Ceylon Sapphire Website – Technical Documentation

1. Project Overview

Ceylon Sapphire is a modern e-commerce and educational gemstone platform developed using Next.js and TypeScript. The primary objective of the system is to showcase and sell Sri Lankan gemstones online while also providing educational content about gems, cutting processes, and industry profiles.

2. Technology Stack

1. Frontend: Next.js 15+, TypeScript, Tailwind CSS
2. 3D Visualization: Three.js rotating ring
3. Backend: External REST API
4. Configuration: Environment variables (.env)
5. Tools: npm, ESLint, VS Code

3. Project Initialization

The project was initialized using the official Next.js starter template. TypeScript, Tailwind CSS, and App Router were enabled during setup to ensure scalability and modern best practices.

4. Environment Configuration

The backend connection is managed through environment variables. The NEXT_PUBLIC_BASE_URL is used across the application to dynamically connect frontend pages with backend APIs.

5. Implemented User Features

1. Home, Shop, Encyclopedia, Gem Cutting, Blog, About, and Contact pages
2. Multi-role profile system (Cutter, Treatment, Seller, Labs)
3. Dynamic gem fetching from backend
4. Responsive Tailwind user interface
5. Three.js rotating ring visualization

6. Cart and Cutting Process Automation

The system includes an automated cart update mechanism. When a user adds a gemstone to the cart, the related cutting process and associated data are automatically updated in the interface. This ensures real-time synchronization between user actions and product processing information, improving the overall shopping experience and accuracy of gemstone workflow tracking.

7. Admin Dashboard Integration

Administrators can add gemstones and blog content through the admin dashboard. Once added, the data is stored in the backend database and automatically fetched and displayed on the user-facing website in real time.

8. Pending Features

1   Compare Wishlist
2   User Account Page
3   Location Module
4   Complete Profiles Main Page

9. Conclusion

The Ceylon Sapphire platform successfully demonstrates a modern gem-selling architecture using Next.js. With dynamic backend integration, automated cart behavior, and 3D visualization, the system provides a strong foundation for a full-scale gemstone marketplace. Future enhancements will further improve user personalization and e-commerce capabilities.