Software Requirement Specification

Project Name: Bidgenius(Online Auction Platform)

1) Introduction

1.1 Purpose:

The purpose of this document is to present a detailed description of the **Bidgenius.** It will describe the system's function, features, interfaces, what it will accomplish, the limitations it must under, and how it will respond to outside stimuli.

1.2 Scope:

Many auction platforms offer features such as real-time bidding, user-friendly interfaces, and secure payment options. Look for tools that help sellers create appealing listings and buyers track their bids easily.

1.3 Technologies to be used:

Web Development:

- HTML5:
  - HTML5 is the latest specification of the HTML language, and represented a major break with previous markup practices. The purpose of the profound changes to the language was to standardize the many new ways in which developers were using it, as well as to encourage a single set of best practices with regards to web development.

- CSS:
  - CSS, also known as Cascading Style Sheets, is a game-changing language that revolutionized the web design process. With its simple design, CSS makes it easy to enhance the presentation of web pages, by applying styles independently of the HTML that

makes up each page. Essentially, CSS is responsible for the aesthetic appeal of a website, dictating everything from font choice to color scheme and spacing. With this language, developers and designers can create visually appealing websites that truly stands out.

- React JS:
  - React is a framework that employs Webpack to automatically compile React, JSX, and ES6 code while handling CSS file prefixes. React is a JavaScript-based UI development library. Although React is a library rather than a language, it is widely used in web development. The library first appeared in May 2013 and is now one of the most commonly used frontend libraries for web development.
  - React offers various extensions for entire application architectural support, such as Flux and React Native, beyond mere UI.

- Bootstrap5:
  - Bootstrap 5 is evolving with each release to better utilize CSS variables for global theme styles, individual components, and even utilities. We provide dozens of variables for colors, font styles, and more at a :root level for use anywhere. On components and utilities, CSS variables are scoped to the relevant class and can easily be modified.

- JavaScript :
  - JavaScript is a scripting language that enables you to create dynamically updating content, control multimedia, animate images, and pretty much everything else. (Okay, not everything, but it is amazing what you can achieve with a few lines of JavaScript code.)

- Back-End Python (Version 3.12.2):
  - Python is a general-purpose, dynamically typed, high-level, compiled and interpreted, garbage-collected, and purely

object-oriented programming language that supports procedural, object-oriented, and functional programming.
- Because of its straightforward language framework, Python is easier to understand and write code in. This makes it a fantastic seasoned programmers in writing clear and error-free code.
- Python has many third-party libraries that can be used to make its programming language for novices. Additionally, it assists functionality is easier. These libraries cover many domains, for example, web development, scientific computing, data analysis, and more.

- Django Rest Framework(DRF)
  - Django REST framework is a powerful and flexible toolkit for building Web APIs.
  - The Web browsable API is a huge usability win for your developers.
  - Authentication policies including packages for OAuth1a and OAuth2.
  - Serialization that supports both ORM and non-ORM data sources.
  - Customizable all the way down - just use regular function-based views if you don't need the more powerful features.
  - Extensive documentation, and great community support.
  - Used and trusted by internationally recognised companies including Mozilla, Red Hat, Heroku, and Eventbrite.

Database Management:

- Use database MySQL for data storage.

Security:

- Implement encryption, multi-factor authentication, and security measures.

API and Integration:

- Development of API to connect with Django Rest Framework.

Backup and Recovery:

- Automated backup solutions for data integrity.

1.4 Definition, Acronyms and Abbreviations:

SQL Server	Structured query language intended for database use.Utilized to specify data storage and retrieval protocols.
User Authentication	The process of verifying the identity of a user attempting to access the system.
Encryption	The process of converting data into a code to prevent unauthorized access or data theft.
API (Application Programming Interface)	A set of rules and protocols for building and interacting with software applications using Django Rest Framework (DRF).
Scalability	The ability of a system to handle increased loads and demand by adding resources or expanding infrastructure.

Software Interfaces:

The Bidgenuis interfaces with several key software components to deliver its functionality, including:

1. User Registration/Login Interface

- **Features**:
    - User input fields: Name, Email, Password, etc.

    - Social media login options (Google, Facebook).
    - Password recovery option.
    - User role selection (Buyer, Seller).

2. Dashboard Interface

- **Features**:
    - Overview of active auctions, bids placed, and won items.
    - Notifications for bids and auction status.
    - Quick links to create a new auction or view past auctions.

3. Auction Creation Interface

- **Features**:
    - Form fields for item title, description, starting bid, and reserve price.
    - Upload images and videos of the item.
    - Set auction duration (start and end time).
    - Preview auction before publishing.

4. Auction Listing Interface

- **Features**:
    - Display of all active auctions with sorting/filtering options (by category, price, ending soon, etc.).
    - Search bar for quick item lookup.
    - Item thumbnail, title, current bid, and remaining time.

5. Auction Detail Interface

- **Features**:
    - Detailed view of the auction item.
    - Bid history showing previous bids.
    - Button to place a bid.
    - Seller information and contact options.
    - Countdown timer for auction end.

6. Bidding Interface

- **Features**:
    - Input field for bid amount with validation (e.g., must be higher than current bid).
    - Instant bid or proxy bidding options.
    - Confirmation dialog before placing a bid.
    - Notifications for outbid alerts.

7. Payment Interface

- **Features**:
    - Integration with payment gateways (PayPal, Stripe).
    - Summary of items won with total amount due.
    - Secure payment processing.
    - Option to save payment methods for future use.

8. User Profile Interface

- **Features**:
    - View and edit user information (name, email, address).
    - View bidding history and won auctions.
    - Manage payment methods.
    - Option to set notification preferences (email alerts, SMS).

9. Admin Dashboard

- **Features**:
    - Overview of user statistics (active users, total auctions, revenue).
    - Manage users (approve, block, view profiles).
    - Monitor auctions and intervene if necessary (suspicious activity).
    - Reporting tools for analytics and insights.

10. Feedback/Rating Interface

- **Features**:
    - Option for buyers to rate sellers after a transaction.
    - Display of seller ratings on their profile.
    - Feedback comments for transparency.

1.5 Hardware Requirements:

The Bidgenuis requires specific hardware resources to operate effectively. The following hardware requirements should be met for optimal system performance:

• **CPU**: An Intel Core i5 or equivalent processor is recommended to handle the system's computational demands efficiently.
• **RAM**: A minimum of 8 GB of RAM is necessary to ensure Smooth.
• Storage: The system should be equipped with a minimum of 500 GB of SSDstorage, ensuring fast data retrieval and ample space for logs and backups.
• **Network**: A high-speed and stable internet connection is essential for seamless access to web-based components, secure data transfers, and communication with external financial networks.
• **Security**: Robust security measures, including firewall protection and antivirus software, should be in place to safeguard the system from potential threats, ensuring data integrity and privacy.

1.6 Functionalities:

These functionalities ensure that BidGenius operates smoothly and effectively, providing a robust platform for both buyers and sellers in the auction space.

1. User Account Management

- User Registration: Easy sign-up via email, social media, or phone.
- Profile Management: Users can update personal details, payment methods, and shipping information.
- Account Verification: Email and/or phone verification to ensure user authenticity.

2. Auction Management

- Create Auction: Sellers can list items with details like description, starting bid, reserve price, images, and auction duration.

- Edit and Cancel Auctions: Sellers can modify auction details or cancel them before they end.
- Auction Status Tracking: Real-time status updates for active auctions (e.g., live, ended, canceled).

3. Bidding Process

- Place Bids: Users can place bids on items, with real-time updates on current bid status.
- Automatic Bidding: Users can set a maximum bid, allowing the system to bid on their behalf.
- Bid Increment Rules: Automatic calculation of minimum bid increments based on current bid.

4. Payment Processing

- Secure Payment Integration: Support for various payment methods (credit/debit cards, PayPal, etc.).
- Payment Confirmation: Immediate notifications for successful transactions.
- Escrow Service: Hold funds securely until the auction process is complete.

5. Notifications and Alerts

- Bid Alerts: Notifications for outbid situations and auction end reminders.
- New Auction Alerts: Users can subscribe to notifications for specific categories or sellers.
- Weekly/Monthly Summaries: Optional summaries of activity and upcoming auctions.

6. Search and Filter

- Search Functionality: Users can search for items using keywords.
- Advanced Filtering: Filters for categories, price range, auction end times, and seller ratings.

7. Ratings and Reviews

- User Ratings: Buyers can rate sellers post-auction based on their experience.

- Review Submission: Users can write reviews for items and sellers.

8. Admin Features

- Admin Dashboard: A comprehensive dashboard for managing users, auctions, and transactions.
- Dispute Resolution: Tools for handling conflicts between buyers and sellers.
- Analytics and Reporting: Insights into user activity, auction performance, and financial transactions.

9. Security and Compliance

- Data Encryption: Ensuring all sensitive user data is encrypted.
- User Privacy Controls: Options for users to manage their privacy settings.
- Compliance Monitoring: Regular checks to ensure adherence to relevant regulations (e.g., GDPR).

10. Accessibility and User Experience

- Responsive Design: Fully functional on desktop, tablet, and mobile devices.
- User-Friendly Interface: Intuitive navigation and layout for ease of use.
- Accessibility Features: Support for users with disabilities (e.g., screen reader compatibility).

11. Customer Support

- Help Center: Comprehensive FAQs, guides, and tutorials.
- Contact Support: Multiple channels for user support (live chat, email, phone).

12. Community and Social Features

- User Forums: A space for users to discuss items, tips, and experiences.

1.7 General Constraints:

1. Legal and Regulatory Constraints

- Compliance with Laws: Ensure adherence to e-commerce regulations, consumer protection laws, and auction-specific legislation in all operating regions.
- Data Protection: Compliance with data protection laws (e.g., GDPR, CCPA) for handling personal information.
- Age Restrictions: Implement age verification to restrict access to users below a certain age.

2. Technical Constraints

- Platform Scalability: Ability to handle varying user loads, especially during peak auction times.
- Performance: Ensure fast load times and responsive interactions, particularly for bidding and auction updates.
- Compatibility: Support for various browsers and devices (mobile and desktop) to ensure a consistent user experience.

3. Security Constraints

- User Authentication: Secure authentication mechanisms, including multi-factor authentication (MFA).
- Data Encryption: Use encryption for sensitive data transmission (e.g., SSL/TLS for payments and personal information).
- Fraud Prevention: Implement mechanisms to detect and prevent fraudulent activities, such as bid rigging or fake accounts.

4. Financial Constraints

- Payment Processing: Compliance with payment processing regulations and standards (e.g., PCI DSS).
- Transaction Fees: Clearly define and communicate any transaction fees to users, both buyers and sellers.

5. User Experience Constraints

- Usability: Interfaces must be intuitive and easy to navigate for users with varying technical skills.
- Accessibility: Ensure the platform is accessible to users with disabilities, following WCAG guidelines.
- Feedback Mechanisms: Implement systems for users to provide feedback or report issues easily.

6. Content Constraints

- Item Listing Policies: Define acceptable and prohibited items for auction (e.g., illegal goods, counterfeit items).
- Content Moderation: Implement moderation processes for user-generated content to maintain platform integrity.

7. Time Constraints

- Auction Duration: Clearly specify auction start and end times, with clear time zone indications.
- Bid Time Limits: Enforce rules for last-minute bids (e.g., extend auction time if bids are placed just before closing).

2) System Features

2.1 Functional Requirements

A. User Registration and Authentication

1. User Registration: Users should be able to create an account using email, social media, or phone verification.
2. User Login: Users must log in using their credentials.
3. Password Recovery: Users should be able to reset their passwords through email verification.
4. Profile Management: Users can update their profiles, including personal information and payment details.

B. Auction Management

1. Create Auction: Sellers can create new auctions, specifying item details, starting bid, reserve price, auction duration, and images.
2. Edit Auction: Sellers can edit details of their active auctions before they end.
3. Cancel Auction: Sellers can cancel their auction within a certain timeframe before it ends.
4. Auction Listing: Users can browse all active auctions, with filters for categories, price range, and auction end time.

C. Bidding Process

1. Place Bid: Registered users can place bids on active auctions.
2. Automatic Bidding: Users can set a maximum bid amount, allowing the system to bid automatically up to that limit.
3. Bid History: Users can view the history of bids placed on each auction.
4. Notification of Outbid: Users receive notifications if they are outbid on an auction.

D. Payment Processing

1. Secure Payment Gateway: Integration with payment gateways for secure transactions.
2. Payment Confirmation: Users receive confirmations for successful payments.
3. Refund Process: Define a process for refunds in case of canceled auctions or disputes.

E. User Notifications

1. Email Notifications: Users receive notifications for auction start/end times, bids, and outbid alerts.
2. In-App Notifications: Users can see notifications within their account dashboard.

F. Search and Filtering

1. Search Functionality: Users can search for auctions by keywords.
2. Advanced Filters: Filters for categories, price, auction duration, and user ratings.

G. Ratings and Reviews

1. User Ratings: Users can rate sellers after an auction is completed.
2. Review System: Users can leave written reviews for their experiences.

H. Admin Features

1. Admin Dashboard: Admins can manage users, auctions, and transactions.
2. Dispute Management: A system for handling disputes between buyers and sellers.
3. Analytics and Reporting: Admins can view reports on user activity, auction performance, and payment transactions.

I. Security and Compliance

1. Data Encryption: All sensitive data should be encrypted.
2. User Privacy Settings: Users can control who sees their profile and activity.
3. Compliance: Ensure compliance with relevant laws and regulations (e.g., GDPR).

J. Accessibility and Usability

1. Responsive Design: The platform should be accessible on various devices (desktop, tablet, mobile).
2. User-Friendly Interface: The platform should have an intuitive layout and navigation.

K. Support Features

1. Help Center: A section for FAQs and guides for users.
2. Contact Support: Users can contact customer support via email or chat.

2.2 Non Functional Requirements

1. Performance Requirements

- Response Time: The system should respond to user actions (e.g., placing a bid, loading pages) within 2 seconds under normal load conditions.
- Throughput: The platform must handle a minimum of 1,000 concurrent users without degradation in performance.
- Scalability: The system should be able to scale horizontally to accommodate increased traffic during peak auction times.

2. Availability and Reliability

- Uptime: The platform should have at least 99.9% uptime, ensuring it is available to users most of the time.
- Fault Tolerance: The system should continue to operate correctly in the event of a failure of one or more components (e.g., load balancer, database).
- Backup and Recovery: Daily backups must be performed, with a recovery point objective (RPO) of no more than 24 hours.

3. Security Requirements

- Data Encryption: All sensitive data (e.g., user credentials, payment information) must be encrypted in transit (SSL/TLS) and at rest.
- Access Control: Implement role-based access control to restrict access to sensitive functionalities based on user roles (e.g., admin, seller, buyer).
- Audit Trails: Maintain logs of all user actions for auditing purposes, including bids placed and account changes.

4. Usability Requirements

- User Interface: The platform should have an intuitive interface that allows users to easily navigate and complete actions (e.g., bidding, registration) without prior training.
- Accessibility: The platform must conform to WCAG 2.1 standards, ensuring it is usable by individuals with disabilities.

- Help and Documentation: Provide easily accessible help resources, FAQs, and user documentation to assist users in navigating the platform.

5. Maintainability and Supportability

- Code Quality: The codebase should adhere to established coding standards to ensure readability and maintainability.
- Modularity: The system architecture should be modular to allow for easy updates and integration of new features without major disruptions.
- Monitoring and Logging: Implement monitoring tools to track system performance, errors, and user activity, enabling quick troubleshooting and issue resolution.

3) Conclusion:

An online auction platform can significantly enhance the buying and selling experience by providing a virtual space where diverse items can be auctioned to a global audience. By prioritizing security, user experience, and operational efficiency, this platform can become a leader in the competitive online auction market, driving engagement and fostering a vibrant community of users.

With careful planning and execution, the online auction platform is poised to thrive, delivering value to users and stakeholders alike, while paving the way for future innovations in the auction space.

The successful implementation of this platform relies on several critical components:

1. **User-Centric Design**: A focus on usability and accessibility ensures that users of all backgrounds can navigate the platform easily, enhancing overall satisfaction and engagement.
2. **Robust Security Measures**: Implementing strong security protocols protects user data and transactions, building trust and fostering a safe environment for all participants.

3. **Performance and Scalability**: The platform must be designed to handle high traffic and transactions, particularly during peak auction periods, ensuring that users can participate without interruptions.