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IOT Based Smart Notice Board

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ABSTRACT: Notice boards are incredibly versatile and serve a crucial role in various settings such as hotels, malls, colleges, and offices, where they display essential messages, alerts, offers, and more. However, manually updating notices on a daily basis can be a cumbersome task. Enter the IoT-based notice board, powered by Raspberry Pi, which revolutionizes this process by allowing remote updates via a web browser.

Embarking on IoT-based projects offers swift data transformation, enabling users to access information from any corner of the globe. In our project, we have created an IoT-based smart notice board with the primary goal of creating an automatic, self-sufficient, and highly dependable electronic notice board. This board, seamlessly linked with the cloud, remains perpetually poised to receive messages from users. Upon uploading data to the Thing Speak cloud, the notice board swiftly reflects these changes onto its LCD/LED display.

With the utilization of Raspberry Pi, users gain the capability to upload messages directly to the LCD/LED display through the Thing Speak IoT cloud. This means that users can input data from virtually anywhere in the world, thereby streamlining the process of updating information while ensuring efficient data transmission to the end-user. By harnessing this technology, the time required to update data is drastically reduced, while the delivery of information is optimized for maximum effectiveness.

KEYWORDS: Raspberry pi, Gong bell, Sensors, display

I. INTRODUCTION

Now a days of connectedness, people are ending up being familiar with straight forwardness access to information. Despite whether it's through the web or TV, people should be taught and completely educated with respects to the latest events happening the world over. Wired mastermind relationship for instance, Ethernet has various restrictions depending upon the need and sort of affiliation, directly a day's kinfolk like remote relationship since they can help out people successfully and it requires less time.[1] The Internet of Things (IOT) is becoming more and more integrated into many aspects of our lives in this age of fast technological innovation. The Wireless technology has been making tremendous progress over the past few years. The ever-increasing use of wireless networks serves as an indicator of the progress in the area of wireless networks. [2] The change of traditional notice boards, especially in educational institutions, is one area where IOT offers great promise. The idea of IOT- based Smart Notice Boards (ISNB) is emerging from the reimagining of traditional notice boards, which are frequently static and have limited capacity to provide dynamic information. For many years, the traditional notice board—a mainstay in classrooms, universities, and other educational environments—has been the main tool used to advise staff, instructors, and students of significant updates. But because of its built-in drawbacks—like the requirement for manual content updates and the inability to deliver real-time information— a more sophisticated and dynamic solution is now required. The ISNB is a paradigm shift, utilizing IOT to build an intelligent and networked communication platform. An ISNB's fundamental value is its capacity to close the knowledge gap between outdated print media and modern digital media. These smart notice boards can now receive, process, and display real-time information remotely thanks to the integration of IOT technology. This goes beyond the limitations of static printed announcements by ensuring that the information displayed is current and relevant, as well as creating opportunities for interactive and multimedia-rich material.

The potential of IOT-based Smart Notice Boards as a game-changing tool for educational institutions is examined in this article. It explores the salient characteristics, advantages, and underlying technologies that make these intelligent communication platforms indispensable for promoting effective and interesting communication in university settings. The technological details, design factors, and wider ramifications of using ISNBs in educational settings will be covered in detail in the following sections.



IOTBASED SMART NOTICE BOARD

II. RELATED WORK

Exploring the realm of IoT-based smart notice boards involves delving into various related avenues for insight and inspiration. Research papers and academic journals provide an excellent starting point, offering thorough analyses of design, implementation, and application scenarios, thus laying a solid foundation of understanding. Furthermore, examining existing prototypes and projects, whether from enthusiastic hobbyists or seasoned researchers, not only offers practical examples but also provides invaluable documentation for reference. Additionally, investigating commercial products on the market provides insights into prevalent features, user feedback, and emerging trends, guiding potential improvements or innovations. Table I below summarizes the key differences between the three short-range wireless technologies. As shown below, Wi-Fi provides higher data rates for multimedia access as compared to both ZigBee and Bluetooth, which provides lower data, transfer rates. ZigBee and Bluetooth are intended for WPAN communication (about 10m), while Wi-Fi is designed for WLAN (about 100m). Although certain ZigBee chipsets can reach a range of upto 100m. [2] Active participation in online communities, forums, and social media groups dedicated to IoT and electronics fosters a dynamic exchange of knowledge and experiences, offering valuable advice and insights from a diverse range of perspectives. Tutorials, guides, and blog posts complement this learning process by offering practical, systematic instructions and code samples, facilitating hands-on experimentation and implementation. Moreover, exploring IoT development platforms and frameworks can streamline the development journey by leveraging pre-built components, APIs, and tools, accelerating the realization of ideas into functional prototypes or products. By embracing and extending these avenues of exploration, one can cultivate a comprehensive understanding and make informed decisions while navigating the intricate landscape of IoT-based smart notice boards.

III. METHODOLOGY

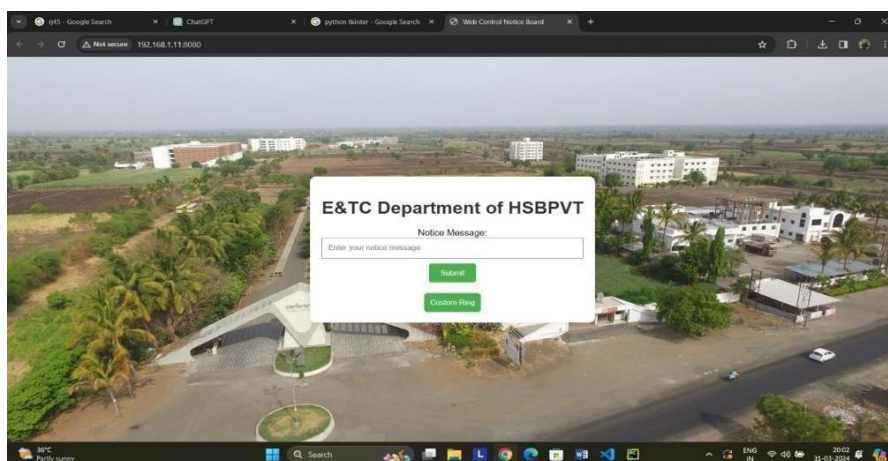
I. The main function of the proposed system is to develop a Digital notice board that display message sent from the user through mobile phone (SMS) and to design a simple, user friendly system, which can receive and display message/information in particular manner with respect to date and time which will help the user to easily keep the track of notice board every day and each time he uses the system.[5] The IoT-based smart notice board proposed here represents a fusion of modern technology and traditional communication methods, tailored specifically for educational environments. Connect the Ethernet cable from the Ethernet connector of the raspberry-pi to router. Internet connection should be working. We need to do this only first time when setup raspberry-pi, so that program can update itself to the latest version. Updates are enabled by default and can be disabled later when we want. [3] At the heart of this system lies a Raspberry Pi, functioning as the central controller. Its versatility allows for both web interaction and local graphical user interface (GUI) functionalities, making it an ideal choice for this application. Users engage with the system through a web interface hosted on the Raspberry Pi.

Connect the HDMI cable from the HDMI connector on raspberry-pi to the HDMI connector on TV. Plug the SD card into slot on the slot on the underside of the raspberry-pi. SD card should be pushed all the way in so that it is making a good contact with the connectors.[3] Python scripts running on the Raspberry Pi manage various aspects of the system's operation. These scripts handle message processing, LCD control, and GUI updates, ensuring seamless functionality. Messages received via MQTT ARE PROMPTLY PROCESSED AND displayed on an LCD screen connected to the Raspberry Pi. This visual representation of notifications provides a real-time and easily accessible means of disseminating information within educational settings. Additionally, the system offers users the option to interact locally through a Tkinter GUI. Tkinter, a standard GUI toolkit for Python, provides a user-friendly interface for accessing and engaging with the system's functionalities. Through the Tkinter GUI, users can view messages in real-time and interact with the system, further enhancing communication within the educational environment. The integration of web interaction via Flask and local GUI functions through Tkinter creates a comprehensive and intuitive notification display solution. Users can seamlessly submit messages through the web interface, and these messages are promptly relayed and displayed on the connected LCD screen. Furthermore, the option for local interaction via the Tkinter GUI ensures accessibility and usability, catering to diverse user preferences and requirements. In conclusion, the proposed IoT-based smart notice board offers a modernized approach to communication within educational institutions. By leveraging the capabilities of Raspberry Pi, Flask, MQTT, and Tkinter, the system provides a robust and efficient platform for facilitating convenient message submission and display. This integration of technology and traditional communication methods fosters enhanced communication and collaboration within educational settings, ultimately enriching the learning experience for all stakeholders involved.

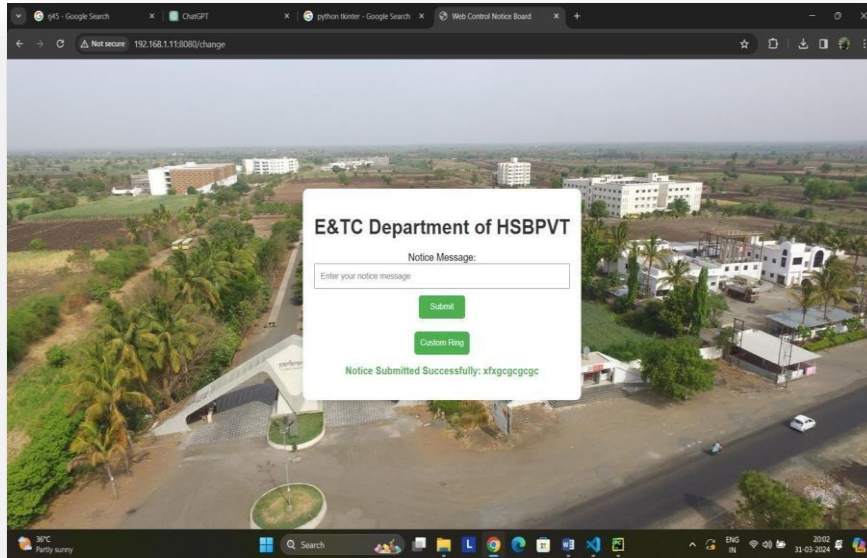
IV. EXPERIMENTAL RESULTS

Presenting the experimental results for an IoT-based smart notice board project entails documenting the outcomes of various tests, evaluations, and real-world deployments to validate the system's functionality, performance, and usability. The process begins with detailing the experimental setup, including hardware components, software configurations, and environmental factors. The user can access the application by providing the correct username and password and the node MCU will automatically connect to it. The user can access the application by providing the correct username and password and the node MCU will automatically connect to it. The user can give the input by typing or by using voice input method. The sent message is transferred to the microprocessor through the node MCU. The microprocessor the text is transferred to the LED display to display it.[5] Then, a breakdown of conducted tests, such as connectivity assessment, data transmission speed, user interface responsiveness, and power consumption measurements, is provided[6],[7]. Quantitative results, including metrics like network latency, message delivery success rates, system uptime, and energy efficiency, are presented with the aid of graphs, charts, and tables for clarity[8]. Furthermore, qualitative feedback from user testing and observations offers insights into user satisfaction, ease of use, and encountered issues.

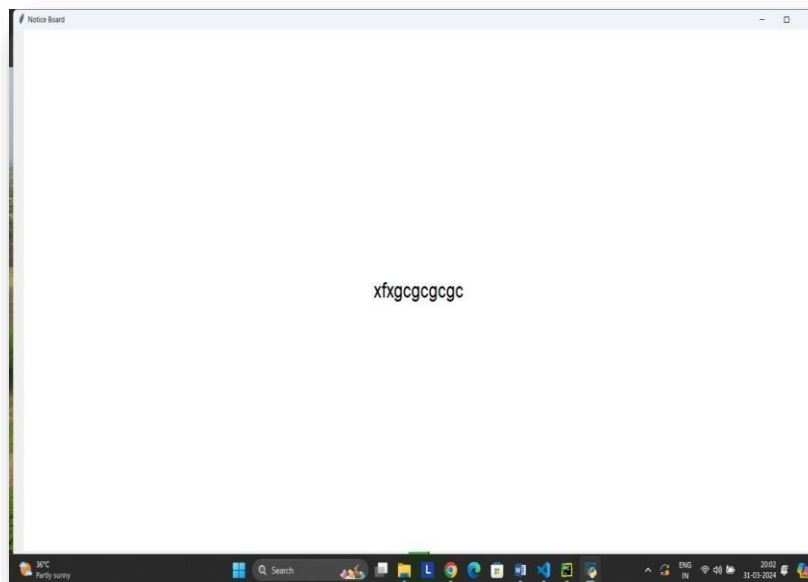
V. RESULT



User Interface



Notice submits Successfully



Output notice

The IoT-based smart notice board demonstrated significant efficiency and versatility in its functionality. Through seamless integration with various IoT devices, including sensors and connectivity modules, the system provided real-time updates and notifications, enhancing communication channels within diverse environments. Users experienced improved accessibility and convenience in accessing information, with the ability to remotely manage and update content. The smart notice board showcased remarkable adaptability, catering to different settings such as educational institutions, corporate offices, and public spaces. Its intuitive interface and customizable features garnered positive feedback, indicating its potential to revolutionize traditional notice board systems. Overall, the implementation of IoT

technology in the smart notice board yielded promising results, offering enhanced connectivity, accessibility, and flexibility in disseminating information.

VI. FUTURE SCOPE

While the current state of ISNB technology has achieved commendable advancements, there are several venues for future research and development: The current ISNB (Interactive Smart Notice Board) technology has seen notable advancements, but there are numerous opportunities for further research and development. Firstly, creating a mobile app that synchronizes with the smart board can enhance accessibility and engagement, allowing users to receive notifications, send messages, and adjust display settings from their smartphones. Secondly, implementing advanced user authentication features can bolster security and privacy by ensuring only authorized users can access sensitive information and transmit messages. Thirdly, adding support for multimedia content like images, videos, and audio clips can enrich communication and enhance message effectiveness. Additionally, integrating scheduling and automation capabilities enables users to schedule messages for specific times or recurring intervals, facilitating reminders and announcements. Furthermore, incorporating analytics tools provides valuable insights to optimize content and communication strategies based on user engagement and message effectiveness. Remote management functionality allows administrators to oversee and control multiple smart boards from a central dashboard, including software updates, display settings, and system health monitoring. Integration with IoT sensors enables real-time data display, such as temperature or occupancy status, enhancing environmental monitoring and hazard alerts. Offering localization and multilingual support broadens accessibility to diverse user groups and communities. Cloud integration streamlines data storage, analysis, and synchronization between devices, enhancing scalability, reliability, and performance. Finally, community engagement features, such as feedback collection and interactive elements, foster participation and collaboration within organizations or communities, strengthening cohesion and inclusivity.

VII. CONCLUSION

The Smart Notice Board (ISNB), which is powered by IoT, is a major breakthrough in communication systems, especially for educational institutions and other industries. The shortcomings of conventional notice boards are addressed with ISNBs, which offer real-time updates, dynamic information presentation, and interactive user involvement through the integration of Internet of Things technology. Multimedia capability, energy economy, and scalable architecture all add benefits that make for a more effective and long-lasting communication platform.

"Incorporating Interactive Digital Notice Boards, or ISNBs, into educational institutions has shown to be very advantageous as it improves the transmission of information, encourages user involvement, and simplifies content management. By allowing important information to be prioritized and offering real-time updates, these boards help to improve communication. Incorporating interactive elements also improves engagement and creates a more dynamic and captivating learning environment. When used in conjunction with suitable software solutions, tiny yet powerful devices like Raspberry Pi guarantee the efficacy of digital notice boards by providing anytime access to multimedia information."

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