontroller or a server) that run an MQTT library that connects to MQTT broker over a network.

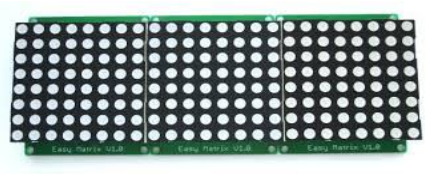


Fig. 2. Represents Dot Matrix display

III. APPLICATION AND FUTURE WORK

1) *Educational Institutions and Organizations:* Currently we are putting papers on notice boards to inform people of events. This method can be discarded by using GSM based LED display to display information in real time. E.g. Placement information, Cultural activities news, etc.
2) *Advertisement:* In shopping mall we get to hear the offers on various products and related offers on various products from time to time. Instead we continuously display the information regarding the products and related offers on electronic display board.
3) *Hotels:* To display the availability of food, order number, rooms, room rents etc.
4) *Railway Station and Bus Stand:* Instead of announcing he delay in arrival of trains and buses we can display the information[2]

IV. WORKING

This will be a moving message display which can be used as the digital notice board this project uses two services one Adafruit MQTT and other ITTT to make it control through Google assistant from anywhere in the world. Adafruit MQTT allows to change the message from any internet connected advice globally. These gateways allow a faster and easy access to the lot world, and they are compatible with lot Services like (Microsoft Azure, Amazon AWS, IBM Cloud, Google Cloud. Etc) that support MQTT protocol. There we are using Fig.1 NodeMCU which will act like MQTT client and therefore it will constantly read message coming from adafruit MQTT broker. When we will make changes on server side, the same changes will be made on the client side also which is on our Node MCU board. To change our message on the MQTTT broker side by using Google assistant, we will be using one service called IFTTT. In IFTTT we are making an applet where will be connect two services first google assistance and Adafruit MTTT. Therefore we can successfully update every message on the adafruit broker side like shown in Fig. 3 with google assistant on any android phone[1].

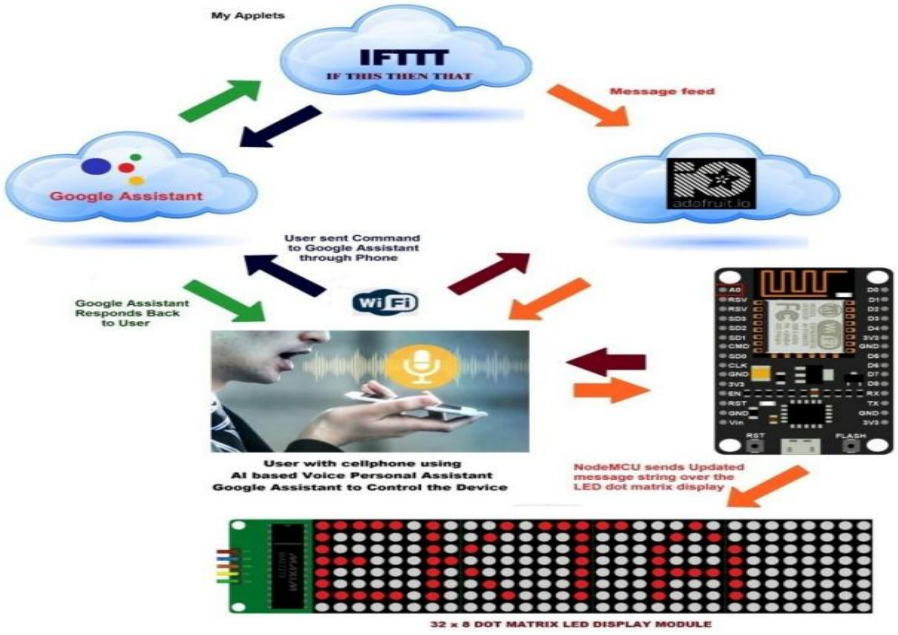


Fig. 3: Represents System Workflow [7]

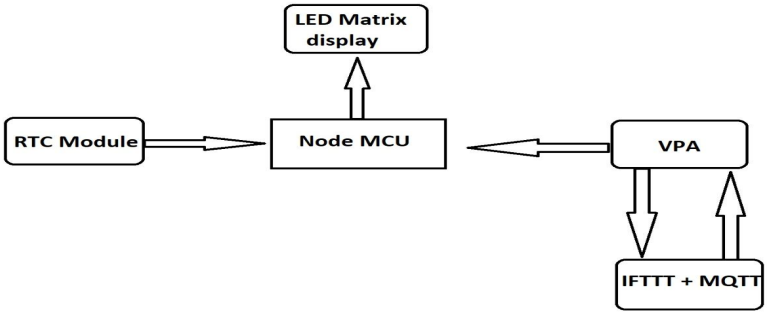


Fig. 4: The Block diagram

V. RESULT ANALYSIS

For final result were obtained and observed on adafruit dashboard and as well as over hardware. For this project the inbuilt Google assistant and IFTTT needed to be installed in the user's android phone.

We have to visit "IO. Adafruit.com" and make an account and then login to the account here we will find default dashboard as welcome dashboard then go inside the dashboard and click on (+) sign and select the text block now enter the feed name here as message and click on create click and select this feed and on next step and choose the font size and click on create block button this is what we have to do an adafruit side[5].

Now to change the message with Google assistant we need to download app name IFTTT open it and go to sign in with Google we have to sign in through same account we have Google assistant and account which go to last section my applets click on (+) sign to create new applet and select Google assistant [5]and click on so say phrase click on comment select the Google account and now trigger commands to send message to adafruit brocket. And now click on that and select adafruit click on send data to and authorize this is what we have to do on server side[6]

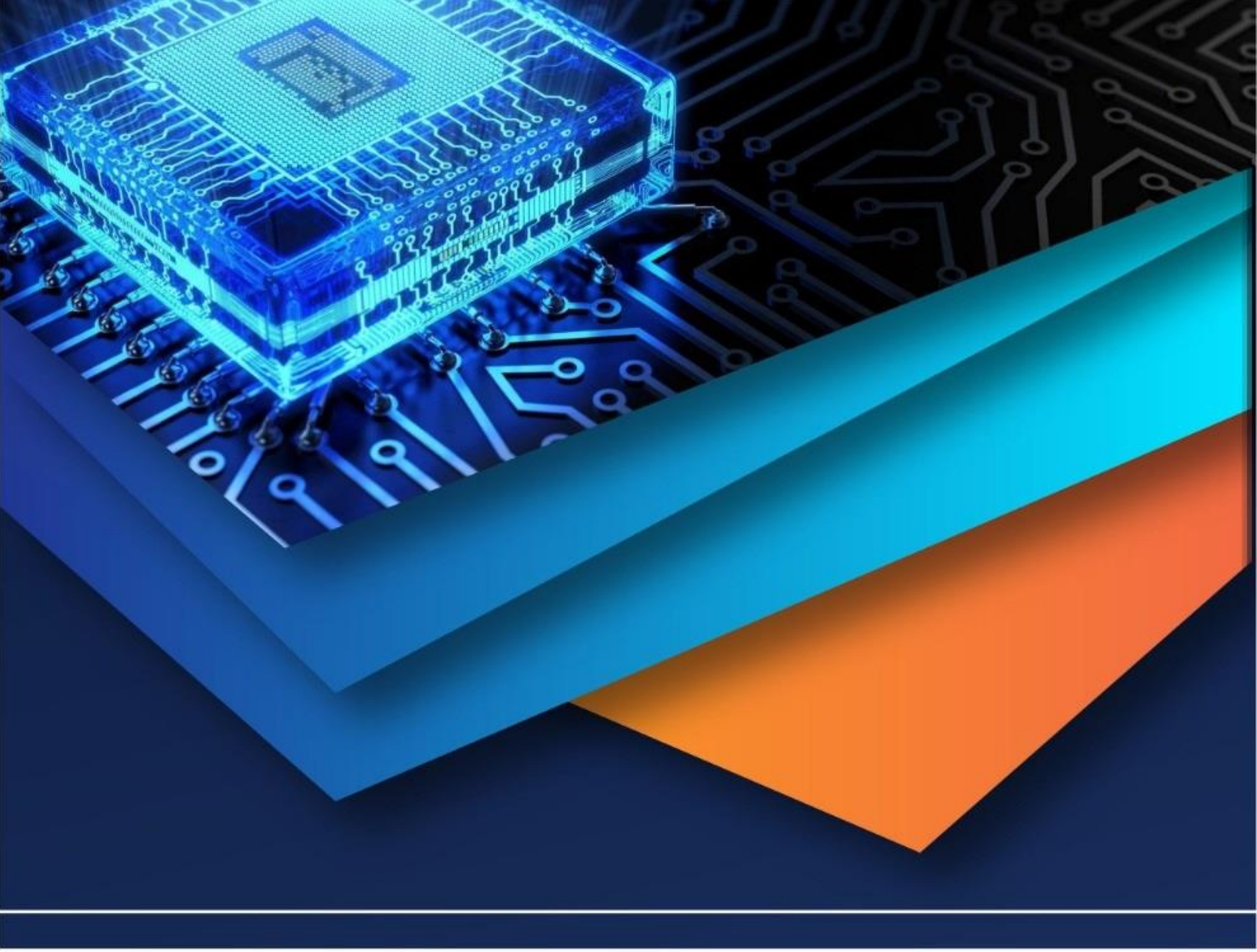
In coding we have to change the name of router and password and we can add multiple name and passion so that router which is present will automatically get connected and are needed to provide adafruit account the credentials username and Active key.

VI. CONCLUSION

In this paper, it is evident that both software and hardware simulation of the project of displaying characters on a LED dot matrix. The system accepts the message, stores it, validates, and displays it on the LED Board. Led Board are used in Bus Station, Railway Station, shopping malls, General stores for displaying advertisement, educational institution, and organizations, managing traffic in smart cities and other public utility places. Now-a-days printing and photocopying is also reduced because of high cost, these electronic devices are one time investment, and the information can be delivered to a large number of people in a very short time. It provides faster transfer of information and are easy to install and maintain. It provides an efficient way of displaying message on Notice Board and the user can display his message by using Google assistant in his Android mobile.

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