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# SMART NOTICE BOARD

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**Abstract: -**In this paper, we explore a cool technology called the Voice Controlled Notice Board (VCNB). Imagine being able to update a notice board just by speaking to it! We use Google Assistant and Node MCU ESP8266, along with a LED display, to make this happen. We'll explain how it all works, from setting up the hardware to writing the software. We'll also share how well it works in real-life situations and what we can do to make it even better in the future. Voice-controlled systems have emerged as a transformative technology, enhancing user interaction and accessibility across various domains. In this paper, we present the design, implementation, and evaluation of a Voice-Controlled Notice Board (VCNB) that leverages Google Assistant and Node MCU ESP8266, integrated with an 8x32 LED matrix display. The VCNB enables users to update and display messages on the LED matrix through natural language commands. Through this research, we aim to contribute to the advancement of voice controlled IoT applications, offering a practical solution for efficient notice board management in diverse settings.

**Keywords: -** NodeMCUESP8266, LED matrix display, Mobile Phone, Arduino IDE.

## 1. INTRODUCTION

In the contemporary digital landscape, traditional notice boards face challenges in meeting the dynamic communication needs of various environments. Manual updates are

often laborious and prone to errors, necessitating innovative solutions to streamline information dissemination processes. Voice-controlled interfaces have emerged as a promising avenue to address these challenges, providing a hands-free and intuitive method for interacting with IoT devices. By integrating Google Assistant with Node MCU ESP8266 and an LED matrix display, this research endeavours to revolutionize notice board management, offering users a convenient and efficient means to update and display messages using natural language commands.

In today's fast-paced world, where information flows incessantly and communication is paramount, the need for efficient and dynamic notice board systems cannot be overstated. Traditional notice boards, with their reliance on manual updates, often fall short in meeting the demands of
modern environments. Whether in the educational institutions, workplaces, or public spaces, the ability to disseminate information quickly and effectively is crucial. Imagine a notice board that listens to your voice commands and updates itself accordingly. This is the vision driving the development of the Voice Controlled Notice Board (VCNB).
The concept of voice-controlled systems has gained significant traction in recent years,

thanks to advancements in natural language processing and the proliferation of smart devices.

The integration of Google Assistant, Node MCU ESP8266, and an LED matrix display opens exciting possibilities for revolutionizing notice board management. By harnessing the power of voice commands, users can update messages, announcements, and alerts on the LED display effortlessly. This not only streamlines the process of information dissemination but also enhances accessibility for users with diverse needs and abilities.

Through this paper, we delve into the design, implementation, and evaluation of the Voice-Controlled Notice Board system. We discuss the underlying technology, the challenges encountered during development, and the potential impact of this innovation on various sectors. Our aim is not only to showcase the technical feasibility of the VCNB but also to explore its broader implications for communication, accessibility, and user experience.

## 2. LITERATURE SURVEY

Voice-controlled systems have emerged as a promising avenue for enhancing user interaction and accessibility in various domains. While extensive research has been conducted on voice-controlled applications such as smart home automation and virtual assistants, there is a noticeable gap in the literature regarding voice control notice boards particularly those integrated with Google Assistant and Node MCU ESP8266 with an 8x32 LED matrix display.

Existing studies have primarily focused on the integration of voice assistants like Google Assistant or Amazon Alexa with IoT devices for home automation and personal assistance. These studies highlight the convenience and usability benefits of voice-controlled interfaces in simplifying tasks such as controlling smart home devices, setting reminders, and retrieving information.

However, limited research has explored the application of voice control technology specifically to notice board management. Notice boards play a crucial role in disseminating information in various settings, including educational institutions, workplaces, and public spaces. Traditional notice boards often rely on manual updates, which can be time-consuming and inefficient.

By integrating voice control with notice boards, it is possible to streamline the process of updating information and enhance accessibility for users. For example, individuals with disabilities or limited mobility may find voice-controlled interfaces particularly beneficial for interacting with notice boards.

While there is a lack of specific research on voice-controlled notice boards integrated with Google Assistant and Node MCU ESP8266, previous studies on voice-controlled systems and IoT applications offer valuable insights. These studies provide guidance on the design principles, implementation strategies, and usability considerations for voice control interfaces in various contexts.

Overall, while the literature on voice control notice boards through Google Assistant with the help of Node MCU ESP8266 and an 8x32 LED matrix display is limited, existing research on related topics provides a foundation for exploring the potential benefits and challenges of such a system. Through empirical investigation and evaluation, this research aims to contribute to the advancement of voice controlled IoT applications in notice board management.

## 3. METHODOLOGY

This system consists of several major components, they are Android phone, Node

MCUESP8266, LED matrix display, mobile phone and Power Supply.

Node MCU is belongs to AVR microcontroller family. Node MCU is heart of this Project because it performs major role and have different features. It consists of Wi-Fi module inbuilt and in other words source on chip (SOC) and it is differed from other microcontroller because other development kit needs Wi-Fi module as separate unit but in Node MCU it is inbuilt.

The user sends their notice or message through Google assistant which connects notice or message to the Adafruit website, through that website message is get transferred to the respective Node MCU. Then received message is converted into text message by the Node MCU then it is displayed on LED matrix display

## HARDWARE SPECIFICATION

**Node MCUESP8266:** - Node MCU is an open-source firmware and development kit that helps you to prototype IoT (Internet of Things) applications. It is built around the ESP8266 Wi-Fi module, which is a low-cost equipment with full TCP/IP stack and microcontroller capability. Node MCU allows you to write and run on the ESP8266, making it easy to create IoT applications without needing extensive knowledge of low-level programming languages or embedded systems. The ESP8266 itself is a highly integrated chip designed for the needs of a new connected world.

**Wi-Fi module:** - A Wi-Fi module is a hardware component designed to provide wireless connectivity to devices that do not have built-in Wi-Fi capabilities. It typically consists of a Wi-Fi chip along with associated components such as antennas, power management circuitry, and interface connectors. Wi-Fi modules enable devices to connect to wireless networks, allowing them to communicate with other devices, access the internet, and exchange data wirelessly. These modules come in various form factors and are designed to be integrated into a wide range of electronic devices, including IoT (Internet of Things) devices, consumer electronics, industrial equipment, and more.

Wi-Fi modules are commonly used in IoT projects to enable devices to connect to the internet and communicate with cloud services, mobile apps, or other devices. They can be controlled and programmed using microcontrollers or embedded systems, allowing developers to create connected devices and applications. Overall, Wi-Fi modules play a crucial role in enabling wireless connectivity in modern electronic devices, facilitating the creation of connected and IoT-enabled solutions.

**Android Phone: -** Using a mobile phone as the interface for a voice-controlled notice board through Google Assistant involves several components working together. The mobile phone serves as the user interface for interacting with the voice-controlled notice board. It typically has the Google Assistant app installed, which enables users to issue voice commands. Google Assistant is the voice-controlled virtual assistant developed by Google. It can understand and responding to voice commands issued by users. Users interact with Google Assistant through their mobile phones by activating it with a wake word (e.g., "Hey Google" or "OK Google") and then issuing voice commands.

**Google Actions:** Google Actions is a platform provided by Google that allows developers to create custom voice interactions for Google Assistant. Developers can define voice commands (intents) and specify how Google Assistant should respond to these commands (fulfilment).

**Voice Commands**: Users issue voice commands to Google Assistant on their mobile phones, instructing it to perform actions such as displaying messages on the notice board. For example, a user might say, "Hey Google, show the weather forecast on the notice board."

**Internet Connectivity:** Both the mobile phone and the voice-controlled notice board need to be connected to the internet to communicate with each other. The mobile phone typically connects to the internet via Wi-Fi or mobile data, while the notice board may use Wi-Fi or another form of internet connectivity.

**Cloud Communication**: When a user issues a voice command to Google Assistant on their mobile phone, the command is sent to Google's servers for processing. Google's servers interpret the command and determine the appropriate action to take based on the developer-defined logic in the Google Actions project.

## SOFTWARE SPECIFICATION

**Adafruit.io:** It is a cloud service-that just means we run it for you, and you don't have to it over the Internet. It's meant primarily for storing and then retrieving data, but it can do a lot more than just that. Our focus is on ease of use and allowing simple data connections with little programming required. IO is built on Ruby on Rails, and Node

**Arduino IDE:** The Arduino Integrated Development Environment (IDE) is a cross-platform application that is written in functions from C and C++. It is used to upload programs to Arduino compatible boards. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library that help to run your project in an effective way.

## 4. EXPERIMENTAL RESULTS

Experimental testing demonstrates the functionality and performance of the VCNB in real-world scenarios. Users can interact with the system by issuing voice commands to update the notice board. The response time and accuracy of message display are evaluated under various conditions, including ambient noise levels and network latency.

## 5. CONCLUSION

The product is designed based on the notice board to resolve its problems with the increment of wireless technology. Voice Controlled Notice Board that offers a novel approach to managing and displaying information using voice commands. By leveraging Google Assistant and Node MCU ESP8266, the system provides a user-friendly interface for updating messages on an LED matrix display. Future work may involve enhancing the system's functionality, expanding compatibility with other voice assistants, and integrating additional features

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