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Wireless Notice Board using Bluetooth

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Abstract

The Wireless Notice Board using Bluetooth is a simple and efficient communication system that enables the wireless transmission and display of notices using Bluetooth technology. The primary objective of this project is to eliminate the need for manually updating traditional notice boards by providing a digital and paperless solution. In this system, a user sends a message from a Bluetooth-enabled smartphone to a Bluetooth module connected to a microcontroller. The microcontroller receives the message, processes it, and displays it on an LCD or LED display instantly. This allows notices to be updated quickly without requiring physical access to the display unit.

The proposed system offers several advantages, including reduced paper usage, lower maintenance costs, faster information updates, and improved convenience. It provides a reliable and user-friendly method for displaying announcements in real time, making it suitable for environments where frequent communication is required. The system can be effectively implemented in educational institutions, offices, hospitals, railway stations, banks, shopping malls, and other public places. Overall, the Wireless Notice Board using Bluetooth is a low-cost, energy-efficient, and practical solution for modern digital communication, improving the speed and effectiveness of information dissemination while minimizing manual effort.

Keywords— *Bluetooth Communication, Wireless Notice Board, Microcontroller, LCD Display, LED Display, Wireless Data Transmission, Embedded System, Digital Communication, Smartphone Interface, Real-Time Information Display.*

Introduction

A Wireless Notice Board using Bluetooth is an electronic display system designed to transmit and display notices wirelessly. It serves as a modern alternative to traditional paper-based notice boards by providing a fast, efficient, and digital method of sharing information. Instead of manually writing and replacing notices, users can send messages directly from a mobile phone to the notice board using Bluetooth technology. The transmitted message is received by a microcontroller, which processes the data and displays it on an LCD or LED display in real time. This wireless communication eliminates the need for physical connections and makes updating notices simple and convenient.

The system offers several advantages, including reduced paper consumption, lower maintenance costs, and significant savings in time and manual effort. It also ensures that important announcements can be updated instantly whenever required. Due to its ease of use, reliability, and cost-effectiveness, the Wireless Notice Board using Bluetooth is widely used in educational institutions, offices, railway stations, hospitals, shopping malls, and other public places where timely communication of information is essential.

Literature Survey

Traditional notice boards have been widely used for displaying information in educational institutions, offices, hospitals, and other public places. However, these notice boards require manual updating, which is time-consuming, labor-intensive, and less efficient, especially when notices need to be changed frequently. To address these limitations, researchers developed digital notice board systems that automate the process of displaying messages, making information sharing faster and more reliable.

In the early stages, many digital notice board systems used GSM modules to transmit messages through SMS, allowing users to update notices remotely. Although GSM-based systems were effective, they depended on mobile network availability and incurred communication costs. To overcome these drawbacks, Bluetooth-based notice board systems were introduced for short-range wireless communication. Bluetooth

technology provides low power consumption, secure data transmission, and easy connectivity with smartphones, enabling users to send notices instantly without requiring an internet or cellular network.

Several research studies have demonstrated that Bluetooth-enabled wireless notice boards improve communication efficiency by reducing manual effort and providing real-time updates. These systems are simple to operate, cost-effective, energy-efficient, and easy to implement using microcontrollers and display modules. As a result, Bluetooth-based wireless notice boards have become a practical solution for modern digital communication in schools, colleges, offices, hospitals, railway stations, and other public environments.

Proposed Method

The proposed Wireless Notice Board system uses Bluetooth technology to transmit messages wirelessly from a smartphone to a digital display. The main objective of the system is to replace conventional paper notice boards with a simple, fast, and efficient electronic notice display. A Bluetooth-enabled smartphone is used to compose and send text messages through a dedicated Bluetooth terminal application.

The transmitted message is received by the Bluetooth module, which is connected to a microcontroller. The microcontroller processes the received data, verifies the message format, and sends the information to an LCD or LED display. The display unit immediately shows the received notice, allowing users to view the updated information in real time. This process eliminates the need for manually writing or replacing notices, thereby reducing time, effort, and paper consumption.

The proposed system provides reliable wireless communication within the effective range of Bluetooth technology, making it suitable for indoor environments such as schools, colleges, offices, hospitals, libraries, and laboratories. The system is easy to install, simple to operate, energy-efficient, and cost-effective. Its low hardware complexity and quick response make it an ideal solution for real-time notice dissemination in places where frequent updates are required.

Hardware Specifications

1. Microcontroller (Arduino Uno / ATmega328)

The Arduino Uno, based on the ATmega328 microcontroller, acts as the main controller of the system. It manages the overall operation, receives data from the Bluetooth module, processes the incoming messages, and sends them to the display unit. It serves as the central processing unit of the wireless notice board.

2. Bluetooth Module (HC-05 / HC-06)

The HC-05 or HC-06 Bluetooth module provides wireless communication between the smartphone and the notice board. It receives text messages sent from a Bluetooth-enabled mobile device and transfers the data to the microcontroller through serial communication. It offers reliable short-range wireless connectivity with low power consumption.

3. LCD Display / LED Display

The LCD or LED display is used to show the received text messages. After processing by the microcontroller, the display presents the notices clearly and instantly. It enables users to view announcements in real time without any manual intervention.

4. Power Supply

A regulated 5V power supply is used to provide stable voltage to all electronic components of the system. It ensures the reliable operation of the microcontroller, Bluetooth module, and display unit while protecting the circuit from voltage fluctuations.

5. Connecting Wires and PCB

Connecting wires and a Printed Circuit Board (PCB) are used to establish electrical connections between all hardware components. They provide a secure and organized circuit layout, ensuring proper signal transmission and stable system performance.

Software Specifications

1. Arduino IDE

The Arduino Integrated Development Environment (IDE) is used to write, compile, and upload the program to the Arduino microcontroller. It provides an easy-to-use platform for developing and testing the embedded application.

2. Embedded C Programming

Embedded C is the programming language used to develop the control program for the microcontroller. It handles Bluetooth communication, processes the received text messages, and controls the LCD or LED display for accurate message presentation.

3. Bluetooth Terminal Application

A Bluetooth Terminal application installed on a smartphone is used to send text messages wirelessly to the Bluetooth module. It establishes a Bluetooth connection with the notice board, allowing users to update notices quickly and conveniently.

4. Serial Communication Protocol

Serial communication is used to transfer data between the Bluetooth module and the microcontroller. It

ensures accurate and reliable transmission of messages, enabling smooth communication within the system.

5. Display Control Program

The display control program converts the received text data into a format suitable for the LCD or LED display. It manages the positioning, formatting, and continuous display of messages, ensuring that notices are presented clearly and correctly.

Block Diagram

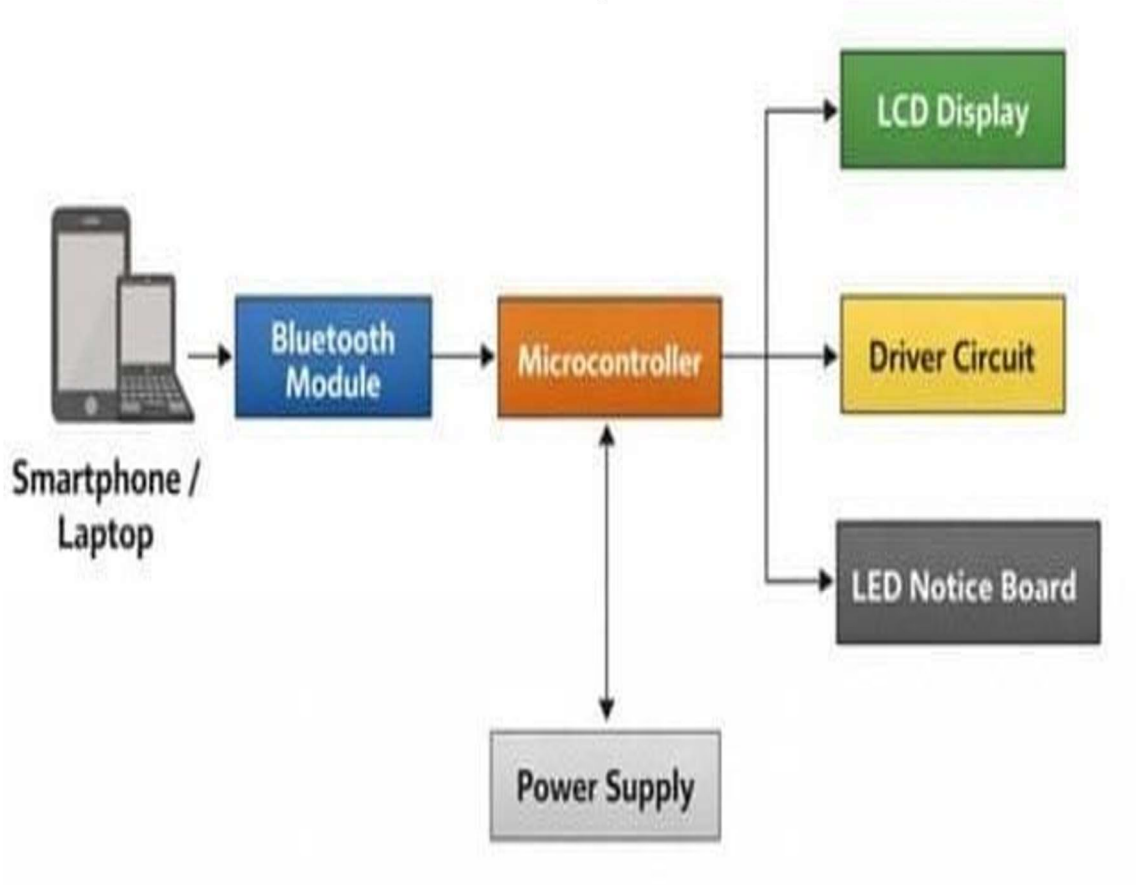

Fig 1; Block Diagram

Working Methodology

The working methodology of the Wireless Notice Board using Bluetooth is based on wireless communication between a smartphone and a microcontroller-controlled display unit. Initially, the user types a text message on a Bluetooth terminal application installed on a Bluetooth-enabled smartphone. After establishing a connection with the Bluetooth module (HC-05), the user sends the message wirelessly.

The Bluetooth module receives the transmitted message and forwards it to the microcontroller through serial communication. The microcontroller reads the incoming data, processes the message, and verifies it before sending it to the display unit. Once the processing is completed, the message is displayed immediately on the LCD or LED notice board.

This entire process takes only a few seconds and eliminates the need for manually updating traditional notice boards. The wireless communication provided by Bluetooth enables fast, reliable, and convenient message transmission within its operating range. As a result, notices can be updated instantly, making the system suitable for educational institutions, offices, hospitals, railway stations, and other public places where quick dissemination of information is essential.

Result and Discussion

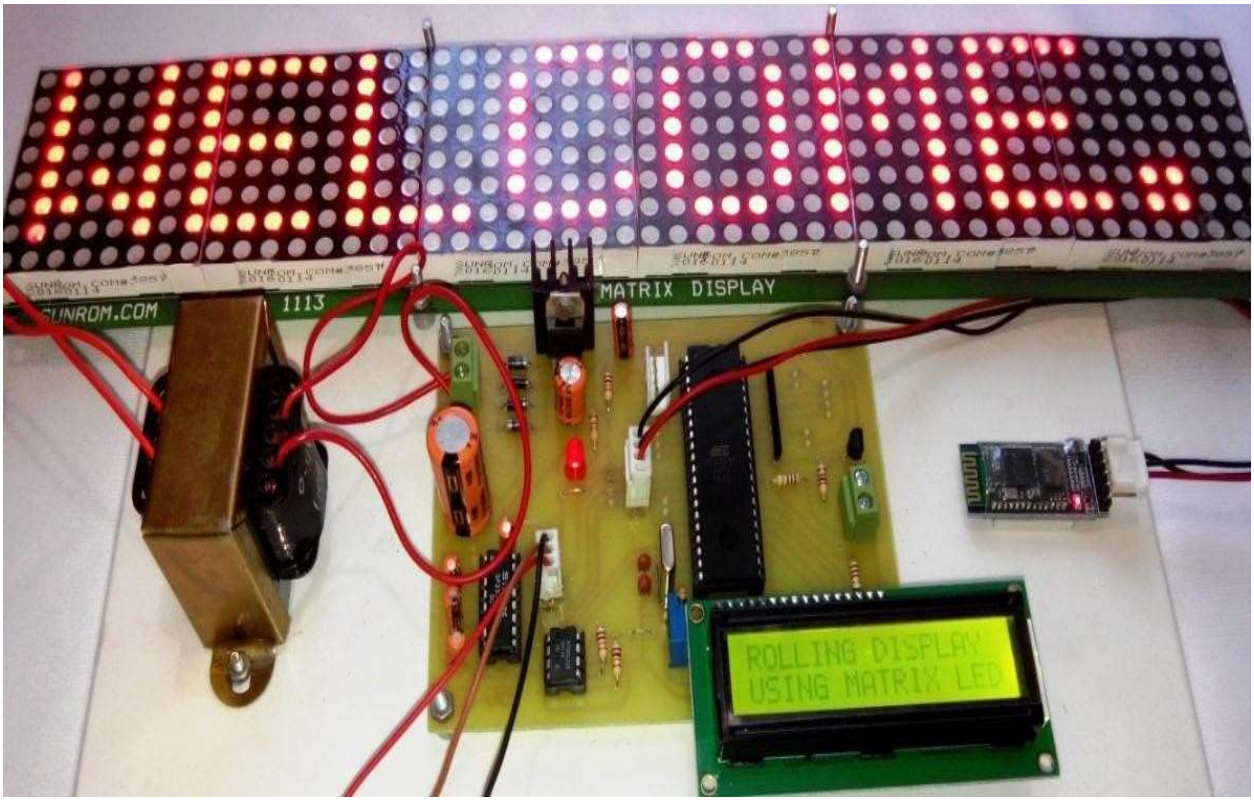

Fig 2; Wireless notice board using Bluetooth

Discussion

The developed Wireless Notice Board using Bluetooth successfully demonstrates the wireless transmission and display of text messages from a smartphone to an LCD or LED display. Communication between the smartphone and the notice board is established through the HC-05 Bluetooth module, providing a simple and reliable short-range wireless connection. The transmitted messages are received by the microcontroller, processed accurately, and displayed on the screen in real time without noticeable delay.

The system effectively eliminates the need for manually updating traditional notice boards, thereby reducing time, paper usage, and human effort. Experimental testing shows that the prototype performs efficiently within the Bluetooth communication range and provides stable message transmission. The overall design is simple, economical, and easy to operate, making it suitable for educational institutions, offices, hospitals, libraries, railway stations, and other public places where frequent notice updates are required. The prototype demonstrates that Bluetooth-based communication is an effective solution for fast and reliable digital notice dissemination.

Conclusion and Future Scope

Conclusion

The Wireless Notice Board using Bluetooth provides an efficient and convenient solution for displaying notices digitally through wireless communication. By replacing conventional paper-based notice boards, the system significantly reduces manual effort, paper consumption, and the time required to update announcements. Messages can be transmitted instantly from a smartphone and displayed in real time, improving the speed and effectiveness of communication. The system is low-cost, energy-efficient, easy to implement, and well suited for use in schools, colleges, offices, hospitals, banks, and other public institutions.

Future Scope

The proposed system can be further enhanced by integrating Wi-Fi or Internet of Things (IoT) technology to enable long-distance and internet-based communication. A dedicated Android or web application can be developed to provide a more user-friendly interface for sending and managing notices. Multiple notice boards can also be interconnected through a centralized network, allowing the same message to be displayed simultaneously at different

locations. In addition, advanced security features such as password protection, user authentication, encrypted communication, and administrator access control can be incorporated to improve system security and prevent unauthorized message transmission.

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