# **System Requirements Specification**

***UMBC Bazaar***

**Client**

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## **1. Introduction**

Welcome to the UMBC Bazaar system requirements specification. UMBC Bazaar is a web application to buy, sell and trade goods or services, which can be thought of as a mixture of Craig’s list, Ebay, and an online services market.

**1.1 Purpose of This Document**

This document is designed to explain the features of the UMBC Bazaar web application, its functions, and the conditions required for operation. The intended audience is the development team, the UMBC community, as well as the customer, Ericka Marable.

**1.2 References**

Eriksson, U. (2012, April 5). *Functional vs Non Functional Requirements*. [Web blog post]. Retrieved October 5, 2016 from reqtest.com

Pressman, R.S. (2010). *Software engineering: A practitioner's approach* (7th ed.). New York:

McGraw-Hill Higher Education.

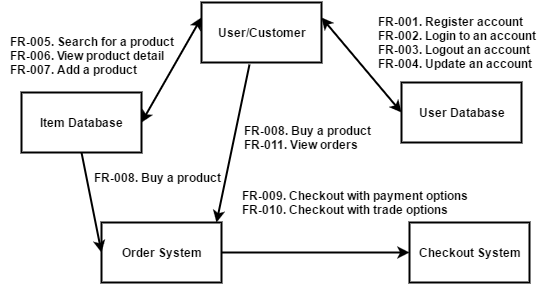
**1.3 Purpose of the Product**

This product shall allow students, faculty and staff at UMBC to navigate the website, sign in with their UMBC ID, and purchase or trade items or services with other registered users.

**1.4 Product Scope**

The UMBC Bazaar web application consists of multiple use cases including, but not limited to: account-based functionalities such as registering or updating user profile, product-based functionalities such as searching or adding products, and transaction-based functionalities such as checking out and viewing order details. Please refer to the diagrams below for further understanding of actions available to users.

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**Context Diagram** Context Diagram.png

**Use-Case Diagram**Use-Case Diagram.png

**2. Functional Requirements**

Please refer to the top-level use case diagram, and context diagram, above for an overview of each use case.

|  |  |  |
| --- | --- | --- |
| **Number** | FR-001 | |
| **Name** | Register an account | |
| **Summary** | User enters their information to register for an account. This website is intended for the UMBC community, and accounts can only created for its members. | |
| **Priority** | 5 | |
| **Preconditions** | The criteria the user initiates the registration process. | |
| **Postconditions** | User has account registered in user database, and is able to login to use the web services (FR-002). | |
| **Primary Actor** | User | |
| **Secondary Actors** | UMBC directory, email system and database system | |
| **Trigger** | User initiates the registration page | |
| **Main Scenario** | **Step** | **Action** |
|  | 1 | User enters their information on the registration page. |
|  | 2 | A verification email shall be sent to the user. |
|  | 3 | The confirmation link shall take the user to the login page. |
| **Extensions** | **Step** | **Branching Action** |
|  | 1a | Invalid UMBC ID**:**   * ID not in the UMBC directory. * Delay or downtime on the UMBC directory service. * Registration denied. * Ask the user to re-enter their UMBC ID. |
|  | 1b | Invalid password format:   * Registration submission is disabled. * Ask the user to re-enter a valid password format. |
|  | 1c | Invalid other information format:   * Registration submission is disabled. * Ask the user to enter valid user information. |
|  | 2a | Confirmation email not received:   * Email is sent to <UMBC ID>@umbc.edu, and not to a personal email. * Delay or downtime on the email system. * Request to resend the confirmation email. |
|  | 3a | The confirmation link is invalid:   * The link is dynamically created for the specific user. * Request to resend the confirmation email. |
| **Open Issues** | Delay or downtime with the UMBC directory service.  Delay or downtime with the email system. | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-002 | |
| **Name** | Login to an account | |
| **Summary** | The user logs in to the site. | |
| **Priority** | 5 | |
| **Preconditions** | User must have a registered account (FR-001). | |
| **Postconditions** | The user is logged in to the site. | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system and session variables | |
| **Trigger** | User initiates the login page | |
| **Main Scenario** | **Step** |  |
|  | 1 | User enters their UMBC ID and password on the login page. |
|  | 2 | The user login credentials are authenticated. |
|  | 3 | The user is logged into the system and information saved in session. |
| **Extensions** | **Step** |  |
|  | 1a | Invalid UMBC ID:   * Incorrect UMBC ID format. * Login submission is disabled. * Ask the user to enter a valid UMBC ID. |
|  | 2a | Login failed:   * User is not a registered account. * Invalid password. * Access is denied, and redirected back to the login page. |
| **Open Issues** | Delay or downtime with the database system. | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-003 | |
| **Name** | Logout an account | |
| **Summary** | The user logs out of the site. | |
| **Priority** | 5 | |
| **Preconditions** | User must be logged in (FR-002). | |
| **Postconditions** | User logged out of the site. | |
| **Primary Actor** | User | |
| **Secondary Actors** | Session variables | |
| **Trigger** | User initiates the logout page. | |
| **Main Scenario** | **Step** |  |
|  | 1 | The current session shall be destroyed, and an empty session shall be created. |
|  | 2 | The user shall be redirected to the login page. |
| **Extensions** | **Step** |  |
|  | 1a | Inactive session for more than 30 minutes:   * The session shall be destroyed, and an empty session shall be created. |
| **Open Issues** |  | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-004 | |
| **Name** | Updating user profile | |
| **Summary** | User can update their profile information. | |
| **Priority** | 4 | |
| **Preconditions** | Logged in (FR-002) and the user criteria entered | |
| **Postconditions** | User profile is updated | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system and session variables | |
| **Trigger** | User initiates the update profile page | |
| **Main Scenario** | **Step** |  |
|  | 1 | User enters their new information. |
|  | 2 | User information updated in the database. |
| **Extensions** | **Step** |  |
|  | 1a | Invalid user information format:   * Entered information does not match regex format. * Update information submission disabled. * Display a message |
|  | 1b | Invalid password change:   * Current password does not match. * New password entered mismatch. * Update password submission disabled. * Display message |
|  | 1c | Invalid other user information:   * Preferred payment option not in the list. * Preferred trade option not in the list. * Update information submission disabled. * Display message |
|  | 2a | User information not updated:   * Database cannot be accessed. * Display a message. |
| **Open Issues** | Delay or downtime with the database system | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-005 | |
| **Name** | Search for a product or service | |
| **Summary** | User enters criteria to product search the site. | |
| **Priority** | 3 | |
| **Preconditions** | Logged in (FR-002) and the user criteria entered | |
| **Postconditions** | A list of relevant items are displayed. | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system and session variables | |
| **Trigger** | User performs a product search | |
| **Main Scenario** | **Step** |  |
|  | 1 | User inputs search criteria for a product or service. |
|  | 2 | System checks the database and displays a list of relevant items. |
| **Extensions** | **Step** |  |
|  | 1a | Invalid Search criteria format:   * Search criteria cleaned and formatted. * Database search is performed |
|  | 2a | Criteria not in the database:   * Display a message |
| **Open Issues** | Delay or downtime with the database system | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-006 | |
| **Name** | View product or service detail | |
| **Summary** | User views more detail about a product or service | |
| **Priority** | 3 | |
| **Preconditions** | Logged in (FR-002) and the user criteria entered | |
| **Postconditions** | Product / service detail is displayed | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system and session variables | |
| **Trigger** | User initiates the detail page of the product / service. | |
| **Main Scenario** | **Step** |  |
|  | 1 | Details and images about the product / service is displayed. |
|  | 2 | Display an interface to buy or trade the product / service. |
| **Extensions** | **Step** |  |
|  | 1a | Product / service not found:   * Item ID passed not in the database. * Item ID no longer available. * Display a message |
|  | 2a | Interface not displayed:   * Product or service no longer available. * Disable user from buying the product. |
| **Open Issues** | Delay or downtime with the database system | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-007 | |
| **Name** | Adding an product / service to sell. | |
| **Summary** | User enters the item details of the product or service to sell. | |
| **Priority** | 5 | |
| **Preconditions** | Logged in (FR-002) and the user criteria entered | |
| **Postconditions** | Product / service is added to the database.. | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system and session variables | |
| **Trigger** | User initiates the seller’s page. | |
| **Main Scenario** | **Step** |  |
|  | 1 | User enters the product / service details to sell. |
|  | 2 | User enters the payment / trade options. |
|  | 3 | Select live/publish option for the product or service. |
|  | 4 | Product / service is added to the database. |
| **Extensions** | **Step** |  |
|  | 1a | Invalid detail:   * Either an product or service from a list. * Missing product details. * Invalid format (number, etc.) * Product submission disabled. * Display a message |
|  | 2a | Invalid payment / trade option:   * At least one option must be selected * Payment option selected is not available. * Trade option selected is not available. * Display a message |
|  | 4a | Database cannot be accessed:   * Product not added to the database. * Display message |
| **Open Issues** | Delay or downtime with the database system | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-008 | |
| **Name** | Buying a product / service. | |
| **Summary** | User searches for a product or service to buy, and then proceed to the checkout process. | |
| **Priority** | 5 | |
| **Preconditions** | Logged in (FR-002) and product / service selected (FR-006) | |
| **Postconditions** | Product / service bought and item database updated | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system, session variables and payment services | |
| **Trigger** | User initiates the buy option on the product/service. | |
| **Main Scenario** | **Step** |  |
|  | 1 | User selects an item to buy (FR-006). |
|  | 2 | User initiates the buy (FR-009) / trade (FR-010) page. |
|  | 3 | User completes the checkout process. |
|  | 4 | Transaction confirmation is sent via email. |
| **Extensions** | **Step** |  |
|  | 1a | Product / Service unavailable:   * User criteria yielded no database match. * Product is not in stock. * Display a message |
|  | 2a | Invalid buyer information entered:   * Preferred payment option not listed. * Preferred trade option not listed. * Display message |
|  | 3a | Buying with payment method:   * Refer to use case FR-009. |
|  | 3b | Buying with trade options:   * Refer to use case FR-010. |
|  | 4a | Transaction confirmation not sent:   * Delay or downtime in the email system. |
| **Open Issues** | Delay or downtime with the database system.  Delay or downtime with the email system. | |

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| --- | --- | --- |
| **Number** | FR-009 | |
| **Name** | Checking out with payment methods | |
| **Summary** | Buying a product or service with the payment options listed. | |
| **Priority** | 5 | |
| **Preconditions** | Logged in (FR-002) and product / service selected (FR-006)  User selects an item and initiates the checkout process (FR-008). | |
| **Postconditions** | Transaction is paid. | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system, session variables and payment services | |
| **Trigger** | User initiates checkout by payment option | |
| **Main Scenario** | **Step** |  |
|  | 1 | Select a payment method from a list. |
|  | 2 | Input payment information and billing address. |
|  | 3 | Confirm order and submit payment. |
|  | 4 | Display order confirmation, and send email to the user and seller. |
| **Extensions** | **Step** |  |
|  | 1a | Preferred payment option not listed |
|  | 2a | COD information missing:   * In-person meeting information required. * Display message |
|  | 2b | Invalid credit card billing information   * Credit card number required * Invalid credit card number format. * Name displayed on card required. * Expiration date required. * CCV required. * Display message |
|  | 3a | Payment method failed:   * Payment service rejected transaction. * User needs to re-enter payment information. * Display message. |
|  | 4a | Transaction confirmation email not sent:   * Delay or downtime with the email system. |
| **Open Issues** | Delay or downtime with the payment service. | |

|  |  |  |
| --- | --- | --- |
| **Number** | FR-010 | |
| **Name** | Checkout with trade options | |
| **Summary** | Buying a product or service with the trade options listed. | |
| **Priority** | 5 | |
| **Preconditions** | Logged in (FR-002) and product / service selected (FR-006)  User selects an item and initiates the checkout process (FR-008). | |
| **Postconditions** | Product / service is traded. | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system and session variables. | |
| **Trigger** | User initiates checkout by trade option | |
| **Main Scenario** | **Step** |  |
|  | 1 | Select trade option from the list. |
|  | 2 | Enter comments or other information to be sent to the seller. |
|  | 3 | Confirm transaction and submit order. |
|  | 4 | Display order confirmation, and send email to the user and seller. |
| **Extensions** | **Step** |  |
|  | 1a | Preferred trade option not listed. |
|  | 2a | Invalid user information |
| **Open Issues** | Delay or downtime with the email system.  Delay or downtime with the database system. | |

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| --- | --- | --- |
| **Number** | FR-011 | |
| **Name** | View orders | |
| **Summary** | User able to view current and past orders. | |
| **Priority** | 3 | |
| **Preconditions** | Logged in (FR-002) and user initiates the view orders page. | |
| **Postconditions** | User orders displayed. | |
| **Primary Actor** | User | |
| **Secondary Actors** | Database system and session variables. | |
| **Trigger** | User initiates the view orders page. | |
| **Main Scenario** | **Step** |  |
|  | 1 | Select specific order from the list. |
|  | 2 | Display order details based on user criteria. |
| **Extensions** | **Step** |  |
|  | 1a | No orders listed:   * Display message |
|  | 2a | No matching order for the user:   * Display message |
|  | 2b | Delay or downtime with the database system |
| **Open Issues** | Delay or downtime with the database system. | |

(This template was adapted from Alistair Cockburn.)

**3. Use Case Tests**

Use case testing is a vital part of product validation and verification. The final product should be stable, bug-free and function as intended. These use case tests outline how to gauge the requirements during the system and release testing.

**3.1 Use Case FR-001 Test - Register an account**

Access the registration page, and user enters an ID of varying length and combination. Check the dynamically populated user fields given a valid UMBC ID. Upon registration, attempt logging in before and after account confirmation. See testing report for further details and results.

**3.2 Use Case FR-002 Test - Login to an account**

Access the login page, and user enters UMBC ID and password of varying length and combination. Check messages and the number of times login will allow failed attempts. Upon login, check the main page the session profile matches the user’s account. See testing report for further details and results.

**3.3 Use Case FR-003 Test - Logout an account**

Logged in user initiates the logout page. Check if the page gets redirected to the login page. Attempt to access the user main page directly, and try gaining access to resources reserved for logged in sessions. Check if the user gets redirected to the login page. See testing report for further details and results.

**3.4 Use Case FR-004 Test - Updating user profile**

Access the update profile page before and after a logged in session. Check if the user gets redirected to the login page. On the update profile page, user enter profile information on editable fields and textboxes. Check for messages required fields, and valid format for password and other user information. See testing report for further details and results.

**3.5 User Case FR-005 Test - Search for a product or service**

Attempt accessing the main or search pages before and after a logged in session. Check if the user gets redirected to the login page. On the main or search page, user enters criteria and perform a product search. Check the displayed keyword against the user entered criteria, and examine the count of returned list of products for matches. See testing report for further details and results.

**3.6 User Case FR-006 Test - View product or service detail**

Attempt accessing a specific product’s page before and after a logged in session. Check if the user gets redirected to the login page. On the product’s page, check messages if the the item is found, available, and the information displayed matches the specific item. See testing report for further details and results.

**3.7 Use Case FR-007 Test - Adding a product / service to sell**

Attempt accessing the add a product page before and after a logged in session. Check if the user gets redirected to the login page.On the add product page, user enters the product information. Check for messages about required fields and valid format for each field. Check if the product will display in a search result before and after selecting live / publish. See testing report for further details and results.

**3.8 Use Case FR-008 Test - Buying a product / service**

Attempt accessing the buy product page before and after a logged in session. Check if user has selected an item or service to buy. Check if the selected item/service is still in stock. See testing report for further details and results.

**3.9 Use Case FR-009 Test - Checking out with payment methods**

Attempt accessing the checkout with payment page before and after a logged in session. Check if the payment method selected is valid. Check if valid payment information is provided. Check if transaction email has been sent. See testing report for further details and results.

**3.10** **Use Case FR-010 Test - Checkout with trade option**

Attempt accessingthe checkout with trade page before and after a logged in session. Check if preferred trade option is listed. Check if valid user information has been entered. Check if transaction email has been sent. See testing report for further details and results.

**3.11 Use Case FR-011 Test - View orders**

Attempt accessing the view orders page before and after a logged in session. Check if there are past orders to view. Check if there are current orders to view. Check if can display order details based on search. See Testing report for further details and results.

**4. Non-Functional Requirements**

|  |  |  |
| --- | --- | --- |
| **Number** | **Item** | **Priority** |
| NFR-001 | The website shall be hosted on the GL server. | 3 |
| NFR-002 | The website shall be secure (https, account login, etc.). | 5 |
| NFR-003 | For GL compatibility, PHP 4.3 standards shall be used. | 3 |
| NFR-004 | MariaDB MySQL database server shall be used. | 3 |
| NFR-005 | The database shall be secure. | 5 |
| NFR-006 | GMail’s mail service shall be used. | 3 |
| NFR-007 | The email system shall be secure (user email masking). | 5 |
| NFR-008 | The client-side code shall be written in HTML5 and JavaScript. | 2 |
| NFR-009 | The UMBC directory service shall be used. | 4 |
| NFR-010 | GitHub shall be used for development and version control. | 3 |
| NFR-011 | User registration shall be limited to the UMBC community. | 5 |
| NFR-012 | Users shall authenticate themselves using their UMBC ID and password. | 5 |
| NFR-013 | Users shall be required to use a password of certain strength. | 5 |
| NFR-014 | The website should be easily navigated. | 4 |
| NFR-015 | The website should be reliable with minimal downtime (hosted on GL server that is available 24 hours / 7 days). | 3 |
| NFR-016 | The website should be clean and highly responsive (1-2 second load time). Simple and intuitive interface. | 3 |
| NFR-017 | Failed login shall be limited to 3 attempts. | 4 |
| NFR-018 | Product image sizes shall be limited to 500kb or less. | 2 |
| NFR-019 | Payment options shall be limited to a preapproved list of providers with supported API. | 3 |
| NFR-020 | Trade options shall be limited to a preapproved list of services. | 3 |
| NFR-021 | All code should be well commented and documented. | 2 |
| NFR-022 | Email notification shall be sent for any account activity. | 3 |
| NFR-023 | Email notification shall be sent within 5 minutes of the activity. | 3 |
| NFR-024 | Payment information shall be sent over a secure connection (SSL) using API services. | 5 |
| NFR-025 | Sensitive user information shall be encrypted using RSA algorithm for privacy. | 5 |
| NFR-026 | Legal disputes shall be elevated to the UMBC Police. | 5 |
| NFR-027 | System architecture shall be updated each year to reflect evolving efficiency standards. | 3 |
| NFR-028 | Anomalies shall not interrupt site uptime and instead return appropriate error codes. | 5 |
| NFR-029 | Products shall be restricted under a legal domain complying with UMBC rules and regulations as well as state and federal laws. | 5 |
| NFR-030 | The service shall be able to support the number of students, instructors, alumni, and any other personnel of UMBC. | 5 |

Consulted (Eriksson, 2012) for NFR archetypes.

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## **5. User Interface**

See “User Interface Design Document for *UMBC Bazaar*.

**6. Deliverables**

*Provide a list of all deliverable items (that is, all artifacts that you will deliver to the customer). This list will include items such as the product itself (What format? Source code? Executable code? Object code?), documentation, and training resources (if any). Specify when (date) and in what format (e.g., hard copy, CD) each will be delivered. A tabular format works well for this section. We will assume that the deliverable items are as follows:*

Hard copies of each of the following:

* Systems Requirement Specification
* System Design Document
* User Interface Design Document
* User Manual
* Administrator Manual
* Copies of all Biweekly Status Reports

A CD (or electronic copy in a ZIP file) containing the following:

* Systems Requirement Specification
* System Design Document
* User Interface Design Document
* User Manual
* Administrator Manual
* All source code
* The executable program
* Any other software required for installation and execution of the delivered program.

**7. Open Issues**

Issues that have been raised and do not yet have a conclusion. These issues will be addressed later in the development process.

* Payment Service API - resolution date by 2nd week of November 2016
  + Credit card processing -- associated charge fees
  + Paypal option
* Email system - resolution date by 3rd week of October 2016
  + Proposed solution - GMail service
    - PHPMailer or SwiftMail
    - Passthru function
  + Proposed solution - privately hosted SMTP server
* UMBC Directory services - solution implemented
  + No direct database access.
  + Crucial for UMBC ID authentication.
  + Proposed solution - Web scraping
    - Use of curl in conjunction with PHP
* Server storage issue - resolution by 3rd week of October 2016
  + GL allocates 100 mb per account (for all uses and classes)
  + Proposed solution - external file hosting service
    - Google Drive, Dropbox, etc.

**Appendix A – Agreement Between Customer and Contractor**

The client agrees to a *UMBC Bazaar* web application with registering, searching, buying, trading, and other user-based capabilities. Use cases are included in the functional requirements section above of the behavior between the system and user. Additional features will be provided in further development iterations.

When and if future changes to this document occur, a new drafted document shall be created. Both a hard and electronic copy of all versions shall be presented to the client for review. Upon approval, the draft will be finalized and signed off by both the client and contractor.

**Client**



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Ericka Marable

**Team**



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Gene Burchette



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Jerson Guansing

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Karl Justice

\_DSII\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: 10/6/2016

Darren Stevens II

Victor Wu\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: 10/5/2016

Victor Wu

**Appendix B – Team Review Sign-off**

This document has been collaboratively written by all members of the team. Additionally, all team members have reviewed this document and agree on both the content and the format. Any disagreement or concerns are addressed in team comments below.



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Gene Burchette



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Victor Wu\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: 9/22/2016

Victor Wu

**Appendix C – Document Contributions**

*Identify how each member contributed to the creation of this document. Include what sections each member worked on and an estimate of the percentage of work they contributed. Remember that each team member must contribute to the writing (includes diagrams) for each document produced.*

**Appendix D – Changes Made**

1. FR-005: Search for a product or service
   1. User enters keyword in the search bar on the top navigation bar.
   2. The form is submitted, and the system checks for matching items.
   3. The user is redirected to another page, and displays a list of relevant items.
2. FR-007: Adding a product / service to sell
   1. User enters price for the listing.
   2. User chooses to enable or disable trade option
   3. Optionally, user selects image to upload for the listing.
3. FR-008: Buying a product/ service
   1. Shopping cart is not implemented.
   2. Craigslist style checkout system is implemented instead.
4. FR-009: Checking out with payment methods
   1. No payment list is implemented. Cash on delivery only.
   2. No longer asks for billing address and other information.
   3. Comment textbox is added to provide additional instructions.
5. FR-010: Checkout with trade options
   1. Two trade option list is implemented. “My Trade Option” list and current products listed.
6. FR-011: View Orders
   1. Select order history as a buyer or a seller.
   2. Ten order details per page are displayed at a time.
   3. Select page number if multiple pages.
7. FR-012: Send email to another user
   1. Can be accessed from the order history, click the email button.
   2. Can be accessed from the product detail, click contact seller.
   3. On the email page, enter the message and hit submit.
   4. A confirmation message will be displayed.
8. NFR-017: failed login shall be limited to 15 attempts, and then IP blocked.
9. NFR-019: Payment option is cash on delivery only.
10. NFR-024: Did not implement third party payment services.
11. NFR-025: Hashing with SHA512 with salt is used instead.