WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

AI-Based Media Generation SaaS Product using Next.JS

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ABSTRACT:

In today's world, artificial intelligence (AI) has become an integral part of our daily lives, transforming industries and enhancing the way we interact with technology. From healthcare to entertainment, AI's applications are vast and continually expanding, driving innovation and efficiency across various sectors.

IntellAI which is the name of our web project is an innovative SaaS product that leverages the power of artificial intelligence to generate media content including images, videos, and music. Built with cutting-edge technologies such as Next.js, React.js, Tailwind CSS, Clerk, Stripe, MongoDB Atlas, and Prisma, IntellAI provides a seamless user experience while ensuring high-quality content generation. The platform integrates Gemini API and Replicate APIs for conversation and media generation, respectively, offering a wide range of AI-powered services.

Keywords: Media Generation, Next.js, React.js, Tailwind CSS, Clerk Authentication, Stripe Payment Processing, MongoDB Atlas, Prisma, Gemini API, Replicate API.

Introduction:

The advent of artificial intelligence (AI) has revolutionized various sectors, including media generation. AI's ability to create images, videos, and music has opened new avenues for creativity and innovation. This paper presents a comprehensive study of "IntellAI," an AI-based Software as a Service (SaaS) product that leverages AI's potential for media generation.

IntellAI is built with cutting-edge technologies such as Next.js, React.js, and Tailwind CSS, providing a robust and efficient framework for the frontend. Next.js offers server-side rendering and static site generation, crucial for high-performance websites, while React.js allows for reusable UI components, enhancing code efficiency and maintainability. Tailwind CSS provides utility classes for custom designs without leaving HTML.

On the backend, IntellAI uses Clerk for secure user authentication and Stripe for reliable payment processing. Data management is handled by MongoDB Atlas and Prisma. The core functionality of IntellAI lies in its integration of OpenAI and Replicate APIs for conversation and media generation, utilizing advanced AI models for creating diverse and high-quality content.

But why we are even Media Generation necessary?

The purpose of media generation is to create various forms of content—such as images, videos, music, and text—using automated or semi-automated processes. This can serve several key objectives:

- Enhancing Creativity: Media generation tools can assist artists, designers, and content creators in exploring new creative possibilities by providing inspiration and generating ideas that they might not have conceived on their own.
- Increasing Efficiency: Automated media generation can significantly speed up the content creation process, allowing creators to produce high-quality content quickly and consistently. This is especially useful for businesses that require a large volume of media content for marketing, advertising, or communication purposes.

- Cost Reduction: By automating parts of the media creation process, organizations can reduce the costs associated with hiring creative professionals or investing in extensive production resources. This makes professional-grade content accessible to smaller businesses and individuals with limited budgets.
- Personalization: Media generation tools can tailor content to specific audiences or individual users. For instance, personalized marketing campaigns can be created based on user data and preferences, increasing engagement and effectiveness.
- Accessibility: These tools democratize content creation, making it accessible to people who may not have specialized skills or training in media production. This opens up opportunities for a broader range of people to express themselves and share their creations.
- Scaling Production: Businesses and creators can scale their production efforts to meet the demands of a growing audience. Automated media generation allows for the consistent production of content without a proportional increase in labor.
- Innovative Applications: Media generation can be used in innovative applications such as virtual reality environments, video game development, and interactive media. These applications often require vast amounts of unique content that can be efficiently produced using AI and automation tools.

Methodology:

When accessing IntellAI, users are greeted with a captivating landing page, where they are prompted to either log in or sign up. The authentication process is facilitated by Clerk, ensuring secure handling of personal information. Upon successful authentication, users are redirected to the IntellAI dashboard, a centralized hub showcasing the platform's array of AI-powered services.

From the dashboard, users can explore the diverse range of services offered by IntellAI. Each service prompts users to input a specific query or prompt. Once the prompt is entered, users simply click the "Generate" button, initiating the content generation process. Within a mere 15 seconds, IntellAI processes the input and delivers the generated result to the user.

For users on the free tier, access to services is limited to 10 uses. Upon reaching this limit, users are prompted to upgrade to IntellAI Plus for continued access. Upgrading to IntellAI Plus is seamless, with a subscription fee of 3.50 rupees. This transaction is securely facilitated by Stripe, ensuring a smooth payment process.

To further enhance user experience, IntellAI incorporates a crisp chat feature. This feature enables users to communicate directly with developers for assistance or troubleshooting. Whether it's addressing technical issues or seeking guidance on maximizing the platform's capabilities, users can rely on real-time support from the IntellAI team.

API Routing:

In the context of IntellAI's API routing, the process begins when a user sends a prompt through the Axios library, which formats the message into an array. The API endpoint corresponding to the specific service receives this message and forwards it to the service provider, ensuring security by validating the secret and public keys stored in the .env file. Once the message is successfully received and authenticated, the server processes the prompt and generates the desired output. This output is then sent back to the API, which, in turn, returns it to Axios in array format. Finally, Axios returns the output to the user interface, where it can be displayed for the user's interaction and utilization. This orchestrated routing mechanism ensures efficient communication between the user interface, API, and external service providers, enabling seamless integration and delivery of AI-generated content to the end user.

The process of integrating Stripe into your application involves configuring webhooks to receive real-time notifications from Stripe about events like payments, customer updates, and subscription changes. These webhooks are set up in your Stripe dashboard, where you specify endpoint URLs to handle incoming event data. Upon receiving a webhook notification, your application processes the event data, typically verifying its authenticity using signatures provided by Stripe, and then performs appropriate actions based on the event type, such as updating your database, sending email notifications, or triggering other business logic. Additionally, interacting with Stripe's services programmatically is facilitated through the Stripe API, which provides HTTP endpoints for actions like creating customers, processing payments, and managing subscriptions. Authentication with the Stripe API is achieved using unique keys, allowing secure communication between your application and Stripe's servers. Responses from the Stripe API are typically in JSON format, providing detailed information about the results of requested operations or any encountered errors.

Objective:

1. Enhance Creativity: Provide users with AI-powered tools to explore new creative possibilities in media generation.
2. Increase Efficiency: Automate the content creation process to produce high-quality media quickly and consistently.
3. Cost Reduction: Offer affordable media generation solutions, making professional-grade content accessible to smaller businesses and individuals.
4. Personalization: Enable the creation of tailored content to specific audiences or individual user preferences.
5. Accessibility: Make advanced content creation tools available to users without specialized skills or training.
6. Scalability: Allow businesses and creators to scale their content production to meet increasing demands.
7. Innovation: Support innovative applications in virtual reality, video game development, and interactive media.

Results

Here are some results from our website:

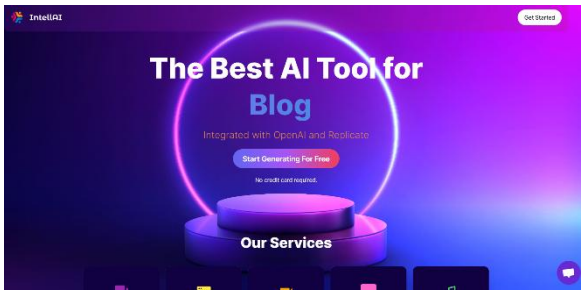

Fig 1: Landing Page

Deploying on Vercel significantly enhances web performance, as evidenced by the swift 5-second page load time, which is notably faster compared to local hosting which takes about 10 to 15 sec to load. This improvement is due to Vercel's optimized infrastructure that ensures rapid content delivery and scalability.

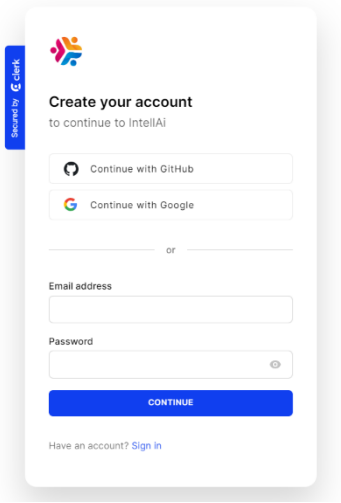

Fig 2: Signup Page

Clerk helps to establish a secured authentication with seamless user interface.

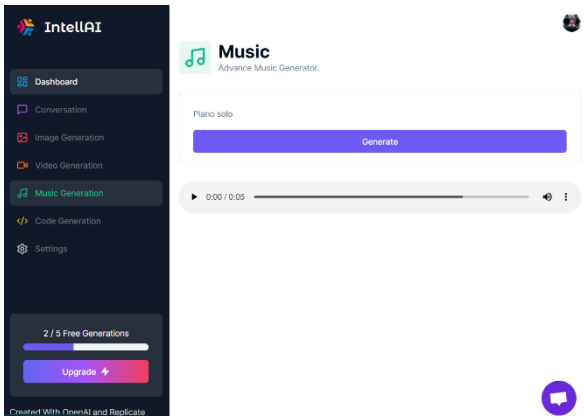

Fig 3: Music Generator

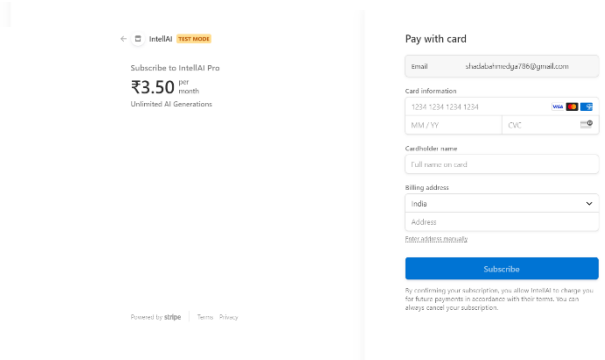

Fig 4: Stripe Checkout Page

The Stripe checkout page presents a straightforward and secure subscription process for IntellAI Pro, priced at an affordable ₹3.50 per month, offering unlimited API generations. Prospective subscribers are prompted to provide their email and card details, including the card number, expiry date, and CVC, along with the cardholder's name and billing address. The layout is designed for ease of use, with a clear "Subscribe" button to finalize the transaction. Additionally, the page includes a note informing users that by subscribing, they agree to initiate a setup fee payment and accept the terms of service. This efficient design ensures a seamless and transparent user experience.

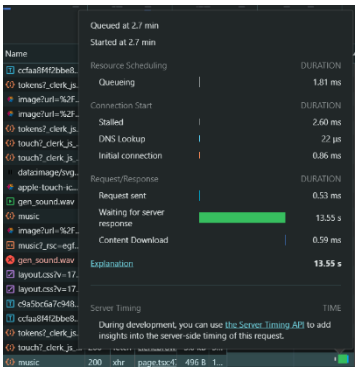

Fig 5: Performance of Music Generator

Even though the server latency that up to 13sec which is alarming but the output it generator is faster than we expect.

Conclusion

A framework like Next.js comes with numerous useful features and optimizations built-in, making it an evolving process rather than a one-time act. The Vercel team designed Next.js to streamline the experience of building web applications, aiming to simplify development and accelerate product delivery. In our project, IntellAI, we utilized Next.js extensively, and this paper delves into our comprehensive experience with this framework. Throughout the development of IntellAI, we encountered various challenges and opportunities for optimization, which Next.js helped us navigate effectively.We discuss the specific features of Next.js that were particularly beneficial, such as server-side rendering, static site generation, and its powerful routing capabilities. These features not only enhanced the performance and SEO of IntellAI but also significantly improved our development workflow. By leveraging Next.js, we were able to build a robust, scalable, and high-performance application that meets modern web standards.

Moreover, we share the lessons learned during our development journey, including best practices for optimizing web applications and the benefits of integrating other technologies such as React.js and Tailwind CSS with Next.js. Our goal is to provide a detailed account of our experiences, offering valuable insights and practical tips for other developers working with Next.js.

In conclusion, we hope this paper serves as a useful resource for developers looking to harness the power of Next.js in their projects. Our experiences with IntellAI demonstrate the potential of Next.js to simplify and enhance web application development, making it an indispensable tool for modern developers.

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