Review and Recommendation System For ShopSmart (RRSS)
System-Wide Requirements Specification

1. Introduction

The Review and Recommendation System for ShopSmart (RRSS) is a comprehensive solution designed to enhance the shopping experience within the esteemed e-commerce platform. It integrates advanced technological innovations with user-centric design principles to offer users a robust suite of features aimed at empowering them to make informed purchasing decisions and actively engage with the shopping community. This document contains System-Wide Functional Requirements, System Qualities, System Interfaces, Business Rules, System Constraints, System Compliance, and System Documentation for the Review and Recommendation System for ShopSmart (RRSS).

2. System-Wide Functional Requirements

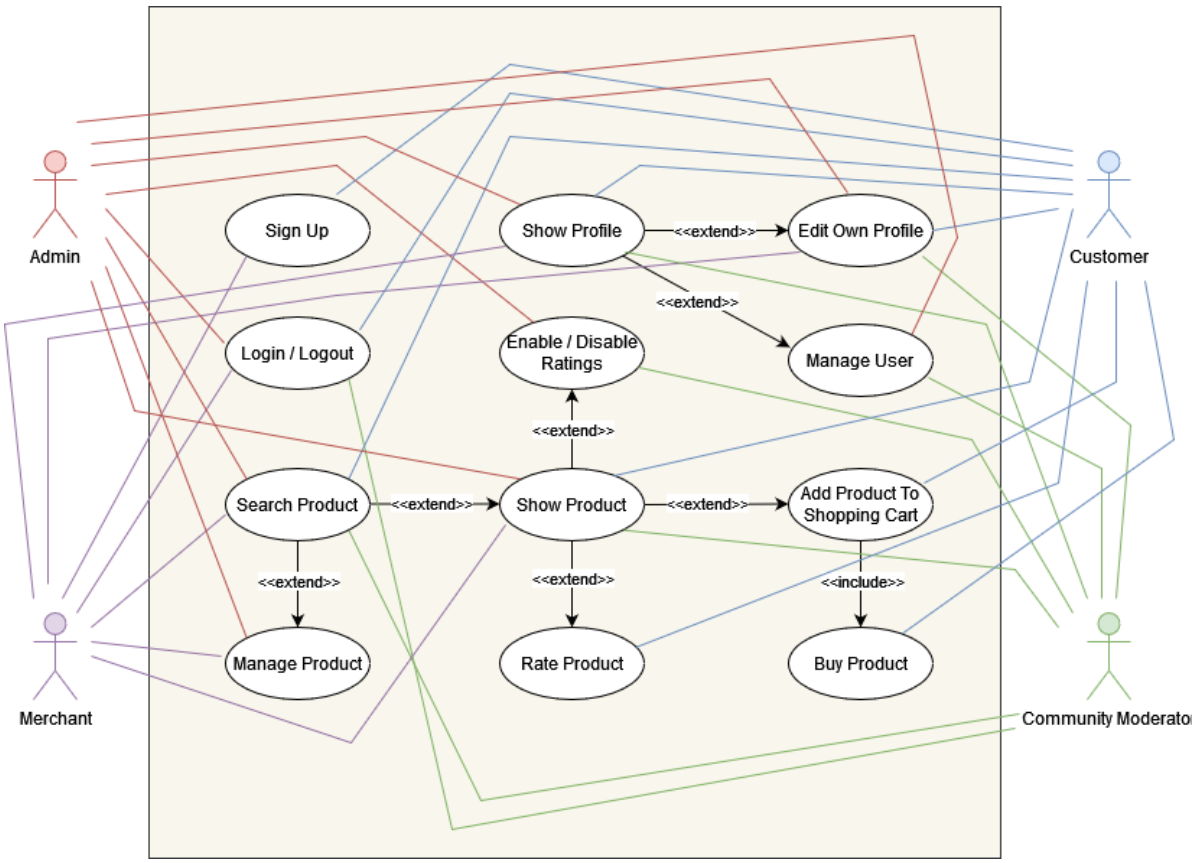

Figure-1: High-Level Use Case Diagram For RRSS

• RRSS has total 12 functional requirements. 10 of them are critical while other 2 of them are non criticial.
• 'Shall have' indicates mandatory requirements, 'should have' indicates desirable requirements and 'may have' indicates optional requirements.
• We can summarize main functional requirements as a table below:

Use Case	Use Case Number	Use Case Code	Use Case Type
Login / Logout	1	RRSS-001	Non-Critical
Sign Up	2	RRSS-002	Non-Critical
Show Profile	3	RRSS-003	Critical
Edit Own Profile	4	RRSS-004	Critical
Manage User	5	RRSS-005	Critical
Search Product	6	RRSS-006	Critical
Show Product	7	RRSS-007	Critical
Manage Product	8	RRSS-008	Critical
Rate Product	9	RRSS-009	Critical
Add Product To Shopping Cart	10	RRSS-010	Critical
Buy Product	11	RRSS-011	Critical
Enable/Disable Ratings	12	RRSS-012	Critical

In addition to them;
• **Reporting:** The system may provide the analytics to understand the behaviors of the users.
• **Auditing:** The system should store the IP addresses of the users who logged in. The system may track the suspicious activities of users and may lock the accounts accordingly.
• **Authentication:** The system shall verify the identity of a user when logging in. The system may need users to verify their emails for specific features.
• **Security:** The system shall hash the passwords of the users. The system may encrypt the mails and the messages between users.

3. System Qualities

3.1 Usability

• The system should ensure consistent design elements throughout the interface, including color schemes, fonts, and button styles, contributing to a smoother user experience and reduced cognitive load.
• The system should seamlessly adapt to different screen sizes and devices, providing an optimal viewing and interaction experience regardless of the user's device, whether it be a desktop, tablet, or mobile device.
• The system should utilize clear visual cues such as contrasting colors, sizing, and placement of elements to guide users' attention to important information or actions, aiding in more effective navigation of the interface.
• The system should simplify complex tasks and information by breaking them down into smaller, digestible chunks, and utilize progressive disclosure techniques to reveal additional details only when needed, thus minimizing cognitive overload.
• The system should implement mechanisms to prevent errors before they occur, such as validation checks on user inputs and clear labeling of form fields, assisting users in avoiding mistakes and enhancing overall system usability.
• The system should streamline the navigation process by organizing content in a logical hierarchy and providing clear pathways for users to move between different sections of the system, utilizing intuitive navigation patterns such as breadcrumbs or navigation menus.
• The system should use clear, simple language in its interface and instructions, making it easy for everyone to understand, while avoiding confusing jargon or technical terms.
• The system should empower users to customize their experience by providing options to adjust settings, personalize preferences, or customize the layout of the interface, giving users a sense of ownership and control over their interactions with the system.

3.2 Reliability

• The system should ensure reliability by consistently delivering accurate and dependable results, fostering trust and confidence among users.
• The system should maintain high availability, minimizing downtime and ensuring that users can access it whenever needed.
• The system should be resilient in the face of failures or disruptions, with built-in mechanisms to recover gracefully and minimize impact on users.
• The system should accurately handle and process user data, ensuring data integrity and reliability throughout all operations.
• The system should be robust against unexpected inputs or adverse conditions, with error handling mechanisms in place to prevent data corruption or system crashes.
• The system should undergo rigorous testing and validation procedures to verify its reliability and performance under various scenarios.
• The system should have backup and recovery mechanisms in place to protect against data loss and ensure continuity of service.
• The system should adhere to industry standards and best practices for reliability, implementing redundant systems and failover mechanisms where necessary.
• The system should have monitoring and alerting capabilities to detect and address potential issues proactively, ensuring uninterrupted service for users.
• The system should have clear documentation and procedures in place for maintenance and troubleshooting, enabling prompt resolution of any reliability issues that may arise.

3.3 Performance

• The system should ensure high performance by delivering fast response times and minimal latency, enabling users to interact with it smoothly and efficiently.
• The system should be capable of handling a large volume of concurrent users and transactions without experiencing degradation in performance, ensuring scalability to accommodate growing demand.
• The system should optimize resource utilization, including CPU, memory, and network bandwidth, to maximize efficiency and minimize bottlenecks.
• The system should prioritize critical tasks and allocate resources accordingly, ensuring that important functions are processed promptly and without delay.
• The system should cache frequently accessed data and utilize caching mechanisms to reduce database load and improve response times for repetitive requests.
• The system should implement efficient algorithms and data structures to process and manipulate data quickly, optimizing performance for complex operations.
• The system should leverage parallel processing and distributed computing techniques to distribute workloads across multiple servers and maximize throughput.
• The system should monitor and analyze performance metrics, such as response times and resource utilization, to identify areas for optimization and improvement.
• The system should undergo performance testing under realistic load conditions to validate its performance capabilities and identify potential bottlenecks or performance issues.

3.4 Supportability

• The system should be designed to be easily installable and configurable, with clear instructions and minimal dependencies required for setup.
• The system should ensure compatibility with a wide range of operating systems, web browsers, and devices commonly used by users, ensuring accessibility across various platforms.
• The system should provide a user-friendly interface for administrators to manage and maintain it, including features such as user management, system configuration, and monitoring tools.

• The system should offer comprehensive documentation, including user manuals, installation guides, and troubleshooting resources, to assist users and administrators in understanding and utilizing the system effectively.
• The system should support seamless upgrades and updates, with mechanisms in place to facilitate the deployment of new versions and patches while minimizing downtime and disruption to users.
• The system should be designed with scalability in mind, allowing it to accommodate increasing data volumes, user traffic, and system requirements as the business grows.
• The system should be easily configurable to adapt to changing business needs and requirements, with options for customizations and extensions to meet specific use cases or integration with third-party systems.
• The system should provide robust security features and compliance with industry standards and regulations, ensuring the integrity and confidentiality of user data and protecting against potential security threats.
• The system should include logging and monitoring capabilities to track system performance, diagnose issues, and audit user activities, enabling administrators to proactively identify and resolve issues.

4. System Interfaces

4.1 User Interfaces

The user interfaces in RRSS aim to provide intuitive experiences across various platforms, enabling efficient navigation and clear information presentation. The primary web interface ensures compatibility with different devices, featuring modern design and responsiveness. Key components include the homepage, product pages, search functionality, user profile, admin dashboard, and support features. These interfaces prioritize simplicity, consistency, and functionality, with responsive layouts ensuring accessibility across all devices.

4.1.1 Look & Feel

The interfaces for RRSS exudes a contemporary and polished vibe, mirroring the sophistication and vitality of the e-commerce platform. It adopts a sleek and minimalist design, allowing users to focus on core elements without distractions. The chosen color scheme is meticulously curated to evoke trust, professionalism, and a welcoming atmosphere, in line with ShopSmart's branding. Interactive features are intuitive and user-friendly, encouraging seamless navigation and interaction. The interface strikes a harmonious balance between visual allure and practical functionality, ensuring users can effortlessly access information and carry out tasks. In essence, the interface embodies elegance, efficiency, and user-centricity, aiming to elevate the overall shopping experience for platform users.

4.1.2 Layout and Navigation Requirements

In terms of layout and navigation, RRSS prioritizes user-friendly organization, with the homepage serving as the central hub for accessing featured products, recent reviews, personalized recommendations, and promotions. Product pages offer comprehensive details, including pricing, availability, and user reviews, with related products or categories suggested for further exploration. Registered users have personalized dashboards for managing settings and viewing order history, while administrators access separate dashboards for system management, content moderation, and analytics. Quick access to feedback and support resources, such as help documentation and contact forms, is available on every page. Lastly, essential links like terms of service and contact information are housed in the footer, contributing to a seamless and intuitive user experience throughout RRSS.

4.1.3 Consistency

Consistency within the user interface is crucial as it allows users to predict system behavior effectively. These requirements apply both internally within the system and externally with other systems. Consistency should be maintained across different aspects, including navigation controls, screen area sizes and shapes, placements for data entry/presentation, and terminology. By adhering to these requirements, the system ensures a smooth and predictable user experience, enhancing overall usability and user satisfaction.

4.1.4 User Personalization & Customization Requirements

In RRSS there will be no content automatically displayed to users or available based on user attributes. In other words, users are not allowed to customize or personalize displayed content.

4.2 Interfaces to External Systems or Devices

4.2.1 Software Interfaces

RRSS is a web-based application that requires compatibility with various web browsers and operating systems. It should function across Windows, Linux, iOS, and Android devices, ensuring compatibility with popular browsers like Chrome, Firefox, Safari, and Edge. JavaScript libraries and frameworks are used for frontend development, while Java libraries handle backend functionalities such as recommendation systems and data analysis. Additionally, third-party plugins may enhance user experience, security, and performance. Behind the scenes, RRSS's software system seamlessly communicates with the database system for efficient data management.

4.2.2 Hardware Interfaces

RRSS operates on both mobile devices (such as Android and iOS) and desktop devices (like Linux and Windows). As the application functions over the internet, any hardware necessary for internet connectivity, such as modems, WAN-LAN connections, and Ethernet cross-cables, serves as a hardware interface for the system. Additionally, RRSS's website is hosted on a web server that contains a relational database. No other hardware interfaces are required for the system's operation.

4.2.3 Communications Interfaces

Communication within RRSS will primarily occur through web browsers, accommodating different versions. A decision must be made regarding whether the website should function across all browser versions or solely on the latest ones. Secure communication protocols will be employed, utilizing HTTPS for internet communication and the TCP/IP protocol suite for intranet communication. Feedback and user data will be collected through online forms, with direct messaging (DM) systems and commenting features being pivotal. End-to-end encryption will ensure communication security, preventing even system administrators from accessing others' messages or confidential data. Communication will take place over port number 80.

5. Business Rules

5.1 Privacy and Security Rules

5.1.1 Privacy and Anonymity Rule (PSR-01)

Rule: If a user opts for review anonymity in their privacy settings, then display their review without any personally identifiable information.

5.1.2 Data Security Compliance Rule (PSR-02)

Rule: If a user requests to delete their account, then permanently delete all personal data associated with that account within 30 days, in compliance with data protection regulations.

5.1.3 Log Out Rule (PSR-03)

Rule: If the user is inactive for a certain period of time, system will automatically log out the user.

5.2 Product Evaluation and Recommendation Rules

5.2.1 Product Rating Update Rule (PERR-01)

Rule: If a new review is submitted for a product, then recalculate the product's overall rating based on all reviews.

5.2.2 Merchant Product Performance Rule (PERR-02)

Rule: If a product receives more than 50 reviews with an average rating of less than 3 stars, then flag the product for review by the merchant to assess potential improvements.

5.2.3 Personalized Recommendation Engine Rule (PERR-03)

Rule: If a user has viewed more than 5 products in a specific category in the last 7 days and has not made a purchase in that category, then recommend products from that category on the user's homepage during their next visit.

5.3 User Interaction Rules

5.3.1 User Review Submission Precondition Rules (UIR-01)

Rule-1: Only registered users can submit evaluations or ratings for a product. If the customer is not registered for the system, then they cannot submit an evaluation.
Rule-2: If a user has purchased a product and 30 days have passed since the purchase date, then the user is eligible to submit a review for that product.
Rule-3: If a user has not logged in for 12 months, then mark the account as inactive and temporarily disable review submission capability until reactivated.
Rule-4: If the customer has already submitted an evaluation for the product, they cannot submit another evaluation.
Rule-5: If the evaluation is incomplete, users cannot submit it.

5.3.2 Duplicate Review Prevention Rule (UIR-02)

Rule: If a user attempts to submit more than one review for the same product, then reject the subsequent review submissions to prevent duplicates.

5.3.3 Review Verification Rule (UIR-03)

Rule: If a review submission does not meet the minimum word count of 50 words, then mark the review as "pending verification" and notify the user to provide more detail.

5.3.4 User Review Approval Rule (UIR-04)

Rule: If a user review contains any flagged keywords (e.g., offensive language, spam) then mark the review for manual review by a community moderator before publication.

5.3.5 Community Engagement Rule (UIR-05)

Rule: If a user review receives more than 20 'helpful' votes, then award the user with ShopSmart points redeemable for discounts or special offers.

5.3.6 Merchant Response Rule (UIR-06)

Rule: If a product receives a review with a rating of 2 stars or less, then notify the merchant and allow them to respond within 7 days.

5.3.7 Moderation Rule (UIR-07)

Rule: If a review is flagged by users for containing inappropriate content, then queue the review for moderation and temporarily hide it from public view until a determination is made

5.3.8 Discount Voucher Rule (UIR-08)

Rule: If there are at least 3 items of the same type in the customer's shopping cart and each item's value is greater than $30, then give the customer a voucher whose value is 10% of the cheapest item's price.

5.3.9 Loyalty Discount Rule (UIR-03)

Rule: If a user has made purchases totaling over $500 in the last year, then offer a 5% discount on their next purchase.

6. System Constraints

• RRSS is a web-based application.
• The programming language is Java.
• The system must support popular web browsers.
• Eclipse is the designated development tool.
• The system can utilize any database.
• Third-party components or class libraries may be employed.
• The system must adhere to specific resource limitations, such as memory and processor usage.
• There may be certain minimum hardware requirements for end-user devices.

7. System Compliance

7.1 Licensing Requirements

Licensing enforcement requirements and usage restrictions for RRSS might involve users needing to agree to a specific license agreement prior to software usage. Furthermore, user roles and permissions could be established, and limitations might be placed on the number of simultaneous software users.

7.2 Legal, Copyright, and Other Notices

RRSS utilizes proprietary technology and may include copyrighted materials. All rights, including those to the software, documentation, and associated images, are reserved for RRSS. Any unauthorized reproduction, distribution, or use of RRSS or its components is strictly prohibited and may lead to legal consequences. Additionally, RRSS may incorporate third-party software components, each subject to its respective license agreements. Any trademarks, service marks, logos, or other branding elements featured in RRSS belong to their respective owners. By using RRSS, users implicitly agree to abide by these terms and conditions.

7.3 Applicable Standards

The RRSS system is designed in compliance with various standards to meet legal, quality, and regulatory requirements. These standards cover a range of areas including legal obligations, quality assurance protocols, and industry regulations. Furthermore, RRSS conforms to established industry standards for usability, interoperability, and internationalization, facilitating smooth operation across different platforms and user settings. Moreover, the system aligns with operating system standards to ensure compatibility and efficient performance. By adhering to these standards, RRSS maintains its reliability, security, and user satisfaction at a high level.

8. System Documentation

For RRSS, there's a need for comprehensive online user documentation and help systems to facilitate effective user navigation and utilization of the platform. This documentation should encompass detailed instructions, FAQs, troubleshooting guides, and tutorials covering all aspects of RRSS functionality. Additionally, there should be readily accessible help-about notices within the system to offer immediate assistance on specific features or tasks.

Expectations for the documentation include clarity, conciseness, and user-friendliness, catering to users with varying levels of technical proficiency. It should be regularly updated to reflect any changes or enhancements to the RRSS platform. The responsibility for creating and maintaining the documentation lies with the RRSS development team in collaboration with the customer support department. Regular reviews and feedback mechanisms should be established to ensure the documentation remains accurate, relevant, and beneficial to users.

9. Appendices

(You Can Take A Look Next Pages.)

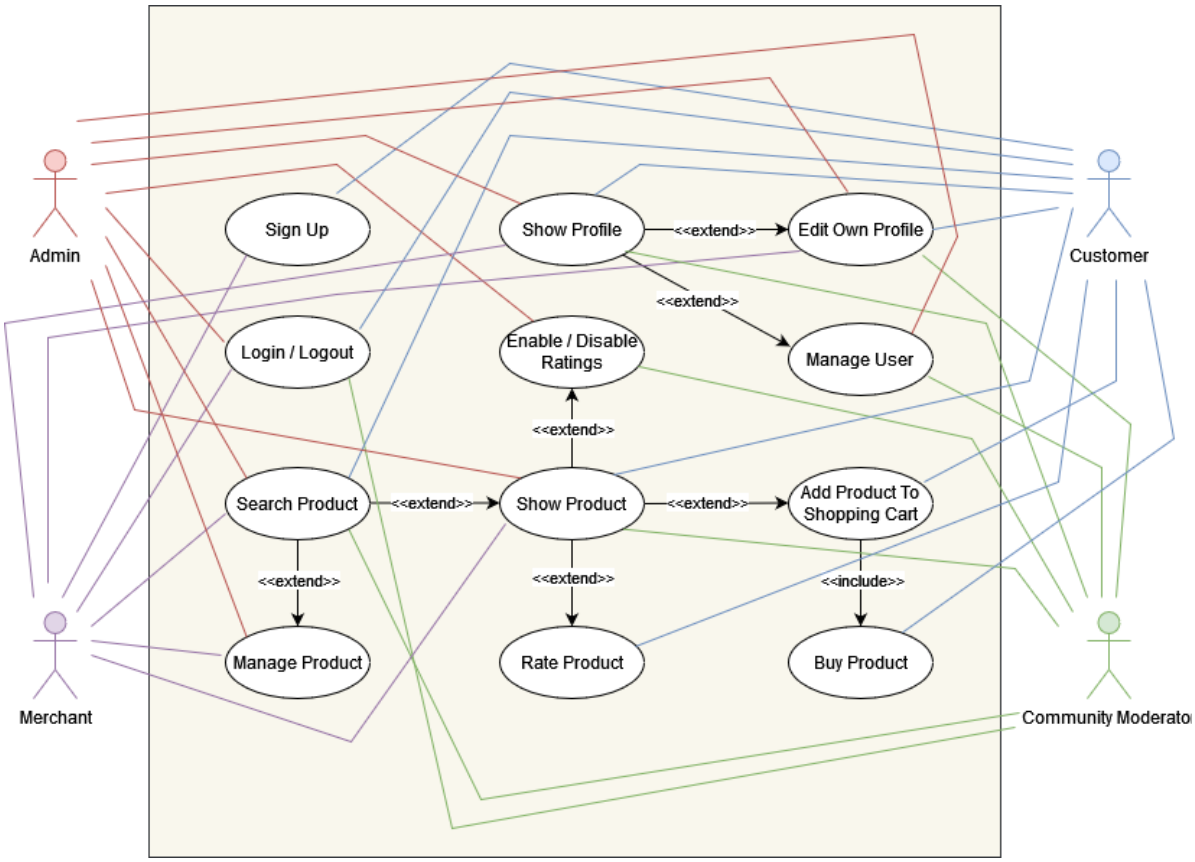

Figure-1: High-Level Use Case Diagram For RRSS

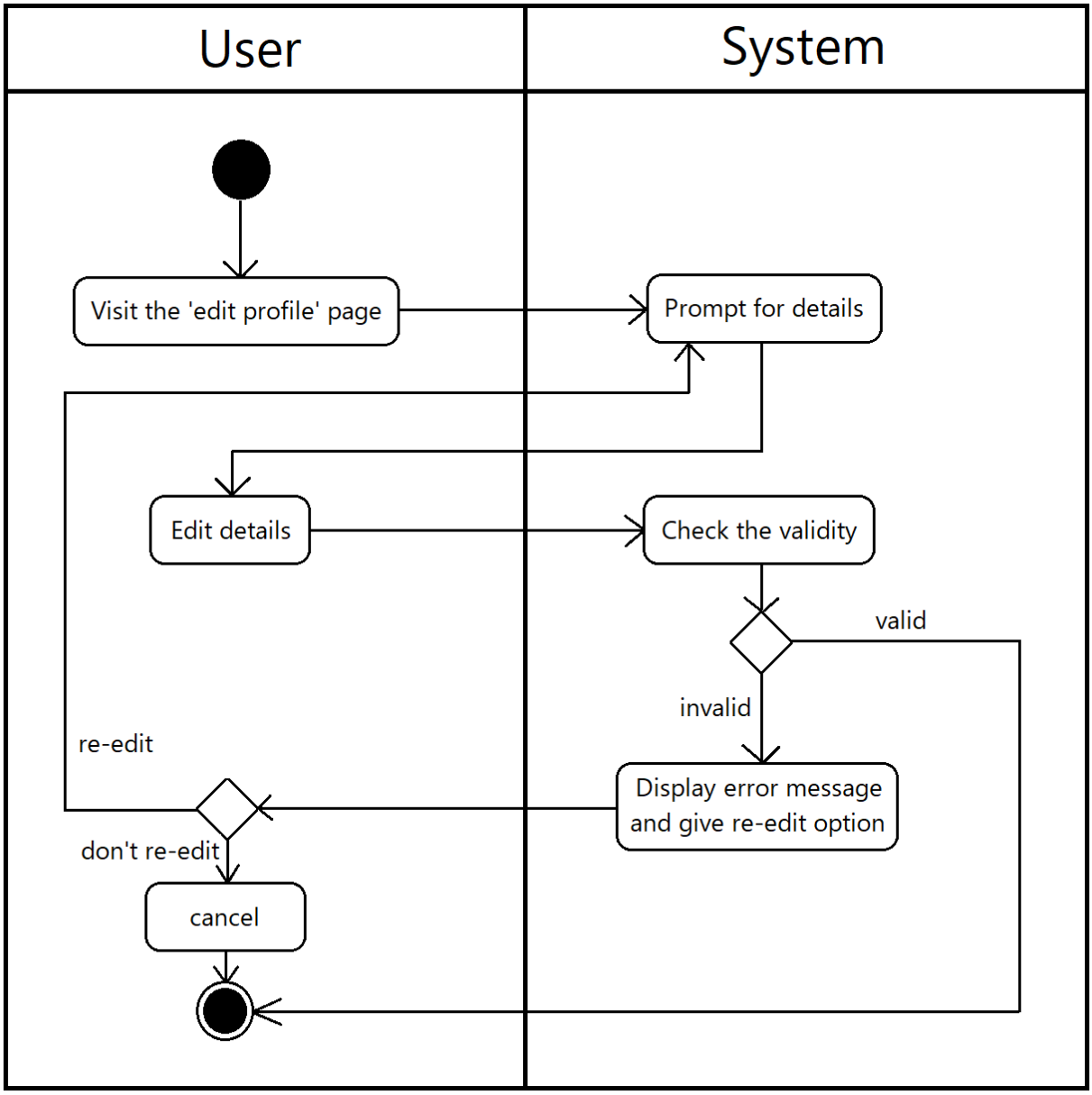

Figure-2: Activity Diagram For A Critical Use Case (Edit Own Profile)

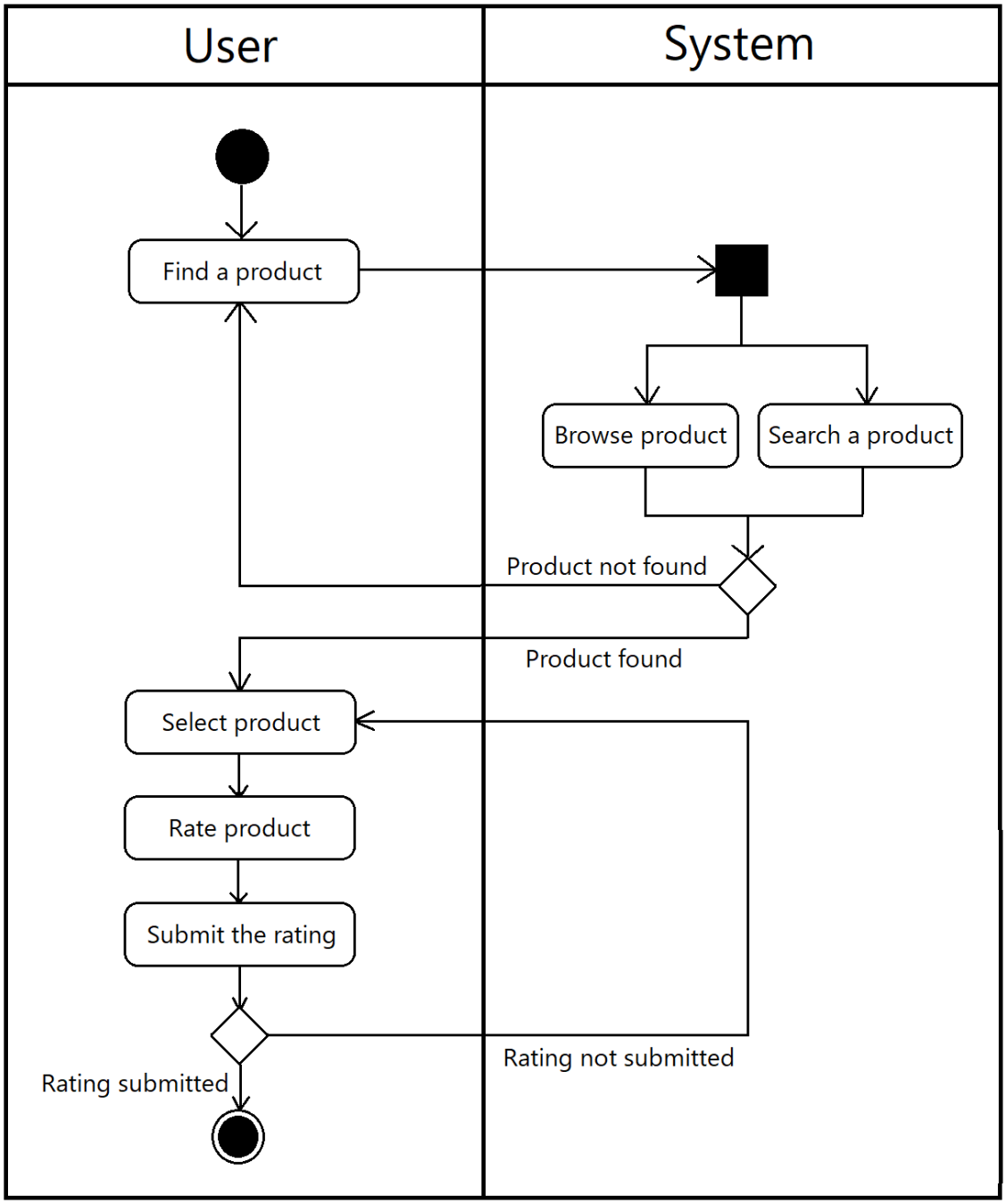

Figure-3: Activity Diagram For A Critical Use Case (Rate Product)

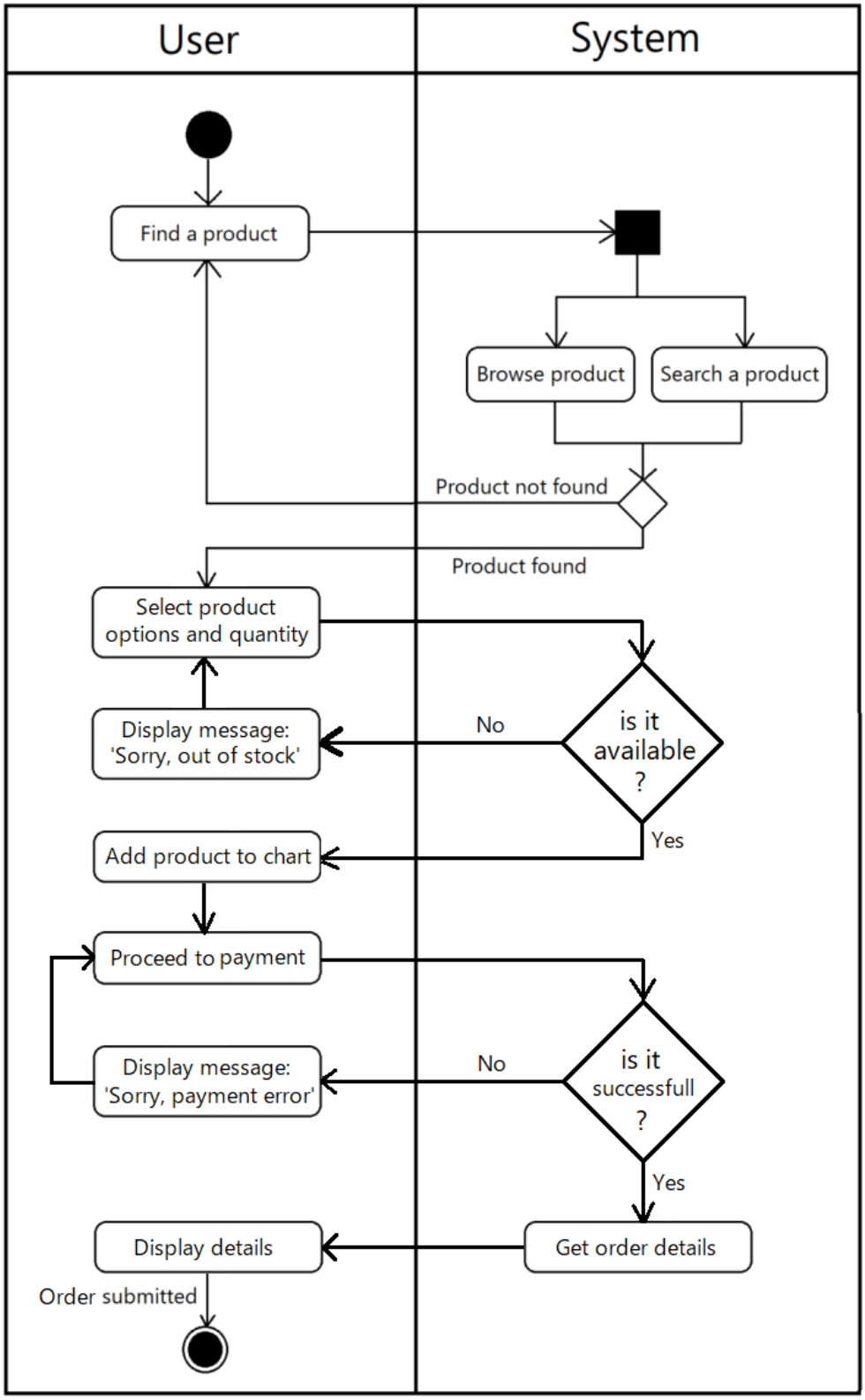

Figure-4: Activity Diagram For 2 Critical Use Cases (Add Product To Shopping Cart and Order -Buy-)
Note: This figure contains activity diagram for more than 1 related critical use cases.

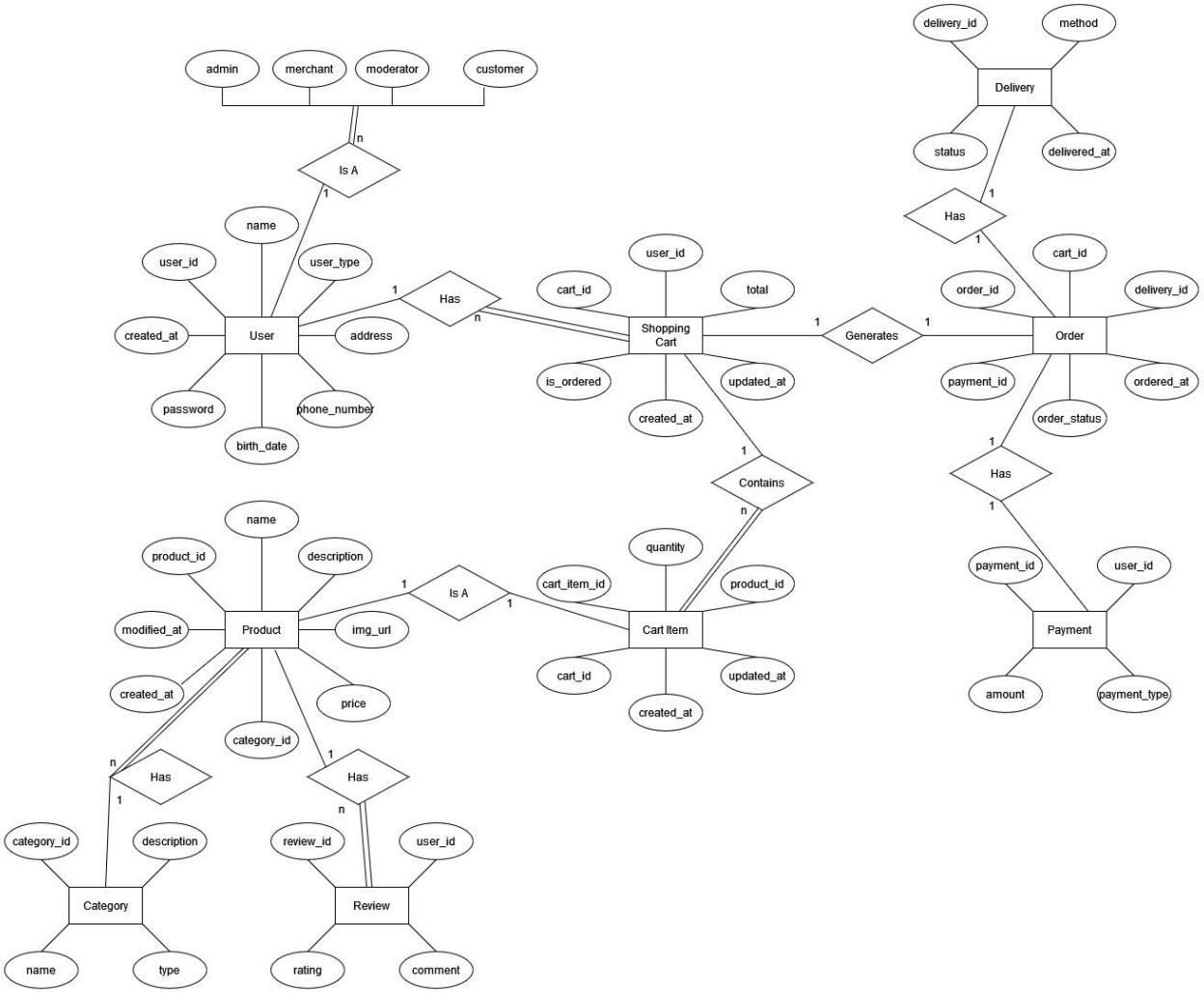

Figure-5: ER Diagram For RRSS
(Another Version With Better Resolution Added As .png File)

10. Traceability Table for Delivery-2

Name	Jobs Done	Work Hours
Mert Tazeoğlu	• Creation of SRS Documentation • Creation of use case diagram • Creation of activity diagram for 3 critical use cases • Creation of ER diagram • 12 cases for Use and Test Case Documentations	15 Hours
Asım Ateş	• Starting development of project (coding) • Testing and reviewing all jobs that done • Correcting mistakes, making improvements	8 Hours
Emre Can Şahin	• Creation of GUI Documentation • Testing and reviewing all jobs that done • Correcting mistakes, making improvements	7 Hours
Kenan Gökdeniz Acet	• Starting development of project (coding) • Testing and reviewing all jobs that done • Correcting mistakes, making improvements	4 Hours
Tarık Sümer	• Starting development of project (coding) • Testing and reviewing all jobs that done • Correcting mistakes, making improvements	4 Hours