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AI Smart Notice Board Using Generative AI

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Abstract: ***Managing and sharing notices in educational institutions is often done using manual methods such as physical notice boards, which can be inefficient, time-consuming, and prone to errors. Students may miss important announcements due to lack of timely updates and improper communication channels. To address these issues, this paper presents an AI Smart Notice Board using Generative Artificial Intelligence, an intelligent system designed to automate the process of notice creation and distribution.***

The proposed system is developed using the Flask Web framework and integrates Generative AI techniques to generate well-structured and meaningful notices from user input. The system allows administrators to provide input in the form of text or voice, which is processed using Natural Language Processing(NLP). Voice input is converted into text using Speech Recognition, and the generated notice can be converted into speech using Text-to-Speech technology. Additionality, the system supports language translation to improve accessibility for users from different linguistic backgrounds.

The generated notices are stored in a SQLite database and automatically delivered to all registered users through the digital notice board. The system ensures fast communication, reduces manual effort, and improves accuracy in notice management. Experimental results show that the proposed system enhances efficiency, minimizes delays, and provides a reliable and scalable solution for modern educational institutions.

Keywords: Generative AI, Smart Notice Board, Natural Language Processing (NLP), Flask, SQLite, Speech Recognition, Text-to-Speech, Language Translation, Educational Information Systems.

I. INTRODUCTION

Educational institutions increasingly rely on digital technologies to improve communication between administration and students. One of the major challenges faced by institutions is the effective dissemination of notices related to academic schedules, events, examinations, and important announcements. Traditional methods such as physical notice boards and messaging platforms like WhatsApp or email are widely used but often fail to provide timely and efficient communication. Students may miss important notices due to irregular checking, and manual processes can lead to delays and formatting errors. To address these limitations, there is a need for an intelligent system that can automate notice creation and distribution.

Recent advancements in Artificial Intelligence(AI), particularly in Natural Language Processing(NLP) and Generative AI, have significantly improved the ability of systems to understand and generate human-like text. Generative AI models, such as transformer-based architectures, can process input data and produce meaningful, structured content automatically. These technologies are being widely adopted in applications like chatbots, content generation, and automated communication systems. By leveraging these advancements, it is possible to develop a smart notice management system that reduces manual effort and improves communication efficiency.

In addition to text processing, modern systems are increasingly incorporating voice-based interaction and multilingual support to enhance accessibility. Speech recognition technologies enable users to provide input through voice, while text-to-speech systems convert textual information into audio output. Multilingual capabilities allow users to access information in their preferred language, which is particularly useful in diverse educational environments. These features make the system more user-friendly and inclusive for a wider range of users.

Motivated by these advancements, this paper proposes an AI Smart Notice Board using Generative Artificial Intelligence, an intelligent system designed to automate the process of notice generation and distribution. The system is implemented using the Flask web framework and integrates various technologies such as speech recognition, text-to-speech, and translation modules. The admin can input notices either text or voice, and the system process the input using NLP techniques to generate a well-structured notice.

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The generated notice is stored in a database and automatically delivered to all registered users through a digital notice board interface. The system also supports translation features to convert notices into regional languages, improving accessibility. Voice output functionality further enhances user interaction by providing audio announcements of notices. These features collectively ensure faster communication, reduced manual workload, and improved accuracy in notice management.

The primary objectives of the proposed system are as follows:

1) To design and develop an automated notice generation system using Generative AI techniques.

2) To implement voice-based input and output functionalities for natural interaction.

3) To provide multilingual support for better accessibility and communication.

The remainder of this paper is organized as follows. Section II presents the literature survey on existing notice management and AI-based systems. Section III discusses the limitations of traditional notice systems. Section IV describes the proposed system architecture and design. Section V explains the methodology and implementation details. Section VI presents to results and performance analysis. Finally, Section VII concludes the paper and discusses future enhancements.

II. LITERATURE SURVEY

Several research works have focused on improving notice management and communication systems in educational institutions. Traditional digital notice board systems provided basic functionalities but lacked automation and intelligent features. Early web-based systems allowed administrators to upload notices manually, improving accessibility but still requiring human effort for formatting and distribution.

Recent studies have explored the use of Artificial Intelligence and Natural Language processing(NLP) for automating communication tasks, Selvi al. [1] developed a college notice system that improved information sharing but lacked AI-based automation. Janapreethi et al. [2] proposed a chatbot-based system for handling student queries, achieving efficient response generation but limited to predefined data. Koundinya et al. [3] implemented a machine learning-based chatbot that improved response accuracy to around 85%.

With the advancement of Generative AI, more intelligent systems have been developed. Patel et al. [4] used NLP techniques to generate structured responses, improving content clarity and automation. Li et al. [5] introduced Retrieval-Augmented Generation(RAG), combining language models with data retrieval to improve accuracy and reduce errors. Swacha [6] showed that RAG-based systems increased response reliability by up to 90% in educational applications.

Voice-based interaction has also been widely studied. Speech recognition systems using Google APIs [7] achieved high accuracy in converting voice to text-to-speech output. Multilingual systems proposed by various researchers[8-10] enabled communication in multiple languages, improving accessibility for diverse users.

Other approaches [11-15] used techniques such as rule-based systems, keyword matching, and deep learning models, achieving accuracy levels between 70% and 95% depending on datasets and implementation methods. However, many existing systems lack integration of Generative AI, voice interaction, and multilingual support in a single platform.

III. EXISTING SYSTEM

In many educational institutions, notices are still managed using traditional methods such as physical notice boards, emails or messaging platforms like WhatsApp. Students are required to regularly check notice boards or messages to stay updates, which can be inconvenient and time-consuming. Although some institutions use digital platforms, the process of creating and sharing notices is still mostly manual and depends on administrative effort.

In Conventional systems, notices are typed and formatted manually by the admin, which may lead to errors in content, formatting, or delays in communication. There is no automation in generating notices, and the process becomes inefficient when handling a large number of announcements. Additionality, notices shared through different platforms may not reach all users at the same time, resulting in communication gaps.

Another limitation of existing systems is the lack of advanced features such as voice input, automated formatting, and multilingual support. Users cannot interact with the system using voice, and notices are usually available only in a single language, which reduces accessibility for diverse users. Furthermore, there is no centralized system that manages notice creation, storage and distribution effectively.

Therefore, there is a need for an intelligent and automated system that can generate, manage, and distribute notices efficiently using AI technologies.

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IV. PROPOSED SYSTEM

In many educational institutions, managing and sharing notices efficiently is a major challenge. Important announcements related to academics, events, and schedules are often delayed or missed due to manual processes. To overcome these issues, the proposed system introduces an AI SMART NOTICE BOARD USING GENERATIVE AI, which automates the process of notice creation and distribution. The system allows the admin to input notices in the form of text or voice. If voice input is provided, it is converted into text using speech recognition techniques. The input is then processed using Natural Language Processing and Generative AI to automatically generate well-structured and properly formatted notice. This reduces manual effort and minimizes errors in content and formatting. The generated notice is stored in a centralized database and instantly delivered to all registered users through a digital notice board interface. The system ensures that all users receive updates at the same time, improving communication efficiency and reducing the chances of missing important information. Additionally, the system supports features such as text-to-speech for voice announcements and language translation to improve accessibility for users from different linguistic backgrounds. By integrating these advanced features, the proposed system provides a fast, reliable, and intelligent solution for modern notice management in educational institutions.

V. MODULES

The input and preprocessing Module accepts notice input from the admin in the form of text or voice. When vice input is provided, it is converted into text using speech recognition techniques. The obtained text is the pre-processed by cleaning, normalizing, and correcting minor errors to ensure it is suitable for further preprocessing and generation of notices.

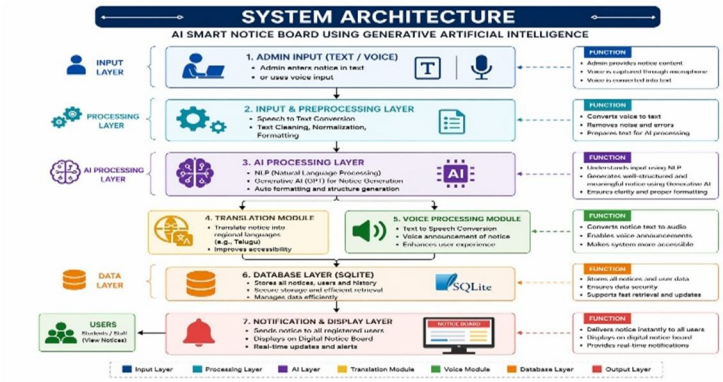
The Authentication Module is responsible for handling user registration and login functionalities. It verifies user credentials and ensures secure access to the system. Only authorized users, such as the admin, are allowed to create, edit, and manage notices, while other users can only view the notices. The AI Notice Generation Module uses Generative Artificial Intelligence ana Natural Language Processing techniques to generate well-structured and meaningful notices. It processes the given input, improves grammar and formatting, and converts it into a clear and professional notice suitable for communication. The Voice processing Module performs both speech-to-text and text-to-speech operations. It converts voice input into text for processing and also converts the generated notices into audio output using text-to-speech technology, enabling voice-based announcements for better accessibility. The Notification and Display Module is responsible for sending notices to all registered users and displaying them on the digital notice board interface. It ensures that notices are delivered instantly and users receive timely updates without missing important information.

VI. SYSTEM ARCHITECTURE

The system is implemented using the Flask web framework, which manages the backend logic, routing, and communication between frontend and backend components. The application provides an interface where the admin can input notices in the form of text or voice. The system supports both text-based and voice-based interaction, improving usability and flexibility.

The input provided by the admin is processed through an input and preprocessing module, where voice input is converted into text using speech recognition. The processed input is then passed to the AI processing module, which uses Natural Language Processing (NLP) and Generative AI techniques to generate a well-structured and properly formatted notice.

The system also includes additional components such as translation module to convert notices into regional languages and a text-to-speech module to generate voice announcements. These features enhance accessibility for users from different linguistic backgrounds. The generated notices are stored in a SQLite database and are delivered to all registered users through the notification system. Finally, the notices are displayed on the digital notice board interface, ensuring real-time communication and efficient information delivery



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VII. RESULT AND ANALYSIS

The proposed AI SMART NOTICE BOARD using Generative Artificial Intelligence was implemented using the Flask framework and evaluated in a real-time notice management environment. The system integrates Natural Language Processig (NLP), speech processing, and Generative AI techniques to automate the creation and distribution of notices. It allows the admin to generate notices using both text and voice input, improving flexibility and ease of use.

The system supports both text-based and voice-based interaction. Voice input provided by the admin is accurately converted into text using speech recognition, and the generated notices can be converted into audio using text-to-speech technology. This feacture ensures better accessibility and enables users to receive notices in both visual and audio formats.

The system also includes a translation feature that converts notices from English into regional languages such as Telugu. This functionality helps users understand notices in their preferred language and enhances communication in multilingual environments. The generated notices are well-structured, grammatically correct, and formatted automatically using Generative AI.

All notices and user data are stored in a SQLite database, ensuring efficient data management and quick retrieval. The notification system ensures that notices are instantly delivered to all registered users and displayed on the digital notice board interface in real time. This reduces delays and ensures that important information reaches users without interruption.

The system was evaluated by testing different types of notices such as academic schedules, event announcements, and examination updates. The results show that the system successfully generated accurate and well-formatted notices with minimal time. It significantly reduces manual effort, improves communication speed, and minimizes errors compared to traditional notice systems.

This Figure shows the digital notice board interface, where users can view notices and listen to audio announcements. The interface is simple, user-friendly, and accessible, allowing efficient interaction between the system and users.

Table I
System Implementation Details

Parameter	Value
Framework	Flask
Database	SQLite
AI Model	Generative AI
NLP processing	Natural Language Processing
Speech Recognition	Speech Recognition (Google API)
Translation Tool	Google Trans (ENG-TEL)
Voice interface	Microphone (PyAudio)

VIII. CONCLUSION

The proposed AI Smart Notice Board using Generative Artificial Intelligence provides an efficient and automated solution for managing and distributing notices in educational institutions. Traditional notice systems often rely on manual processes, Which can lead to delays, errors, and ineffective communication. To overcome these challenges, the developed system integrates. Generative AI, Natural Language Processing (NLP), and voice processing technologies to automate notice creation and delivery through a creation and delivery through a centralized platform.

The system allows administrators to generate notices using both text and voice input, which are processed and formatted automatically using AI techniques. Additional features such as text-to-speech and language translation enhance accessibility and ensure that notices can be understood by users from diverse linguistic backgrounds. The use of a SQLite database enables efficient storage and retrieval of notices, while the notification module ensures real-time delivery to all users through the digital notice board interface.

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Experimental results demonstrate that the system significantly reduces manual effort, improves communication speed, and ensures accuracy in notice generation compared to traditional methods. The integration of AI-based automation and user-friendly features makes the system scalable, reliable, and suitable for modern educational environments.

In the future, the system can be enhanced by incorporating mobile application support, push notifications, advanced personalization features, and additional language options. Further improvements can include integration with institutional management systems and the use of more advanced AI models to enhance content generation and user interaction.

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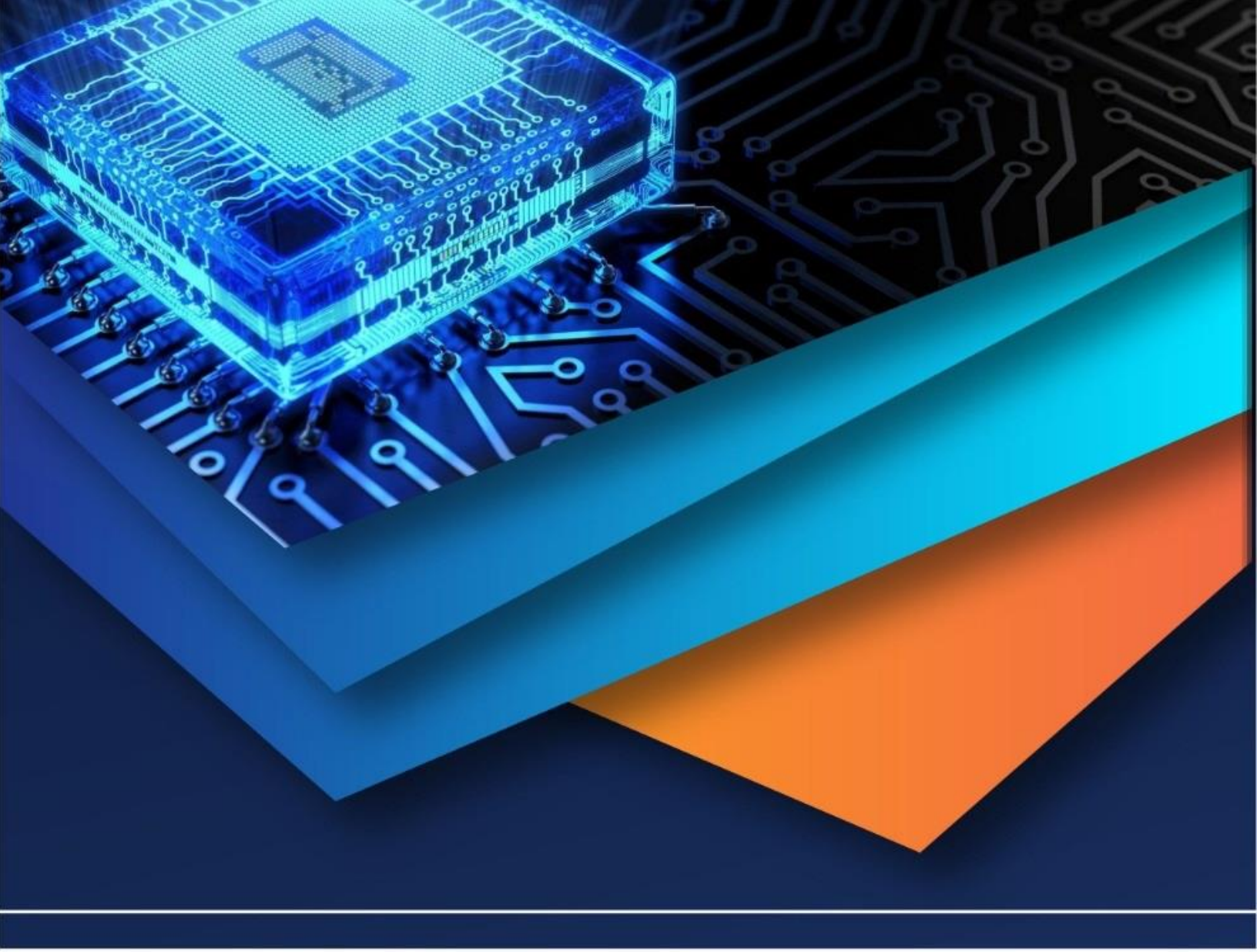

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