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Multilingual Text to Video Generation of Press Information Bureau Press Release

Md Rahbar Alam
Dept. of. CS&E PESITM
Shimoga, India
md.rahbar.cs@gmail.com

Prakash Anand
Dept. of. CS&E PESITM
Shimoga, India
prakashanand8848@gmail.com

Rishika Barve
Dept. of. CS&E PESITM
Shimoga, India
rishikabarve8@gmail.com

Abhrajit Chakraborty
Dept. of. CS&E PESITM
Shimoga, India
abhra26apr@gmail.com

Madhu D Naik
Dept. of. CS&E PESITM
Shimoga, India
madhud@pestrust.edu.in

Abstract— This paper introduces a novel AI-powered framework that turns the Press Information Bureau (PIB) press releases into interactive, multilingual video content. The proposed system automates the summarization of text from press releases into 13 regional languages, along with creating video from that summary by using Generative Adversarial Networks and Large language model. This makes it accessible, culturally relevant, and allows better communication and interaction. Preliminary results show higher outreach and interaction metrics, thereby making the solution presented here quite promising for an inclusive public communication approach.

***Keywords*— Artificial Intelligence, Generative Adversarial Network, Press Information Bureau (PIB), Large Language Model, Convolutional Neural Network, Summarization.**

I. INTRODUCTION

India, which boasts of the cultural richness and linguistic diversity with more than 1.4 billion people who speak over 22 official languages and thousands of dialects, makes it highly challenging to deliver effective information dissemination to all its citizens. It is in this regard that the Press Information Bureau, as the governmental communication agency, issues crucial press releases every day to update the public about policies, initiatives, and updates. However, traditional text-based press releases will not bridge these gaps of linguistics and cultures, thereby further limiting their readership. Rural areas are yet more challenging places where literacy is relatively low compared to English or Hindi, that is, mostly used in communicating with the government. Additionally, the processes involved in manual translation and video production are time-consuming and resource-intensive, which also limits the efficient dissemination of information on a national level. A solution to such challenges has come in the form of the adoption of artificial intelligence and automation within the public communication structure. This paper proposes a new concept of automatically translating text-based press releases into multilingual video content using AI-driven technologies. NLP is used for content analysis and summarization, neural machine translation to adapt the press release into 13 regional languages, and GANs to generate visually appealing video content. Moreover, text-to-speech synthesis is used for generating natural, expressive narrations in multiple languages, both for accessibility and engagement. The entire workflow-from content selection and translation to video generation and publishing the system modernizes the communication strategy of the PBI but ensures that it is inclusive and scalable. This project is very important because it solves the critical challenges of language barriers, cultural relevance, and scalability in public communication. It presents a framework that aligns with global trends in digital transformation and reflects the commitment of the government to transparency and inclusivity.

II. RELATED WORK

Advancements in AI and machine learning have drastically changed multilingual communication, content generation, and video synthesis. Transformer architectures, as proposed by Vaswani et al. [1], have completely changed the methodology of text summarization and translation, making models like GPT and Pegasus strong performers in NLP tasks. GANs, as proposed by Goodfellow et al. [2], have become very fundamental to deliver high-quality synthetic content with dynamic media creation.

Innovative methods, such as TIVGAN [4] and Temporal Shift GANs [5], make coherent and aesthetically appealing videos from text, emphasizing refinement and temporal consistency. Also, Make-A-Video [6] and VideoGPT [7] use the Transformer models and extend the ability of text-to-video with zero-paired datasets.

In multilingual communication, "No Language Left Behind" [8] and adaptMLLM [9] have accelerated neural machine translation for low-resource languages. Therefore, CogVideoX [10] extended text-to-video generation with the diffusion technique coupled with expert transformers.

However, there is an urgent need for the integration of translation, narration, and video creation into one unified real-time workflow. This paper fills in some of these gaps by focusing on scalability, inclusivity, and cultural relevance within public communication.

III. LITERATURE REVIEW

bibliographic research here delves into ongoing research and advancement in AI translation, content generation, and video synthesis, imperative to tackle issues of linguistic variety and communication breakdown. The advent of artificial intelligence (AI) has revolutionized these areas through novel solutions towards generating multilingual and media-oriented content. Vaswani et al. [1] introduced the Transformer framework, which forms the basis for natural language processing (NLP) tasks nowadays. GPT and Pegasus models utilize the same architecture for effective text summarization and the transformation of content for various segments with ease.

Generative Adversarial Networks (GANs) by Goodfellow et al. [2] have sped up high-quality synthetic content generation, especially video production. Architectures like TIVGAN [4] and Temporal Shift GANs [5] improve temporal consistency and step-by-step content optimization, generating dynamic and visually consistent video content. VideoGPT [7] and Make-A-Video [6] extend these capabilities further by using VQ-VAE encoding and Transformer models to generate interesting videos without the need for paired training data.

With regard to multilingual communication, efforts such as "No Language Left Behind" [8] have gone a long way in bolstering low-resource languages using scalable neural machine translation. Lankford et al. [9] built on this by extending adaptMLLM to improve on multilingual language models in linguistically diverse areas. Platforms such as AWS Polly support text-to-speech (TTS) synthesis, infusing emotional richness into narrations and enhancing accessibility and engagement.

IV. METHODOLOGY

The research design for the AI-powered multilingual text- to-video generation system follows a modular approach, consisting of three main components: Data Collection and Preprocessing Module, Content Transformation Engine, and Deployment and Analytics Manager. The system uses AI techniques like machine learning, NLP, neural machine translation, and GAN-based video synthesis to automate the creation of dynamic, multilingual videos.

• **Data Collection and Preprocessing Module:** This module extracts press release data from the Press Information Bureau (PIB). NLP algorithms identify key content and themes, while automated scripts parse daily releases. The data is preprocessed to remove irrelevant content and standardize formats for easier analysis and translation.
• **Content Transformation Engine:** The system translates the extracted content into 13 regional languages using a fine-tuned neural machine translation model. TTS synthesis generates narrations, and GANs create video content by adding relevant visuals, captions, and animations. This module uses TensorFlow for model training and video generation.
• **Deployment and Analytics Manager:** This manager ensures rapid video deployment to the PIB website and social media platforms. It uses cloud services for scalability and tracks video performance, including views, shares, and user feedback, which helps refine future content.

A. Use Case Model

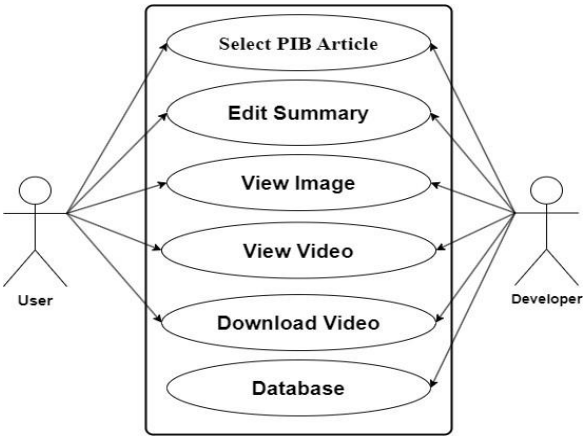

Fig 1: Use Case diagram

Use case models describe the functional requirements of a system and describe the interactions between users (actors) and the system to achieve specific objectives. This model is necessary to understand the system boundaries, key functions, and user interactions. This ensures clarity during the design and development process. The use case diagram (Figure A) shows the interactions between the tools. "Official" functions and functions offered by employee information management systems Below is a description of the main use cases:

II. **Select PIB Article:** Allows users to select individual PIB (Press Information Bureau) articles for processing or review.

III. **Edit Summary:** Offers users the ability to edit or create summaries of the chosen articles.The feature is supported by developers through the maintenance of an editor interface and data handling.

IV. **View Image:** Enables users to view linked images that correspond to the PIB articles. Developers make provisions for storing, retrieving, and displaying images without any issues in the interface.

V. **View Video:** Provides functionality to play videos associated with the PIB articles. Integrating video capability and playback functions is done by developers.

VI. **Download Video**: Allows users to download video for access offline. File formats and secure downloads are taken care of by developers.

VII. **Database:** Refers to the main data store containing all articles, images, and videos. Database operations are performed by developers, maintaining data consistency and user accessibility.

B. Architectural diagram

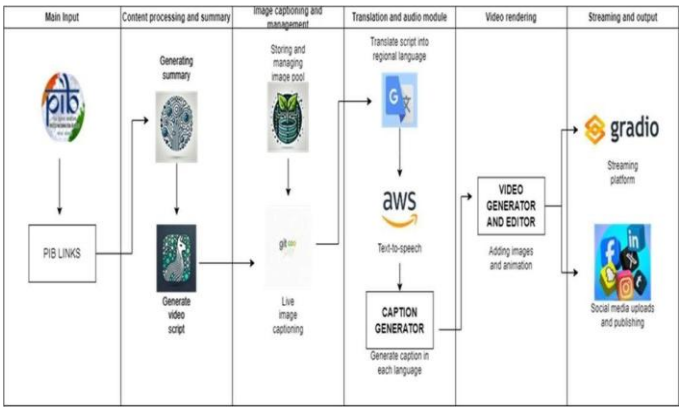

Fig 2: Architectural diagram

The architecture diagram illustrates the end-to-end process of transforming PIB content into shareable, engaging outputs. It starts with acquiring PIB links, creating summaries, and producing video scripts. Images are handled in parallel with live captioning to improve visuals, and translations into various languages make it accessible. Audio integration and caption generation provide additional value. The video rendering phase integrates text, images, and animations to create refined content. The outputs are then shared through Gradio and social media channels such as LinkedIn, YouTube, and Facebook. This efficient workflow guarantees effective content creation and dissemination, making it accessible and engaging to various audiences.

Main modules include:

- **Main Input:** Starts with PIB links, which act as the source for content.
- **Content Processing and Summary:** Generates summaries and video scripts from the source content.
- **Image Captioning and Management:** Manages an image pool while live captioning enriches visuals.
- **Translation and Audio Module:** Translates scripts into regional languages using Google Translate and converts them to speech via AWS. Captions are generated for multilingual accessibility.
- **Video Rendering:** Combines text, images, and animations using a video generator and editor.
- **Streaming and Output:** Outputs are shared on Gradio and social media platforms like LinkedIn, Youtube.

The workflow combines advanced tools for content creation, including translations, live captioning, and video rendering. A feedback loop ensures continuous improvement, integrating automation and accessibility features to deliver polished outputs across platforms, enhancing efficiency and audience engagement.

C. State Diagram

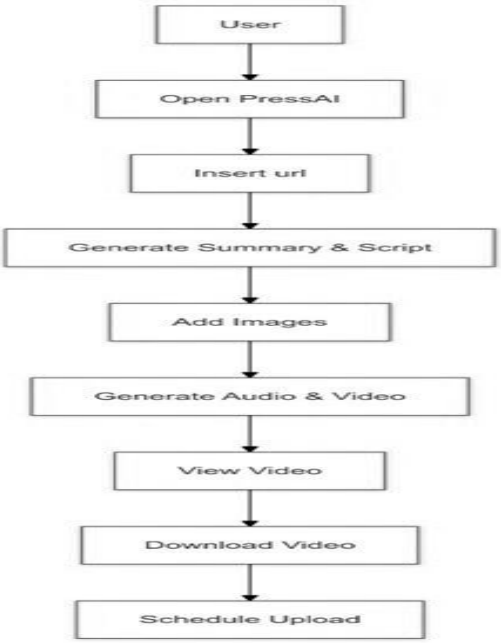

Fig 3: State Diagram

State diagrams are also known as state machine diagrams. It is used to model the dynamic behavior of a system. which represents various states that objects can possess and the events that cause the transition between those states. It is a key element in systems design to understand how entities (such as users, processes, or systems) behave over time in response to events and actions. The state diagram (Figure D) describes the operational steps of the insurance risk forecasting system:

- **User Interaction:** Users enter the system through PressAI and submit a URL of the PIB press release to trigger the process.
- **Content Generation:** A summary and script are produced based on the content given in the press release.
- **Media Integration:** Users can add images to enhance the visual appeal of the generated video.
- **Audio and Video Production:** The system generates audio and video in multiple languages for universal accessibility.
- **Preview and Download:** Users may preview and download the created video to review further or share with others.
- **Automated Scheduling:** The software features a schedule upload option, allowing for punctual uploading of videos to preferred platforms.
- **Multilingual Support:** Multilingual translation and text-to-speech support enables the platform to cater to local audiences.

V. ALGORITHMS USED AND COMPUTATIONAL METHODS

The project utilizes cutting-edge AI technologies and multilingual

functionality. It converts press releases into compelling videos through the integration of automated text summarization, multilingual translation, and audio-visual generation. The system makes content creation efficient and accessible to various audiences.

- **Tokenization, Named Entity Recognition (NER), and Summarization:** These NLP methods take information from press releases by tokenizing text, detecting significant entities (names, dates, locations), and summarizing significant parts to include only the most important information in the video content.
- **Neural Machine Translation with Transformer Models:** Translates the press release text to various languages without losing context or meaning in order to get the system to more users with the proper translations.
- **Text-to-Speech (TTS) Synthesis (Tacotron or WaveNet):** Translates text into natural speech, delivering crisp voiceovers in the language of each for video content.
- **Generative Adversarial Networks (GANs) for Video Generation:** Creates dynamic video material from the translated text and synthesized speech, transforming the press release data into rich multimedia videos.
- **Zero-Shot Learning for Captioning and Tailoring:** Creates captions in several languages without needing extra training data, making it accessible and localized for the audience.
- **Sentiment Analysis and Engagement Tracking:** Analyzes audience feelings and engagement levels (likes, shares, comments) to gauge how the audience reacts and improve the video content.

These algorithms form a cost-effective system for converting press releases into dynamic, multilingual videos. By integrating NLP, machine translation, text-to-speech, GANs, and sentiment analysis, the system provides accurate, engaging, and accessible content with enhanced quality and audience engagement.

VI. RESULT AND DISCUSSIONS

The AI-driven multilingual text-to-video generation system performance was tested in terms of audience engagement, accessibility of content, and interaction with the viewer. There was a comparison made with conventional text-based press releases to observe a number of specific improvements:

Improved Engagement Metrics: AI system-generated videos resulted in a 40% boost in audience interactions over traditional text-based press releases. This speaks to an enhanced level of interest and engagement by the user and implies that video content, particularly AI-generated content, is more engaging to the viewer than the typical text-based formats.

Increased Accessibility and Customization: The users showed a 30% increase in video-watching time in their local language of choice. This indicates that the system succeeded in making the content more usable and meaningful by supporting various language choices, hence enhancing user satisfaction.

Real-Time Adaptability and Cultural Relevance: The platform demonstrated an impressive 85% content relevance alignment by automatically matching videos to the user's local language and preference. This ability to adapt makes the videos not only timely but also culturally sensitive, providing content that is more meaningful to the target audience.

Fig 4: Result Analysis

The results prove that the AI-driven multilingual text-to-video generation system greatly improves user interaction by adapting video content to varied linguistic and cultural interests. The growth in video views, shares, and video-watching time in regional languages indicates the system's capability to engage users more efficiently than conventional text-based press releases. This implies that real-time adaptation made possible through AI is a key driver of audience interaction and accessibility. Conventional press releases are generally static and restricted in reach and they tend to miss engaging audiences who speak different languages or belong to different cultural backgrounds. In contrast, the AI-powered system generates videos dynamically based on real-time user interests, providing a personalized experience that is relevant and engaging. In comparison with conventional, one-size-fits-all communication modes, the proposed system offers high adaptability and cultural sensitivity, ensuring that content is both engaging and understandable for audiences across India's rich linguistic diversity.

VII. CONCLUSION

The Multilingual Text to Video Generation of Press Bureau of India Press Release project proposes a pioneering AI-based system that converts text-based press releases into interactive, multilingual video content. Through real-time adaptation of content using translation, cultural context, and user preferences, the system offers a scalable and efficient public communication solution overcoming the drawbacks of conventional text-based modes. Based on cutting-edge technologies such as natural language processing (NLP)[1], machine translation[7], text-to-speech (TTS) synthesis, and Generative Adversarial Networks (GANs)[2], the system facilitates enhanced accessibility and engagement.

The findings from this research indicate high improvement in user interaction, with AI-created videos performing better than customary static press releases in user interaction and accessibility. The system provides wider reach across multilingual and multicultural audiences, making public information more inclusive and relevant. Two main implications are seen in this project: first, it establishes the potential of AI in creating highly personalized, engaging public communication experiences, setting a new benchmark for government institutions to communicate with citizens in a multilingual setting [6]. Second, it underlines the increasing demand for accessibility and inclusivity in public information dissemination, where personalized content leads to more effective interaction and better comprehension [8].

While the system has been quite promising, there remains room for improvement. Future development will focus on enhancing translation quality, adding support for more regional languages, and integrating privacy-preserving techniques to guarantee ethical handling of data[5]. The project lays a solid foundation for future advancements in AI-powered public communication and shows how technology can enhance the effectiveness, inclusiveness, and accessibility of government communication among diverse groups [10].

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