Software Requirements Specification

for

AUCTION SITE

Version 1.0 approved

Prepared by:

Dhriti Agarwal

Katepalli Priyadarshini

Krish Hindocha

Koganti Sirichandana

Arun Shashank Varma Chekuri

Sidda Akhilesh

Adla Deepanker Reddy

**Mahindra University**

23-03-2023

Table of Contents

Table of Contents ii

Revision History ii

1. Introduction 1

1.1 Purpose 1

1.2 Document Conventions 1

1.3 Intended Audience and Reading Suggestions 1

1.4 Product Scope 1

1.5 References 1

2. Overall Description 2

2.1 Product Perspective 2

2.2 Product Functions 2

2.3 Operating Environment 2

2.4 Design and Implementation Constraints 2

2.5 User Documentation 2

2.6 Assumptions and Dependencies 3

2.7 Functional Requirements Specification

3. External Interface Requirements 3

3.1 User Interfaces 3

3.2 Hardware Interfaces 3

3.3 Software Interfaces 3

3.4 Communications Interfaces 3

4. System Features 4

4.1 Functional Requirements 4

5. Other Nonfunctional Requirements 4

5.1 Performance Requirements 4

5.2 Safety Requirements 4

5.3 Security Requirements 4

5.4 Software Quality Attributes 5

6. Other Requirements 5

Appendix A: Glossary 5

# Introduction

## Purpose

Outlining the functional and non-functional requirements along with system models for the development of an online auction site is the purpose of this software requirement specification (SRS) document. The scope of an online auction site is to offer a platform for bidding on and bidding off items or services. Among other things, it has user registration, item listing, bidding, payment, and feedback procedures.

<Identify the product whose software requirements are specified in this document, including the revision or release number. Describe the scope of the product that is covered by this SRS, particularly if this SRS describes only part of the system or a single subsystem.>

## Document Conventions

<Describe any standards or typographical conventions that were followed when writing this SRS, such as fonts or highlighting that have special significance. For example, state whether priorities for higher-level requirements are assumed to be inherited by detailed requirements, or whether every requirement statement is to have its own priority.>

The SRS for Auction Site follows the following typographical conventions:

1. Requirements are numbered for ease of reference and organization.
2. Requirements are written using clear, concise, and unambiguous language.
3. Acronyms and abbreviations are defined in the glossary section of the SRS.
4. Bold text is used to highlight important information and headings.
5. Italic text is used to emphasize a point or to indicate a variable or placeholder.
6. External policies or regulations are referenced where relevant.

These conventions are intended to improve the readability and clarity of the SRS for Auction Site and to ensure that all stakeholders understand the requirements and specifications clearly.

## Intended Audience and Reading Suggestions

The main target audience of this SRS will be the clients who eagerly await the development of the programme and the technical experts who are creating and testing the product. The remaining section of this SRS consists of a broad description that provides a complete overview of the software system while taking the target audience into mind. Also, it describes the general operation of the system, including any restrictions or limits. The section on input and output requirements that emphasises the necessity for external connections is next. As we go, the section on system features shows a visual depiction of the software system to show how it will function and how various components will interact with one another. The non-functional requirements section explains the software system's quality attributes, such as its performance, stability, security, and durability. Regulatory and compliance criteria that the software must meet should also be included. The final section contains any additional details, such as glossaries, citations, or technical specifications, that are relevant to the software requirements. The best way to read this SRS is to go about in the sequential order maintained by the writer.

<Describe the different types of reader that the document is intended for, such as developers, project managers, marketing staff, users, testers, and documentation writers. Describe what the rest of this SRS contains and how it is organized. Suggest a sequence for reading the document, beginning with the overview sections and proceeding through the sections that are most pertinent to each reader type.>

## Product Scope

An online auction site’s purpose is to give the users a web-based platform to conduct auction-style negotiations for the purchase and sale of products or services. Users of the website can register, add goods to their auction lists, and place bids on those products. Usually, the auction site offers a wide range of categories for products including electronics, clothing, collectibles, and more. The scope also includes additional features like seller ratings and feedback, live auctions, etc.   
The website's objective is to make it as easy as possible for users to purchase or sell things at auction. It contains features like recently seen items, active bids, and previous bids. The software is being created with the intention of making the environment and the things we do dependable, simple, and speedy. One advantage is that it makes transactions between buyers and sellers simpler, which leads to secure payment options for the goods.

<Provide a short description of the software being specified and its purpose, including relevant benefits, objectives, and goals. Relate the software to corporate goals or business strategies. If a separate vision and scope document is available, refer to it rather than duplicating its contents here.>

## References

<List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document. Provide enough information so that the reader could access a copy of each reference, including title, author, version number, date, and source or location.>

# Overall Description

## 2.1 Product Perspective

<Describe the context and origin of the product being specified in this SRS. For example, state whether this product is a follow-on member of a product family, a replacement for certain existing systems, or a new, self-contained product. If the SRS defines a component of a larger system, relate the requirements of the larger system to the functionality of this software and identify interfaces between the two. A simple diagram that shows the major components of the overall system, subsystem interconnections, and external interfaces can be helpful.>

The product being specified in this SRS is a fresh, independent auction site that lets users conduct online auction transactions for the purchase and sale of products and services. This website is not a replacement for any existing system or a subsequent part of a product family. The auction house's website will have unique requirements and features, including user authentication, ad construction, bidding, messaging, and payment processing. The website can only be viewed using a computer browser connected to the internet. The auction house's website will be a component of a larger system that includes external connections for money processors, shipping services, and email providers. A few social media platforms will also need to be linked with the website.

## 2.2 Product Functions

<Summarize the major functions the product must perform or must let the user perform. Details will be provided in Section 3, so only a high-level summary (such as a bullet list) is needed here. Organize the functions to make them understandable to any reader of the SRS. A picture of the major groups of related requirements and how they relate, such as a top-level data flow diagram or object class diagram, is often effective.>

An auction site must perform the following major functions:

* **User registration and authentication**: Users can sign up easily and verify themselves through captchas or email verification processes.
* **Auction Listing**: Sellers can create listings and provide their item’s descriptions, images, and starting prices.
* **Bidding**: Buyers can bid on items they are interested in.
* **Payment processing**: Our site facilitates safe and secure payment processing to make sure that buyers pay for the items they win and sellers get their share of money.
* **Communication**: The site allows easy communication between the buyers and sellers and includes a feedback system to rate in different parameters.
* **Search and filtering**: The site will provide a search and filtering system that allows the user to easily find the item they want to purchase,
* **Tracking and shipping**: The site provides sellers with tools they need to ship the items and buyers with the tools they need to track their orders.
* **Analysis**: The site ensures that the sellers are provided with reports and analytics to help them understand their sales and identify the areas for improvement.
* **Dispute resolution**: The site contains a clear and transparent dispute resolutions in case of any discrepancies during payments.
* **Security**: The site implements strong security measures to protect the user data and prevent fraud, hacking and other security breaches.

A high-level object class diagram for the functions of the auction site:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| User |  | Auction |  | Payment |  |
| -id: int  -username: string, int  -password: string, int  -email: string  -phone: int  -address: string | -id: int  -seller\_id: int  -product\_id: int  -start\_time: date  -end\_time: date  -current\_bid: float  -reserve\_price: float  -status: string  -description: string | -id: int  -buyer\_id: int  -amount: float  -status: string  -payment\_date: date |  |
|  |  |
|  |  |

The three classes are connected through their attributes. For instance, an auction item has a seller\_id that connects it to a user item that represents the seller. The diagram does not show all the methods that the classes might have, bit it gives a high-level view of the data flow between the different functions of the auction site.

## 2.3 Operating Environment

<Describe the environment in which the software will operate, including the hardware platform, operating system and versions, and any other software components or applications with which it must peacefully coexist.>

**Hardware platform**:

The auction website software will be hosted on a dedicated server with the following specifications:

Processor Intel(R) Core (TM) i7-7700HQ CPU @ 2.80GHz 2.81 GHz

System RAM 8.00 GB

System type 64-bit operating system, x64-based processor

Gigabit Ethernet interface

Uninterruptible power supply (UPS)

**Operating system**:

The server will run Ubuntu Server 20.04 LTS, a popular Linux distribution for web servers.

The server will also have the latest security patches and updates installed.

**Software components and applications**:

The auction website software will be built using a combination of programming languages, frameworks, and libraries, including:

PHP 8.0, a server-side scripting language

Laravel 8.0, a web application framework

Vue.js 2.6, a JavaScript framework for building user interfaces

MySQL 8.0, a relational database management system

Redis 6.2, an in-memory data store and message broker

The auction website will also interact with other software components and applications, including:

**Payment processing**: The website will use the PayPal REST API to process payments securely and efficiently.

**Email delivery**: The website will use the SMTP protocol to send email notifications to users.

The server will run Postfix 3.5 as the mail transfer agent (MTA).

**Search engine**: The website will use Elasticsearch 7.13 to enable users to search for items based on keywords and other criteria.

The software for the auction website will be created in a way that allows it to coexist peacefully with other server-side software components and programmes.

If the server has enough resources, it can handle high traffic while still being available and responsive.

To maintain data security and recovery in the event of hardware or software problems, regular backups will be taken.

## 2.4 Design and Implementation Constraints

<Describe any items or issues that will limit the options available to the developers. These might include: corporate or regulatory policies; hardware limitations (timing requirements, memory requirements); interfaces to other applications; specific technologies, tools, and databases to be used; parallel operations; language requirements; communications protocols; security considerations; design conventions or programming standards (for example, if the customer’s organization will be responsible for maintaining the delivered software).>

The online auction system must abide by all applicable laws governing the purchase and selling of products and services via the Internet, including consumer protection legislation, data privacy laws, etc. Strong security mechanisms must be incorporated into the system's design to guard against fraud, hacking, and unauthorised access. Other applications like payment gateways, storage management systems, and shipping services may require the system to communicate with them. The usage of particular technologies and communication protocols may be necessary for these interactions. The system must be designed with clear and consistent coding standards, design conventions, and programming standards. This ensures that the code is maintainable and scalable and can be easily modified and updated. The system may be required to support multiple languages to accommodate a diverse user base. The system may need to support multiple concurrent users and transactions at the same time. This requires careful design and implementation of parallel operations to ensure efficient performance and scalability.

## 2.5 User Documentation

<List the user documentation components (such as user manuals, on-line help, and tutorials) that will be delivered along with the software. Identify any known user documentation delivery formats or standards.>

The auction site – BIDNESS, is an auction site only for the students of MU. Here, people can sell products they want to get rid of and buy products they need, mostly in an emergency where ordering online isn't an option due to the location of the college, which is on the outskirts of the city. Generally, an auction is held until 3 counts, but here this won't be the case. It will have a limited time duration wherein people can auction the product for a higher price.

Students have to register themselves on the website by providing a username and a password. Recommended username would be their name so as to maintain transparency between the person buying and selling the product. The password can extend up to 20 characters and should have a minimum of 5 characters including numbers, alphabets and special characters. Once the account is created and verified, the student has to enter his/her contact information which includes mobile number and hostel room number. There will be a choice to add his/her profile picture as well.

Students can look for the products they need with the help of the search box and the top of the website. They can search for keywords of products they want or browse through the category section which is at the left side of the website. It will have a list of categories, for example, clothes, stationery, skincare.

If any student wants to sell a product, they must go to their profile and click on “new product” and upload a picture of the product with the name and condition of the product mentioned. They can set the price of the product and mention mode of payment also.

Once the auction is completed for a product, the seller and the buyer meet at some place (comfortable to both) on the campus and finish the deal.

The time of payment can be decided mutually by the seller and buyer. The buyer can pay before collecting the product or after as well.

Some expected FAQs could be:

* What is the time duration for auctioning a particular product?
* What if the condition of the product is worse/better than the condition claimed by the seller?
* What if, after payment, the seller doesn’t show up or has previously sold the item to some other student?
* What if a student repeatedly shows fraud practices?
* Is there any section for new products as well or just used ones?

Once you have sold an item, you must mark it as “sold” on your products list on your profile. This will help prevent confusion among students regarding available products.

There will be a “Contact us” section towards the bottom right of the website where you will be asked for your phone number and there will be a box where you can type in your doubt/issue. This will be received by us, and we will get back to you with the solution as soon as possible.

## 2.6 Assumptions and Dependencies

<List any assumed factors (as opposed to known facts) that could affect the requirements stated in the SRS. These could include third-party or commercial components that you plan to use, issues around the development or operating environment, or constraints. The project could be affected if these assumptions are incorrect, are not shared, or change. Also identify any dependencies the project has on external factors, such as software components that you intend to reuse from another project, unless they are already documented elsewhere (for example, in the vision and scope document or the project plan).>

**Assumed factors** **that could affect the requirements of an auction website include**:

**Traffic**: The quantity of data flow, the number of active users, and any possible scalability needs of the website.

**Security**: The degree of security necessary to safeguard user data, including data encryption, identification, and permission.

**Payment processing**: Having the ability to safely process payments, including integrating with third-party payment companies and handling credit cards.

**Third-party components**: The accessibility and interoperability of external parts, such as hosting companies, online frameworks, and libraries.

**Compliance**: Observance of legal and governmental requirements, such as customer protection laws, tax laws, and data privacy laws.

**User interface**: The usability and functionality of the website, including the user interface design, navigation, and search capabilities.

**Content management**: The ability to manage and display auction listings, including the creation, editing, and removal of listings.

**Marketing**: The ability to promote and market the website, including search engine optimization (SEO) and social media integration (SMI).

**Dependencies** **on external factors could include**:

Integration with third-party APIs or services, such as payment gateways or shipping providers.

Use of open-source software or libraries, which may have their own dependencies and compatibility issues.

Compatibility with specific browsers or operating systems.

Hardware requirements for hosting and running the website, including server capacity and network infrastructure.

## 2.7 Functional Requirement Specifications

<Itemize the detailed functional requirements associated with this feature. These are the software capabilities that must be present in order for the user to carry out the services provided by the feature, or to execute the use case. Include how the product should respond to anticipated error conditions or invalid inputs. Requirements should be concise, complete, unambiguous, verifiable, and necessary. Use “TBD” as a placeholder to indicate when necessary information is not yet available.>

<Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind.>

**User Registration**: Users should be able to create an account on the auction site. The registration process should collect user information such as name, email address, and password. The system should store the user information securely and allow users to log in and out of their accounts.

**Item Listing**: On the website, vendors should be able to offer products for auction. Sellers should be able to define the opening bid, reserve price, and length of the auction through the system. The system need to include a way for vendors to post pictures and descriptions of their products.

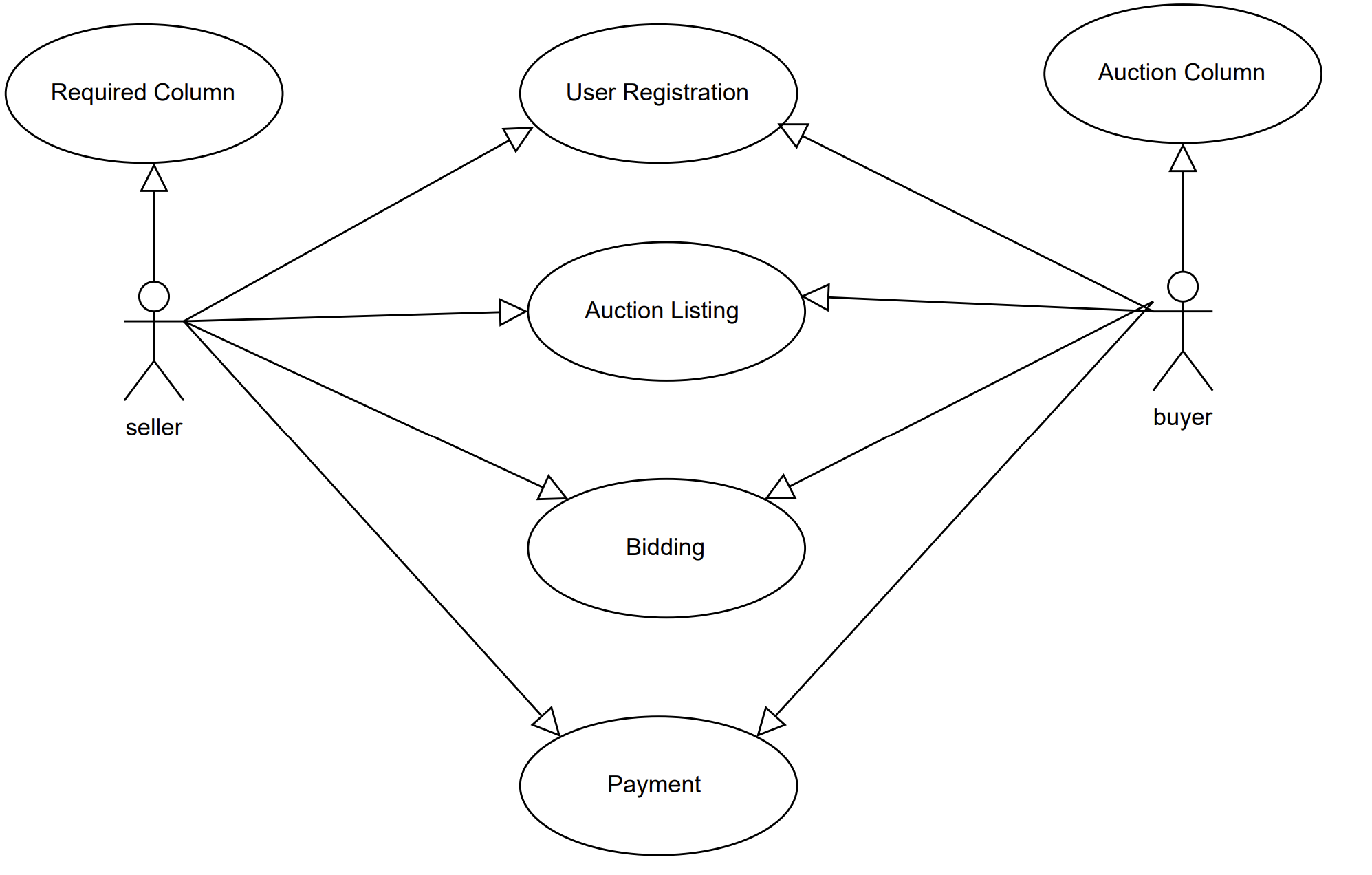
**Bidding**: Users should be able to place bids on auction items. The system should update the current bid amount in real-time and notify the bidder if they have been outbid. The system should also prevent users from placing bids that are lower than the current bid or below the reserve price.

**Payment Processing**: The system should provide a mechanism for buyers to make payments for the items they have won in the auction. The system should allow for different payment methods, such as credit card or PayPal, and should store payment information securely.

**Auction Completion**: Once an auction has ended, the system should notify the winning bidder and the seller. The system should provide a mechanism for the seller to ship the item to the buyer and for the buyer to confirm receipt of the item.

### *2.7.1 Role use case 1*

**Use case:**



# External Interface Requirements

## User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

The software product of an auction site requires several user interfaces to interact with the users. Some of the user interfaces and their logical characteristics are:

**Registration and Login Interface**: This interface is used to allow new users to register and existing users to log in to their accounts. The interface should include fields for entering user details such as name, email address, password, and contact information. The interface should also provide a "forgot password" option and error messages for incorrect login credentials.

**Dashboard Interface**: This interface is used to display an overview of the user's account, including current auctions, bidding history, messages, and account settings. The interface should have an intuitive layout and be easy to navigate.

**Auction Listing Interface**: This interface is used to display details of the auction items available for bidding. The interface should include clear images of the item, detailed item descriptions, bidding history, and other relevant information such as shipping details and payment options.

**Bidding Interface**: This interface is used to place bids on auction items. The interface should display the current highest bid, provide options for placing a higher bid, and confirm the bid amount before submission.

**Payment Interface**: This interface is used to facilitate payment for auction items won by the user. The interface should include options for payment methods such as credit card, PayPal, or other payment gateways.

**Messaging Interface**: The buyer and seller can communicate using this interface to ask questions about the item, discuss shipment, and exchange other pertinent information. There should be choices for sending and receiving messages as well as examining message history on the user-friendly, simple interface.

The user interface design should follow recognized GUI guidelines, such as restrictions on screen layout, typical buttons and features (such as help), guidelines for error message display, and keyboard shortcuts. The specifics of the user interface design should be documented in a style guide or user interface specification document. It is also possible to give example screen shots to aid in the design.

## Hardware Interfaces

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>

**Payment gateway**: A payment gateway is a hardware interface that enables users to make online payments securely. Your auction site may require integration with one or more payment gateways to allow users to bid and pay for items.

**Barcode scanner**: A barcode scanner is a hardware interface that allows users to scan the barcode on items they wish to bid on. This can be useful if your auction site is selling physical products.

**RFID reader**: An RFID reader is a hardware interface that can read RFID tags attached to items. This can be useful for tracking items that are being auctioned off.

**Point-of-sale (POS) system**: A POS system is a hardware interface that allows users to purchase items at a physical location. If you have a physical auction location, you may need to integrate your auction site with a POS system to process payments.

**Mobile device support**: Many users access the internet through their mobile devices. To ensure that your auction site is accessible to everyone, you may need to consider hardware interfaces that enable mobile device support, such as responsive web design or a mobile app.

**Printer**: A printer is a hardware interface that can print receipts, invoices, and other important documents. If your auction site requires the printing of such documents, you may need to integrate it with a printer.

**Network infrastructure**: Your auction site may require network infrastructure such as routers, switches, and other networking equipment to ensure reliable connectivity and data transfer.

## Software Interfaces

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>

An auction site involves many interconnected software components. Some key connections between an auction site and other software components include:

* **Database**: The site maintains a database containing user accounts, things up for sale, bids, transactions, etc. To retrieve and update this data, the auction site software connects to the database.
* **Payments**: The auction site links with payment processing platforms like Gpay, Paytm, PayPal or any UPI to make transactions easier between buyers and sellers.
* **Image hosting**: When sellers submit their pictures of products, the auction site integrates with an image hosting service such as Amazon S3 or Imgur to store and serve these images.
* **Shipping and logistics**: To determine shipping costs and simplify the delivery of items to bidders, the site interfaces with a shipping and logistics firm, like FedEx, BlueDart etc.
* **Analytics and reporting**: To provide insight into the number of things sold, amount of money made, the site integrates with an analytics and reporting system like Google Analytics or Mixpanel.

Data items or messages coming into the system include:

* **User registration data**: A user’s name, email address and password are provided when they register for an account on the auction site. May be shared between web servers and database servers along with payment processing and shipping providers.
* **Item listing data**: This is the data of the new item listing like item name, description, starting bid price and photos. May be shared between web servers and the database servers along with image hosting providers or shipping providers.
* **Bid data**: This includes the user’s id, item id and the bid amount. May be shared between web server, database server and payment processing providers.
* **Payment data**: When a buyer makes a payment, this contains the buyer’s id, seller’s id, item id and the payment amount. May be shared between web server and payment processing provider
* **Shipping data**: The buyer's shipping address and tracking details are included in the shipment data when a seller ships goods to a customer. The shipping service, the database server, and the web server could all share this.

Data items or messages going out of the system include:

* **Email notifications**: The site sends email notifications to users when they have been outbid on an item, when they win an auction, or when a new item matching their search criteria is listed.
* **Item listings**: The auction site displays item listings to users, including information such as item name, description, bidding status and photos.
* **Bid updates**: Updates the bidding information in real-time, showing users current highest bid and whether they have been outbid.
* **Payment confirmation**: The site sends confirmation messages to both buyers and sellers when a payment has been made successfully.
* **Shipping notifications**: The site sends shipping and tracking notifications to the buyers.

The security and privacy of the shared data is an implementation restriction in the data sharing method. While exchanging data, authentication, access control, encryption, data validation and sanitization, and compliance with data protection laws should all be taken into account.

## Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

**Email**: The system should allow users to receive notifications about bids, item status updates, andother important information via email. The system should also allow users to communicate with each other through email.

**Web Browser**: The system should be accessible through a web browser, which is the primary means of interacting with the system.

**Network Server Communications Protocols**: The system should use standard network protocols like TCP/IP and HTTP to communicate with the server and other devices.

**Electronic Forms**: The system should allow users to fill out electronic forms to provide information about their items for sale, bids, and other relevant information.

**Message Formatting**: The system should use a standardized message format for all communications between the server and client devices. This ensures that messages can be easily interpreted and processed by the recipient.

**Communication Standards**: The system should use standard communication protocols such as FTP, HTTP, and HTTPS to facilitate communication between the server and client devices.

**Communication Security and Encryption**: The system should ensure that all communications between the server and client devices are secure and encrypted to prevent unauthorized access to sensitive data.

**Data Transfer Rates**: The system should ensure that data is transferred at an optimal rate to prevent delays and ensure smooth operation.

**Synchronization Mechanisms**: The system should employ synchronization mechanisms to ensure that data is consistent and up to date across all devices and users.

With quick data transmission rates, standardised message formats, and safe encryption techniques to protect sensitive data, the communications functions of the Online Auction system should be developed to offer consumers a seamless and secure experience.

# System Features

<This template illustrates organizing the functional requirements for the product by system features, the major services provided by the product. You may prefer to organize this section by use case, mode of operation, user class, object class, functional hierarchy, or combinations of these, whatever makes the most logical sense for your product.>

## Search Article

|  |  |
| --- | --- |
| **Use Case Name** | Register an account in auction site |
| **XRef** | Section 4.1  SDD, Section 7.1 |
| **Trigger** | The user creates an account to participate in the auction system. |
| **Precondition** | Users must have a college email address and be a student at our university. |
| **Basic Path** | User enters personal information like name,batch,branch etc. , and creates a username and password, and submits the form. |
| **Alternative Paths** | User enters invalid information or username that is already taken, and the system prompts them to correct the errors. |
| **Postcondition** | A user account is created, and they can log in to participate in the auction system. |
| **Exception Paths** | None |
| **Other** | None |
| **Use Case Name** | Create an auction listing |
| **XRef** | Section 4.1  SDD, Section 7.1 |
| **Trigger** | The user sells an item and lists it on the auction site. |
| **Precondition** | Users must have an account and be logged in. |
| **Basic Path** | The user enters item details (description, photo, starting bid price), and submits the listing in the REQUIRED COLUMN. |
| **Alternative Paths** | User enters invalid information or forgets to include required fields, and the system prompts them to correct the errors. |
| **Postcondition** | Auction listing is created and appears on the site for other users to bid on in the AUCTION COLUMN. |
| **Exception Paths** | The items that are repeated may also be displayed under a separate sub grouped section according to the variation in the auction price displaying the owner’s name. |
| **Other** | None. |
| **Use Case Name** | Bidding on an item |
| **XRef** | Section 4.1,  SDD, Section 7.1 |
| **Trigger** | User buys an item listed on the auction site. |
| **Precondition** | Users must have an account and be logged in. The user must be a seller. |
| **Basic Path** | User navigates to the item listing, enters a bid amount, and submits the bid. |
| **Alternative Paths** | User enters an invalid bid amount or bid lower than the reserve price set up manually by the website, and the system prompts them to correct the errors. |
| **Postcondition** | The user's bid is recorded and the current reserve price for the item is updated. |
| **Exception Paths** | If no one is going to accept the current bid which is almost equal to the reserve price of the website, then,  The first task is to lower the price by averaging it according to the number of people posting the query about the price of the item. Or  Remove the item from the auction list if the above also does not work. |
| **Other** | If a seller puts the same item for auction with the same auctioning price of their fellow mate, then the person posting their item first will be given chance to auction and the other person will not get access suggesting that person to make changes in either their item or the price. |
| **Use Case Name** | Winning an auction |
| **XRef** | Section 4.1,  SDD, Section 7.1 |
| **Trigger** | The user has the highest bid at the end of the auction. |
| **Precondition** | Users must be a buyer with proper credentials and be logged in to the website. |
| **Basic Path** | The system sends notification to the user that they have won the auction and provides instructions for payment and item pickup/delivery. |
| **Alternative Paths** | None. |
| **Postcondition** | The user has successfully purchased the item and the seller is notified to proceed with the transaction. |
| **Exception Paths** | If the user is stuck with the transaction due to some technical issues, then the website provides the phone number or email of the seller allowing the buyer to contact that person and choose alternative methods. |
| **Other** | If the buyer wants to cancel their auction in the last moment after winning, then they need to pay the penalty amount to the seller. |

|  |  |
| --- | --- |
| **Use Case Name** | Canceling an auction. |
| **XRef** | Section 4.1  SDD, Section 7.1 |
| **Trigger** | The seller wants to cancel an auction listing. |
| **Precondition** | The seller must have an account and be logged in. |
| **Basic Path** | Seller navigates to their auction listing, selects "cancel listing", and provides a reason for cancellation. |
| **Alternative Paths** | None |
| **Postcondition** | Auction listing is removed from the site and any bids on the item are canceled. |
| **Exception Paths** | None |
| **Other** | None |

# Other Nonfunctional Requirements

## Performance Requirements

<If there are performance requirements for the product under various circumstances, state them here and explain their rationale, to help the developers understand the intent and make suitable design choices. Specify the timing relationships for real time systems. Make such requirements as specific as possible. You may need to state performance requirements for individual functional requirements or features.>

Performance requirements are important to ensure that the online auction system can function efficiently and effectively under various circumstances. Here are some performance requirements and their rationales:

1. **Response Time**: The system should respond to user actions within 2 seconds. This is important to provide a smooth user experience and prevent frustration.
2. **Concurrent Users**: The system should be able to handle at least 1000 concurrent users without any significant decrease in performance. This is important to ensure that the system can handle a large number of users during peak usage times.
3. **Transaction Throughput**: The system should be able to process at least 100 transactions per second. This is important to ensure that the system can handle a large number of transactions simultaneously, which is critical for an online auction system.
4. **Availability**: The system should be available 99.9% of the time. This means that the system should not be down for more than 43 minutes per month. This is important to ensure that the system is always available for users to use.
5. **Scalability**: The system should be able to handle a significant increase in users and transactions without any significant decrease in performance. This is important to ensure that the system can grow with the user base.

Timing relationships for real-time systems:

1. **Latency**: For the system to process a real-time event, there should be a maximum delay of 500 milliseconds. This is crucial to do in order to guarantee that the system can handle real-time events rapidly enough to give consumers a smooth experience.
2. **Responsiveness**: The system should respond to user actions within 2 seconds. This is important to provide a smooth user experience and prevent frustration.

Performance requirements for individual functional requirements or features:

1. **User Authentication**: The system should be able to authenticate a user within 1 second. This is important to ensure that users can log in quickly and securely.
2. **Item Listing**: The system should be able to process an item listing request within 1 second. This is important to ensure that users can list items quickly and easily.
3. **Item Search**: The system should be able to search for items within 2 seconds. This is important to provide a fast and accurate search experience for users.
4. **Bidding**: The system should be able to process a bid within 1 second. This is important to ensure that users can bid quickly and efficiently.
5. **Payment Processing**: The system should be able to process a payment within 3 seconds. This is important to ensure that users can complete transactions quickly and securely.

## Safety Requirements

<Specify those requirements that are concerned with possible loss, damage, or harm that could result from the use of the product. Define any safeguards or actions that must be taken, as well as actions that must be prevented. Refer to any external policies or regulations that state safety issues that affect the product’s design or use. Define any safety certifications that must be satisfied.>

As an auction site, it is important to ensure that safety measures are in place to protect both buyers and sellers. Here are some safety requirements that an auction site should consider implementing:

* **Secure user registration and authentication**: To prevent illegal access to their accounts, auction sites should require that users generate strong passwords, verify their email addresses, and utilize two-factor authentication.
* **Privacy protection**: A comprehensive privacy policy outlining the collection, use, and protection of user data should be present on auction platforms. The organisations that own the website should also have safeguards in place to prevent the sharing of user information with unauthorised third parties.
* **Payment security**: To protect users' financial information, auction sites should only accept secure payment methods. Also, a system should be in place to identify and stop fraud cases.
* **Prohibition of counterfeit or illegal items**: To protect users from fraud or illegal activities, auction services should forbid the sale of fake and unlawful goods.
* **User feedback and ratings**: The user should be able to trust and value auction sites by leaving reviews and ratings for sellers.
* **Customer support**: Online auction sites should offer quick and efficient customer service to assist users in resolving any issues that they might face.
* **Transparency and disclosure**: Auction sites should be transparent and truthful about its policies, pricing, and terms of service. To keep their users' trust, they should also be transparent about any conflicts of interest or relationships with sellers.

## Security Requirements

<Specify any requirements regarding security or privacy issues surrounding use of the product or protection of the data used or created by the product. Define any user identity authentication requirements. Refer to any external policies or regulations containing security issues that affect the product. Define any security or privacy certifications that must be satisfied.>

An auction website's security and privacy are top priorities since it facilitates transactions between buyers and sellers and handles sensitive personal data including contact and payment information. To protect the security and privacy of users and their data, the ensuing conditions and factors must be taken into account:

**Authentication**: The auction website should require strong authentication for user accounts to prevent unauthorized access. User passwords should be encrypted and stored securely, and multi-factor authentication should be implemented to increase the security of user accounts.

**Secure communication**: All communication between the website and the user's browser should be encrypted using secure protocols such as HTTPS to prevent eavesdropping and data interception.

**Payment security**: Payment transactions should be handled securely, with user payment details encrypted and processed only by trusted payment gateways that comply with Payment Card Industry Data Security Standards (PCI DSS).

**Data protection**: The auction website should implement appropriate measures to protect user data, such as encryption, access controls, and regular data backups. User data should be stored securely and accessed only by authorized personnel.

**Privacy policies**: The auction website should have clear and concise privacy policies that inform users of the types of data collected, how it is used, and the measures taken to protect it. The privacy policies should be easily accessible to users and updated regularly to reflect any changes.

Overall, the auction website should prioritize security and privacy as core features of the product to build trust with users and ensure the long-term success of the platform.

## Software Quality Attributes

<Specify any additional quality characteristics for the product that will be important to either the customers or the developers. Some to consider are: adaptability, availability, correctness, flexibility, interoperability, maintainability, portability, reliability, reusability, robustness, testability, and usability. Write these to be specific, quantitative, and verifiable when possible. At the least, clarify the relative preferences for various attributes, such as ease of use over ease of learning.>

To ensure that the auction site is successful, it possess several key software quality attributes including:

• **Performance**: A huge volume of transactions and traffic should be handled by an auction site without any delay issues. It should deliver prompt notifications of bid updates and transaction status as well as quickly reply to user requests.

• **Usability**: The site must be simple to use with an easy-to-navigate layout that enables users to find what they’re searching for quickly. The website should minimize the requirement for user training or support by offering clear instructions and feedback.

• **Security**: A secure auction site protects user data and transactional information from unwanted access and modification. The website has to implement the required security safeguards, such as data validation, access control, encryption, and adherence to data protection legislation.

• **Reliability**: An auction site must be reliable and have a high availability rate and little downtime. In addition to giving consumers clear error messages and recovery choices, it should be able to recover quickly from any failure.

• **Maintainability**: The site needs to be easily maintainable, with clear documentation and code that programmers can quickly edit or extend. The site should also have well specified interfaces between components, as well as a defined architecture and modular design.

• **Scalability**: A scalable auction site can accommodate an expanding user base and rising transaction volume without compromising on performance or dependability. Using load balancing to guarantee high availability and fault tolerance, the website should be built to accommodate horizontal scaling.

# Other Requirements

<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

Other requirements that should be addressed in the SRS for the auction site include:

1. **Database requirements**: The auction site will require a robust and scalable database management system (DBMS) to handle the storage and retrieval of large amounts of data. The DBMS should be capable of handling concurrent transactions and provide mechanisms for data backup and recovery. The database schema should be designed to support the business rules of the auction site and allow for efficient querying and reporting.
2. **Internationalization requirements**: The auction site accepts users from all around the world and offers support for many languages and currencies. With support for non-Latin characters and formatting choices for dates, times, and currencies, the user interface should be created with internationalisation in mind.
3. **Legal requirements**: The auction site complies with all relevant laws and regulations, including those related to e-commerce, data protection, and consumer protection. The site includes terms and conditions of use, a privacy policy, and other legal notices as required by law.
4. **Reuse objectives**: The auction site may include software components that can be reused in other projects. The SRS specifies reused design patterns such as Model-View-Controller (MVC) or Repository pattern, to ensure consistency and maintainability in the codebase. Any reuse objectives for these components, including any documentation or training requirements for potential reusers.
5. **Performance requirements:** The auction site is designed to perform well under high load conditions, with minimal downtime and fast response times. The SRS specifies performance requirements, such as maximum response times, expected load capacity, and system availability.
6. **Maintenance and support requirements**: The auction site should include mechanisms for maintenance and support, such as software updates, bug fixes, and user support. The SRS specifies maintenance and support requirements, including any service level agreements (SLAs) for response times and problem resolution.
7. **Integration requirements**: The auction site may need to integrate with other software systems, such as payment gateways, shipping providers, or accounting software. The SRS should specify integration requirements, including any APIs or other interfaces required to facilitate integration.

Generally, all needs for the design, development, and operation of the auction site should be covered by the SRS, including those relating to database administration, internationalisation, legal compliance, performance, maintenance and support, and system integration.

Appendix A: Glossary

<Define all the terms necessary to properly interpret the SRS, including acronyms and abbreviations. You may wish to build a separate glossary that spans multiple projects or the entire organization, and just include terms specific to a single project in each SRS.>

**Auction site** - A web-based platform that allows users to buy and sell goods and services via an auction-style process.

**Bid** - An offer to purchase an item or service at a specified price.

**Buyer** - An individual or entity that purchases goods or services on the auction site.

**Seller** - An individual or entity that sells goods or services on the auction site.

**Auction item** - An item or service that is being offered for sale through the auction process.

**Reserve price** - The minimum price that a seller is willing to accept for an auction item.

**Winning bid** - The highest bid received for an auction item when the auction ends.

**User account** - An account created by a user on the auction site to facilitate the buying and selling of goods and services.

**Feedback rating** - A numerical score assigned to a user on the auction site based on feedback received from other users.

**Shipping address** - The address to which a purchased item will be shipped.

**Payment method** - The method used by the buyer to pay for a purchased item, such as credit card or PayPal or UPI or cash on delivery.

Appendix B: Analysis Models

<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams.>