

Software Requirements Specification

**for
CuseBids**

Version Final

Prepared by

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| Version | Date | A/D/C (Add, Delete , Change) | Author | Document Section # | Description |
|---------|-------------|------------------------------|----------|--------------------|---------------|
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1. INTRODUCTION

1.1. Purpose

This Software Requirements Specification (SRS) is intended to delineate software requirements for the customer's CuseBids System. This SRS is intended to provide guidance to the developers of the system to implement required functionality, as well as the test team to develop appropriate Verification and Validation (V&V) plans and procedures required to demonstrate to the customer that the system was built to this specification.

1.2. Scope

This document specifies the requirements for the following capabilities.

1. creating cuseBids auction platform along with login support for users
2. includes requirements for listing an item for auction in the platform use case
3. includes requirements for searching for an item to bid by a user use case
4. includes requirements for participating for bidding for the items use case
5. further includes the performance requirements expected of the platform and the design constraints that limit the scope of the project.

1.3. Definitions

| | |
|-------|-------------------------------------|
| BDD | Block Definition Diagram |
| SRS | Software Requirements Specification |
| UML | Unified Modeling Language |
| V & V | Verification and Validation |

1.4. References

1. IEEE Std 830-1998 - IEEE Recommended Practice for Software Requirements Specifications - Revision of IEEE Std 830-1993

1.5. Overview

This document follows the recommended format specified in IEEE Std 830-1998 IEEE Recommended Practice for Software Specifications. For Section 3, the specific template A.5 for organizing information by feature is followed.

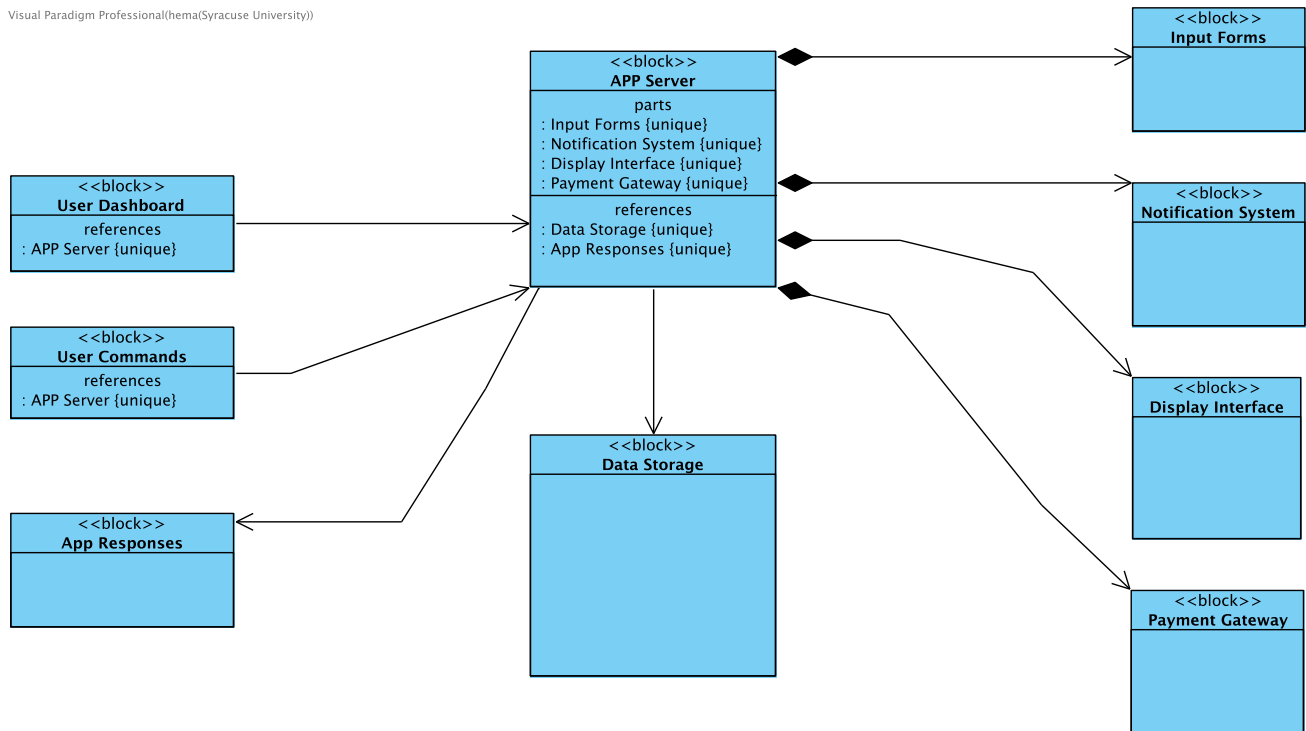
2. OVERALL DESCRIPTION

2.1. Product Perspective

The bidding app system is designed to facilitate efficient and secure bidding processes, catering to both buyers and sellers. Primarily accessed through its user interface, the app provides an intuitive platform for users to engage in auctions, browse items, and place bids. The Bidding System governs the bidding process, ensuring transparency and fairness by tracking bids in real-time and determining winning bids based on predefined rules. Administrators utilize the Auction Management System to create and manage auctions, setting parameters such as item details, starting bids, and duration. Integral to the system is the Payment Gateway, facilitating seamless financial transactions between parties, while the User Authentication System ensures user identity verification and access control.

2.1.1. System Block Diagram

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2.1.2. APP Server

This is the main system where all the backend work happens and all the microservices are located here.

2.1.3. App Responses

Whenever the user sends some specific commands to the system. The system sends the app response here.

2.1.4. Data Storage

This the database system to store the user information as well as the listed items information.

2.1.5. Display Interface

Display Interface block for showing search results and listing information.

2.1.6. Input Forms

For submitting data like listing details and bids.

2.1.7. Notification System

Notification System block to alert users about bids and auction updates

2.1.8. Payment Gateway

Payment Gateway block for handling transactions.

2.1.9. User Commands

Whenever user interacts with the web interface it send commands through user commands.

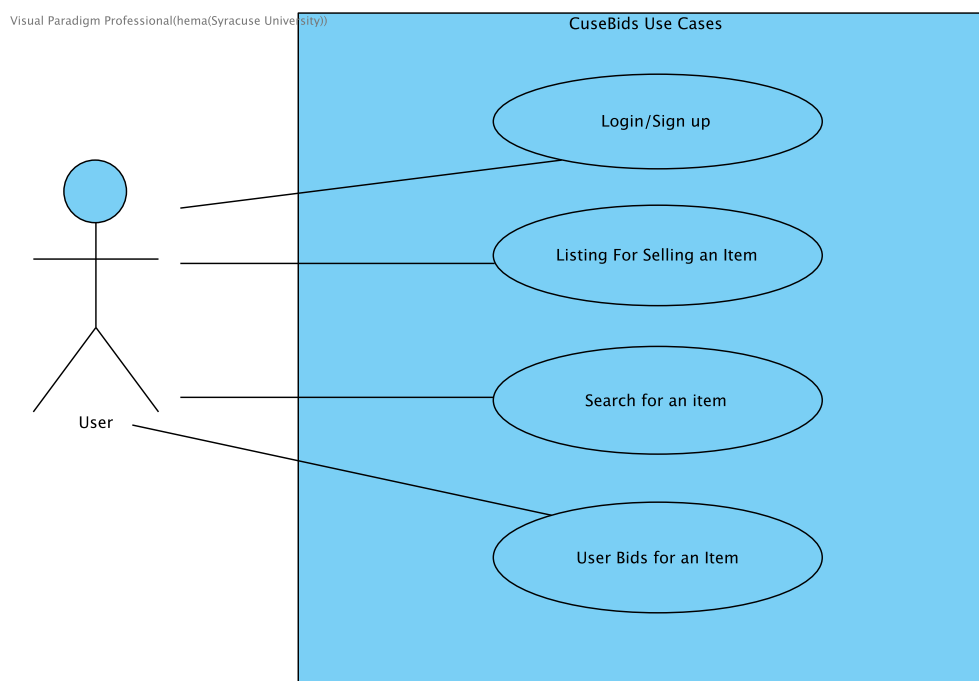
2.1.10. User Dashboard

This is the web interface where user can interact with the system and send commands to the systems.

2.2. Product Functions

The following use case diagram depicts the users of the system, and the intended way in which they will interact with the system.

2.2.1. auction



2.3. Use Case Description

2.3.1. User

ID: AC01

The user is a registered and authenticated user enrolled at Syracuse University. The user acts as both buyer and seller. Buyers search and browse for items and place bids. Sellers create,manage listings and view bids.









2.3.1.1. Properties

| | |
|----------|-------|
| Abstract | false |
|----------|-------|



Leaf false

Root false

2.3.1.2. Relationships

| Relationship | From | To |
|--------------|--|---|
| unnamed |  User |  Search for an item |
| unnamed |  User |  Listing For Selling an Item |
| unnamed |  User |  User Bids for an Item |
| unnamed |  User |  Login/Sign up |

2.3.1.3. Traceability





| Type | Value |
|------------|--|
| Transit To |  Analysis Model.Swimlane |
| Transit To |  Analysis Model.Swimlane2 |
| Transit To |  Analysis Model.Swimlane3 |

2.3.2. CuseBids Use Cases

2.3.2.1. Properties

| | |
|----------|-------|
| Abstract | false |
| Leaf | false |
| Root | false |

2.3.2.2. Children Summary

| Name | Description |
|---|-------------|
|  Listing For Selling an Item | |
|  Login/Sign up | |
|  Search for an item | |
|  User Bids for an Item | |

2.3.3. Listing For Selling an Item

ID: UC06

2.3.3.1. Primary Actors

 [User](#)

2.3.3.2. Details

| | |
|-------|-----|
| Level | N/A |
|-------|-----|

| | |
|------------------------------|--|
| Complexity | N/A |
| Use Case Status | N/A |
| Implementation Status | N/A |
| Preconditions | User has a valid item to list. |
| Post-conditions | Sunny Day: Item has been listed. Rainy Day: Item has been not listed. |
| Author | N/A |
| Assumptions | N/A |

2.3.3.3. Scenarios

2.3.3.3.1. Scenario

1. User clicks on the new item list option.
2. Provides the required information in front of the user.
3. Once the information has been provided, the systems check for the information validity.
4. After validation, the system lists the new item and assigns a unique ID.

2.3.3.3.2. Scenario2

1. User enters invalid data or incomplete data, hence the information wont submitted.
2. Systems informs the user to refine the information to be valid.

2.3.3.3.3. Scenario3

1. In the middle of the listing process the user cancels the process.
2. System discards all the information and returns back to homepage.

2.3.3.4. Requirements

2.3.3.4.1. Interface for Listing

ID: UC06.REQ001

The system shall provide a proper detailed interface with required information to list a new item for sale.

2.3.3.4.2. Listing and Identification

ID: UC06.REQ003

Once the item is validated it should be listed and provided with a unique ID.

2.3.3.4.3. Validate Listed Item

ID: UC06.REQ002

The system shall go through the information provided by the user and check for its validity for listing.

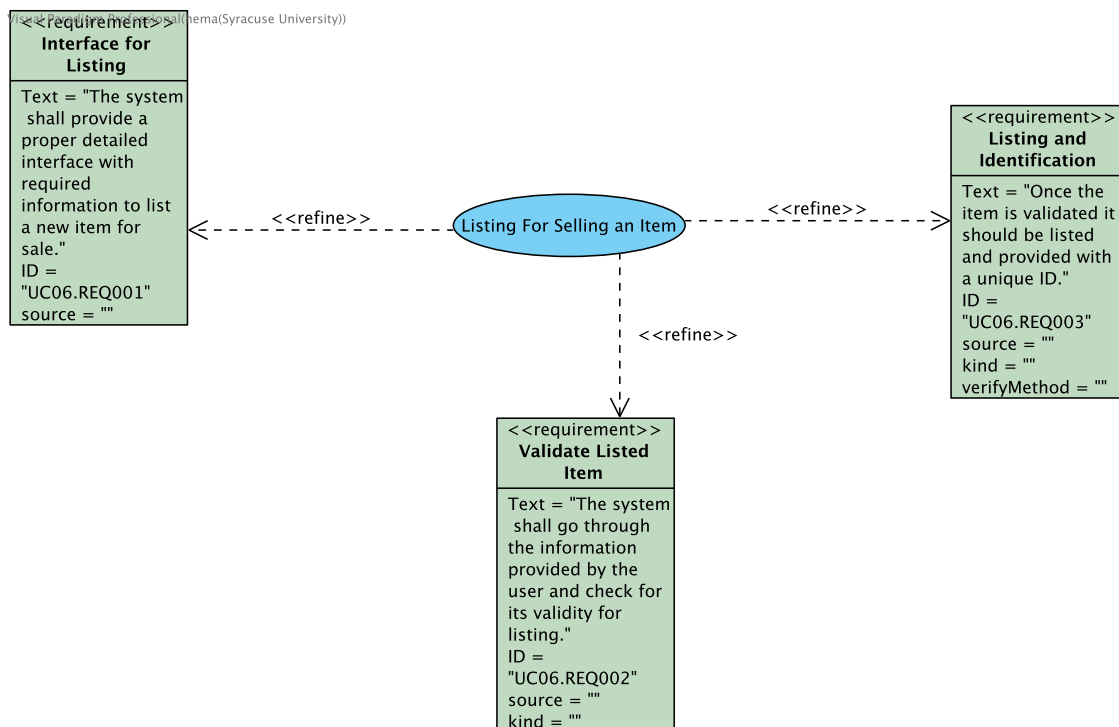
2.3.3.5. Relationships

| Relationship | From | To |
|---|---|--|
|  Unnamed |  Listing For Selling an Item |  Interface for Listing |
|  Unnamed |  Listing For Selling an Item |  Validate Listed Item |
|  Unnamed |  Listing For Selling an Item |  Listing and Identification |

| Relationship | From | To |
|--------------|-----------------------------|-----------------------------|
| unnamed | Listing For Selling an Item | Interface for Listing |
| unnamed | Listing For Selling an Item | Listing and Identification |
| unnamed | Listing For Selling an Item | Validate Listed Item |
| unnamed | Listing For Selling an Item | List Item for Bidding |
| unnamed | Listing For Selling an Item | Item Details Validation |
| unnamed | Listing For Selling an Item | Starting Bid and Reserve |
| unnamed | Listing For Selling an Item | Auction Duration |
| unnamed | Listing For Selling an Item | Listing Confirmation |
| unnamed | Listing For Selling an Item | Listing Cancellation |
| unnamed | Listing For Selling an Item | Listing Visibility |
| unnamed | User | Listing For Selling an Item |

2.3.3.6. Sub Diagrams

2.3.3.6.1. Listing For Selling an Item Requirement Diagram



2.3.4. Search for an item

ID: UC01

2.3.4.1. Primary Actors

User

2.3.4.2. Details

| | |
|------------------------------|---|
| Level | N/A |
| Complexity | N/A |
| Use Case Status | N/A |
| Implementation Status | N/A |
| Preconditions | User must be logged in and knows what to search in the system. |
| Post-conditions | Sunny Day : Once the output is displayed, the user can choose to go with it or refine the search. Rainy Day : The keyword user entered was invalid or unknown to the system, hence no items are displayed. |
| Author | N/A |
| Assumptions | N/A |

2.3.4.3. Scenarios

2.3.4.3.1. Scenario

1. When the user enters the Keyword or chooses a Category, the system obtains the keyword or the selected category option.
2. After this the system provides the required output list for the matched keyword or the mentioned category.
3. Once the items are displayed, the user can explore among the output.
4. The user can choose the required item from the presented list or he can refine his search.

2.3.4.3.2. Scenario2

1. User enters a keyword which is not present in the system or is unknown to the system.
2. System displays a message with no result found due to invalid input and informs the user to refine their search.

2.3.4.4. Requirements

2.3.4.4.1. After Valid Search

ID: UC01.REQ001

The System shall display the list of items that match the search criteria

2.3.4.4.2. Invalid Search

ID: UC01.REQ002













The System shall display a message saying "Item not found"

















2.3.4.4.3. Search Bar

ID: UC01.REQ003

Upon Clicking on the search bar, the user should be able to search for items

2.3.4.5. Relationships

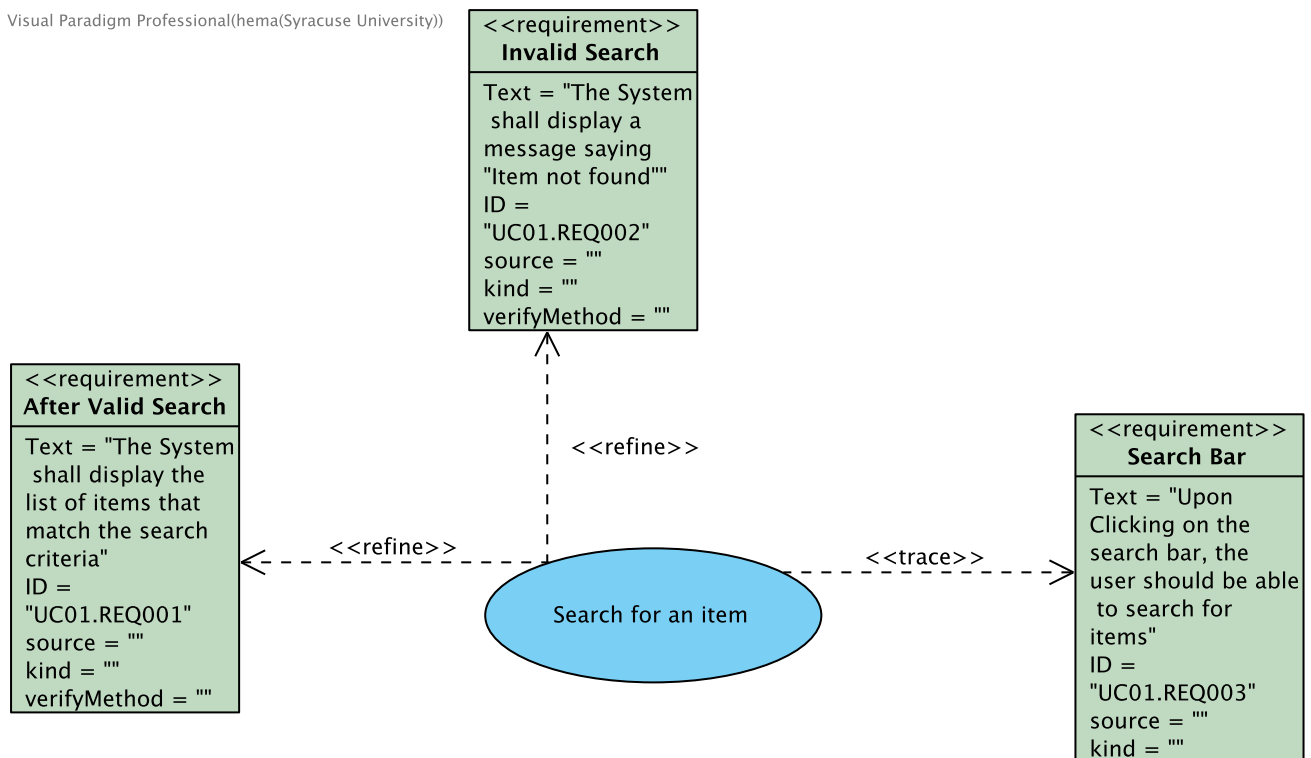
| Relationship | From | To |
|---|--|---|
|  Unnamed |  Search for an item |  User doesn't exist |
|  Unnamed |  Search for an item |  Account Creation |
|  Unnamed |  Search for an item |  Existing user valid creds |
|  Unnamed |  Search for an item |  Existing user invalid creds |

| Relationship | From | To |
|--------------|--|--|
| unnamed |  Search for an item |  Invalid Search |
| unnamed |  Search for an item |  After Valid Search |
| unnamed |  Search for an item |  Search Bar |
| unnamed |  Search for an item |  Basic Search Functionality |
| unnamed |  Search for an item |  Auto-complete Suggestions |
| unnamed |  Search for an item |  User Search History |
| unnamed |  Search for an item |  Sorting Capabilities |
| unnamed |  Search for an item |  Handling of No Results |
| unnamed |  User |  Search for an item |

2.3.4.6. Sub Diagrams

2.3.4.6.1. Search for an item Requirement Diagram

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2.3.4.7. Reference Diagrams

2.3.5. Login/Sign up

ID: UC19

2.3.5.1. Primary Actors

 [User](#)

2.3.5.2. Details

| | |
|------------------------------|--|
| Level | N/A |
| Complexity | N/A |
| Use Case Status | N/A |
| Implementation Status | N/A |
| Preconditions | User must be able to access the login page |
| Post-conditions | Sunny Day: User is able to create a account or is able to login to the existing one. Rainy Day: User is not part of the system or is providing invalid credentials. |
| Author | N/A |
| Assumptions | N/A |

2.3.5.3. Scenarios

2.3.5.3.1. Scenario

1. User can signup and provide the required information to create a account in the system

2.3.5.3.2. Scenario2

1. If an existing user is providing valid credentials then they will be able to login to the system.
2. They will be able to access the application

2.3.5.3.3. Scenario3

1. If an existing user enters invalid credentials.
2. They will be asked to provide proper details or create a new account if not already.
3. They wont be able to access they system

2.3.5.4. Requirements

2.3.5.4.1. Account Creation

ID: UC19.REQ002

The system shall allow user to create a new account

2.3.5.4.2. Existing user invalid creds

ID: UC19.REQ004

The system shall will not allow existing users with invalid credentials to login

2.3.5.4.3. Existing user valid creds

ID: UC19.REQ003




The system shall allow user who are already existing in the system to login using valid credentials

2.3.5.4.4. User Doesn't Exist

ID: UC19.REQ005

If the user doesnt exist in the system they will be prompted to signup and register.

2.3.5.5. Relationships

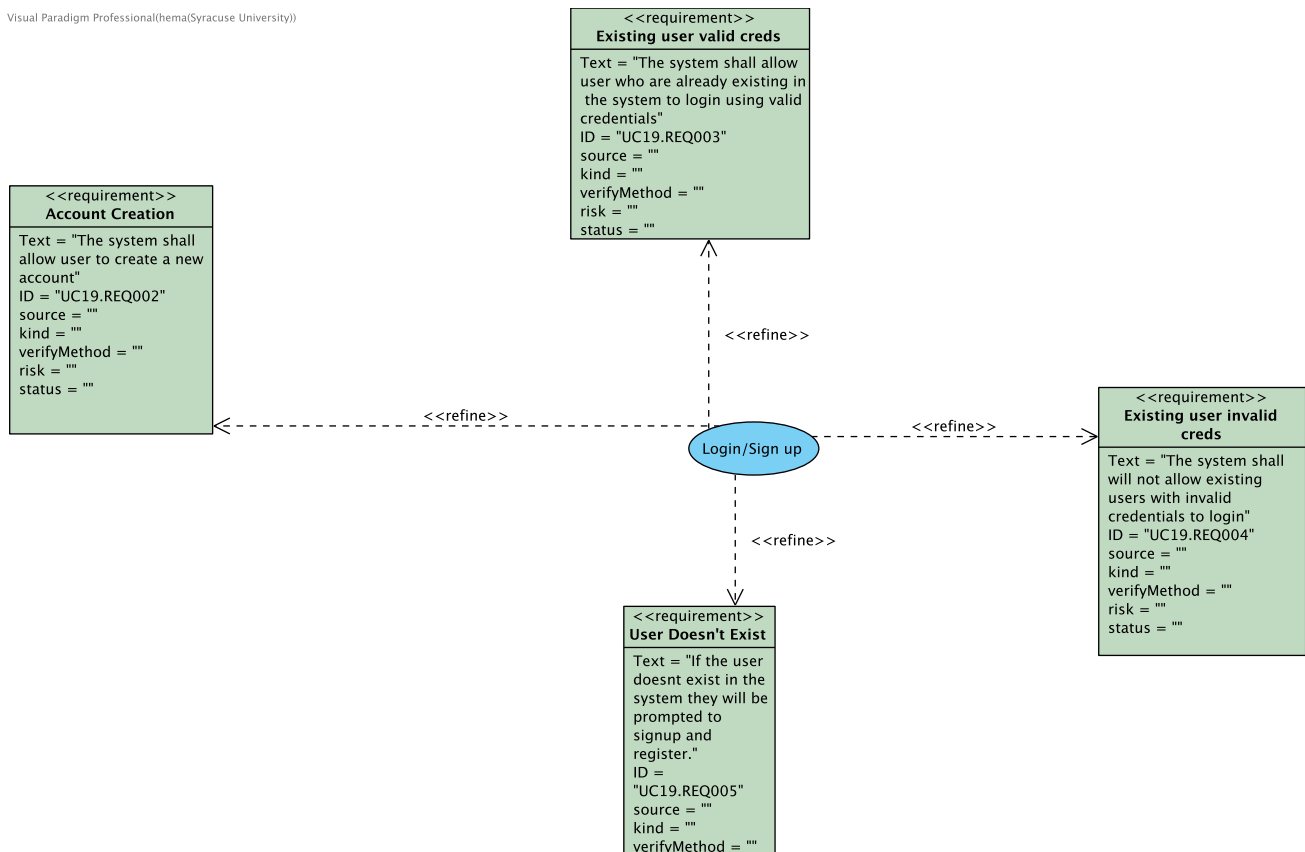
| Relationship | From | To |
|---|---|--|
|  unnamed |  Login/Sign up |  Account Creation |

| Relationship | From | To |
|--------------|---------------|-----------------------------|
| unnamed | Login/Sign up | Existing user valid creds |
| unnamed | Login/Sign up | Existing user invalid creds |
| unnamed | Login/Sign up | User Doesn't Exist |
| unnamed | Login/Sign up | Credential Check |
| unnamed | Login/Sign up | Authentication Process |
| unnamed | Login/Sign up | Secure Storage |
| unnamed | Login/Sign up | Account Creation |
| unnamed | Login/Sign up | Unique Account Guarantee |
| unnamed | User | Login/Sign up |

2.3.5.6. Sub Diagrams

2.3.5.6.1. Login/Sign up Requirement Diagram

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2.3.6. User Bids for an Item

ID: UC07

2.3.6.1. Primary Actors

User

2.3.6.2. Details

| | |
|------------------------------|---|
| Level | N/A |
| Complexity | N/A |
| Use Case Status | N/A |
| Implementation Status | N/A |
| Preconditions | User has the item which they want to bid on. |
| Post-conditions | Sunny Day: bid has been registered and user is the leader of bid. Rainy Day: If invalid amount is entered, system displays error. Rainy Day 2 : If the item is no longer available, the systems provides the required relevant information. |
| Author | N/A |
| Assumptions | N/A |

2.3.6.3. Scenarios

2.3.6.3.1. Scenario

1. The user can click on the listed item.
2. Once the user clicks on the item a interface to bid or buy is presented by the system.
3. The user provides the amount in the bid box.
4. The system validates the amount and compares with the highest bid.
5. If valid, the systems updates the bid history and makes the user as the highest bidder.

2.3.6.3.2. Scenario2

1. The user enters the low amount than the required bid.
2. The system invalidates the amount.
3. And asks the user to enter the valid amount for the bid.

2.3.6.3.3. Scenario3

1. The user tries to enter the amount on an item which recently got sold or expired.
2. Systems displays a message saying the items no longer available.

2.3.6.4. Requirements

2.3.6.4.1. Amount for Bidding

ID: UC07.REQ002

User will provide amount to be entered in the bidding process.

2.3.6.4.2. Interface for Bidding or Buying

ID: UC07.REQ001

System shall provide a user interface for bidding or directly buying the item.

2.3.6.4.3. Update the Bid

ID: UC07.REQ003

If the amount is valid the system updates the highest bidder.

2.3.6.4.4. Validate the amount

ID: UC07.REQ004

System check if the amount is valid and larger than the previous bid.

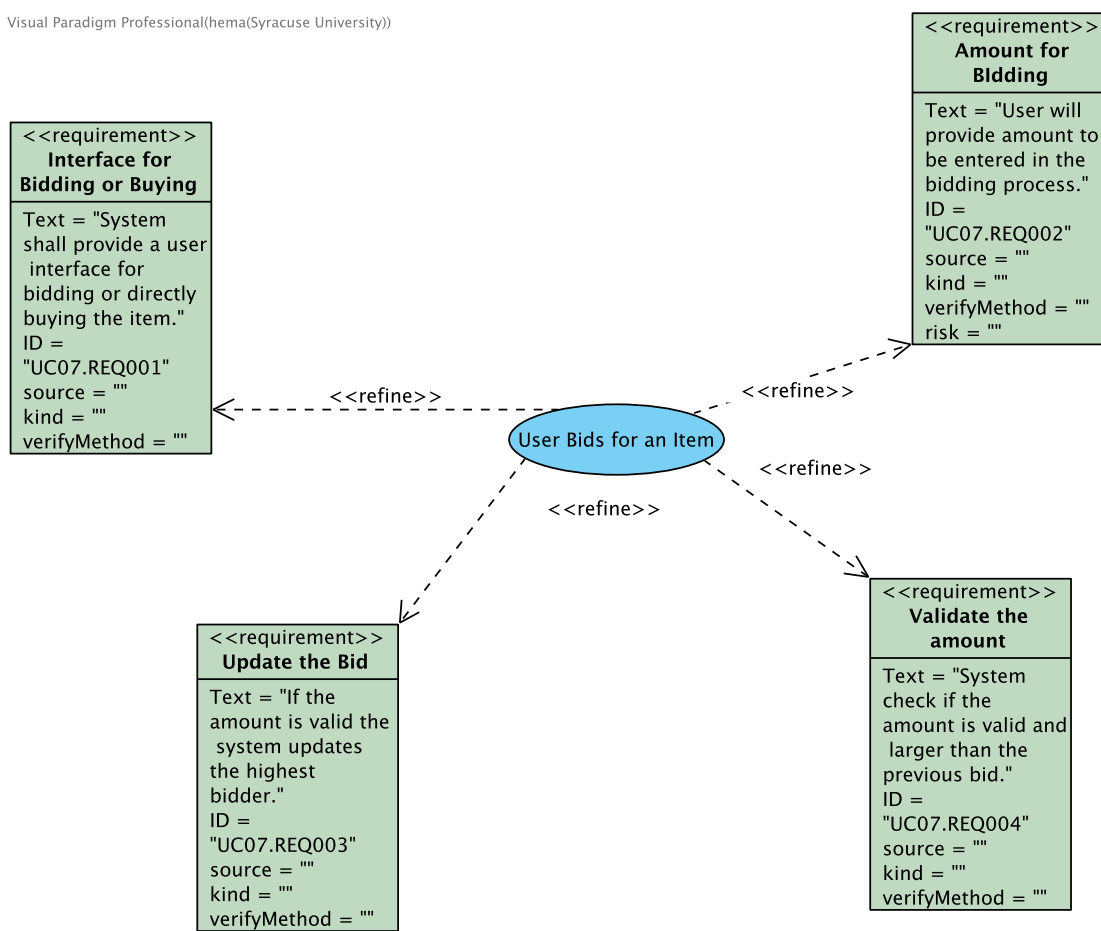
2.3.6.5. Relationships

| Relationship | From | To |
|--------------|-----------------------|---------------------------------|
| unnamed | User Bids for an Item | Interface for Bidding or Buying |
| unnamed | User Bids for an Item | Amount for Bidding |
| unnamed | User Bids for an Item | Update the Bid |
| unnamed | User Bids for an Item | Validate the amount |
| unnamed | User Bids for an Item | Interface for Bidding or Buying |
| unnamed | User Bids for an Item | Update the Bid |
| unnamed | User Bids for an Item | Amount for Bidding |
| unnamed | User Bids for an Item | Validate the amount |
| unnamed | User Bids for an Item | Bidding Process |
| unnamed | User Bids for an Item | Bid Validation |
| unnamed | User Bids for an Item | Real-time Bidding Updates |
| unnamed | User Bids for an Item | Bid History |
| unnamed | User Bids for an Item | Maximum Bid |
| unnamed | User Bids for an Item | Winning Bid Notification |
| unnamed | User Bids for an Item | Auction Closing |
| unnamed | User | User Bids for an Item |

2.3.6.6. Sub Diagrams

2.3.6.6.1. User Bids for an Item Requirement Diagram

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2.4. User Characteristics

Refer to Use Case Diagram above and the descriptions of the actors.

2.5. Constraints

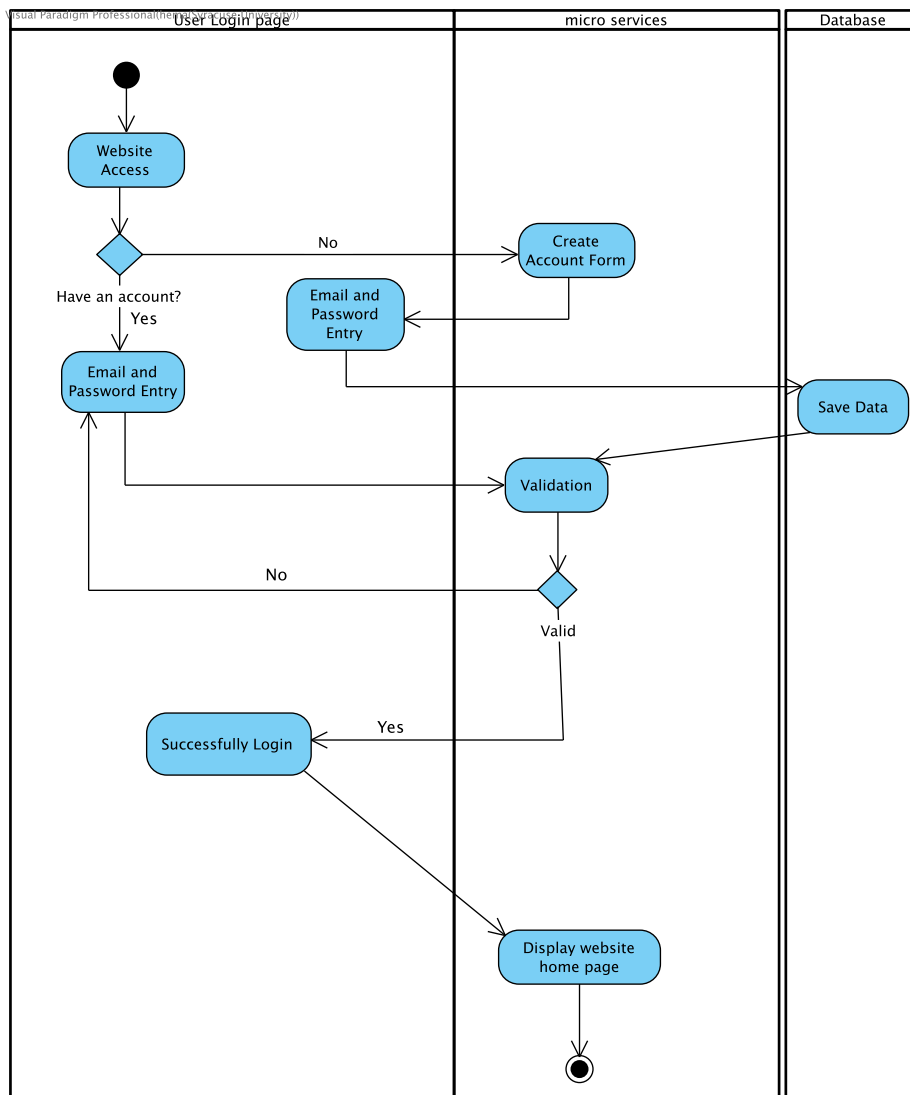
These are defined specifically in Section 3.

3. Specific Requirements

3.1. Overview

This auction platform will allow SU students to auction items that of interest to the campus community. This section provides the detailed features of the system and the associated requirements for each of the use cases: login implementation, listing an item in the platform, search for an item of interest and finally participating in the bidding of a selected item.

3.1.1. Login/Sign up Activity Diagram



3.1.2. Create Account Form

Web interface displays a form to gather information about the user

3.1.3. Display website home page

3.1.4. Email and Password Entry

User will be able to enter the email, password etc to validate their access

3.1.5. Email and Password Entry

pressing login button opens a form to enter user name and password

3.1.6. Save Data

The user registration information is stored in the database

3.1.7. Have an account?

The web interface displays the choice, login or register

3.1.8. Successfully Login

3.1.9. Valid

If the login information is correct then, web interface will proceed further

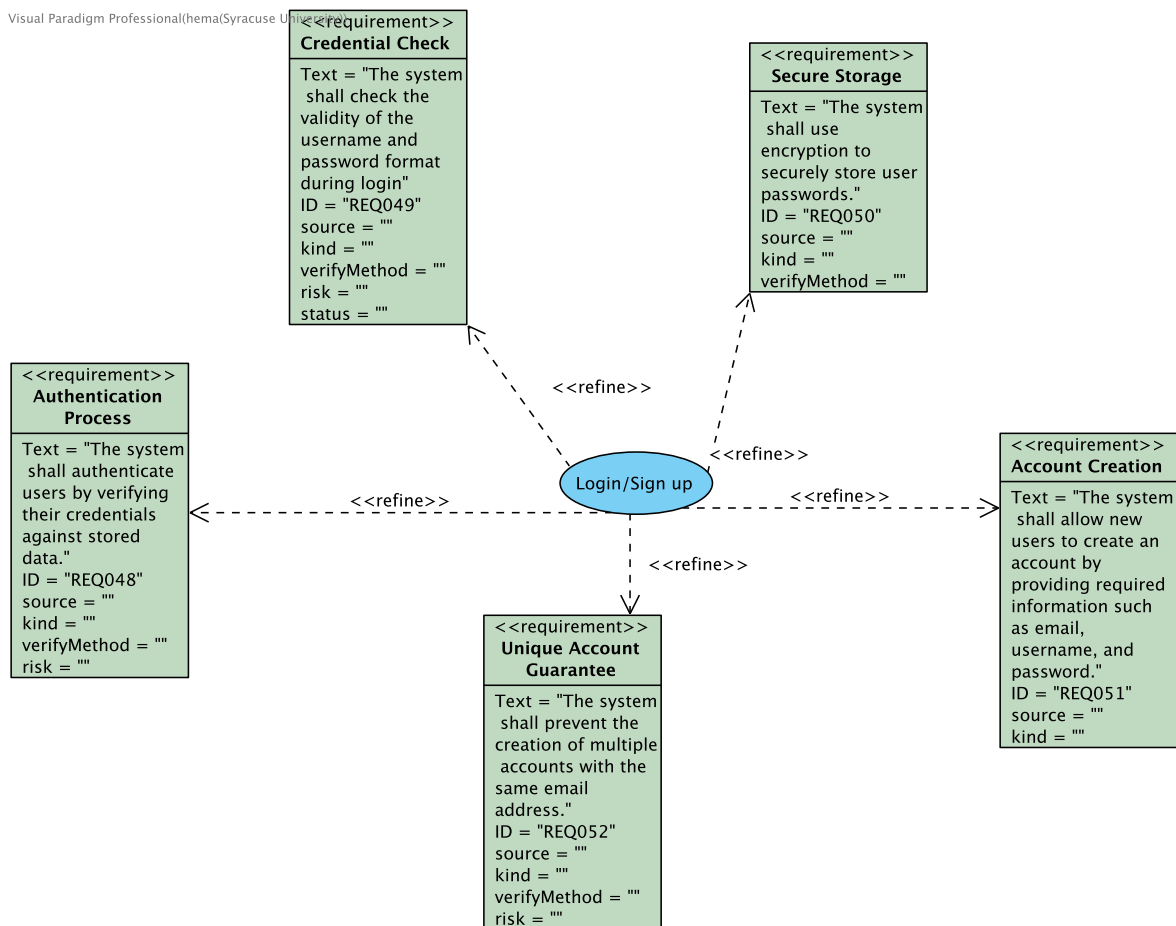
3.1.10. Validation

The backend framework will validate the login data by checking it against the database

3.1.11. Website Access

User enters the cusebids address in search bar and lands on login page

3.1.12. Login / Signup System Diagram



3.1.13. Login/Sign up

ID: UC19

3.1.14. Account Creation

ID: REQ051

The system shall allow new users to create an account by providing required information such as email, username, and password.

3.1.15. Authentication Process

ID: REQ048

The system shall authenticate users by verifying their credentials against stored data.

3.1.16. Credential Check

ID: REQ049

The system shall check the validity of the username and password format during login

3.1.17. Secure Storage

ID: REQ050

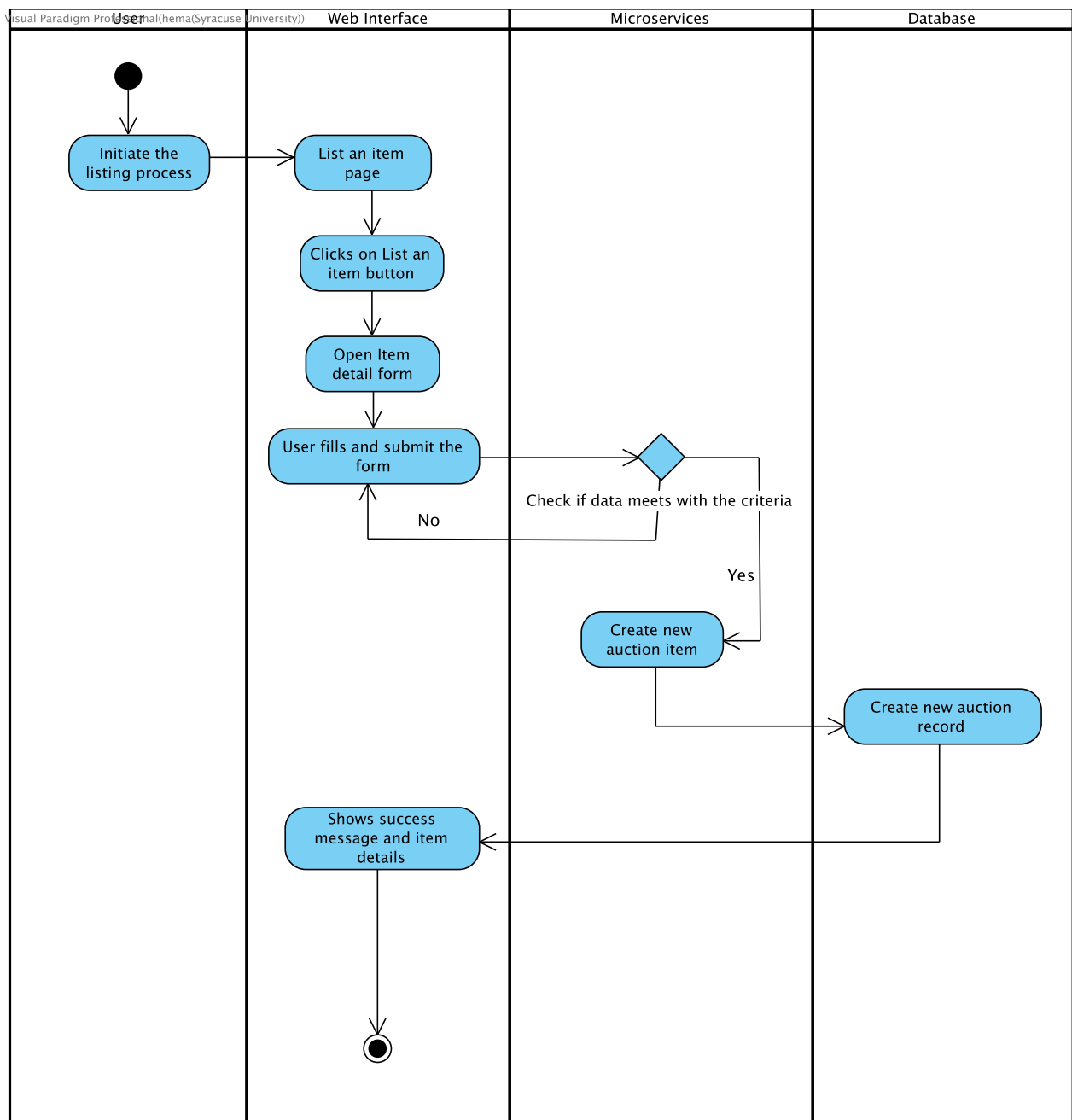
The system shall use encryption to securely store user passwords.

3.1.18. Unique Account Guarantee

ID: REQ052

The system shall prevent the creation of multiple accounts with the same email address.

3.1.19. Listing Item Activity Diagram



3.1.20. Initiate the listing process

Registered user initiates the listing of an item

3.1.21. List an item page

User navigates to the listing an item API end point

3.1.22. Clicks on List an item button

The User clicks on the "List an Item" button to start the process of new listing

3.1.23. Open Item detail form

The web interface will reveal a form to enter details about the item

3.1.24. User fills and submit the form

User carefully enters the details such as description of the item, price, and bid time etc

3.1.25. Check if data meets with the criteria

The microservices backend validates the data entered in the form, to maintain consistent listing experience

3.1.26. Create new auction item

The system creates a new auction for the item and proceeds to store it in the database

3.1.27. Create new auction record

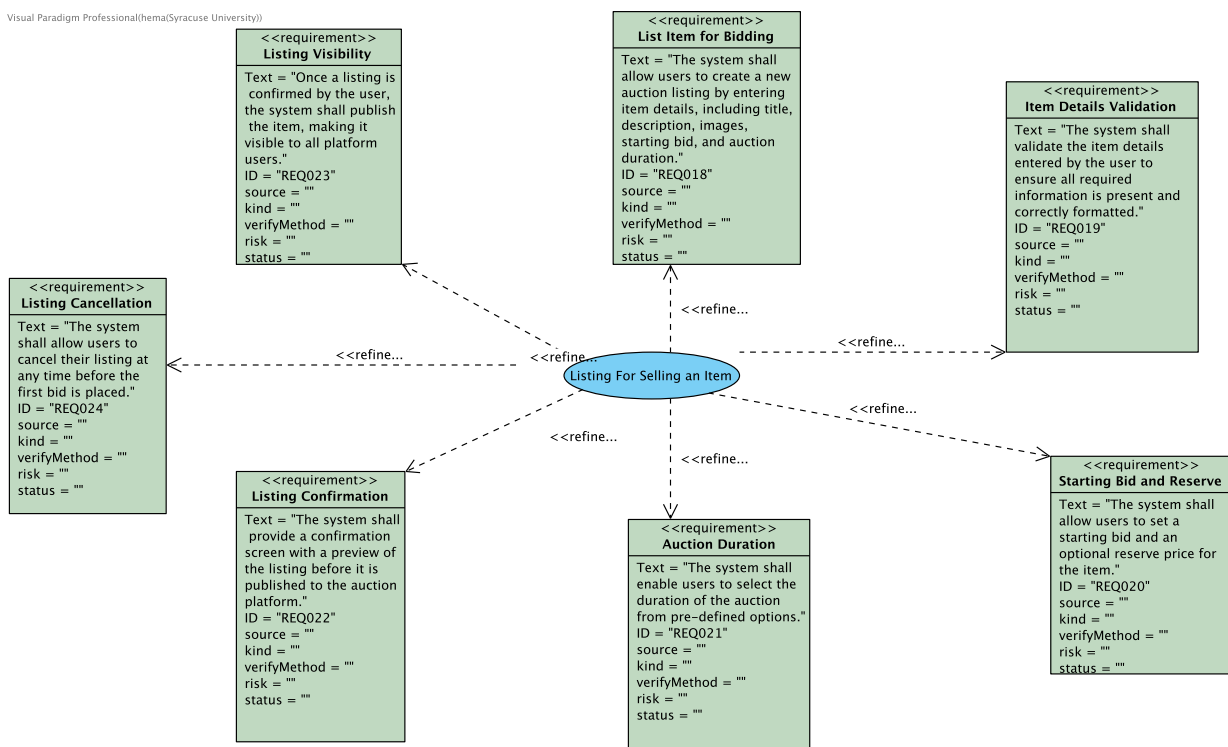
database creates a new record of the listed item and assigns a unique ID to it

3.1.28. Shows success message and item details

The web interface displays a confirmation message and shows the item details to the user

3.1.29. Listing System Requirement Diagram

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3.1.30. Listing For Selling an Item

ID: UC06

3.1.31. Auction Duration

ID: REQ021

The system shall enable users to select the duration of the auction from pre-defined options.

3.1.32. Item Details Validation

ID: REQ019

The system shall validate the item details entered by the user to ensure all required information is present and correctly formatted.

3.1.33. List Item for Bidding

ID: REQ018

The system shall allow users to create a new auction listing by entering item details, including title, description, images, starting bid, and auction duration.

3.1.34. Listing Cancellation

ID: REQ024

The system shall allow users to cancel their listing at any time before the first bid is placed.

3.1.35. Listing Confirmation

ID: REQ022

The system shall provide a confirmation screen with a preview of the listing before it is published to the auction platform.

3.1.36. Listing Visibility

ID: REQ023

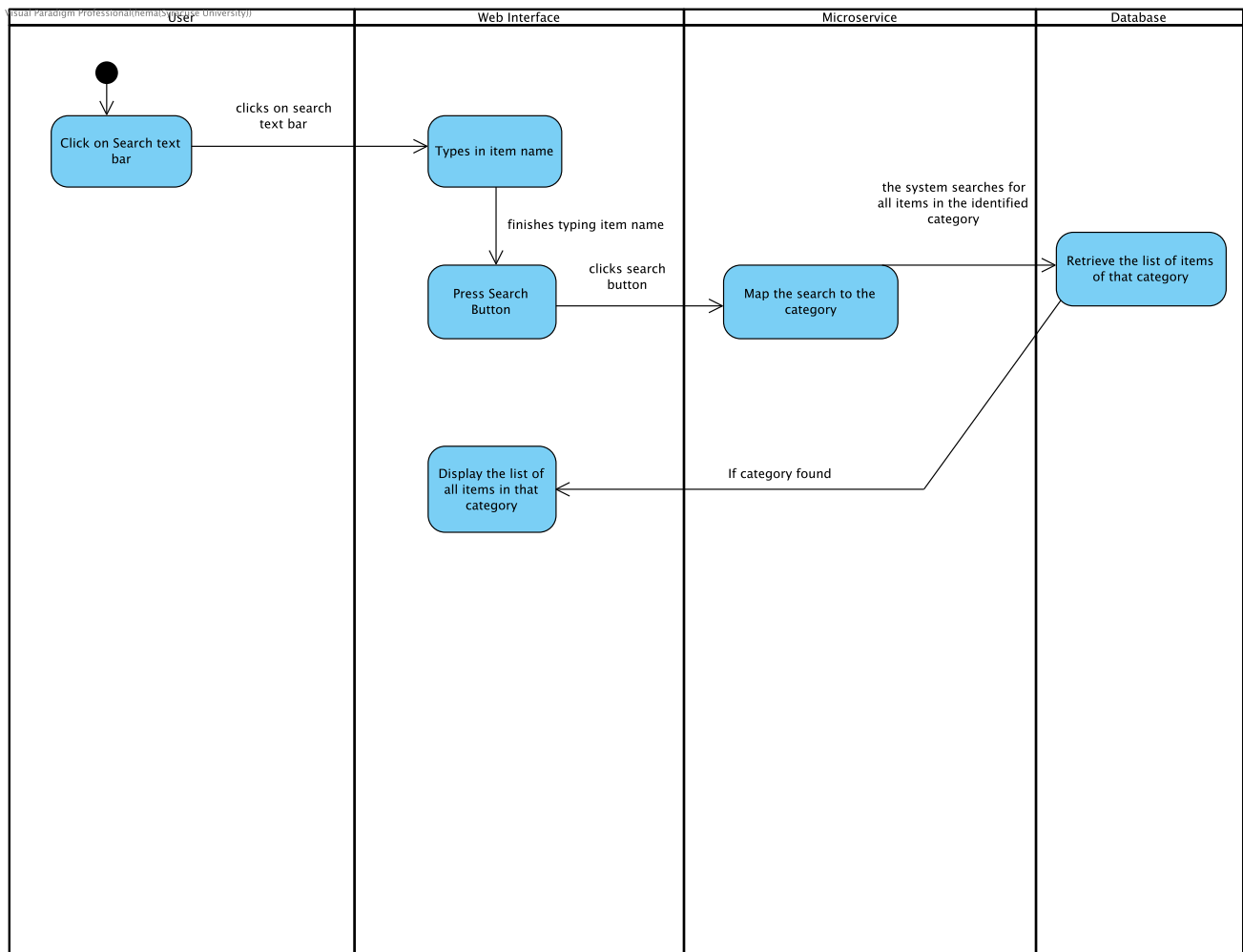
Once a listing is confirmed by the user, the system shall publish the item, making it visible to all platform users.

3.1.37. Starting Bid and Reserve

ID: REQ020

The system shall allow users to set a starting bid and an optional reserve price for the item.

3.1.38. Search Activity Diagram



3.1.39. Click on Search text bar

When the user clicks on the text bar, he should be able to search for any item he wants

3.1.40. Types in item name

User types the name of the item they want to search for

3.1.41. Press Search Button

Clicks on search button on the right of the text bar

3.1.42. Map the search to the category

The system maps the search word to the category of items in the search from the database

3.1.43. Retrieve the list of items of that category

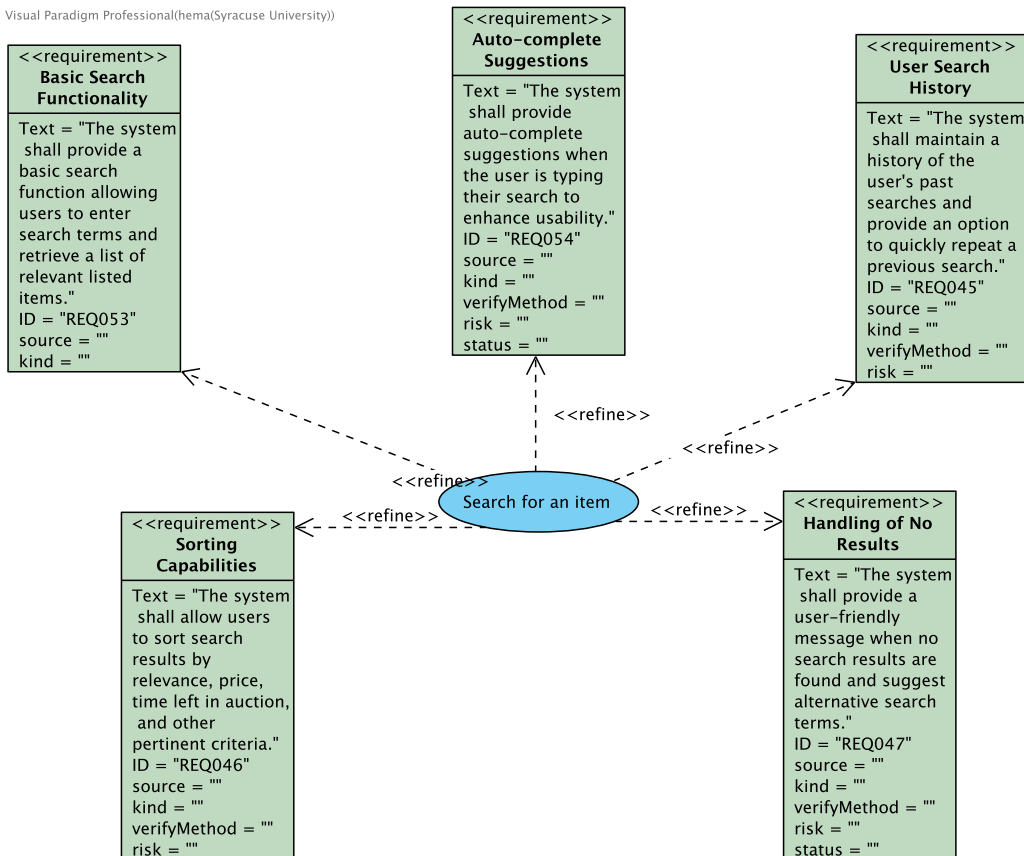
If the category of items is found, the system returns top 10 items in that category

3.1.44. Display the list of all items in that category

Display list of items retrieved from the database of items

3.1.45. Search System Requirements Diagram

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3.1.46. Search for an item

ID: UC01

3.1.47. Auto-complete Suggestions

ID: REQ054

The system shall provide auto-complete suggestions when the user is typing their search to enhance usability.

3.1.48. Basic Search Functionality

ID: REQ053

The system shall provide a basic search function allowing users to enter search terms and retrieve a list of relevant listed items.

3.1.49. Handling of No Results

ID: REQ047

The system shall provide a user-friendly message when no search results are found and suggest alternative search terms.

3.1.50. Sorting Capabilities

ID: REQ046

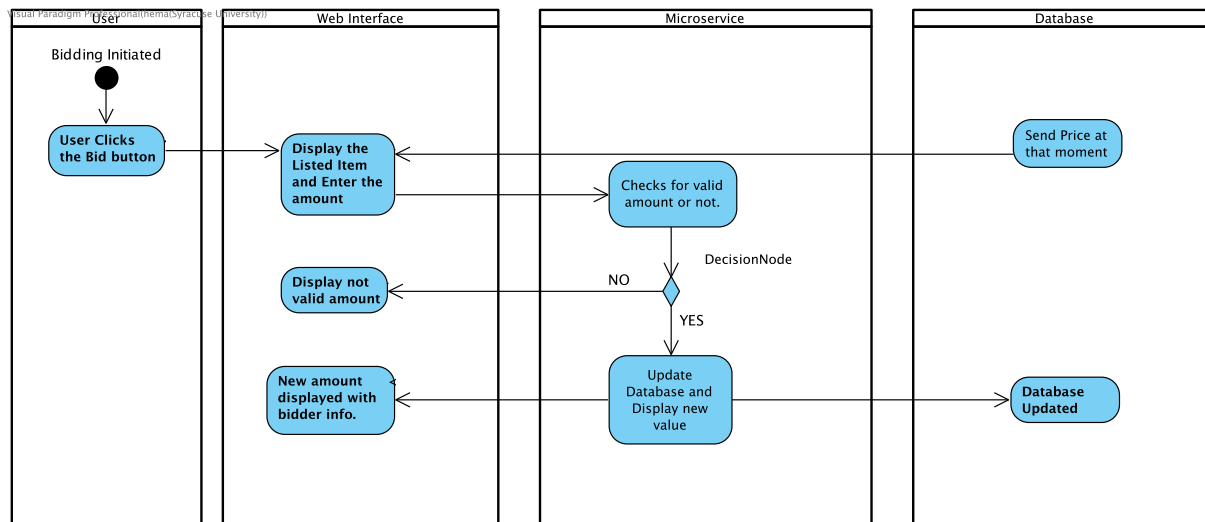
The system shall allow users to sort search results by relevance, price, time left in auction, and other pertinent criteria.

3.1.51. User Search History

ID: REQ045

The system shall maintain a history of the user's past searches and provide an option to quickly repeat a previous search.

3.1.52. Bid an item Activity Diagram



3.1.53. User Clicks the Bid button

Once the user enters the new amount and clicks the bid button.

3.1.54. Send Price at that moment

Should send the proper price to the interface to display the price.

3.1.55. Display the Listed Item and Enter the amount

Web user interface shows the listed item and its current bid.

3.1.56. Checks for valid amount or not.

A microservice which initiates the decision making for the valid amount.

3.1.57. DecisionNode

Checks if the entered bid amount is valid or not and makes the required decision.

3.1.58. Update Database and Display new value

If the entered amount is valid it updates the interface as well as the database with the newly added amount.

3.1.59. Database Updated

3.1.60. Display not valid amount

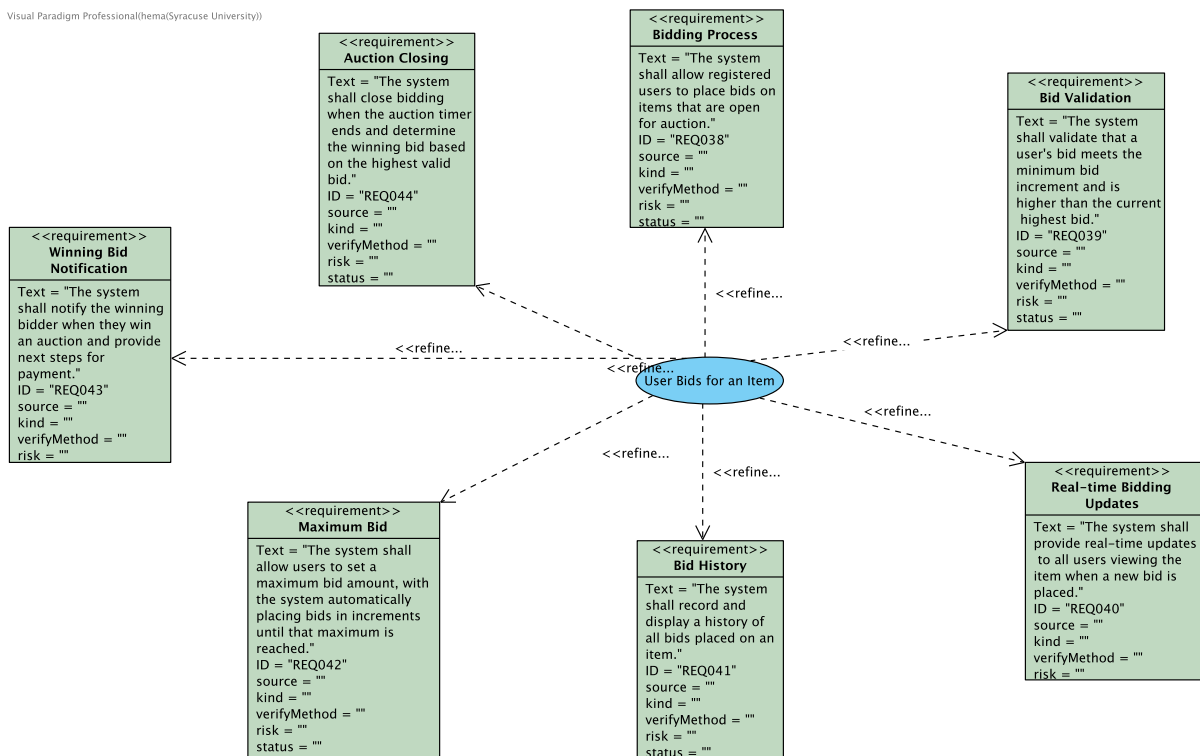
If the valid amount is not entered, the display of invalid amount is shown.

3.1.61. New amount displayed with bidder info.

Displays the newly updated information of amount and new bidder.

3.1.62. Bid an item Systems Requirements

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3.1.63. User Bids for an Item

ID: UC07

3.1.64. Auction Closing

ID: REQ044

The system shall close bidding when the auction timer ends and determine the winning bid based on the highest valid bid.

3.1.65. Bid History

ID: REQ041

The system shall record and display a history of all bids placed on an item.

3.1.66. Bid Validation

ID: REQ039

The system shall validate that a user's bid meets the minimum bid increment and is higher than the current highest bid.

3.1.67. Bidding Process

ID: REQ038

The system shall allow registered users to place bids on items that are open for auction.

3.1.68. Maximum Bid

ID: REQ042

The system shall allow users to set a maximum bid amount, with the system automatically placing bids in increments until that maximum is reached.

3.1.69. Real-time Bidding Updates

ID: REQ040

The system shall provide real-time updates to all users viewing the item when a new bid is placed.

3.1.70. Winning Bid Notification

ID: REQ043

The system shall notify the winning bidder when they win an auction and provide next steps for payment.

3.2. Performance Requirement

3.2.1. Data Processing Speed

ID: REQ026

The system shall process bids and update the bid status in real-time, not exceeding a delay of 1 second.

3.2.2. Database Access Times

ID: REQ029

Database read and write operations shall complete within 100 milliseconds under peak load.

3.2.3. Error Rates

ID: REQ030

The system shall maintain an error rate below 0.1% for all transactions.

3.2.4. System Availability

ID: REQ027

The system shall be available with an uptime of 99.9% outside of scheduled maintenance windows.

3.2.5. System Response Time

ID: REQ025

The system shall display search results within 2 seconds of initiating the search.

3.2.6. Transaction Throughput

ID: REQ028

The payment gateway shall process at least 100 transactions per minute.

3.3. Design Constraints

3.3.1. Data Storage

ID: REQ035

Data storage solutions must be selected based on a balance of cost-efficiency and performance, with a plan for regular backups and disaster recovery.

3.3.2. Development Frameworks and Tools

ID: REQ036

Development must use the agreed technology stack to ensure compatibility and maintainability across the different components of the system.

3.3.3. Performance Limits

ID: REQ034

The system must be designed to handle a specified maximum load without performance degradation, determined by projected user growth over the next 5 years.

3.3.4. Platform Compatibility

ID: REQ031

The user interface must be compatible with the latest versions of major browsers and be responsive to both mobile and desktop devices.

3.3.5. Scalability

ID: REQ033

The system architecture must be scalable to support an increasing number of users and listings without significant redesign.

3.3.6. Security Requirements

ID: REQ032

All sensitive data, including user credentials and payment information, must be encrypted using industry-standard protocols.