IoT-Based Smart Electronic Notice Board for Real-Time Communication

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Abstract: The project presents an innovative approach for displaying messages on an electronic notice board using wireless technology. Notice boards are essential in places such as hospitals, airports, bus stations, railway stations, shopping malls, and other public areas, but manually updating them is time-consuming and inefficient. To address this issue, a wireless digital display system is proposed that enables users to send messages remotely. The main objective is to develop a smart notice board that can receive and display messages from authorized users through voice assistance technology. Using a Bluetooth module, the system receives voice or text input from a mobile device, converts it if necessary, and displays it instantly on the electronic board. This approach makes the process faster, easier, and more efficient by allowing real-time updates from anywhere.

KEYWORDS: Notice Board, Arduino Uno micro controller, Bluetooth Module (HC-05).

1. INTRODUCTION

The rapid advancement of wireless communication and embedded systems has greatly improved the way information is shared in public and organizational environments. Notice boards are widely used in places such as educational institutions, hospitals, transport hubs, and offices, but traditional boards require manual updates, which are time-consuming and inefficient. These limitations make it difficult to provide timely information, especially when frequent updates are needed. To overcome these challenges, digital notice boards integrated with wireless technologies offer a faster and more flexible solution. In particular, Bluetooth communication provides a simple, low-cost, and reliable method for short-range data transfer, making it ideal for indoor applications. The addition of voice assistance further enhances usability by enabling quick and hands-free message transmission.

This project proposes a wireless digital notice board that allows authenticated users to send messages remotely using voice or text through a mobile device. The system uses Bluetooth to receive messages, which are then displayed instantly on an electronic display board. This approach reduces manual effort, ensures rapid communication, and simplifies information sharing. The system also ensures security by restricting access to authorized users, preventing

unauthorized message updates. Its mobile-based control improves accessibility, allowing users to update notices easily without technical expertise. Additionally, the minimal hardware requirement makes the system cost-effective and suitable for small- to medium-scale applications. Overall, the proposed solution provides an efficient, user-friendly, and reliable method for real-time notice display.

2. LITERATURE SURVEY

S. Kumar et al. (2019) introduced a smart notice board system integrated with voice recognition technology. The system converted voice commands into text using a speech-to-text module and displayed the output on an electronic notice board. The study highlighted improved user convenience and reduced time required for message updates. Nevertheless, the accuracy of voice recognition was affected by background noise, and the system required stable processing capability to handle voice data efficiently.

M. R. Naik et al. (2020) proposed an IoT-enabled smart notice board that allowed authorized users to update messages remotely using mobile applications. The system improved flexibility and real-time information sharing in public utility areas such as hospitals and transportation hubs. Although the system enhanced connectivity and automation, it relied on internet availability and did not provide offline communication through short-range wireless technologies such as Bluetooth for quick local updates.

3. PROPOSED SYSTEM

In the proposed system, an Arduino microcontroller is used as the main control unit, while a Bluetooth (HC-05) module enables the transmission of voice or text messages from an authenticated mobile device. The received message is processed and displayed on a P10 LED display module, forming a wireless notice board with AI-based voice assistance capability. The use of Bluetooth technology ensures efficient, reliable, and fast communication with minimal errors. This system is cost-effective, requires low maintenance, and is easy to operate. It effectively replaces conventional notice boards that depend on manual updates, reducing time and effort. As a result, wireless digital notice boards are becoming increasingly popular in both small institutions and large organizations for real-time and convenient information display.

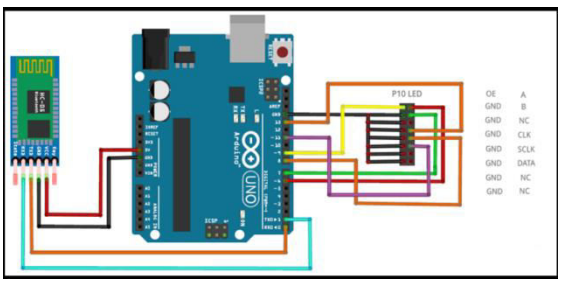

Fig 1: Block Diagram

A Bluetooth-based wireless notice board with voice assistance is an innovative

communication system that allows users to display messages remotely on a digital board using Bluetooth technology. The system typically consists of a microcontroller, a Bluetooth module (like HC-05 and an LCD or LED display. A mobile application or a dedicated device can be used to send text messages via Bluetooth, which the microcontroller processes and then displays on the board. To enhance usability, voice assistance is integrated, enabling users to give voice commands for updating or retrieving messages. This is achieved using speech recognition modules convert spoken words into text, which is then transmitted to the notice board. The system is particularly useful in educational institutions, offices, and public spaces where instant updates and announcements are required without the need for physical intervention. It offers a cost-effective, user-friendly, and efficient way to manage notice boards wirelessly.

3.1 Flow chart

A Bluetooth-based digital notice board using an Arduino, HC-05 module, and P10 display operates by receiving serial data wirelessly from a smartphone and processing it to scroll across an LED matrix. The system follows a continuous loop of checking for new serial data and updating the display buffer accordingly.

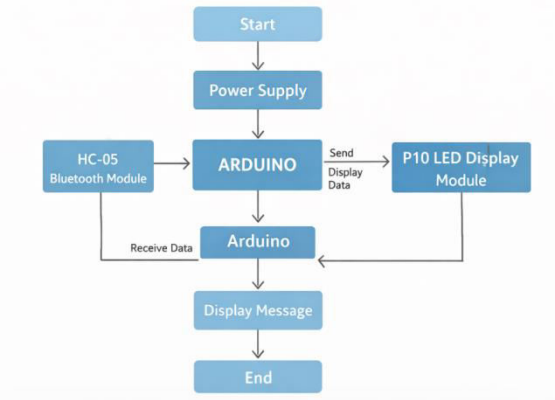

Fig 2: Flow Chart

4. RESULTS AND DISCUSSION

The smart electronic wireless e-notice board successfully displayed real-time updates and announcements through wireless communication, ensuring quick and efficient information dissemination. It demonstrated reliable performance in receiving and updating messages remotely without manual intervention. The system improved communication efficiency in institutions by replacing traditional paper-based notice boards.

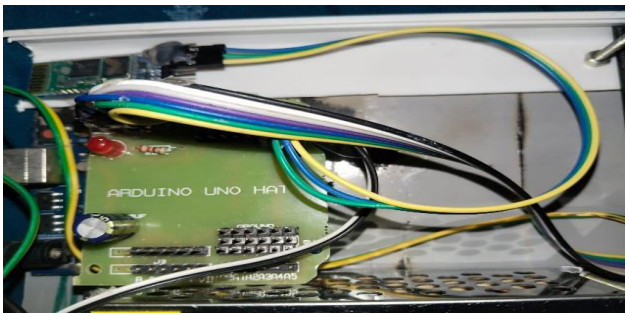

Fig 3: Hardware Implementation

FIG 4: Final Hardware Output

5. CONCLUSION

In conclusion, the Bluetooth-based wireless notice board using Arduino, HC-05, and a P10 LED display offers an efficient and modern solution for real-time message display. It eliminates manual effort by allowing users to send voice or text messages from a mobile device, ensuring quick and easy communication. The system is cost-effective, user-friendly, and suitable for various applications such as schools, offices, hospitals, and public places, with potential for future enhancements like improved connectivity and advanced voice recognition.

FUTURE SCOPE: The system can be upgraded using IoT technology to allow remote message updates through the internet from anywhere. Integrating a GSM module enables message transmission via SMS, removing Bluetooth limitations and increasing range. These improvements enhance scalability, accessibility, and suitability for large-scale applications.

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