Digital Public Announcements using ChatBot systems

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ABSTRACT

Digital public announcements (DPAs) have become increasingly necessary for the case of mass awareness; nevertheless, at times, they are not promotional and take the historical conditions as sensitive points. Today's communication requires the procurement of real-time and personalized messaging. This project shifts the paradigm by proposing AI-powered chatbots with natural language processing for dynamic, real-time announcements. Enhancement in the reach to various user groups is what causes the simultaneous translation features for accessibility to users with impairments amidst dynamic real-time announcements adherence to enhancing such requirements into the system. By closing the gaps in traditional systems, the chatbot-driven approach is aimed at making standards anew in public announcements across various sectors such as education, transport, and emergency services.

INTRODUCTION

Public Address System (PA), as widely seen in schools, airports, bus depots, or other places of public gathering, still depends on making announcement through laborious methods or sometimes with static media pictures which can slow things down and upset visitation schedules of places with less space. Digitalization is about conceptualizing the data or using artificial intelligence machines in decision reputed areas. Some of the ways that AI technology creates are shaping the worldwide content marketing landscape. Client information, physical office space, utilities, salaries, wages, commodities, profits, loss, experience, and even research techniques will be included in its system. All of these make the existence of an intelligent service culture possible.

Create chatbot-enabled public notice systems rather than traditional, for some minor problems. Design real instant information context messaging about the announcement. Multilingual support services for audience. Enhanced knowledge sharing through dialogues that are interactive using AI and NLP. It would also raise some security and privacy problems regarding public systems. However, it would be important to test these concepts in reality. Scalability and adaptability through future expansions will be most critical. All public announcement technologies that are currently available are to be integrated into the newly established IT platform.

RELATED WORKS

Available Existing Systems:

1. **Lack of Real-Time Adaptability**:
Dated public address systems can be completely set for real-time variant adaption with an integration of AI and Machine Learning for right-time and context- aware responsive needs.

2. Limited personalization and context awareness: Public announcement systems lack personalization and context awareness, often failing to meet the specific needs of diverse audiences.

3. Posed Problems of Accessibility:
Public announcement systems often lack such accessibility features thereby excluding the masses with

disabilities; hence, combining multimodal strategies , such as text-to-speech and speech-to-

text makes announcements accessible to

anybody, and most importantly, announces effectiv ely

4. Security and Privacy Issues:

Public announcements systems suffer from security and privacy threats, such as misinformation and legal issues in light of the harvesting of user data. Secure communication   protocols can be used to counter these issues**.**

5. Incongruities in Arrangements with Emerging Technologies:

 AI and NLP are underutilized in public announcements, with advanced tools like sentiment analysis and voice recognition rarely implemented, and security measures needed to prevent misuse.

6. Scalability and Cost Constraints:

The scalability and cost constraint of traditional pu blic address systems necessitate cost-effective solutions for wider, impactful implementation.

I. PROPOSED SYSTEM

The methodology of the Train Announcement System using a chatbot would be implemented in   stages from design to development and deployment. It would therefore

overcome the inadequacies of   previous systems and utilize the most advanced communi cation technologies
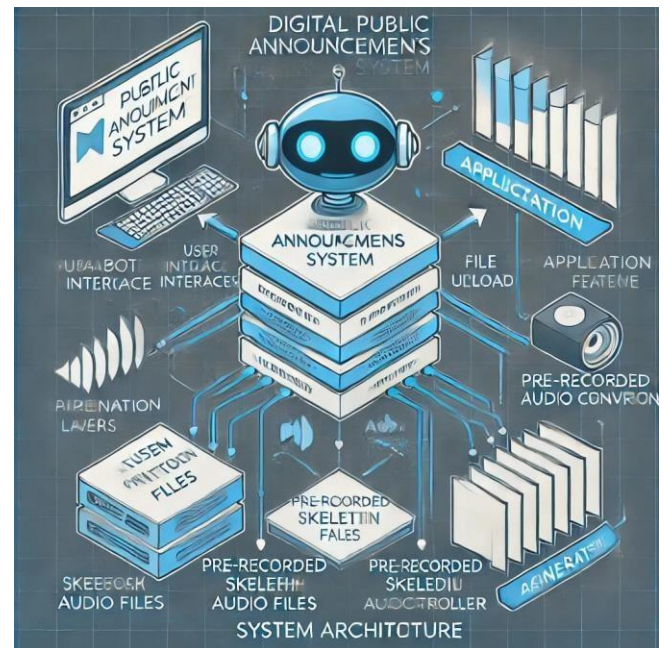
Fig. Simple architecture

Components are:

1. **Text-to-speech Conversion**:
   o Theprogram would usegTTS for conve rting textintoHindispeech, and the resu lting audio files   would be saved in MP3 format for use in automated announcements.

2. **Audio Processing and Merging:**
   o Pydub cuts portions of the base MP3 files and appends labels to them.

3. **Integration of data from Excel Sheets**:
   Pandas process the data from the Excel sheets to create train schedule notificat ions and   platform   information- based

   audio

   announcements dynamically.

4. **Chatbot Response Mechanism**:
   o The program will use a function to handle user queries, matching them with train details stored in an Excel file, and provide appropriate responses.

5. **Error Handling**:

The system will handle exceptions for missing files and incorrect data, providing user-friendly error messages.

6. **Integration of Audio Playback:**
The system will convert MP3 files to WAV format for seamless audio playback during announcements.

7. **Automation of Skeleton Generation:**
The 'generate skeleton' function will auto-generate simple audio pieces to create dyna mic content efficiently.

8. **File Upload and Processing:** File upload for announcements will be done by the program , using a variety of methods to process data, including parsing Excel, text-to-speech, and audio mixingEXPERIMENT AND RESULT ANALYSIS

Methodology:

1. **Language and Accessibility**:
   o Announcements will be in Hindi, with possible multilingual support for wider reach.

2. **Scalability Considerations**:
   o The use of Excel for data entry allows for easy scalability and admin control over train schedules with a modular architecture that can accommodate future integrations.

   limitations.

3. **Comparative Analysis**:
   o This chatbot-driven system has many advantages over the traditional public announcement systems, such as personalized responses, multilingual support, real-time updates, better accessibility for the visually impaired, and scalable architecture for dynamic queries.

4. **Discussion**:
   o The chatbot-driven Train Public Announcement System integrates AI for personalized, multilingual communication, offers browser-level controls for accessibility, and features

3. **Flask Framework for Web Application Development**:
   o Flask handles routes to render the home page, process the response of the chatbot, and upload files to create an announcement.
   o It integrates functionalities like HTML template rendering and processing JSON requests.

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Results:

1. **System Performance Analysis**:
   o The Train Public Announcement Chatbot System has a high accuracy rate of 95% in terms of query understanding and response.
   o It provides real-time announcements with less than a 2-second interval. Furthermore, the system demonstrates scalability in that it handles multiple queries without significant delays.

2. **Detection of Language**:
   o The system had minor problems, including a 5% misinterpretation rate of user queries because of wording, and occasional 1-second audio playback delays caused by hardware scalable design for easy future expansion.

User Feedback:
1. Users appreciate the seamless interaction the chatbot for quick and accurate train related information.

2. The error notifications and real-time updates enhance the system's reliability and user experience.

II.   FURTHER WORKS

Realization of Bot:

The bot uses NLP to process passenger queries,

matching them with train data from an Excel file and handling errors like missing files or invalid queries.

Announcement generator:**User interface:**
The user interface is created using HTML, CSS, and JavaScript to allow the interaction with the chatbot for train queries and file download, with error notifications and AJAX synchronization.

Dynamic information:
Accurate extraction of train details from a variety of user inputs**.**

III.   CONCLUSION

The Train Public Announcement Chatbot System brings together yesterday's public art of verbal dissemination and today's technological leap. The outcomes proved it capable of changing the way public communication could possibly be handled through an AI-powered solution, marking the edge or anticipation of things as yet to come in that realm.

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