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IOT BASED NOTICE BOARD USING ESP32

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Abstract :- **An extensive investigation, the development and use of an Internet of Things notice board based on ESP32 is given in this research report. The digital notice board's design made use of ESP32. The cornerstone of our effort is IoT. Notifications can be posted on a website, and information can be shown on an electronic notice board. Customers who have registered can receive notifications on their Android phone, and changes to the message can be done remotely using our website. One common tool for displaying critical information is a notice board. Colleges and other organizations frequently put announcements on their bulletin boards. The core idea behind an Internet of Things (IoT) visual display powered by an ESP32 is the main topic of this study. Ensuring that data is updated and output is displaced on every internet-connected device is the proposed goal of this project. In our daily activities, notice boards are quite important. In a paperless age, a digital notice board can greatly simplify information distribution by replacing a traditional, analog notice board. The major goal is to develop a workable solution that allows for the gathering of data in real-time, remote-control functionality, secure environmental parameters, and a wireless notice board that shows the messages supplied by the webserver [1]. The components of the system are a breadboard, power supply unit, ESP32, dot matrix display, and jumper wires. Because of the system's intuitive design, users may operate it and send messages from anywhere at any time.**

Keywords: : IoT, ESP32, Website, Analog Notice Board, Dot Matrix Display

I. INTRODUCTION

In our modern, technology-driven society, the Internet of Things (IoT) has arisen as a powerful agent of change, fundamentally altering the landscape various aspects of our daily lives. Creating smart systems that enable effective connectivity and communication in a variety of settings is one well-known use for IoT technology. IoT-based notice boards are one of these technologies that has drawn considerable attention due to their capacity to upgrade user interaction, expedite information transmission, and increase the efficacy of communication overall. IoT based Notice Board Using ESP In the fast-paced world of today, (Espressif) modules are crucial for meeting communication needs. This solution combines the potential of the Internet of Things (IoT) with useful applications, especially in settings where real-time information dissemination is crucial. It does this by utilizing the capabilities of ESP8266 or ESP32 modules, which provide built-in Wi-Fi connectivity.[1]

The current noticeboard management technique is manual and extremely time-consuming. A few of the frequent issues with managing the present noticeboard include printing documents, physically walking to the board's location, altering a notice, and arranging them. Additionally, pins and clips need to be maintained along with every fresh notice paper. A noticeboard requires a lot of human labor and time to maintain properly. In this study, we present a completely new idea of Internet of Things (IOT)-based noticeboards that greatly simplify and expedite the notice-posting procedure. A user must log in to our system and post a message in order to update a board.

An IoT-based notice board's basic idea is to combine conventional notice boards with Internet of Things (IoT)-capable gadgets like ESP8266 or ESP32 microcontrollers. Due to their Wi-Fi capabilities, these devices may connect to the internet and exchange data with other IoT devices and servers. IoT-based notice boards, as opposed to traditional static boards, can provide a number of enhanced features and functionalities by utilizing this connectivity.

An IoT-based notice board's dynamic nature is one of its main benefits. IoT-enabled notice boards can show real-time information pulled from databases or online sources, in contrast to static notice boards that need to be updated manually. The remote management and control capabilities of Internet of Things-based notice boards constitute a noteworthy feature.

LITERATURE SURVEY

Kruthika Simha Shreya Chethan Kumar, Parinitha C., and Shashidhar Tantry [1] proposed an IoT based Notice board based on high efficiency with low power supply. They utilize ESP only as the core processing unit for notice board. Neeraj Khera, Divya Shukla, Shambhavi Awasthi [2] proposed the implementation of notice board by use of services like Google Cloud IoT. Kruthika Simha, Shreya, Chethan Kumar, Parinitha C, and Shashidhar Tantry [3] proposed an automated prototype of a notice board that helps with information security, which allow users to update and manage the messages on notice board remotely. SamikshaNeware,[4], said integration of smart notice board promises with enhanced safety of information. AjinkyaGaikwad, Tej Kapadia, Manan Lakhani, Deepak Karia.[5], Design a system which is scalable and allow additional features such as voice announcements. Ms.Sejal V. Gawande, Dr.Prashant R.Deshmukh [6] suggest the notice board offer improved efficiency and remote accessibility.

METHODOLOGY

An adaptable IoT-based notice board has been proposed following a thorough analysis of the numerous research articles and a discussion of their suggested work in the literature survey section. Through creative IoT technology integration, this research aims to improve user interaction, communication efficiency, and sustainability while promoting smart and connected settings.

The proposed system uses a Super Display Dot matrix and an ESP8266 microprocessor (NodeMCU) due to its versatility, low power consumption, integrated Wi-Fi and Bluetooth capabilities, ample processing power, and support for a wide range of sensors and peripherals.

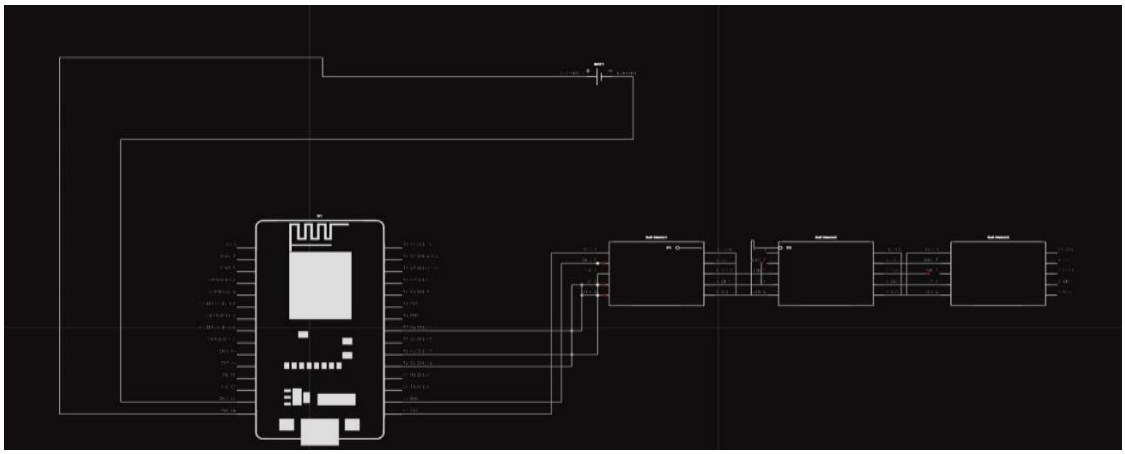

Figure 1: Hardware Schematic diagram of IoT Based Notice Board Using ESP

A. Composed Proposed:

ESP32 Microcontroller, Display Screen (Super MAX7219 Dot Matrix Display), Power Supply, Connecting Wire, Web Page.

B. Step Used in Proposed Work:

The ESP32 offers numerous GPIO pins that facilitate convenient control and connectivity with external sensors and devices. These pins support interfaces like SPI, I2C, UART, and PWM, making them versatile for various applications, including building energy management.

Step 1: Clearly state the needs and goals of the Internet of Things-based notice board project, including the features that will be used for user interaction, display capabilities, and connectivity choices. Select the relevant parts, such as the ESP32 microcontroller, display screen, sensors, input devices, power supply, connectivity modules, enclosure, and any extra peripherals, in accordance with the specified specifications.

Step 2: Install and set up the required software and development tools, including Proteus, so that they can be used with the ESP32 microcontroller board.

Step 3: Utilizing the C/C++ programming languages, create the firmware or software for the ESP32 microcontroller. This code should be able to perform tasks including establishing a Wi-Fi connection, getting data from sensors, managing user interactions, managing the display screen, and putting communication protocols (such MQTT and HTTP) for data exchange into practice.

Step 4: In accordance with the wire schematics and hardware standards, connect and integrate it with the ESP32 microcontroller. Configure the display screen so that text appears on it. Write code that incorporates logic to dynamically alter the display content in response to sensor data, user inputs, or external triggers.

Step 5: Evaluate how well the Internet of Things-based notice board system works by running several scenarios, checking the display's output, and making sure it can communicate with outside sources. Debugged any problems or mistakes that come up when testing.

Step 6: Create an intuitive user interface for the notice board that allows users to interact with it via voice commands, touchscreen controls, button interactions, and menu navigation. Make sure the user interface is easy to use and reacts quickly to input from the user. Improve code efficiency, reduce power consumption, increase display refresh rates, and add error handling procedures to maximize notice board system performance.

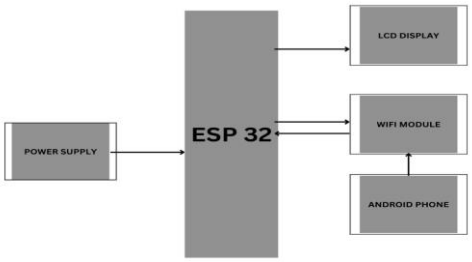

Figure 2: Block Diagram showing the working of our proposed system

Figure 2 outlines the operation of our proposed system. In the subsequent block diagram, the ESP8266 serves as the control hub, operating on a steady 5V DC power supply and maintaining a continuous internet connection. A proposed system for an IoT-based notice board using ESP32 includes the integration of an ESP32 microcontroller with sensors for

data collection, a display screen for information presentation, and Wi-Fi connectivity for remote management, creating a dynamic and interactive communication platform.

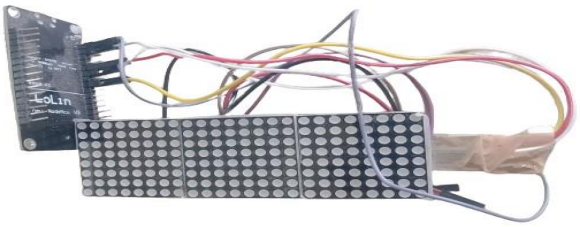

Figure 3: Circuit Implementation

RESULT AND DISCUSSION

In our research paper We should focus on presenting and evaluating the findings of your study on an Internet of Things-based notice board using ESP (such as ESP32 or ESP8266) in our research report. It explains the hardware and software components that were employed in the IoT notice board's successful ESP implementation. During the conversation, evaluate the system's scalability, energy efficiency, user experience, and effectiveness. Then, make suggestions for future developments to the IoT notice board system.

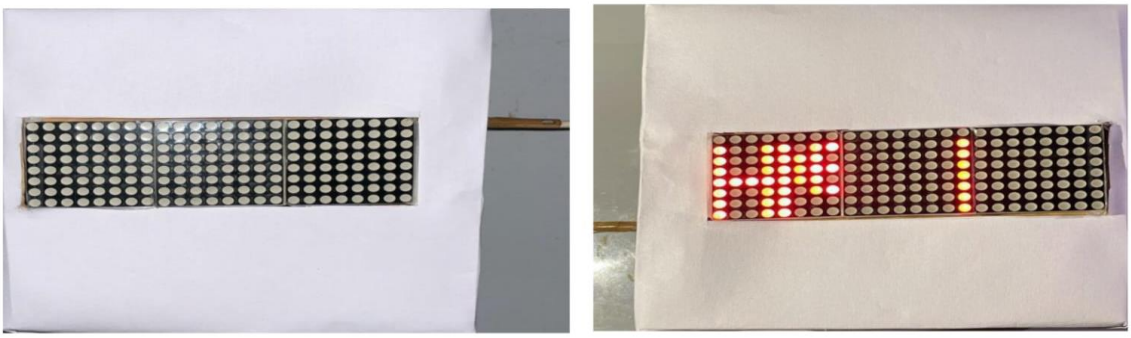

Figure 4: Project Result

FUTURE ADVANCEMENTS

Future advancements appear promising and have the potential to drastically change connectivity and communication in ESP32-based Internet of Things notice boards. One crucial area is the integration of artificial intelligence (AI) technology, which provide predictive analytics, intelligent content scheduling, and personalized notifications. Notice boards can use AI algorithms to deliver contextually relevant information, optimize content. Another fascinating topic is the addition of augmented reality (AR) features to enhance user engagement and interactivity.

Advanced user interfaces like as gesture detection, voice commands, and touchless controllers have the potential to enhance user experiences and accessibility. Energy efficiency will also be a major focus of future development, with an emphasis on creating low-power modes, optimizing energy use, and making use of renewable energy sources. Advanced user interfaces like as gesture detection, voice commands, and touchless controls can enhance user experiences and accessibility.

CONCLUSION

In this research paper on an Internet of Things notice board with ESP32 would delve into the outcomes of the study and their implications. It might discuss how well the ESP32 microcontroller integrated with sensors, display screens, and input devices to create a functional system. The discussion could cover aspects like the reliability of Wi-Fi connectivity for real-time updates and remote management, the user-friendliness of the interface for navigation and interaction, and the accuracy of sensor data collection and processing. It could also address any challenges faced during development or deployment, potential use cases in different environments, and areas for future research and improvement. Overall, this section would analyse the performance, usability, and potential impact of the IoT-based notice board system using ESP32, contributing insights to the field of IoT applications and communication technologies.

REFERENCES

[1] Prof. Kruthika Simha Shreya Chethan Kumar, Parinitha C., and Shashidhar Tantry [1] (Department of Electronics and Communication Engineering, PES Institute of Technology, Bangalore College of Engineering, Belagavi, India) proposed an IoT based Notice board based on high efficiency with low power supply.

[2] Neeraj Khera, Divya Shukla, Shambhavi Awasthi [2] In this paper the technological advancement of the notice board is purposed that will help to save time and resources. It works on real time updates. Also, it makes the information available fast to the person.

[3] An automated prototype of a notice board that helps with information security was proposed by Kruthika Simha, Shreya, Chethan Kumar, Parinitha C, and Shashidhar Tantry [3] in their paper "Electronics Notice Board with Multiple Output Display" at the International Conference on Signal Processing, Communication, Power, and Embedded System (SCOPES) - 2016.

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