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Section 1 – Group Report

1. Introduction

1.1 Project Overview

CheapDeals.com LTD is a UK-based retailer specializing in affordable mobile, tablet, and broadband deals. The company operates through physical stores and an online portal, with Customer Sales Representatives (CSRs) managing subscriptions via an automated Customer Relationship Management (CRM) system. However, outdated processes and rising competition have led to declining subscriptions and customer dissatisfaction.

To address these challenges, the company is investing in a mobile application to modernize its services and enhance the customer experience. This application will offer real-time customer support, self-service subscription management, and secure online transactions. With a £70,000 budget and a strict eight-month timeline, the goal is to smoothen business operations, reduce service costs and limitations, and provide an intuitive digital platform that improves customer engagement and retention.

1.2 Vision statement

For:

- Customers range from young to elderly individuals aged 16 and 65 who seek mobile, tablet, and broadband deals with swift customer support and seamless transactions.
- Customer Sales Representatives (CSRs) who want a solution to take care of the customer's needs.
- Administrators who need to handle account privileges between the CSRs and the users.

Who:

- Want a customizable, easy-to-use online application to manage their accounts, simplify order operations, and increase customer satisfaction.

The:

- CheapDeals.com Mobile App.

Is a:

- Mobile application supported beyond Android 10 with an extensive CRM support system.

That:

Provide the Customer:

- A pleasant browsing experience with extensive customization, and reliable verification.
- Inquire about specific orders, detailed mailing, and payment of subscription packages through various methods in real-time at a discounted price on special occasions.
- If an order is processed through the app, customers can use special offer codes to enjoy buying more at a competitive price.

Provide the CSRs:

- A robust CRM system that offers personalized deals, and resolves customer queries instantly.

Provide the Admin:

- A set of tools to monitor account roles and the overall system's security.

Unlike:

- Traditional ordering processes through phone and face-to-face meetings, which consist of long wait times, indirect involvement, and inconsistent price updates.

Our product:

- Ensuring immediate access to package deals, automated customer support, and handles real-time payment and inquiries all in one app solution.

To redesign how CheapDeals.com communicates to its customers and improve the company's management infrastructure. Our vision offers a digital platform that is intuitive, accessible to various users, and allows them to browse, customize, and purchase different bundles with various secure payment methods. Furthermore, the system empowers the Customer Sales Representatives (CSRs) to handle customer demands efficiently, the CSRs can view statistics and make personal profiling that can help them make strategic operations to satisfy the customer further. Additionally, the system is oriented toward the Admin and helps them manage account privileges for security purposes and flexibility in management. By aiming toward what the customer cares about, the digital solution will improve management, build trust and brand reputation as well as solidify CheapDeals.com's competitive position in the market as the most popular affordable mobile, tablet and broadband deals.

2. Scrum Implementation

2.1 Scrum Team Members and Roles

The Team is formed by five members, which consist of 1 Scrum Master and 4 Developers. Every member has an impact on the success of the project:

1. [Han] - Scrum Master.
2. [Huy] - Developer.
3. [Minh] - Developer.
4. [Bao] - Developer.
5. [Bach] - Developer.

Adhering to the SCRUM framework, the team has been assembled accordingly and will follow the practices and principles:

- The Scrum Master will make sure that the team strictly follows the values of Scrum.
- The Development Team with their T-shaped skillsets with deep and broad areas of expertise is responsible for designing, developing, and ensuring that the user has a smooth experience.

- The Product Owner (Mr. Andrew Fowler) represents the stakeholder who provides the list of requirements and the functional aspects of the mobile app and the CRM system in the product backlog.
- The cross-functional team is effective for communication, self-organization as well as reacting to obstacles and challenges faced throughout the project.

2.2 Scrum Events

Adhering to the backbone rule of adaptability and agility, The Scrum process is put into practice via 5 key events as a formal opportunity to constantly reflect and improve the artifacts of Scrum. These events promote transparency and regularity while minimizing complexity and the need for unaccounted meetings.

Sprint:

These are continuous fixed-length events that contain all subsequent events to achieve the Product Goal, and can be viewed as a short project. Although with minor trade-offs, research has shown that faster cycles of projecting leads to cheaper cost and higher performance [link]. Scrum Sprints also allow the product backlog to be refined and scope be negotiated as needed, enabling flexibility.

Sprint Planning:

The entire Scrum team collaboratively plans and lays out the roadmap of work ahead, discussing the important Product Backlog and their contribution towards Product Goal. This event embodies the collective commitment and transparency through shared understanding of the team that can result in an effective team performance [link].

Daily Scrum

These are 15-minute time-boxed events for the Developers Team to collectively inspect progress and provide daily touchpoints for real-time course correction. These meetings are short, kept daily and less formal than usual long-form meetings to enable efficiency and facilitate constant communication [link]. The Scrums should focus on progressing towards the Sprint Goal and identifying/correct impediments.

Sprint Review:

An external inspection of a sprint's result and decision for future adaptations, where the Scrum team demonstrates prototypes and completed works to stakeholders for feedback. This event is placed second-to-last of a sprint and is timeboxed for a maximum 4 hours of meeting for a one-month Sprint. Transparency with stakeholders is ensured via the feedback loop of this event.

Sprint Retrospective:

An internal meeting to examine the team performance during the Sprint with regards to individuals, processes and their Definition of Done, and identifying improvements for future Sprints. This event is a structured approach to learning and enhancing the team's dynamics and working methodology. It is timeboxed for a maximum 3 hours for a one-month Sprint, promotes continuous improvement and encourages the team's ability to evolve.

3. Product Backlog

3.1 Turning Requirements into User Stories and Acceptance Criteria

Epic 1 (CD_1): Customer registration and authentication

ID	User Stories	Description
CD_11	Account creation	As an unregistered customer, I want to create a new account so that I can browse the application using my account.
CD_12	Account login	As a registered user, I want to login with my account so that I can access the application with it.
CD_13	Password reset	As a registered user, I want to reset my password when i accidentally forget it, so that I can access to my account with the new password
CD_14	Social login	As a customer, I want to login using my social accounts so that I can save time instead of typing the username and password

Table 1: User Stories broken down from Epic 1

ACCEPTANCE CRITERIA:

CD_11: Account creation

- There is a "create account" button
- Have a registration form with relevant details (name, email, address, phone number, credit card details,...)
- There are "terms and conditions" and "privacy policy" to be viewed.
- All the fields in the form must be validated before submission.
- If user failed to submit, it must display the error message
- User receives a verification email after successful submission.
- User must click the link in the email to complete registration process
- Once verified, the user is notified that their account has been successfully created and can now browse the app while logged in.

CD_12: Account login

- There is a login button on the login
- There is email/phone number and password field for user to insert their information
- The password field must be hidden for security reason
- There is a option to show password
- System must validate filled informations
- If user failed to login, it must display error message
- Redirect user to homepage after a successful login
- There is a "remember me" checkbox on login page
- If user tick the "remember me" checkbox, allow user to bypass the login session on the next access.
- If user logout manually or change their password, ask user to login again on next access

CD_13: Password reset

- There is a password reset option on login page
- After clicking, redirect the user to a password reset page.

- User must fill valid email in the field to submit
- System must validate filled informations before submission
- If user failed to submit the correct password, it must display error message
- User must be received the password reset email that contains a link after successful submission
- Clicking the link, redirect user to a create new password page
- There should be a new password and confirm password fields on the page
- After successfully setting up a new password, there should be a pop-up message then redirects the user to the login page.

CD_14: Social login

- There is a login with social account option on login page
- Redirect user to provider's authentication page after clicking
- Authenticate, login automatically and redirect user to homepage if access granted
- Display error message if access denied
- If it is a new user, must redirect them to account creation before access

Epic 2 (CD_2): Customer Profile

ID	User Stories	Description
CD_15	Account Details	As a registered customer, I want to view and adjust my account information so that I can keep it up to date.
CD_16	Password Change	As a registered customer, I want to change the account password so that I can keep my account secure.

Table 2: User Stories broken down from Epic 2

ACCEPTANCE CRITERIA:

CD_15: Account details

- There must be a profile on the menu
- After clicking the icon, If user is logged in, redirect user to the profile section. If user hasn't logged in, a pop-up message appears ask user to login or create account.

- On the profile section, key details like name, email, phone number, address and saved credit card must be displayed
- There must be an adjusting button on some information that appears on the page.
- If user decide to adjust or fill in new information for the account, all the adjustment must be validated before submission.
- If failed to submit, it must display an error message.
- User must receive verification email after successful submission.
- User must be able to successfully change or add their information after clicking the link in the email.
- User must be able to see the new account information displayed on the page after successfully changing it.

CD_16: Password change

- There must be a visible option to change the password on the profile page
- After clicking on the change password option, redirect user to the change password page
- The user must enter their current password, a new password, and confirm the new password.
- The password fields are default to be hidden
- If the current password is incorrect, the system must show an error message.
- Upon successful change, the user should receive a confirmation message and optionally an email notification.

Epic 3 (CD_3): Package browsing and customization

ID	User Stories	Description
CD_17	Customer browsing	As a customer (unregistered, registered), I want to browse freely so that I can explore the service without commitment.
CD_18	View item	As a customer, I want to view item or package details so that I can decide whether it meets my needs
CD_19	Item feedback	As a registered customer, I want to leave feedback on my purchased item so that other customers can make informed decisions based on real user experiences.
CD_20	Items search	As a customer, I want to search for items easily so that I can find the suitable option.
CD_21	Package customize	As a customer, I want to customize a package so that I can choose the best option to align my needs.

Table 3: User Stories broken down from Epic 3

Acceptance criteria

CD_17: Customer browsing

- Customer is allowed to access to some section of the application without register.
- Customer can view the homepage even without login
- Homepage display some items, packages
- Displayed item with brief details such as price or image
- Customer allowed to click on items, packages

CD_18: View item

- Customer can view items on homepage an also can sort by category on homepage.
- Clicking on items or packages on the homepage redirect customer to that items or packages details page.
- All the items details is displayed on the item page such as price, availability, specification, etc…

- Customer can also view additional images of the item not just one that display on homepage.

CD_19: Rate Item

- Customers can only leave feedback after the purchased order status is marked as “received.”
- The feedback section for the customer to write is on the history page.
- After submitting feedback, it is immediately updated and visible on the corresponding item’s detail page.
- Each customer can only submit one feedback per purchased item but can edit it later if needed

CD_20: Items search

- There must be a search bar on product page
- Display suggestion , relevance item based on user type.
- Customer should be able to filter, sort based on category
- If there is no result, should display error message.

CD_21: Package customize

- After proceeded to the item page, there must be a customize section appear on the item page
- The app must display deal combinations, including DoublePackage and TriplePackage.
- Customers must be able to switch between default and custom configuration before proceeding to checkout.
- The system must display suggested configurations based on customer profile or popular combinations.
- The total price must update in real time as changes are made
- Custom package selections must be reviewed and confirmed by the user before being added to an order.

Epic 4 (CD_4): Enquiry

ID	User Stories	Description
CD_22	Inquiry and support	As a customer, I want to ask general questions and product-related questions so that I can get an accurate answer.
CD_23	FAQ	As a customer, I want to read the FAQ so that I can get the answer without contacting the customer support.

Table 4: User Stories broken down from Epic 4

Acceptance criteria

CD_22: Inquiry and support

- There must be live chat on the homepage available for users.
- Unauthorized users must fill the form before using live chat.
- Authorized user must be able to start the chat immediately without re-entering personal details
- It should display a basic query list on live chat
- It must display queue time if no CSR is available

CD_23: FAQ

- There should have a FAQ section.
- There should be option link directly to FAQ section on live chat so that customer can find answer during queue
- User should be able to search for question using keyword
- User should be able to rate if it was helpful or not

Epic 5 (CD_5): Shopping Cart

ID	User Stories	Description
CD_24	Add to cart	As a customer, I want to add item to my cart so that I can purchase it later
CD_25	Manage cart item	As a customer, I want to adjust or remove items in my cart so that I can customize my purchase before checking out.

Table 5: User Stories broken down from Epic 5

Acceptance criteria

CD_24: Add to cart

- There must be an add to cart button on item page.
- Add to cart button should be visible on each item if it is available.
- When the item is added to cart, a confirmation message should be displayed.
- After click the button, the selected item must be display on the cart page.
- There must be a cart icon on home page.
- Clicking on the cart icon redirect user to the cart page.
- On the cart page, each item must be displayed in an editable format (e.g., remove or update quantity).
- The total cart value must be visible at the bottom of the screen.

CD_25: Manage cart item

- Customer must be able to adjust the item quantity by clicking the "+" or "-" button or a numeric input.
- There should be a quantity limits (e.g., no negative number, a fixed maximum quantity).
- If the quantity of the item equal to zero, the item must be removed from the cart.
- On each displayed item, there must be a visible remove button.
- Before successfully removing the item from the cart, there should be a warning message pop-up.

- After all the item in the cart is removed, the cart should display an empty state message.
- The displayed quantity and total cost should be updated right after the adjustment

Epic 6 (CD_6): Ordering – Place order through app

ID	User Stories	Description
CD_26	Review order	As a customer, I want to review my order details so that I can ensure everything is correct before making payment.
CD_27	Order confirmation	As a customer, I want to receive a confirmation of my order after placing order so that I can be sure my purchase was successful.
CD_28	Order tracking	As a customer, I want to track my order after successfully placing order so that I can know the progress of my order.
CD_29	Order history	As a customer, I want to view my previous orders so that I can track my order activity.

Table 6: User Stories broken down from Epic 6

Acceptance criteria

CD_26: Review order

- There is a checkout button on the cart page, clicking it to proceed to checkout page with orders details
- If customer is registered, redirect customer to the checkout page
- If customer is not registered, ask customer to login or create an account
- In the checkout page, It must display the order details (e.g, quantity, individual item price, subtotal price) and customer account details (e.g, Name, Phone number, address, credit card)
- The order should be automatically apply the 15% discount while ordering through app
- After the discount applied, a message should pop-up to notify

- The subtotal must be updated after the discount applied
- Must display the total cost before and after the discount apply
- The discount must not conflict with other promotional codes or offers
- The customer should be able to edit the delivery details (e.g, Phone number, credit card)
- All fields must be filled and validated before placing order

CD_27: Order confirmation

- If failed to place order, there must be an error message pop up
- If successfully placed order, redirect customer to new page with a confirmation message
- This confirmation page includes the basic order details (e.g: item names, quantity, estimated delivery time)
- An confirmation email must be sent to user right after successfully placing order

CD_28: Order tracking

- There must be an order tracking option in the user page.
- The option only visible for registered customer.
- After choosing the option, redirect user to the tracking page
- On the page, display every phase of the order (e.g: Processing, Confirm, Packed, On Delivery, Delivered)
- Order on any phase display the estimated delivery time

CD_29: Order history

- There must be an order history option in the user page.
- The option only visible for registered customer.
- After choosing the option, redirect user to order history page.
- On the page, display all the purchased order of customer.
- On each order, display the order details (e.g: Completed date, Subtotal, order ID).

Epic 7 (CD_7): Billing

ID	User Stories	Description
CD_30	Receive order receipt	As a customer, I want to receive order receipt after successfully placing order so that I can have proof of my transaction
CD_31	Pay with credit card	As a customer, I want to make payment using my credit card so that I can conveniently complete my order

Table 7: User Stories broken down from Epic 7

Acceptance criteria

CD_30: Receive order receipt

- After successfully placing order, redirect user to PDF receipt page.
- There is a save and download option as button in the receipt page.
- If the download option is chosen, generate into PDF file and allow user to download to their device.
- Customer must also receive a receipt email after successfully placing order.
- Customer should receive email within a reasonable timeframe.

CD_31: Pay with credit card

- Credit card is the only payment method available on the mobile application.
- There must be an option that allows registered customers to select which saved credit card to proceed payment.
- In the selection option, there should be an option to enter new card.
- After choosing to enter new card, there must be form to fill in card details.
- Card details must be validated before submission.
- If failed to validate, display error message.
- After successful selecting card, display the brief of card details on checkout page.

Epic 8 (CD_8): CSR operation

ID	User Stories	Description
CD_32	Customer identification	As a CSR, I want to identify my customer when they call so that I can verify their details before assisting them placing order.
CD_33	Customer account creation	As a CSR, I want to create an account for new customer so that I can assist them placing order.
CD_34	Customer support	As a CSR, I want to view and respond to customer enquiries so that I can provide quick and helpful assistance.
CD_35	Item access	As a CSR, I want to access all the item details and status so that I can provide accurate information and updates to customers.
CD_36	Profile Customers for Offers	As a CSR, I want to profile customers by their package usage so that I can send them relevant special offers through the app.

Table 8: User Stories broken down from Epic 8

CD_32: Customer identification

- CSR must have access to the form to fill in customer details (e.g: name, phone number,...)
- CSR must be allowed to search for customer using the provided details
- If the details match, display their profile with order history.
- If the details doesn't match, display error message to notify

CD_33: Customer account creation

- There is a customer account creation option on the CSR user interface
- Choosing the option redirect CSR to the account creation page.
- A form with account details (e.g: name, phone number, email) displayed on the page
- All fields must be validated before submission
- If successfully create account, display a confirmation and send a confirmation email to customer

- If failed to submit, display error message

CD_34: Customer support

- CSR must be able to access to live chat interface.
- CSR must be able view and solve enquiries from both registered and unregistered customer
- CSR must be able to chat to multiple customer at a time
- The interaction between CSR and customer must be in real time.
- Once the problem solved, the chat close and display a confirmation message

CD_35: Item access

- CSR must be able to access to any item and package details.
- CSR can search for any items by name, keyword, category or item ID
- CSR can also view the item, package quantity and availability.
- CSR can search item, package while chatting with customer.

CD_36: Profile Customers for offers

- CSR has access to a customer profile that shows the packages the customer is currently using.
- CSR can review usage patterns such as preferred package types or combinations.
- CSR can identify customers who may benefit from a specific deal based on their current usage.
- CSR can select or recommend relevant special offers tailored to the customer's profile.

Epic 9 (CD_9): Promotion and Special offers

ID	User Stories	Description
CD_37	Special offer code	As a customer, I want receive and use my special offer code, so that I can enjoy exclusive deals on my purchases
CD_38	Loyalty points	As a customer, I want to receive and use points on each of my orders so that I can feel rewarded for my purchases.

Table 9: User Stories broken down from Epic 9

Acceptance criteria

CD_37: Apply offer code

- Customer receives a special offer code via email when they are eligible.
- The same offer code is saved and visible in the loyalty section of the customer's app account.
- Each offer code includes details such as the discount amount, what it applies to, status (used, expired, available) and the expiration date.
- Customer can apply an offer code at checkout to receive a discount.
- Customer receives confirmation after a code is successfully used.
- If the applied code is expired, display error message.
- After the code's status change, update it immediately in the loyalty section.

CD_38: Loyalty points

- Points are added to the customer's account automatically after each completed order.
- The number of points earned is based on the order value and is clearly shown to the customer.
- The customer can view their total available points in the loyalty section.
- The customer can choose to use points during checkout to reduce the subtotal of a future order.
- Based on the total accumulated points, the customer is assigned a loyalty rank (e.g., Silver, Gold, Platinum).
- The customer can view their current rank and progress toward the next rank in the loyalty section.
- A small percentage discount is automatically applied to each order based on the customer's current rank
- Customers may receive additional perks based on rank
- Rank upgrades happen automatically when the required point threshold is reached.

- Customers are notified by the app notification or email when their rank changes or when they unlock a new benefit.

Epic 10 (CD_10): Admin operation

ID	User Stories	Description
CD_39	User account creation	As an administrator, I want to create user account so that the employee can access to their account and do their work
CD_40	User account management	As an administrator, I want to manage user accounts. so that I can control access and ensure users have the correct roles and permissions.
CD_41	Content management	As an administrator, I want to modify the application content so that I can manage what the user sees and interacts with

Table 10: User Stories broken down from Epic 10

Acceptance criteria

CD_39: User account creation

- There is a create user account section on the admin dashboard.
- There must be an account details form to fill in order to create account
- All fields must be validated before submission
- If failed to validate, display error message and highlight the wrong field
- Display message and update to user account list after successfully create account.

CD_40: User account management

- There must be a user account list for administrator to choose and manage.
- Administrator must be able to gain access or permission to user account.
- Administrator must be able to deactivate or delete user account.
- If administrator decide to deactivate or delete user account, It must be a confirmation before proceeding.
- User account permission must be updated right after successful modification.

CD_41: Content management

- Administrator must be able to view existing content (e.g., packages, descriptions, deals, banners).
- Administrator must be able to edit text, images, visibility status, and availability of content items.
- All modification must be validated before submission.
- If failed to submit, It must display error message.
- Any changes must reflect in customer-facing app in real time.

3.2 User Stories Prioritization

Prioritizing the defined user stories is the next critical step in the Agile development process, providing better understanding of the development pathway. This section documents the team's effort to do so utilizing the MoSCoW technique combined with the Value-Effort matrix. This process has helped the team to establish a logical guideline for the implementation pathway.

User Flow

In order to help the team understand the necessity of later-decided tasks, an user flow chart (Figure 1.) was created. This clearly identifies critical components for the later Minimum Viable Product.

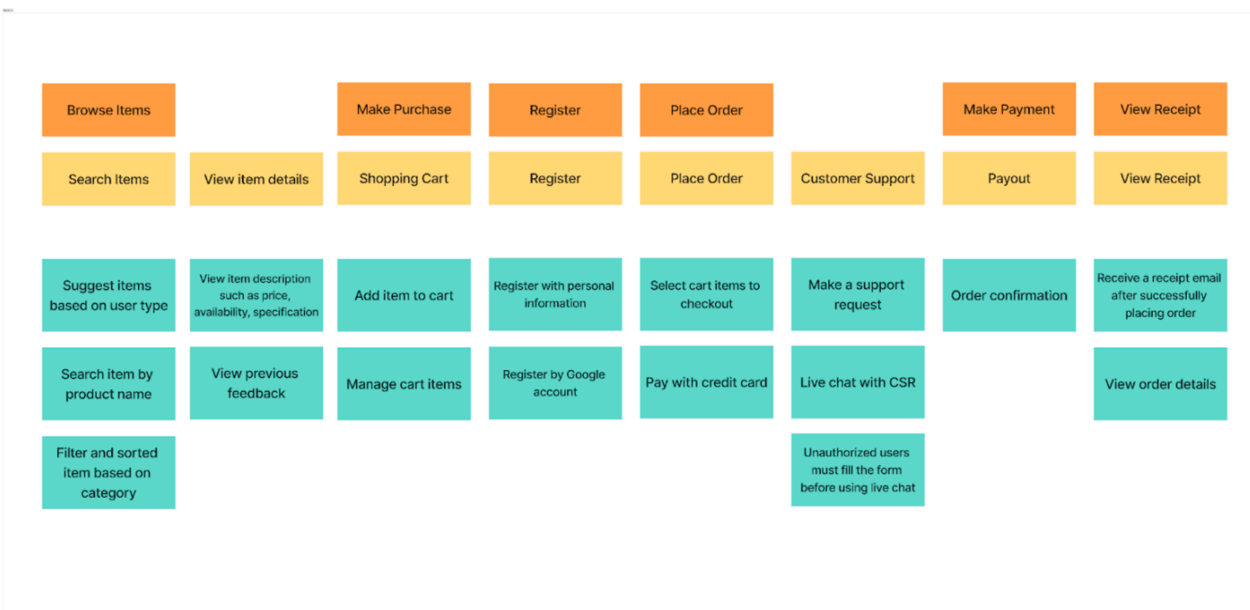

Figure 1: Customer User Flow

MoSCoW

As our user stories are broken down deep enough, a MoSCoW table was created, categorizing the user stories into different priority states. This helped the team gain insight into the need for each feature. A Value-Effort Matrix was chosen as an addition to the categorization of the MoSCoW technique, providing a complementary perspective by further evaluating each user story. This helped prioritizing the user stories in each category: focusing on big points (high value - high effort) and targeting quick wins (high value - low effort).

Must Have (60% of User Stories)

These are non-negotiable requirements that are critical for the success of the project. Without these, the system would fail to meet the business needs.

ID	User Stories	Justification	Business Value (1-10)	Effort (1-10)
CD_11	Account creation	Essential for customer identification and personalized experience	7	6
CD_12	Account login	Core functionality for accessing personal accounts	7	4
CD_17	Customer browsing	Fundamental for customers to explore available products	10	8
CD_18	View item	Critical for informed purchasing decisions	9	6
CD_22	Inquiry and support	Essential for customer assistance and satisfaction	7	9
CD_24	Add to cart	Core e-commerce functionality	8	4
CD_25	Manage cart item	Basic cart management requirement	7	5
CD_26	Review order	Critical for order verification before payment	7	6
CD_37	Special offer code	Enhances sales but not critical for basic operation	5	7

CD_31	Pay with credit card	Essential payment method for completing transactions	10	6
CD_32	Customer identification	Critical for CSR to provide personalized support	8	7
CD_35	Item access	Necessary for CSRs to access product information	8	6
CD_40	User account management	Essential for administrators to control system access	8	5
CD_41	Content management	Critical for maintaining up-to-date information	9	7
CD_27	Order confirmation	Essential for purchase verification	7	3
CD_34	Customer support	Critical for customer satisfaction and retention	9	8
CD_21	Package customize	Essential for personalized offerings	9	6
CD_15	Account details	Necessary for users to verify their information	5	5

Table 11: MoSCoW must have list

Should Have (25% of User Stories)

Desirable features that would enhance the user experience but are not essential.

ID	User Stories	Justification	Business Value (1-10)	Effort (1-10)
CD_13	Password reset	Important for account security but has workarounds	5	4
CD_14	Social login	Enhances user experience but traditional login exists	3	6
CD_20	Item Search	Critical navigation feature	8	7
CD_16	Password change	Enhances security but not immediately critical	3	4

CD_28	Order tracking	Valuable for customer experience but not essential for MVP	7	7
CD_29	Order history	Important for reference but not critical for operations	6	5
CD_33	Customer account creation	Important CSR function but can be managed differently initially	3	4
CD_36	Profile customers for offers	Valuable for targeted marketing but can be implemented later	7	8
CD_30	Receive order receipt	Legal requirement for transaction confirmation	5	2

Table 12: MoSCoW should have list

Could Have (15% of User Stories)

Desirable features that would enhance the user experience but are not essential.

ID	User Stories	Justification	Business Value (1-10)	Effort (1-10)
CD_19	Item feedback	Enhances user engagement but not core functionality	5	7
CD_23	FAQ	Helpful but live support covers immediate needs	2	2
CD_38	Loyalty points	Enhances customer retention but not essential for initial launch	4	8
CD_39	User account creation	Administrative convenience but workarounds exist	5	5

Table 13: MoSCoW could have list

3.3 Minimum Viable Product

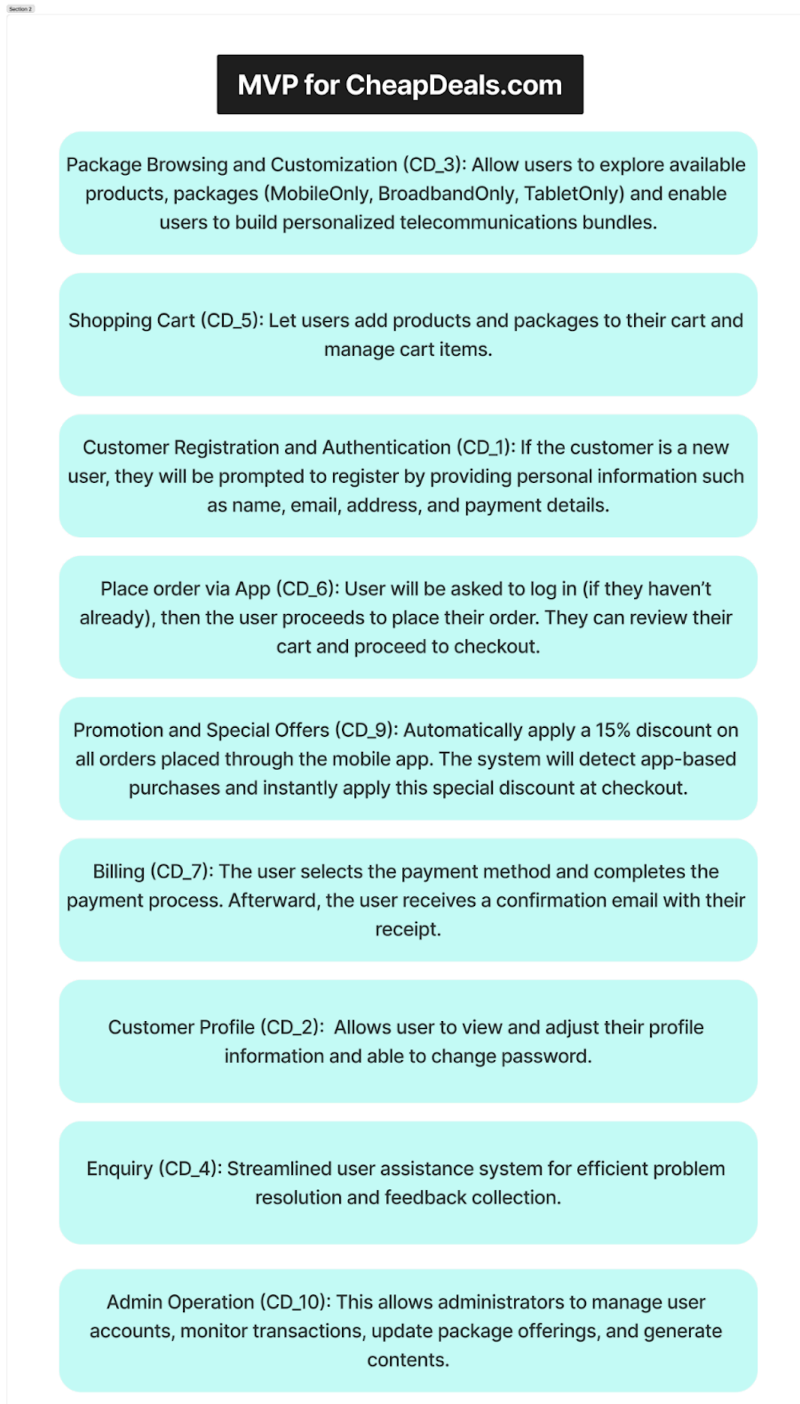

Figure 2: Minimum Viable Product for CheapDeals

Minimum Viable Product Use-case Diagram

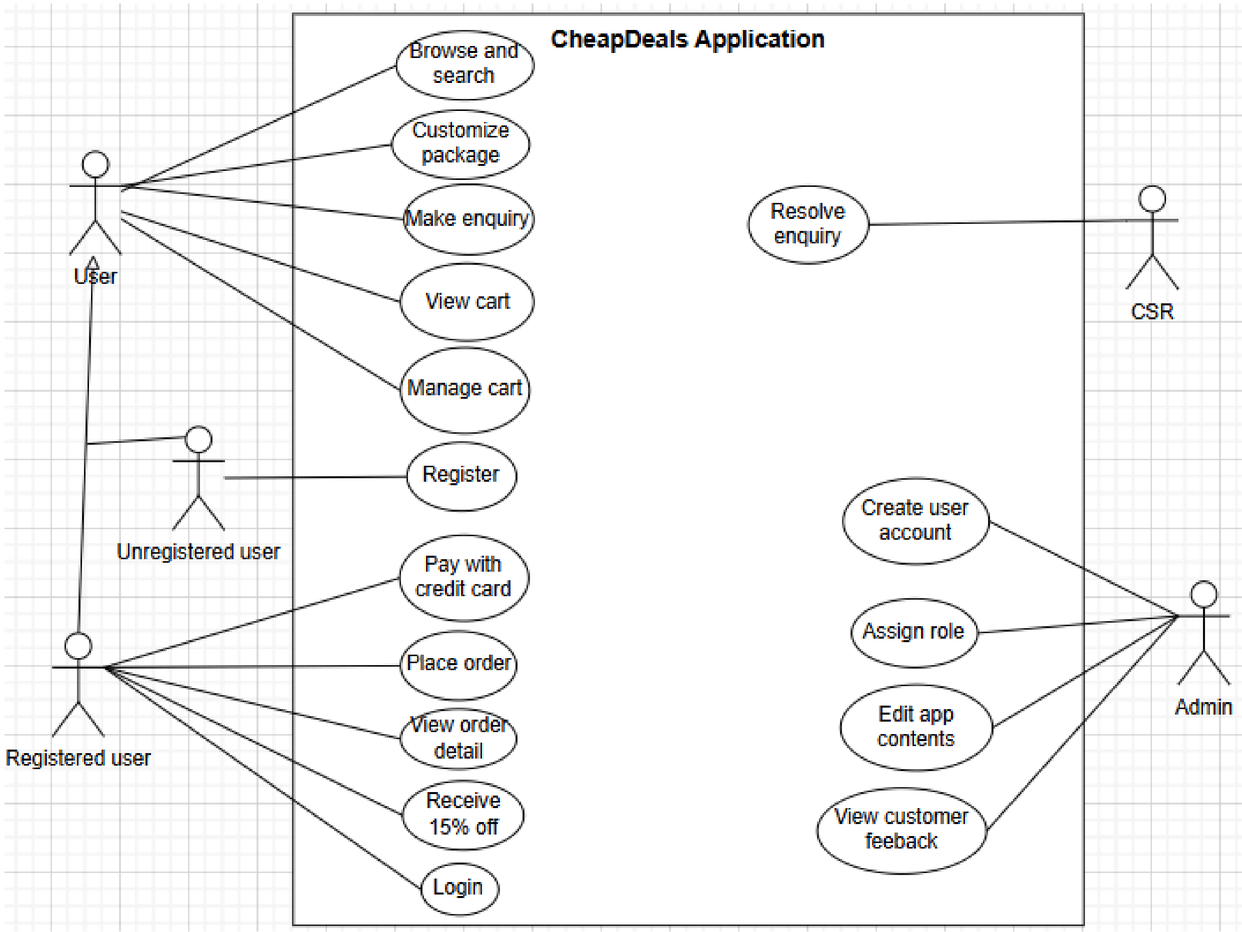

Figure 3: MVP Use-case Diagram

3.4 Planning Poker

ID	User Stories	Huy	Bach	Minh	Bao	Final estimation
CD_11	Account creation	2	3	3	2	2
CD_12	Account login	0	0	0	0.5	0
CD_13	Password reset	1	1	1	1	1
CD_14	Social login	1	1	1	0.5	1
CD_15	Account details	0	1	1	0.5	0.5
CD_16	Password change	0	0.5	0	0	0
CD_17	Customer browsing	8	8	8	8	8
CD_18	View item	3	3	3	5	3
CD_19	Item feedback	5	3	5	3	5
CD_20	Item search	5	3	3	8	3

CD_21	Package customize	3	3	3	5	3
CD_22	Inquiry and support	13	5	8	5	8
CD_23	FAQ	1	0.5	0	0	0
CD_24	Add to cart	5	5	5	3	5
CD_25	Manage cart item	1	0.5	0	0.5	0.5
CD_26	Review order	5	5	3	3	3
CD_27	Order confirmation	1	1	1	0.5	1
CD_28	Order tracking	3	1	2	3	2
CD_29	Order history	1	2	3	5	1
CD_30	Receive order receipt	3	0.5	0	0.5	0
CD_31	Pay with credit card	1	0.5	1	0.5	0.5
CD_32	Customer identification	3	8	1	1	3
CD_33	Customer account creation	2	1	1	1	1
CD_34	Customer support	5	3	0.5	5	5
CD_35	Item access	2	5	5	3	3
CD_36	Profile Customers for Offers	5	8	8	5	5
CD_37	Special offer code	3	3	5	5	3
CD_38	Loyalty points	8	3	8	5	5
CD_39	User account creation	1	1	3	3	1
CD_40	User account management	2	1	3	3	1
CD_41	Content management	5	5	8	3	3
					Total Story Points	**77.5**

Table 14: Planning Poker Estimation

Planning Poker discussion

By discussing outliers, the team members can quickly determine the practicality of each User Story and come to terms with each other during the sprint:

ID	Outlier reasoning	Final Estimation Justification
CD_18: View Item	Bao said, "It is a 5 because there could be multiple views and we're developing a mobile application that needs to be flexible in terms of scaling for phones, tablets, and other devices".	The estimation of 3 is moderate due to responsive and scalable resolution for different devices. However, the team acknowledges this is relatively easy to follow once the base view is created
CD_22: Inquiry and support	Huy and Minh said that this user story will need to be	The estimation of 8 is a significant complexity since it

	analyzed with the existing system or decide to separate the system or integrate it so it should be 8.	requires assessing and evaluating the impact directly on the customer.
CD_32: Customer identification	Bach estimated 5 because many verification steps needed to be considered to protect the customer's information.	The final estimation is 3 after the team has clarified that they only need basic role-based security and account verification through email and further security is sufficient
CD_38:Loyalty point	There were variances between Bach and Huy, while Bach estimated 3. Huy explained that many complex components need to be considered like how the system updates when an order is completed and its calculation rules	The final estimation of 5 reflects the difficulty. However, this feature can be implemented incrementally in a later sprint based on the feedback

Table 15: Planning Poker Estimation Justification

4. Sprint One

4.1 Sprint Planning and Sprint Backlog

4.1.1 Sprint Goal

The initial sprint goal is to deliver the core functionalities of a mobile app to the Admins and Customers and accompany the CSRs with basic features.

For the customer:

- A user-friendly, secure customer registration and login process with the ability to manage personal information *(CD_11, CD_12, CD_15)*.
- A smooth package browsing with detailed viewing information and inquiry support (CD_17, CD_18, CD_22).
- Adding and adjusting the quantity using the shopping cart with the option to review orders in the app (CD_24, CD_25, CD_26).

- Payment is processed through a credit card and the customer will receive detailed billing receipts (CD_30, CD_31).
- Loyalty Points (CD_38)

For the Admin:

- Create user account and manage contents of the app (CD_39, CD_41).

For the CSRs

- Identify customer account by filling the form with provided information from them (CD_32).
- Accessing, querying all items for the customer support (CD_35).

4.1.2 Sprint Duration

● Start Date March 3rd, 2025

● Due Date: March 17th, 2025

● Duration 12 working days (2 weeks including Saturday)

4.1.3 Scrum Team Capacity

Team member	Availability (Hours)	Individual Capacities
Bach	60	50
Minh	70	65
Han	70	63
Bao	60	55
Huy	80	77

Table 16: Scrum team capacity in Hours

4.1.4 Definition of Done

The following checklist summarizes the Definition of Done (DoD) criteria to ensure a high-quality and stable Android application build for Sprint 1:

- All the user stories and acceptance criteria from requirements in sprint 1 are implemented and functional on Android 10 and above.
- Dependencies are up-to-date and free of known critical vulnerabilities.

- UI design aligns the guidelines are consistent and responsive across different screen sizes and resolution
- All user interactions (buttons, swipe,..) are functional and smooth
- Code has no significant issues, code smells, or anti-patterns identified by tools
- No crashes detected under normal or edge-case scenarios
- Unit tests are written with at least 75% code coverage
- Crashlytics integrated and debugged logging output appropriately.
- Proper loading states and error states are displayed
- API calls are implemented with adequate success and error handling
- App builds successfully without runtime errors and passes CI/CD pipeline checks
- Necessary API documentation updated.
- Sensitive information is not exposed in source control, configuration files, or logs.
- Display user-friendly error message for invalid login attempts or incorrect credentials input.

4.1.5 Sprint Backlog

Figure 4: Sprint 1 Backlog using Jira

4.1.6 Task Assignment

Even though, most Agile implementation try to advise against clearly assigning tasks on the sprint planning phase, as it could lead to the decrease in team responsibility [link], the team has decided that the first Sprint should require a task assignment breakdown in the planning phase as the team has not fully grasped the working velocity of themselves and the team. This can also build the team's personal responsibility and trust for one another's potential**.**

User Story	Story Points	Member Contribution
CD_11 - Account Creation	2	Minh

CD_12 - Account Login	0	Minh
CD_15 - Account Details	1	Huy
CD_17 - Customer Browsing	8	Bao
CD_18 - View Item	3	Bao
CD_22 - Inquiry and Support	8	Bach
CD_24 - Add to Cart	5	Huy
CD_25 - Manage Cart Item	0.5	Huy
CD_26 - Review Order	3	Bach
CD_30 – Receive Order Receipt	0	Bao
CD_31 - Pay with Credit Card	1	Bao
CD_32 - Customer Identification	3	Minh
CD_35 - Item Access	3	Minh
CD_39 - User Account Management	1	Huy
CD_41 - Content Management	3	Bach

Table 17: Sprint 1 Task Assignment

4.1.7 Breakdown User Stories included in the Sprint Backlog in Tasks

4.2 Sprint Cycle

4.2.1 Use-Case Diagram

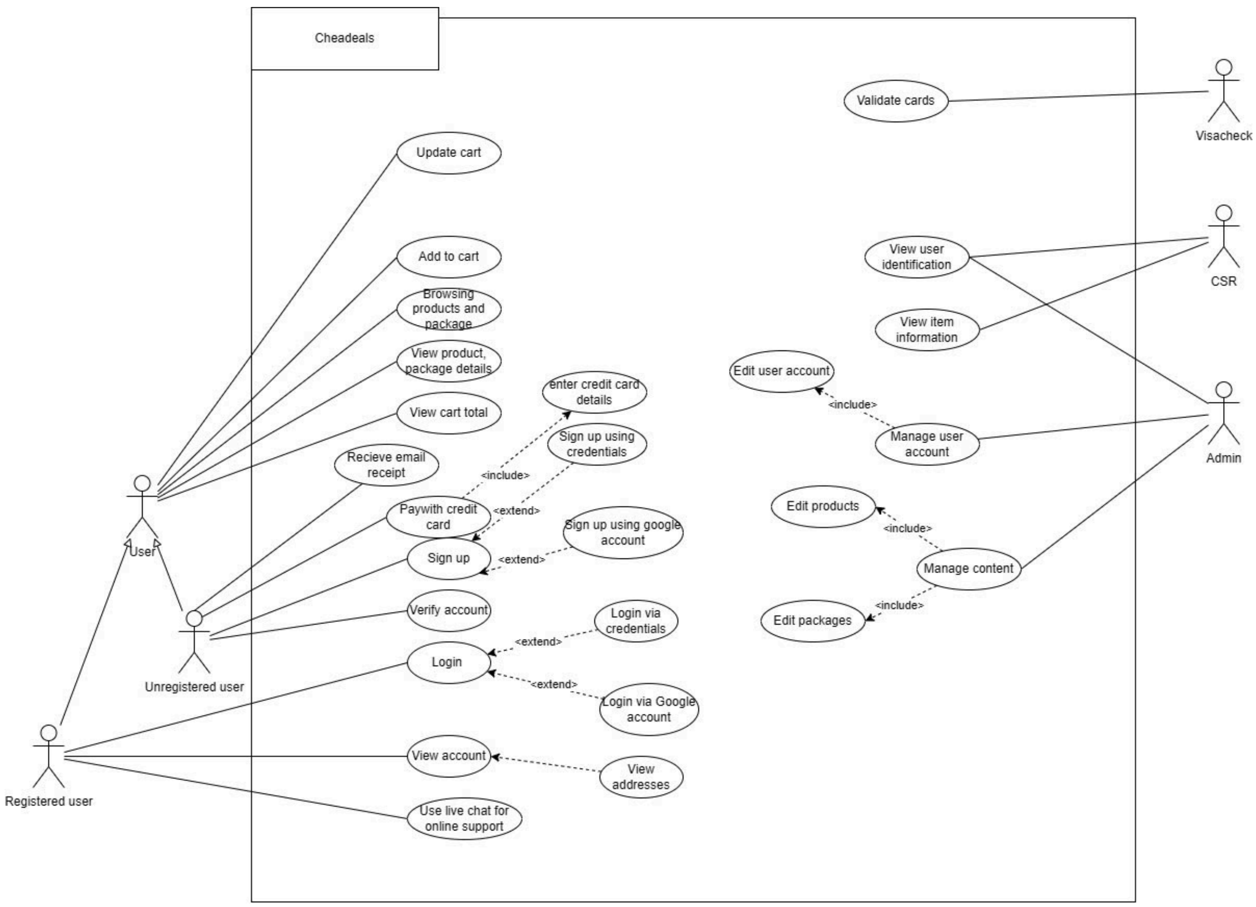

Figure 5: Sprint 1 Use-case Diagram

Scenario: Customer Shopping and Payment flow

Use case name	Customer use case for Sprint 1	
Actors	Customer	
Description	The user registration process enables customers to fill in personal information and verify their account through this use case. Users must first register before they can access the product and package viewing features through login. The system enables customers to add items to their cart and view the total cost while allowing them to update their cart contents before paying with a credit card.	
Typical Course	Actor Action	System Response

Sign Up, Login	Step 1: The user fills in personal information and clicks the "Sign Up" button to register Step 3: The system activates an email API to deliver confirmation emails after successful registration. Step 5: The user navigates to the login page. Step 7: The user completes the form and clicks the "Sign In" button.	Step 2: The system verifies all entered data before transmitting it to backend storage systems. Step 4: The system displays a notice "You have activated your account, please login to continue". Step 6: The system displays a form for "Email or Username" and "Password". Step 8:The system validates all the input and navigates user to Homepage
View Account	Step 1: The customer accesses the system and clicks on the "Profile" icon. Step 3: The customer can view their account information.	Step 2: The system transfers the customer to the profile page. Step 4: The system displays the customer information.
Browsing products and packages **View Product** **Package details (Guest)**	Step 1: The user accesses the system and can browse products, packages without having an account. Step 3: The user clicks on a product and navigates to the product details page.	Step 2: The system displays the lists of all available products and packages. Step 4: The system displays the product details.
Add to cart **Manage cart item (Guest)**	Step 1: The user can add a product to their cart after exploring and satisfied. Step 3: The user clicks on the "Cart" icon on the right corner to view their cart. Step 5: The user is able to manage their cart by adjusting the quantity and deleting the product. Step 7: The user makes payment by clicking "Checkout Now".	Step 2: The system displays a notice after the user adds a product to cart. Step 4: The system displays all the products that the user has added. Step 6: The system displays a notice after the user updates the items. Step 8: The system validates if the user has logged in yet, if not the system transfers the user to the registration page.

Pay with creadit card **Receive order receipt**	Step 1: If the customer logged in, the customer accesses the payment page. Step 3: The customer inputs information and clicks “Complete Payment”. Step 5: After checking out successfully, the customer receives an email receipt.	Step 2: The system displays customer address information and payment method and additional information. Step 4: The VISAcheck system validates card information to verify if it is corrected. Step 5: The system provides an receipt through customer’s email
Inquiry and Support		
Alternative Course	**1. Sign Up, Login** Sign Up (Registration): - Username exists: *"A user with that username already exists."* - Email exists: *"This email address is already registered."* - Passwords don't match: *"The two password fields didn’t match."* - If password doesn't meet complexity rules: *"This password is too common."*, *"This password is too short."* - Other validation errors: *"Please correct the errors below."* - On success (before email verification): *"Registration successful! Please check your email to verify your account."* - If email fails: *"Failed to send verification email. Please try again later or contact support."* Login: - Invalid credentials: *"Invalid username or password."* - Inactive account: *"Your account is inactive. Please check your email for the verification link or contact support."* - Too many failed attempts: Either a generic invalid message or *"Too many failed login attempts."* **2. View Account (Guest)** - Guests can’t access account pages, the system redirects to the login page with message: *"Please log in to access this page."* **3. Browsing products and packages, View product, package details (Guest)** - If inactive/deleted item URL: *"Product not found."* (Standard 404 error), or redirects to the main product/package list page. - Guests can browse active items **4. Add to cart, Manage cart item (Guest)** - Guest carts are usually handled via sessions.	

	Adding to Cart: - Exceeds stock: *"Quantity exceeds available stock for [Product Name]." / "Cannot add more [Product Name] to cart. Only [Stock Quantity] available."* - Inactive product: *"This product is currently unavailable."* - Success: *"Added [Product Name] to cart."* Managing Cart: - Exceeds stock: *"Cannot update quantity. Only [Stock Quantity] available."* - Expired session: Cart appears empty, no message. **5. Pay with credit card, receive email receipt (Guest)** - Most e-commerce sites require login or a guest checkout process where an email is mandatory. - If guest tries to checkout: *"Please log in or register to continue checkout."* - Usually redirected to login/signup page OR prompted for email/shipping details for guest checkout. - During Guest Checkout: - If no email: *"Email address is required to complete the order."* - Payment issues: *"Invalid card selected."*, *"Please fill in all card details."* Email Receipt: - If email sending fails: (The user won't see an error, but the receipt won't arrive. This is a backend issue)
Precondition	- The user or guest has a stable internet connection to access the app. - The user or guest accessed the system and browsed or viewed item details. - The user or guest views available products or packages and adds to cart, managing cart items. - The customer must be logged in to make payment.
Postcondition	- The customer's information is saved, and receives a confirmation email. - The customer's cart is saved, and adjusted based on the user's need. - The customer receives an email receipt after check out.
Assumptions	- The customer provides correct data which gets stored in the database.

	- All product and package details are up-to-date. - The system enables immediate access to package data without any waiting time. - The system automatically adjusts prices, quantity according to customer choices in real-time.

Table 18: Customer use-case diagram scenario

Scenario: Admin and CSR interaction flow

Use case name	Admin and CSR interaction	
Actors	Admin, CSR	
Description	The use case grants administrator full control to manage item content alongside user account management and enable CSRs to view user identification and item information	
Typical Course	Actor Action	System Response
Manage User Account (Admins)	Step 1: Admin clicks on the "Users" option from the admin dashboard. Step 3: Admin selects a specific customer to edit profile.	Step 2: The system displays a list of existing accounts with options to add, edit, view, or delete account. Step 4: The system transfers admin to the selected action.
Edit User	Step 1: Admin selects an account to adjust the account information, role and clicks "Update User".	Step 2: The system validates new adjusted information and updates the account in the database, saving the changes.
Content Management (Admin)	Step 1: Admin selects any content to edit (eg.,"Products , Packages"	Step 2: The system transfers admin to the selected action.
Products	Step 1: Admin selects the "Edit" option to adjust the product. Step 3: Admin fills in the new information and clicks "Update Product".	Step 2: The system displays the product information to adjust. Step 4: The system validates new adjust information and update in the database, saving the changes
Packages	Step 1: Admin selects the "Edit" option to adjust the package.	Step 2: The system displays the package information to adjust.

<table>
<tr><td></td><td>Step 6: Admin fills in the new information and clicks “Update Package”.</td><td>Step 7: The system validates new adjust information and update in the database, saving the changes.</td></tr>
<tr><td>Customer Identification (CSR Phone Order)</td><td>Step 1: CSR verifies the customer through the information the customer provides when receiving the call.</td><td>Step 2: The system displays the customer information through the CRM system dashboard (eg,. “User profile”, “Shipping Address”, “User order information”.</td></tr>
<tr><td>Item Access (CSR Management)</td><td>Step 1: CSR accesses the CRM system and clicks on “Products</td><td>Step 2: The system displays the product full information for the CSR to manage.</td></tr>
<tr><td>Alternative Course</td><td colspan="2">1. Manage User Account (Admin) - Edit User
<u>Saving Edit User Form:</u>
- Form validation errors: (Standard form validation errors are displayed next to the fields).
- Success: “User "[username]" updated successfully with [Role Name] role.”
<u>Resetting Password:</u>
- Passwords don’t match: "The two password fields didn’t match."
- Invalid password: “Password validation errors”
- Success: “Password for "[username]" has been reset successfully.”
<u>Deleting User:</u>
- Confirm:"Are you sure you want to delete the user '[username]’?"
- Success: “User "[username]" deleted successfully.”
2. Content Management (Admin) - Products
<u>Listing Products:</u>
- No products found: "No products found matching your criteria."
<u>Creating/Editing Product:</u>
- Form validation errors(e.g., non-numeric price, missing name, invalid category, image upload error): "Please correct the errors below."
- Save errors: "Error creating product: [Error details]" / "Error updating product: [Error details]"</td></tr>
</table>

	- Success: *"Product "[Product Name]" created successfully. / Product "[Product Name]" updated successfully."* Deleting Product: - *"Are you sure you want to delete the product '[Product Name]'?"* - Success: "*Product "[Product Name]" deleted successfully."* **3. Content Management (Admin) - Packages** Listing Packages: - No packages found: *"No packages found matching your criteria."* Creating/Editing Package: - Form validation errors: (e.g., non-numeric prices, missing name, discount price > original price, minimum purchase invalid): *"Please correct the errors below."* - No products: *"Please add at least one product to the package."* - Duplicate products: *"Cannot add the same product multiple times."* - Save errors: *"Error creating package: [Error details]" / "Error updating package: [Error details]"* - Success: *"Package "[Package Name]" created successfully. / Package "[Package Name]" updated successfully."* Deleting Package: - *"Are you sure you want to delete the package '[Package Name]'?"* - Success: Package: *"[Package Name]" deleted successfully.* **4. Customer Identification (CRM Phone Order)** - The CRM doesn't appear to have a dedicated "phone order" flow where customer identification by phone is the primary step. - CRM User Search: When searching for users in the CRM list: - No users found: *"No users found matching '[search term]'."* - CRM Add User: (See "Create New User" from earlier) checks by username/email **5. Item Access (CRM Management)** - Access Denied (CRM views): *"You do not have access to this area. (Redirects away from CRM)"* - CRM login restriction: *"You don't have permission to access the CRM system."*

	Viewing Item Lists (Products, Packages, Orders): - Search fields have no results: *"No products found." / "No packages found." / "No orders found."* Viewing Item Details: - Invalid item ID: *"Not Found"* **6. Alternative Course (General Admin/CRM)** - Invalid Date Format (e.g., in Order filters): *"Invalid date format. Please use YYYY-MM-DD."* - Missing Profile: *"User profile not found."* (or profile is auto-created) - Generic Errors: *"An error occurred. Please try again."*
Precondition	- The admin is logged in and has the permissions to manage user accounts and manage content. - The CSR is logged in and has the permissions to identify customer and item access.
Postcondition	- The account is successfully edited, in the system. - The content is successfully edited, in the system.
Assumptions	- The system implements role-based permissions which restrict these actions to admins and CSRs. - The system validates all input fields before allowing either saving or deleting operations.

Table 19: Admin and CSR interaction flow scenario

4.2.2 Development

CD_11: Account creation

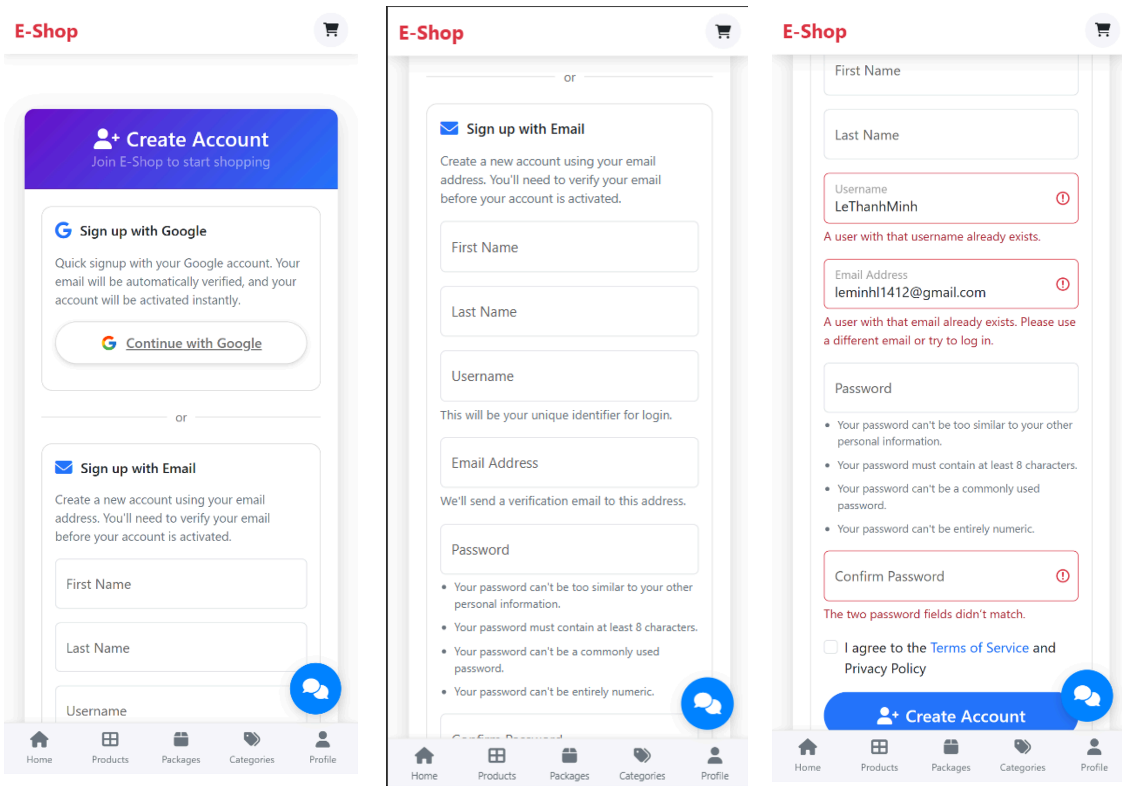

Figure 6: Account create process interface

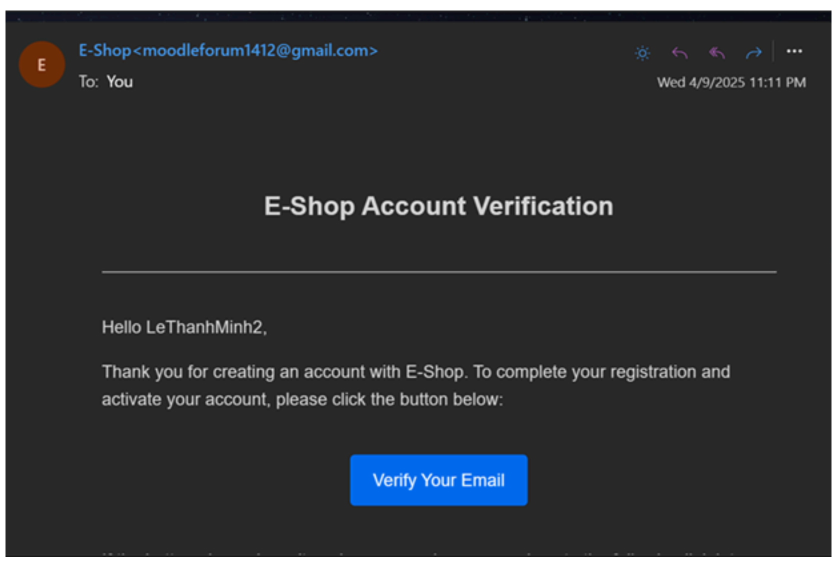

Figure 7: Account create verification email

CD_12: Account login **CD_15: Account details**

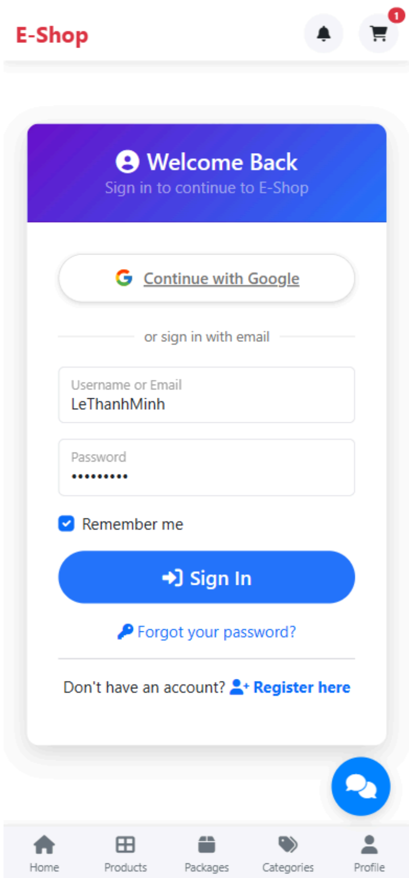

Figure 8: Login interface

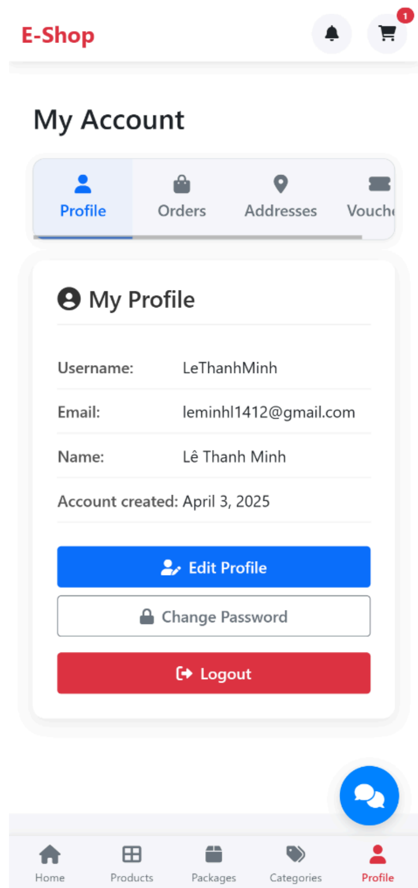

Figure 9: Account details interface

CD_17: Customer browsing	CD_18: View item	CD_22: Inquiry and support

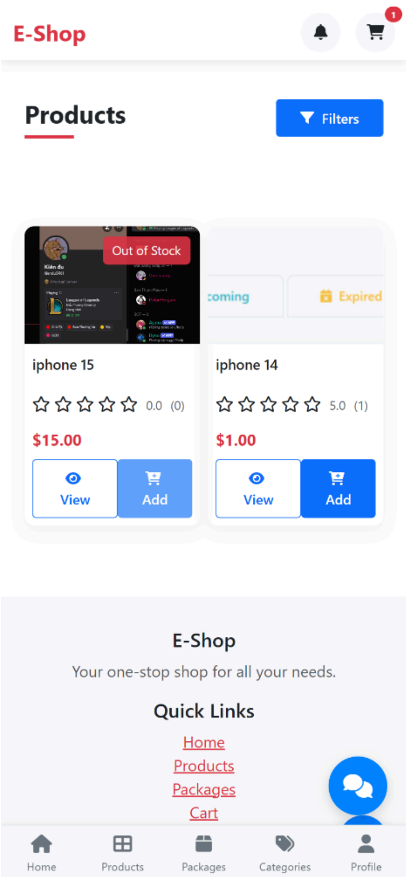

Figure 10: Homepage interface

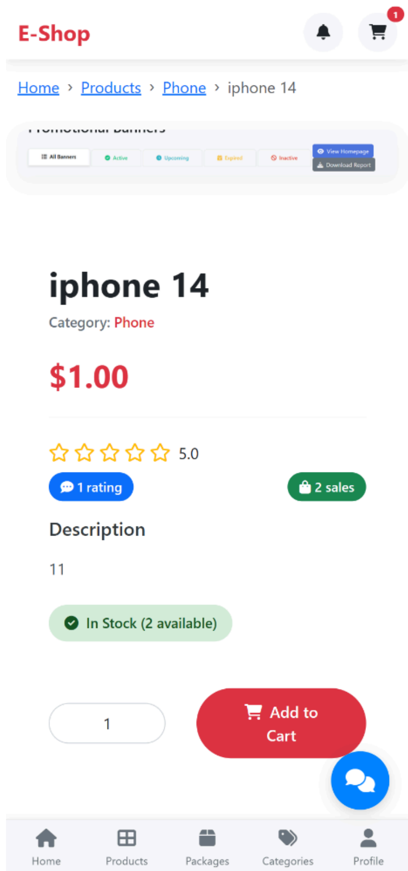

Figure 11: Item page interface

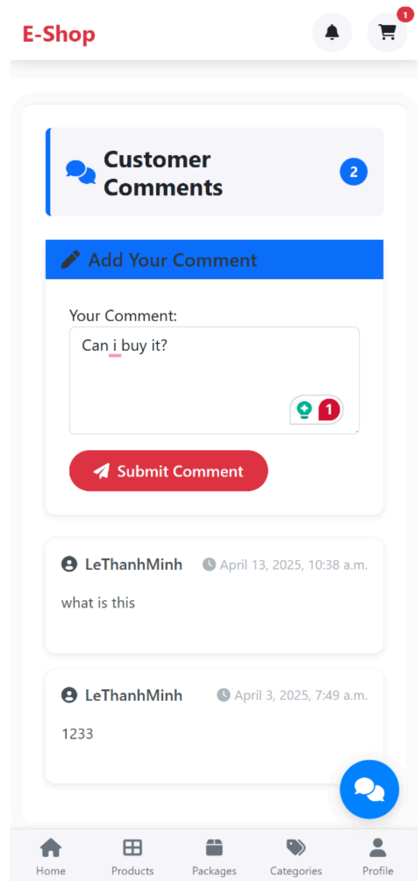

Figure 12: Live chat interface

CD_24, CD_25: Add to card and Manage cart item

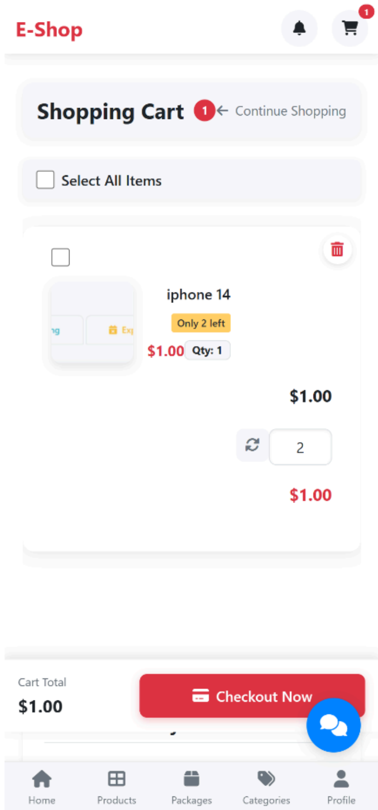

Figure 13: Cart interface

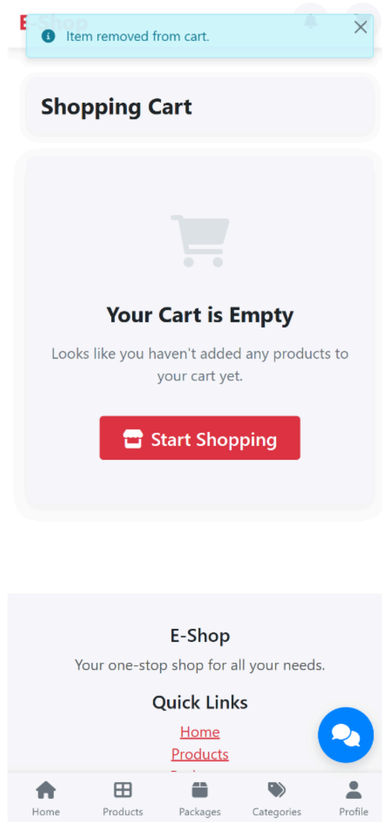

Figure 14: Empty cart interface

CD_26: Review Order

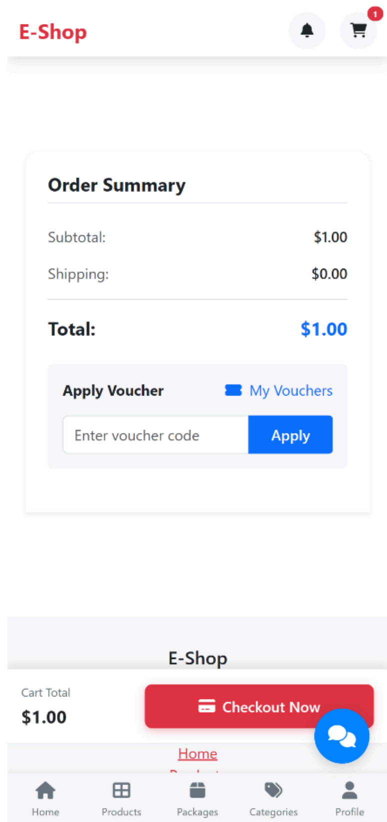

Figure 15: Order summary interface

CD_30: Receive order receipt

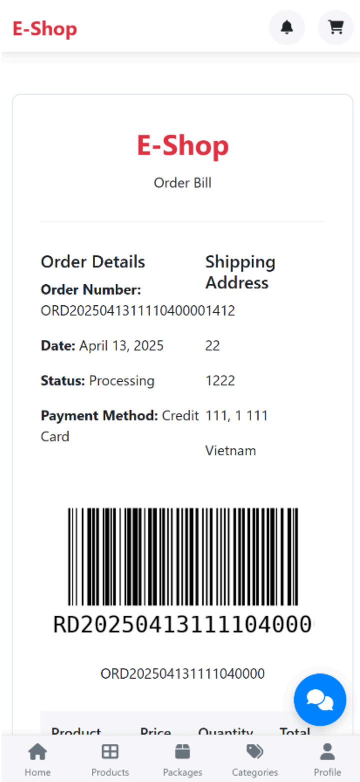

Figure 16: Order Receipt

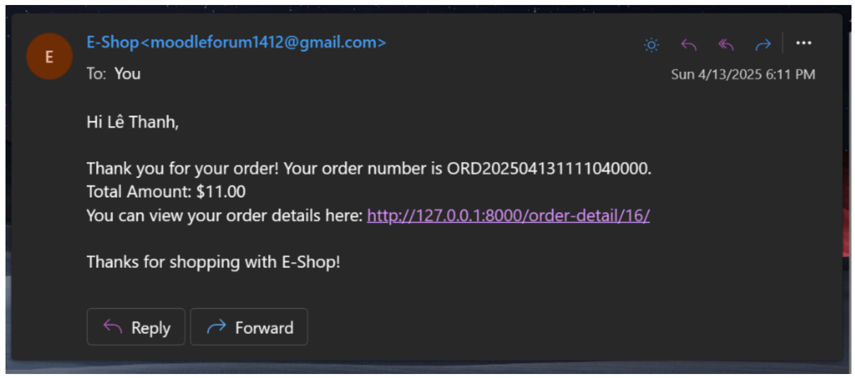

Figure 17: Receipt email

4.2.3 Scrum Board

4.2.4 Burndown Charts

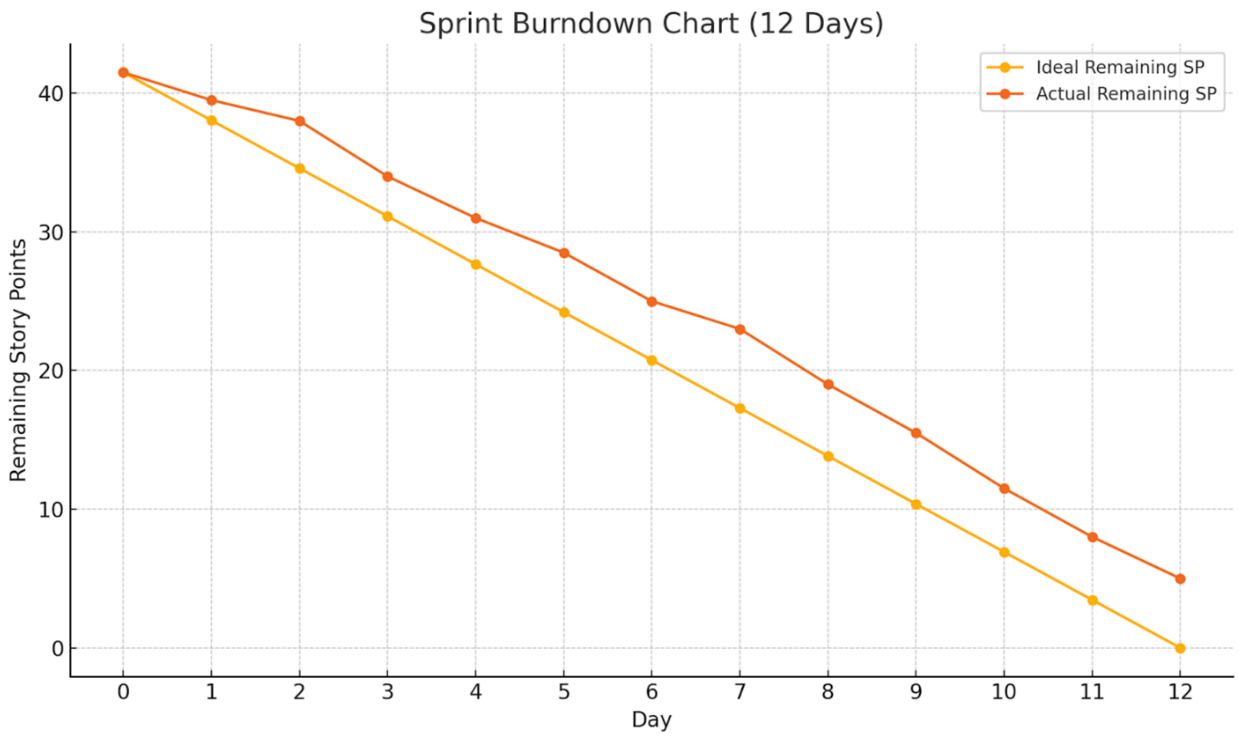

Figure : Sprint 1 Burndown Chart

4.2.5 Sprint Review

Ending the initial sprint, a sprint review is carried out with the product owner and the stakeholders from the marketing, sales, and customer support departments to discuss the feedback on what features and proposals were implemented below.

Meeting note:

<u>What was done:</u>

- Customers can browse freely and view packages available for each device such as CustomersaleOnly, Broadband Only, or Tablet only.

- Customers can store personal information like name, phone number, address, credit card information, and email.
- Any information that is not valid will display a red error message that notifies the user to adjust the information.
- Upon a successful account creation, there will be a confirmation email sent to the customer to activate their account.
- The CSRs can Identify the customer and assist them through the live chat.

What was not done:

- Loyalty point is not fully implemented and suffered minor bugs that may affect the user’s general experience.

Feedback:

Valuable feedback has been given by the stakeholders to evaluate sprint one. They expressed that the core functionalities have been delivered adequately, emphasizing the ease of use in the package browsing experience. Furthermore, they have suggested finding bottlenecks in the system to improve latency on low-performing devices and try to estimate tasks more realistically in each sprint. The development team will consider the suggestion in the next sprint.

From all of the stakeholders involved in the project have agreed that Sprint 1 is completed with minor negligible issue that can be improved in the next sprint.

4.2.6 Sprint Retrospective

Concluding the sprint, team members have gathered around to reflect on what can be improved after the initial sprint, gather feedback, and make actionable outcomes for continuous improvement indicated in the following table:

Attendees: Bao, Huy, Han, Bach, Minh

Agenda	What went well?	What can be improved?	Action to improve in the next sprint
Scrum meeting	Everyone is present in every scrum meeting	During scrum meetings, team members usually get sidetracked by other task	Set clear goals before the meeting and initiate a small agenda(set of questions) for daily stand-ups
Loyalty points implementation	Almost all of the features promised in sprint 1 is implemented	Due to miscalculations, the Loyalty point system is not fully implemented in sprint 1	Set realistic tasks and days before the end of the sprint for unexpected technical challenges
Peer Collaboration	Team members collaborated effectively and overcome blockers throughout the sprin	Communication across sub-task was not apparent which lead to overlapping work	Defining clear individual ownership one task at a time and encourage frequent checkups to update
Documentation	Notification of changes are were delivered to the team member quickly,	Some update entries lacked context which lead to more misunderstanding that is clarified in the next meeting	Encourage team member to collaborate more and keep information centralized in a separate file dedicated for all changes

Table 20: Sprint 1 Retrospective

Discussion:

Agenda:

What aspect of the sprint went well?

- Collaborating within the team yielded tangible results and communicating with the team allowed us to address and handle issues quickly.
- During daily scrum sessions, any unexpected issues were notified to the team member and they can work on it as soon as possible.

Team member conversation:

<u>Minh</u>: Every team member faced the challenge head-on with courage and was not afraid to try different methods to catch up with the schedule.

<u>Huy</u>: The team members are willing to take up each other's work when some of them are not available. Being adaptive has helped the team make a thorough review and move forward together.

<u>Bach</u>: Setting up goals only addresses one part of the problem the team lacked when coordinating with each other. To prevent miscalculations and delays, the team should pay attention more to setting individual responsibilities, and make sure everyone is up to date with the sprint objectives and documentation.

<u>Bao</u>: Utilizing the unit test as soon as possible can help minimize cognitive overload, and help the team operate smoothly and isolate components of the code incrementally rather than debugging the entire system all at once.

Overall Reflection:

While the sprint demonstrated our ability to adapt and be flexible, and clear with communication and support each other, it also revealed the need for better initial planning precautions and managing realistic expectations. Moving forward we will fully implement what is left from Sprint 1 as well as improve the system further entering Sprint 2.

5. Sprint Two

5.1 Sprint Planning and Sprint Backlog

5.1.1 Sprint Goal

The second sprint will target improved user experience through enhanced account management capabilities and shopping features which include post-purchase improvements and it will advance internal CSR and Admin operational tools.

For the customer:

- Providing reset passwords for the customer. *(CD_13)*
- Enable password changes. *(CD_16)*
- Search available items to quickly find desired products. (CD_20)
- Customize packages to meet personal needs and preferences. (CD_21)
- Allow customers to give feedback and submit ratings for previously purchased items. (CD_19)
- Track the progress of active orders and view their full order history. (CD_28, CD_29)
- Confirm orders and receive confirmation messages. (CD_27)
- Loyalty Point (CD_38)

For the Admin:

- Managing, assign role and permission for system user. (CD_40)

For the CSRs:

- Create new customer accounts through the CRM system. (CD_33)
- Support customers via real-time chat functionality. (CD_34)
- Profile customers to offer targeted deals and packages. (CD_36)

5.1.2 Definition of Done

The following checklist summarizes the Definition of Done (DoD) criteria to ensure a high-quality and stable Android application build for Sprint 1:

- All the user stories and acceptance criteria from requirements in sprint 1 are implemented and functional on Android 10 and above.

- Dependencies are up-to-date and free of known critical vulnerabilities.
- UI design aligns the guidelines are consistent and responsive across different screen sizes and resolution
- All user interactions (buttons, swipe,..) are functional and smooth
- Code has no significant issues, code smells, or anti-patterns identified by tools
- No crashes detected under normal or edge-case scenarios
- Unit tests are written with at least 75% code coverage
- Crashlytics integrated and debugged logging output appropriately.
- Proper loading states and error states are displayed
- API calls are implemented with adequate success and error handling
- App builds successfully without runtime errors and passes CI/CD pipeline checks
- Necessary API documentation updated.
- Sensitive information is not exposed in source control, configuration files, or logs.
- Display user-friendly error message for invalid login attempts or incorrect credentials input.

5.1.3 Sprint Backlog

5.1.4 Breakdown user stories included in the Sprint Backlog into Tasks

5.2 Sprint Cycle

5.2.1 Use-case Diagram

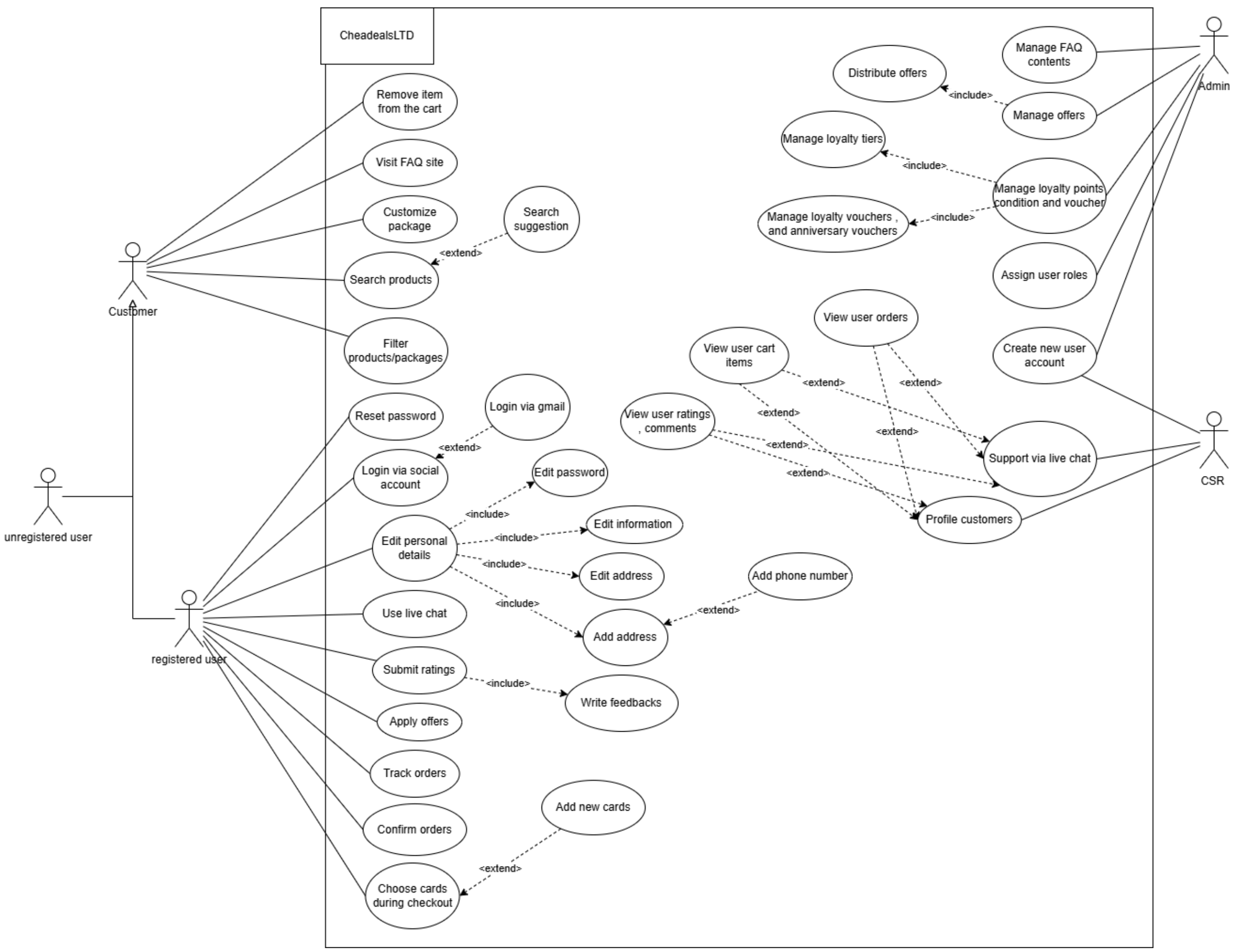

Figure : Sprint 2 Use-case Diagram

5.2.2 Development

5.2.3 Scrum Board

5.2.4 Burndown Chart

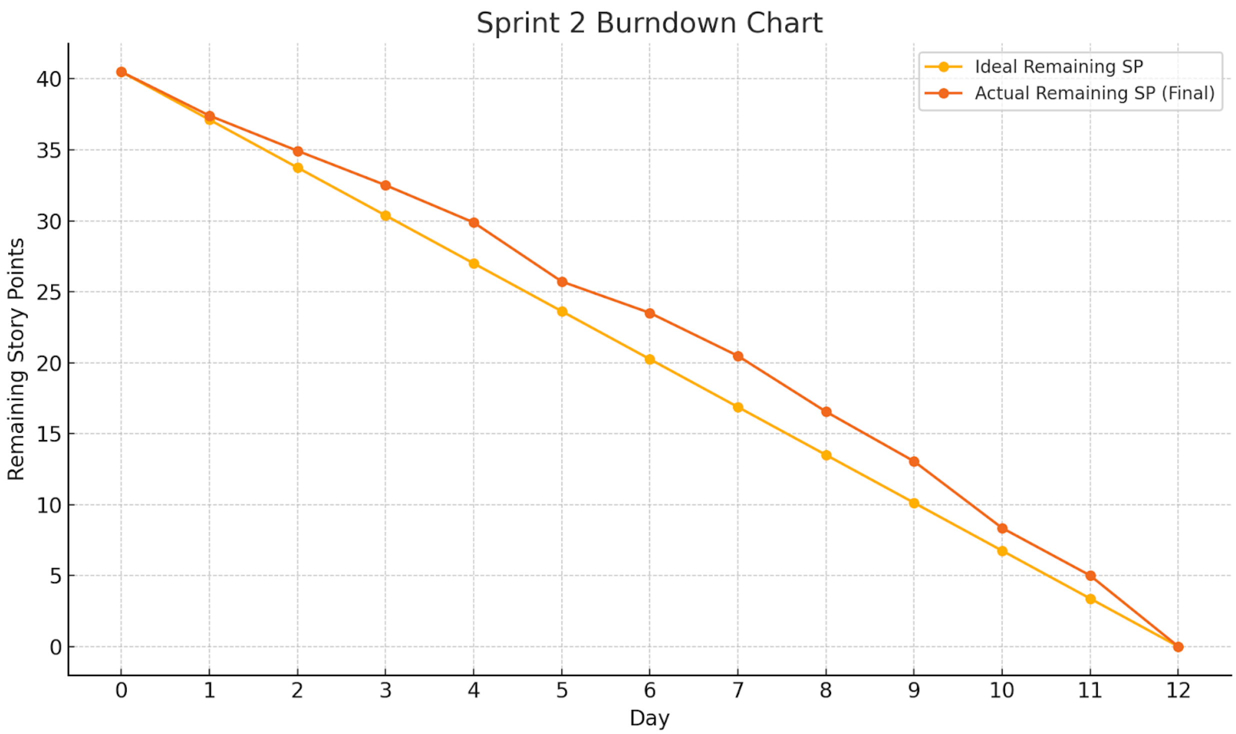

Figure : Sprint 2 Burndown Chart

5.2.5 Sprint Review

5.2.6 Sprint Retrospective

6. Sprint Three

6.1 Sprint Planning and Sprint Backlog

6.1.1 Sprint Goal

6.1.2 Definition of Done

6.1.3 Sprint Backlog

6.1.4 Breakdown user stories included in the Sprint Backlog into Tasks

6.2 Sprint Cycle

6.2.1 Use-case Diagram

6.2.2 Development

6.2.3 Scrum Board

6.2.4 Burndown Chart

6.2.5 Sprint Review

6.2.6 Sprint Retrospective