

Implementation Of Wireless Notice board for Classrooms

¹Veda Sree M, ²DR.Sudha M S, ³Syed Kaif Ulla Hussaini, ⁴Zubair Ul Haq, ⁵Tasmiya Khanum

^{1,3,4,5}Student, ²Associate Professor
Department of Electronics and Communication Engineering
Cambridge institute of technology
KR Puram, Banglore-560036

Abstract- The Wireless Digital notice board that is regulated by an android device which displays messages. There were notice boards where any type of information or notice had to be circulated daily. This project overcomes this problem by introducing an electronic digital notice board connected to an android device through Bluetooth connectivity. The Android device sends messages to an Arduino via Bluetooth, enabling communication with the digital notice board. In institutions, organizations, and public spaces like railway stations and bus stops, digital notice boards play a crucial role. However, managing diverse information on a daily basis can be a challenging task. Transforming the traditional notice board's limitations in swift message updates, our implemented project introduces an advanced wireless notice board. This upgraded approach utilizes cutting-edge technology to ensure prompt information delivery. Users can now instantly transmit and update messages using a dedicated Android application on their smartphones or tablets, establishing a smooth Bluetooth connection for communication.

Index Terms- Notice board, Bluetooth, Arduino, Wireless connection, Android application, Display, Information.

I. INTRODUCTION

In this outlined approach, the progress of simple and low-cost wireless Android based notice board is implemented. The approached system uses Bluetooth wireless serial data communication for showcasing messages on a digital bulletin board. Android based software applications are accessible for Bluetooth are used for transmitting the alpha-numeric text messages. Using the Bluetooth or the related trans-receiver the module has been combined with Arduino board at the receiver end.

For this objective, a low-cost microcontroller board (Arduino Uno) is programmed to receive alphanumeric text messages in Bluetooth modes. This approached system will help in lowering the human effort, paper, cost for manual and printer to transmit information in a manual way. Now a days, BLUETOOTH technology has become one the most popular medium for wireless data transfer. This technology has a wide range and is efficient in its work. The Digital notice board serves as a widely employed communication platform in diverse institutions and public spaces such as bus stops, railway stations, and amusement parks. Despite its ubiquity, managing information across various notice boards can be cumbersome. The wireless Digital notice board emerges as a common tool designed for efficient information display. It employs LCDs and Graphical LCDs to showcase messages.

The wireless system for these displays operates by utilizing Radio Frequency as the transmission medium. This system consists of two integral elements. the transmitter and the receiver. Users interact with the transmitter module, employing input devices like mobile phones to convey messages. The conveyed data is then wirelessly sent to the receiver, facilitated by Bluetooth technology. Subsequently, the received information undergoes decoding and is then presented on the wireless Digital notice board. This streamlined process enhances the dissemination of information, providing a convenient and effective means of communication in diverse settings.

II. LITERATURE SURVEY

Sindhuja et al. explains that [1] to operate a LED Notice board using a Bluetooth eliminating This project has a Buzzer and LED Notice board to the micro controller wirelessly using Bluetooth technology.

Zungeru et al. explains that [2] a meticulously crafted GSM-based notice board circuit was deliberately designed and implemented. proved to be efficient and cost-effective. Once the implementation was successfully completed, individuals with authorization could transmit text messages from their mobile phones to the system. via a GSM network, were received by GSM modem and consequently, the message were instantly displayed on the LED display board.

Prajapati et al. explains that [3] By incorporating Bluetooth technology into our communication systems, while minimizing errors and maintenance. This approach aims to make our communication processes more streamlined and expeditious

Gurav et al. explains that [4] the display boards constitute an integral part of the major communications medium for mass media. Local language can be added as a variation in this project. This can be achieved by using graphics and other decoding techniques.

Gemeda et al. explains that [5] The successful presentation of the design and hardware implementation of a wireless digital notice board underscores its cost-effectiveness and user-friendly nature. The system not only proves to be economically viable but also simplifies handling, significantly reducing expenses related to printing and photocopying. Jadhav et al. explains that [6] Leveraging wireless technology ensures swift and efficient long-range communication, leading to resource and time savings. Our system facilitates data transfer from distant locations, incorporating user authentication for added security. Unlike the previous GSM-based notice board systems, our implementation overcomes message limitations by allowing the storage of multimedia data on a chip or SD card.

Raut et al. explains that [7] The efficiency of the prototype lies in its simplicity, utilizing readily available components in the market. This simplicity makes it highly accessible and suitable for commercial deployment in various settings such as colleges, banks, railway stations, and industrial environments for the intent of displaying notices and messages. Arulmurugan et al. explains that [8] In the realm of wireless communication, advancements contribute to heightened efficiency and faster data transfer. Improved efficiency translates into more accurate message displays and fewer errors, thereby enhancing overall communication effectiveness.

Anushree S. P et al. explains that [9] The ENB (Electronic Notice Board) offers a streamlined and organized approach to disseminate notices, surpassing the conventional paper-based wooden notice board system. The utilization of ENB minimizes human congestion at notice board locations, as individuals can electronically access information from any ENB, reducing the reliance on physical notice boards.

Zohedi et al. explains that [10] The dot matrix display's wireless system operates by employing Radio Frequency as its transmission medium.

III. METHODOLOGY

Block Diagram:

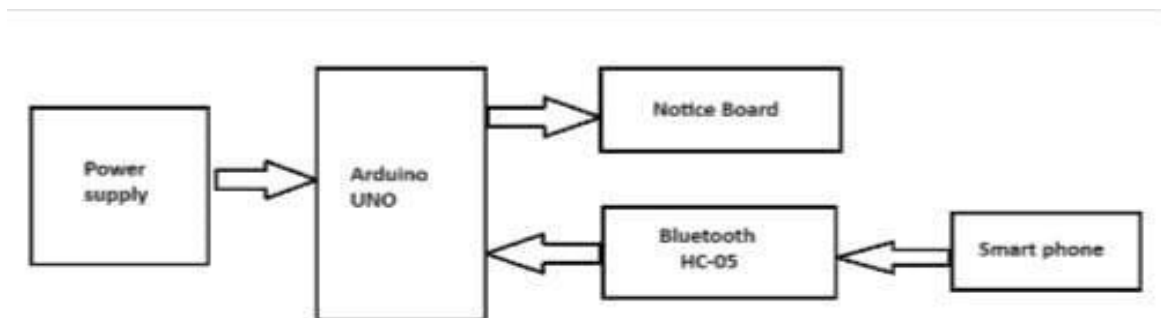


fig 1. Block diagram of wireless notice board

The process involves utilizing a power supply, Arduino UNO, LED module, Bluetooth HC-05, and a mobile application. Following the program upload to Arduino UNO, external power source activates all equipment functions. During this time, we transmit desired notices or SMS using a mobile.

Design of Hardware:

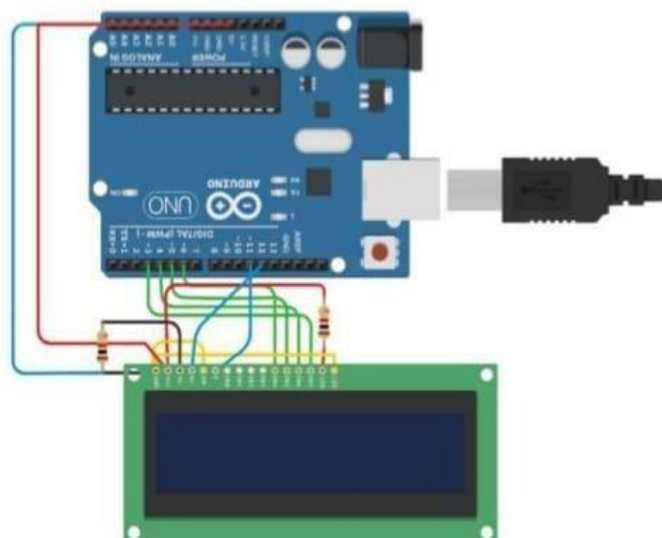


fig 2. Schematic Diagram of Wireless Notice board

A notice board that operates wirelessly through Bluetooth connectivity. and Arduino operates on the principle of wireless communication between a smartphone or computer (with Bluetooth capability) and an Arduino board. Here's how it works:

Hardware Components: We used Arduino board (e.g., Arduino Uno), a Bluetooth module (e.g., HC-05 or HC-06), an LED matrix or an LCD display for the notice board, and a power supply.

Bluetooth Communication: The Bluetooth component or device is connected to the Arduino board. It acts as a bridge between the smartphone or computer and the Arduino. The smartphone sends data (e.g., text messages) over Bluetooth to the Arduino.

Message Encoding: Messages sent from the smartphone should be encoded within a particular context format so that the Arduino can interpret them correctly. As an illustration, you have the capability to transmit. messages like "DISPLAY: Hello, World!" where "DISPLAY" is a command to display the following text.

Displaying Messages: The Arduino controls the LED matrix or LCD display to show the received messages. It may need to scroll messages if they are longer than the display can show at once.

Power Supply: Ensure that the Arduino and display are powered appropriately. You may need a separate power supply for the display, depending on its requirements.

User Interface: On the smartphone or computer side, we used app and software that allows users to input messages and send them to the Bluetooth module. This app should establish a Bluetooth connection with the module.

Bluetooth Pairing: Before using the notice board, the Bluetooth module on the Arduino and the smartphone or computer need to be paired. Once paired, they can establish communication with one another.

In operation, a user opens the app on their smartphone or computer, types a message, and sends it to the Arduino via Bluetooth. The Arduino receives the message, processes it, and showcases it on the notice board.

Arduino Code: We wrote Arduino code that actively awaits incoming Bluetooth data and processes it. When it receives a communication from the smartphone, it interprets the message and presents it on the LED matrix or LCD display. The code should include functions to receive, decode, and display the messages.

Flow Chart

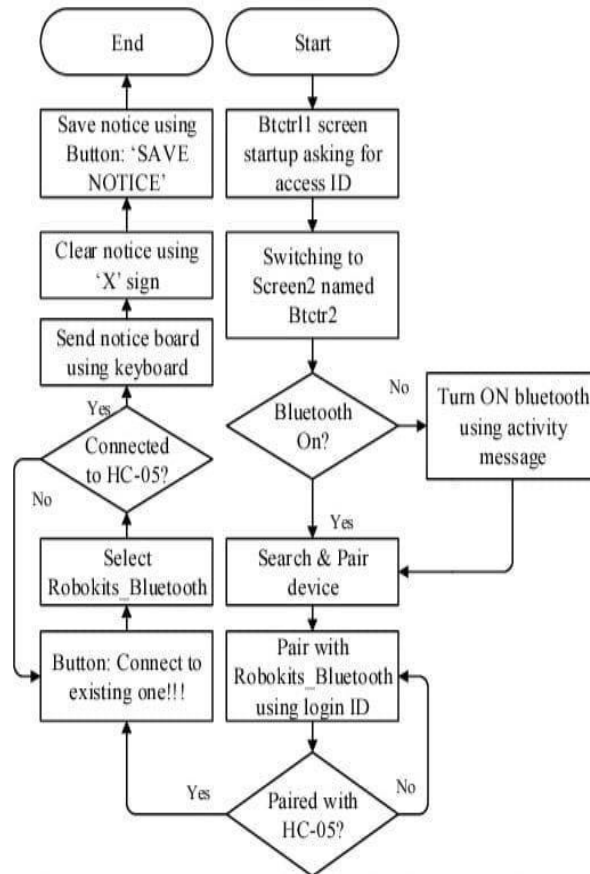


fig 3. Flow chart of wireless notice board

IV. RESULT&DISCUSSION

A notice board that operates wirelessly through Bluetooth connectivity involves integrating Bluetooth communication into the system to enable the wireless transmission of messages. To begin, select a suitable microcontroller or development board equipped with Bluetooth capabilities, such as an Arduino with a Bluetooth module or a Raspberry Pi with integrated Bluetooth. Connect the chosen display unit, whether it's an LED matrix or an e-paper display, to the microcontroller for rendering the messages. Integrate a Bluetooth module, like HC-05 or HC-06, into the system and configure it for communication in either master or slave mode built upon the project's needs. Establish a protocol for encoding messages to be transmitted via Bluetooth, deciding on a format that suits the information to be displayed. Develop a mobile app, compatible with Android or iOS, enabling users to compose and send messages to the notice board wirelessly.

Implement Bluetooth communication protocols within the application to establish a connection with the notice board. On the microcontroller side, write a program that actively awaits incoming Bluetooth messages, decodes them, and displays the relevant information on the connected display unit. Optionally, include user authentication and security measures to regulate access. Optimize power management strategies for energy efficiency, particularly in regard to prolonged usage.

Thoroughly test the system in various scenarios, addressing any issues that arise, and document the specifications and protocols for future reference. Consider user interface improvements or additional features, such as scheduling messages or multimedia integration, to enhance user experience. Always keep Bluetooth range in mind and deploy security measures, particularly in shared environments, to ensure a secure and reliable wireless notice board system.

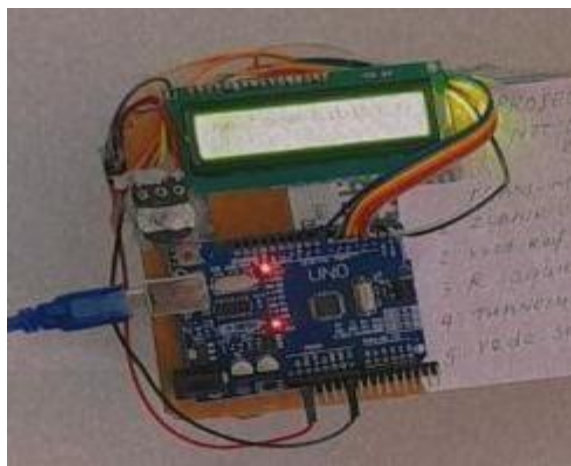


fig 4. Real time implementation of wireless notice board

V.FUTURE SCOPE

The future scope for wireless notice boards in classrooms is promising, with several potential enhancements. Adding interactive features, such as touch-screen capabilities, fosters engagement and allows users to interact with displayed content. Multimedia support, including videos and audio messages, can make communication more dynamic. Implementing an emergency alert system ensures quick dissemination of critical information during emergencies or important announcements. Exploring energy-efficient technologies like e-ink displays addresses environmental concerns. A remote management system enables administrators or teachers to update notice board content from anywhere, enhancing flexibility.



Fig.5 Displaying message

VI. CONCLUSION

With the constant evolution of technology, display board systems are transitioning from traditional handwritten displays to digital formats and, more recently, to wireless units. This undertaking involves specifically focuses on the development of a wireless notice board system integrated with Bluetooth connectivity. This system enables users to convey their desired messages via SMS in densely populated or congested locations. By incorporating wireless technology into the communication field, we aim to improve the efficiency and speed of our communication processes. This improvement allows for the display of messages with increased accuracy, fewer errors, and reduced maintenance requirements.

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