



Online Auction App FYP-026/FL24

Software Requirements Specifications

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1. Introduction

The Online Auction System simplifies auctions by allowing users to bid on items, offering a competitive pricing model. It includes a user profile management system, auction module with item descriptions and bidding conditions, and a time-dependent bidding system that tracks bid history. A chatting system enables direct price negotiations, while admins can manage auctions, user accounts, and disputes. Users are notified of auction updates, and the app is mobile-optimized for easy access on the go.

1.1 Purpose of Document

The purpose of this document is to provide a detailed Software Requirements Specification (SRS) for the Online Auction App. This document outlines the system's functionality, performance, and operational requirements to ensure the successful implementation and deployment of the application.

1.2 Intended Audience

The Online Auction System is designed for users looking for a simple and competitive way to bid on items. It offers a secure profile management system, detailed auction descriptions, and a real-time bidding experience. Users can communicate directly for price negotiations and stay updated with auction changes. Admins can easily manage auctions and resolve user issues, while the mobile-friendly design ensures convenient access anytime, anywhere.

1.3 Abbreviations

SRS: Software Requirements Specification

AI: Artificial Intelligence

SDK: Software Development Kit

IDE: Integrated Development Environment

UI: User Interface

UAT: User Acceptance Testing

CRUD Create, Read, Update, Delete

LAN: Local Area Network

IP: Internet Protocol

2. Overall System Description

2.1 Project Background

The online shopping platform is designed to overcome the limitations of traditional e-commerce platforms, which basically offer fixed pricing with no flexibility for customers to negotiate or bid on products role. This application provides a dynamic and interactive environment in which users can engage in real-time trading, giving sellers the opportunity to maximize profits and provide buyers with competitive deals.

To accomplish this, the app uses modern technologies such as Flutter and Dart to create a functional and efficient interface. Google Firebase acts as a database, ensuring data stability, real-time updates, and secure storage. The app has advanced features such as secure email authentication, real-time notifications of new announcements, and chat features, which empower buyers and sellers communicate directly, creating transparency and trust

The app is designed to meet both practical and non-functional needs. Functional requirements include things like store names, checkout options, and user profile management, while non-functional requirements focus on better performance, reliability, and advanced security measures, including password protection and including low latency.

During testing, the app takes several steps to ensure quality and compliance. Unit testing validates individual components, integration testing monitors the interactions between these components, and system testing examines all application functionality. Finally, user acceptance testing (UAT) ensures that the app is global personal expectations, making it user-friendly and effective.

The significance of this project lies in its ability to provide a platform for buyers and sellers to engage in business dynamically. Features such as product categorization, wishlist creation, and personalized messages make it a comprehensive solution for modern auction needs. The Online Auction App bridges the gap between traditional e-commerce and live auction systems, making it an innovative tool for enhancing online trade.

The importance of this project lies in its ability to offer a platform for customers and dealers to interact in enterprise dynamically. Features inclusive of product categorization, wishlist introduction, and customized messages make it a complete solution for current auction wishes. The Online Auction App bridges the distance among conventional e-trade and live auction systems, making it an progressive device for enhancing on line alternate.

2.2 Problem Statement

The problem statement highlights the limitations of present e-trade apps, that specialize in their reliance on fixed pricing fashions. These apps do now not allow buyers to negotiate or bid on

merchandise, creating a gap that the Online Auction System pursues to cope with via introducing real-time bidding.

2.3 Project Scope

The scope of the application describes the main features and functions of the Online Auction App:

- User management: Managing registration, access, and user information.
- Auction List: To include items for auction with information such as start/end times and minimum bids.
- Bidding : Enable real-time bidding and update users on the current bid status.
- Chat system: facilitates communication between buyers and sellers during negotiations.
- Chat bot: Assist users by providing automated responses and enhancing the overall user experience.
- Administration: Managing user accounts, selling and resolving disputes.
- Reports: Sends real-time updates on auctions and bids.
- Mobile Compatibility: Make sure the application is responsive and accessible on all devices.

2.4 Not in Scope

While not explicitly stated, potential Not in Scope items might include:

- Integration with external e-commerce platforms.
- Handling physical delivery of auctioned items.
- Advanced AI-driven price prediction or bidding suggestions.
- Support for desktop platforms.

2.5 Project Objectives

The objectives of the Online Auction System include:

- Providing a secure, user-friendly platform for online auctions.
- Empowering users to buy or sell goods dynamically through bidding.
- Enhancing business opportunities for sellers and offering competitive deals for buyers.
- Facilitating real-time interactions between users for negotiations.
- Ensuring seamless, responsive operation on mobile devices.

2.6 Stakeholders& Affected Groups

Key stakeholders and affected groups include:

- Buyers: Individuals looking for competitive prices and unique items.

- Sellers: Individuals or businesses aiming to reach a broader audience and maximize profits.
- Administrators: Responsible for managing auctions, user disputes, and overall system integrity.
- Developers: Maintaining and updating the app's functionalities.
- Educational Institutions: Using the project as a model for future academic work.

2.7 Operating Environment

The app operates on:

- Mobile Devices: Designed primarily for Android, with potential expansion to iOS.
- Firebase Database: Ensures real-time data updates, secure storage, and robust performance.
- Dart & Flutter Frameworks: Providing a cross-platform development environment optimized for mobile applications.

2.8 System Constraints

- Performance Limitations: Excessive traffic may lead to lag or increased firebase costs.
- Database Dependency : Full reliance on firebase for real-time functionality and storage.
- Platform Restriction: Initially limited to mobile platforms, without desktop support.
- Financial Constraints: Limited resources for scalability and premium hosting services.

2.9 Assumptions & Dependencies

Assumptions:

- Users will have access to stable internet connections for real-time bidding.
- Firebase services will remain affordable and reliable for project needs.
- Buyers and sellers will adhere to platform rules to minimize disputes.

Dependencies:

- Reliance on Firebase for backend operations.
- Compatibility with Android devices during initial implementation.

3. External Interface Requirements

3.1 Software Interfaces

The application interfaces with the following software:

- **Firestore Backend Services:**
 - **Firestore Real time Database:** For storing auction listings, user profiles, and bid updates.
 - **Firestore Authentication:** For user sign-in, sign-up, and email verification.
 - **Firestore Messaging:** For sending notifications to users regarding auctions and bids.
- **External Owners:** Firestore, owned by Google, manages the backend operations, including database hosting, authentication services, and notification delivery.
- **Interface Details:**
 - Firestore APIs are used to integrate these services, ensuring seamless communication between the app and the backend.

3.2 Communications Interfaces

The app relies on the following communication interfaces:

- **Network Communication:**
 - **Wi-Fi/Cellular Network:** The app requires an active internet connection to interact with the Firestore services for real-time data sync.
 - **REST APIs:** Used to interact with Firestore for CRUD (Create, Read, Update, Delete) operations.
- **Communication with Devices:**
 - **Push Notifications:** Delivered through Firestore Cloud Messaging, ensuring users receive updates on auctions and bids.
- **Local Area Network (LAN):**
 - Although not explicitly stated, the app can be used over a secure local network if configured, but its primary reliance is on cloud-based communication.

4. System Functions / Functional Requirements

4.1 System Functions

1. User Functionalities

1.1 User Registration:

- Users can create an account by registering with their personal details, including name, email, password, and contact information.
- Email verification is required to activate the account.

1.2 User Login:

- Registered users can log in using their email and password.
- A password reset feature is available for users who forget their credentials.

1.3 Homepage Access:

- After successful login, users are directed to a personalized homepage displaying auction highlights, popular items, and ongoing bids.

1.4 Add Bids:

- Users can view auction items and place bids.
- The system displays the current highest bid and allows users to input their own bid.
- Users receive notifications when they are outbid.

1.5 View Items by Category:

- Users can browse items organized into categories and subcategories for easier navigation.

1.6 Post an Auction:

- Users can post their own auction by providing item details, images, starting bid, and auction duration.
- The auction will be visible to all users once approved.

1.7 Chat System:

- A chat system enables users to communicate with one another in real-time.
- Public chat rooms and private messaging are supported.

2. Admin Functionalities

2.1 Manage Users:

- Admin can view and manage user accounts.
- Admin can edit user details and track user activity.

2.2 Manage Items:

- Admin can view, edit, or delete auction items as necessary.
- Items can be approved or rejected based on compliance with platform policies.

2.3 Manage Categories:

- Admin can create, edit, and delete product categories and subcategories.
- Categories are structured to improve item discoverability.

2.4 Administrative Functions:

- Admin has access to system analytics and reports, including user engagement, auction performance, and revenue statistics.
- Admin can configure system-wide settings, such as notifications and auction rules.

3. Additional Features

3.1 Email Notifications:

- Users and admin receive email notifications for important updates, such as bid status, auction deadlines, and account activities.

3.2 Pop-Up Notifications:

- Real-time pop-up notifications alert users to outbids, auction status changes, or new messages.

3.3 Delivery Information:

- Sellers can provide delivery details for auctioned items.
- Buyers can track the delivery status through the app.

	Functions	Category	Attribute	Details & Boundary Constraints
R1.1	Record the underway sale – the items purchased	Evident	System Response time	Price listing within 3 seconds

				Availability agreement in less than 10 sec
R1.2	Reduce inventory quantities when a sale is committed	Hidden	Concurrent user load	Supports up to 100 concurrent users without performance degradation.
...	Manage user profiles securely	Hidden	Security	Enforce password complexity and encryption. - Multi-factor authentication.
R1.3	Facilitate competitive bidding for items b	Evident	User Interaction	Real-time updates on the bidding status with sub-second latency.
R1.4	Notify users about changes in auction status or bids	Evident	Real-Time Notification	Notification delivery within 2 seconds of change.
R1.5	Track bid history and update bid status	Evident	Data Accuracy	Bid history is accurate and updated within 1 second of bid placement.
R1.6	Enable direct communication for price negotiations	Evident	Communication response	Chat messages delivered within 1 second.
R1.8	Streamline admin management of auctions and user disputes	Hidden	Admin Efficiency	Admin actions reflected within 5 seconds of operation.
R1.9	Optimize application for mobile devices	Frill	Compatibility	Application responsive and operational on devices with screens as small as 4 inches.

5. System Attributes/ Nonfunctional Requirements

4.1 Performance Requirements

- The application will perform with minimal lag.

- Real time database ensures instant updates and synchronization.

4.2 Reliability

- Ensure data consistency across all users and sessions.

4.3 Security

- Password protection and encryption are implemented to safeguard user data.

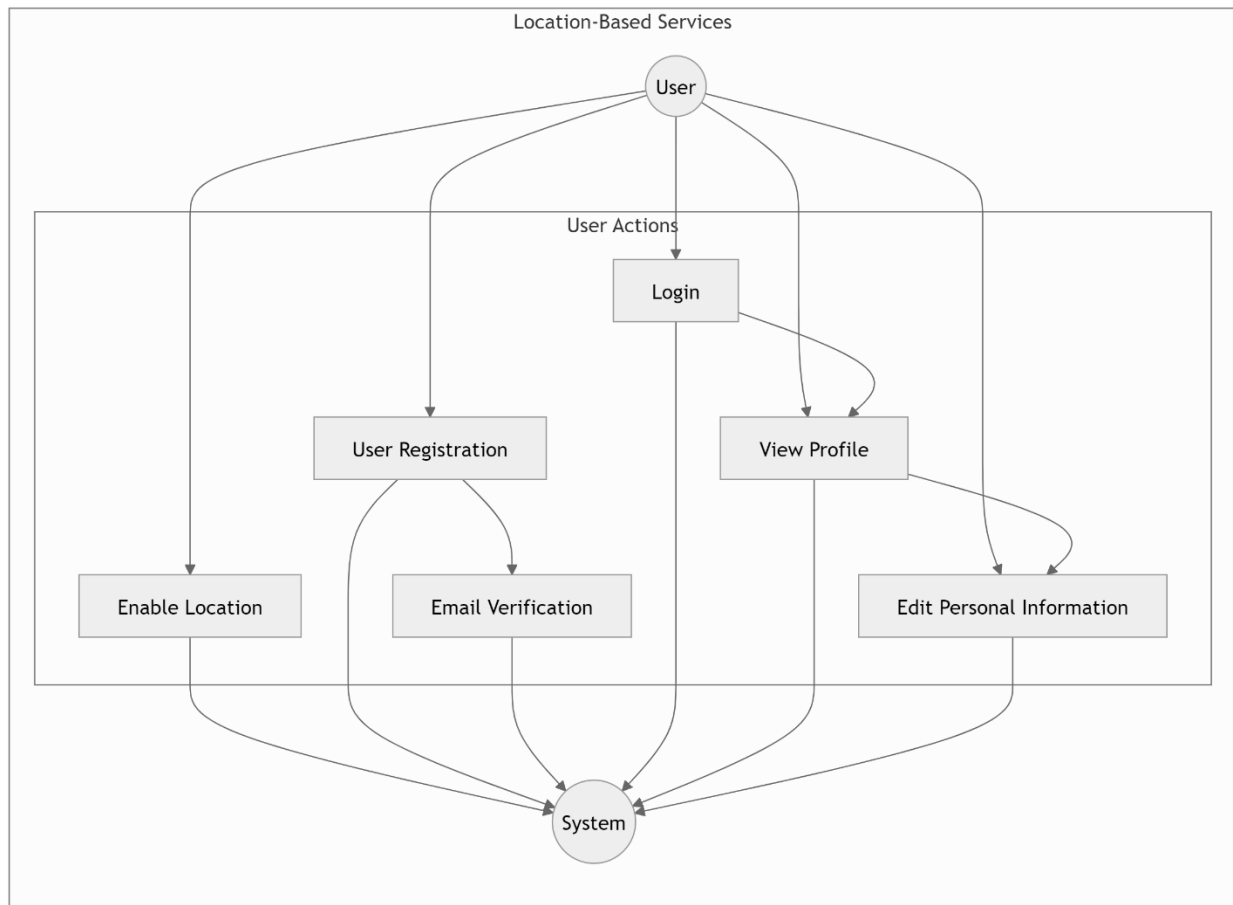
Attribute	Details and Boundary Constraints	Category
Response Time	The system should complete important tasks, like placing bids or viewing updates, within 5 seconds.	Optional
Concurrent User Load	The app must handle at least 10 users at the same time without slowing down.	Mandatory
Data Availability	The system should be up and running 99.9% of the time to ensure users can access it whenever needed.	Mandatory
User Interface	The app should be easy to use and work well on different devices.	Optional
Security Measures	Use passwords, encryption, and secure communication to keep user data safe.	Mandatory
Expansion Flexibility	The system should allow easy addition of new features and handle more users as needed.	Optional

4.1 Use Cases

4.1.1 List of Use Cases

- User Registration:
The user creates an account by entering their details and initiating the registration process.
- Email Verification:
After registration, the system sends a verification email, which the user must validate to activate their account.
- Login:
The user provides credentials (email and password) to authenticate and access their account.
- Profile:
The user views their account details, including personal information and other settings.
- Edit Personal Information:
The user updates their account details, such as name, contact information, or email.

4.1.2 Use Case Diagram



4.1.3 Description of Use Cases

1. Enable User

Name	Enable User
Actors	User
Purpose	To allow the user to enable location services to enhance the functionality of application.
Description	The user can enable location services to receive location specific features, such as displaying nearby auction items or arranging local deliveries.
Cross References	None
Pre-Conditions	The user must have a registered account and be logged in.

Successful Post-Conditions	The location services are enabled, and the application can use the user's location to provide relevant features.
Failure Post-Conditions	Location services remain disabled, and the user cannot access location specific features.

2. User Register

Name	User register
Actors	User
Purpose	To allow a new user to create an account in the system.
Description	The user enters personal information, such as name, email, and password, to register on the platform.
Cross References	Email verification
Pre-Conditions	The user must not have an existing account.
Successful Post-Conditions	A new account is created, and the user receives an email for verification.
Failure Post-Conditions	The account is not created, and the user must try registered again.

3. Email Verification

Name	Email verification
Actors	User
Purpose	To confirm the user's email address to activate the account.
Description	After registration, the user receives a verification email. Clicking the link in the email confirms the user's email address.
Cross References	User Register
Pre-Conditions	The user must have completed the registration process.
Successful Post-Conditions	The user's email is verified, and the account is activated.
Failure Post-Conditions	The email remains unverified, and the user cannot fully access the platform.

4. Login

Name	Login
Actors	User
Purpose	To allow the user to access their account.
Description	The user provides their email and password to log into their account.
Cross References	None
Pre-Conditions	The user must have a registered and verified account.
Successful Post-Conditions	The user is logged in and can access their account.
Failure Post-Conditions	The user remains logged out, and they must retry logging in.

5. Profile

Name	Profile
Actors	User
Purpose	To allow the user to view and manage their personal information.
Description	The user can access their profile to see personal details, such as name, email, and account settings.
Cross References	Edit Personal Information
Pre-Conditions	The user must be logged in.
Successful Post-Conditions	The user can view their profile details.
Failure Post-Conditions	The user cannot view their profile, and they must retry accessing it.

6. Edit Personal Information

Name	Edit Personal Information
Actors	User
Purpose	To allow the user to update their personal details.
Description	The user can edit personal information, such as their name, email, or password, through their profile.
Cross References	Profile

Pre-Conditions	The user can edit personal information, such as their name, email, or password, through their profile.
Successful Post-Conditions	The user's personal information is updated successfully.
Failure Post-Conditions	The changes are not saved, and the user must retry editing their information.

4.2.5 Typical Course Events

Actor Action	System Response
User registers for a new account	The system validates the input, sends an email verification, and upon successful validation, creates a new user account.
User logs in with credentials	The system verifies the credentials and grants access to the user's dashboard if the credentials are correct.
User views available auctions	The system retrieves and displays a list of active auctions categorized by type.
User places a bid on an item	The system checks if the bid is higher than the current highest bid, updates the bid status, and notifies the user of the bid status.
User posts a new auction	The system validates the auction details, posts the auction in the relevant category, and notifies the user of a successful post.
Admin manages user accounts	The system allows the admin to view, edit, block, or delete user accounts based on administrative actions.
User sends a message in the chat system	The system delivers the message to the intended recipient and notifies both parties of new messages.

Actor Action	System Response
User receives a notification on bid update	The system sends a real-time notification to the user regarding updates on bids they are interested in.
Admin manages auction listings	The system enables the admin to edit, approve, or remove auction listings and resolves any disputes arising from auctions.
User logs out	The system logs the user out, ensuring session termination and data security.

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