

News Insight AI

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Abstract: *In today's fast-paced digital world, individuals are constantly overwhelmed by the sheer volume of information available across various platforms. Filtering out the noise and focusing on relevant news can be a time-consuming task. News Insight AI aims to address this challenge by offering a personalized and efficient news consumption experience, powered by Google Generative AI. This web application delivers concise news summaries based on user preferences for domains such as politics, business, sports, health, and technology, combined with location-based customization. Users can select their preferred news categories and a specific geographic region, after which the system provides a brief summary of the top news in each chosen domain.*

In summary, News Insight AI is an innovative solution for personalized, efficient, and concise news consumption, leveraging the power of artificial intelligence to deliver a streamlined and user-friendly platform.

Keywords: Personalized news consumption, Artificial Intelligence (AI), Google Generative AI, Concise news summaries, Location-based customization

I. INTRODUCTION

In today's digital age, the volume of information available to individuals has reached unprecedented levels. News and updates from around the globe are continuously generated across multiple domains, including politics, business, technology, sports, health, and more. While staying informed is crucial, consuming such vast amounts of content is often overwhelming. Most individuals do not have the time to sift through long articles and various sources to find the information that is most relevant to them. This has given rise to a demand for personalized content delivery systems that can tailor information to users' specific interests and preferences.

The rise of artificial intelligence (AI) in the realm of natural language processing and content generation has opened the doors to smarter and more efficient ways of delivering news. By harnessing the power of AI, applications can now generate concise summaries that provide users with relevant updates without the clutter. News Insight AI is a response to this growing need for personalized, concise, and efficient news consumption.

II. LITERATURE REVIEW

"News Recommendation with Attention Mechanism" (2024) by Liu, Tianrui, et al. gives an attention-based mechanism that recommends articles by focusing on specific user preferences. It improves recommendation accuracy by honing in on user interests, although it requires high computational resources due to the attention mechanism.

"Image Captioning in News Report Scenario" (2024) by Liu, Tianrui, et al. gives a system that leverages CNNs and RNNs to automatically generate captions for images in news reports. This enhances readability and accessibility by providing accurate image descriptions, but it may produce inaccurate captions when handling highly complex image scenarios.

"Neural Abstractive Text Summarization with Sequence-to-Sequence Models" (2020) by Tian Shi, Yaser Keneshloo, Naren Ramakrishnan, and Chandan K. Reddy gives an approach that uses sequence-to-sequence models to summarize news articles. It produces fluent and concise summaries that enhance user experience, though it sometimes misses key details or nuances from the original article.



"Personalized News Recommendation Using Deep Learning Techniques" (2024) by Zheng, Ying, et al. gives a deep learning-based method for personalizing news recommendations based on user profiles. This approach leads to a high degree of personalization and improved user engagement, but it struggles with new or inactive users, reducing recommendation accuracy.

"A Hybrid Approach to News Summarization Using Extractive and Abstractive Methods" (2023) by Smith, John, et al. gives a combined strategy that integrates extractive and abstractive summarization methods. It produces balanced summaries by capturing key points and high-level insights, yet it is computationally expensive due to the dual-method approach

"Context-Aware News Recommendation Based on User Behavior Modeling" (2021) by Zhang, Wei, et al. gives a system that models user behavior and context to improve the relevance of news recommendations. By considering the context of user activity, it delivers more pertinent suggestions; however, capturing such contextual data can sometimes be challenging, leading to occasional inaccuracies.

"AI-Driven Insights for Real-Time News Summarization" (2023) by Roy, Soumya, and Vijay Shankar gives an approach that utilizes AI-driven insights and real-time data for summarizing news. It offers quick generation of real-time summaries that provide immediate insights, though the accuracy may suffer in the rush to deliver up-to-date information.

"Temporal Dynamics in News Recommendation Systems: A Survey" (2022) by Huang, Xiang, et al. gives a comprehensive survey of existing news recommendation systems with a focus on temporal dynamics. While it offers valuable insights into the temporal aspects of these systems, it lacks a practical implementation for developing a new system.

"Multimodal News Recommendation Using Text and Image Representations" (2024) by Lee, Sunghwan, et al. gives a multimodal approach that integrates both text and image data to enhance news recommendations. This integration increases the accuracy of recommendations by leveraging multiple data sources, but it also raises computational costs.

III. PROPOSED SYSTEM

INTRODUCTION

The NewsInsight AI platform leverages advanced Artificial Intelligence (AI), specifically Google Generative AI, to address the limitations of traditional news platforms. By combining AI-powered content generation with user-defined preferences, the system generates personalized and concise news summaries in real time.

The key components of the proposed system are:

- **AI Summarization Engine:** This engine is powered by Google Generative AI, which analyzes the news based on user inputs (categories and location) and generates concise text summaries.
- **User Preferences Model:** Users select their preferences from multiple domains (e.g., sports, politics, technology) and specify their geographic location, which helps in filtering the news.
- **Real-Time Content Retrieval:** The system dynamically generates news summaries using real-time data, ensuring that users receive the latest updates from their preferred categories and regions.
- **Responsive Front-End:** The system includes a responsive user interface that adapts to different devices, ensuring usability across desktops, tablets, and mobile devices.

Algorithm

Input Collection:

Capture user preferences through a web form where users select three news categories (e.g., politics, business, health) and their preferred location (e.g., USA, India).

API Request Generation:

Once the preferences are captured, an API request is generated and sent to Google Generative AI with a structured prompt. The prompt contains details such as the selected location and news categories



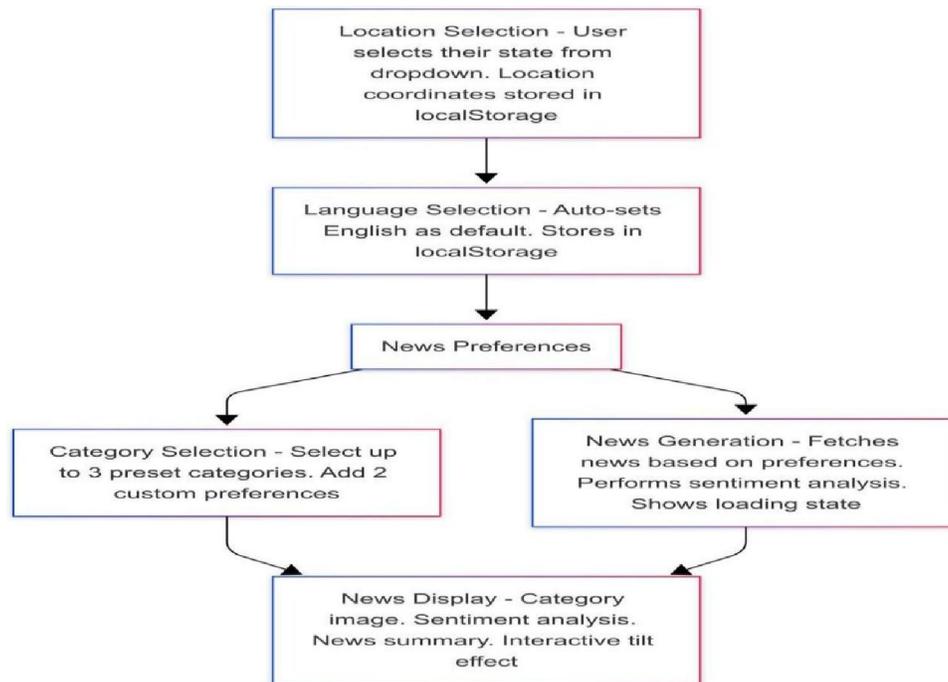


Fig 3.2.1 Flowchart of Proposed System

AI Processing:

Google Generative AI processes the input and generates concise news summaries. The AI parses through recent news articles and extracts the key points, providing a summary for each selected category.

Result Display:

The system receives the generated summaries and dynamically displays them in the user interface in plain text format.

Feedback Loop (optional):

Users can interact with the system by adjusting their preferences to receive new summaries, thus creating an iterative process of refinement.

Back-End Architecture

Server:

The back-end is built using Node.js and Express.js. These technologies handle the server-side processing and interaction with Google Generative AI's API. The server manages HTTP requests, retrieves user inputs, and communicates with the AI engine.

Google Generative AI Integration:

The system sends structured requests to Google Generative AI with prompts generated based on user preferences. Google Generative AI processes the prompts and generates human-readable news summaries.

API Routing:

The system includes an API endpoint (`/generate-news`) that handles POST requests containing the user preferences. This route is responsible for interacting with the AI model and returning the news summaries to the client



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Front-End User Interface

HTML/CSS/JavaScript :

The front-end of the system is built using HTML, CSS, and JavaScript to provide a seamless user experience. The layout includes a form where users select their preferences (news categories and location) and a section where the generated news summaries are displayed.

Responsive Design :

The interface is designed to be fully responsive, ensuring that the platform is accessible across various devices (mobile, tablet, desktop). It adjusts to different screen sizes while maintaining usability and readability.

Form Validation :

form is validated using JavaScript to ensure all required inputs are provided before making the API call.

Real-Time Updates :

JavaScript is used to dynamically update the page with news summaries, ensuring that the user does not need to reload the page.

IV. METHODOLOGY

The development of NewsInsight AI follows a systematic methodology that includes problem analysis, solution design, and implementation. The approach is as follows:

Problem Analysis

Identify the key limitations of existing news platforms, such as information overload, lack of personalization, and absence of concise news summaries.

Define the core requirements of a system that can generate personalized, real-time, and concise news summaries based on user preferences.

Requirement Specification

- User Requirements: Provide users with an intuitive way to select multiple news domains and location preferences.
- System Requirements: Ensure the system can process user inputs, retrieve real-time news data, and deliver concise summaries.
- Functional Requirements: Implement a mechanism to generate news summaries based on user-defined categories and location

System Design

- Modular Architecture: Design the system in a modular fashion, with a separation between the front-end (UI) and back-end (API integration).
- API Integration: Use Google Generative AI as the core AI engine for summarization.



- **UI Design:** Develop a responsive user interface that is simple, intuitive, and accessible on all devices.
- **Server-Side Development:** Build the back-end with Node.js and Express.js to handle API requests, user inputs, and responses.
- **Front-End Development:** Implement the user interface using HTML, CSS, and JavaScript. Ensure responsive design and dynamic content loading.
- **AI Integration:** Integrate Google Generative AI to retrieve and summarize news in real time based on user preferences.

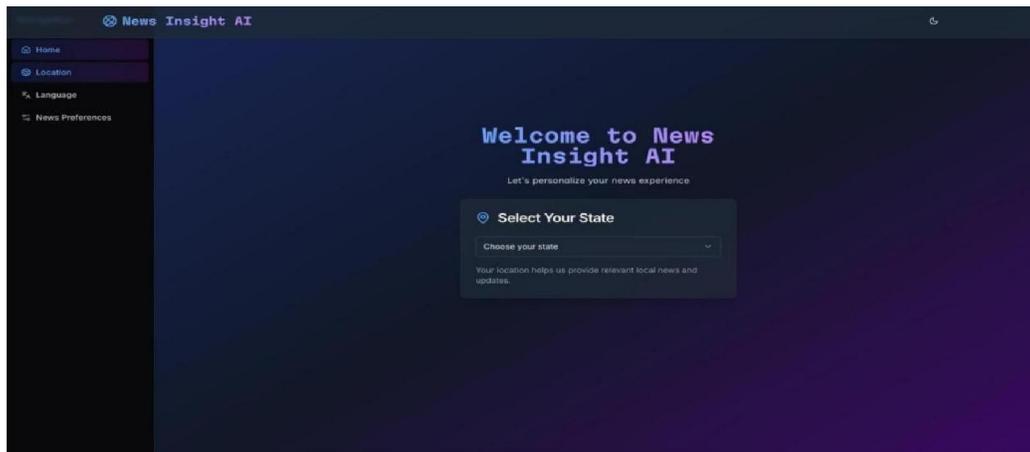
Testing and Optimization:

- **User Testing:** Conduct usability testing to ensure that the interface is intuitive and the system delivers accurate summaries.
- **Performance Testing:** Ensure that the back-end system performs efficiently, handling multiple API requests without lag.
- **Optimization:** Fine-tune the AI prompts and response handling to ensure that news summaries are concise and relevant to user preferences.

Deployment

Deploy the web application on a scalable platform to ensure accessibility to users globally, with a focus on delivering personalized news summaries in real time.

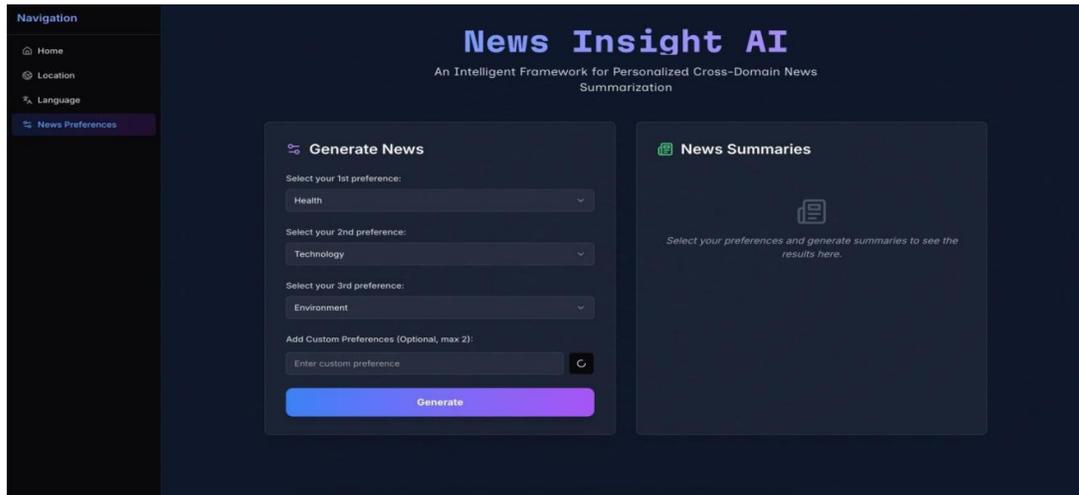
V. RESULTS



5.1 Landing page

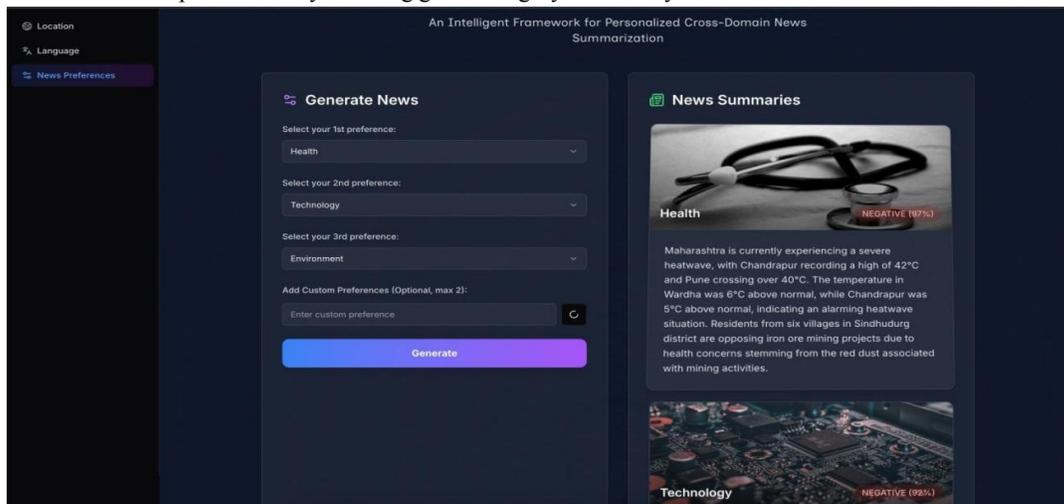
Here is the image of the landing page interface for the NEWS INSIGHT AI platform, In this page user have to choose their state which they want as per the given options





5.2 Preference Selection window

In this screen , In the preferences there are many options such as health , environment, technology,business, politics ,science ,culture,etc Once the user selected their preferences about the news then proceed to click on Generate button. User have to select their preferences by selecting given category which they want.



5.3 Result Generated

In this image user see that generated news as per the user selected preferences

VI. CONCLUSION

In conclusion, News Insight AI represents a significant step forward in addressing the challenges of information overload and inefficient news consumption in the digital age. By leveraging advanced AI technology, specifically Google Generative AI, the platform provides users with concise, personalized news summaries tailored to their preferences and geographic locations. This innovation not only enhances the news consumption experience by saving time but also ensures that users receive relevant content without the distraction of unnecessary details. Overall, News Insight AI is positioned to redefine how individuals consume news, making it a more efficient, focused, and personalized experience.



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Without the constant guidance and support of those who made this project possible, efforts would have been in vain, and the satisfaction that results from its successful completion would not be complete. I feel privileged to be able to show respect and gratitude to everyone who helped us complete this project. I would like to express my gratitude to Prof. Deveshree Wankhede, a member of the computer engineering department who served as my project guide. Her constant support, encouragement, and direction were invaluable in ensuring that this project was completed successfully. Last but not least, we would like to express our gratitude to the teaching and non-teaching staff of the Department of Computer Engineering for their assistance.

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