Software Requirements Specification

for

CowbellCoffee

Version 1.0 approved

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1. Introduction

1.1 Purpose

The purpose of this website, CowbellCoffee, is to provide an area online where users can purchase coffee makers, espresso machines, and other coffee-related products. This document provides a description of the use case for the website, the software architecture and the methods used to create the website itself, and other systems that make up the website such as payment systems, cybersecurity measures, and data management.

1.2 Document Conventions

- Convention for Section Names:
  - Size: 18
  - Font Type: Times New Roman
  - Spacing: 1.25
  - Format: X.Section where X is the section's number and section is the name
- Convention for Subsection Names:
  - Size: 14
  - Font type: Times New Roman
  - Spacing: 1.25
  - Format: X.Section where X is the subsection's number and section is the name
- Convention for texts:
  - Size: 12
  - Font: Times New Roman
  - Spacing: 1.25
  - Format: Bullet points / Paragraph Description
- Convention for References:
  - MLA 9th edition format
    - Works cited (1.5) and citations
  - Spacing: 1.25

1.3 Intended Audience and Reading

- **Developers** – to develop a clear understanding of the requirements of the software they are building or maintaining.
- **TA / Instructor** – to be able to visualize the route that the developers will take in creating the software and validate if they are going in the right direction.
- **Users** – to understand how to properly utilize the software and know what the extent of its capabilities are.
- **Testers**: To identify testing scenarios and requirements.

1.4 Product Scope

The CowbellCoffee website gives users a platform to buy coffee makers, espresso machines, grinders, and other coffee-related products. This website enables users to explore a wide range of coffee machines offered by various brands. It has a search bar to enable users to look directly for a product on the main page based on trending products, products on sale, and sponsored products.

Sellers using CowbellCoffee can advertise their various products for sale as well as receive reviews and profits from their sales.

The CowbellCoffee admins are able to manage both sellers and products to ensure that products meet the platform's standards and that the platform's policies are not violated. The administrators can resolve any disputes between sellers and buyers and maintain communication to ensure a communicative environment.

CowbellCoffee has the option for both credit card payments and PayPal. Buyers can use credit cards such as Visa, MasterCard, and American Express. For customers who prefer to use digital wallets, the website also supports PayPal, which is a very secure and widely used method of payment.

The platform is designed to allow users to create and log into secure accounts. Buyers will have access to a dashboard where they can manage their profiles: updating personal information, saving items, and modifying payment methods and delivery addresses.

CowbellCoffee ensures that all user information is handled with the utmost security. The platform has secure authentication methods to protect users' personal and financial information from unauthorized access.

1.5 References

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2. Overall Description

2.1 Product Perspective

CowbellCoffee is an e-commerce website designed to allow users to purchase products related to coffee such as coffee makers, espresso machines, grinders, and other products. Sellers that produce these products are able sell their various merchandise through CowbellCoffee and receive reviews and profits through the website.

2.2 Product Functions

- All users will be able to log into and log out of their respective accounts

- Buyers will be able to do the following:
    - Search for specific items
    - Compare several products and their prices

  - Purchase products
  - Return products to sellers
  - Add and remove payment methods from their accounts
- Sellers will be able to do the following:
  - Add products to the catalog
  - Remove their products from the catalog
  - Choose prices for their products
  - Receive payments for the products they sell
- Admins will be able to do the following:
  - Approve or block any actions from the buyer or seller
  - Remove buyers, sellers, and products

2.3 User Classes and Characteristics

- **User**

  Function: Users can view and browse product listings.
  - **Buyer**

    Function: The Buyer class is considered a registered user subclass of the User class, and it has the same abilities as the User class with the added features of purchasing products and being able to manage an account.
  - **Seller**

    Function: The Seller class is considered a registered user subclass of the User class. Sellers are given the ability to list, take down, and edit information about their products.
  - **Admin**

    Function: Admin is a subclass of User containing administrative privileges to control the platform and user capabilities.

2.4 Operating Environment

CowbellCoffee is developed using Python for the back-end to ensure high performance and scalability. The front end is built with HTML and CSS. PostgreSQL serves as the database, managing user accounts, product listings, and transactions. This platform will be compatible with Windows, macOS, and popular web browsers.

2.5 Design and Implementation Constraints

- Regulations:
  - Ensuring compliance with local and international e-commerce regulations, such as CAN-SPAM Act and Federal Trade Commission Act.
  - Following industry standards for secure online payment processing, including PCI-DSS.

- Technical Constraints
  - Must be optimized for performance across various devices, including smartphones, tablets, and desktops, with those devices having minimum system requirements.
  - Server capabilities, including memory and processing power, to handle expected traffic and transaction volumes.
- Interfaces to Other Applications
  - Third-party payment (Paypal, Stripe, etc.)
  - Compatibility with existing inventory management and shipping software
  - API connections with social media platforms for marketing and customer engagement
- Databases
  - Implementation of a robust database system (MySQL, PostgreSQL) for product and customer data management
- Parallel Operations
  - Support for simultaneous user operations, including browsing, purchasing, and account management, without performance degradation
- Language Requirements
  - Multilingual support for the website to cater to a global audience
  - Adaptation to different currencies and regional pricing models
- Data Transmission Standards
  - Secure communication protocols (HTTPS, SSL/TLS) for all transactions and user interactions
  - Real-time notifications and updates through email or SMS, requiring reliable communication services
- Protection Measures
  - Establishment of robust user authentication and access control systems
  - Data encryption for sensitive customer information
  - Regular security audits and updates to protect against vulnerabilities and breaches

- User Interface Guidelines
    - Use of responsive design principles to ensure the website is accessible and user-friendly across all devices
    - Following development guidelines and methods to ensure code is scalable and sustainable
    - Documentation for future developers who may maintain or extend the website's functionality

3. System Features

3.1 Login and Registration

3.1.1 Description and Priority

With this feature, users can either create an account or log in to an existing account. This feature is of high priority.

3.1.2 Stimulus/Response Sequences

- **User Action:** User clicks on a "sign up" button
- **System Response:** The user is brought to a page with registration information to either type in or select.
- **User Action:** User enters all information and clicks on a "confirm" button
- **System Response:** If all of the required information is filled out correctly and the information does not match an existing account, the user will be notified that account creation was successful and be taken to the catalog. If not, the user will be notified that the information entered needs to be edited to fit the qualifications.

3.1.3 Functional Requirements

REQ-1: User Registration/Login

-The system must be able to allow a potential user to register with the website using their email address and allow them to set a username and password.
-The system must be able to recognize when a user logs in based on username and password.

-The system must be able to save information about the user (email address, product history, etc)
-The system must be able to log a user out of their account when prompted by the user.

3.2 Account Management

3.2.1 Description and Priority

This feature allows users to manage their accounts, by adding their billing information, shipping address, and email. This feature has a high priority.

3.2.2 Stimulus/Response Sequences

Accessing Account Management

- **User Action:** User selects “profile management” button.
- **System Response:** The system redirects the user to the profile management page displaying profile information, payment methods, saved addresses, and order history.

Accessing Account Information

- **User Action:** User selects “edit profile” button.
- **System Response:** The system displays fields for editing profile picture, username, email address and password.
- **User Action:** User selects “edit profile picture”.
- **System Response:** The system displays an “upload new profile picture” tab
- **User Action:** User selects the “upload new profile picture” tab
- **System Response:** The system asks for permission to access the User’s photos.
- **User Action:** User selects a photo and clicks on the "Submit" button.
- **System Response:** The system displays the selected photo as a new profile picture.
- **User Action:** User updates profile details and selects the "Submit" button.
- **System Response:** The system saves the updated profile information and redirects the user back to the account management page

Managing Payment Methods

- **User Action:** User selects the "Payment Methods" tab.
- **System Response:** The system plays current payment methods, such as credit cards or PayPal.
- **User Action:** User selects "Add Payment Method" or "Edit" next to an existing method.
- **System Response:** The system prompts the user to enter or update payment information.
- **User Action:** User selects the "Submit" button.
- **System Response:** The system saves the payment information and redirects the user to the account management page.

Updating Shipping Address

- **User Action:** User selects the "Shipping address" tab.
- **System Response:** The system displays current saved addresses.
- **User Action:** User selects "Add New Address" or "Edit" next to an existing address.
- **System Response:** The system prompts the user to enter or update shipping address details.
- **User Action:** User selects the "Submit" button.
- **System Response:** The system saves the updated address information and redirects the user to the account management page.

Viewing Order History

- **User Action:** User selects the "Order History" tab.
- **System Response:** The system displays the list of previous orders with details like order date, items purchased, and total amount.
- **User Action:** User selects an individual order to view more details.
- **System Response:** The system displays detailed order information, including shipping status and tracking number.
- **User Action:** User selects the "Back" button.
- **System Response:** The system redirects the user to the account management page.

3.2.3 Functional Requirements

REQ-1: Profile Editing

- When prompted by the user, the system must allow the user to change any aspect of their profile such as their username, profile picture, email address associated with their account, password, etc.

REQ-2: Destination Editing

-When prompted by the user, the system must allow the user to change their shipping destination and origin.

REQ-3: History Viewing

-When prompted by the user, the system must allow the user to be able to view their search history and ordering history.

3.3 Catalog

3.3.1 Description and Priority

With this future, any user can browse a wide variety of products that have been listed by different sellers. Listings for products are displayed to the users, which they can view further information on and even compare different products. This feature is of high priority.

3.3.2 Stimulus/Response Sequences

Viewing Product Information

- **User Action:** User clicks on a product listing.
- **System Response:** System displays all of the information about the product, including description of the item, price, and reviews.

Comparing Products

- **User Action:** User clicks a “compare” button.
- **System Response:** The user is prompted to search for the item that they want to compare the current product to.

Filtering Products

- **User Action:** User picks from a selection of product filters.
- **System Response:** The catalog is limited down to products that fit the filters that the user set in place.

3.3.3 Functional Requirements

REQ-1: Item Description

-When prompted by the user, the system should be able to show the information requested by the user about the product they select.

REQ-2: Item Comparison

-Users should be able to compare the information and prices of any two items that they select.

REQ-3: Filtering

-Users should be able to filter products based on criteria such as price level and quantity.

3.4 Shopping Cart

3.4.1 Description and Priority

This feature allows users to manage products that they show intent to buy. They can add items to the cart, remove items, increase/decrease the number of each product they want to buy, and purchase items. This feature has a high priority.

3.4.2 Stimulus/Response Sequences

Adding items to the cart

- **User Action:** User clicks the “add to cart” button in the catalog.
- **System Response:** System lists the product in the shopping cart.

Removing items from the cart

- **User Action:** User selects the “remove from cart” button.
- **System Response:** The product disappears from the shopping cart page, and a notification appears to say that the removal is successful.

Changing the number of products in the cart

- **User Action:** User clicks the plus button next to the current number of items.
- **System Response:** The amount of product being bought increases by 1.
- **User Action:** User clicks the minus button next to the current number of items.
- **System Response:** The amount of product being bought decreases by 1.
- **User Action:** User types in a number in place of the current number of items.

- **System Response:** The amount of product being bought becomes the number entered.

Purchase Items

- **User Action:** User selects the button labeled “proceed to checkout.”
- **System Response:** The user is brought to a checkout page to confirm the purchase and select the payment method being used.
- **User Action:** User enters all information and selects “confirm”
- **System Response:** If the purchase was successful, the system gives a notification of success and displays a receipt with an arrival date on it. The items are then all removed from the cart. If the purchase failed, the system gives the user a notification that the purchase failed and to try again.

3.4.3 Functional Requirements

REQ-1: Items Going In and Out of the Cart

-The user should be able to add items to the cart

-The user should be able to remove items from the cart

REQ-2: Changing Quantities

-The user should be able to edit the amount of a specific product that they are buying.

REQ-3: Purchasing Items

-The user should be able to proceed to checkout

-The user should be able to review the items in their cart

4. Other Nonfunctional Requirements

4.1 Performance Requirements

The target response for the CowbellCoffee website is still under consideration. The goal is to make CowbellCoffee accessible through different devices, Mac computers and all Windows systems. The system will be tested to handle large volumes of users and transactions, ensuring smooth performance during high-traffic periods. All the above will be ensured using PostgreSQL. The Git-Hub repository will help us backup all our work.

4.2 Safety Requirements

4.2.1 Data Security and Privacy

- **Data Protection:** Ensure that all customer data, including payment information and personal details, is encrypted and securely stored, Comply with General Data Protection Regulation (GDPR) for European customers and California Consumer Privacy Act (CCPA) for customers in California.
- **Safeguards:** Implementation HTTPS for secure data transmission, use secure payment gateways, and regularly update security protocols.
- A**ctions to Prevent:** Prevent unauthorized access to customer data by implementing robust authentication and access control measures.

4.2.2 Web Accessibility

- **Compliance:** Ensure the website is accessible to all users, including those with disabilities, in compliance with the Web Content Accessibility Guidelines (WCAG) and Americans with Disabilities Act (ADA).
- **Safeguards:** Use accessible design practices such as alternative text for images, keyboard navigation, and screen reader compatibility.
- **Actions to Prevent:** Prevent the creation of barriers that could exclude users with disabilities from accessing or using the website.

4.2.3 Product Safety Information

- **Accurate Description:** Provide clear and accurate information about the coffee products, including ingredients, allergens, and usage instructions. Ensure compliance with Federal Trade Commission (FTC) guidelines for advertising.
- **Safeguards:** Regularly review and update product descriptions to reflect current safety information and regulatory requirements.
- **Actions to Prevent:** Avoid misleading claims or incomplete information that could result in harm or dissatisfaction.

4.2.4 Order Fulfillment and Shipping

- **Safe Packaging:** Ensure that products are packaged securely to prevent damage during transit. Follow International Air Transport Association (IATA) guidelines for shipping food and beverages.
- **Safeguards:** Implement quality control measures to verify that products are packed correctly and that shipping carriers handle packages with care.

- **Actions to Prevent:** Prevent delays or mishandling by providing accurate shipping information and tracking options.

4.2.5 Website Performance and Reliability

- **Uptime and Security:** Maintain high website uptime and protect against cyber threats such as Distributed Denial of Service (DDoS) attacks. Ensure compliance with ISO/IEC 27001 for information security management.
- **Safeguards:** Use reliable hosting services and implement regular backups to mitigate data loss.
- **Actions to Prevent:** Prevent frequent outages or slow performance by optimizing website infrastructure and monitoring for potential security threats.

4.2.6 Customer Support and Dispute Resolution

- **Support Channels:** Provide clear information on how customers can contact support for issues related to orders, refunds, or other concerns. Ensure compliance with Consumer Protection Laws.
- **Safeguards:** Implement a robust support system with trained personnel to handle customer inquiries and complaints effectively.
- **Actions to Prevent:** Prevent unresolved disputes by offering clear return and refund policies and prompt resolution of customer issues.

4.3 Security Requirements

4.3.1 Data Breach Notification

- **Requirement:** Establish and maintain a data breach notification protocol that complies with relevant regulations, such as GDPR's 72-hour notification requirement and CCPA's breach notification provisions.
- **Safeguards:** Implement procedures to detect, assess, and notify affected users and regulatory authorities in the event of a data breach. Prepare notification templates and processes in advance to ensure timely and accurate communication.
- **Actions to Prevent:** Prevent delayed or ineffective breach notifications by conducting regular drills and ensuring that the incident response team is trained and ready to act quickly.

4.3.2 User Identity Authentication

- **Authentication Requirements:** Implement multi-factor authentication (MFA) for user accounts, especially for administrative access and sensitive actions such as order processing or account changes.
- **Assign Admin Account:** If a user is determined to be qualified to be an administrator, the user account will then be assigned 'admin' status.
- **Safeguards:** Use strong password policies (e.g., minimum length, complexity requirements) and secure authentication methods (e.g., OTPs, biometric verification).
- **Actions to Prevent:** Prevent unauthorized account access by avoiding weak or default passwords and ensuring that authentication mechanisms are resistant to common attacks like brute force or phishing.

4.3.3 Data Protection and Privacy Regulations

- **Compliance:** Ensure compliance with **General Data Protection Regulation (GDPR)** for EU customers, **California Consumer Privacy Act (CCPA)** for California residents, and any relevant national or regional data protection laws.
- **Safeguards:** Conduct regular audits and impact assessments to ensure ongoing compliance with data protection regulations. Implement user consent mechanisms for data collection and processing.
- **Actions to Prevent:** Prevent non-compliance by staying up-to-date with changes in data protection laws and implementing necessary changes to policies and practices.

4.3.4 Secure Development Practices

- **Requirement:** Follow secure development practices throughout the website's development lifecycle, including code reviews, secure coding guidelines, and regular security testing.
- **Safeguards:** Implement a secure development lifecycle (SDLC) framework that includes threat modeling, secure coding practices, and regular security assessments. Conduct code reviews and penetration testing to identify and address vulnerabilities.
- **Actions to Prevent:** Prevent security issues in production by integrating security testing into the development process and ensuring that all code changes are reviewed and tested for vulnerabilities before deployment.

4.3.5 Website Security Measures

- **Vulnerability Management:** Regularly scan the website for vulnerabilities and apply security patches and updates promptly.
- **Safeguards:** Use a Web Application Firewall (WAF) to protect against attacks such as SQL injection and cross-site scripting (XSS). Implement secure coding practices to reduce the risk of vulnerabilities.
- **Actions to Prevent:** Prevent website breaches by performing regular security testing, including penetration testing and vulnerability assessments.

4.3.6 User Data Access and Control

- **Access Control:** Implement role-based access control (RBAC) to limit access to user data based on user roles and responsibilities.
- **Safeguards:** Ensure that users can access and manage their personal data, including the ability to view, modify, or delete their information as required by regulations.
- **Actions to Prevent:** Prevent unauthorized data access by enforcing strict access controls and conducting regular access reviews.

4.4 Software Quality Attributes

CowbellCoffee is set to make the user's experience simple. Therefore, the following attributes are going to be frequently measured and verified through user feedback. We want to ensure that the platform always meets the customer's needs.

4.4.1 Usability

- CowbellCoffee offers an intuitive interface that allows buyers to easily navigate, search for products, and manage transactions without requiring extensive learning. The welcome page shows a variety of products: trending, on sale, and sponsored.

4.4.2 Reliability

- The platform is designed for high availability, ensuring uninterrupted service even during high-traffic periods like sales events.

4.4.3 Portability

- The platform supports access across multiple devices, including smartphones, tablets, and desktops, ensuring a consistent experience on both Windows and macOS operating systems.

4.4.4 Adaptability

- The system is built with flexibility, allowing for future modifications or expansions to meet evolving business requirements or user needs.

4.4.5 Accessibility

- The platform supports basic zoom features on the products.

4.4.6 Multilingual Support

- CowbellCoffee can support 3 languages: English, Spanish and French. Users can easily switch between these languages through the platform's interface. The platform's content, including product descriptions, user instructions, and customer support, will be fully translated to maintain consistency across all languages. This multilingual feature enhances user engagement and broadens the reach of CowbellCoffee to international markets, particularly in regions where English is not the primary language.

Section 5 - Other Requirements

Appendix A: Glossary

MLA - Modern Language Association

HTML - Hypertext Markup Language

WAF - Web Application Firewall

API - Application Programming Interface

XSS - Cross-Site Scripting attacks - An attack in which an attacker injects malicious executable scripts into the code of a trusted application or website

SRS - Software Requirements Specification - Document that defines all system features, functions, nonfunctional requirements, and classes in order to convey the objectives of the software and the manner in which the software will satisfy those objectives.

CAN-SPAM Act - Controlling the Assault of Non-Solicited Pornography and Marketing

PCI-DSS - Payment Card Industry Data Security Standard

HTTPS - Hypertext transfer protocol secure - It encrypts the website visitor's connection and hides cookies, URLs and other types of sensitive metadata

SSL - Secure Sockets Layer - Used to establish an encrypted connection between a browser or user's computer and a server or website.

TLS - Transport Layer Security - A widely adopted security protocol designed to facilitate privacy and data security for communications over the Internet.

SMS - Short Message Service

GDRP - General Data Protection Regulation

CCPA - California Consumer Privacy Act of 2018

ISO - International Organization for Standardization

IEC - International Electrotechnical Commission

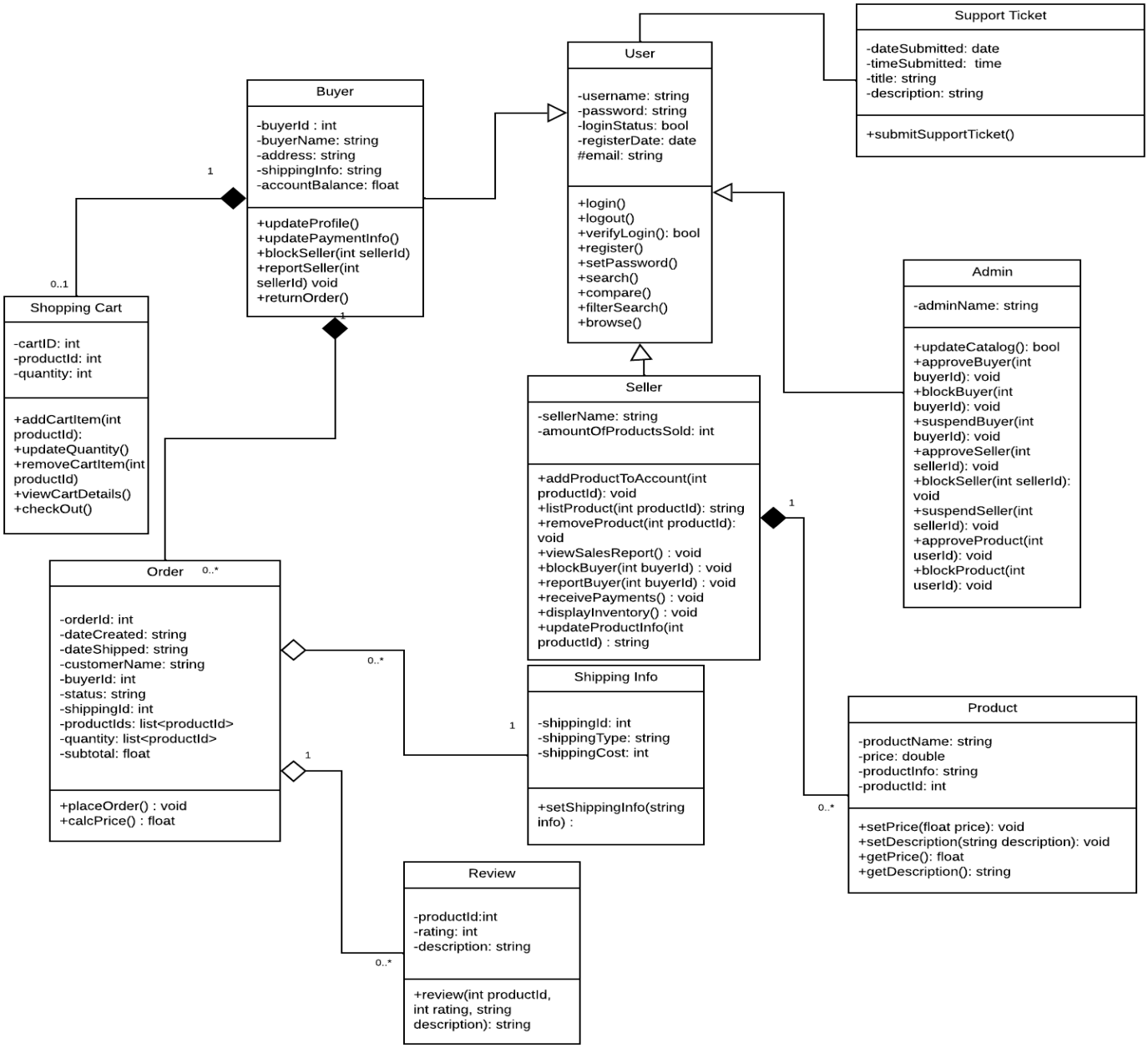
OTP - One-time Password

SDLC - Software Development Life Cycle

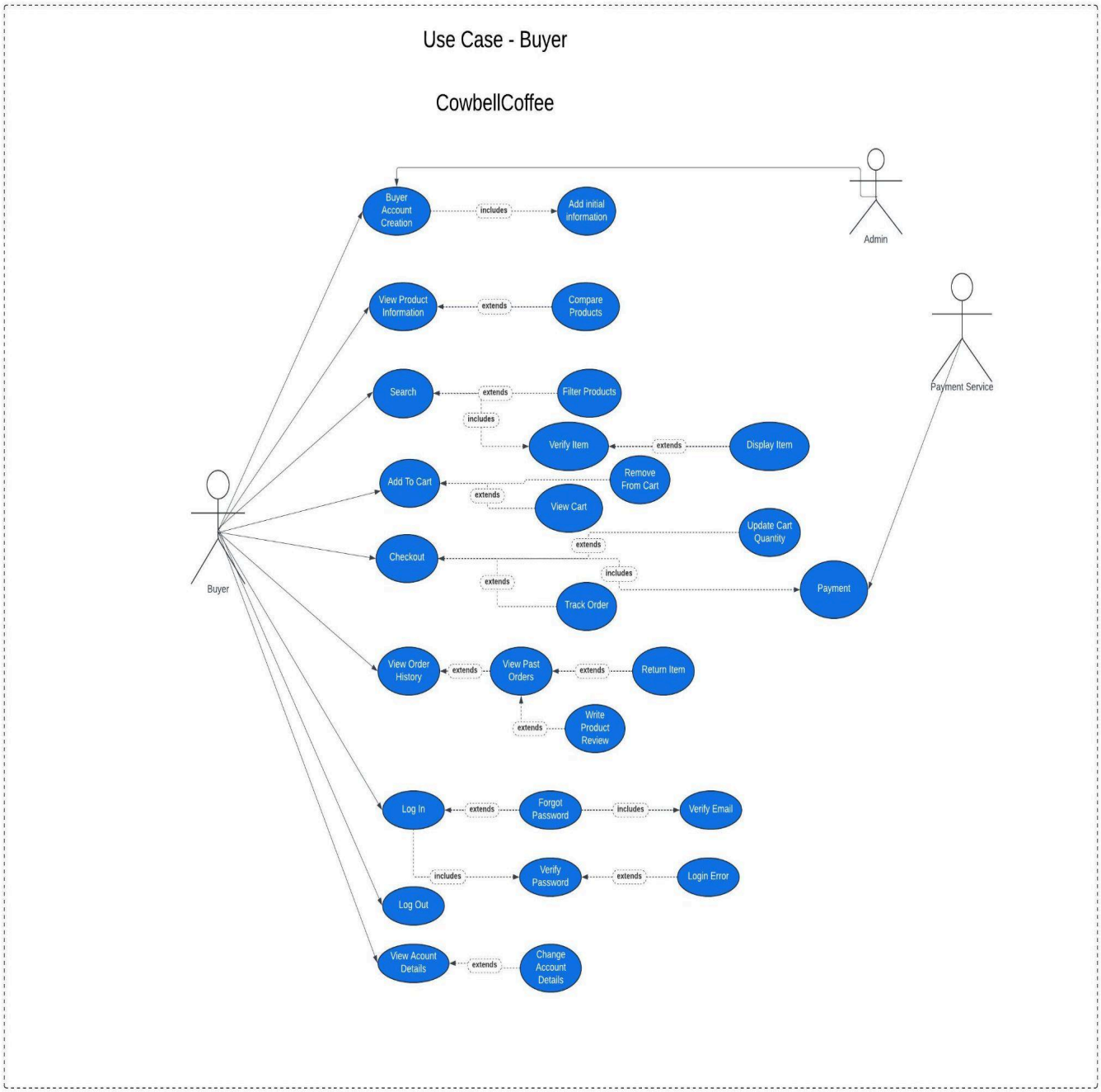
RBAC - Role-based access control

Appendix B: Analysis Models

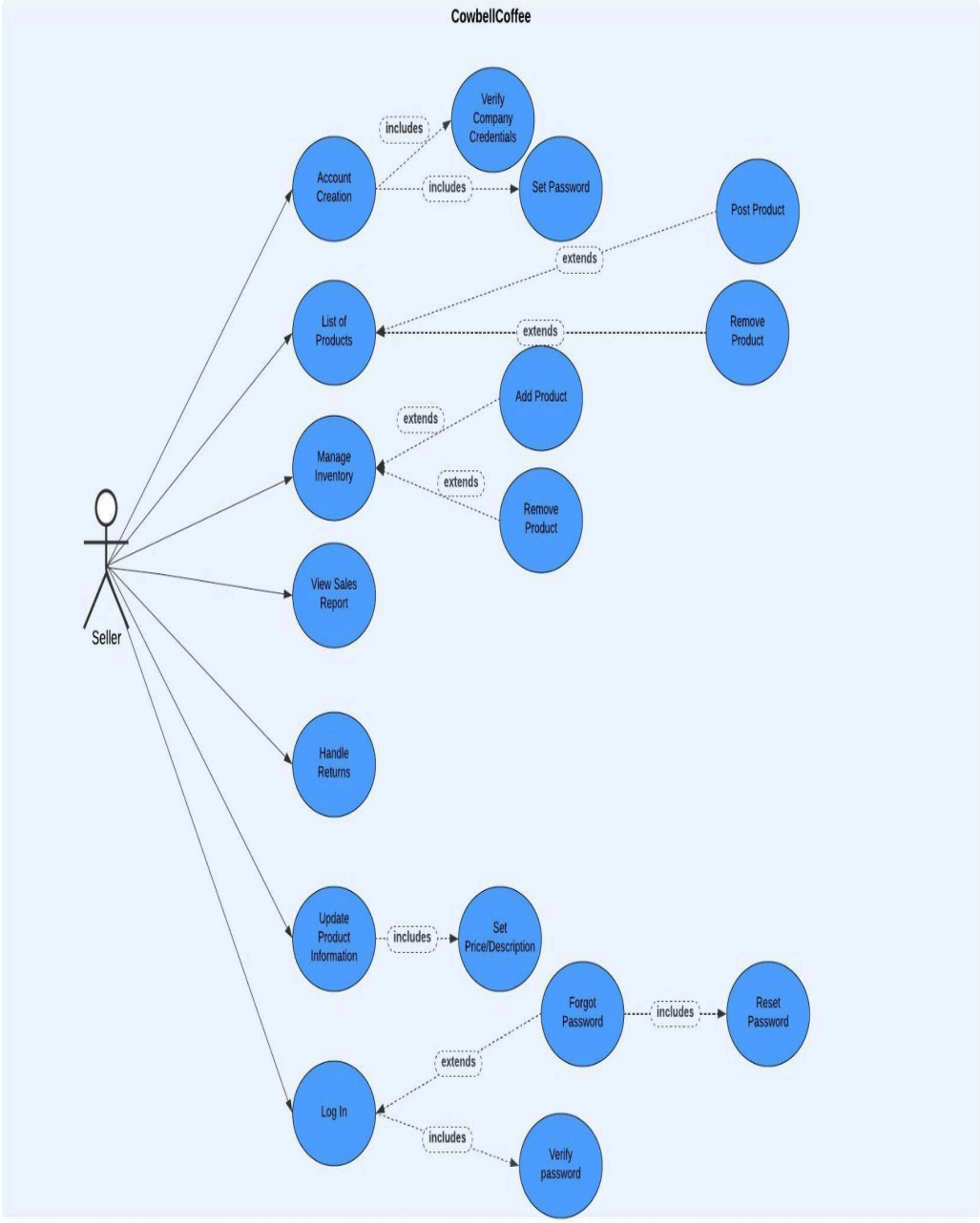
UML Class Diagram



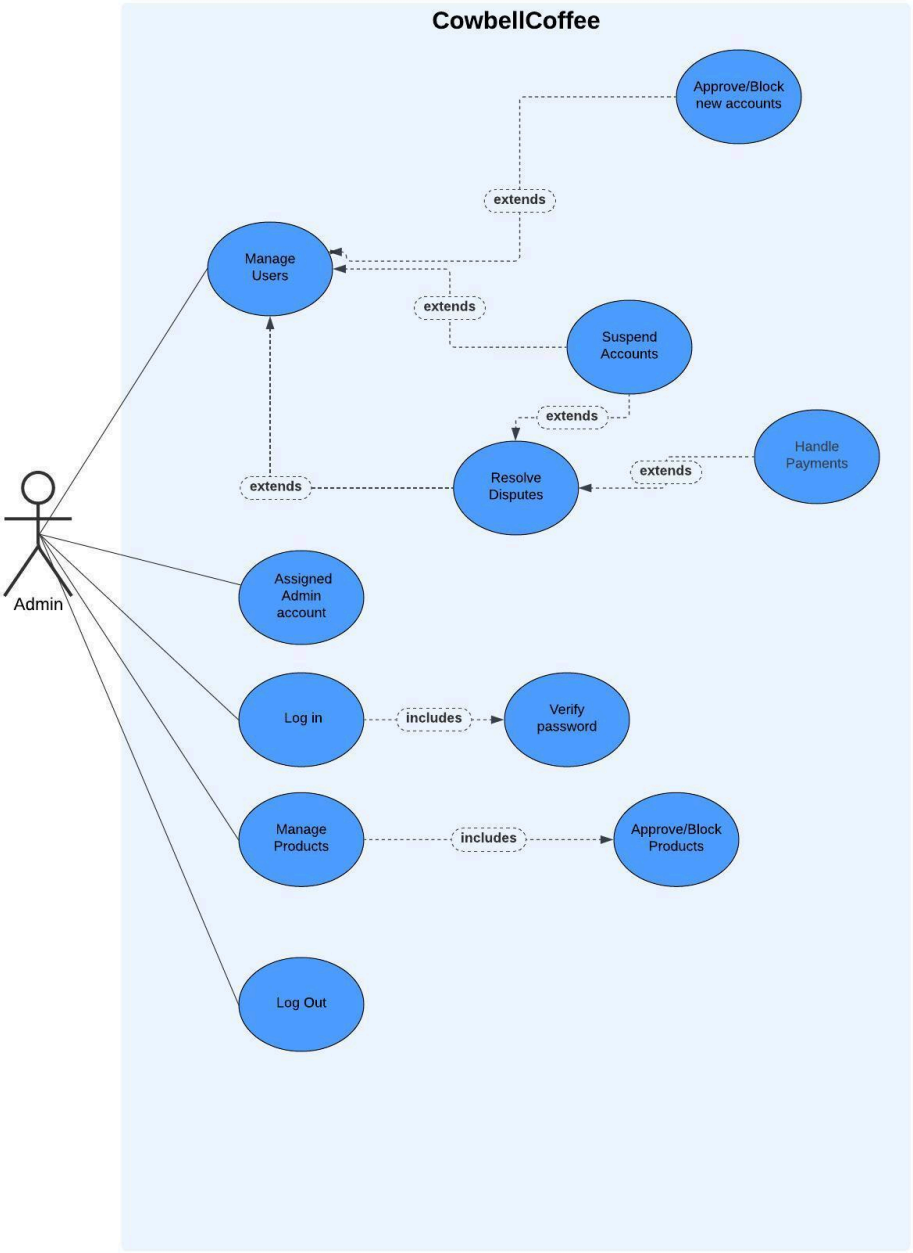
Buyer Use Case Diagram



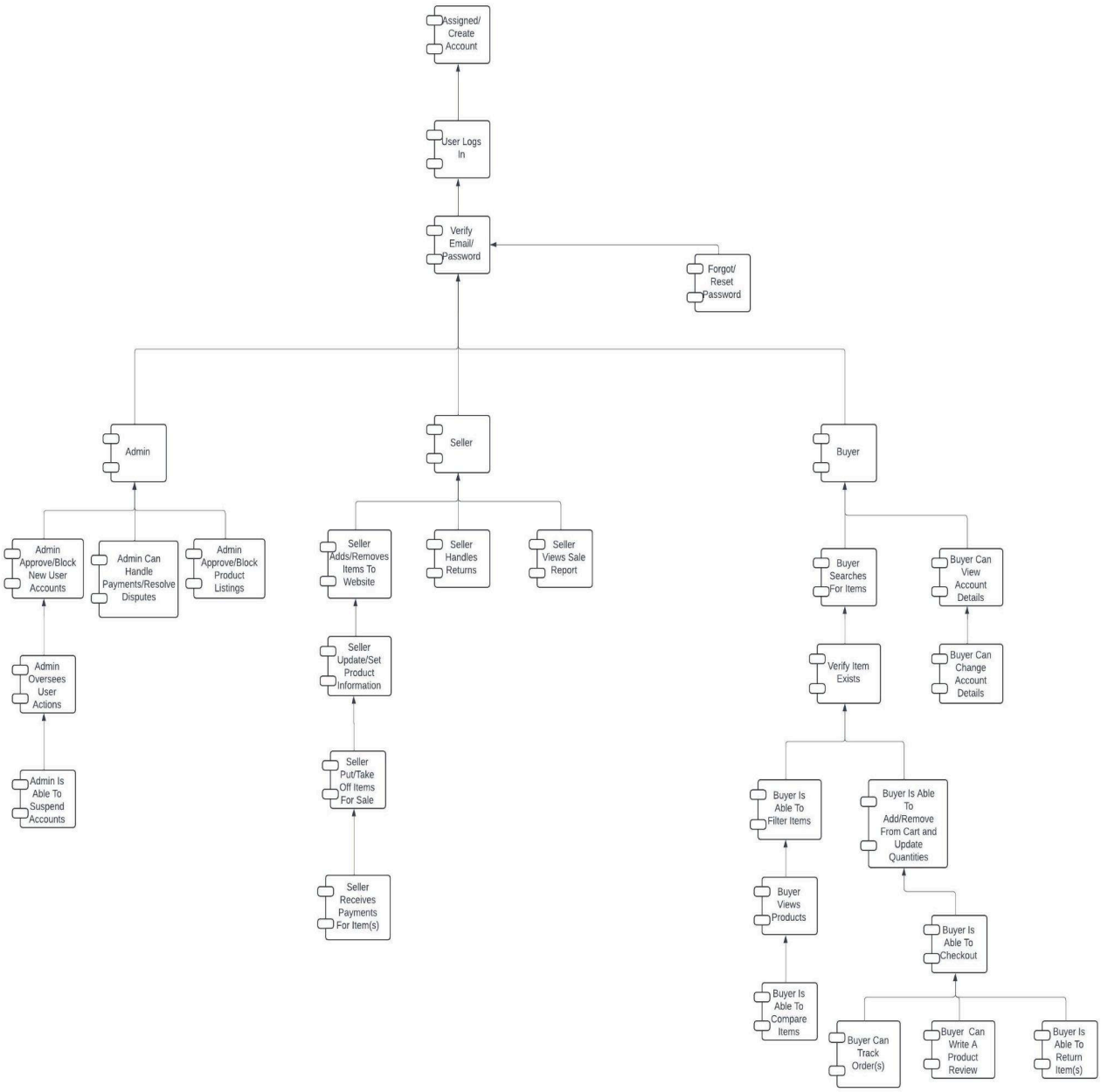
Seller Use Case Diagram



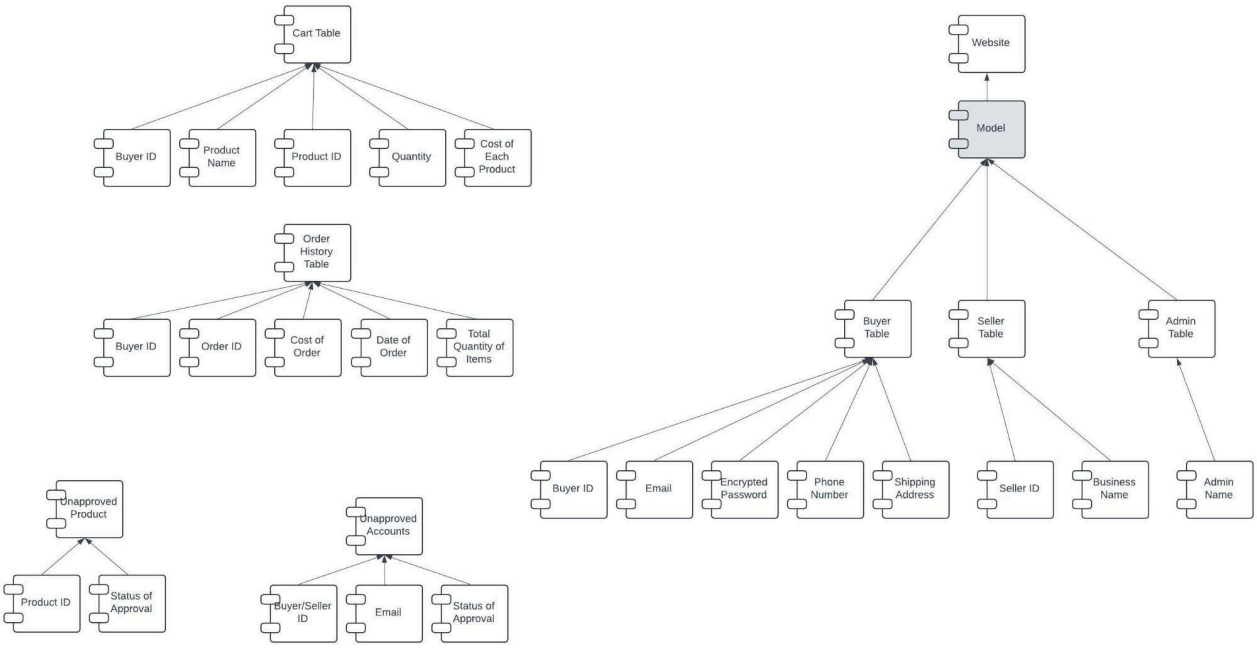
Admin Use Case Diagram



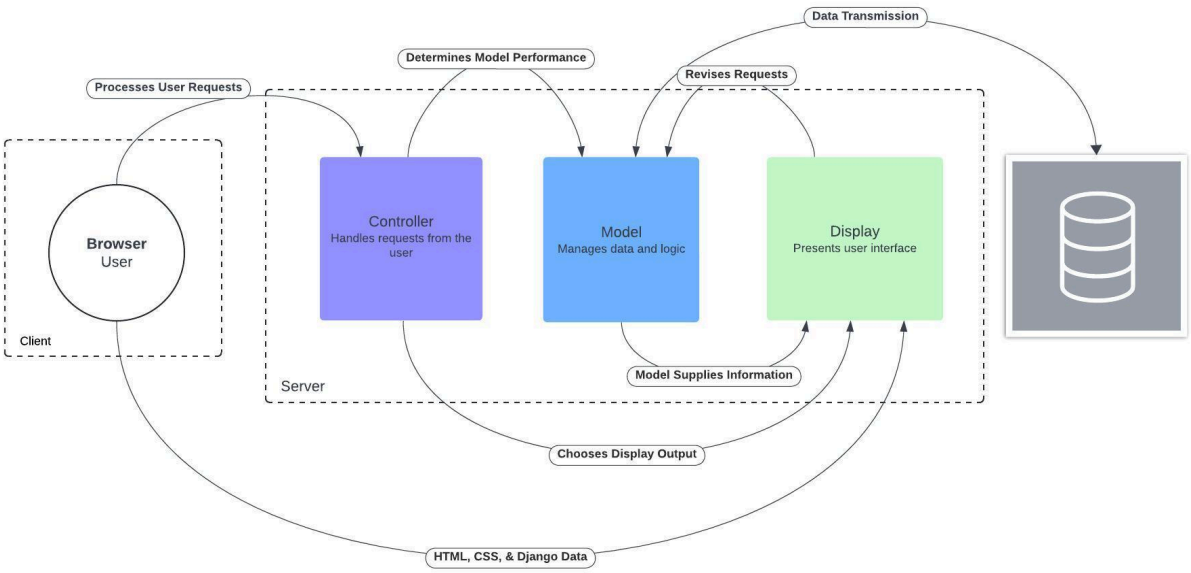
Component Diagram



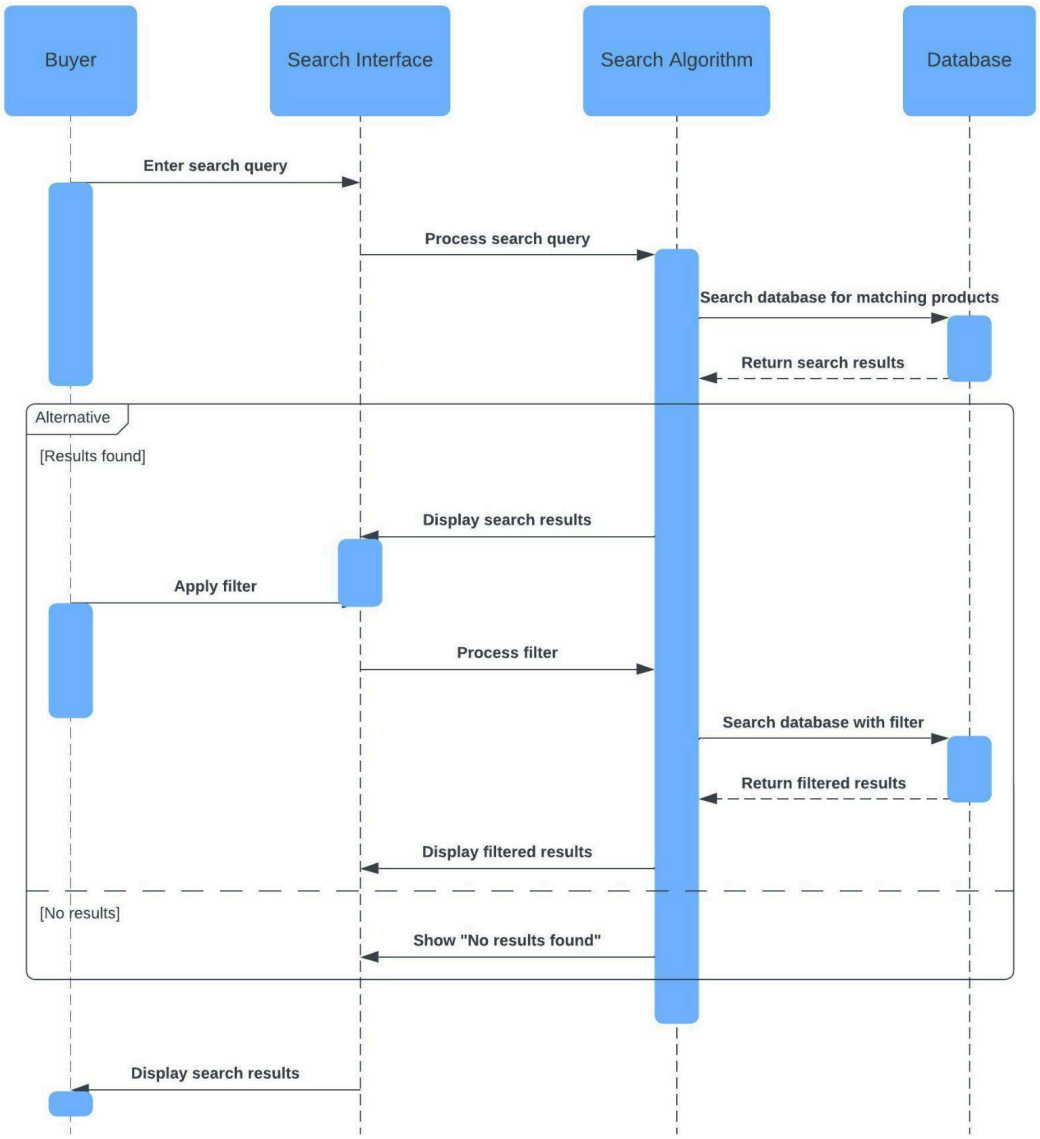
Database Component Diagram



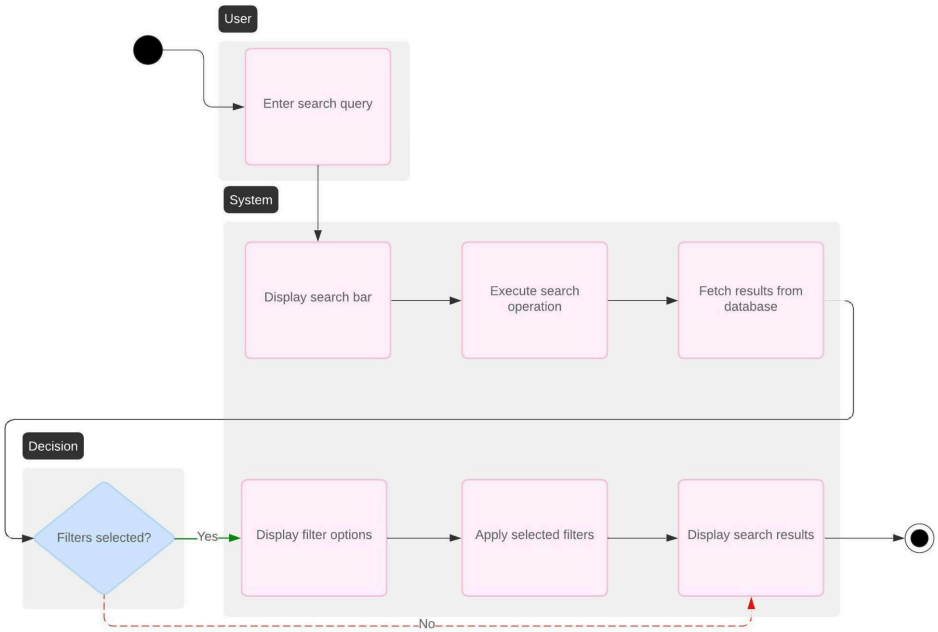
Architecture Diagram



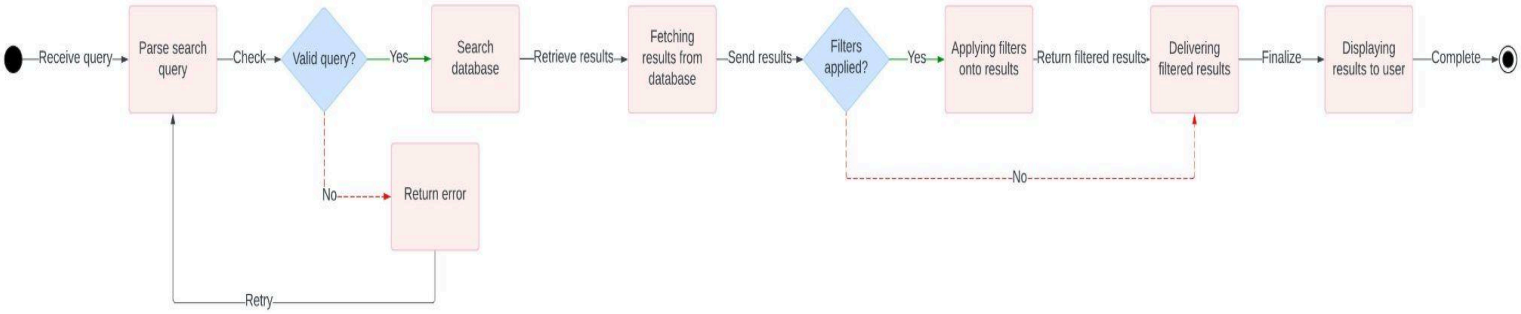
“Search” Sequence Diagram



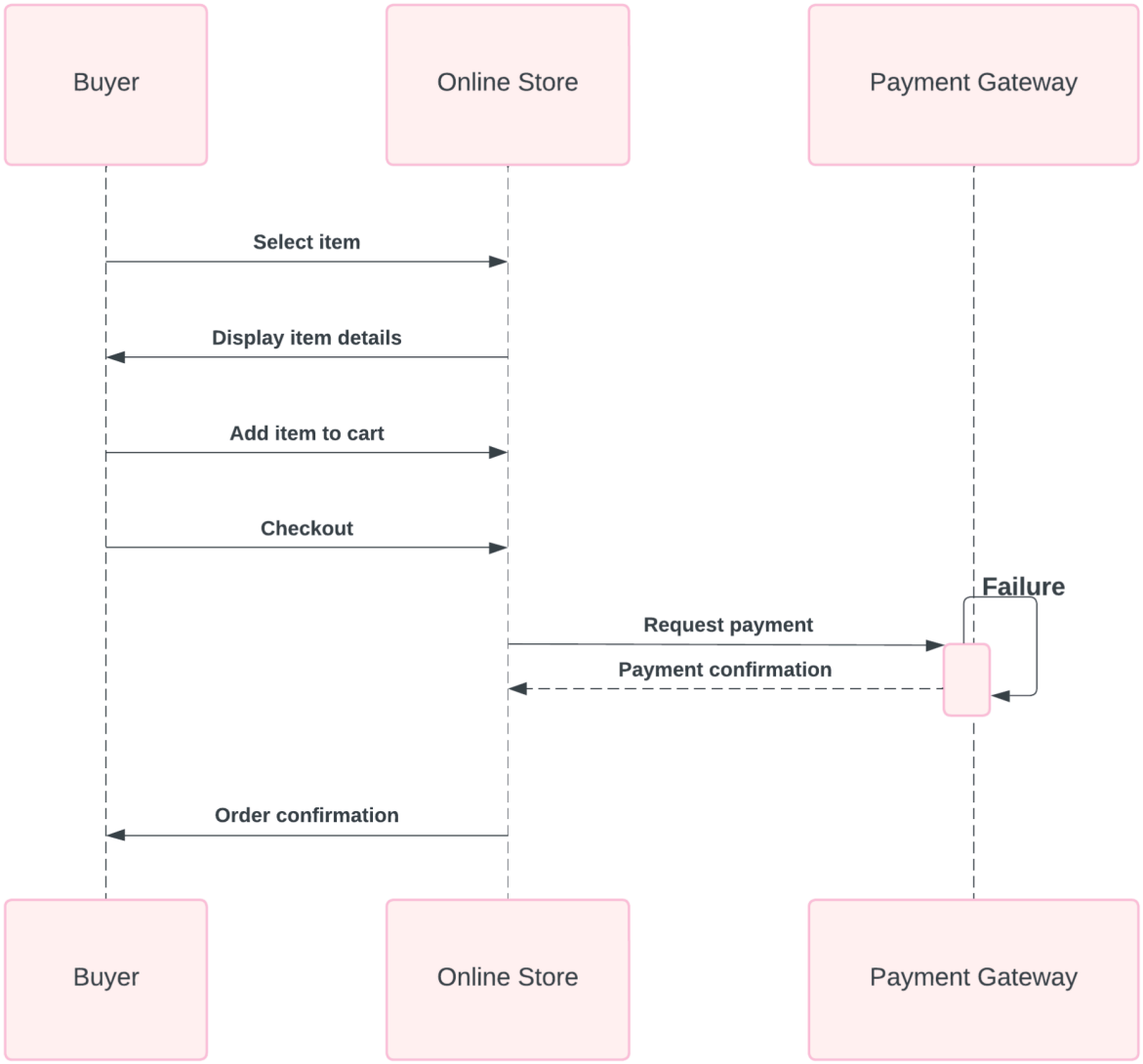
"Search" Activity Diagram



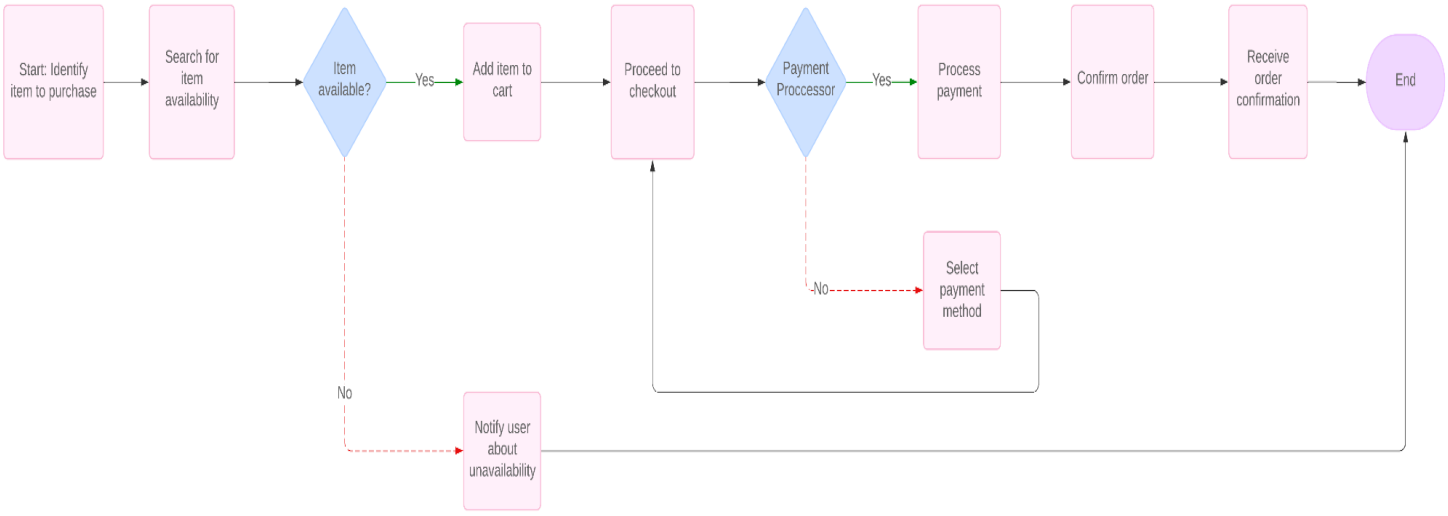
"Search" State Diagram



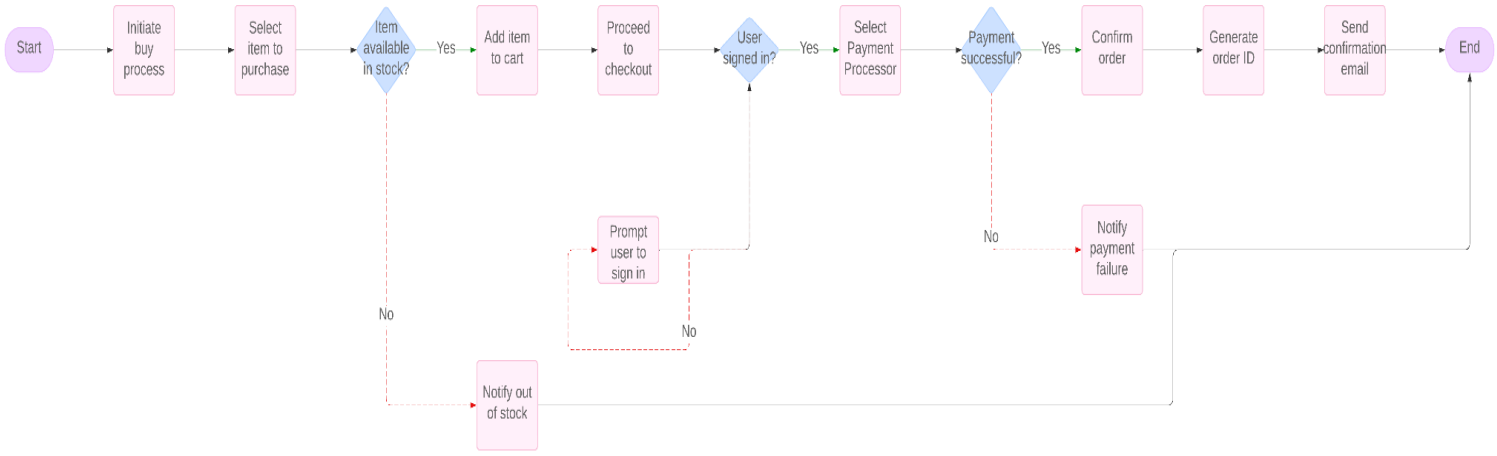
"Buy Product" Sequence Diagram



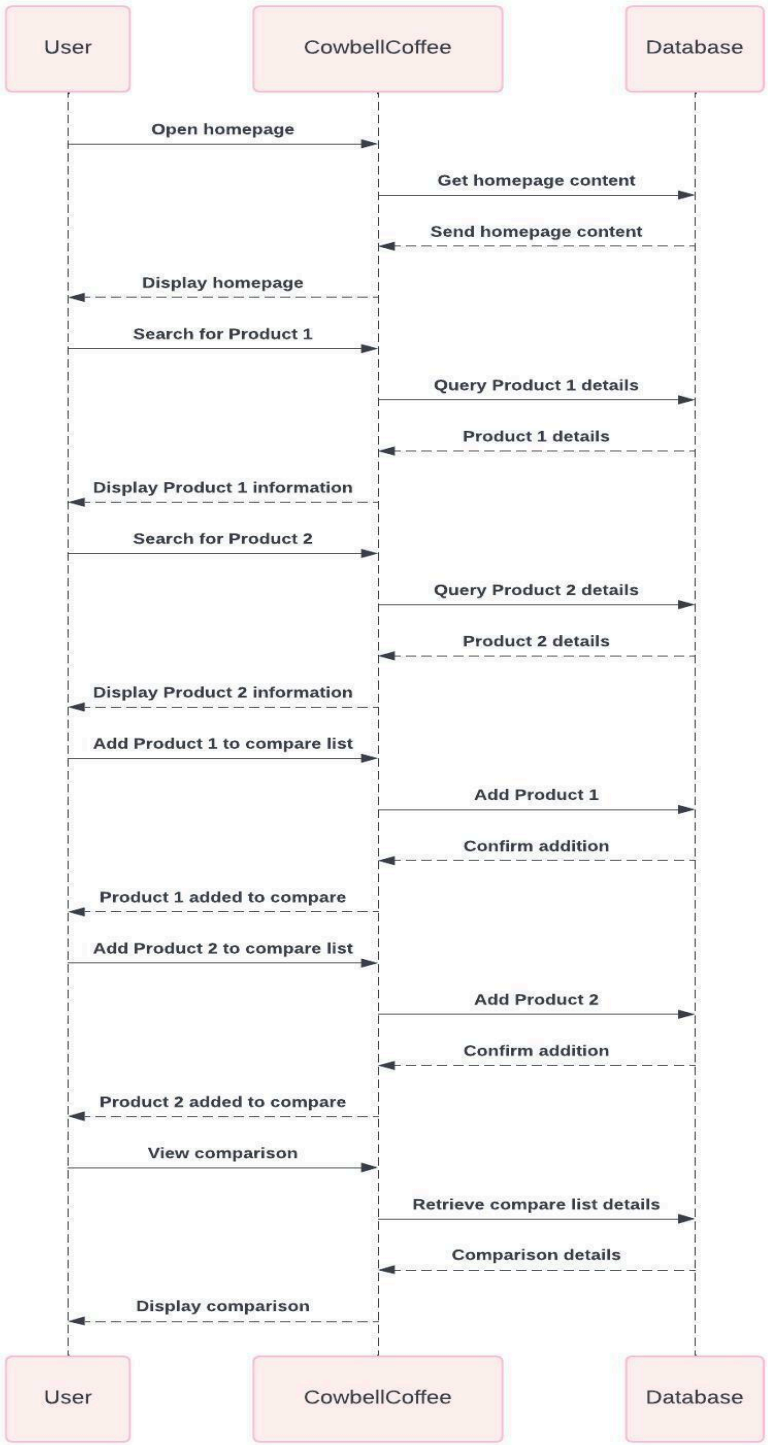
"Buy Product" Activity Diagram



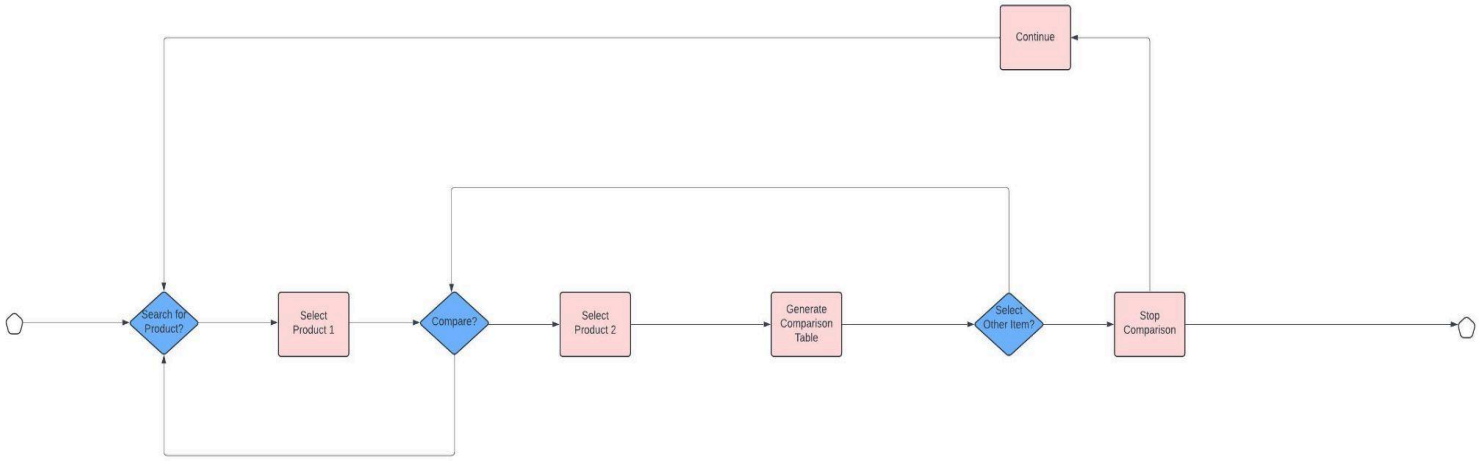
"Buy Product" State Diagram



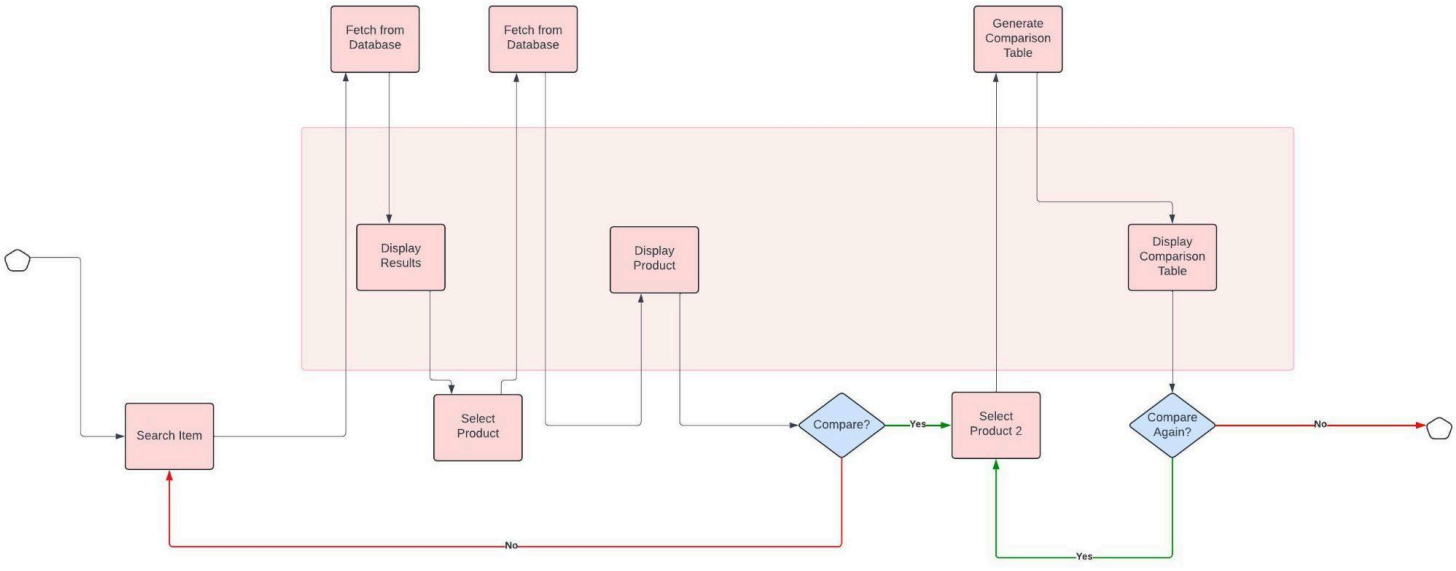
“Compare Product” Sequence Diagram



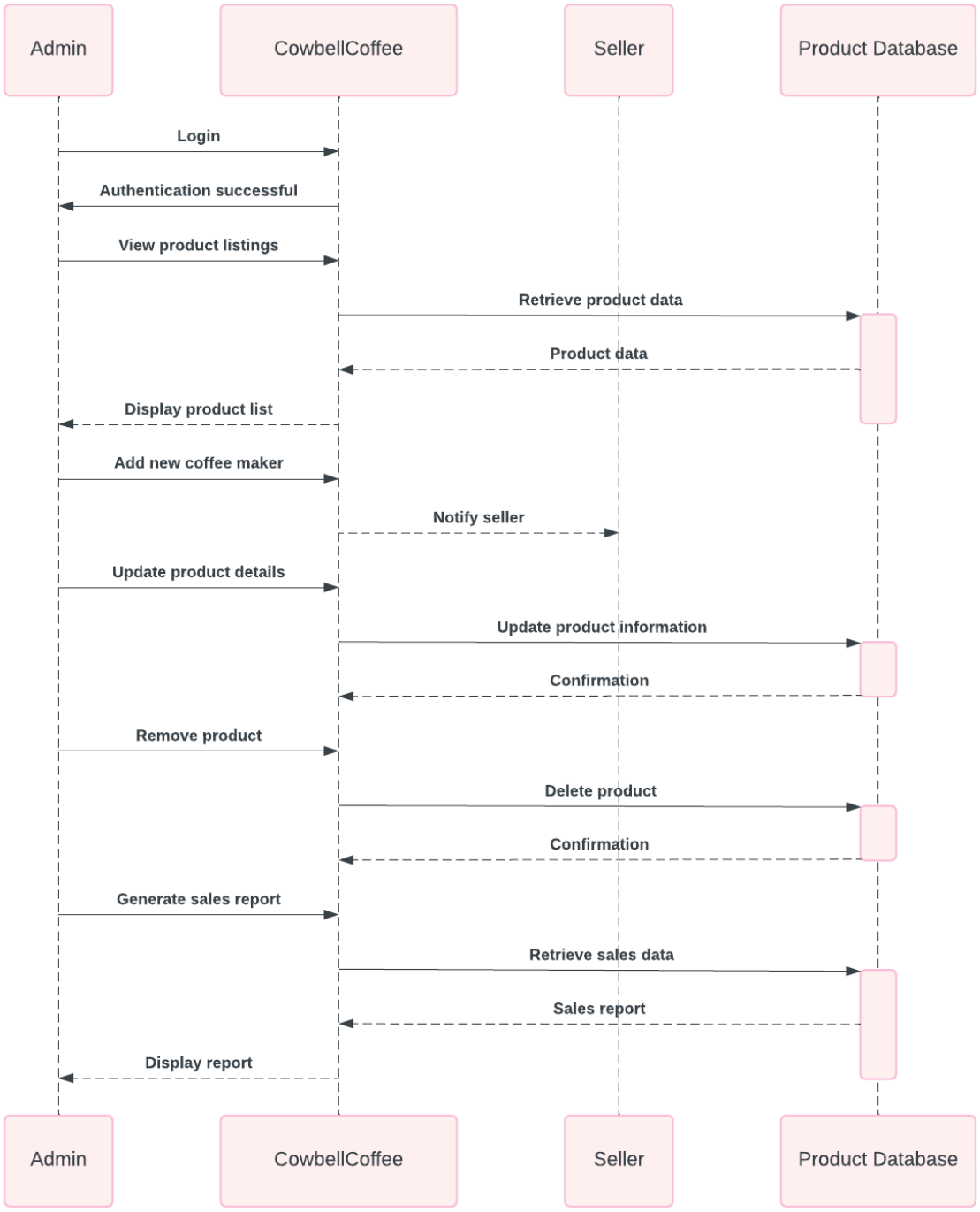
"Compare Product" Activity Diagram



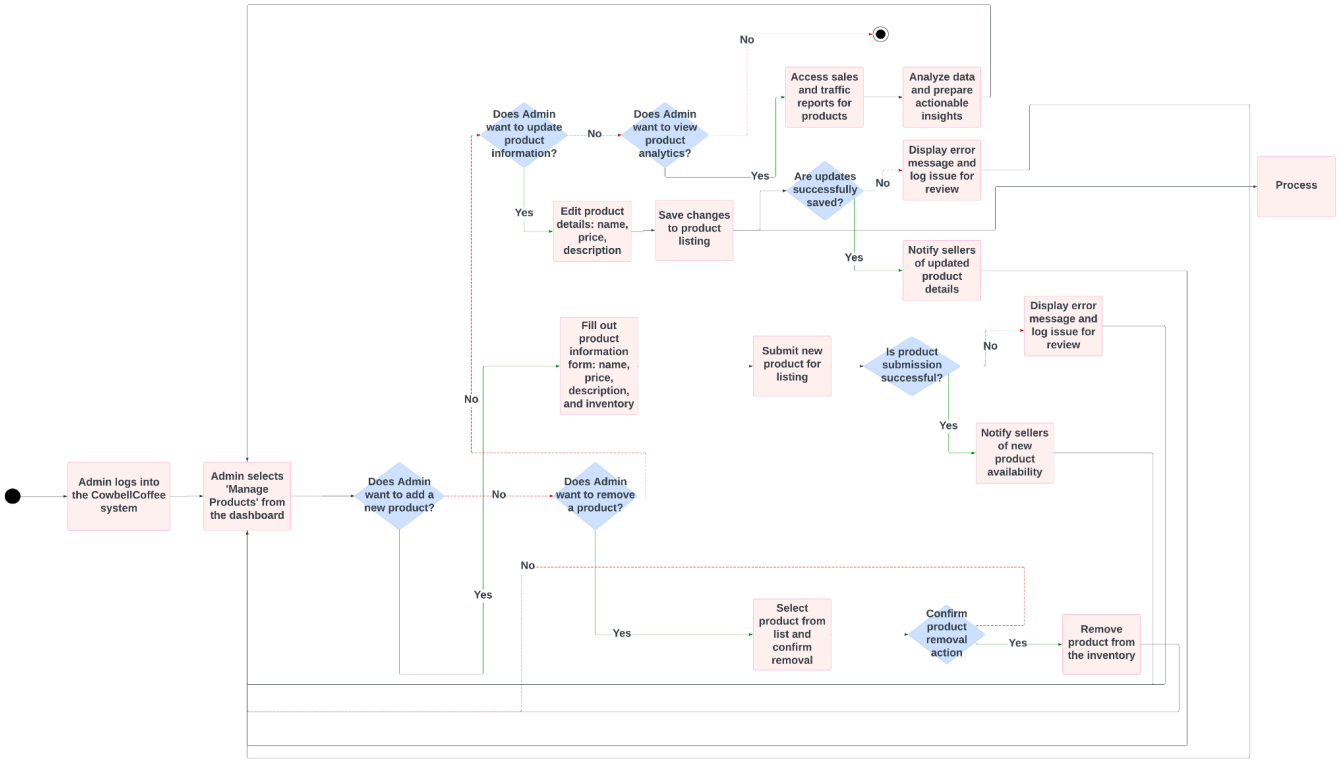
"Compare Product" State Diagram



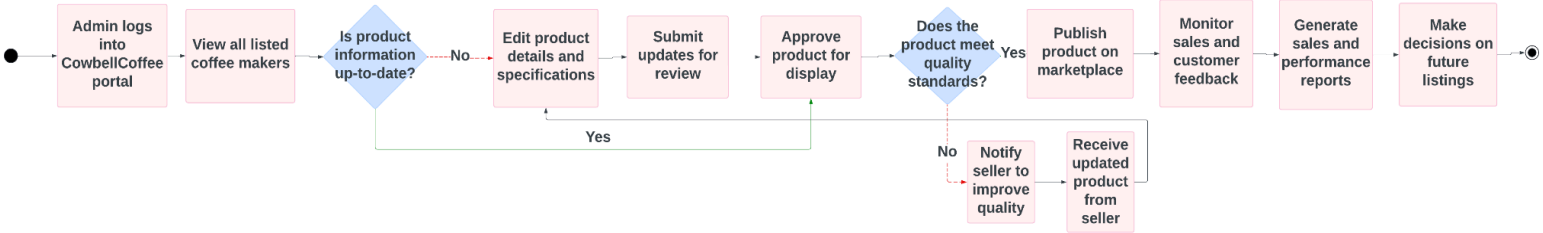
"Manage Products" by Admin Sequence Diagram



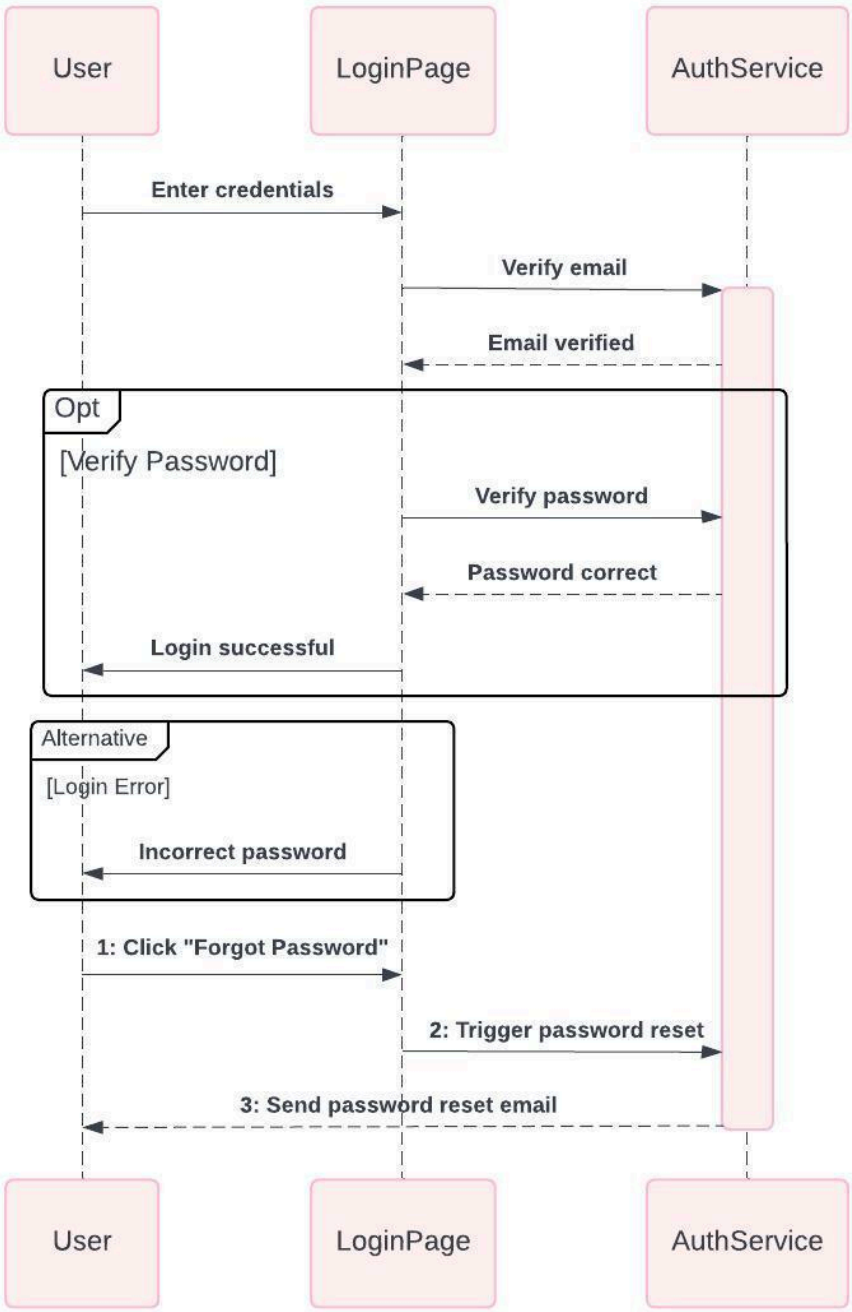
“Manage Products” by Admin Activity Diagram



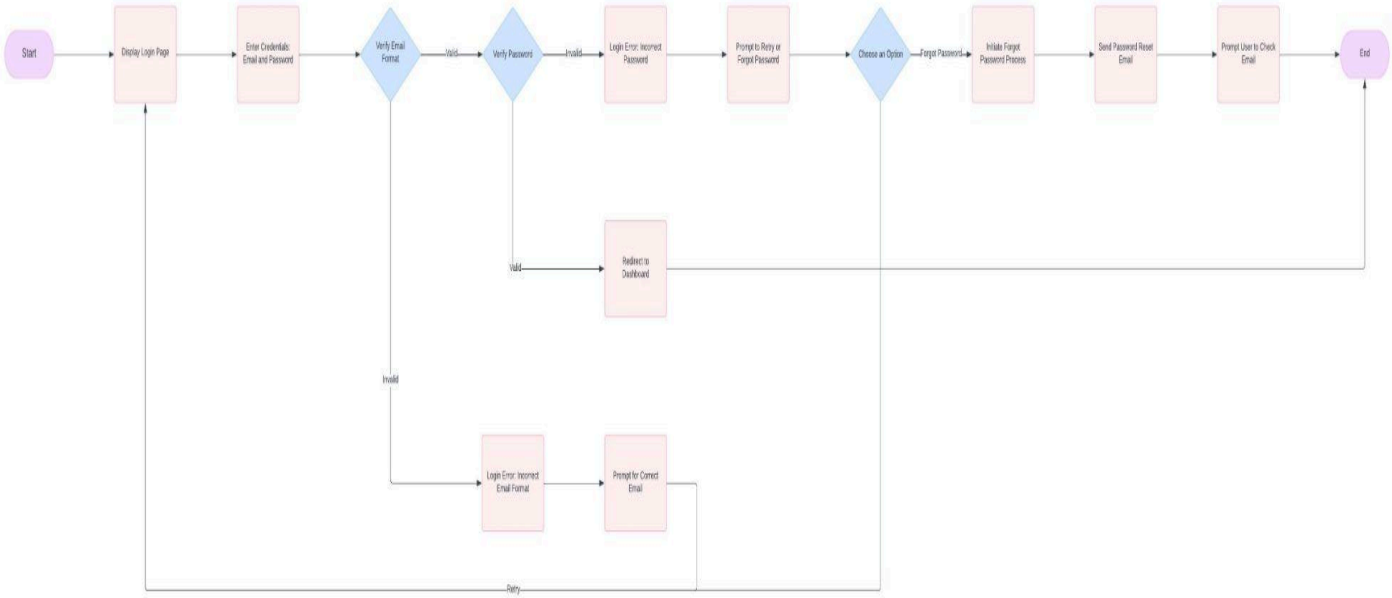
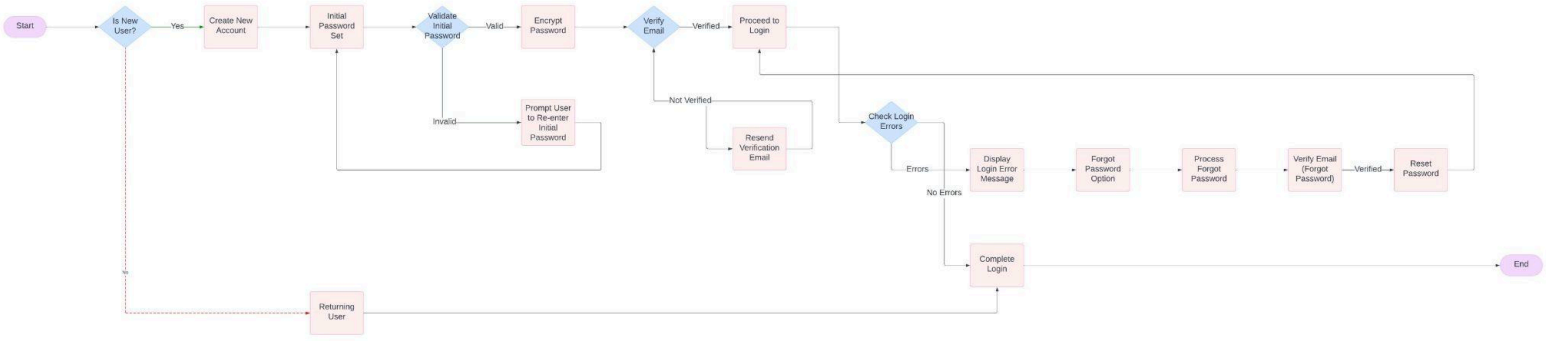
“Manage Products” by Admin State Diagram



“Login” Sequence Diagram



"Login" Activity Diagram



"Login" State Diagram