Software Requirements Specification

for

Cross Border

Version 1.1 approved

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Revision History

Name	Date	Reason For Changes	Version
Jolene Chan	27/01/24	Added introduction and basic product functions	1.0
Aaron Chen	28/01/24	Added product functions and non-functional requirements	1.0.1
Jolene Chan	29/01/24	Added functional requirements and use case descriptions for registration features	1.0.2
Banerjee Mohor Jolene Chan Aaron Chen	31/01/24	Edited functional requirements and use case descriptions	1.0.3
Banerjee Mohor Jolene Chan	01/02/24	Added use case descriptions and functional requirements for new features	1.0.4
Aaron Chen	01/02/24	Added Settings Page	1.0.5
Aaron Chen	03/02/24	Added some use case descriptions	1.0.6
Aaron Chen	03/02/24	Added more non-functional requirements	1.0.7
Banerjee Mohor	04/02/24	Added more functional requirements	1.0.8
Jolene Chan	04/02/24	Revised functional requirements and use case descriptions, Edited formatting	1.0.9
Jolene Chan	04/02/24	Finalized for submission of Lab 1 deliverables	1.1
Jolene Chan	15/03/24	Updated introduction and description	1.1.1
Jolene Chan	18/03/24	Updated use case descriptions and functional requirements	1.1.2

1. Introduction

1.1 Purpose

When migrant workers arrive in a new country for work, they may not be knowledgeable of the new environment and unaware of the resources available. Team SimpleOne aims to facilitate access to essential services and information tailored to the unique needs of migrant workers in Singapore by developing a web application, **Cross Border**, that consolidates key utilities to make daily life in Singapore more navigable and comfortable for the migrant community. Through these functionalities, Cross Border aims to enhance the overall living and working experience of migrant workers in Singapore.

1.2 Document Conventions

Software Requirement Specification Format: This document follows IEEE standard. Priorities of higher-level requirements are inherited by detailed-level requirements.

Font: Times New Roman.

Main Header: Size 18, Bold.

Sub Header: Size 14, Bold.

Content: Size 12.

Line Spacing: 1.15.

1.3 Intended Audience and Reading Suggestions

This document is intended for all stakeholders involved in Cross Border. The intended audience includes application users, developers, user acceptance testers, documentation writers, and other relevant business stakeholder groups, including marketing and publicity.

This document contains details of the different features of the web application, their intended purposes and the rationale for their respective functionalities. A detailed write-up on Cross Border and its functionalities is presented, and pictorial illustrations of the web pages are embedded to facilitate visualization and understanding. The document is intended to be read in sequence for users, application testers and stakeholders involved in the commercial operations of Cross Border. For

developers and stakeholders involved in the engineering of Cross Border, we recommend beginning with the overall description, followed by each system features and finally the requirements for the web page to operate, including stipulated external interface requirements and non-functional requirements.

1.4 Product Scope

Cross Border is a web application that serves as a user-centric platform for migrant workers in Singapore. It facilitates access to essential services and information, encompassing features like a currency exchange calculator, navigation routes via public transport, directory of nearby amenities, personalized news feed, and an AI chatbot to assist with inquiries. Through these functionalities, Cross Border aims to enhance the overall living and working experience of migrant workers in Singapore. This aligns with Team SimpleOne's goal of making daily life in Singapore more navigable and comfortable for the migrant community.

2. Overall Description

2.1 Product Perspective

Cross Border is a new, self-contained product designed to cater to the needs of migrant workers in Singapore by offering access to essential information and personalized services used in daily life. This product is not a member of an existing product family nor a direct replacement for any existing system.

While the product operates independently, it interfaces with several APIs like Google Places API, Currency-converter API, etc. APIs are external systems which serve as a primary source of real-time data and resources. This integration enhances the product's functionality by providing updated real-time information about location, exchange rates, etc. The product remains self-contained in terms of its core functionalities and user interface.

2.2 Product Functions

The application's main functions include the following:

1. The application allows users to register for an account and manage their profile information to provide users with personalized services.

2. The application allows users to access key functions from the dashboard menu.

3. The application provides users with currency exchange information from SGD to the currency of their home country, or vice versa.

4. The application provides users with detailed route information to get from their starting location to their destination via public transport, including distance and estimated time.

5. The application provides users with a list of amenities such as MRT stations, bus stops, eateries, shops, and hospitals nearest to their current location.

6. The application allows provides user with answers to their queries using an AI chatbot.

7. The application allows users to change their phone number linked to their account

8. The application allows users to change their password or reset their password if they have forgotten it.

9. The application is seamlessly integrated with various APIs, retrieving and displaying real-time data to users regularly.

2.3 User Classes and Characteristics

The Cross Border application anticipates its user classes to be of the following demographics:

Users

Attributes	Description
Frequency of use	High
Subset of functions used	All
Technical expertise	Low
Security/privilege levels	No access to privilege levels

3. System Features

3.1 Registration

4.1.1   Description and Priority

The Registration Page allows a user to register for an account with a valid username, password and phone number.

4.1.2 Stimulus/Response Sequences

The user will be redirected to the Registration Page after selecting to sign up for an account from the Login page.

4.1.3 Functional Requirements

1. The system must allow the user to create an account.

    1.1 The system must display 3 text fields for the user to enter their username, password, and confirm password.

        1.1.1 The system shall hide the text in the password and confirm password fields.

            1.1.1.1 The system shall allow the user to show or hide the text in the password and confirm password fields.

        1.1.2 The system shall inform the user of the strength of their password with a Weak (red) / Good (orange) / Strong (green) indicator.

    1.2 When the user clicks the "Sign Up" button, the system must verify that the user has input valid information, otherwise the system must display an error message.

        1.2.1 The system must verify that all fields have been filled in.

        1.2.2 The system must verify that the username chosen by the user is not already associated with an existing account in the database.

        1.2.3 The system must verify that the username only contains alphanumeric characters.

        1.2.4 The system must verify that the password meets the strength requirements.

            1.2.4.1 The password must contain at least 8 characters.

            1.2.4.2 The password must contain at least 1 uppercase character.

            1.2.4.3 The password must contain at least 1 lowercase character.

            1.2.4.4 The password must contain at least 1 special character.

        1.2.5 The system must verify that the text in the password and confirm password fields match.

    1.3 If all the information is valid, the system must display a numeric input field for the user to enter their phone number.

1.3.1   The system shall allow the user to select their country code from a dropdown list.

1.4   When the user clicks the "Send code via SMS" button, the system must verify that the user has input a valid phone number, otherwise the system must display and error message.

     1.4.1   The system must verify that the phone number field has been filled in.

     1.4.2   The system must verify that the phone number is a working phone number.

     1.4.3   The system must verify that the phone number is not already associated with an existing account in the database.

1.5   If the phone number is valid, then the system must send an OTP to the user's phone number.

     1.5.1   The OTP must be 6 digits long.

     1.5.2   The OTP must be valid for 60 seconds.

1.6   When the OTP is sent, the system must display a numeric input field for the user to enter the OTP.

     1.6.1   The input field must require the user to enter exactly 6 numbers.

1.7   When the user clicks the "Verify OTP" button, the system must verify that the user has input the correct OTP within the time limit, otherwise the system must display an error message.

     1.7.1   The system must verify that it is a 6-digit number.

     1.7.2   The system must verify that the OTP is entered within 60 seconds of being sent.

     1.7.3   The system must verify that the OTP entered matches the OTP sent.

1.8   If the OTP is not entered after 60 seconds of being sent, the system must display a "Resend OTP" button.

     1.8.1   When the user clicks the "Resend OTP" button, the system must send another OTP to the user's phone number.

         1.8.1.1 The new OTP must not be the same as previous OTPs sent.

1.9   If the OTP is correct, then the system must redirect the user to the Create Profile Page.

3.2 Create Profile

4.2.1   Description and Priority

The Create Profile Page allows a user to set up their profile with their personal information such as full name, gender, nationality, profession, home address, postal code, security question and answer, and profile picture.

4.2.2   Stimulus/Response Sequences

The user will be redirected to the Create Profile Page after completing the initial account registration.

4.2.3   Functional Requirements

1.   The system must allow the new user to enter their profile information to create a profile following successful user registration.

    1.1   The system must display input fields for the user to enter their profile information.

        1.1.1 The system must display a text field for the user to enter their full name.

        1.1.2 The system must display a dropdown list for the user to select their gender.

        1.1.3 The system must display a dropdown list for the user to select their nationality.

        1.1.4 The system must display a text field for the user to enter their profession.

        1.1.5 The system must display a text field for the user to enter their home address, and a numeric input field for the user to enter their postal code.

        1.1.6 The system must display a dropdown list for the user to select their security questions, and a text field for the user to enter their answer.

    1.2   When the user clicks the "Log In" button, the system must verify that the user has input valid information, otherwise the system must display an error message.

        1.2.1   The system must verify that all fields have been filled in.

       1.2.2   The system must verify that home address and postal code exists.

    1.3   If all the information is valid, the system must allow the user to upload a file to use as their profile picture.

       1.3.1   The file must be of image file format.

       1.3.2   The system shall allow the user to either browse their device storage for a file or drag-and-drop the file.

    1.4   When the user clicks the "Finish" button, the system must create a new user account in the database with the profile information.

    1.5   If the account is successfully created, then the system must redirect the user to the Dashboard Page.

       1.5.1   The user's profile information shall be utilized to provide personalized information and services within the application.

3.3 Login

4.3.1 Description and Priority

The Login Page allows a user to sign into their account by entering their username and password and verifying their phone number.

4.3.2 Stimulus/Response Sequences

The user will be redirected to the Login Page after clicking "Get Started" on the Landing Page.

4.3.3 Functional Requirements

1.   The system must allow the user to log in to their account.

    1.1   The system must display 2 text fields for the user to enter their username and password.

       1.1.1   The system shall hide the text in the password field.

        1.1.1.1 The system shall allow the user to show or hide the text in the password field.

1.2   When the user clicks the "Log In" button, the system must verify that the username and password entered are correct, otherwise the system must display an error message.

    1.2.1   The system must verify that the username and password fields have been filled in.

    1.2.2   The system must verify that the username and password entered matches against the system's user account database.

1.3   The system must implement two-factor authentication for an added layer of security.

    1.3.1   Upon successful username and password verification, the system must extract the user's registered phone number from the database.

    1.3.2   The system must send an OTP to the user's registered phone number.

        1.3.2.1 The OTP must be 6 digits long.

        1.3.2.2 The OTP must be valid for 60 seconds.

    1.3.3   When the OTP is sent, the system must display a numeric input field for the user to enter the OTP.

        1.3.3.1 The input field must require the user to enter exactly 6 numbers.

    1.3.4   When the user clicks the "Verify OTP" button, the system must verify that the user has input the correct OTP within the time limit, otherwise the system must display an error message.

        1.3.4.1 The system must verify that it is a 6-digit number.

        1.3.4.2 The system must verify that the OTP is entered within 60 seconds of being sent.

        1.3.4.3 The system must verify that the OTP entered matches the OTP sent.

    1.3.5   If the OTP is not entered after 60 seconds of being sent, the system must display a "Resend OTP" button.

1.3.5.1 When the user clicks the "Resend OTP" button, the system must send another OTP to the user's phone number.

1.3.5.1.1 The new OTP must not be the same as previous OTPs sent.

1.4.6 If the OTP is correct, then the system must redirect the user to the Dashboard Page.

3.4 Logout

4.4.1 Description and Priority

The Logout Page allows a user to sign out of their account.

4.4.2 Stimulus/Response Sequences

The user will be redirected to the Logout Page after clicking "Logout" on the Settings Page.

4.4.3 Functional Requirements

1. The system must allow the user to log out of their account.

    1.1 When the user clicks the "Logout" button, the system shall redirect the user to the Landing Page after 3 seconds.

3.5 Reset Password

4.5.1 Description and Priority

The Reset Password Page allows a user to reset their password if they forget it.

4.5.2 Stimulus/Response Sequences

The user will be redirected to the Reset Password Page after clicking "Forgot Password?" on the Login Page.

4.5.3 Functional Requirements

1. The system must allow the user to reset their password if they have forgotten it.

    1.1 When the user clicks the "Forgot Password?" button, the system shall redirect the user to the Forgot Password Page.

        1.1.1 The system must display a numeric input field for the user to enter their phone number.

            1.1.1.1 The system shall allow the user to select their country code from a dropdown list.

        1.1.2 When the user clicks the "Send code via SMS" button, the system must verify that the user has input a valid phone number, otherwise the system must display and error message.

            1.1.2.1 The system must verify that the phone number field has been filled in.

            1.1.2.2 The system must verify that the phone number is a working phone number.

            1.1.2.3 The system must verify that the phone number is already associated with an existing account in the database.

        1.1.3 If the phone number is valid, then the system must send an OTP to the user's phone number.

            1.1.3.1 The OTP must be 6 digits long.

            1.1.3.2 The OTP must be valid for 60 seconds.

        1.1.4 When the OTP is sent, the system must display a numeric input field for the user to enter the OTP.

            1.1.4.1 The input field must require the user to enter exactly 6 numbers.

        1.1.5 When the user clicks the "Verify OTP" button, the system must verify that the user has input the correct OTP within the time limit, otherwise the system must display an error message.

            1.1.5.1 The system must verify that it is a 6-digit number.

    1.1.5.2 The system must verify that the OTP is entered within 60 seconds of being sent.

    1.1.5.3 The system must verify that the OTP entered matches the OTP sent.

  1.1.6 If the OTP is not entered after 60 seconds of being sent, the system must display a "Resend OTP" button.

    1.1.6.1 When the user clicks the "Resend OTP" button, the system must send another OTP to the user's phone number.

      1.1.6.1.1 The new OTP must not be the same as previous OTPs sent.

1.2 The system must implement two-factor authentication for an added layer of security.

  1.2.1 Upon successful OTP verification, the system must extract the user's registered security question from the database.

  1.2.2 The system must redirect the user to the Security Question Page.

    1.2.2.1 The system must display the user's security question.

    1.2.2.2 The system must display a text field for the user to enter their answer.

  1.2.3 When the user clicks the "Submit Answer" button, the system must verify that the user has input the correct answer to the security question, otherwise the system must display an error message.

    1.2.3.1 The system must verify that the answer field has been filled in.

    1.2.3.2 The system must verify that the security question and answer entered matches against the system's user account database.

1.3 If the answer to the security question is correct, then system must redirect the user to the Reset Password Page.

  1.3.1 The system must display 2 text fields for the user to enter their new password and confirm password.

    1.3.1.1 The system shall hide the text in the password and confirm password fields.

1.3.1.1.1   The system shall allow the user to show or hide the text in the password and confirm password fields.

1.3.2.1 The system shall inform the user of the strength of their password with a Weak (red) / Good (orange) / Strong (green) indicator.

1.3.2   When the user clicks the "Reset Password" button, the system must verify that the user has input valid information, otherwise the system must display an error message.

1.3.2.1 The system must verify that all fields have been filled in.

1.3.2.2 The system must verify that the password meets the strength requirements.

1.3.2.2.1   The password must contain at least 8 characters.

1.3.2.2.2   The password must contain at least 1 uppercase character.

1.3.2.2.3   The password must contain at least 1 lowercase character.

1.3.2.2.4   The password must contain at least 1 special character.

1.3.2.3 The system must verify that the text in the password and confirm password fields match.

1.3.2.4 The system must verify that the new password is not the same as the old password.

1.3.3   If the new password is valid, then the system changes the user's account password in the database to the new password.

1.3.3.1 If the password has been successfully reset, then the system must redirect the user to the Dashboard Page.

3.6 Change Password

4.6.1   Description and Priority

The Change Password Page allows a user to change their password to a different password.

4.6.2   Stimulus/Response Sequences

The user will be redirected to the Change Password Page after clicking "Change Password" on the Settings Page.

4.6.3   Functional Requirements

1.   The system must allow the user to change their account password to a different password.

   1.1   The system must display 2 text fields for the user to enter their new password and confirm password.

      1.1.1   The system shall hide the text in the password and confirm password fields.

         1.1.1.1 The system shall allow the user to show or hide the text in the password and confirm password fields.

      1.1.2   The system shall inform the user of the strength of their password with a Weak (red) / Good (orange) / Strong (green) indicator.

   1.2   When the user clicks the "Change Password" button, the system must verify that the user has input valid information, otherwise the system must display an error message.

      1.2.1   The system must verify that all fields have been filled in.

      1.2.2   The system must verify that the password meets the strength requirements.

         1.2.2.1 The password must contain at least 8 characters.

         1.2.2.2 The password must contain at least 1 uppercase character.

         1.2.2.3 The password must contain at least 1 lowercase character.

         1.2.2.4 The password must contain at least 1 special character.

      1.2.3   The system must verify that the text in the password and confirm password fields match.

      1.2.4   The system must verify that the new password is not the same as the old password.

1.3   If the new password is valid, then the system changes the user's account password in the database to the new password.

    1.3.1   If the password has been successfully reset, then the system must redirect the user to the Dashboard Page.

3.7 Change Phone Number

4.7.1   Description and Priority

The Change Phone Number Page allows a user to change their phone number if they have switched to a different phone number.

4.7.2   Stimulus/Response Sequences

The user will be redirected to the Change Phone Number Page after clicking "Change Phone Number" on the Settings Page.

4.7.3   Functional Requirements

1.   The system must allow the user to change their account phone number to a different phone number.

    1.1   The system must display a numeric input field for the user to enter their phone number.

        1.1.1   The system shall allow the user to select their country code from a dropdown list.

    1.2   When the user clicks the "Save" button, the system must verify that the user has input a valid phone number, otherwise the system must display and error message.

        1.2.1   The system must verify that the phone number field has been filled in.

        1.2.2   The system must verify that the new phone number is a working phone number.

        1.2.3   The system must verify that the new phone number is not already associated with an existing account in the database.

        1.2.4   The system must verify that the new phone number is not the same as the old phone number.

1.3   If the phone number is valid, and the user clicks the "Send code via SMS" button, then the system must send an OTP to the user's phone number.

       1.3.1   The OTP must be 6 digits long.

       1.3.2   The OTP must be valid for 60 seconds.

1.4   When the OTP is sent, the system must display a numeric input field for the user to enter the OTP.

       1.4.1   The input field must require the user to enter exactly 6 numbers.

1.5   When the user clicks the "Verify OTP" button, the system must verify that the user has input the correct OTP within the time limit, otherwise the system must display an error message.

       1.5.1   The system must verify that it is a 6-digit number.

       1.5.2   The system must verify that the OTP is entered within 60 seconds of being sent.

       1.5.3   The system must verify that the OTP entered matches the OTP sent.

1.6   If the OTP is not entered after 60 seconds of being sent, the system must display a "Resend OTP" button.

       1.6.1   When the user clicks the "Resend OTP" button, the system must send another OTP to the user's phone number.

          1.6.1.1 The new OTP must not be the same as previous OTPs sent.

1.7   If the OTP is correct, then the system must redirect the user to the Dashboard Page.

3.8   View and Edit Profile

4.8.1   Description and Priority

The Profile Page allows a user to view and edit their profile information.

4.8.2   Stimulus/Response Sequences

The user will be redirected to the Profile Page after clicking on their profile picture on the Dashboard page, or after clicking "Edit Profile" on the Settings Page.

4.8.3   Functional Requirements

1.   The system must allow the user to view and edit their profile information.

1.1   The system must display input fields for the user to view and enter their profile information.

1.1.1 The system must display a text field for the user to edit their full name.

1.1.2 The system must display a dropdown list for the user to edit their gender.

1.1.3 The system must display a dropdown list for the user to edit their nationality.

1.1.4 The system must display a text field for the user to edit their profession.

1.1.5 The system must display a text field for the user to edit their home address, and a numeric input field for the user to edit their postal code.

1.1.6 The system must display a dropdown list for the user to edit their security questions, and a text field for the user to edit their answer.

1.1.7   The system must allow the user to upload a file to edit their profile picture.

1.1.7.1 The file must be of image file format.

1.1.7.2 The system shall allow the user to either browse their device storage for a file or drag-and-drop the file.

1.1.8   The system shall allow the user to remove their profile picture.

1.2   When the user clicks the "Save" button, the system must verify that the user has input valid information, otherwise the system must display an error message.

1.2.1   The system must verify that all fields have been filled in.

1.3   The system must update the user account in the database with the new profile information.

1.3.1 The user's profile information shall be utilized to provide personalized information and services within the application.

3.9 Currency Converter

4.9.1 Description and Priority

The Currency Converter Page allows a user to convert an amount from SGD to the currency of their home country, or vice versa.

4.9.2 Stimulus/Response Sequences

The user will be redirected to the Currency Converter Page after clicking on the "Currency Converter" widget on the Dashboard page.

4.9.3 Functional Requirements

1. The system must allow the user to access currency conversion functionalities.

    1.1 The system must display SGD as the From currency and the user's home currency as the To currency by default.

    1.1.1 The system must extract the user's nationality from the database.

    1.1.2 The system must allow the user to swap the From and To currency using the "Switch" button.

    1.2 The system must display a numeric input field for the user to enter an amount to convert.

    1.2.1 The system must verify that the user has entered a valid amount to convert, otherwise the system must display an error message.

    1.2.1.1 The system must verify that the amount field has been filled in.

    1.2.1.2 The system must verify that the amount is a positive number.

    1.3 If the amount entered is valid, the system must display the current market exchange rate and converted amount in the To currency.

3.10 News Viewer

4.10.1 Description and Priority

The News Viewer Page allows a user to view news articles from the world, Singapore or their home country.

4.10.2 Stimulus/Response Sequences

The user will be redirected to the News Viewer Page after clicking on the "News Viewer" widget on the Dashboard page.

4.10.3 Functional Requirements

1. The system must allow the user to view news articles from the location of their choice.

    1.1 The system must display a dropdown list for the user to select a location.

        1.1.1 The system must extract the user's nationality from the database.

        1.1.2 The system must allow the user to choose news from the world, Singapore, or their home country.

    1.2 The system must display news headlines from the user's chosen location.

        1.2.1 The system must display the news in reverse-chronological order.

        1.2.2 The system must display the most recent news on top.

3.11 Navigation

4.11.1 Description and Priority

The Navigation Page allows a user to search for transit routes from a starting location to their destination.

4.11.2 Stimulus/Response Sequences

The user will be redirected to the Navigation Page after clicking on the "Navigation" widget on the Dashboard page.

4.11.3   Functional Requirements

1.   The system must allow users to search for transit routes from a starting location to a destination.

   1.1   The system shall display a map of the user's current location.

   1.1.1   If the user does not have geolocation tracking enabled on their device, the system shall display a map of Singapore.

   1.2   The system must display 2 text fields for the user to enter a start location and a destination.

   1.2.1   The system shall display a dropdown list of the user's recently entered locations.

   1.2.2   The system must display a dropdown list of suggested addresses as the user types.

   1.2.3   The system shall allow the user to use their current location as the start location.

   1.2.3.1 The system shall obtain the user's location from geolocation tracking.

   1.2.4   The system must verify that the user has entered valid a start location and destination, otherwise the system must display an error message.

   1.3   The system must display the route from the start location to the destination.

3.12 Nearest Amenities Finder

4.12.1   Description and Priority

The Nearest Amenities Finder Page allows a user to search for nearest amenities (MRT stations, bus stops, shops, eateries, hospitals) to their current location.

4.12.2 Stimulus/Response Sequences

The user will be redirected to the Nearest Amenities Finder Page after clicking on the "Nearest Amenities Finder" widget on the Dashboard page.

4.12.3 Functional Requirements

1.   The system must allow the user to search for nearest amenities to their current location.

  1.1   The system must display a list of amenity types for the user to choose from.

    1.1.1   The system must allow the user to choose from MRT stations, bus stops, shops, eateries, and hospitals.

      1.1.1.1 The shops and eateries shall be of the user's nationality.

        1.1.1.1.1   The system must extract the user's nationality from the database.

  1.2   The system must display a map of the user's current location, and the location of the nearest amenities.

    1.2.1   The system must obtain the user's location from geolocation tracking.

    1.2.2   The system must display the details of the amenities.

      1.2.2.1 The system must display the address of the amenity.

      1.2.2.2 The system must display the operating hours of the amenity.

      1.2.2.3 The system must display a description of the amenity.

3.13 AI Chatbot

4.13.1 Description and Priority

The AI Chatbot Page allows a user to receive answers to their queries from an AI chatbot.

4.13.2   Stimulus/Response Sequences

The user will be redirected to the AI Chabot Page after clicking on the "AI Chabot" widget on the Dashboard page.

4.13.3   Functional Requirements

1.   The system must allow users to receive answers to their queries from an AI chatbot.

   1.1   The system must allow users to ask questions to the AI chatbot.

       1.1.1   The system must display a text field for the user to enter their question.

   1.2   The system must allow users to ask the AI chatbot about an image.

       1.2.1   The system must allow users to upload an image.

   1.3   The system must analyze the input and provide relevant answers.

   1.4   The system must allow users to engage in ongoing interaction with the chatbot.

       1.4.1   The system must allow users to ask further questions or upload additional images without restarting the interaction process.

   1.5   The system must manage instances where the chatbot cannot answer a query.

       1.5.1   The system must display a message prompting the user to rephrase the question or ask a different question.

   1.6   The system must address issues with image uploads that do not meet system requirements.

       1.6.1   The system must display a message informing users of unsupported image formats or size restrictions and prompt the user to upload a different image.

4. Other Nonfunctional Requirements

4.1 Performance Requirements

1. The application must be able to boot within 10 seconds.
2. The user must be able to login within 5 seconds.
3. The system must display and return results of the converted currency amount within 5 seconds.
4. The system must display and return results of route to target location within 5 seconds.
5. The system must display and return results of nearest amenities searched within 5 seconds.
6. The system must send OTP to the user within 20 seconds when an OTP is requested.

4.2 Safety Requirements

1. The system must include comprehensive logging of all user interactions and system errors to aid in quick diagnosis and resolution of errors.
2. The system must define specific response times for critical safety issue reporting and resolution in accordance with industry best practices and regulatory requirements.
3. The system must perform regular automated backups of user data to prevent loss in the case of a system failure.
4. The system must be designed to prevent single points of failure that could lead to a total system shutdown or safety incident.
5. Any safety-critical warnings or alerts must be displayed prominently within the user interface and be distinguishable from non-critical notifications.

4.3 Security Requirements

6. Login session token will expire after 30 days.
7. The system will deny feature access to unauthorized users.
8. All transmitted data must be encrypted using HTTPS.
9. The system must hash passwords before storing them into the database to protect against data breaches.

5. Use Cases

5.1 Use Case Notations

6.2.1. Alternative Flow Origin

The exact step of the Normal Flow from which the Alternative Flow originated from is indicated using the following notation: AF-SX, where AF denotes Alternative Flow, and SX denotes that it came from Step X of the Normal Flow. For instance, AF-S1 will denote that the Alternative Flow originated from Step 1 of the Normal Flow.

5.2 Use Case Specifications

6.3.1 REG-01: Register New Account

Use Case ID:	REG-01		
Use Case Name:	Register New Account		
Created By:	Jolene Chan	Last Updated By:	Jolene Chan
Date Created:	29 January 2024	Date Last Updated:	18 March 2024

Actor:	New User (Initiating Actor), Database
Description:	A first-time user can register for an account by clicking the "Sign Up" button. The user must input their username, password and phone number to create an account.
Preconditions:	1. The user has navigated to the Registration Page of the application. 2. The account system is operational and able to process new user registrations. 3. The user is connected to the Internet. 4. The user must not have an existing account already registered in the system with the same credentials.
Postconditions:	1. A new user account is successfully created in the system database. 2. The user is redirected to the Create Profile Page. (REG-02: Create New Profile)

Priority:	High
Frequency of Use:	Low
Flow of Events:	1. The user launches the application, the Landing Page is displayed. 2. The user clicks the "Get Started" button on the Landing Page, then is redirected to the Login Page. 3. The user clicks the "Don't have an account? Sign Up" button on the Login Page, then is redirected to the Registration Page. 4. The user enters their chosen username and password into the respective fields and confirms their password, then clicks the "Sign Up" button. 5. The system validates the provided information, then asks the user to provide a valid phone number. 6. The user enters their phone number, then clicks the "Send code via SMS" button. 7. The system validates the provided information, then sends an OTP to the user's phone number. 8. The user enters the OTP, then clicks the "Verify OTP" button. 9. The system validates the OTP, then redirects the user to the Create Profile Page. (REG-02: Create New Profile)
Alternative Flows:	<u>AF-S4: The user clicks the "Sign Up" button before completing all fields</u> 1. The system displays "Please complete all fields" error prompt. 2. The system returns to Step 4 and waits for inputs from the user. <u>AF-S4: The user enters a password that does not meet the strength requirements</u> 1. The system displays "Please use a stronger password" error prompt. 2. The system returns to Step 4 and waits for inputs from the user. <u>AF-S4: The password and confirm password fields do not match</u> 1. The system displays "Passwords do not match" error prompt. 2. The system returns to Step 4 and waits for inputs from the user. <u>AF-S5: The user enters a username that is already associated with an existing account</u> 1. The system displays "Username already in use" error prompt.

	2. The system returns to Step 4 and waits for inputs from the user.
	AF-S6: The user clicks the "Send code via SMS" button without entering a phone number
	1. The system displays "Please enter a valid phone number" error prompt.
	2. The system returns to Step 6 and waits for inputs from the user.
	AF-S7: The user inputs an invalid phone number
	1. The system displays "Please enter a valid phone number" error prompt.
	2. The system returns to Step 6 and waits for inputs from the user.
	AF-S7: The user inputs a phone number that is already associated with an existing account
	1. The system displays "Phone number already in use" error prompt.
	2. The system returns to Step 6 and waits for inputs from the user.
	AF-S8: The user clicks the "Verify OTP" button without entering the OTP
	1. The system displays "Please enter the OTP" error prompt.
	2. The system returns to Step 8 and waits for inputs from the user.
	AF-S8: The user fails to enter the OTP within the 60-second time limit
	1. The system allows the user to click the "Resend OTP" button.
	2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
	3. The system returns to Step 8 and waits for inputs from the user.
	AF-S9: The user enters the OTP incorrectly
	1. The system displays "OTP verification failed" error prompt.
	2. The system displays a "Resend OTP" button.
	3. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
	4. The system returns to Step 8 and waits for inputs from the user.
Exceptions:	EX1: The system loses internet connection
	1. The system displays the error message "Network connection lost."

	2. The system returns to the Landing Page.
	
	EX2: The user did not receive the OTP
	
	    1. After 60 seconds, the system displays a "Resend OTP" button.
	    2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
	    3. The system returns to Step 8 and waits for inputs from the user.

Includes:	REG-02: Create New Profile

Special Requirements:	For security, passwords must conform to a specific password policy:
	
	    1. Minimum length of 8 characters
	    2. At least 1 uppercase character
	    3. At least 1 lowercase character
	    4. At least 1 special character

Assumptions:	-
Notes and Issues:	-

6.3.2   REG-02: Create New Profile

Use Case ID:	REG-02		
Use Case Name:	Create New Profile		
Created By:	Jolene Chan	Last Updated By:	Jolene Chan
Date Created:	29 January 2024	Date Last Updated:	18 March 2024

Actor:	New User (Initiating Actor), Database
Description:	After registering for an account, the new user inputs their personal information (full name, gender, nationality, profession, home address, postal code, security question and answer) to create their profile.
Preconditions:	1. The user has navigated to the Create Profile Page of the application. 2. The account system is operational and able to process new user registrations. 3. The user is connected to the Internet.

Postconditions:	1. A new user account is successfully created in the system database. 2. The user is logged into the application. 3. The user is redirected to the Dashboard Page.
Priority:	High
Frequency of Use:	Low
Flow of Events:	1. After the user has successfully registered for a new account, the Create Profile Page is displayed. 2. The user enters their personal information (full name, gender, nationality, profession, home address, postal code, security question and answer) into the respective fields, then clicks the "Log In" button. 3. The system validates the provided information, then asks the user to upload an image for their profile picture. 4. The user uploads an image, then clicks the "Finish" button. 5. The system validates the file, then creates a new user account in the database. 6. The system redirects the user to the Dashboard Page.
Alternative Flows:	AF-S2: The user clicks the "Log In" button before completing all fields 1. The system displays "Please complete all fields" error prompt. 2. The system returns to Step 2 and waits for inputs from the user. AF-S4: The user clicks the "Finish" button without uploading a profile picture 1. The system continues to Step 5.
Exceptions:	EX1: The system loses internet connection 1. The system displays the error message "Network connection lost." 2. The system returns to the Landing Page.
Includes:	-
Special Requirements:	-
Assumptions:	-
Notes and Issues:	-

6.3.3 LOG-01: Login

Use Case ID:	LOG-01		
Use Case Name:	Login		
Created By:	Jolene Chan	Last Updated By:	Jolene Chan
Date Created:	30 January 2024	Date Last Updated:	18 March 2024

Actor:	User (Initiating Actor), Database
Description:	A user can log in to their account to access the features of the app by using their username and password and verifying their phone number.
Preconditions:	1. The user has navigated to the Login Page of the application. 2. The account system is operational and able to process login requests. 3. The user is connected to the Internet. 4. The user must have an existing account already registered in the system.
Postconditions:	1. The user is successfully authenticated and logged into the application. 2. The system displays the Dashboard Page.
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The user launches the application, the Landing Page is displayed. 2. The user clicks the "Get Started" button on the Landing Page, then is redirected to the Login Page. 3. The user inputs their username and password, then clicks the "Log In" button. 4. The system validates the provided information. If it matches an existing account, then the user passes the first step of authentication and is directed to the next. 5. The system extracts the phone number registered with this username from the database, then sends an OTP to the phone number. 6. The user enters the OTP, then clicks the "Verify OTP" button.

	7. The system validates the OTP. If the OTP is correct, then the user passes the second step of authentication.
	8. The system redirects the user to the Dashboard Page.
Alternative Flows:	AF-S3: The user clicks the "Log In" button before completing all fields
	1. The system displays "Please complete all fields" error prompt.
	2. The system returns to Step 3 and waits for inputs from the user.
	AF-S4: The user inputs a non-existent username
	1. The system displays "No account has been created with this username. Please sign up instead." error prompt.
	2. The system returns to the Login Page.
	AF-S4: The user inputs a wrong password
	1. The system displays "Incorrect password" error prompt.
	2. The system returns to Step 3 and waits for inputs from the user.
	AF-S6: The user clicks the "Verify OTP" button without entering the OTP
	1. The system displays "Please enter the OTP" error prompt.
	2. The system returns to Step 6 and waits for inputs from the user.
	AF-S6: The user fails to enter the OTP within the 60-second time limit
	1. The system allows the user to click the "Resend OTP" button.
	2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
	3. The system returns to Step 6 and waits for inputs from the user.
	AF-S7: The user enters the OTP incorrectly
	1. The system displays "OTP verification failed" error prompt.
	2. The system displays a "Resend OTP" button.
	3. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
	4. The system returns to Step 6 and waits for inputs from the user.
Exceptions:	EX1: The system loses internet connection
	1. The system displays the error message "Network connection lost."

	2. The system returns to the Landing Page.
	<u>EX2: The user did not receive the OTP</u>
	1. After 60 seconds, the system displays a "Resend OTP" button.
	2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
	3. The system returns to Step 6 and waits for inputs from the user.
Includes:	(Extends) PASS-01: Reset Password
Special Requirements:	The system must implement two-factor authentication for an added layer of security.
Assumptions:	-
Notes and Issues:	-

6.3.4 LOG-02: Logout

Use Case ID:	LOG-02		
Use Case Name:	Logout		
Created By:	Jolene Chan	Last Updated By:	Jolene Chan
Date Created:	1 February 2024	Date Last Updated:	18 March 2024

Actor:	User (Initiating Actor)
Description:	A user can log out of their account.
Preconditions:	1. The user has navigated to the Settings Page of the application.
	2. The account system is operational and able to process logout requests.
	3. The user is connected to the Internet.
	4. The user is already logged into their account.
Postconditions:	1. The user is logged out of their account.
	2. The system displays the Landing Page.
Priority:	High
Frequency of Use:	Medium

Flow of Events:	1. The user navigates to the Settings Page. 2. The user clicks the "Logout" button. 3. The system logs the user out of their account. 4. The system redirects the user to the Landing Page.
Alternative Flows:	-
Exceptions:	<u>EX1: The system loses internet connection</u> 1. The system displays the error message "Network connection lost." 2. The system returns to the Landing Page.
Includes:	-
Special Requirements:	-
Assumptions:	-
Notes and Issues:	-

6.3.5   PASS-01: Reset Password

Use Case ID:	PASS-01		
Use Case Name:	Reset Password		
Created By:	Jolene Chan	Last Updated By:	Jolene Chan
Date Created:	16 March 2024	Date Last Updated:	18 March 2024

Actor:	User (Initiating Actor), Database
Description:	A user can reset their password if they have forgotten it.
Preconditions:	1. The user has navigated to the Login Page of the application. 2. The account system is operational and able to process login requests. 3. The user is connected to the Internet. 4. The user must have an existing account already registered in the system.
Postconditions:	1. The user's account password is changed to their new password in the system database. 2. The user is logged into their account.

	3. The system displays the Landing Page.
Priority:	High
Frequency of Use:	Low
Flow of Events:	1. The user navigates to the Login Page. 2. The user clicks the "Forgot Password?" button. 3. The system redirects the user to the Forgot Password Page. 4. The user enters their phone number, then clicks the "Send code via SMS" button. 5. The system validates the provided information, then sends an OTP to the user's phone number. 6. The user enters the OTP, then clicks the "Verify OTP" button. 7. The system validates the OTP. If the OTP is correct, then the user passes the first step of authentication and is directed to the next. 8. The system extracts the security question registered with this phone number from the database, then redirects the user to the Security Question Page. 9. The user enters the answer to the security question, then clicks the "Submit Answer" button. 10. The system validates the answer. If the answer is correct, then the user passes the second step of authentication. 11. The system redirects the user to the Reset Password Page. 12. The user enters their new password and confirms their password, then clicks the "Reset Password" button. 13. The system validates the provided information, then redirects the user to the Dashboard Page.
Alternative Flows:	<u>AF-S4: The user clicks the "Send code via SMS" button without entering a phone number</u> 1. The system displays "Please enter a valid phone number" error prompt. 2. The system returns to Step 4 and waits for inputs from the user. <u>AF-S4: The user inputs an invalid phone number</u> 1. The system displays "Please enter a valid phone number" error prompt. 2. The system returns to Step 4 and waits for inputs from the user.

AF-S5: The user inputs a phone number that not associated with an existing account

1. The system displays "No account has been created with this phone number. Please sign up instead." error prompt.
2. The system returns to the Login Page.

AF-S6: The user clicks the "Verify OTP" button without entering the OTP

1. The system displays "Please enter the OTP" error prompt.
2. The system returns to Step 6 and waits for inputs from the user.

AF-S6: The user fails to enter the OTP within the 60-second time limit

1. The system allows the user to click the "Resend OTP" button.
2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
3. The system returns to Step 6 and waits for inputs from the user.

AF-S7: The user enters the OTP incorrectly

1. The system displays "OTP verification failed" error prompt.
2. The system displays a "Resend OTP" button.
3. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
4. The system returns to Step 6 and waits for inputs from the user.

AF-S9: The user clicks the "Submit Answer" button without entering an answer

1. The system displays "Please give and answer" error prompt.
2. The system returns to Step 9 and waits for inputs from the user.

AF-S10: The user inputs a wrong answer

1. The system displays "Incorrect answer" error prompt.
2. The system returns to Step 9 and waits for inputs from the user.

AF-S12: The user clicks the "Reset Password" button before completing all fields

1. The system displays "Please complete all fields" error prompt.
2. The system returns to Step 12 and waits for inputs from the user.

	AF-S12: The user enters a password that does not meet the strength requirements 1. The system displays "Please use a stronger password" error prompt. 2. The system returns to Step 12 and waits for inputs from the user. AF-S12: The password and confirm password fields do not match 1. The system displays "Passwords do not match" error prompt. 2. The system returns to Step 12 and waits for inputs from the user. AF-S13: The new password and old password are the same 1. The system displays "New password cannot be same as old password" error prompt. 2. The system returns to Step 12 and waits for inputs from the user.
Exceptions:	EX1: The system loses internet connection 1. The system displays the error message "Network connection lost." 2. The system returns to the Landing Page. EX2: The user did not receive the OTP 1. After 60 seconds, the system displays a "Resend OTP" button. 2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number. 3. The system returns to Step 6 and waits for inputs from the user.
Includes:	-
Special Requirements:	The system must implement two-factor authentication for an added layer of security. For security, passwords must conform to a specific requirement: 1. Minimum length of 8 characters 2. At least 1 uppercase character 3. At least 1 lowercase character 4. At least 1 special character
Assumptions:	-
Notes and Issues:	-

6.3.6 PASS-02: Change Password

Use Case ID:	PASS-02		
Use Case Name:	Change Password		
Created By:	Jolene Chan	Last Updated By:	Jolene Chan
Date Created:	16 March 2024	Date Last Updated:	18 March 2024

Actor:	User (Initiating Actor), Database
Description:	A user can change their password to a different password.
Preconditions:	1. The user has navigated to the Change Password Page of the application. 2. The user is connected to the Internet. 3. The user must have an existing account already registered in the system. 4. The user is already logged into their account.
Postconditions:	1. The user's account password is changed to their new password in the system database. 2. The system displays the Dashboard Page.
Priority:	High
Frequency of Use:	Low
Flow of Events:	1. The user navigates to the Settings Page. 2. The user clicks the "Change Password" button. 3. The system redirects the user to the Change Password Page. 4. The user enters their new password and confirms their password, then clicks the "Change Password" button. 5. The system validates the provided information, then redirects the user to the Dashboard Page.
Alternative Flows:	AF-S4: The user clicks the "Change Password" button before completing all fields 3. The system displays "Please complete all fields" error prompt. 4. The system returns to Step 4 and waits for inputs from the user.

	AF-S4: The user enters a password that does not meet the strength requirements
	3. The system displays "Please use a stronger password" error prompt.
	4. The system returns to Step 4 and waits for inputs from the user.
	AF-S4: The password and confirm password fields do not match
	3. The system displays "Passwords do not match" error prompt.
	4. The system returns to Step 4 and waits for inputs from the user.
	AF-S5: The new password and old password are the same
	1. The system displays "New password cannot be same as old password" error prompt.
	2. The system returns to Step 4 and waits for inputs from the user.
Exceptions:	EX1: The system loses internet connection
	1. The system displays the error message "Network connection lost."
	2. The system returns to the Landing Page.
Includes:	-
Special Requirements:	For security, passwords must conform to a specific requirement:
	1. Minimum length of 8 characters
	2. At least 1 uppercase character
	3. At least 1 lowercase character
	4. At least 1 special character
Assumptions:	-
Notes and Issues:	-

6.3.7 PHN-01: Change Phone Number

Use Case ID:	PHN-01		
Use Case Name:	Change Phone Number		
Created By:	Jolene Chan	Last Updated By:	Jolene Chan
Date Created:	16 March 2024	Date Last Updated:	18 March 2024

Actor:	User (Initiating Actor), Database
Description:	A user can change their phone number if they have switched to a new phone number.
Preconditions:	1. The user has navigated to the Settings Page of the application. 2. The user is connected to the Internet. 3. The user must have an existing account already registered in the system. 4. The user is already logged into their account.
Postconditions:	1. The user's account phone number is changed to their new phone number in the system database. 2. The system displays the Dashboard Page.
Priority:	High
Frequency of Use:	Low
Flow of Events:	1. The user navigates to the Settings Page. 2. The user clicks the "Change Phone Number" button. 3. The system redirects the user to the Change Phone Number Page. 4. The user enters their new phone number, then clicks the "Save" button. 5. The system validates the provided information, then redirects the user to the Verify Phone Number Page. 6. The user clicks the "Send code via SMS" button. 7. The system validates the provided information, then sends an OTP to the user's phone number. 8. The user enters the OTP, then clicks the "Verify OTP" button. 9. The system validates the OTP, then redirects the user to the Dashboard Page.
Alternative Flows:	AF-S4: The user clicks the "Send code via SMS" button without entering a phone number 1. The system displays "Please enter a valid phone number" error prompt. 2. The system returns to Step 4 and waits for inputs from the user. AF-S4: The user inputs an invalid phone number

1. The system displays "Please enter a valid phone number" error prompt.
2. The system returns to Step 4 and waits for inputs from the user.

AF-S5: The user inputs a phone number that not associated with an existing account

1. The system displays "No account has been created with this phone number. Please sign up instead." error prompt.
2. The system returns to the Login Page.

AF-S6: The user clicks the "Verify OTP" button without entering the OTP

1. The system displays "Please enter the OTP" error prompt.
2. The system returns to Step 6 and waits for inputs from the user.

AF-S6: The user fails to enter the OTP within the 60-second time limit

1. The system allows the user to click the "Resend OTP" button.
2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
3. The system returns to Step 6 and waits for inputs from the user.

AF-S7: The user enters the OTP incorrectly

1. The system displays "OTP verification failed" error prompt.
2. The system displays a "Resend OTP" button.
3. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
4. The system returns to Step 6 and waits for inputs from the user.

AF-S9: The user clicks the "Submit Answer" button without entering an answer

1. The system displays "Please give and answer" error prompt.
2. The system returns to Step 9 and waits for inputs from the user.

AF-S10: The user inputs a wrong answer

1. The system displays "Incorrect answer" error prompt.
2. The system returns to Step 9 and waits for inputs from the user.

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AF-S12: The user clicks the "Reset Password" button before completing all fields

1. The system displays "Please complete all fields" error prompt.
2. The system returns to Step 12 and waits for inputs from the user.

AF-S12: The user enters a password that does not meet the strength requirements

1. The system displays "Please use a stronger password" error prompt.
2. The system returns to Step 12 and waits for inputs from the user.

AF-S12: The password and confirm password fields do not match

1. The system displays "Passwords do not match" error prompt.
2. The system returns to Step 12 and waits for inputs from the user.

AF-S13: The new password and old password are the same

1. The system displays "New password cannot be same as old password" error prompt.
2. The system returns to Step 12 and waits for inputs from the user.

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<tr><td>Exceptions:</td><td>

EX1: The system loses internet connection

1. The system displays the error message "Network connection lost."
2. The system returns to the Landing Page.

EX2: The user did not receive the OTP

1. After 60 seconds, the system displays a "Resend OTP" button.
2. The user clicks the "Resend OTP" button, then the system sends another OTP to the user's phone number.
3. The system returns to Step 6 and waits for inputs from the user.

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<tr><td>Includes:</td><td>-</td></tr>
<tr><td>Special Requirements:</td><td>

The system must implement two-factor authentication for an added layer of security.

For security, passwords must conform to a specific requirement:

5. Minimum length of 8 characters
6. At least 1 uppercase character
7. At least 1 lowercase character

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	8. At least 1 special character
Assumptions:	-
Notes and Issues:	-

6.3.8 PRF-01: View and Edit Profile

Use Case ID:	PRF-01		
Use Case Name:	View and Edit Profile		
Created By:	Aaron Chen	Last Updated By:	Jolene Chan
Date Created:	4 February 2024	Date Last Updated:	18 March 2024

Actor:	User (Initiating Actor), Database
Description:	A user can view and edit their personal information on their profile.
Preconditions:	1. The user has navigated to the Dashboard Page or Settings Page of the application. 2. The user is connected to the Internet. 3. The user must have an existing account already registered in the system. 4. The user is already logged into their account.
Postconditions:	1. The system updates the user's profile to reflect the changes. 2. The changes are saved into the database.
Priority:	High
Frequency of Use:	Medium
Flow of Events:	1. The user navigates to the Dashboard Page or the Settings Page. 2. The user clicks on their profile picture or the "Edit Profile" button. 3. The system redirects the user to the Profile Page. 4. The user can view their profile information and edit their profile information. 5. The user enters their new profile information, then clicks the "Save" button. 6. The system validates the provided information, then updates the information in the database to reflect the changes.

Alternative Flows:	AF-S5: The user clicks the "Save" button before completing all fields 1. The system displays "Please complete all fields" error prompt. 2. The system returns to Step 5 and waits for inputs from the user.
Exceptions:	EX1: The system loses internet connection 1. The system displays the error message "Network connection lost." 2. The system returns to the Landing Page.
Includes:	-
Special Requirements:	-
Assumptions:	-
Notes and Issues:	-

6.3.9   CUR-01: Currency Converter

Use Case ID:	CUR-01		
Use Case Name:	Currency Converter		
Created By:	Banerjee Mohor	Last Updated By:	Jolene Chan
Date Created:	4 February 2024	Date Last Updated:	18 March 2024

Actor:	User (Initiating Actor), Currency Exchange API
Description:	A user can input an amount to convert from SGD to the currency of their home country, or vice versa, and view the current exchange rate.
Preconditions:	1. The user has navigated to the Dashboard Page of the application. 2. The user is connected to the Internet. 3. The user must have an existing account already registered in the system. 4. The user is already logged into their account.
Postconditions:	1. The system displays the converted amount and the current market exchange rate.
Priority:	High
Frequency of Use:	High

Flow of Events:	1. The user navigates to the Dashboard Page.
	2. The user clicks on the Currency Converter widget.
	3. The system redirects the user to the Currency Converter Page.
	4. The system displays SGD as the From currency and the user's home country currency as the To currency by default.
	5. The user can click "Switch" button to swap the From and To currency.
	6. The user enters an amount to convert, then clicks the "Convert" button.
	7. The system validates the provided information, then displays the converted amount and current exchange rate.
Alternative Flows:	AF-S6: The user clicks the "Convert" button without entering an amount
	1. The system displays "Please enter an amount to convert" error prompt.
	2. The system returns to Step 6 and waits for inputs from the user.
	AF-S6: The user enters zero or a negative number
	1. The system displays "Please enter a positive number to convert" error prompt.
	2. The system returns to Step 6 and waits for inputs from the user.
Exceptions:	EX1: The system loses internet connection
	1. The system displays the error message "Network connection lost."
	2. The system returns to the Landing Page.
Includes:	-
Special Requirements:	The system must fetch real-time currency exchange rates from a reliable financial data API.
Assumptions:	-
Notes and Issues:	-

6.3.10 NEWS-01: News Viewer

Use Case ID:	NEWS-01

Use Case Name:	News Viewer		
Created By:	Banerjee Mohor	Last Updated By:	Jolene Chan
Date Created:	1 February 2024	Date Last Updated:	19 March 2024

Actor:	User (Initiating Actor), News API
Description:	A user can view the latest news from around the world, Singapore, or their home country.
Preconditions:	1. The user has navigated to the Dashboard Page of the application. 2. The user is connected to the Internet. 3. The user must have an existing account already registered in the system. 4. The user is already logged into their account.
Postconditions:	1. The system displays news headlines from around the world, Singapore, or the user's home country, depending on the user's choice. 2. The system displays in reverse-chronological order with the latest news at the top. 3. The user can select a news article to read.
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The user navigates to the Dashboard Page. 2. The user clicks on the News Viewer widget. 3. The system redirects the user to the News Viewer Page. 4. The user selects the location (World, Singapore or Home Country) from a dropdown list. 5. The system validates the user's choice, then displays the news headlines from that location in reverse-chronological order. 6. The user clicks on a news headline. 7. The system redirects the user to the news article.
Alternative Flows:	-
Exceptions:	EX1: The system loses internet connection 1. The system displays the error message "Network connection lost."

	2. The system returns to the Landing Page.
Includes:	-
Special Requirements:	The system must fetch real-time news headlines from a reliable news API.
Assumptions:	-
Notes and Issues:	-

6.3.11 MAP-01: Navigation

Use Case ID:	MAP-01		
Use Case Name:	Navigation		
Created By:	Banerjee Mohor	Last Updated By:	Jolene Chan
Date Created:	2 February 2024	Date Last Updated:	19 March 2024

Actor:	User (Initiating Actor), Places API, Maps API
Description:	A user can search for transits routes from a starting location to their destination.
Preconditions:	1. The user has navigated to the Dashboard Page of the application. 2. The user is connected to the Internet. 3. The user must have an existing account already registered in the system. 4. The user is already logged into their account.
Postconditions:	1. The system displays the travel route from the user's chosen start location to destination on a map. 2. The system displays the details of the route, including the mode of transport (walk, MRT, bus etc.), distance and duration.
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The user navigates to the Dashboard Page. 2. The user clicks on the Navigation widget. 3. The system redirects the user to the Navigation Page. 4. The system displays a map of the user's current location.

	5. The user enters the start location and destination, then clicks the "Find Route" button.
	6. The system validates the provided information, then displays the travel route from the start location to the destination on the map.
	7. The system displays the details of the route, including mode of transport (walk, MRT, bus etc.), distance and duration.
Alternative Flows:	AF-S4: Geolocation tracking is disabled in the user's device settings
	1. The system displays a map of Singapore.
	2. The system continues to Step 5.
	AF-S5: The user clicks on the "Use Current Location" button
	1. The system uses geolocation tracking to determine the user's current location.
	2. The system uses the user's current location as the start location.
	3. The system returns to Step 5 and waits for inputs from the user.
	AF-S5: The user clicks on the "Find Route" button without entering a starting location or a destination
	1. The system displays "Please complete all fields" error prompt.
	2. The system returns to Step 5 and waits for inputs from the user.
	AF-S6: The user enters a non-existent address
	1. The system displays "Please enter a valid address" error prompt.
	2. The system returns to Step 5 and waits for inputs from the user.
Exceptions:	EX1: The system loses internet connection
	1. The system displays the error message "Network connection lost."
	2. The system returns to the Landing Page.
	EX2: The user clicks on the "Use Current Location" button, but geolocation tracking is disabled in the user's device settings
	1. The system displays "Please enable geolocation tracking on your device" error prompt.
	2. The system returns to Step 5 and waits for inputs from the user.

Includes:	-
Special Requirements:	The system must fetch real-time location data from a reliable map API.
Assumptions:	-
Notes and Issues:	-

6.3.12 MAP-02: Amenities Finder

Use Case ID:	MAP-02		
Use Case Name:	Nearest Amenities Finder		
Created By:	Banerjee Mohor	Last Updated By:	Jolene Chan
Date Created:	1 February 2024	Date Last Updated:	19 March 2024

Actor:	User (Initiating Actor), Places API, Maps API
Description:	The user can search for the nearest amenities (MRT stations, bus stops, shops, eateries, hospitals) to their current location.
Preconditions:	1. The user has navigated to the Dashboard Page of the application. 2. The user is connected to the Internet. 3. The user has enabled geolocation tracking on their device. 4. The user must have an existing account already registered in the system. 5. The user is already logged into their account.
Postconditions:	1. The system displays the locations of the chosen amenity nearest to the user's current location on a map. 2. The system displays the details of the amenities, including the address, opening hours and description.
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The user navigates to the Dashboard Page. 2. The user clicks on the Nearest Amenities Finder widget. 3. The system redirects the user to the Amenities Page.

	4. The user selects an amenity type (MRT station, bus stops, shops, eateries, hospitals), then clicks the "Find Nearest Amenities" button. 5. The system displays a map of the user's current location and displays the locations of the amenities. 6. The system displays the details of the amenities, including the address, opening hours and description.
Alternative Flows:	<u>AF-S4: The user clicks the "Find Nearest Amenities" button without selecting an amenity type</u> 1. The system displays "Please choose an amenity" error prompt. 2. The system returns to Step 4 and waits for inputs from the user.
Exceptions:	<u>EX1: The system loses internet connection</u> 1. The system displays the error message "Network connection lost." 2. The system returns to the Landing Page. <u>EX2: Geolocation tracking is disabled in the user's device settings</u> 1. The system displays "Please enable geolocation tracking on your device" error prompt. 2. The system returns to Step 4 and waits for inputs from the user.
Includes:	-
Special Requirements:	The system must fetch real-time location data from a reliable map API.
Assumptions:	-
Notes and Issues:	-

6.3.13 AI-01: AI Chatbot

Use Case ID:	AI-01		
Use Case Name:	AI Chatbot		
Created By:	Banerjee Mohor	Last Updated By:	Jolene Chan
Date Created:	4 February 2024	Date Last Updated:	19 March 2024

Actor:	User (Initiating Actor), AI Chatbot API
Description:	The user can interact with an AI-powered chatbot by asking questions and uploading images for analysis, where they can receive immediate automated responses.
Preconditions:	1. The user has navigated to the Dashboard Page of the application. 2. The user is connected to the Internet. 3. The user must have an existing account already registered in the system. 4. The user is already logged into their account.
Postconditions:	1. The system displays a response from the AI chatbot.
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The user navigates to the Dashboard Page. 2. The user clicks on the Chatbot widget. 3. The system redirects the user to the Chatbot Page. 4. The user enters a question or uploads an image and clicks the send button. 5. The AI processes the input, then the system displays its response. 6. The user can continue asking more questions or upload additional images.
Alternative Flows:	-
Exceptions:	EX1: The system loses internet connection 1. The system displays the error message "Network connection lost." 2. The system returns to the Landing Page. EX2: The user asks a question that the AI cannot understand or answer 1. The system displays "I'm not sure how to answer that. Can you ask in a different way or try a different question?" error prompt. EX3: The uploaded image is not in a supported format or is too large

	The system displays "Unsupported image format or image too large. Please upload a different image." error prompt.
Includes:	-
Special Requirements:	-
Assumptions:	-
Notes and Issues:	Considerations for user privacy and data handling policies for uploaded images and conversation logs should be addressed.

Appendix A: Data Dictionary

Term	Definition
Cross Border	The name of the web application designed to facilitate access to essential services and information tailored to the unique needs of migrant workers in Singapore
System	Refers to the entire Cross Border web application, including its front-end interface and back-end services.
User	An individual who has registered and logged into the Cross Border web application. Users have access to full functionalities including personalized information and services.
One-Time Password (OTP)	An automatically generated alphanumeric string that authenticates the user for a login session.
Amenity	A desirable feature or facility such as MRT stations, bus stops, eateries, shops, and hospitals.
Profile	A list of user profile details such as name, gender, age, home country, profession, area of residence in Singapore and profile picture.
Password	A string of characters (alphabets, numbers, special characters) that is used to login to the account and protect it from unauthorized users.
Chronological	Following the order which they occurred.
Transit Route	Mode of transport and the route which they take between a starting point and end point.
Currency Exchange Rate	The rate at which one currency will be exchanged for another currency.
Geolocation Tracking	The ability to track a device's whereabouts using GPS, cell phone towers, Wi-Fi access points or a combination of these.