

**Bachelor of Software Engineering
Centre for IT Education (CITES)
Department of Electrical and Computer Engineering
The Open University of Sri Lanka**

**EEY4189 - Software Design in Group
PROJECT PROPOSAL**

**Gem Nest
Mobile Application**

Team: HY_2

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Supervisor's Approval

The supervisor will review this document and hereby agree that the contents herein are accurate. Any changes to this document must be communicated in writing and signed off by the supervisor.

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Table of Contents

1.	Introduction and Background.....	4
1.1.	Introduction	4
1.2.	Background.....	4
2.	Problem Statement and Project Objectives	5
2.1.	Problems.....	5
2.2.	Objectives.....	6
3.	Introduction to a similar type of System	7
4.	Proposed Solution	8
4.1.	high level use case diagram	8
5.	Technology planning to use.....	10
6.	Project Timeline and Conclusion	11
6.1.	Project Timeline.....	11
6.2.	Conclusion.....	11

1. Introduction and Background

1.1. Introduction

The gemstone industry represents a significant sector of the global luxury market, encompassing precious stones, semi-precious stones, and jewelry components that hold both aesthetic and investment value. However, gem traders, collectors, and enthusiasts often face challenges in accessing transparent markets and obtaining fair valuations for their precious stones. The emergence of mobile technology presents an unprecedented opportunity to revolutionize this traditional industry by creating a digital platform that facilitates the selling, buying, and auctioning of gemstones through secure online transactions.

This project aims to develop a comprehensive mobile application designed to connect gem sellers directly with buyers, collectors, and investors, enabling efficient transactions and transparent pricing mechanisms. The application will serve as a specialized digital marketplace where gem owners can list their precious stones for direct sale or auction, while buyers can bid on or purchase these gems with confidence and ease.

1.2. Background

The traditional gemstone trading market has historically relied on physical auctions, gem shows, and established dealer networks, which often involve multiple intermediaries that can significantly reduce profits for individual sellers. Additionally, geographical limitations restrict sellers to local markets, limiting their ability to reach global collectors and investors who might offer better prices for their precious stones. These conventional systems also lack real-time market data and transparent pricing mechanisms, making it difficult for both sellers and buyers to make informed decisions about gem valuations and market trends.

Existing online platforms for gemstone trading either lack comprehensive auction features, proper authentication systems, or do not cater specifically to the unique requirements of gem trading, such as detailed gem certification, high-quality imaging, and secure payment processing for high-value transactions. By leveraging cutting-edge mobile technology, blockchain for authentication, and real-time market data capabilities, our proposed GemNest application aims to address these critical limitations. The app will provide an intuitive, secure interface where gem sellers can create detailed listings with professional photography and certification documents, while buyers can participate in auctions or make direct purchases with complete transparency and security.

2. Problem Statement and Project Objectives

2.1. Problems

Gem sellers, collectors, and traders frequently encounter significant difficulties in accessing global markets and securing fair, transparent valuations for their precious stones. The traditional gemstone market is fragmented, opaque, and often dominated by intermediaries who reduce profit margins for individual sellers. To address these challenges, we aim to establish a comprehensive online platform specifically designed for gem enthusiasts to list, showcase, and auction their precious stones on a global scale, fostering transparent, competitive pricing and authentic gem trading.

This platform will serve as a specialized digital marketplace, connecting gem sellers directly with collectors, investors, and buyers worldwide. By integrating advanced features such as gem authentication systems, professional photography tools, market trend analysis, and secure payment processing, the platform will enhance the overall trading experience. The application will make it seamless for sellers to create detailed, professional listings and for buyers to navigate, evaluate, and bid on authenticated gemstones with confidence.

2.2. Objectives

Centralize: Create a comprehensive online platform for gem sellers to list and auction precious stones globally, ensuring transparent, competitive pricing and authentic gem trading with proper certification and authentication systems.

Empower: Enhance user experience with an intuitive interface featuring professional photography tools, real-time market analysis, secure payment processing, and instant notifications for new listings, auction updates, and market trends.

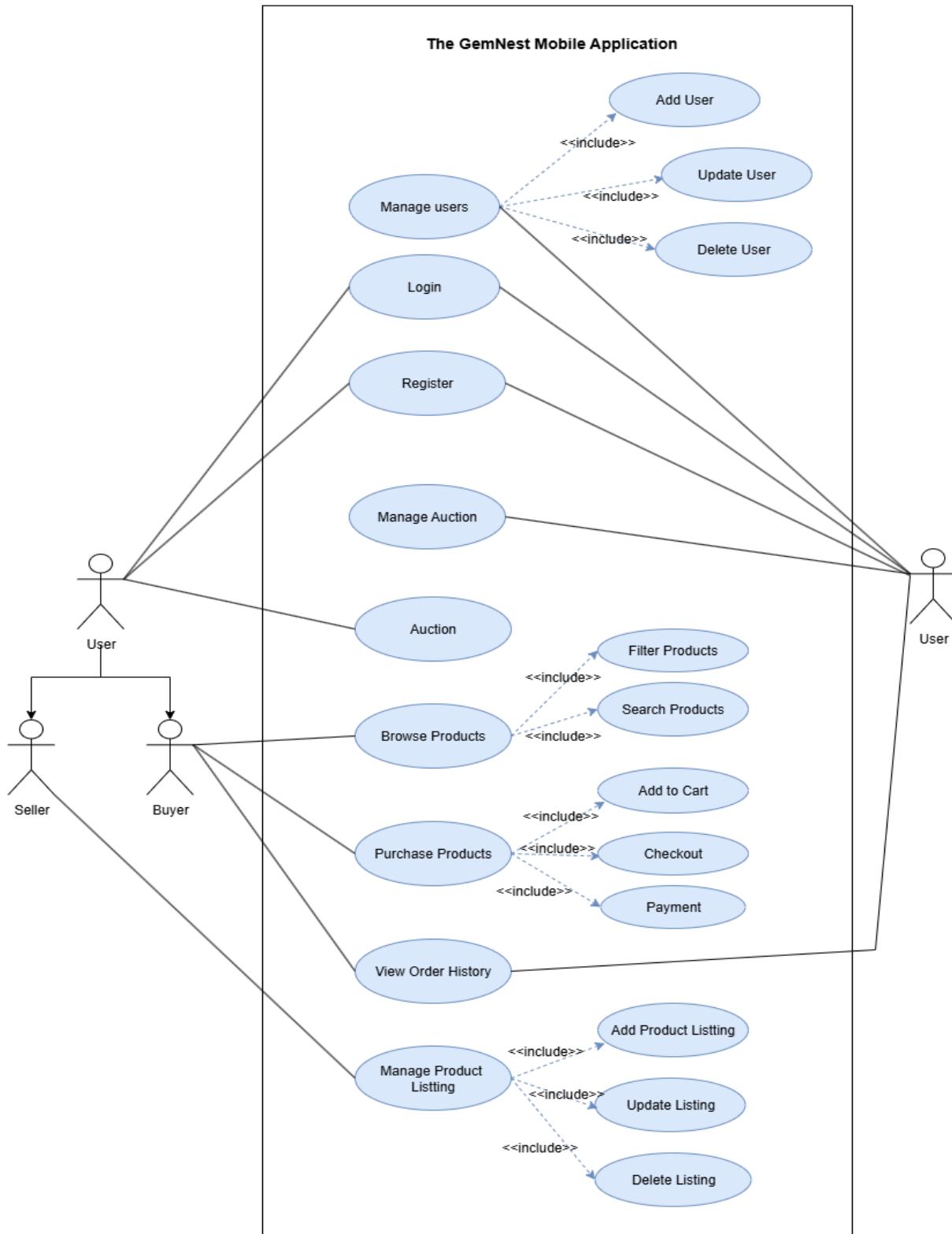
Authenticate: Implement robust gem authentication and certification systems to ensure buyer confidence and maintain market integrity through verified gem documentation and expert validation processes.

3. Introduction to a similar type of System

Feature	 CEYLON GEM HUB	 PRESTIGE GEMS Fine Gems and Jewelry	 GEM ROCK auctions
Target Users	Gem dealers, collectors, and international buyers worldwide	Local and foreign clientele seeking certified Ceylon Sapphires	Global gemstone collectors, buyers, and verified sellers worldwide
Core Functionality	Online platform for buying Ceylon gemstones with real-time stock updates and global delivery	Direct sales of natural Ceylon Sapphires with custom jewelry creation services	Leading global online marketplace with comprehensive auction system
Unique Selling Points	Direct access to live gem stocks from Sri Lankan markets eliminating middlemen, partnership with 200+ dealers, over 3 decades of experience	Over 35 years of experience, custom jewelry design, international shipping within 3 weeks, WhatsApp communication	Rigorous seller verification, comprehensive Gemstone Encyclopedia, educational resources, wide variety of categories
User Interface	Simple and user-friendly online marketplace	Professional website with customer review system	Easy-to-use online bidding system with educational platform integration
Access	Global access with worldwide shipping	Global access with international shipping	Global marketplace with international reach
Auction Features	Limited auction capabilities, primarily direct sales	No auction system, direct sales only	Advanced auction system with multiple auction types and categories

4. Proposed Solution

4.1. high level use case diagram



1. Gem Seller:

- **Login:** Gem sellers can securely log into the system
- **Register:** Gem sellers can register to create verified accounts
- **Manage Gem Listings:** Sellers can comprehensively manage their gem listings, including:
 - **Add Gem Details:** Adding new gemstones with detailed specifications
 - **Upload Certificates:** Uploading authentication and certification documents
 - **Update Listing:** Updating existing gem details and pricing
 - **Delete Listing:** Removing gemstones from the marketplace
- **Manage Auctions:** Sellers can create and manage auctions for their gemstones
- **Market Analysis:** Access real-time market trends and pricing data
- **Transaction History:** View complete sales and auction history

2. Gem Buyer:

- **Login:** Buyers can securely log into the system
- **Register:** Buyers can register and verify their accounts
- **Browse Gemstones:** Buyers can explore available gemstones, including:
 - **Advanced Search:** Search for specific gem types, cuts, colors, and certifications
 - **Filter Options:** Filter gems by price, carat weight, origin, and certification
- **Purchase Gemstones:** Buyers can purchase gems through:
 - **Add to Cart:** Adding gemstones to shopping cart
 - **Secure Checkout:** Advanced checkout with multiple payment options
 - **Payment Processing:** Secure payment with escrow services
- **Auction Participation:** Participate in live and timed auctions
- **View Order History:** Access complete purchase and bidding history
- **Authentication Verification:** Verify gem authenticity through blockchain records

3. System Administrator:

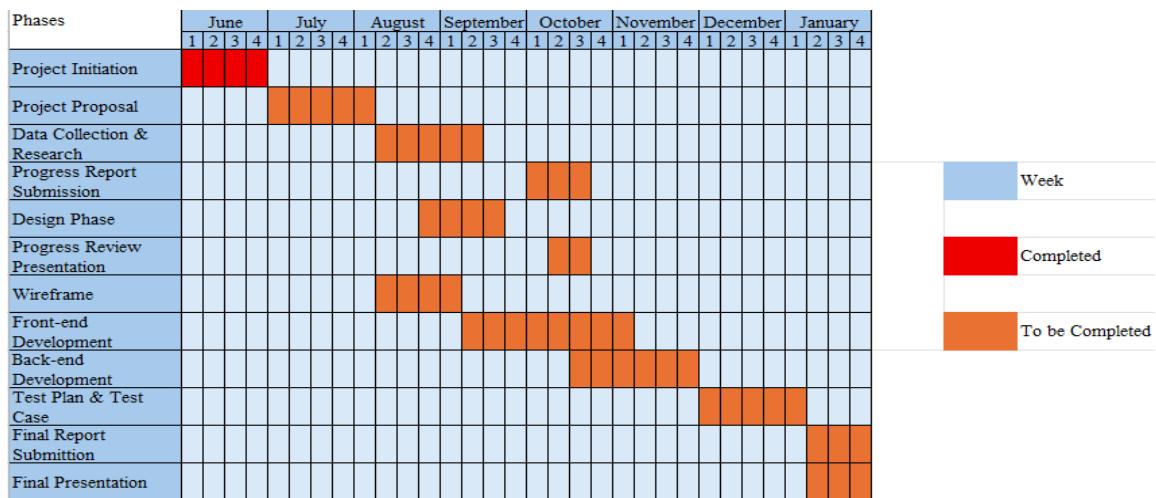
- **Login:** Admins can access the administrative dashboard
- **User Management:** Comprehensive account management:
 - **Add User:** Creating new user accounts
 - **Update User:** Modifying user account details
 - **Delete User:** Removing user accounts
 - **Verify Accounts:** Validating seller and buyer credentials
- **Gem Listing Management:** Oversee all gem listings and auctions
- **Authentication Oversight:** Monitor and verify gem authentication processes
- **Transaction Monitoring:** Oversee all transactions and resolve disputes
- **Market Analysis:** Generate market reports and trend analysis
- **Security Management:** Ensure platform security and fraud prevention

5. Technology planning to use

- **SDK:** Flutter
- **Programming Languages:** Dart
- **Integrated Development Environment (IDE):** Visual Studio Code
- **Database:** Firebase Firestore, SQLite
- **Authentication:** Firebase Authentication
- **Payment Processing:** Stripe
- **Version Control System:** GitHub
- **Project Management Tool:** Trello

6. Project Timeline and Conclusion

6.1. Project Timeline



6.2. Conclusion

In conclusion, the GemNest Mobile Application is positioned to revolutionize the gemstone trading industry by offering a comprehensive, secure digital solution tailored specifically to the needs of gem sellers, collectors, and investors. This application will dramatically enhance market accessibility, ensuring that gem owners can reach a global audience and obtain fair, transparent valuations for their precious stones.

By incorporating a sophisticated auction mechanism coupled with blockchain-based authentication, the app promotes transparent pricing while maintaining the integrity and authenticity that is crucial in the gemstone market. The integration of real-time market analysis, secure payment processing,

Furthermore, the implementation of instant notifications and market updates will ensure that users are always informed about the latest gem listings, auction activities, and market trends. This comprehensive approach will significantly improve the efficiency of gemstone transactions while building trust and confidence in the digital gem trading ecosystem, ultimately democratizing access to the global gemstone market for sellers and buyers alike.