

“Real-Time Cloud Based Smart Digital Notice Board”

Mrs. Alka Shrivastava
Assistant Professor
CT Department
Priyadarshini College of Engineering
Nagpur, Maharashtra
India, Asia, 440019
alkacse2009@gmail.com

Mr. Arpan Wanve
Research Scholar
CT Department
Priyadarshini College of Engineering
Nagpur, Maharashtra
India, Asia, 440019
arpanwanve02@gmail.com

Mr. Abhijeet Deshpande
Research Scholar
CT Department
Priyadarshini College of Engineering
Nagpur, Maharashtra
India, Asia, 440019
abhijeetdeshpande124@gmail.com

Mr. Pritam Landage
Research Scholar
CT Department
Priyadarshini College of Engineering
Nagpur, Maharashtra
India, Asia, 440019
pritamlandage075@gmail.com

Ms. Shweta Ratnaparkhi
Research Scholar
CT Department
Priyadarshini College of Engineering
Nagpur, Maharashtra
India, Asia, 440019
ashwetasanjay17@gmail.com

Mr. Arpith Malke
Research Scholar
CT Department
Priyadarshini College of Engineering
Nagpur, Maharashtra
India, Asia, 440019
malkearpith20@gmail.com

ABSTRACT - The Real time cloud based Multifunctional live smart digital notice board aims to modernize the way information is shared in educational institutions and other organizations by transitioning from traditional notice boards to a digital, web-based system. This system allows notices to be displayed on LED screens, controlled remotely via the web, and updated in real-time. Administrator can post, edit, and delete notices through a simple user interface, with added functionalities such as priority setting and scheduling for important notices. The use of Raspberry Pi enables seamless integration between the software and display board, ensuring automated, timely updates.

The system offers several advantages over traditional notice boards, including ease of use, real-time updates, cost-effectiveness, and reduced reliance on paper. It also supports event management, allowing organizations to manage registrations and attendance tracking. Security features, such as user authentication and data encryption, ensure that only authorized personnel can manage notices. This digital platform not only enhances communication within institutions but also improves the efficiency of delivering messages to a broader audience in public spaces like shopping malls, railway stations, and smart cities.

I. INTRODUCTION

The Real-Time Cloud Based Multi-Functional Live Smart Digital Notice Board is designed to address the limitations of traditional notice boards in educational institutions and organizations. Conventional methods of displaying important information rely on printed circulars or static boards, which are often time-consuming to update and may go unnoticed by many. Additionally, the need for physical handling and maintenance of notices leads to inefficiencies and delays in communication.

In contrast, a digital notice board allows for dynamic, real-time updates that are more visually engaging and easier to manage. Information is displayed on an LED screen, and notices can be updated remotely via the internet. This system is highly efficient as multiple notices can be displayed at once using a scrolling feature, ensuring that all relevant information is visible to the intended audience. The platform is user-friendly, allowing administrators to easily add, update, or delete notices with just a few clicks.

Moreover, the system offers a variety of benefits, including time and resource savings, improved communication, and real-time notifications. It is also scalable, meaning it can be used in multiple locations such as schools, shopping malls, bus stations, and other public venues, providing a versatile solution for delivering information. The platform supports both desktop and mobile devices, enabling users to manage and view notices from anywhere with an internet connection, ensuring that communication is both flexible and highly accessible.

II. LITERATURE SURVEY

1. Web-Based Centralized Notice Board Platform

A literature review on web-based centralized notice board systems with event management highlights the evolution of digital platforms designed to improve information dissemination and event coordination. These systems have been developed to replace traditional notice boards, offering real-time updates, notifications, and remote accessibility. Key features include user-friendly interfaces, mobile responsiveness, and cross-platform compatibility, which allow users to access notices and events from multiple devices, such as desktops, tablets, and smartphones.

Early implementations focused on improving communication efficiency by eliminating the delays inherent in physical notice

boards. Over time, advanced features such as event categorization, filtering options, and automated notifications were introduced to help users easily navigate and locate relevant information. The integration of event management tools enabled users to organize, schedule, and manage events, with features like venue booking, registration, and attendee management.

Recent advancements include the incorporation of analytics tools, allowing administrators to monitor user engagement and assess the effectiveness of notices and events. Personalization features have also been added, enabling users to filter content based on preferences, enhancing the relevance of the information. The system's integration with social media platforms and other institutional software further extends its utility, making it a versatile solution for modern organizations.

2. Web application based digital notice board

A literature review on the "Web Application Based Digital Notice Board" system reflects the shift from traditional, paper-based notice boards to more efficient and environmentally friendly digital signage solutions. Digital notice boards, implemented through technologies like Raspberry Pi, web applications, and cloud storage, are becoming increasingly popular in educational institutions and public spaces. These systems eliminate the need for manual paper notices, reducing waste and human effort while offering real-time updates.

The key innovation in such systems is the use of cloud-based storage and web applications for content management. Administrators can easily create, edit, and schedule notices remotely, with updates displayed instantly on digital screens such as LED or LCD monitors. Technologies like HTML, CSS, and JavaScript enable responsive, user-friendly interfaces, while the back-end development, often handled through JavaScript frameworks like jQuery, facilitates seamless communication between the user and the digital board.

In addition to reducing paper usage, these digital notice boards offer greater flexibility in content delivery, supporting text, images, and videos. They also provide more control over notice scheduling and accessibility, ensuring that important information reaches users instantly and efficiently. This approach enhances communication within institutions, making notice management more sustainable and effective.

3. Interactive Digital Notice Board

The "Interactive Digital Notice Board" system leverages the Digital Signage (DS) method to enhance information dissemination, addressing challenges like environmental pollution and paper waste associated with traditional notice boards. Digital notice boards have emerged as a viable alternative in places like hospitals, schools, and airports, offering rapid and systematic content delivery through dynamic interfaces. By utilizing Wi-Fi technology, content can be updated remotely from a centralized server, eliminating the need for localized control systems.

In this study, an interactive digital notice board system is developed, incorporating deep learning for age classification to enhance accessibility for older adults. When users above a certain age are detected, the system adjusts the font size to facilitate easier reading. The system's architecture includes features such as time, date, weather updates, and announcement notifications, managed through a web interface by authorized personnel for content security. The use of wireless technology allows for flexible, real-time content updates.

This system highlights the growing role of Internet of Everything (IoE) technologies, providing a scalable, efficient, and user-friendly

method for content management. Future research can explore further enhancements in DS systems, such as improved user interaction and expanded content customization options.

4. Pushing the Digital Notice Board toward Ubiquitous Based on the Concept of the Internet of Everything

The integration of digital notice boards into Internet of Everything (IoE) environments offers new possibilities for ubiquitous communication, especially in contexts such as smart campuses and transportation hubs. The "Pushing the Digital Notice Board toward Ubiquitous" system proposes an interactive message exchange architecture based on the Message Queuing Telemetry Transport (MQTT) protocol. This system enables users to post messages to various digital notice boards and social media platforms through a publish/subscribe model, providing a flexible and dynamic content management experience. Unlike traditional notice boards that are constrained by location, this IoT-ready system allows users to send messages from any authorized device, offering greater versatility. Several studies have explored the use of single board computers (SBCs) like Raspberry Pi and Arduino, as well as GSM, ZigBee, and Wi-Fi for building digital notice board systems. These systems focus on addressing issues such as user interface design, connectivity, management, and security. The proposed system introduces an advanced interaction model, allowing users, boards, and data to communicate seamlessly, promoting real-time engagement with notices.

5. Iot Based Smart Notice Board

The IoT-based Smart Notice Board system replaces traditional paper-based notice boards with a digital, automated solution that uses wireless technology for fast and remote data transfer. The primary objective of this system is to create a reliable and efficient electronic notice board connected to a cloud server. By integrating the ESP8266 Wi-Fi module with an AT89S52 microcontroller and Arduino Uno, the system allows users to update notices remotely via a dedicated website. Messages are transmitted to an LED display in real-time, reducing the manual effort involved in updating physical boards.

This system leverages Wi-Fi for seamless connectivity, allowing authorized users to write and rewrite messages from anywhere in the world, thus improving efficiency and accessibility. The UART protocol facilitates data transmission from the Wi-Fi module to the microcontroller, which updates the LED board accordingly. The system also includes a buzzer for notifications when new messages are received, ensuring timely information delivery.

The implementation of this IoT-based notice board reduces the need for paper, contributing to eco-friendliness, while also minimizing the costs associated with printing and labor. Future enhancements could include moving displays with variable speed and expanded applications in public spaces such as malls and highways.

Study	Focus	Key Features	Technologies Used	Findings /Contributions
1. Web-Based Centralized Notice Board Platform (Samanta et al., 2023)	Digital platforms for notice dissemination and event management	Real-time updates, notifications, remote accessibility, user-friendly interfaces	Web applications, cloud technology	Improved communication efficiency, user engagement through event management tools
2. Web Application Based Digital Notice Board (Patil et al., 2020)	Transition to digital signage in educational and public spaces	Cloud storage, real-time updates, remote content management	Raspberry Pi, HTML, CSS, JavaScript	Enhanced communication and reduced paper waste; flexible content delivery
3. Interactive Digital Notice Board (Yasa et al., 2020)	Enhancing information dissemination using deep learning	Dynamic interfaces, age classification for accessibility	Digital signage technology, Wi-Fi	Rapid content delivery, accessibility improvements for older adults
4. Pushing the Digital Notice Board toward Ubiquitous (Chen et al., 2019)	Integration into IoT environments for ubiquitous communication	Interactive message exchange, publish/subscribe model	MQTT protocol, single board computers (Raspberry Pi, Arduino)	Enhanced real-time engagement and flexible content management in IoT applications
5. IoT Based Smart Notice Board (Srivana Kumar et al., 2022)	Automated, digital solution for notice display	Remote updates, LED display, buzzer notifications	ESP8266 Wi-Fi module, AT89S52 microcontroller	Eco-friendly and efficient notice management; improved accessibility and reduced costs
6. Web Controlled Smart Notice Board Using NodeMCU (Abishek et al., n.d.)	Web-based control of notice boards	Scrolling messages, wireless control via smartphones/tablets	NodeMCU, LED matrix display	Reduction of manual labor and paper waste; enhanced sustainability in communication

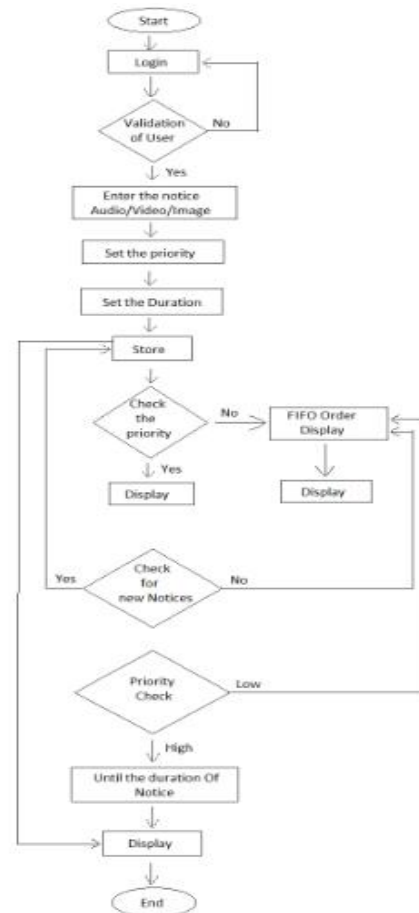
III. OBJECTIVE

The **Web Controlled Centralized Notice Board** system aims to enhance the efficiency of communication within organizations by providing a modern and dynamic platform for managing notices. The key objectives of the system include:

1. **Developing a wireless technology** that allows for the remote management of notices, eliminating the need for manual updates and enabling real-time communication.
2. **Designing a user-friendly interface** to ensure that adding, updating, and deleting notices is simple and accessible for all users.
3. **Tracking notices by date and time** to allow for effective scheduling and the prioritization of important messages that need immediate attention.
4. **Ensuring security** by allowing only authenticated users to manage and post notices, protecting the system from unauthorized access.
5. **Creating a dynamic notice structure** that can accommodate various forms of content, including text, images, and videos, for versatile and engaging information displays.

IV. PROJECT METHODOLOGY

Digital notice board is system user has to login first. If the user is valid then software shows the page in which user can add the notices. Notice can be a text, audio, video. While inserting the notices user has to set priority of the notice as well as the duration for which notice will be display on to the notice board. For the purpose of scheduling we are going to use FIFO and Priority Scheduling algorithm. As per the scheduling the notices are displayed on the board. Raspberry pie Model B is using for connecting the software system and the LCD Board. Following is the flowchart which shows the flow of working of system.



Experimental Method/Procedure/Design

The procedure for creating and testing a web-based online notice board with event management involves defining goals and objectives, determining user requirements, designing and developing the website, testing and validation, and ongoing deployment and maintenance. The proposed system for a web-based online notice board with event management would provide a comprehensive platform for managing events and disseminating information to a specific audience. The system would be user-friendly, secure, and feature-rich, providing a valuable tool for organizations and institutions to communicate with their stakeholders.

Analysis of Proposed system Figure Captions

- User authentication and access control: Users must register and log in to access the system's features, with access control measures implemented to ensure that users can only view and modify content that they are authorized to access.
- Notice board: The system includes a notice board where users can view and search for notices and announcements. Notices can be categorized by topic or department to make it easier for users to find relevant information.
- Notice creation and management: Users can create and post new notices, with details such as title, description, and category. They can also edit or delete their own notices as needed.

- Event creation and management: Users can create and manage events, with details such as date, time, location, and description. Users can register for events and receive notifications and reminders.

Analysis of High-level Representation

User authentication and authorization:

- Define user roles and permissions
- Implement user registration and login functionality

Notice board:

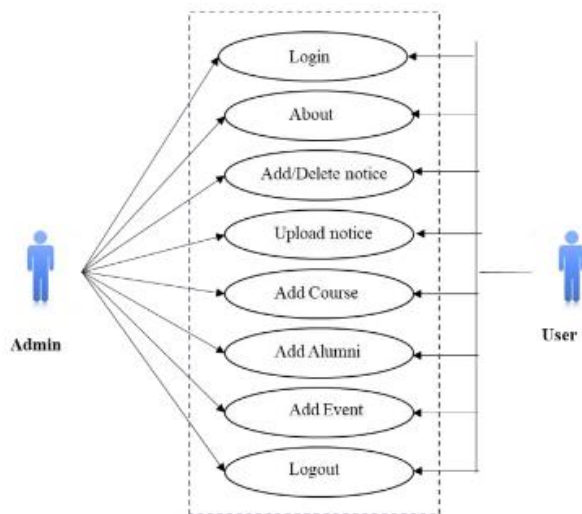
- Create functionality for posting notices and announcements.
- Implement categorization and tagging for notices.
- Develop search, filter, and sorting functionality for notices.

Event management:

- Implement functionality for creating events with details such as date, time, location, and description
 - Develop categorization and tagging for events
 - Implement user registration and notification functionality for events
- Security: - Implement encryption and user data protection measures - Conduct regular security audits and updates to maintain website integrity

V. USE CASE DIAGRAM

A visual picture of the interactions between actors and the system is provided by the use case diagram for a web-based online notice board with an event management system.



VI. CONCLUSION

A digital notice board provides a streamlined, modernized approach to communication within various settings, such as schools, workplaces, and public spaces. Unlike traditional paper based notice boards, digital boards allow information to be updated instantly and

shared with a wide audience in real-time, making them especially valuable for time-sensitive announcements. Through an internet connected system, administrators can remotely control content, ensuring that updates reach viewers immediately, which is critical for emergency notices or last-minute changes. Acknowledgment The heading of the Acknowledgment section and the References section must not be numbered. The Research Publication wishes to acknowledge Causal Productions and other contributors for developing and maintaining the LaTeX style files which have been used in the preparation of this template.

VII. REFERENCES

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