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Development of a Voice-Based College Circular System for Realtime Communication and Enhanced Campus Connectivity

[1]G Madhuri, [2]J Manideep, [3]B Teja Reddy, [4]Mr.Sreerama Sreekanth
[1,2,3] UG Scholars, [4]Assistant Professor
[1,2,3,4] Department of Computer Science and Engineering,
[1,2,3,4] Guru Nanak Institutions Technical Campus, Hyderabad, Telangana, India.

ABSTRACT:

In educational institutions, effective communication plays a crucial role in ensuring smooth academic and administrative operations. Traditional methods, such as paper-based circulars and notice boards, often result in delays and miscommunication. This project introduces a voice-based college circular system aimed at real-time communication and enhanced campus connectivity. By leveraging speech recognition, fingerprint authentication, and smart display technology, the system provides a seamless way for faculty to broadcast messages efficiently. Users can log in using fingerprint authentication, speak their message, and have it converted into text for verification. The approved message is then broadcast to connected smart devices such as smart TVs. This ensures instant, paperless communication, reducing dependency on conventional methods while increasing accessibility and security. The system's real-time capabilities and user-friendly interface make it an essential tool for modern educational institutions striving for digital transformation.

INTRODUCTION:

Communication is a fundamental aspect of any educational institution, facilitating the smooth flow of information between administration, faculty, and students. Traditional communication channels, such as printed notices, word-of- mouth, and email notifications, often pose challenges related to timeliness, accessibility, and security. Given the increasing reliance on digital technology, there is a pressing need for an advanced communication system that enhances real-time connectivity while maintaining security and efficiency.

Voice-based college circular system integrates modern technologies, including speech recognition, fingerprint authentication, and smart broadcasting. Faculty members can issue circulars through a voice command, which is transcribed and displayed for verification before being broadcasted. This eliminates errors, improves accessibility, and ensures authenticated communication. The system not only enhances efficiency but also aligns with sustainability efforts by reducing paper usage. By deploying this solution, colleges can significantly improve information dissemination and foster a more connected academic environment.

In traditional systems, circulars are printed and pinned on notice boards, often leading to delays and inefficiencies. Many students miss crucial updates due to their reliance on physical presence at notice boards. While email and SMS notifications provide digital alternatives, they still present challenges such as inbox clutter, spam filtering, and lack of immediate attention. The need for a real-time, accessible, and reliable communication system has never been greater.

The implementation of speech recognition technology in the proposed system makes it easier for faculty to issue circulars without manually typing

them. Faculty members can simply speak their message, which is then converted into text and displayed for verification before being broadcasted to smart TVs or digital boards across the campus. This process minimizes errors and ensures that messages are delivered exactly as intended.

Furthermore, security is a key concern in college communication. Unauthorized access to official announcements can lead to misinformation and administrative challenges. To address this, the system integrates fingerprint authentication, ensuring that only authorized personnel can issue circulars. This feature enhances trust and reliability in the system, preventing unauthorized modifications or misinformation.

Another significant advantage of this system is its ability to function in real- time. In emergency situations or urgent announcements, relying on traditional methods can lead to delays. With this system, messages can be broadcast immediately, ensuring that all students and faculty members receive important updates without unnecessary delays.

Moreover, this voice-based system supports accessibility for individuals with disabilities. Typing-based systems may pose difficulties for individuals with mobility impairments, whereas a speech-driven interface makes it easier for everyone to contribute and access information. The system is designed to accommodate diverse users, ensuring inclusivity and efficiency.
Sustainability is another important factor driving the adoption of this technology. Educational institutions often consume large amounts of paper for printed circulars and notices. By shifting to a digital and voice-based circular system, colleges can reduce their environmental footprint, contributing to eco- friendly campus initiatives.

It aligns with modern smart campus initiatives that aim to integrate digital solutions into educational environments. Many institutions worldwide are investing in technology-driven campus management systems to improve operational efficiency. By implementing a voice-based circular system, colleges can take a step forward in embracing technological advancements and streamlining administrative processes.

The voice-based college circular system presents a transformative approach to campus communication. By integrating speech recognition, fingerprint authentication, and smart broadcasting, it enhances security, efficiency, and accessibility. The system addresses the challenges of traditional communication methods, providing a modern and effective solution that meets the evolving needs of educational institutions.

1.1 OBJECTIVE:

The primary objective of this project is to develop an innovative voice-based college circular system that enhances real-time communication and strengthens campus-wide connectivity within educational institutions. The system aims to replace traditional paper-based and notice board methods, which are often inefficient and prone to delays or miscommunication. By integrating advanced technologies such as speech recognition, fingerprint authentication, and smart display devices, the project seeks to provide a secure, accessible, and user-friendly platform for faculty to broadcast important messages. Users can authenticate themselves using biometric verification, dictate their messages via voice input, and review the auto-converted text before approval and dissemination. The finalized message is then instantly displayed on connected smart devices like smart TVs across the campus

1.2 SCOPE:

The scope of this project encompasses the design, development, and implementation of a voice-based circular system tailored for educational institutions to enhance real-time communication and campus-wide connectivity. The system is intended primarily for faculty and administrative staff to create and disseminate circulars using voice input, with integrated fingerprint authentication ensuring secure access. The project includes the use of speech-to-text

conversion for message verification and the deployment of smart display technology, such as smart TVs, for broadcasting approved messages across various campus locations. The solution aims to eliminate delays associated with traditional communication methods like paper notices and bulletin boards, while also increasing the accessibility of information for all stakeholders. Additionally, the system will support multilingual voice inputs and be designed for easy scalability and integration with existing campus infrastructure. By focusing on usability, security, and efficiency, the project contributes to the digital transformation of institutional communication processes.

1.3 PROBLEM STATEMENT:

Colleges and universities rely heavily on various forms of communication, including physical notices, emails, and SMS alerts. However, these methods often fall short due to delays, lack of engagement, and accessibility issues. Notice boards require students to be physically present to receive updates, while emails and SMS notifications may go unread due to message overload or filtering issues. Additionally, unauthorized access to important circulars can lead to misinformation or security concerns.

This project addresses these challenges by developing a secure and real-time voice-based circular system. By implementing fingerprint authentication, only authorized personnel can issue circulars, ensuring security and authenticity.

Speech-to-text technology eliminates the need for manual typing, making the process faster and more

efficient. Moreover, broadcasting messages to connected smart devices, such as smart TVs across the campus, ensures instant communication to a larger audience. This system revolutionizes information dissemination in educational institutions, promoting efficiency and reducing the dependency on paper-based communication.

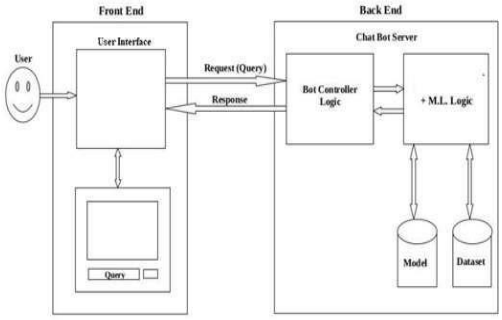
1.4 EXISTING SYSTEM:

The existing technique of using printed circulars involves distributing hard copies of official announcements to various departments or directly to students within an educational institution. This method is commonly used for communicating important information such as schedules, meeting notices, examination details, and administrative updates. While it is a traditional and straightforward approach, it often results in delays due to the time required for printing, manual distribution, and physical delivery. Additionally, there is a risk of circulars being misplaced or not reaching the intended recipients, leading to miscommunication. The process is also resource-intensive, relying on paper, printing supplies, and human effort, which makes it less efficient and environmentally sustainable in the long run. Despite being widely practiced, the printed circular method lacks the immediacy, security, and accessibility offered by modern digital communication systems.

1.4.1 Existing System Disadvantages:

Printed circulars, while commonly used in educational institutions, come with several disadvantages. One of the major drawbacks is the delay in communication, as the process of preparing, printing, and physically distributing circulars takes time, which can hinder the timely delivery of important information. Additionally, manual distribution increases the risk of circulars being lost**,** misplaced, or not reaching the intended recipients, leading to gaps in communication. This method is also resource-intensive, requiring paper, ink, and printing equipment, which contributes to environmental waste and increased operational costs. Furthermore, printed circulars lack interactivity and accessibility—they cannot be easily updated, translated, or adapted for students with disabilities. In today's fast-paced, digital environment, the reliance on printed circulars is increasingly seen as inefficient, outdated, and unsustainable for effective campus-wide communication.

1.5 SYSTEM ARCHITECTURE:



1.5.1 EXPLANATION:

The proposed system introduces a secure, voice-driven platform for disseminating college circulars, aiming to enhance the speed, accessibility, and efficiency of campus communication. The application is structured into three main functional modules. The Authentication Module ensures that only authorized users can access the system by employing fingerprint authentication, thereby preventing unauthorized personnel from issuing or manipulating circulars and maintaining the integrity of the information shared. The Speech-to-Text Conversion Module leverages AI-driven speech recognition technology to capture spoken messages and convert them into text, allowing users to review and edit the content before approval. This feature enhances usability and accuracy while accommodating natural voice input. Finally, the Smart Broadcast Module is responsible for broadcasting the verified message to connected smart devices, such as smart TVs across the campus. This ensures instantaneous, paperless communication, significantly reducing delays and reliance on traditional methods, and enabling a more efficient and secure flow of information within educational institutions.

1.6 PROPOSED SYSTEM

The proposed system introduces a secure, voice-driven method for sharing college circulars. The application is designed with three main modules:

Authentication Module:

Users log in using fingerprint authentication, ensuring security and restricted access.

Unauthorized personnel are prevented from

issuing circulars.

Speech-to-Text Conversion Module:

Captures the spoken message and converts it into text using AI- driven speech recognition.

The converted text is displayed for verification

can be edited if necessary.

Smart Broadcast Module:

Once verified, the message is broadcast to connected smart devices such as smart TVs.

Ensures real-time communication across the campus, reducing delays and improving efficiency.

1.6.1 PROPOSED SYSTEM ADVANTAGES:

The proposed system offers several key advantages that significantly enhance the communication process within educational institutions. By incorporating fingerprint authentication, the system ensures a high level of security, allowing only authorized users to

access and distribute circulars, thereby preventing unauthorized actions and maintaining information integrity. The AI-powered speech-to-text module provides a convenient and efficient way to create messages through voice input, making the system user-friendly and accessible, particularly for users who may not be comfortable with typing. The ability to verify and edit the converted text ensures accuracy and clarity before dissemination. Furthermore, the smart broadcast module facilitates instant, campus-wide communication by sending approved messages directly to connected smart devices like smart TVs. This eliminates the delays associated with traditional methods such as printed circulars or manual announcements, resulting in a faster, paperless, and environmentally friendly communication system. Overall, the system promotes efficiency, accessibility, and security, aligning with the goals of digital transformation in education.

2 DESCRIPTION:

2.1 GENERAL:

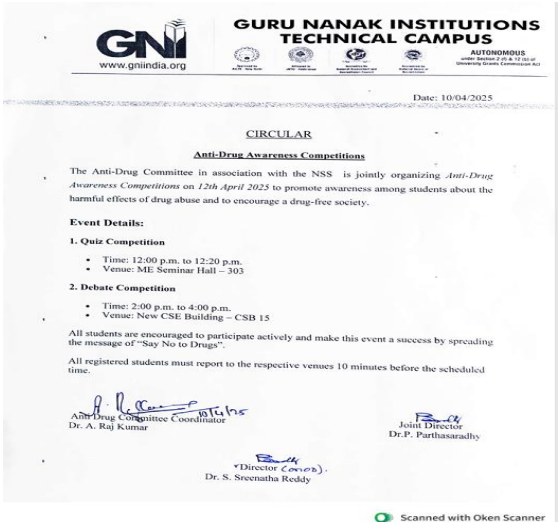
The proposed system is a secure, voice-driven solution designed to modernize the way college circulars are created and distributed. It is built around three core modules that work together to ensure efficient and real-time communication across the campus. The Authentication Module utilizes fingerprint authentication to restrict access and ensure that only authorized personnel can issue circulars, thereby enhancing security and preventing unauthorized usage. The Speech-to-Text Conversion Module enables users to speak their messages, which are then accurately converted into text using advanced AI-powered speech recognition technology. This text is displayed for review and can be edited to ensure clarity and correctness before final submission. Once approved, the message is handled by the Smart Broadcast Module, which disseminates the circular instantly to connected smart devices, such as smart TVs, placed throughout the campus. This real-time broadcasting capability significantly reduces communication delays, eliminates the need for paper-based notices, and improves the overall efficiency and accessibility of institutional announcements.

2.3 TECHNIQUE USED OR ALGORITHM USED

2.3.1 EXISTING TECHNIQUE:

Printed Circulars:

Printed circulars are a traditional method of communication commonly used in educational institutions to share official announcements, schedules, event notifications, and administrative information. These circulars are prepared in hard copy format and physically distributed to various departments, staff members, or directly to students. While this method is simple and familiar, it often involves considerable time and effort for printing and manual distribution. As a result, there can be significant delays in delivering important messages. Additionally, printed circulars are prone to being misplaced, overlooked, or not reaching all intended recipients, leading to miscommunication. This approach also relies heavily on paper and printing resources, making it less sustainable in the context of growing environmental concerns. Despite its long-standing use, printed circulars are gradually being replaced by more efficient and eco-friendly digital alternatives in modern educational settings.



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Date: 10/04/2025

CIRCULAR

Anti-Drug Awareness Competitions

The Anti-Drug Committee in association with the NSS is jointly organizing *Anti-Drug Awareness Competitions* on *12th April 2025* to promote awareness among students about the harmful effects of drug abuse and to encourage a drug-free society.

Event Details:

1. Quiz Competition

- Time: 12:00 p.m. to 12:20 p.m.
- Venue: ME Seminar Hall – 303

2. Debate Competition

- Time: 2:00 p.m. to 4:00 p.m.
- Venue: New CSE Building – CSB 15

All students are encouraged to participate actively and make this event a success by spreading the message of "Say No to Drugs".

All registered students must report to the respective venues 10 minutes before the scheduled time.

Anti-Drug Committee Coordinator
Dr. A. Raj Kumar

Joint Director
Dr.P. Parthasaradhy

Director (Cores).
Dr. S. Sreenatha Reddy

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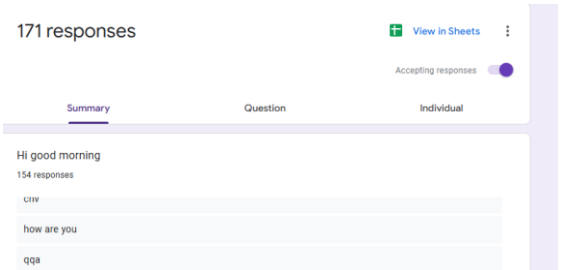
2.3.2 PROPOSED TECHNIQUE USED OR ALGORITHM USED:

Smart Voice Circular System:

The proposed system is a Voice-Enabled Smart Circular Distribution System designed to streamline communication within educational institutions by replacing traditional, paper-based methods with a secure, real-time digital solution. The system allows authorized faculty or administrative staff to issue circulars using voice commands, which are then converted to text through advanced speech recognition technology. To ensure secure access, the system includes fingerprint authentication, restricting circular creation and distribution to authorized personnel only. After voice input is converted to text, the user can review and edit the message before approval. Once verified, the circular is instantly broadcast to connected smart devices, such as smart TVs, across the campus. This ensures that important announcements reach the entire institution quickly, efficiently, and without the need for physical distribution. By integrating biometric security, AI-driven speech-to-text processing, and smart broadcasting, the system not only enhances communication but also supports the institution's shift toward digital transformation, sustainability, and inclusive access.

3 RESULT:



4 FUTURE ENHANCEMENT:

Future enhancements for the proposed voice-based circular system could significantly expand its functionality and accessibility. One key improvement would be the integration of multilingual speech recognition, allowing users to interact with the system in various regional languages, thereby catering to a more diverse user base and promoting inclusivity. Additionally, incorporating AI-based message prioritization can help automatically categorize and highlight urgent or time-sensitive circulars, ensuring that critical information reaches the intended recipients promptly. Another valuable enhancement would be the expansion of the system to include push notifications and mobile alerts, enabling students and staff to receive updates directly on their smartphones or tablets, even when they are off-campus. These advancements would further modernize the communication infrastructure, making it more responsive, accessible, and effective. Overall, the project lays a strong foundation for a technology-driven communication system that can evolve to meet the growing needs of academic institutions while enhancing operational efficiency and campus-wide connectivity.

5 CONCLUSION:

The voice-based college circular system presents a modern and efficient approach to addressing communication challenges within educational institutions. By leveraging technologies such as speech recognition, biometric authentication, and smart broadcasting, the system ensures that important information is shared securely, accurately, and in real time. It not only enhances the speed and reliability of campus-wide announcements but also minimizes the dependency on traditional paper-based methods, contributing to environmental sustainability and operational efficiency. Additionally, its user-friendly design promotes greater accessibility for all members of the institution, including those with limited technical skills. Overall, this system represents a significant step toward the digital transformation of academic communication, fostering a more connected and responsive educational environment.

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