



# AI-Enhanced Nail Design Assistant for Nail Technicians

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## Introduction

Nail artistry has become one of the fastest-growing areas of the beauty industry, yet the creative workflow behind it remains surprisingly unsupported by technology. Nail technicians spend significant time searching platforms like Pinterest and Instagram for inspiration during or between appointments - a process that is repetitive, non-personalized, and often stressful when clients expect something unique. Meanwhile, the U.S. nail salon market is projected to exceed \$4.3 billion by 2030, and global demand continues to rise (Grand View Research). This growing industry relies heavily on creativity, but the tools available to technicians focus almost entirely on logistics such as scheduling and payments, not artistic ideation.

At the same time, modern text-to-image AI models like DALL-E and Stable Diffusion can generate high-quality custom visuals from simple prompts. These tools have transformed fields like makeup, fashion, and digital art, but they are not currently adapted for nail professionals or integrated into the salon workflow. This project aims to bridge that gap by developing an AI-Enhanced Nail Design Assistant: a mobile iOS app that helps technicians quickly generate personalized nail design concepts using natural-language prompts, while also supporting client profiles and appointment organization.

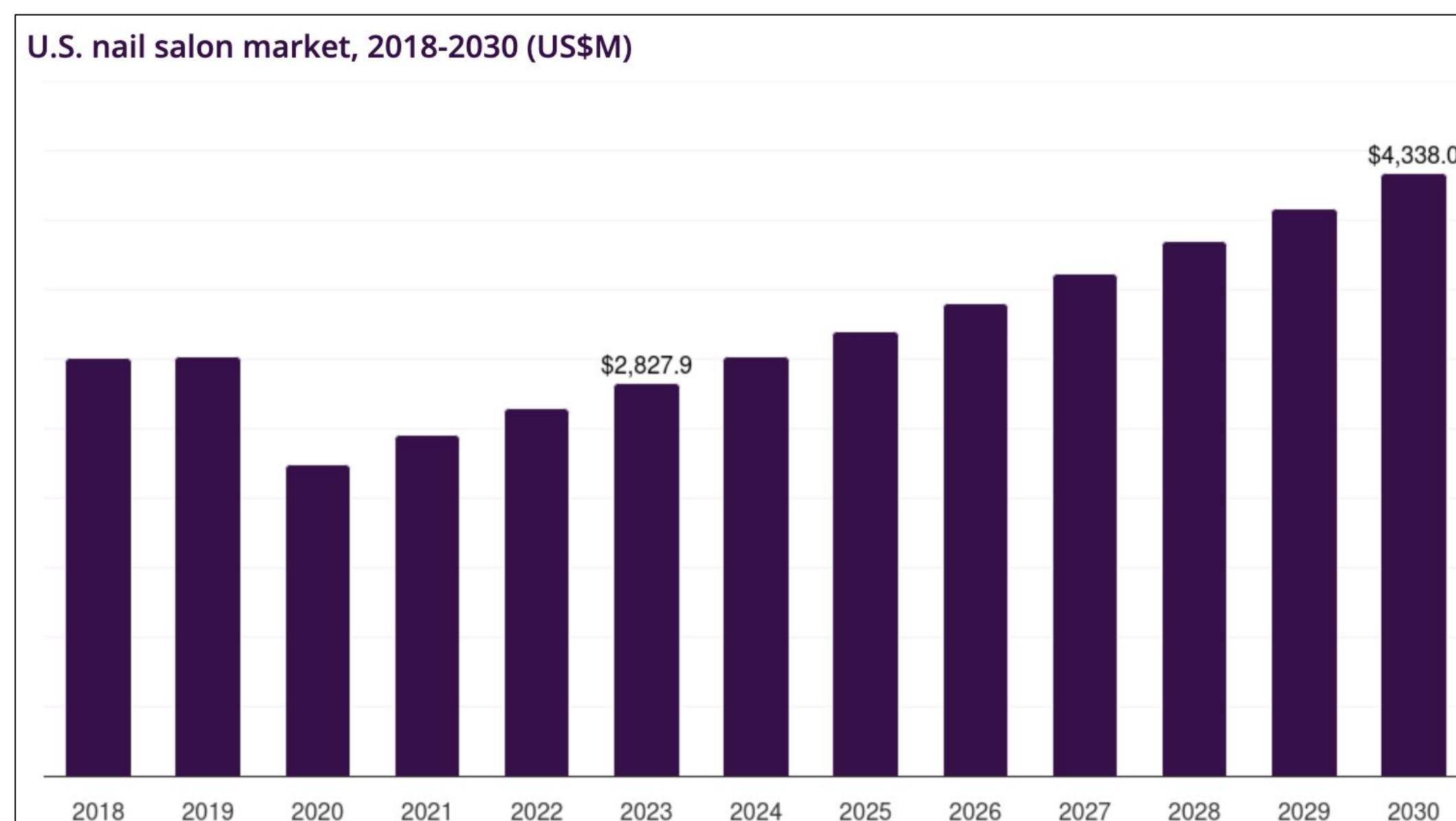


Figure 1. Projected growth of the U.S. nail salon industry (GrandView Research)

## Methodology

### App Architecture

The AI-Enhanced Nail Design Assistant is built as a native iOS application using SwiftUI. The app's primary features - Calendar, Clients, and AI Helper - are organized through a TabView navigation system for simple movement between sections. Backend services run on Firebase, which handles user authentication and structured data. Firestore stores client information, appointment details, and references to generated designs.

### Backend Infrastructure

→ Authentication: Secure login using Firebase Auth  
→ Data Storage: Client profiles, appointment history, and saved design references stored in Firestore

### AI Design Generation

AI designs are created using the OpenAI Images API, accessed through a Node.js backend. When a user enters a natural-language prompt, the app sends it to the Node server, which communicates with OpenAI and returns the generated image to the AI Helper view. Users can save design information to client profiles for future reference. The project follows an iterative, user-centered development approach.

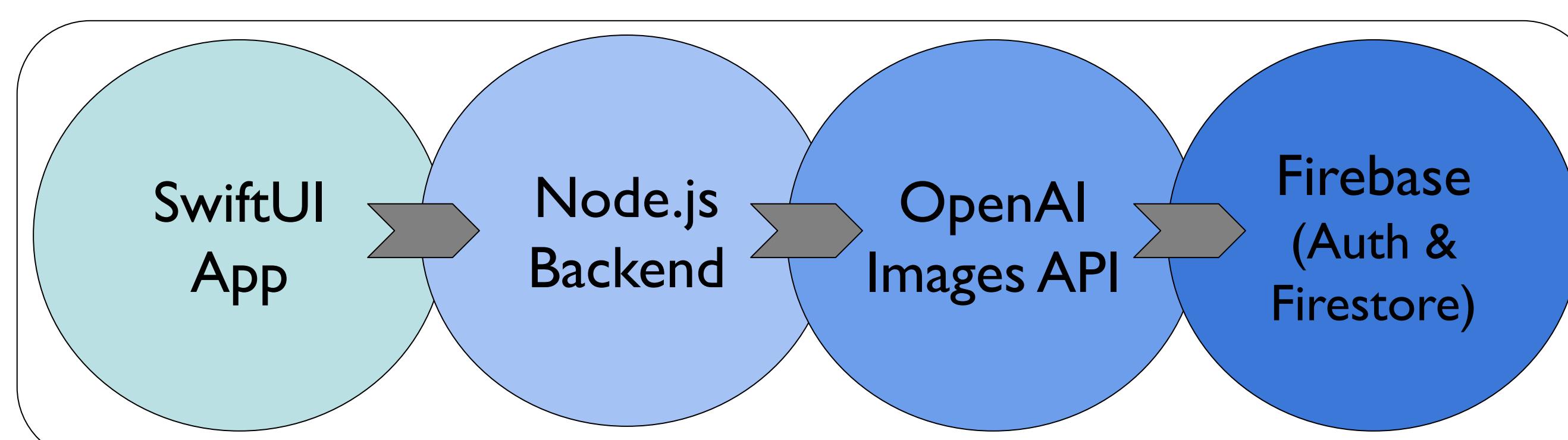


Figure 2. System flow for AI design generation and data storage.

## Results

The finished prototype of the AI-Enhanced Nail Design Assistant successfully demonstrates all core features planned for the system. The app presents a fully functional interface that allows nail technicians to create prompts and instantly generate original nail art concepts using the integrated AI engine. The generated images display in a clean gallery format, and users can save designs directly into each client's profile, creating a centralized visual history that can be referenced during appointments.

The Calendar section supports adding and viewing appointments, giving technicians a clear overview of upcoming sessions. The Clients section allows storing client details, design preferences, and saved AI outputs, creating a streamlined record-keeping system within the app. All stored designs and client information remain accessible across sessions, supporting a consistent workflow as the user navigates through different parts of the application.

Overall, the completed system shows that AI image generation can be effectively incorporated into a salon-focused mobile application. The results demonstrate that the app can reduce time spent on design ideation, help technicians prepare personalized looks more efficiently, and serve as a practical foundation for future enhancements.

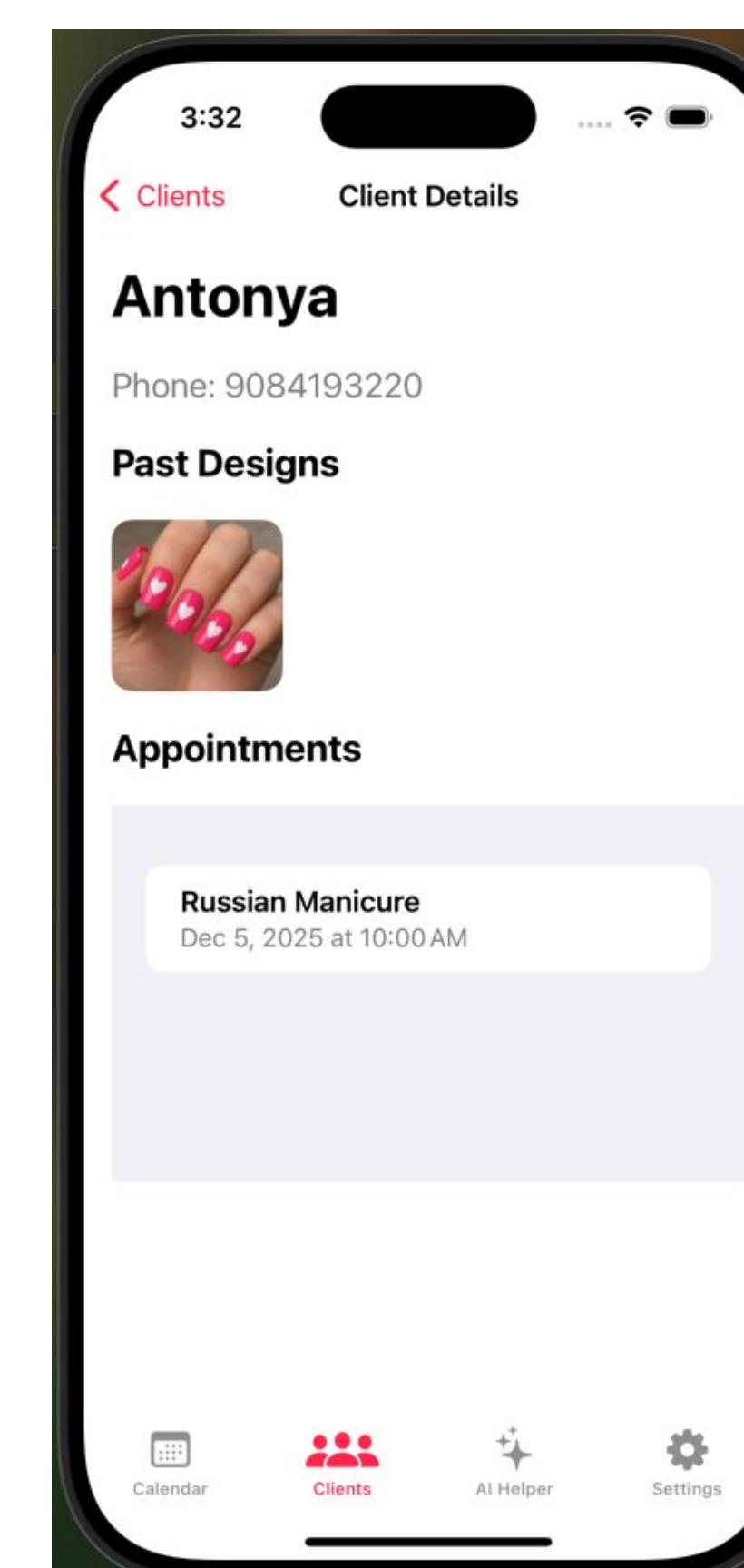


Figure 3. The Clients view stores individual client information and saved AI-generated designs.

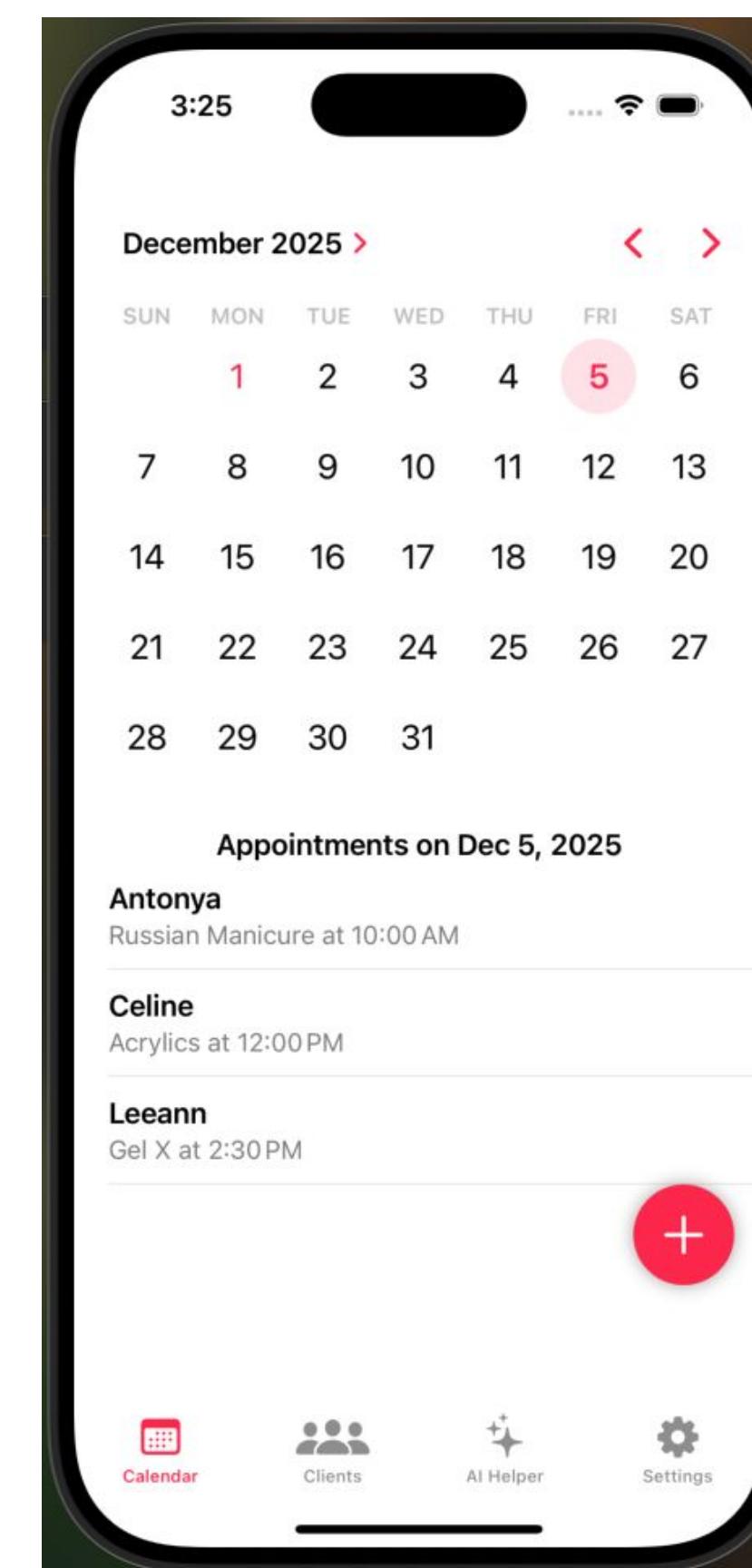


Figure 4. The Calendar view allows technicians to track and manage appointments within the app.

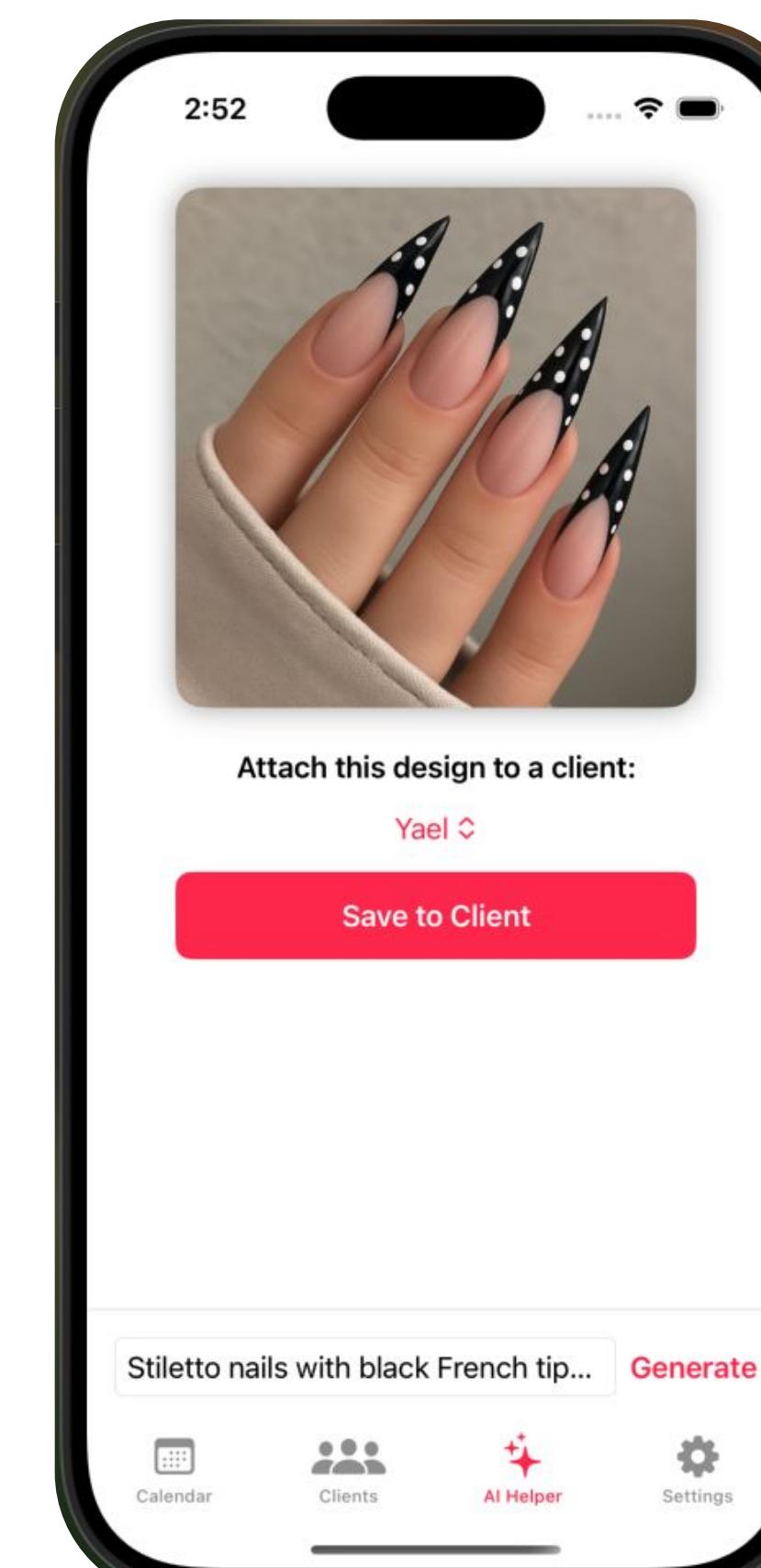


Figure 5. Example of AI-generated nail designs produced from a natural-language prompt.

## Conclusions

The AI-Enhanced Nail Design Assistant shows that AI-generated imagery can be effectively incorporated into a salon-focused mobile app. The system produces custom nail designs from natural-language prompts and organizes them alongside client and appointment information, reducing the time technicians spend searching for inspiration. By combining creative support with practical workflow tools, the app offers a more efficient and personalized design process. The prototype also provides a strong foundation for future enhancements such as expanded design customization and preference-based recommendations, demonstrating the potential of AI as a creative partner in beauty technology.

## Literature Cited

GrandView Research. United States Nail Salon Market Size & Outlook, 2023–2030.

## Acknowledgements

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## Further Reading

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