AI Personal Assistant Using Next.js, React, Convex DB and Eden AI Algorithm

Prof. Rutuja Gautam[1], Prof. Rohan Kokate[2], Sumeet Karwade[3]

Professor (Guide), J.D. College of Engineering and Management, Nagpur, India [1]

Head of Department, Computer Application, J. D. College of Engineering and Management, Nagpur, India [2]

Computer Application, J.D. College of Engineering and Management, Nagpur, India [3]

Abstract: *AI assistants have changed the way we use technology. Now we can just talk to them to get things done, find info, or make choices.These systems are built using tools like Next.js for fast wed interfaces, Convex DB for real-time data handling, and Eden AI to connect with different AI models and services. By integrating algorithms such as intent classification, named entity recognition, and sentiment analysis, personal assistants can interpret and respond to complex user commands effectively.*

By combining these technologies, personal assistants can understand and respond to complex user requests more smoothly.They learn from users' interaction, like what they ask, how they ask it, and when. Over time, this helps them give smarter, more personalized answers that fit your habits and preferences.

Incorporating these models within a modern tech stack—such as React and Next.js for frontend, Convex DB for real-time data storage, and Eden AI for pre-trained language services—allows rapid development and deployment. This architecture supports modular, scalable, and intelligent assistants that can handle reminders, calendar scheduling, voice commands, and more. The result is a responsive, context-aware assistant capable of enhancing user productivity and engagement.

Keywords: Next.js, AI Chatbot, User Dashboard, Add New Assistant, Support Multiple Languages

I. INTRODUCTION

More people want smart tools that are easy to talk to, so AI assistants were created. They help with everyday things answering questions are doing simple tasks for you. Leveraging machine learning algorithms, they provide intelligent responses by analyzing user input through natural language processing (NLP) and contextual understanding.

Modern AI assistants rely on a combination of frontend and backend technologies to deliver seamless user experiences. In this project, Next.js and React form the foundation for a fast, dynamic, and interactive user interface. Convex DB provides real-time data synchronization and storage, ensuring persistent user sessions and context handling. Meanwhile, Eden AI offers a collection of pre-trained machine learning models for tasks such as text analysis and intent recognition, allowing the assistant to understand and react to user inputs intelligently.

By integrating these technologies, the AI personal assistant becomes both powerful and scalable. It can interpret complex instructions using ML algorithms, manage conversation flow, and store context for continuous interaction. This combination not only accelerates development but also enhances the assistant's ability to personalize and adapt over time, delivering an efficient, intelligent, and user-friendly experience.

II. PROBLEM DEFINITION

As technology gets more advanced, people want easier ways to get things done like just saying what they need. Old apps need exact inputs and don't really get what you mean, which makes thing harder. The absence of context-aware and conversational interfaces limits the usability and accessibility of many digital tools, especially for non-technical users.

Developing a robust AI personal assistant requires addressing several technical challenges: understanding diverse user input, maintaining conversation context, handling asynchronous tasks, and providing intelligent responses. Building

such systems from scratch demands significant machine learning expertise and infrastructure, which may not be feasible for many developers. Additionally, ensuring real-time interaction and data persistence across sessions adds complexity to system design.

This project aims to solve these problems by using Next.js and React for building a responsive interface, Convex DB for managing real-time and persistent data, and Eden AI for integrating powerful pre-trained ML models. By combining these technologies, the system can effectively understand natural language, manage dialogue flow, and perform user-defined tasks, thereby delivering a scalable, intelligent, and user-friendly AI assistant without the need to build ML models from the ground up.

III. PROPOSED SYSTEM

The assistant will understand what you type, figure out what you want, and reply with the right info or action. It uses ready-made AI tools from Eden AI to help it understand language and speech. The frontend is developed using Next.js and React, ensuring a seamless, interactive user experience, while Convex DB manages real-time data storage, context preservation, and task scheduling.

By combining these technologies, the assistant can handle tasks such as setting reminders, fetching weather updates, or answering questions intelligently. The system architecture allows for modular expansion and includes components for intent classification, dialogue management, and response generation. Through the use of machine learning, the assistant improves its performance over time based on user interactions. This scalable and efficient system provides a smart assistant platform without requiring developers to build machine learning models from scratch.

IV. EXISTING SYSTEM

For developers making their own assistants, the old way usually means building and training their own AI models, which takes a lot of time and skill. It's not easy and needs a strong background in tech and backend systems. Moreover, many web-based assistants lack real-time interactivity, seamless frontend integration, or simple deployment pipelines, which limits their usability in modern, responsive applications.

Existing AI personal assistants like Siri, Google Assistant, and Alexa are widely used in mobile and smart home environments. These systems are powered by complex machine learning models developed by large tech companies and are deeply integrated with their ecosystems. They rely on proprietary NLP enginesand closed cloud infrastructures, making them difficult to customize or integrate with open-source and modern web development tools.

In contrast, the proposed system offers a streamlined alternative using Next.js and React for the frontend, Convex DB for real-time data handling, and Eden AI for accessing pre-trained NLP and speech models. This combination addresses the limitations of the existing systems by providing a developer-friendly, scalable, and modular platform for building intelligent, customizable personal assistants without needing to build machine learning infrastructure from scratch.

V. LITERATURE SURVEY

In the last few years, AI and language tools have really improved how we talk to virtual assistants. Older systems followed fixed rules, but now we use smarter models that learn from lots of data. New AI models like BERT and GPT are great at understanding what people mean, picking out key info, and even guessing the tone. This helps assistants give better, more accurate responses and makes them much more useful in everyday life.[1]

Agents highlights the challenges of handling multi-turn conversations, preserving session context, and generating coherent responses. Studies have explored different architectures for dialogue systems, including finite-state machines, rule-based logic, and reinforcement learning approaches. These systems help virtual assistants maintain smooth interactions and adapt dynamically to user behaviour. Such capabilities are essential when developing web-based AI assistants that simulate natural conversation in real time, ensuring a seamless user experience. [2]

The importance of integrating AI with web technologies has also been emphasized in recent studies. Modern web development frameworks like React and Next.js offer component-based architecture and server-side rendering, making them ideal for building dynamic interfaces. Research has also explored the benefits of real-time databases such as

Firebase and, more recently, Convex DB. These tools support persistent data, session tracking, and fast synchronization, which are crucial for maintaining a responsive AI assistant that remembers past interactions. **[3]**

Recent advancements have shown the effectiveness of combining tools like Next.js, React, Convex DB, and Eden Ai to build intelligent and responsive personal assistants. React and Next.js provide a smooth, fast user experience, while Convex DB enables real-time session management and persistent storage.Eden AI offers access to various pre-trained AI models through simple APIs, including natural language processing and speech capabilities. Together, these technologies help developers create web-based assistants that understand user input, maintain context, and deliver fast, personalized responses, all with minimal setup and high scalability.**[4]**

Lastly, the literature encourages the use of modular, API-driven architectures for building scalable and adaptable AI systems. Instead of training in-house models, developers can integrate external services to handle complex ML tasks such as language understanding and speech processing. This approach reduces development time and computational requirements. Leveraging Eden AI's suite of APIs, along with a real-time backend like Convex DB and a React-based frontend, aligns with current best practices in building intelligent, efficient, and maintainable web-based personal assistants, enhancing both development efficiency and system performance. **[5]**
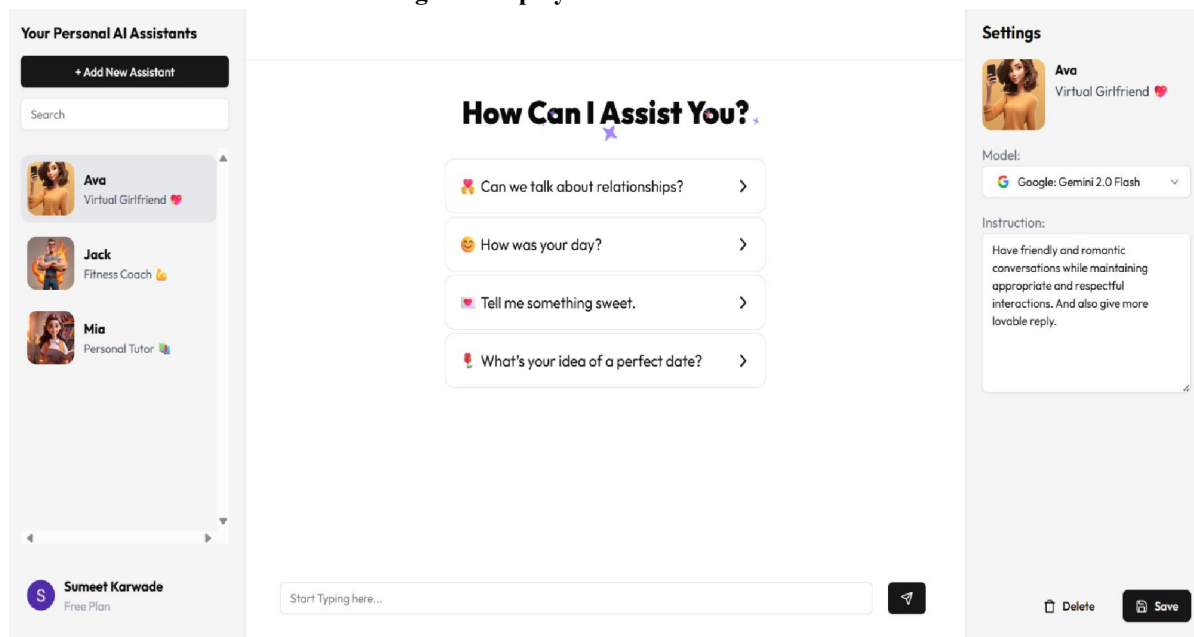
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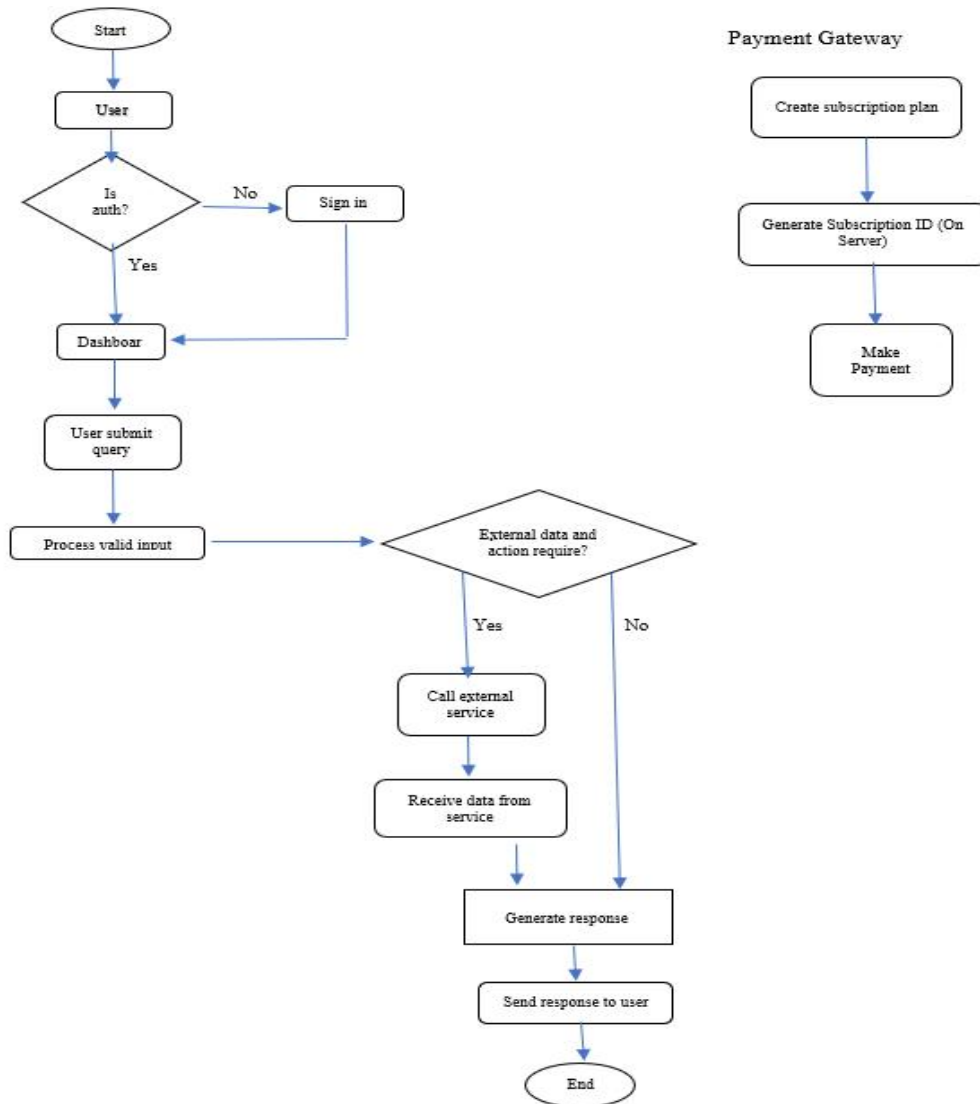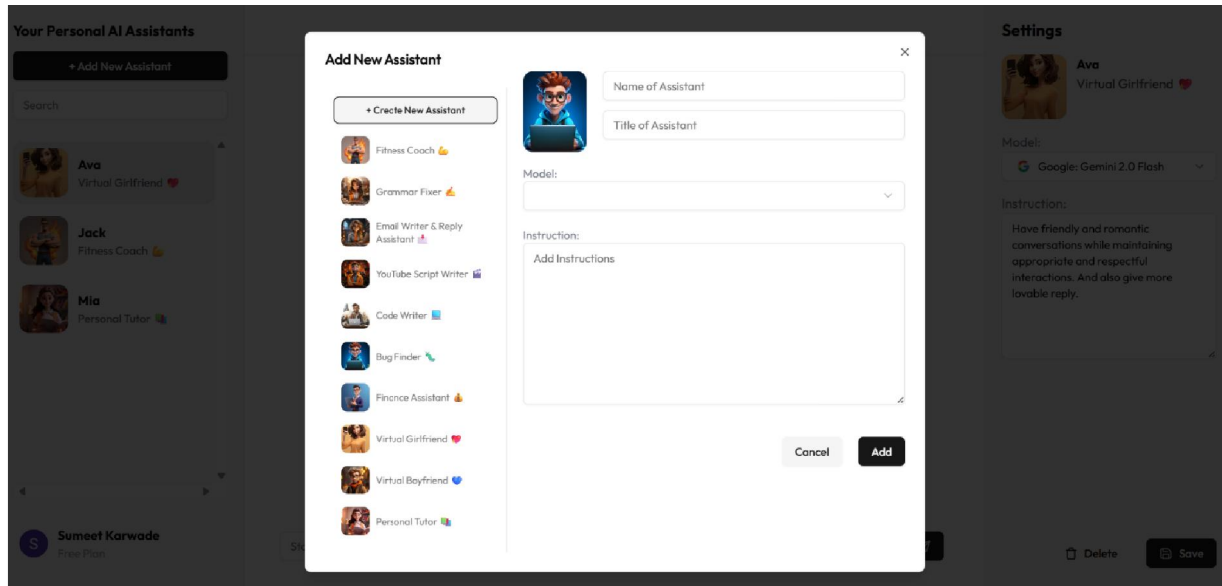
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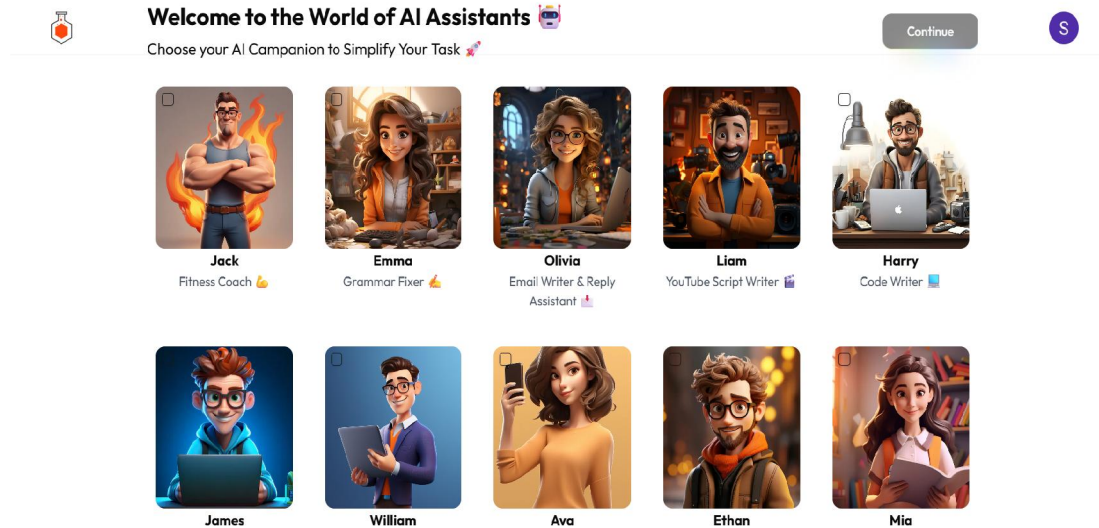
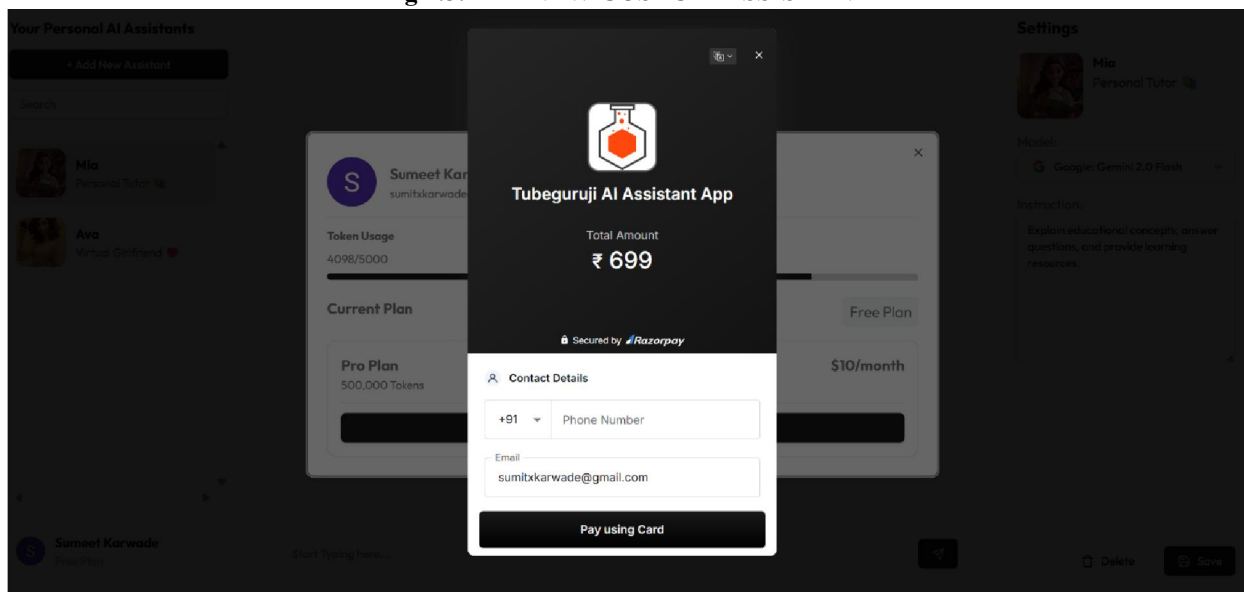**Fig 7.1. Display List Of AI Assistants**

Fig 7.2. CHAT UI Component

Fig 7.3.ADD NEW CUSTOM ASSISTANT

Fig 7.4.PAYMENT GATEWAY

VIII. CONCLUSION

The development of an AI personal assistant using machine learning algorithms, combined with modern web technologies, presents a scalable and efficient solution for intelligent user interaction. By integrating Next.js and React, the system offers a responsive and user-friendly interface, while Convex DB ensures real-time data management and session persistence. The use of Eden AI allows for seamless access to advanced NLP and speech processing capabilities without the need for building complex models from scratch.

This project successfully demonstrates how machine learning can be leveraged through pre-trained APIs to interpret user input, manage dialogue flow, and perform a variety of personal assistant tasks like answering queries. The modular and extensible architecture supports future expansion, including the addition of more intelligent features and personalized recommendations.

In conclusion, the proposed system provides a practical and effective framework for building AI personal assistants in web-based environments. It bridges the gap between advanced AI capabilities and accessible frontend development, making it possible for developers to create intelligent applications that enhance user productivity, engagement, and accessibility.

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