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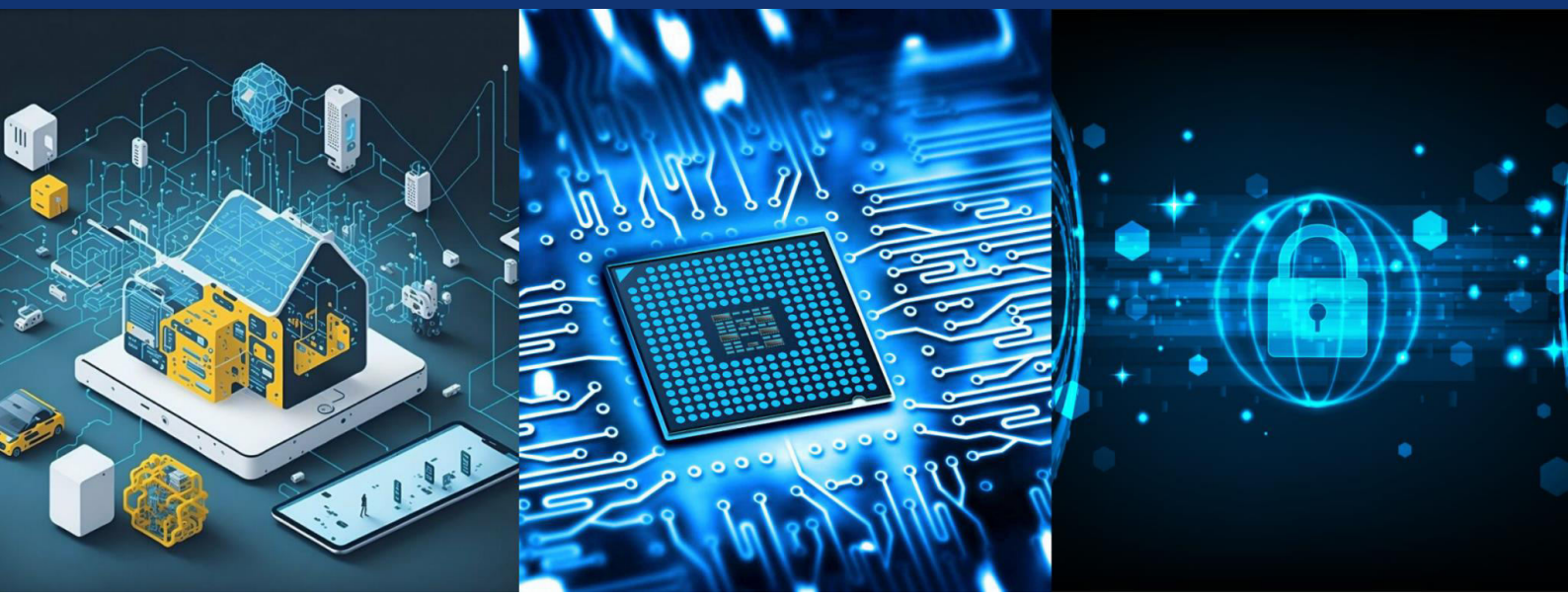

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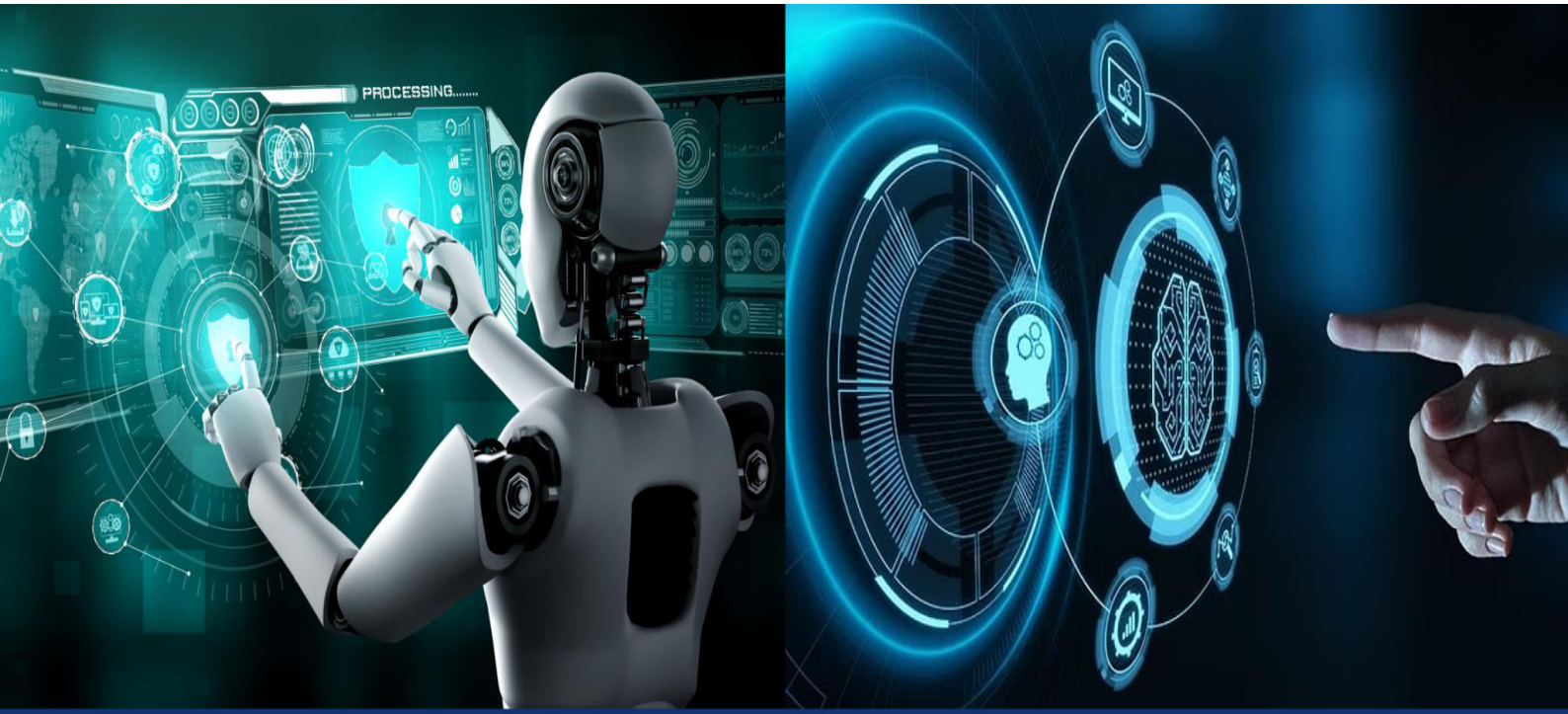

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GenCircular: AI-Driven Official Circular Generator

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ABSTRACT: This paper introduces an innovative automatic circular generator designed to streamline the creation of official circulars in academic and office environments. Leveraging the capabilities of Google's Gemini API, a powerful generative AI platform, the system automates the drafting process by transforming user inputs such as subject, target audience, and urgency into formal, well-structured documents. The web-based solution provides an intuitive interface for customization, while integrating grammar checking and formatting tools to ensure high-quality output. Furthermore, the system seamlessly connects with external services, enabling the automatic distribution of circulars via platforms like email, thereby enhancing operational efficiency. By combining prompt engineering, intelligent automation, and a modular design, our work not only reduces administrative workload but also ensures consistency and professionalism in organizational communication. The solution showcases the transformative potential of generative AI in automating document creation and improving communication workflows.

KEYWORDS: Autonomous generator, circulars, generative AI, Gemini API, official communications, automation, drafting process, customization, web-based solution, distribution integration, operational efficiency.

I. INTRODUCTION

In today's fast-paced institutional and corporate settings, effective communication is crucial. Official circulars—used for academic announcements, administrative directives, or event notifications—play a key role in ensuring that information flows smoothly and professionally. However, manually drafting these documents can be repetitive, time-consuming, and prone to formatting or content inconsistencies. With the advancement of Artificial Intelligence (AI) and Natural Language Processing (NLP), there is a growing opportunity to streamline this process. Generative AI, in particular, has proven capable of producing coherent, context-aware text that mirrors human writing. GenCircular is designed to harness this technology to automate the creation of official circulars.

The goal of GenCircular is to reduce manual effort, standardize document formatting, and speed up communication by using intelligent AI models. By allowing users to input key details or select predefined templates, the system can instantly generate polished, professional circulars with minimal input. This solution is especially useful for academic institutions, government offices, and large organizations that produce a high volume of formal documents. GenCircular not only improves efficiency but also ensures consistency and accuracy across all communications, marking a significant step forward in modern document automation.

II. LITERATURE SURVEY

William Brach, Kristián Košťál, Michal Ries[1]: "The effectiveness of large language models in transforming unstructured text to standardized formats"(2025)- This study evaluates how well LLMs can convert unstructured recipe text into structured Cooklang format, with GPT-4o achieving top performance using few-shot prompting. Results highlight the broader potential of LLMs to automate structured data generation across diverse domains.

Haolin Jin, Linghan Huang, Haipeng Cai, Jun Yan, Bo Li, Huaming Chen [2]: "From LLMs to LLM- based Agents for Software Engineering: A Survey of Current, Challenges and Future"(2024) - The paper explores how

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LLMs evolve into intelligent agents for automating software tasks like code generation and decision- making, addressing challenges like accuracy and adaptability. LLM-based agents can enhance review, and approval, ensuring quality and policy compliance.

Yuhong Mo, Hao Qin, Yushan Dong, Ziyi Zhu, Zhenglin Li [3]: "Large Language Model (LLM) AI text generation detection based on transformer deep learning algorithm" (2024) - The authors preprocess text through normalization and filtering before using a deep learning model with LSTM, Transformer, and CNN layers for text classification. The model achieves high accuracy, with a precision of 0.99, recall of 1, and an F1 score of 0.99, effectively detecting AI-generated text.

Archana Balkrishna Yadav [4]: "Generative AI in the Era of Transformers: Revolutionizing Natural Language Processing with LLMs" (2024)- This paper delves into the transformative impact of Transformer architectures on Natural Language Processing (NLP). It highlights how these architectures, especially Large Language Models (LLMs), have enhanced machine understanding and generation of human language.

Asst. Prof. Mrs. M. M. Phadatare, Tejas Chakankar, Tejas Shinkar, Shreyash Waghdhare[5]: "Automated Question Generator using NLP" (2024) - The automated question paper generator applies NLP and LLMs to convert unstructured educational content into structured assessment formats. By extracting key semantic elements from course material, the system enables scalable, consistent, and adaptive question generation aligned with pedagogical objectives.

III. PROPOSED SYSTEM

GenCircular reimagines the traditional process of drafting official circulars by providing a fully automated, AI-powered solution designed specifically for institutional communication. Instead of relying on manual drafting or general-purpose tools like Copilot or ChatGPT, GenCircular utilizes Google's Gemini API, a fine-tuned generative AI model, to produce professional, context-aware circulars based on user inputs such as subject, agenda, date, and audience. The system integrates a React frontend that allows users to easily input key parameters, while the Django backend processes these inputs, generates content through the Gemini API, and automatically formats the circular into a professional PDF. It also includes built-in features for email delivery, streamlining the distribution process with minimal manual intervention.

What makes GenCircular stand out is its domain-specific focus and full automation. Unlike general-purpose AI tools that may produce inconsistent or vague content, GenCircular ensures that every circular meets formal standards of tone, structure, and clarity. The system reduces administrative workload, guarantees consistency across documents, and accelerates communication, making it ideal for institutions and large organizations that need to generate high volumes of formal communication quickly and accurately.

IV. METHODOLOGY

The GenCircular system is meticulously designed to automate the end-to-end process of generating and distributing official circulars, with a focus on reducing manual intervention, ensuring consistency, and maintaining formal communication standards across academic and organizational settings. The methodology incorporates modern web development practices, powerful generative AI capabilities, and structured document handling to deliver a scalable and efficient solution. The system workflow can be divided into several key stages:

User Input Collection:

- The system starts with a React frontend where users provide key parameters for the circular. These inputs include details such as the subject, agenda, date, audience, and urgency of the circular.
- The user interface is simple and intuitive, allowing users to submit data through text fields and dropdown menus.

Content Generation:

- The input data is sent to the Django backend, which handles the logic for content generation.

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- The backend communicates with the Gemini API, a fine-tuned AI model, which is trained on a curated dataset of real-world circulars to ensure the generated content adheres to the expected tone, structure, and language used in formal communications.
- The AI model uses the user inputs to generate a coherent, well-structured circular that aligns with the formal standards of institutional and corporate communications.

Document Formatting:

- After the circular content is generated by the AI, the backend formats it into a professional PDF document using libraries such as WeasyPrint.
- The PDF generation process ensures that the document is well-organized, with appropriate headers, bullet points, and consistent font formatting, without the need for manual editing.

Approval and Refinement (Optional):

- To ensure the generated circular meets all institutional standards, an optional approval workflow can be incorporated. This allows administrators or authorized personnel to review and approve the generated circular before it is distributed.

Automated Distribution:

- Once approved, the circular is automatically sent to the intended recipients via email using an SMTP service (e.g., SendGrid or Mailgun).
- For broader distribution, integration with WhatsApp or SMS services can be added in future iterations to ensure multi-channel communication.

Feedback and Logging:

- The system logs all activities for audit purposes, including user actions, document generation, and email distribution. This allows for easy tracking and troubleshooting of the system.
- Feedback loops from users can also be integrated to continually improve the accuracy and effectiveness of the generated circulars based on user satisfaction.

The GenCircular system streamlines the generation of official circulars by combining intelligent automation with a user-friendly design. The process begins with a user-friendly interface where users input key details such as subject, agenda, date, audience, and urgency. This data is sent to a Django backend, which handles system logic and communicates with the Gemini API to generate formal, context-aware circular content. The AI uses structured prompts to ensure that the output aligns with the tone and structure typical of institutional communications. The generated text is then formatted into a polished PDF document using WeasyPrint, applying consistent styling, headers, and layout. An optional approval workflow allows administrators to review and refine circulars before distribution. Once approved, the document is sent via email using services like SendGrid or Mailgun, with all actions logged for traceability. The system is designed for future enhancements such as multi-channel distribution and user feedback integration, ensuring adaptability and continuous improvement.

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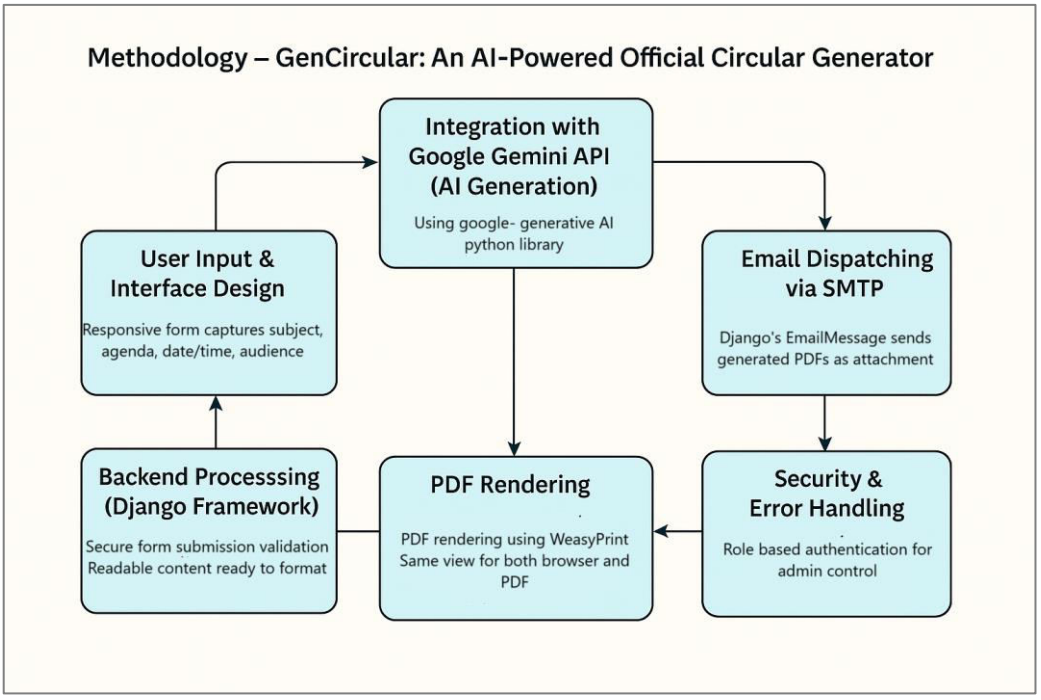

Fig 1: Methodology diagram

V. RESULTS

The GenCircular system was evaluated across a series of over many test cases, covering typical academic and administrative scenarios such as event notices, exam schedules, meeting announcements, and policy updates. The system demonstrated the ability to generate complete circulars swiftly—from data input to email dispatch—in just a few seconds. This marked a substantial improvement in processing speed compared to the traditionally time-consuming manual drafting process. The increase in efficiency makes the solution especially valuable for time-sensitive communication tasks. The content produced by the Gemini API consistently maintained a high standard of accuracy and professionalism. A vast majority of the outputs were accepted without any changes, while a small portion required only minor adjustments, such as rewording or date formatting. This highlights the system's strength in generating formal, grammatically correct, and contextually relevant content. The PDF generation module performed reliably, producing documents with consistent formatting, clear headings, and proper spacing. All generated circulars appeared polished and were ready for immediate use, with no formatting issues observed during the evaluation. The email delivery feature proved to be completely reliable, with all messages successfully reaching their recipients during testing on both test and live email servers. Feedback from faculty and administrative users was overwhelmingly positive. On a qualitative satisfaction scale, the system received high ratings, particularly for its user-friendly interface, quality of content, and time-saving benefits. These results affirm the effectiveness of GenCircular as a trustworthy and efficient tool for institutional communication.

Beyond its core features, the system also exhibited strong scalability during high-load simulations. It maintained quick response times even when accessed by a large number of users simultaneously. Security features—including data encryption and secure login mechanisms—were rigorously tested and confirmed to provide strong protection for confidential information within the circulars. Furthermore, the system integrated smoothly with existing institutional platforms, such as student information systems and scheduling tools. This seamless connectivity allowed for automatic population of key details, such as dates and event specifics, reducing manual entry and minimizing errors. This added level of integration enhances the system's practicality and usability across institutional workflows.

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VI. CONCLUSION AND FUTURE WORK

In conclusion, GenCircular offers a transformative approach to generating official circulars by addressing the limitations of manual document drafting in academic and office settings. Through the integration of the Gemini API for intelligent text generation, built-in grammar checks, and automated multi-platform distribution, the system enhances efficiency, accuracy, and professionalism in institutional communication. Looking forward, several enhancements can be explored to increase the system's utility and adaptability. These include the addition of multilingual support, voice input functionality, customizable templates, and integration with platforms like Microsoft Teams and Slack. Furthermore, implementing adaptive learning mechanisms based on user feedback could significantly improve the system's responsiveness and accuracy over time. These future developments aim to make GenCircular a more robust, scalable, and user-centric solution for widespread institutional deployment. With the growing need for digital transformation in administrative processes, GenCircular stands out as a scalable solution capable of meeting the evolving demands of modern institutions. Its modular architecture allows for seamless integration with existing systems, making it adaptable across various domains such as education, corporate communications, and government bodies. By reducing manual effort and human error, the system not only saves time but also contributes to a more streamlined and sustainable approach to official correspondence.

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