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Review Paper on Wireless Notice Board

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Abstract

This paper is used widely for notice boards particularly focusing on Wi-Fi based digital notice boards and GSM Technology .We can find Wi-Fi based digital notice board in schools, colleges,railway stations, airports and work places.These boards utilize Raspberry Pi as a receiver connected to local Wi-Fi networks. To send information to the Raspberry Pi, the sender must first connect to the corresponding Wi-Fi network. Wi-Fi has a maximum range of about 100 meters, information exchange is restricted within this range.

GSM technology is utilized for transmitting information to digital notice boards emphasizing its versatility in various projects such as data acquisition systems and controlling multiple devices. This involved using a GSM module at the board to receive text messages from authorized users.Notices can be in various formats such as docx, pdf, images, videos. An authorized user can send notices from their PC or smart devices to the Raspberry Pi connected to the display monitor via Wi-Fi.The review touches upon the widespread use of GSM technology in various projects, emphasizing its role in data acquisition systems, teaching and learning systems, and controlling multiple devices.An application installed on the administrator's mobile phone includes a speech-to-text converter for sending messages.

Keywords: E-Notice Board, Wi-Fi, Raspberry Pi , Large Display,Mobile Phone

1. Introduction

The concept of a Wireless E-Notice Board, is a modern solution for displaying notices and information in various environments such as educational institutions, corporate offices, and public spaces. This innovative system eliminates the need for pl oards and enables the wireless transmission of messages, announcements, and updates to a digital display. The Wireless Notice Board combines the power of Raspberry Pi, a versatile microcomputer, with IoT capabilities to create a dynamic and interactive platform for displaying information. This innovative approach offers numerous advantages over conventional notice boards, including remote management, real-time updates, and multimedia content support. By leveraging wireless communication technologies, the Wireless E-Notice Board offers flexibility, efficiency, and real-time dissemination of information. The Wireless Notice Board is a modern communication system designed to simplify the process of displaying messages and notices. It provides an efficient and convenient way for users to transmit information wirelessly, eliminating the need for physical notice boards or manual updates. This system offers a user-friendly interface, allowing users to access and send messages through the internet or a mobile application. With features like date and time-based organization, it ensures that messages are

displayed in a timely manner, making it easy for users to stay informed. The Wireless Notice Board enhances communication by providing a seamless platform for sharing information across different locations and devices, making it an invaluable tool for various settings such as schools, offices, and public spaces. presents an innovative solution for modernizing communication systems. In today's fast-paced world, effective dissemination of information is crucial, and traditional notice boards often fall short in meeting these demands. This paper introduces a wireless electronic notice board system designed to address these challenges. By leveraging technologies like Raspberry Pi and wireless communication protocols, the system aims to provide a dynamic and efficient platform for displaying notices, announcements, and updates. With a focus on user-friendliness and accessibility, the authors aim to create a solution that not only streamlines information dissemination but also enhances engagement and interaction. Through this research, the team endeavors to contribute to the advancement of communication technology, offering a practical and scalable solution that can be implemented in various settings such as educational institutions, corporate offices, and public spaces.

2. Proposed Methodology

The proposed methodology for the Wireless E-Notice Board Initially, Initially, the hardware setup will be established, which includes configuring Raspberry Pi, connecting it to necessary peripherals such as display screens, and integrating IoT components. Following this, the software development phase will commence, focusing on programming the Raspberry Pi to manage data processing, display content, and interact with IoT devices. Next, the integration of IoT will be carried out, enabling communication between the Digital Notice Board and other IoT devices or sensors for gathering data or triggering notifications. Subsequently, a user-friendly interface will be designed to allow administrators to control and update the content displayed on the notice board remotely. The system will then undergo rigorous testing and validation to ensure its functionality, reliability, and security. Feedback from testing will be used to refine the system further. Once validated, the system will be deployed in real-world scenarios for practical evaluation. Continuous monitoring and updates will be performed to ensure smooth operation and address any issues that may arise. Overall, this methodology aims to systematically implement a Digital Notice Board using Raspberry Pi and IoT technology, providing an effective platform for communication and information dissemination in various environments. will design the system architecture, identifying the necessary hardware and software components. The proposed system is a wireless notice board utilizing Raspberry Pi as a processor and a portable projector or LCD display for showcasing notices in various formats such as text, images, and PDF files. Users can send messages through a web interface or a mobile application, which includes a voice-to-text feature for convenience. These messages are transmitted to the cloud and then accessed by the Raspberry Pi connected to the internet via Wi-Fi. The Raspberry Pi retrieves the messages from the cloud and displays them on the screen, scrolling through text messages and displaying images and PDF files. The system allows for easy deletion and modification of messages through the web interface. Additionally, it supports SMS messaging through a GSM modem, with the Raspberry Pi interfacing with the modem to receive and display messages. Messages are displayed for a predefined period, and in case of multiple messages, those with higher priority are displayed first, with notifications sent to other users via SMS.

3. Block Diagram

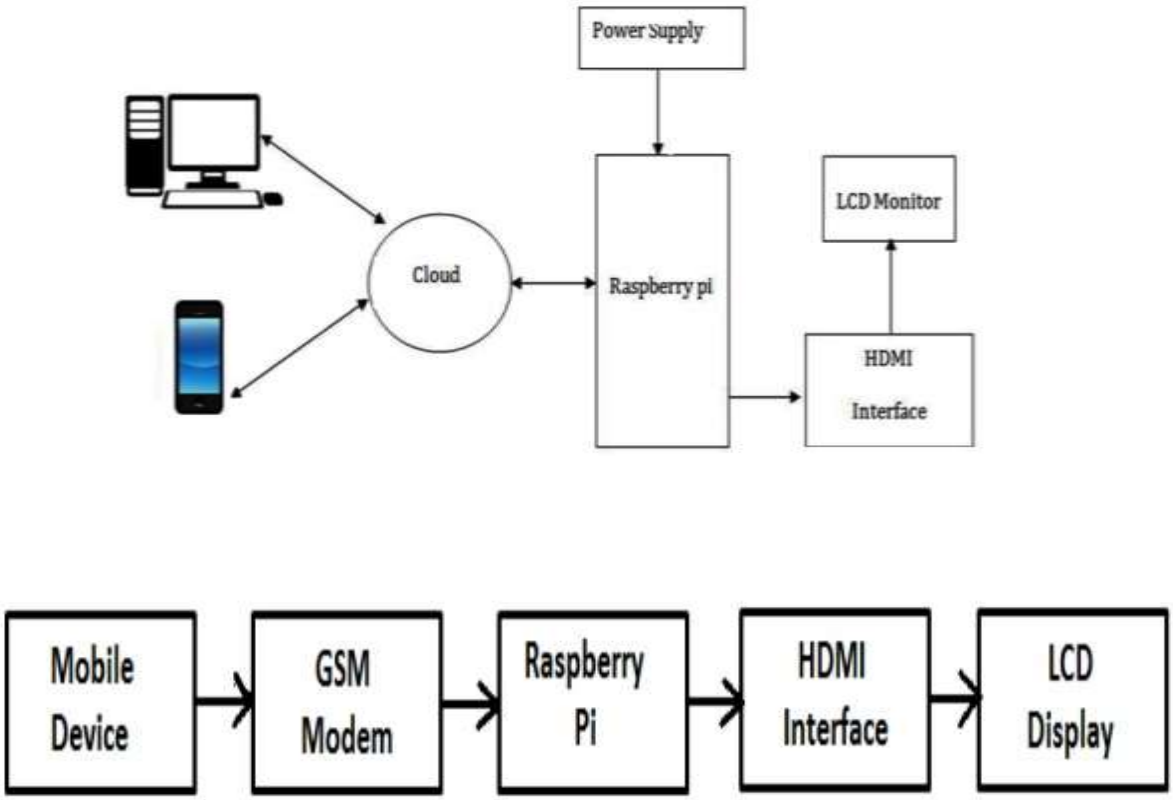

Fig 1: Block Diagram

Users can send SMS messages to a specific phone number linked to a SIM card inside a GSM modem. This modem receives messages from any phone number and uses AT commands to work. It's connected to a Raspberry Pi (model B+) by linking its TXD and RXD pins to the RXD and TXD pins of the Raspberry Pi. This connection allows messages to be transmitted through a serial port. The TXD and RXD pins of the Raspberry Pi are located at the 8th and 10th pins, respectively, among the 40 GPIO pins. The Raspberry Pi is then connected to an LCD monitor using an HDMI cable. Messages received by the GSM modem are retrieved by the Raspberry Pi using appropriate AT commands. The received messages are displayed on the LCD monitor. They stay on the screen for a set period of time. After this time expires, a default message or image is shown until a new message is received. If multiple messages are received at the same time, the message from the user with the highest priority (previously determined) is displayed first. Other users are notified about the displayed message via SMS. The main purpose of the proposed system is to create a digital notice board that can display messages sent by users over the internet. The goal is to design a simple and user-friendly system that organizes notices based on date and time, making it easy for users to keep track of information. The system consists of two sections: the sender and the receiver, as depicted in Figure 1.

The sender is responsible for transmitting important information via a wireless network. To access the digital notice board, the sender must visit a specific web address. For security purposes, the web address requires authentication in the form of a username and password. If the entered credentials are incorrect, access to the digital notice board is denied. However, if the username and password are correct, the web address opens up, providing space for transmitting information. Users can access this web address using either a personal computer or a mobile phone. To enhance user-friendliness, an Android application is developed. This application allows senders to directly access the web address, simplifying the process of sending messages.

4. Implementation

Fig 2: Login Page

Fig 3: Invalid Password Detection

A system is described where a PC or Android application acts as a transmitter, while a Raspberry Pi serves as the receiver. They communicate through a wireless network. A display is connected to the receiver side (Raspberry Pi). The Raspberry Pi is connected to a Wi-Fi network to access data stored on the cloud. Once the connection is established, the data from the cloud is displayed on the connected display. To send information, the sender needs to access a login page. Figure 2 illustrates this login page. The username and password are predetermined. If the sender enters the wrong username or password, an error message is displayed on the login page (as shown in Figure 3).

After entering the correct username and password, the next page will be displayed on the web server. This process ensures secure access to the system's functionalities, allowing authorized users to send information effectively. the system facilitates wireless communication between a transmitter and a Raspberry Pi receiver. The Raspberry Pi accesses data from the cloud and displays it on a connected display. Authentication through a login page ensures only authorized users can send information, enhancing system security.

5. Results

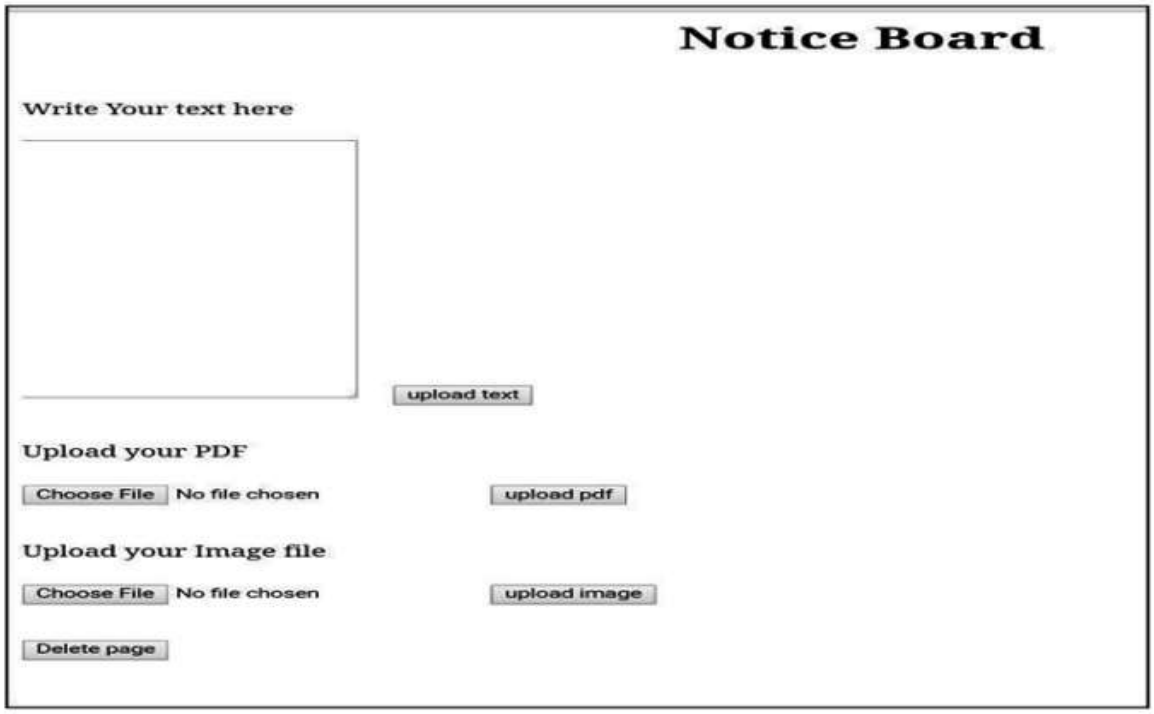

Fig 4: Upload Page

The upload page has icons for sending text messages, PDF files, and image files. There's also a separate icon for deleting previously sent data. Figure 4 displays how this upload page looks on the web server. To delete previously sent data, just click on the delete page icon. A new window will open, providing options to delete documents.

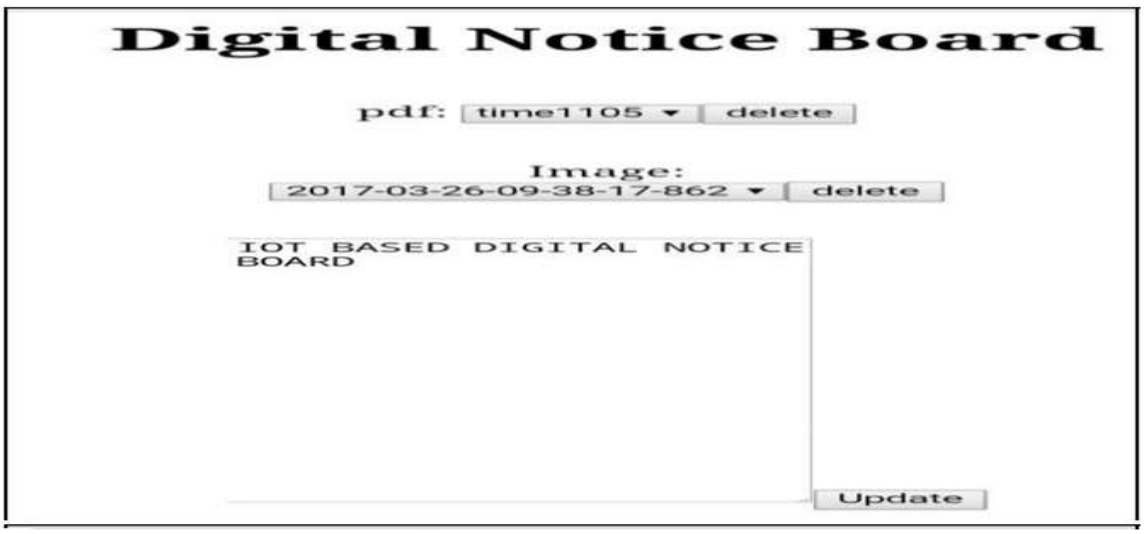

Fig 5: Digital Notice Board

On the delete page, you'll find a separate list showing our previously sent data. To delete data, simply choose the corresponding data from the list and click on the delete icon. After a short delay, the deleted data will be removed from the receiver section.

Fig: 6 . Display pdf files

Figure 6 illustrates how PDF files are displayed on our digital notice board, showing two PDF pages simultaneously on the monitor. If an received image is too large, it will be resized to fit our predetermined size and then displayed. Text messages are displayed like breaking news on TV channels. They can also be sent from the Android application using voice commands. Messages change every 10 seconds. Newly sent PDFs or image files have priority, displaying first, followed by previously received messages after a 10-second delay. However, text messages are displayed one after the other, with newly received ones appearing first, followed by previously sent ones. This cycle continues as long as there is power supply. Presentation of Results usually starts by summarizing the main findings of the study. It may include data, statistics, or any other relevant information obtained during the implementation of the Digital Notice Board using Raspberry Pi and IoT.

Analysis of Results following the presentation of results, would typically delve into an in-depth analysis of what the findings mean. They might compare the results to existing literature, theories, or expectations. This analysis helps readers understand the significance of the findings and their implications.Key Findings would then discuss the key findings in detail, highlighting their importance and relevance to the research question or objectives. They may address any unexpected results, discrepancies, or limitations encountered during the study.

Interpretation and Contextualization involves interpreting the results within the broader context of the field of study. The authors may discuss how their findings contribute to existing knowledge, theories, or practical applications. They might also speculate on the potential implications for future research or real-world implementations.The acknowledge any limitations or challenges encountered during the study. This could include constraints in the methodology, sample size, data collection, or other factors that may have influenced the results suggesting potential avenues for future research or development. This could include addressing unanswered questions, refining methodologies, or exploring new applications or extensions of the Digital Notice Board system.

6. Conclusion

The system allows users to send messages remotely via SMS or through an Android application, enhancing accessibility and convenience. The use of Raspberry Pi as the central controller enables seamless integration with other devices and networks, facilitating real-time communication and data retrieval from the cloud. Furthermore, the system's user-friendly interface, which includes features like a login page for authentication and an upload page for sending different types of files, ensures ease of use and enhances security. The ability to display text messages, PDF files, and images on the notice board provides versatility in content presentation, catering to diverse communication needs. The automatic resizing of images and the sequential

display of text messages ensure optimal utilization of screen space and efficient information delivery. By leveraging the capabilities of Raspberry Pi as a central controller and integrating IoT technologies, the system enables seamless communication and data retrieval from the cloud. This enhances accessibility and ensures real-time information dissemination to the intended audience.

The user-friendly interface of the Digital Notice Board, featuring options for uploading different types of content such as text messages, PDF files, and images, enhances usability and convenience. Additionally, the implementation of a login page with predetermined credentials enhances security and restricts access to authorized users only. Furthermore, the system's ability to automatically resize images and display text messages in a sequential manner optimizes screen space utilization and ensures efficient communication of information. highlights the significance of adopting new techniques in line with the ongoing digitalization trend. The proposed wireless notice board system utilizes wireless technology for fast and long-range data transmission, eliminating the need for cables and expanding coverage area compared to previous systems. Security is enhanced through username and password authentication.

The transition from traditional notice boards to digital and wireless display systems signifies advancements in technology, enabling faster dissemination of information with better quality. The system's use of GSM technology allows users to send messages from anywhere globally, making it applicable in various settings such as educational institutions, organizations, traffic management, crime prevention, railways, and advertisements. The system's user-friendliness, long-range capabilities, and fast information dissemination make it suitable for improving security systems, raising awareness during emergency situations, and mitigating potential dangers. Overall, the wireless e-notice board presents a significant improvement over traditional notice boards, particularly in college campuses. The transition from traditional notice boards to digital and wireless display systems signifies advancements in technology, enabling faster dissemination of information with better quality.

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7. Future Scope

One potential direction for future development is the integration of artificial intelligence (AI) and machine learning algorithms. These technologies could enable the notice board to analyze user preferences and behavior patterns, allowing for personalized content delivery and targeted messaging. Additionally, there is scope for enhancing the scalability and adaptability of the system. This could involve expanding the capabilities of the notice board to support multimedia content such as videos and interactive presentations, thereby catering to a wider range of communication needs in various settings.Furthermore, advancements in wireless communication protocols and IoT technologies could be leveraged to enhance connectivity and interoperability with other smart devices and systems. This could enable the notice board to interact with IoT sensors for real-time data monitoring and integration with smart building management systems.

Real-time Updates and Notifications: Implementing real-time updates and push notifications would further streamline the dissemination of information. Users could receive instant notifications on their devices whenever new content is posted on the notice board.Security Enhancements with the increasing importance of data security and privacy, future iterations of the system could incorporate advanced security features such as encryption, user authentication, and access control mechanisms to safeguard sensitive information.

Integration with Cloud Services could enhance scalability and reliability. Storing content and managing the system's functionality in the cloud could offer benefits such as remote access, automatic backups, and seamless integration with other web-based services.

Localization and Multilingual Support to cater to diverse user groups, adding support for multiple languages and localization features would be beneficial. This would ensure that the notice board can be used effectively in different regions and communities.Energy Efficiency and Sustainability Optimizing the system for energy efficiency and sustainability could be another area of focus. This could involve implementing power-saving

features, utilizing renewable energy sources, and designing the hardware and software components for minimal environmental impact.Integration with IoT Devices Expanding the integration with IoT devices could enable additional functionalities and automation. For example, sensors could be used to detect environmental conditions or occupancy, triggering specific actions or content updates on the notice board accordingly.Incorporating analytics and reporting capabilities could provide valuable insights into usage patterns, popular content, and user engagement. This data could be used to optimize the content strategy and improve the overall effectiveness of the notice board.

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