

Project Name

AuctionNest

System Requirements Document (SRD)

Version 1 – October 1, 2024

Tri-Star Alliance

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**System Requirements****AuctionNest**

VERSION: 1

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Approval of the System Requirements indicates an understanding of the purpose and content described in this deliverable. By signing this deliverable, each individual agrees with the content contained in this deliverable.

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## Contents

Section 1	Purpose .....	4
Section 2	System Design .....	4
2.1	Overview.....	4
2.2	Review Modules of System.....	4
2.3	Review Data Flow .....	4
2.4	Major System Conditions .....	4
2.5	Major System Capabilities .....	4
2.6	System User Characteristics.....	5
Section 3	Deployment Design (Not Required) .....	5
Section 4	Data Design .....	5
Section 5	User Interface Design .....	5
Section 6	References .....	5
Section 7	Glossary.....	5
Appendix A.....		7
Appendix B.....		13
Appendix C.....		17
Appendix D.....		20

## Section 1 Purpose

The purpose of AuctionNest is to provide a secure, interactive, and transparent online marketplace for users to buy and sell goods through a competitive bidding process. Unlike other platforms, AuctionNest prioritizes user safety by implementing two-factor authentication (2FA) and stringent user verification standards, creating a secure and reliable environment. The platform caters to both buyers and sellers by offering real-time auction tracking, verified listings, and clear bidding histories. These features enhance the online shopping experience by building trust and facilitating secure transactions, ultimately redefining how people interact in digital marketplaces.

Replace this section with the following sections from the Project Scope Document.

### 1.01 Title of System

The title of the system for this project is "**AuctionNest: A Secure and Transparent Marketplace Platform for Auctions.**"

### 1.02 System/Project Scope

**AuctionNest** is designed to provide a reliable and user-friendly platform for hosting and participating in auctions. Users can create and join auctions in a secure environment, view bidding histories, and make purchases confidently, knowing all users have been verified through 2FA. The platform allows sellers to create detailed, verified listings and receive payments securely, while buyers can track bids in real-time. AuctionNest also incorporates data-driven recommendations and multi-device synchronization to enhance accessibility and ensure a seamless experience for buyers and sellers alike.

### 1.03 Project Importance

The AuctionNest project addresses a common challenge in online marketplaces—creating a secure and trustworthy environment for users to buy, sell, and conduct auctions. With increasing digital transactions, AuctionNest's 2FA, verified user policies, and transparent bidding structure make it an essential tool for secure transactions. This approach builds user confidence, reduces fraud risks, and fosters a transparent, competitive shopping experience, enhancing overall user satisfaction.

### 1.04 Background

Online marketplaces like Facebook and eBay provide auction and sales capabilities but often lack thorough verification methods, making them vulnerable to fraud. AuctionNest was developed to bridge this gap by offering a platform where users are authenticated through 2FA,

items are verified, and auction histories are transparent. This design fosters a secure environment where users feel confident in both the bidding process and the authenticity of listed items.

## Section 2 System Design

### Overview

*Specify the major system capabilities in terms of availability, target deployment environment(s), device accessibility, and/or technical capability.*

- **AuctionNest** is a comprehensive auction management solution built for high availability and multi-platform accessibility. Deployed on a cloud-based infrastructure (e.g., AWS or Azure), AuctionNest ensures reliable 24/7 service with 99.9% uptime. The system is accessible through iOS and Android apps as well as a responsive web platform, supporting smartphones, tablets, and desktops. Real-time synchronization across devices ensures up-to-date bidding and inventory information. Security is paramount, with 2FA, encrypted data storage, and secure payment gateways safeguarding user information and transactions. Additionally, AuctionNest incorporates push notifications for bid updates and AI-powered recommendations to personalize the shopping experience.

### 2.2 Review Modules of System

*Review the Registration and Scheduling Modules.*

#### Authentication and Registration Module:

- Manages user account creation, onboarding, and 2FA for secure login.
- Assigns roles for different user types (buyer, seller, auctioneer).
- Allows multiple devices to access the same account with 2FA-enabled verification.
- Integrates social media and email-based sign-ups for a streamlined process.

#### Auction and Bidding Module:

- Enables users to set up and conduct auctions with real-time updates.
- Provides bidding alerts and notifications via push, in-app alerts, and SMS.
- Allows buyers to track bidding history and receive bid outcome notifications.
- Supports scheduling of auction start/end times, with reminders sent to participants.

### 2.3 Review Data Flow

*a. Use Case Review*

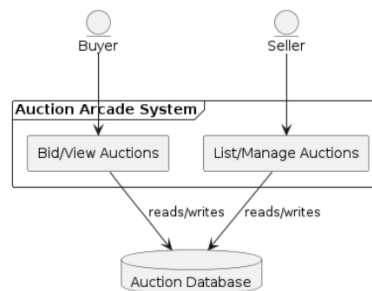
*b. Data Flow Level 0-3 for System*

*c. Data Flow of Steps to Access System, Register and then Schedule: UML Use Case, UML Sequence*

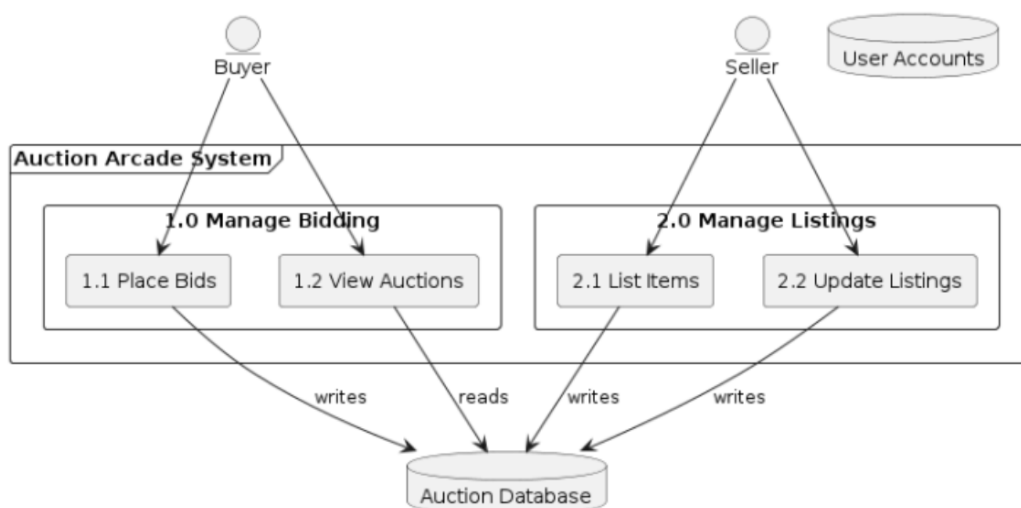
*d. Based on Requirements/Diagrams Shown in Appendix A*

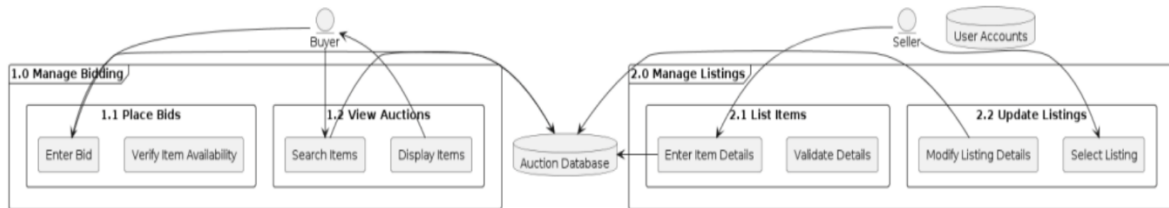
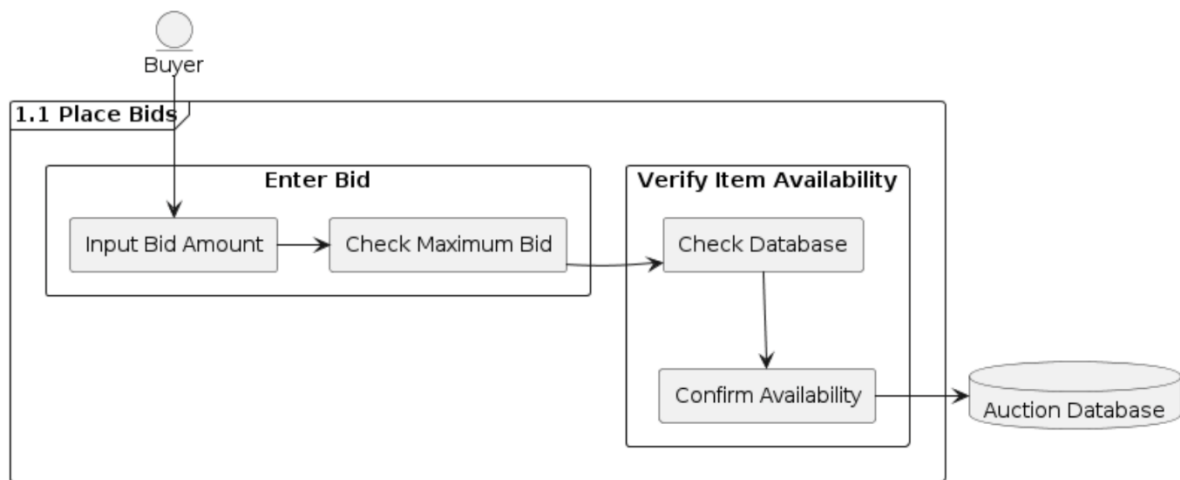
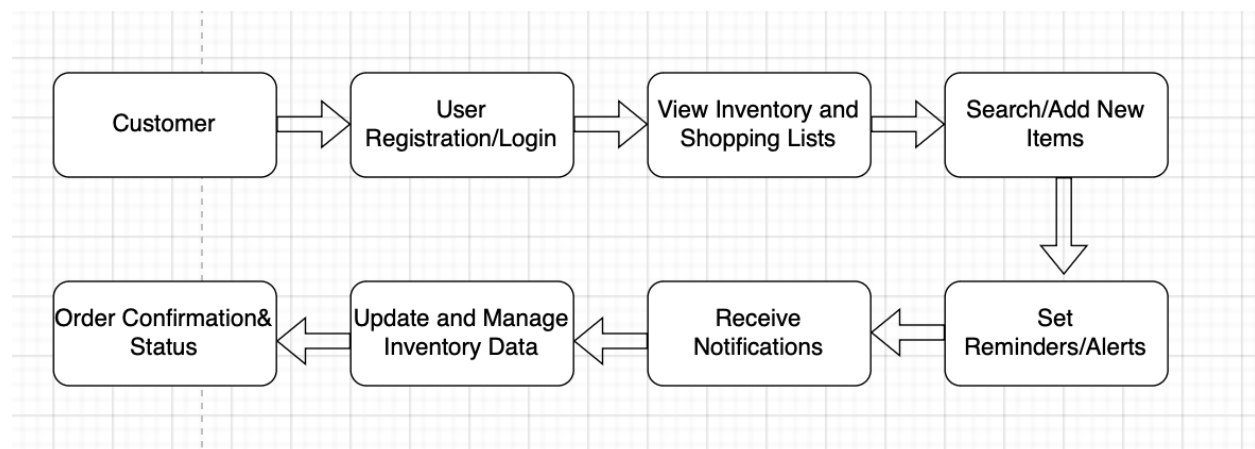
- **Use Case Review:** The primary use cases cover user registration, auction creation, bidding, and secure payments.
- **Data Flow Levels (0-3):** Detailed flow diagrams outline each process, from accessing the system and registering to bidding and payment processing.
- **Data Flow for Access, Registration, and Auction Setup:** UML Use Case and Sequence Diagrams in Appendix A show steps for user interactions, including authentication, item listing, and conducting auctions.

#### Data Flow Level 0:

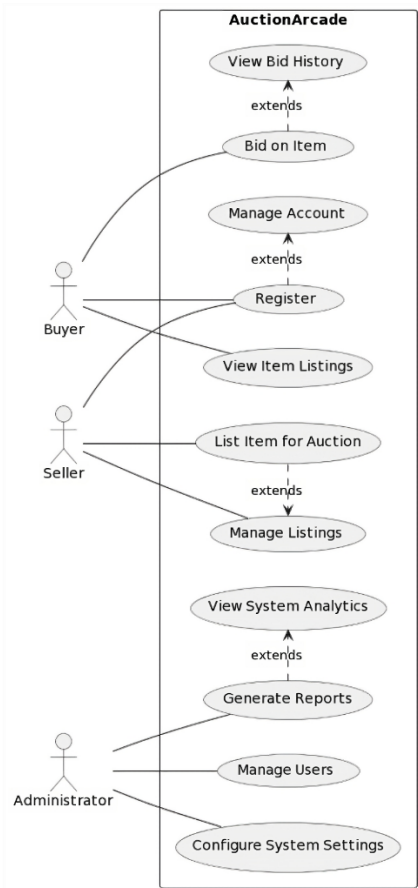


#### Data Flow Level 1:

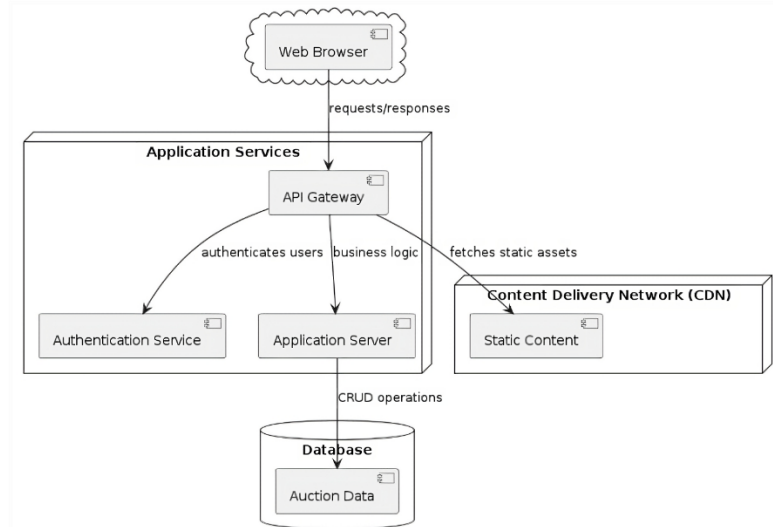


**Data Flow Level 2:****Data Flow Level 3:****User Data Flow:**

User case Review:



Architecture Diagram:





## 2.4 Major System Capabilities

*Specify the major system capabilities in terms of availability, target deployment environment(s), device accessibility, and/or technical capability.*

*Provide at least 8 requirements.*

- The system shall support user registration and role-based access for household members.
- The system shall allow users to manage household inventory, including adding, editing, and deleting items.
- The system shall provide a personalized shopping list feature based on inventory and task-based needs.
- The system shall enable task scheduling with reminders for shopping and low-stock items.
- The system shall offer real-time data synchronization across multiple devices.
- The system shall feature a responsive interface compatible with both mobile and desktop.
- The system shall include data encryption and secure user authentication for privacy.
- The system shall generate reports on inventory usage and shopping trends.

## 2.5 Major System Conditions

*Specify major system assumptions and/or constraints (aka conditions). The conditions may limit the options available to the designer/developer. For example:*

*Provide at least 8 requirements.*

*- The system shall be developed using the existing infrastructure of ASP, MS SQL, IIS*

Specify **major system assumptions and/or constraints** (conditions) that may limit design options.

- **Cloud-Based Deployment:** AuctionNest shall be deployed on cloud infrastructure, such as AWS or Azure, to ensure scalability and high availability.
- **Integration with Existing Infrastructure:** The system shall utilize the organization's current infrastructure for database management and user authentication, ensuring compatibility with established systems.
- **High Availability Standards:** AuctionNest shall be optimized for 99.9% uptime to guarantee continuous access for users throughout auctions and bidding periods.
- **Data Privacy Compliance:** The system must comply with data privacy regulations (e.g., GDPR) to secure user data and build trust.
- **Robust Security Protocols:** AuctionNest must employ 2FA, HTTPS, and data encryption to safeguard user accounts and financial data.
- **Scalability Requirements:** The system shall support scalability, allowing for an increase in user base, auctions, and transaction volume as the platform grows.
- **Development and Production Environments:** The development environment shall closely mirror the production environment, ensuring seamless feature testing and security protocol checks before deployment.

- **User-Friendly Experience:** AuctionNest shall undergo rigorous testing for ease of use and reliability, ensuring that users experience an intuitive and secure interface.

## 2.6 System User Characteristics

*What are the types of users of the system?*

*What are the different roles?*

*Are there indirect users of the system/data? For example, how do stakeholders/executive use the system or data from the system?*

*How is the data used by these users?*

*3.1 The System shall include the role of System Administrator.*

*3.2 The System shall require two-factor authorization for the System Administrator role.*

*3.3 The System Administrator shall have access configuration web page.*

*3.4 The configuration web page shall allow configuration of Lab Testing Scheduled.*

*3.5 The System Administrator shall create a schedule.*

*3.5.1 The System Administrator shall identify the start and end time per day.*

*3.5.2 The System Administrator shall identify the duration for appointment blocks.*

*3.5.3 The System Administrator shall identify the number of appointments per appointment block.*

*3.6 The configuration web page shall allow configuration of Employees.*

*3.6.1 The System Administrator shall have the ability to set the eligibility flag for an employee.*

- The system shall include the role of System Administrator for overseeing configurations.
- The system shall require two-factor authentication for the System Administrator role.
- The System Administrator shall have access to a configuration webpage.
- The configuration webpage shall support settings for auction scheduling, user access levels, and security protocols.
- The System Administrator shall be able to create and adjust auction schedules.

The administrator can set start and end times for each auction.

Define bidding durations for each auctioned item.

Set the maximum bids per user if needed.

- The configuration webpage shall allow user and role management settings.

- The System Administrator shall be able to set eligibility flags for sellers to list high-value items.
- The system shall provide notifications to users for scheduled auctions, bidding updates, and successful purchases.

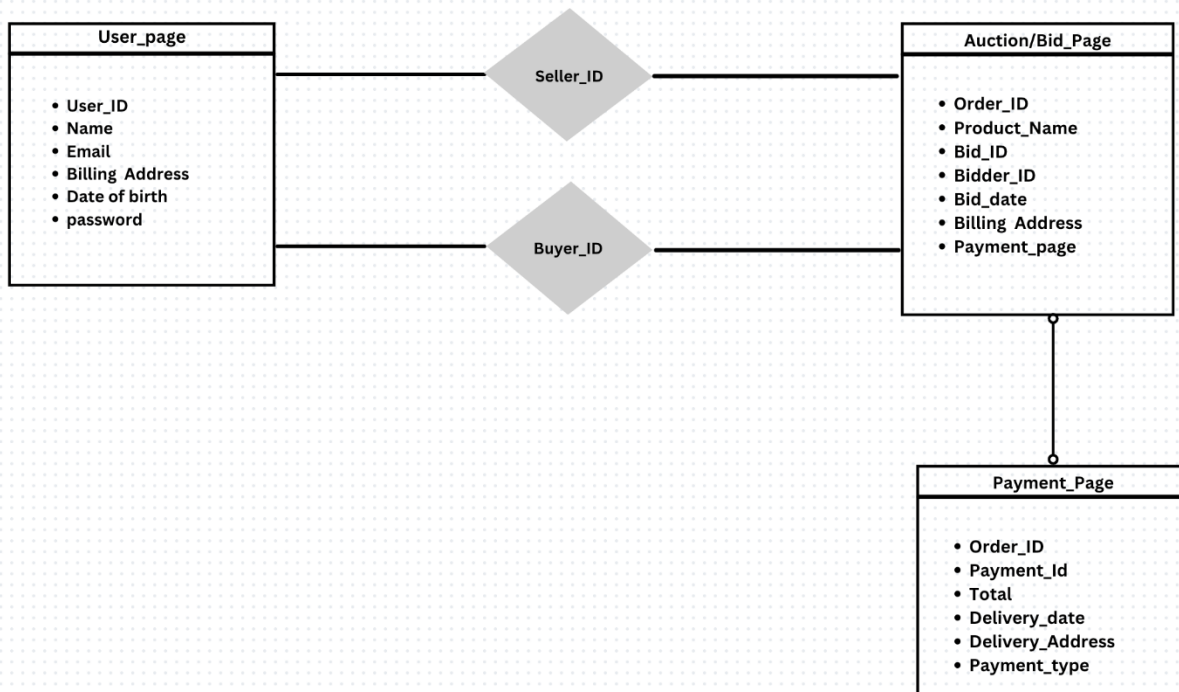
### **Section 3 Deployment Design (Not Required)**

- Overview*
- Architectural Design – Environment Review*
- Review External Components*
- Diagrams – See Appendix B*

### **Section 4 Data Design**

- Review Database Tables*
- Class Diagram or ERD – See Appendix C*

The **data design** for AuctionNest includes structured database tables to efficiently store and manage user data, auction listings, bid histories, and payment transactions. Each table is designed to support fast data retrieval and secure interaction. The class diagram or ERD (see Appendix C) illustrates the relationships between users, listings, bids, and payment processing, creating a structured data foundation optimized for AuctionNest’s active marketplace needs.

**AuctionNest- Database****Section 5 User Interface Design**

- a. *Overview*
- b. *Screen Images (optional, but desirable; mockups are good) – See Appendix D*
- a. *Overview*

The User Interface (UI) for **AuctionNest** is designed to provide an intuitive and visually engaging experience that facilitates secure buying, selling, and auction participation. With a focus on usability and responsiveness, the interface emphasizes straightforward navigation, making it easy for users to manage auctions, view bidding histories, and access personalized recommendations.

**1.Home Page:**

- **a. Welcoming Layout:** The home page features the **AuctionNest logo**, a search bar, and quick-access navigation options, welcoming users with a streamlined design.

- **b. Primary Actions:** Key actions such as “Browse Auctions,” “Sell Item,” and “My Bids” are prominently displayed to enable easy access to essential functionalities, helping users navigate the core features effortlessly.

## 2. Navigation and Main Functions:

- **a. Navigation Menu:** A clear and accessible navigation bar directs users to major sections, such as auctions, personal bids, and account settings, providing a seamless browsing experience.
- **b. Search and Filter:** The search bar, accompanied by advanced filters, enables users to find items by category, price, or auction status, ensuring efficient browsing.

## 3. User Authentication:

- **a. Login and Sign-Up Options:** Users are presented with secure “Login” and “Sign Up” options on the main screen, with two-factor authentication (2FA) enabled for enhanced account security.
- **b. Account Verification:** A prominent verification process for buyers and sellers ensures that users access the system with the necessary authentication, building trust within the platform.

## 4. Auction and Bid Management:

- **a. Auction Creation:** Sellers are provided with clear options for setting up auctions, including options to upload item images, set bidding start and end times, and specify minimum bids.
- **b. Bid Tracking:** A dedicated interface displays current bid status, allowing buyers to track their bids in real-time and receive outbid notifications.

## 5. Personalized Recommendations:

- **a. AI-Driven Suggestions:** The UI incorporates AI-driven recommendations, displaying auction suggestions based on a user’s past searches and bidding history to enhance the shopping experience.
- **b. Chat Interface:** A chat feature connects users with **AuctionNest’s AI assistant**, providing tailored auction and product recommendations for a personalized experience.

## 6. Auction Alerts and Notifications:

- **a. Real-Time Updates:** Users receive real-time notifications for bid updates, auction endings, and new item listings, keeping them informed and engaged in the bidding process.

- **b. Low Bid Reminders:** Alerts for auctions nearing close allow buyers to place last-minute bids, creating an engaging experience.

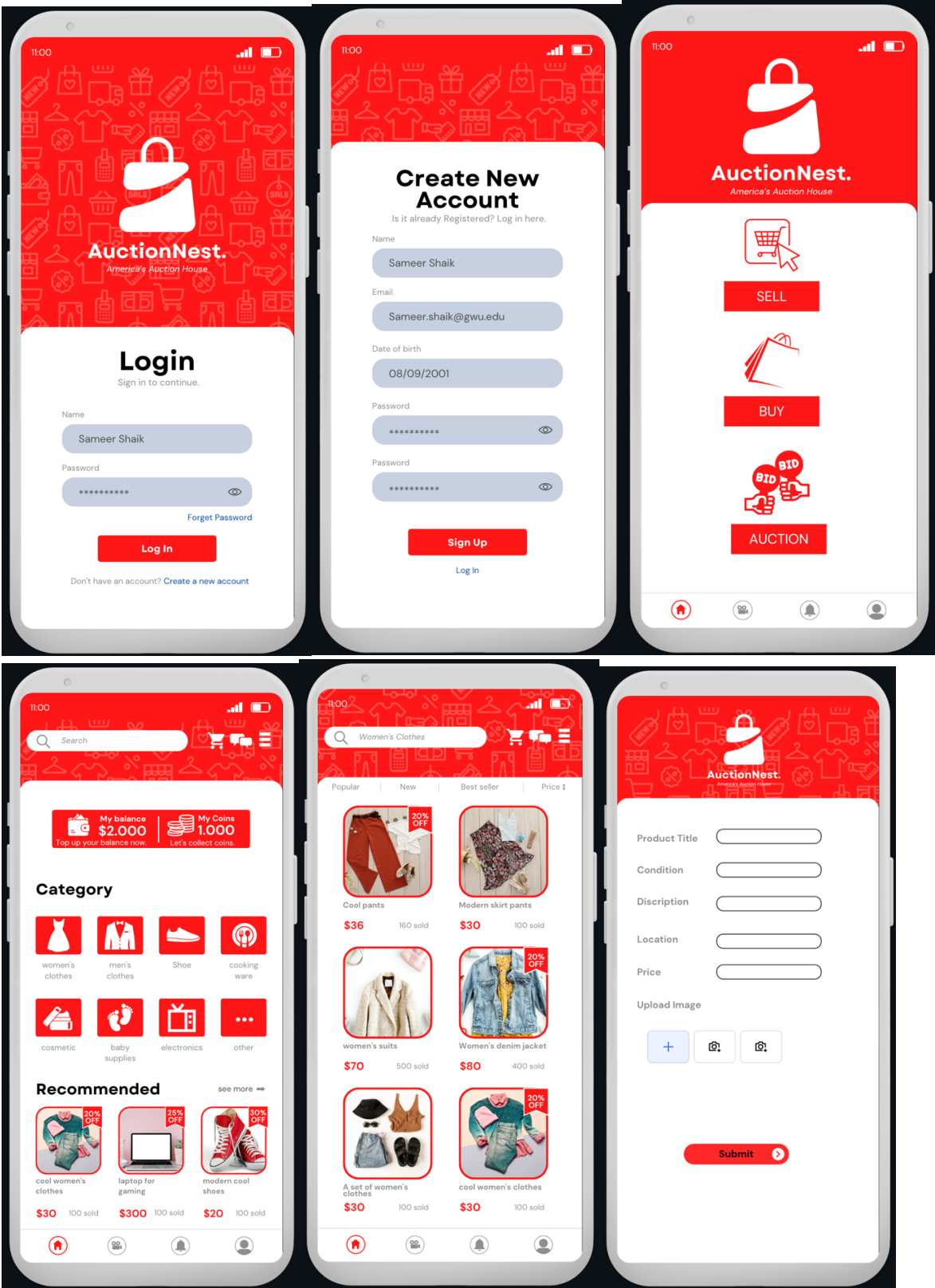
## 7. Inventory and Sales Management (for Sellers):

- **a. Inventory Dashboard:** Sellers have a dashboard view of their active listings, sold items, and bids, allowing efficient management of current and upcoming auctions.
- **b. Sales Analytics:** A visually structured display provides insights into completed sales and bidding trends, helping sellers optimize future listings.

## 8. Responsive Design:

- **a. Multi-Device Accessibility:** AuctionNest's UI is fully responsive, delivering a seamless experience across desktop, tablet, and mobile devices, ensuring users can participate in auctions on the go.
- **b. Consistent Layout:** Each screen adapts fluidly to different screen sizes, preserving the user experience while supporting real-time bidding and notifications across all devices.

*a. Screen Images (optional, but desirable; mockups are good) – See Appendix D*



## Section 6 References

*Provide a list of all documents and other sources of information referenced in this document and utilized in its development. Include for each the document number, title, date, and responsible office/author.*

Document No.	Document Title	Date	Author
1)	<b>ISO/IEC 12207:2017</b> - <i>Systems and Software Engineering—Software Life Cycle Processes</i> : This standard outlines processes, activities, and tasks that occur throughout the life cycle of software.	2017	ISO/IEC/IEEE
2)	<b>IEEE 830-1998</b> - <i>IEEE Recommended Practice for Software Requirements Specifications</i> : Although a bit older, this standard remains relevant for creating effective and well-structured software requirements specifications (SRS).	1998	IEEE
3)	<b>ISO/IEC 33063:2015</b> - <i>Process Assessment Model for Software Testing</i> : This model provides a framework for evaluating software testing processes.	2015	ISO/IEC
4)	OpenAI API Documentation	2023	OpenAI
5)	Applications of Artificial Intelligence in the Food Industry. <i>Foods</i> , 12(24), 4511.	2023	Li, Wei
6)	<b>IEEE 1012-2016</b> - <i>IEEE Standard for System and Software Verification and Validation</i> : This standard defines verification and validation processes across the software life cycle, focusing on both functional and structural aspects of software to ensure it meets requirements and quality standards.	2016	IEEE



## Section 6 Glossary

*Define of all terms and acronyms required to properly interpret the requirements contained within this document.*

AI (Artificial Intelligence): The simulation of human intelligence in machines programmed to think, learn, and improve. AuctionNest uses AI for personalized auction recommendations and to analyze user activity patterns.

API (Application Programming Interface): A set of rules that allows software programs to communicate with each other. AuctionNest integrates third-party services, such as payment gateways and notification systems, using APIs.

AES-256 (Advanced Encryption Standard 256-bit): A secure encryption algorithm used in AuctionNest to protect sensitive data like user credentials, bid information, and financial transactions.

AWS (Amazon Web Services): A cloud computing platform used for scalability, secure data storage, and reliable uptime for AuctionNest's services.

CCPA (California Consumer Privacy Act): A data privacy law granting California residents rights over their personal data, which AuctionNest complies with to ensure user privacy and transparency.

GDPR (General Data Protection Regulation): A European Union regulation focused on data protection and privacy, requiring AuctionNest to handle users' personal data with consent and security measures.

MFA (Multi-Factor Authentication): A security process requiring multiple forms of verification, ensuring that only authorized users' access AuctionNest accounts.

NoSQL: A database system that allows for flexible data storage without a strict schema, used by AuctionNest to manage dynamic data related to auctions, bids, and user profiles.

SLA (Service Level Agreement): A contract defining the expected service level for AuctionNest, covering uptime, customer support response times, and system performance.

SMS (Short Message Service): A messaging service AuctionNest uses to send users notifications about auction activity, such as outbids, win notifications, and auction end reminders.

**UAT (User Acceptance Testing):** The process by which real users test AuctionNest to ensure it meets their needs and expectations before the platform is launched.

**UI (User Interface):** The space where users interact with AuctionNest, including dashboards, search functions, and navigation elements for browsing auctions.

**Bid Tracking:** A feature in AuctionNest that allows users to monitor their current bids, see updates, and receive alerts when they are outbid.

**Personalized Recommendations:** AI-driven suggestions in AuctionNest for auctions or products based on user preferences and previous bidding activity.

**Real-Time Data:** Data processed and made available instantly, such as auction bid updates in AuctionNest.

**Push Notifications:** Alerts sent from AuctionNest to users' devices about important events, including bid updates, auction start times, and outbid alerts.

**Generative AI:** A type of AI in AuctionNest that provides personalized recommendations and product suggestions based on user browsing and bidding behavior.

**Outbid Notification:** A notification sent to users when they have been outbid on an auction, allowing them to increase their bid if desired.

**Multi-Device Synchronization:** The ability of AuctionNest to sync auction data, bids, and user preferences across devices, providing seamless access and updates.

**Data Encryption:** The process of converting data into a secure format to prevent unauthorized access, ensuring the protection of user information on AuctionNest.