

Wireless Notice Board Using Bluetooth HC-05 and Arduino Uno-R3

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Abstract: This paper presents a survey of the existing literature on the topic of wireless notice boards using Bluetooth HC-05 and Arduino Uno. Wireless notice boards provide an efficient and convenient means of displaying information in real-time, enabling seamless communication and updates. The objective of this survey is to examine the various research works, methodologies, and applications related to wireless notice boards implemented using Bluetooth HC-05 and Arduino Uno. The survey encompasses a comprehensive analysis of the hardware and software components involved, including the Arduino Uno board, HC-05 Bluetooth module, and display technologies such as LCD or LED. It explores the methodologies employed in developing such notice boards, including the establishment of Bluetooth communication, message processing, and display techniques. Furthermore, the paper examines the diverse applications of wireless notice boards in public spaces, educational institutions, retail stores, and other domains. Additionally, it identifies future directions and potential advancements in the field, such as enhanced user interfaces, integration with IoT devices, cloud connectivity, and advanced display technologies. The survey concludes that wireless notice boards using Bluetooth HC-05 and Arduino Uno present promising opportunities for effective information dissemination and communication, with the potential to revolutionize various industries and improve user experiences in both public and private settings.

Keywords: Arduino Uno, Bluetooth Module Hc-05, Lcd Display, Power Supply, Mobile Source.

I. INTRODUCTION

In this world Mobile Phones and the related technologies are becoming more and more prevalent. Various technical arenas in the field of Telecommunication and Embedded Systems are becoming omnipresent in the people. The use of cell phones has rapidly increased over the last decade and a half Upgradation in networking technologies has encouraged the development and growth of very dense networks. Notice boards are one of the widely used ones ranging from primary schools to major organizations to convey messages at large. A lot of paper is been used and which is later wasted by the organizations. This in turn leads to a lot of deforestation thus leading to global warming. Small innovative steps in making use of technology for regular purposes would have an adverse effect on the environment issues which we are presently concerned about. In this world Mobile Phones and the related technologies are becoming more and more prevalent.

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The whole process can be described from the transmitter and receiver section. The Bluetooth module receives a message from the authorized mobile phone and the message is extracted by the microcontroller from the Bluetooth module and is displayed on the matrix display board. Serial to parallel communication is used for the entire process from Bluetooth module to Microcontroller and from microcontroller to the matrix display. And for the acknowledgement LCD display is used. The proposed system "Bluetooth based Wireless Notice Board using Arduino" is cheap, quick reliable and secured for any organization that requires to circulate notice regularly and reduce physical efforts. We are using Bluetooth technology. We can send notice from any location. This proposed system in this project has many upcoming applications in educational institutions and organizations, crime prevention, traffic management, railways, advertisements etc. Been user friendly, long range and faster means of conveying information are major bolsters for this application. By using this proposed methodology, we can enhance the security system and make awareness of the emergency situations and avoid many dangers.

II. LITERATURE SURVEY**[1] Ramya R, Bavithra N, Priyanka M, “Wireless E-notice board using Bluetooth technology”**

The paper explains E-notice board with the help of Bluetooth technology. The document deals with an innovative rather an interesting manner of intimating the message to the people using a wireless electronic display board which is synchronized using the Bluetooth technology. It will help us in passing any message almost immediately without any delay just by sending a SMS which is better and more reliable than the old traditional way of passing the message on notice board. The proposed technology can be used in colleges many public places, malls or big buildings to enhance the security system and make awareness of the emergency situations and avoid many dangers.

[2] Dharmendra Kumar Sharma, Vineet Tiwari, “Small and medium range wireless electronic notice board using Bluetooth & ZigBee”

The paper introduces Notice Board using Bluetooth and ZigBee technology. When the information exchange occurs between people via a network, then authentication and security of data have more priority. The paper introduces a low cost, handheld, wireless electronic notice board by using Atmel’s ATmega32 microcontroller and different wireless technologies (Bluetooth & ZigBee) and their performance analysis based on the parameter such as range, BER (bit error rate), RSSI (Received signal strength indicator), signal attenuation and power consumption. The notice board receives serial data from wireless module receiver and displays it on the graphical liquid crystal display. We have realized a common communication receiver hardware for notice board having compatibility with both wireless modules i.e., Bluetooth and ZigBee. We used KS0108 based 128x64 graphical LCD as display element.

[3] M. Abila Mary, B. Pavithra, R. Sangeetha, Prof. T.C. Subbu Lakshmi, “GSM based wireless noticeboard using Arduino”

In the paper built a Noticeboard using GSM technology. The GSM based notice board is aimed at the colleges and universities for displaying day-to-day information continuously or at regular intervals during the working hours. Being GSM-based system, it offers flexibility to display flash news or announcements faster than the programmable system. To develop a GSM based notice board whose contents can be updated through an SMS which realized through an embedded system with microcontroller. To design a project simple, easy to install, user friendly system, which may receive and display notice in a very specific manner. SMS based notice board incorporating the widely used GSM to facilitate the communication of displaying message on notice board via user’s mobile phone. SIM 800 GSM modem with a SIM card is interfaced to the ports of the Arduino with the help of AT commands.

[4] Pallavi M. Banait, Nikita P. Bakale, Mayuri S. Dhakulkar, Bhushan S. Rakhonde, “Cost effective Android based wireless notice board”

IJETER International Journal of Emerging Technologies in Engineering Research. In the day-to-day life, smart phone is gaining a wide range of importance in its usage and is portable. Thus, an android smart phone can be for the purpose. An android application is installed in the user’s smart phone which permits the transmission. At receiver end, a low-cost microcontroller board (Arduino Uno) is programmed to receive and display messages in any of the above communication mode. Using the developed system, two different applications for displaying messages on a remote digital notice board and wireless person calling has been implemented. The developed system will therefore aim in wirelessly sharing the information with intended users and helps in saving the time and the cost for paper and printing hardware.

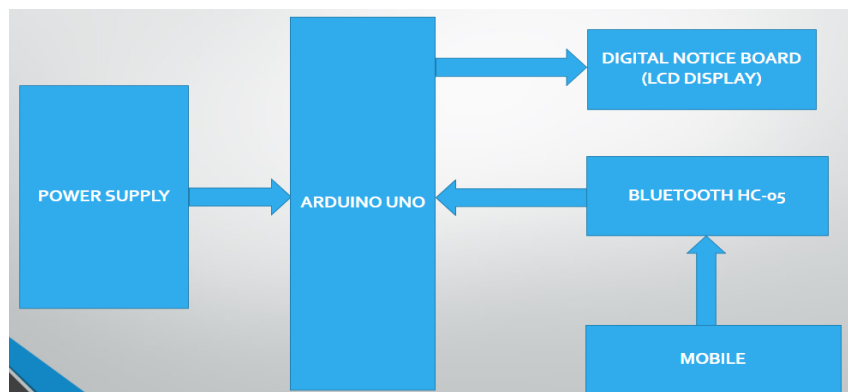
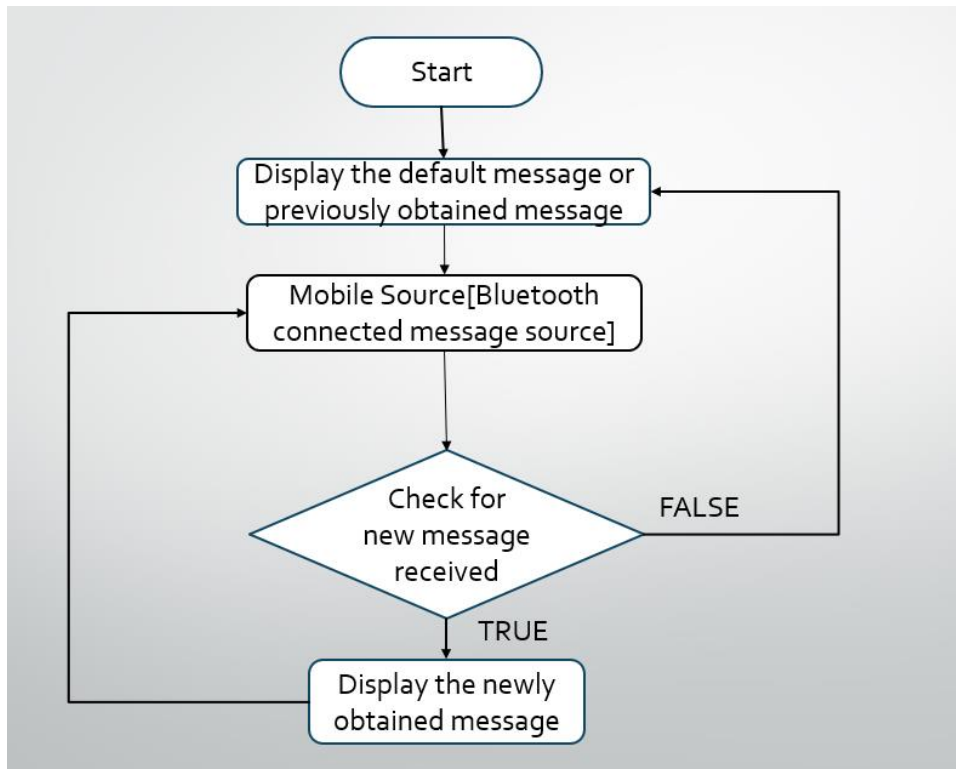
III. BLOCK DIAGRAM

Fig1. Block diagram for Wireless Notice Board using Bluetooth module HC-05 and Arduino Uno R-3

IV. FLOW CHART**Fig2.** Flow chart for the above methodology

Here is a **step-by-step methodology** for creating a wireless notice board using Bluetooth HC-05 and Arduino Uno:

1. **Gather the Required Components:** Collect all the necessary components for the project, including an Arduino Uno board, HC-05 Bluetooth module, LCD or LED display, connecting wires, breadboard (optional), and a power supply.
2. **Set up the Hardware:** Connect the HC-05 Bluetooth module to the Arduino Uno board. Make sure to connect the VCC pin of HC-05 to the 5V pin on Arduino, GND pin to GND, RX pin to Arduino's TX pin, and TX pin to Arduino's RX pin. If you are using an LCD display, wire it up according to its specifications.
3. **Install the Arduino IDE:** Download and install the Arduino Integrated Development Environment (IDE) from the official Arduino website (<https://www.arduino.cc/en/software>). This IDE will be used to write and upload the code to the Arduino board.
4. **Write the Arduino Code:** Open the Arduino IDE and start a new sketch. Write the code that establishes a Bluetooth connection with the HC-05 module, receives data from the connected device, and displays it on the notice board. You will need to use the appropriate libraries and functions to handle the Bluetooth communication and display output. Ensure that the code is well-commented and organized.
5. **Upload the Code:** Connect the Arduino Uno board to your computer using a USB cable. Select the appropriate board and port in the Arduino IDE. Verify that the code does not contain any errors and upload it to the Arduino board.
6. **Test the Communication:** Once the code is uploaded successfully, power up the Arduino board and make sure the HC-05 module is in discoverable mode. Use a Bluetooth-enabled device (such as a smartphone or computer) to pair and connect with the HC-05 module. Verify that the Bluetooth connection is established.
7. **Send Messages:** Develop a simple user interface, either as a mobile application or a computer program, that allows users to compose and send messages to the wireless notice board. The interface should send the messages over the Bluetooth connection to the HC-05 module, which will forward them to the Arduino board for display.



8. **Display Messages:** Implement the code on the Arduino board to receive the messages from the Bluetooth module and display them on the connected display device (LCD or LED display). Make sure the messages are formatted and presented correctly on the notice board.
9. **Test and Refine:** Test the wireless notice board by sending various messages from the user interface and ensuring they are displayed correctly. Make any necessary adjustments or refinements to the code, hardware connections, or user interface based on testing results.
10. **Finalize the Project:** Once the wireless notice board is functioning as desired, finalize the project by securing the components, organizing the wiring, and packaging the notice board in an appropriate enclosure if desired.

V. APPLICATIONS

A wireless notice board using Arduino and Bluetooth HC-05 can be a useful and practical application for displaying information in a convenient and easily updatable manner. Here's a breakdown of the components and how they can be utilized:

- **Public Spaces and Events:** Wireless notice boards can be deployed in public spaces such as transportation hubs, parks, stadiums, and exhibition centers. They can display important announcements, schedules, directions, and emergency alerts, enhancing communication with the public.
- **Educational Institutions:** Schools, colleges, and universities can utilize wireless notice boards to disseminate information to students, faculty, and staff. Notices about class schedules, exams, events, and general announcements can be displayed in real-time, ensuring effective communication within the educational community.
- **Retail Stores:** Wireless notice boards can be installed in retail environments to showcase product information, promotions, discounts, and advertisements. They enable dynamic and targeted messaging, enhancing customer engagement and driving sales.
- **Healthcare Facilities:** Hospitals, clinics, and medical centers can use wireless notice boards to communicate important information to patients, visitors, and staff. They can display waiting times, appointment schedules, health tips, and emergency notifications, improving patient experience and operational efficiency.
- **Corporate Offices:** Wireless notice boards can be placed in office spaces to display internal announcements, meeting schedules, employee recognition, and company news. They enhance internal communication and facilitate the dissemination of information across departments.
- **Transportation Systems:** Wireless notice boards can be integrated into transportation systems such as bus stops, train stations, and airports. They can display real-time arrival and departure information, platform changes, service disruptions, and safety notices, assisting commuters and travelers in their journey.
- **Community Centers:** Wireless notice boards can be installed in community centers, libraries, and recreational facilities. They can provide information about local events, classes, workshops, and community news, fostering community engagement and participation.
- **Hospitality Industry:** Hotels, resorts, and restaurants can benefit from wireless notice boards by displaying guest information, dining menus, event schedules, and facility updates. They enhance guest experience and provide a platform for personalized communication.
- **Industrial Environments:** Wireless notice boards can be used in industrial settings to display safety instructions, production updates, and maintenance schedules. They improve workplace communication and help ensure a safe working environment.
- **Home Automation:** Wireless notice boards can be integrated into smart home systems to display personalized messages, weather updates, calendar events, and home automation controls. They provide a convenient and centralized information hub for homeowners.

VI. RESULTS

The wireless notice board using Bluetooth HC-05 and Arduino Uno-R3 allows you to display a message wirelessly on and lcd display.

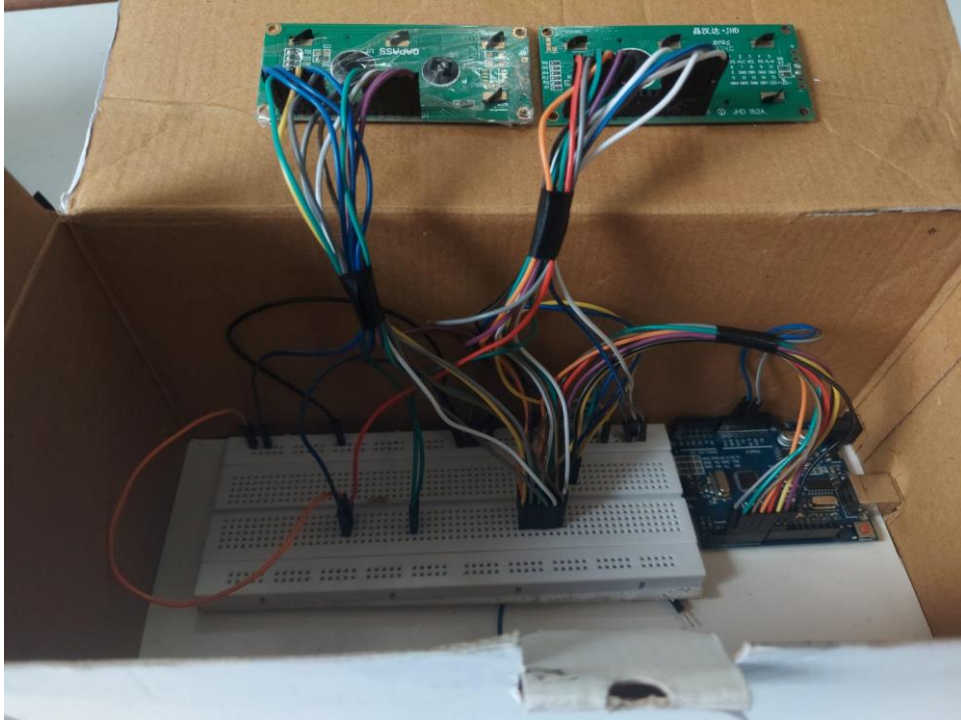


Fig3. Circuit Connection of the Wireless Notice Board using Bluetooth and Arduino Uno.

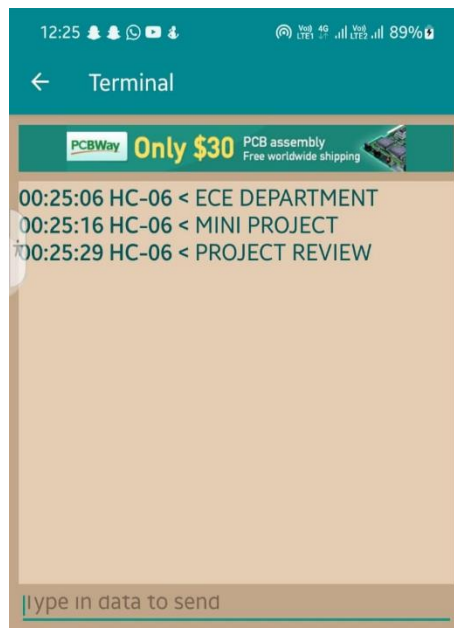


Fig4. These are the messages given as input to the lcd display

The below are the images of the message being displayed serially from Right to Left.



VII. CONCLUSION

In conclusion, a wireless notice board using Bluetooth HC-05 and Arduino Uno provides a convenient and efficient way to display information in various settings. It offers real-time updates, easy communication, and flexibility in sharing messages and notices. By integrating Bluetooth technology with the Arduino Uno microcontroller, the notice board becomes wirelessly accessible, allowing for remote control and management of displayed information.

The wireless notice boards using Bluetooth HC-05 and Arduino Uno offer a versatile and efficient solution for displaying notices and information in different contexts. With further advancements and innovations, they have the potential to revolutionize communication and information sharing in public spaces, organizations, and homes.

VIII. FUTURE SCOPE

The future of wireless notice boards holds exciting possibilities. Here are some potential developments:

- **Enhanced User Interfaces:** User interfaces can be further developed to provide more intuitive and interactive experiences. This may include touchscreen displays, voice commands, or smartphone applications for message composition and management.
- **Integration with IoT Devices:** Wireless notice boards can be integrated with other IoT devices and systems, allowing for automated updates based on various triggers, such as weather conditions, sensor data, or calendar events.
- **Cloud Connectivity:** Connecting the notice board to the cloud can enable remote management and content updates from anywhere. It would allow administrators to control multiple notice boards simultaneously and provide seamless synchronization of information across different locations.
- **Advanced Display Technologies:** Advancements in display technologies, such as e-paper displays or flexible displays, can offer improved readability, energy efficiency, and design possibilities for wireless notice boards.
- **Data Analytics and Insights:** By analyzing usage patterns, content engagement, and user feedback, valuable insights can be gained to optimize the effectiveness and relevance of displayed information. This could lead to personalized messaging and targeted content delivery.
- **Integration with AI and Voice Assistants:** Integration with artificial intelligence (AI) and voice assistants can enable voice-activated commands, natural language processing, and intelligent content recommendations based on user preferences and historical data.
- **Expansion of Applications:** Wireless notice boards can find applications in various industries, including retail, healthcare, transportation, and smart cities, where real-time communication and information dissemination are crucial.

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