

**NANYANG  
TECHNOLOGICAL  
UNIVERSITY**  
**SINGAPORE**

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**SC2006: Software Engineering**

**Tutorial Class: SCCA**

**Group: Missing1**



**Software Requirements Specification**

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## **Lab 2 Deliverables : Requirements Analysis**

### **1. Refined Use Case Models**

1.1. Refined Use Case Diagram

1.2. Refined Use Case Description

### **2. Class Diagram of Entity Classes**

### **3. Key Boundary, Control, and Entity Classes**

### **4. Sequence Diagrams of some Use Cases**

4.1. Login and Register Sequence Diagram

4.2. SearchTrail and ViewTrail Sequence Diagram

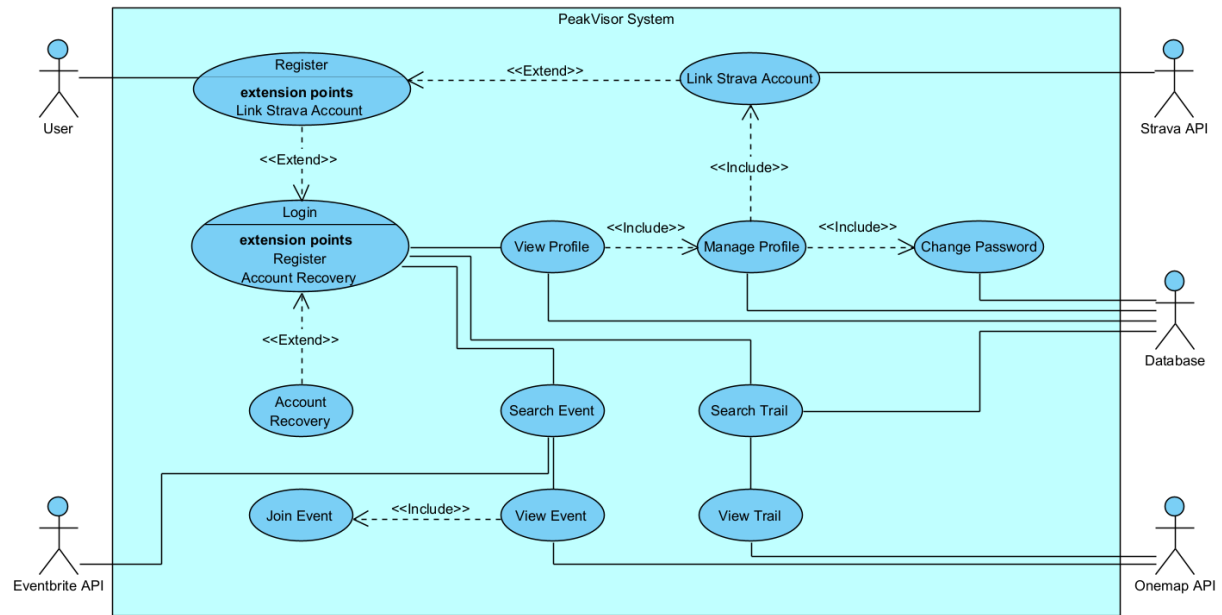
4.3. SearchEvent Sequence Diagram

4.4. ViewEvent and JoinEvent Sequence Diagram

### **5. Initial Dialog Map (State Machine Diagram)**

# 1. Refined Use Case Models

## 1.1. Refined Use Case Diagram



## 1.2. Refined Use Case Description

Use Case ID:	001		
Use Case Name:	Register		
Created By:	Jeannie Wong	Last Updated By:	Ben
Date Created:	30 January 2024	Date Last Updated:	5 February 2024

Actor:	User (Initiating Actor), System
Description:	Users visiting the website for the first time can register for a new account.
Preconditions:	The user must not have a user account tagged to their registering email address prior to the registration
Postconditions:	<p>The user has successfully registered for a user account in the website with a unique email address and password and their new user account is added into the system database.</p> <p><b>OR</b></p> <p>The user is notified of the reason(s) why the registration of the account is unsuccessful.</p>
Priority:	High

Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. On the landing page, the User clicks on the Login button.</li> <li>2. The System will direct the user to the login page.</li> <li>3. A new User will be redirected to the Registration Page 1 to register for a new user account.</li> <li>4. The User will enter a Name and valid email address for their new user account in the respective text fields.</li> <li>5. The User will click "Get OTP".</li> <li>6. The System queries the database to check if an identical email address already exists.</li> <li>7. The System will automatically generate a One-Time Password (OTP), which is sent to the User's email address.</li> <li>8. The User enters OTP into the OTP field and clicks Next.</li> <li>9. The System verifies the correctness of the OTP.</li> <li>10. The User clicks Next and gets redirected to Registration Page 2.</li> <li>11. The User will enter a valid Password into Password Field.</li> <li>12. The System will verify if the password satisfies all the requirements.</li> <li>13. The User will re-enter the password to confirm their password.</li> <li>14. The User will click on the "Sign Up" button to complete the User Account Registration.</li> <li>15. Upon verification, the System will store the new user account in the database securely.</li> <li>16. Once registration is successful, the System will automatically help the User to log into their account.</li> </ol>

Alternative Flows:	<p><u>AF-S5: The user enters an email address that has already been registered.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message “Email address has already been registered, please enter another email address.” under the email address field.</li> <li>2. The system will return to Step 5 and wait for the user to enter another email address.</li> </ol> <p><u>AF-S8: The user inputs an incorrect OTP</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message “Incorrect OTP! Please try again.” at the top of the registration form.</li> <li>2. The system will re-generate a new OTP and send it to the user’s mobile phone number or email address.</li> <li>3. The system will return to step 8 and wait for the user to enter the correct OTP.</li> </ol> <p><u>AF-S11: The user enters a password that does not satisfy all the requirements.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message “Password does not meet all the requirements, please try again!” under the password field.</li> <li>2. The System will return to Step 11 and wait for the user to enter another password.</li> </ol> <p><u>AF-S12: The user enters a mismatched password.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message “Passwords do not match, please try again!” below the password field.</li> <li>2. The system will return to Step 12 and wait for the user to re-enter the password.</li> </ol> <p><u>AF-S14: The user did not complete all of the input fields.</u></p> <ol style="list-style-type: none"> <li>1. When the user clicks on the “Sign Up” button, the system will display the message “Please check that all the fields are filled up.” at the top of the registration form.</li> <li>2. The system will return to Step 14 and wait for the user to complete all remaining fields and click on the “Sign Up” button.</li> </ol>
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Exceptions:	<p><u>EX-1: The user did not receive the OTP in his email.</u></p> <ol style="list-style-type: none"> <li>1. The user can click on the “Resend OTP” button, made available after 1 minute.</li> <li>2. Once the user clicks on the “Resend OTP” button, a new OTP will be generated.</li> <li>3. The system will return to Step 8 and wait for the user to enter OTP again.</li> </ol> <p><u>EX-2: The user requests for more than 3 OTP requests.</u></p> <ol style="list-style-type: none"> <li>1. The fourth time the user requests to generate a new OTP, the system will generate the message “Please try again with a different email.” at the top of the registration page.</li> <li>2. The system will return to Step 4 and wait for the user to enter a different email.</li> </ol>
Extends:	Login
Special Requirements:	N/A
Assumptions:	The User has Internet access during this process.
Notes and Issues:	N/A

Use Case ID:	002		
Use Case Name:	Login		
Created By:	Jeannie Wong	Last Updated By:	Brendan
Date Created:	3 February 2024	Date Last Updated:	5 February 2024

Actor:	User (Initiating Actor), System
Description:	The User can login to his/her account with the correct credentials that he/she has entered when he/she registered for an account.
Preconditions:	<ol style="list-style-type: none"> <li>1. The user must be connected to the Internet.</li> <li>2. The user must have a registered account.</li> </ol>
Postconditions:	<p>The user has successfully logged into his/her own account.</p> <p><b>OR</b></p> <p>The user is notified of the reason(s) why he/she is unable to login into his/her account. For instance, the user has entered the wrong email address or password.</p>
Priority:	High
Frequency of Use:	High



Flow of Events:	<ol style="list-style-type: none"> <li>1. On the landing page, the user may click on the Login button, the System redirects the user to the login page.</li> <li>2. On the login page, the System prompts the User to enter their email address and password.</li> <li>3. The User will enter their email address and password that they registered their account with.</li> <li>4. The User then clicks on the "Sign In" button to login into their user account.</li> <li>5. The System will verify the login credentials (email address and password) provided with the database.</li> <li>6. If the email address and password entered are correct and verified, the User will be directed to their account on the My Hiking Profile page.</li> </ol>
Alternative Flows:	<p><u>AF-S4: The user did not fill up all the fields.</u></p> <ol style="list-style-type: none"> <li>1. The System will display the message "Please ensure that all fields are filled."</li> <li>2. The System will prompt the User to fill all required fields.</li> <li>3. The System will return to Step 3 and wait for the user to fill all the fields appropriately.</li> </ol> <p><u>AF-S5: The user has entered an incorrect email address or password.</u></p> <ol style="list-style-type: none"> <li>1. When the user clicks on the "Login" button, the system will display the message "Invalid email address and/or password!" at the top of the login page.</li> <li>2. The system will then return to Step 3 and wait for the user to fill up all the fields again.</li> </ol>

Exceptions:	<p><u>EX-1: The user has entered an incorrect email address and password more than 3 times.</u></p> <ol style="list-style-type: none"> <li>1. After 3 attempts, the System will display the message “Please try again after 10 minutes.”</li> <li>2. The System will return to Step 3 after 10 minutes elapses.</li> </ol> <p><u>EX-2 : The user has forgotten their email address or password.</u></p> <ol style="list-style-type: none"> <li>1. The User may click on “Forgot Password” that is situated below the login button.</li> <li>2. The User may then recover his/her account using the extended use case AccountRecovery.</li> </ol>
Special Requirements:	N/A
Assumptions:	The User has Internet access during this process.
Notes and Issues:	N/A

Use Case ID:	003		
Use Case Name:	AccountRecovery		
Created By:	Brendan	Last Updated By:	Brendan
Date Created:	1 February 2024	Date Last Updated:	1 February 2024

Actor:	User (Initiating Actor), System
Description:	Users who have lost either their username or password may request to recover their account.
Preconditions:	<ol style="list-style-type: none"> <li>1. The User must have a user account prior to recovery.</li> <li>2. The User must have a valid email address that is linked to their user account.</li> </ol>
Postconditions:	<p>The System has successfully issued an account recovery email to the User's email address.</p> <p><b>OR</b></p> <p>The User is notified of the reason(s) why the recovery of the account is unsuccessful.</p>
Priority:	High
Frequency of Use:	Low
Flow of Events:	<ol style="list-style-type: none"> <li>1. On the landing page, the User clicks on the "Login" button and the System directs the User to the login page.</li> </ol>

	<ol style="list-style-type: none"> <li>2. The System prompts the User to enter their username and password to login.</li> <li>3. If the User has forgotten their password, they may click on the “Forget Password” button.</li> <li>4. The System directs the User to the “Account Recovery” page and prompts them to type in a valid email address.</li> <li>5. The User inputs a valid email address linked to their user account in the displayed field.</li> <li>6. The User clicks on the “Recover Account” button.</li> <li>7. The System sends a request to the Database and checks if the email address exists.</li> <li>8. Upon verification, the System sends a recovery email to the corresponding email address.</li> <li>9. The System informs the User that a recovery email has been sent successfully to their email address via a message on the “Account Recovery” page.</li> </ol>
Alternative Flows:	<p><u>AF-S7: The email address does not exist in the database.</u></p> <ol style="list-style-type: none"> <li>1. The System informs the User that the email address does not exist in the database and prompts them to try again via a message on the “Account Recovery” page.</li> <li>2. The System returns to Step 5 and waits for the User to enter a valid email address.</li> </ol>
Exceptions:	N/A
Extends:	Login
Special Requirements:	N/A
Assumptions:	The User has Internet access during the process.
Notes and Issues:	N/A

Use Case ID:	004		
Use Case Name:	ViewProfile		
Created By:	Jeannie Wong	Last Updated By:	Jeannie Wong
Date Created:	4 February 2024	Date Last Updated:	6 February 2024

Actor:	User (Initiating Actor), System
Description:	The user should be able to click on the Profile and ViewProfile option in the dropdown menu at the top right hand corner of the page and view his/her profile contents.
Preconditions:	<ol style="list-style-type: none"> <li>1. The user must be logged into his/her user account.</li> <li>2. The user must have a Strava account that is linked to his/her user account.</li> </ol>
Postconditions:	<p>The System displays the contents of the user's profile on My Hiking Profile Page.</p> <p><b>OR</b></p> <p>The System notifies the user of the reason(s) why it is unable to display the contents of the user's profile.</p>
Priority:	Medium
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. On the All Trails Events Page, the user can click on the dropdown menu at the top right hand corner of the page.</li> </ol>

	<ol style="list-style-type: none"> <li>2. The dropdown menu will list a few pages such as Profile, Settings and Logout.</li> <li>3. The user can click on Profile and then ViewProfile.</li> <li>4. The System will redirect the user to the My Hiking Profile Page.</li> </ol>
Alternative Flows:	<p><u>AF-S4: The user has not linked his/her Strava account to his/her user account.</u></p> <ol style="list-style-type: none"> <li>1. The System will display the message “Looks like you are not connected to Strava yet. Link to your Strava account to begin tracking your activities.”</li> <li>2. The System will prompt the user to link his/her user account to his/her Strava account.</li> <li>3. The System will then return to Step 1 again.</li> </ol>
Exceptions:	N/A
Special Requirements:	N/A
Assumptions:	The User has Internet Access during the process.
Notes and Issues:	N/A

Use Case ID:	005		
Use Case Name:	ManageProfile		
Created By:	Brendan	Last Updated By:	Brendan
Date Created:	1 February 2024	Date Last Updated:	4 February 2024

Actor:	User (Initiating Actor), System
Description:	The User may edit and update their account details on the Account Settings page.
Preconditions:	The User must have logged in to their user account.
Postconditions:	The User has successfully updated their account details.
Priority:	Low
Frequency of Use:	Low
Flow of Events:	<ol style="list-style-type: none"> <li>1. On the profile page, the User clicks on the "Edit Profile" button.</li> <li>2. The System directs the User to the "Edit Profile" page.</li> <li>3. The User may change their username, email address, and/or other account details in the appropriate fields.</li> <li>4. The User clicks on the "Save" button.</li> <li>5. The System sends an update request to the database to update the User's profile records accordingly.</li> <li>6. The System directs the User back to their profile page and informs them that the operation was successful.</li> </ol>

Alternative Flows:	<p><u>AF-S4: The User enters a username and/or email address that does not satisfy the requirements.</u></p> <ol style="list-style-type: none"> <li>1. The System will display the message “This field does not meet all the requirements, please try again!” under the appropriate field.</li> <li>2. The System will then return to Step 3.</li> </ol> <p><u>AF-S4: The User has left at least one of the input fields empty.</u></p> <ol style="list-style-type: none"> <li>1. The System will display the message “Please check that all the fields are filled up.” at the top of the page.</li> <li>2. The System will then return to Step 3.</li> </ol>
Exceptions:	N/A
Includes:	ChangePassword, LinkStravaAccount
Special Requirements:	N/A
Assumptions:	The User has Internet access during the process.
Notes and Issues:	N/A



Use Case ID:	006		
Use Case Name:	ChangePassword		
Created By:	Jeannie Wong	Last Updated By:	Jeannie Wong
Date Created:	3 February 2024	Date Last Updated:	3 February 2024

Actor:	User (Initiating Actor), System
Description:	The user can change his/her password on the account settings page.
Preconditions:	<p>The user must be logged into his/her user account.</p> <p><b>OR</b></p> <p>The user must be attempting to recover his/her account.</p>
Postconditions:	The user changes his/her password successfully, updating his/her account details.
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. On the Account Settings page, the user will click on the password field.</li> <li>2. The user then needs to enter a new password that satisfies the password requirements.</li> <li>3. The system will prompt the user to re-enter their password again.</li> <li>4. The user then clicks on the edit button to save the changes made to the password.</li> <li>5. The user then clicks on the update button to update his/her account details.</li> </ol>

Alternative Flows:	<p><u>AF-S2: The user enters a new password that does not satisfy all the requirements.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message "Password does not meet all the requirements, please try again." under the password field.</li> <li>2. The system will then return to Step 2 and wait for the user to enter another password.</li> </ol> <p><u>AF-S3: The user enters a mismatched password.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message "Passwords do not match, please try again." below the password field.</li> <li>2. The system will then return to Step 3 and wait for the user to enter the password again.</li> </ol> <p><u>AF-S4: The user forgets to click on the edit button to save changes made to the password.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message "Please remember to click on the edit button to save any changes."</li> <li>2. The system will then return to Step 2 and wait for the user to enter the password again.</li> </ol> <p><u>AF-S5: The user forgets to click on the update button to update his/her account details.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message "Please remember to click on the update button to save any changes."</li> <li>2. The system will then return to Step 2 and wait for the user to enter the password again.</li> </ol>
Exceptions:	N/A
Includes:	N/A
Special Requirements:	N/A
Assumptions:	N/A
Notes and Issues:	N/A

Use Case ID:	007		
Use Case Name:	SearchTrail		
Created By:	Jeannie Wong	Last Updated By:	Jeannie Wong
Date Created:	3 February 2024	Date Last Updated:	6 February 2024

Actor:	User (Initiating Actor), System
Description:	The user can search for available trails in Singapore for him/her to hike at.
Preconditions:	The user must be connected to the Internet.
Postconditions:	<ol style="list-style-type: none"> <li>1. The user should be able to search for trails in Singapore he/her wants to hike at.</li> <li>2. The system should be able to display a list of available trails for hiking in Singapore.</li> </ol>
Priority:	Low
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. On the All Trails Page, the user can click on the search bar.</li> <li>2. The user can enter a search term in the search bar and click on "Go" to look for the trail he/she is interested in.</li> <li>3. After the user enters his/her search term, the system queries the database to return a list of records that match the query.</li> </ol>

	4. The system displays the trail that the user has searched for.
Alternative Flows:	<p><u>AF-S3: The database does not return any record regarding the search term for the trail.</u></p> <ol style="list-style-type: none"> <li>1. The system will display the message “Your search returned no results.” on the All Trails Page.</li> <li>2. The system will then return to Step 1 and wait for the user to enter a new search query.</li> </ol>
Exceptions:	N/A
Special Requirements:	N/A
Assumptions:	N/A
Notes and Issues:	N/A

Use Case ID:	008		
Use Case Name:	ViewTrail		
Created By:	Jeannie Wong	Last Updated By:	Jeannie Wong
Date Created:	3 February 2024	Date Last Updated:	3 February 2024

Actor:	User (Initiating Actor), System
Description:	The user may click on a trail to view its contents.
Preconditions:	The user must be connected to the Internet.
Postconditions:	The system displays the information for the trail that the user has searched for and clicked on.
Priority:	Low
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. The user uses the extended use case SearchTrail to have the page display the trail specified.</li> <li>2. The user clicks on his/her desired trail and views its content.</li> </ol>
Alternative Flows:	N/A
Exceptions:	N/A

Special Requirements:	N/A
Assumptions:	N/A
Notes and Issues:	N/A

Use Case ID:	009		
Use Case Name:	SearchEvent		
Created By:	Brendan	Last Updated By:	Brendan
Date Created:	3 February 2024	Date Last Updated:	3 February 2024

Actor:	User (Initiating Actor), System
Description:	The User may search for hiking events on the website.
Preconditions:	The User must be logged in to their user account.
Postconditions:	The System returns a list of hiking events based on the User's search query.
Priority:	Low
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. The User clicks on the search bar on the Events page.</li> <li>2. The User may enter a search term in the search bar to look for their desired events.</li> <li>3. After the User enters their search term, the System queries the database to return a list of records corresponding to the desired event.</li> <li>4. The System displays the list of search results on the Events page.</li> </ol>
Alternative Flows:	<u>AF-S3: The database does not return any record regarding the search term for the event.</u>

	<ol style="list-style-type: none"> <li>1. The System displays the message “Your search returned no results” on the Events page.</li> <li>2. The System returns to Step 1 and waits for the User to enter a new search query.</li> </ol>
Exceptions:	N/A
Special Requirements:	N/A
Assumptions:	N/A
Notes and Issues:	N/A



Use Case ID:	010		
Use Case Name:	ViewEvent		
Created By:	Brendan	Last Updated By:	Brendan
Date Created:	3 February 2024	Date Last Updated:	4 February 2024

Actor:	User (Initiating Actor), System
Description:	The User may click on a hiking event to view its contents.
Preconditions:	The User must have logged in to their user account.
Postconditions:	The System displays the information for the event that the User has clicked on and prompts the User to perform an action.
Priority:	Low
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. The User uses the extended use case Search Event to have the page display a list of hiking events.</li> <li>2. The User clicks on their desired event.</li> <li>3. The System displays the User's selected event.</li> <li>4. The System prompts the User to click on the desired button: JOIN, or CANCEL.</li> <li>5. If the User selects JOIN, then they use the extended use case Join Event to sign up for the event.</li> <li>6. If the User selects CANCEL, then the System returns to the "Events" page.</li> </ol>

Alternative Flows:	N/A
Exceptions:	N/A
Includes:	JoinEvent
Special Requirements:	N/A
Assumptions:	The User has Internet access during the process.
Notes and Issues:	N/A

Use Case ID:	011		
Use Case Name:	JoinEvent		
Created By:	Brendan	Last Updated By:	Brendan
Date Created:	3 February 2024	Date Last Updated:	5 February 2024

Actor:	User (Initiating Actor), System
Description:	The User may sign up for a hiking event.
Preconditions:	The User must have logged in to their user account.
Postconditions:	<p>The User has successfully joined an event.</p> <p><b>OR</b></p> <p>The User is not allowed to join the event due to a scheduling conflict.</p>
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. The User views an event via the use case View Event that this use case extends.</li> <li>2. The User selects the JOIN button.</li> <li>3. The System retrieves the date and time information of the current event.</li> <li>4. The System compares the date and time of the current event against the User's participating events to check for any scheduling conflicts.</li> </ol>

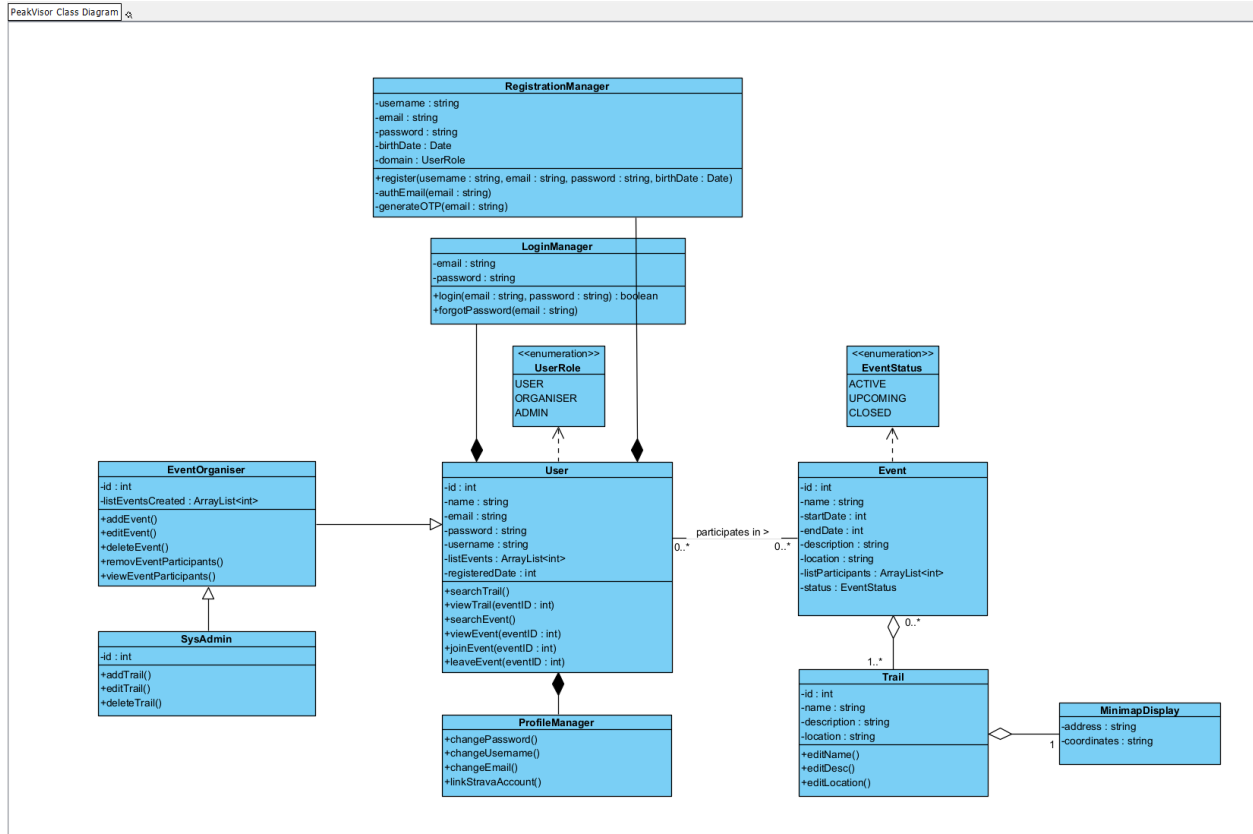
	<ol style="list-style-type: none"> <li>5. If there are no conflicts, the System queries the database to update the User's records with the event.</li> <li>6. The System displays the message "You have successfully signed up for the event!".</li> <li>7. The User is redirected back to the "Events" page.</li> </ol>
Alternative Flows:	N/A
Exceptions:	<p><u>EX-1: The User's schedule is not free to accommodate the event.</u></p> <ol style="list-style-type: none"> <li>1. If there is a scheduling conflict, the System displays the message "Error: You have signed up for another event in the same time slot."</li> <li>2. The User is redirected back to the "Events" page.</li> </ol> <p><u>EX-2: The event has reached maximum candidacy.</u></p> <ol style="list-style-type: none"> <li>1. If the participation limit for the event has been reached, the System displays the message "Error: The event has reached maximum candidacy. Please choose another event".</li> <li>2. The User is redirected back to the "Events" page.</li> </ol>
Special Requirements:	N/A
Assumptions:	The User has Internet access during the process.
Notes and Issues:	N/A

Use Case ID:	012		
Use Case Name:	LinkStravaAccount		
Created By:	Brendan	Last Updated By:	Brendan
Date Created:	3 February 2024	Date Last Updated:	5 February 2024

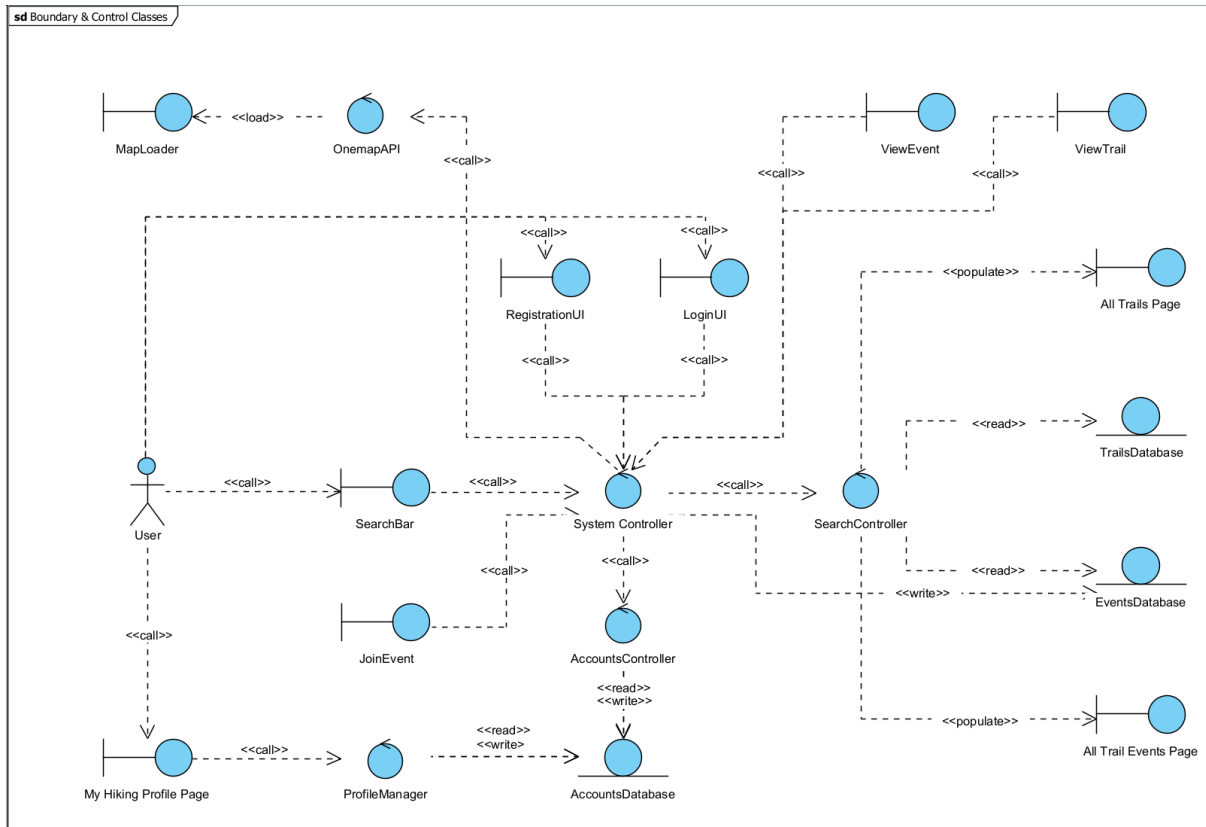
Actor:	User (Initiating Actor), System
Description:	The User may link their Strava account to their profile.
Preconditions:	The User must be logged in to their user account.
Postconditions:	The User's Strava account is saved to their profile.
Priority:	Low
Frequency of Use:	Low
Flow of Events:	<ol style="list-style-type: none"> <li>1. The User must first access the parent use case Manage Profile.</li> <li>2. The User enters their Strava account ID into the respective text field.</li> <li>3. The User clicks on the LINK button.</li> <li>4. A request is made to the Strava API endpoint to verify if the requested Strava account exists and is tagged to the user's email address.</li> <li>5. If successful, the User's Strava account is saved to their profile.</li> </ol>

Alternative Flows:	<u>AF-S2: If the Strava account does not exist</u>
	<ol style="list-style-type: none"> <li>1. The System displays the message “The Strava account does not exist” on the Manage Profile page.</li> <li>2. The System returns to Step 2.</li> </ol>
Exceptions:	N/A
Extends:	Register
Special Requirements:	N/A
Assumptions:	N/A
Notes and Issues:	N/A

## 2. Class Diagram of Entity Classes



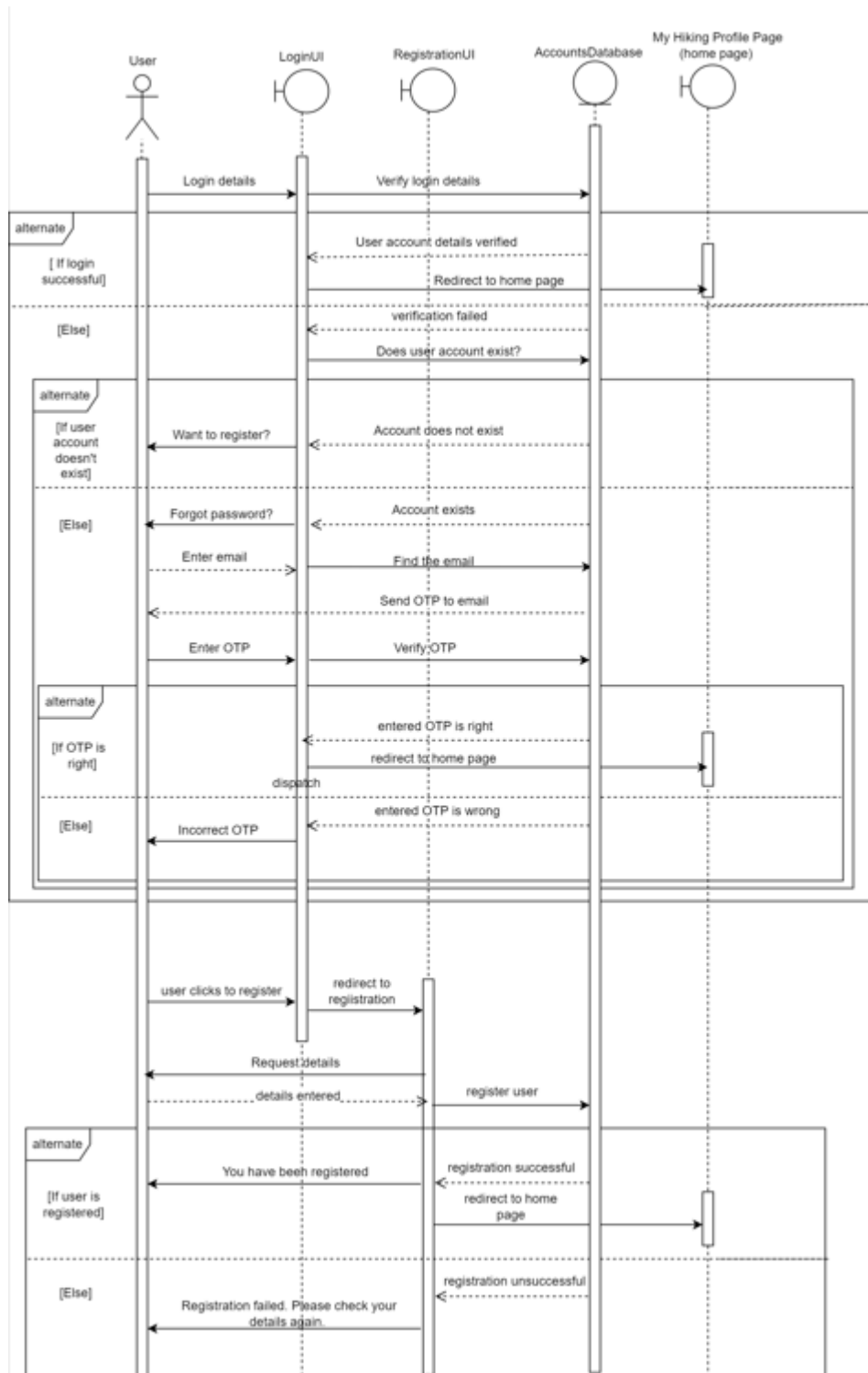
### 3. Key Boundary, Control, and Entity Classes



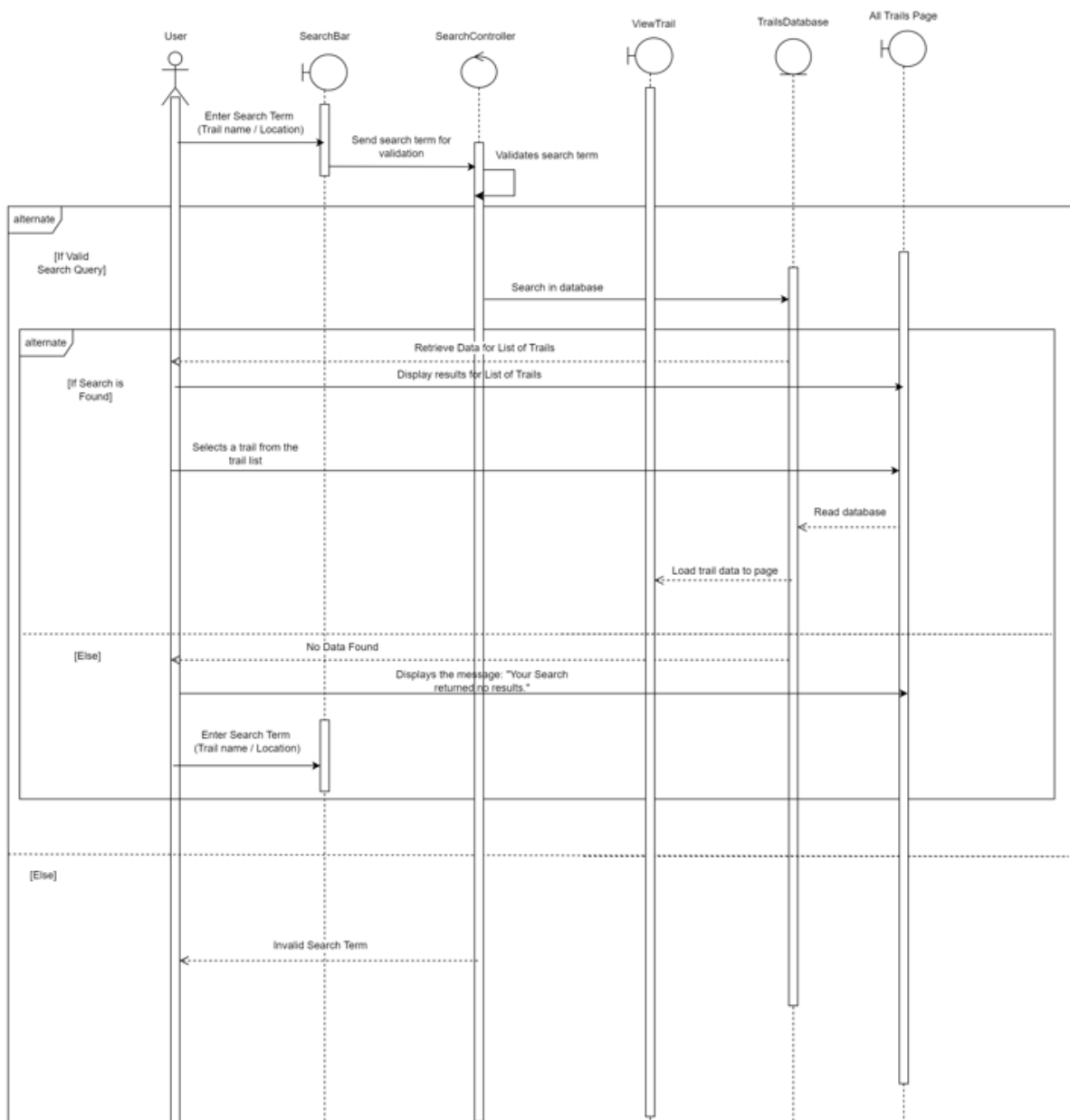


## 4. Sequence Diagrams of some Use Cases

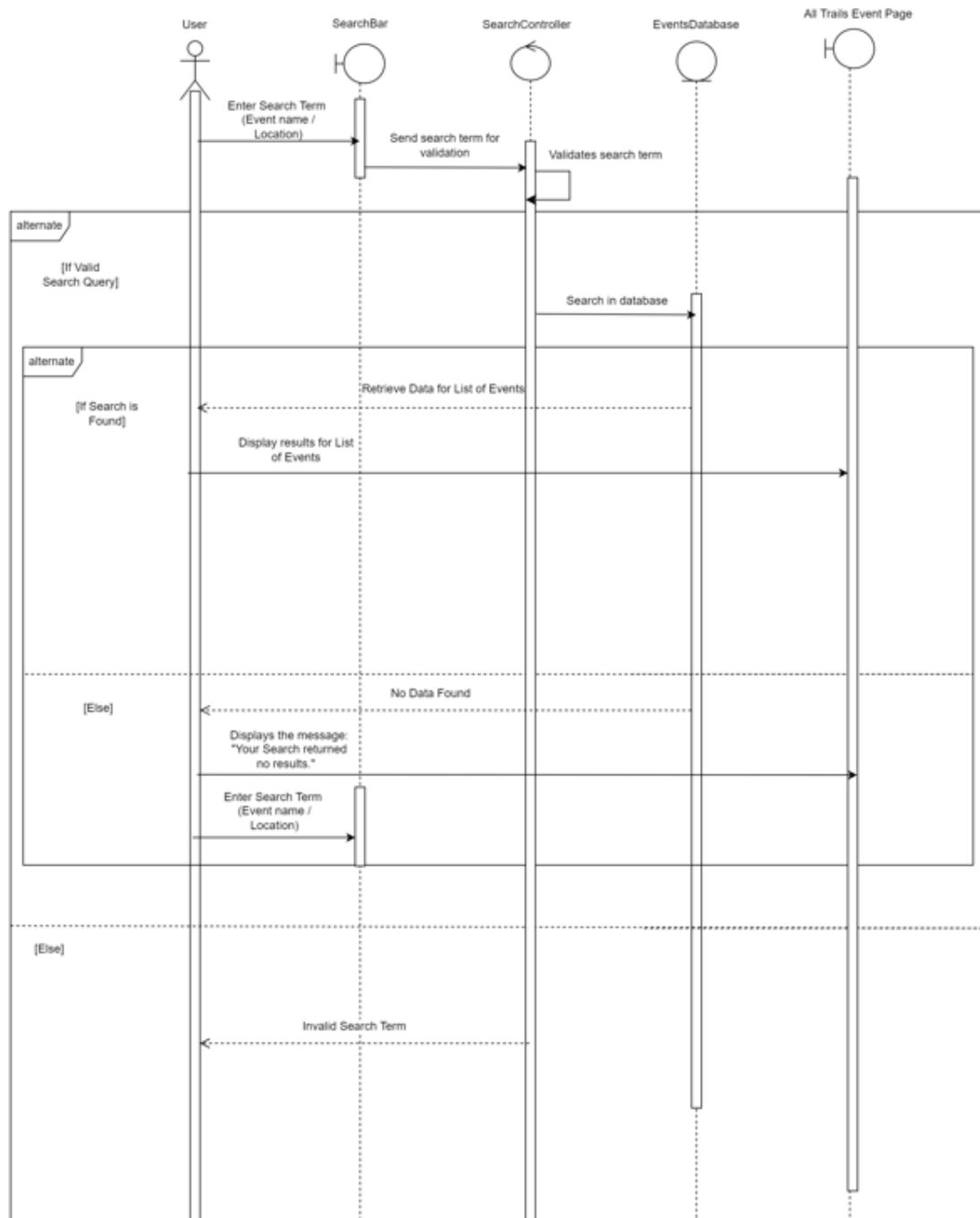
### 4.1. Login and Register Sequence Diagram



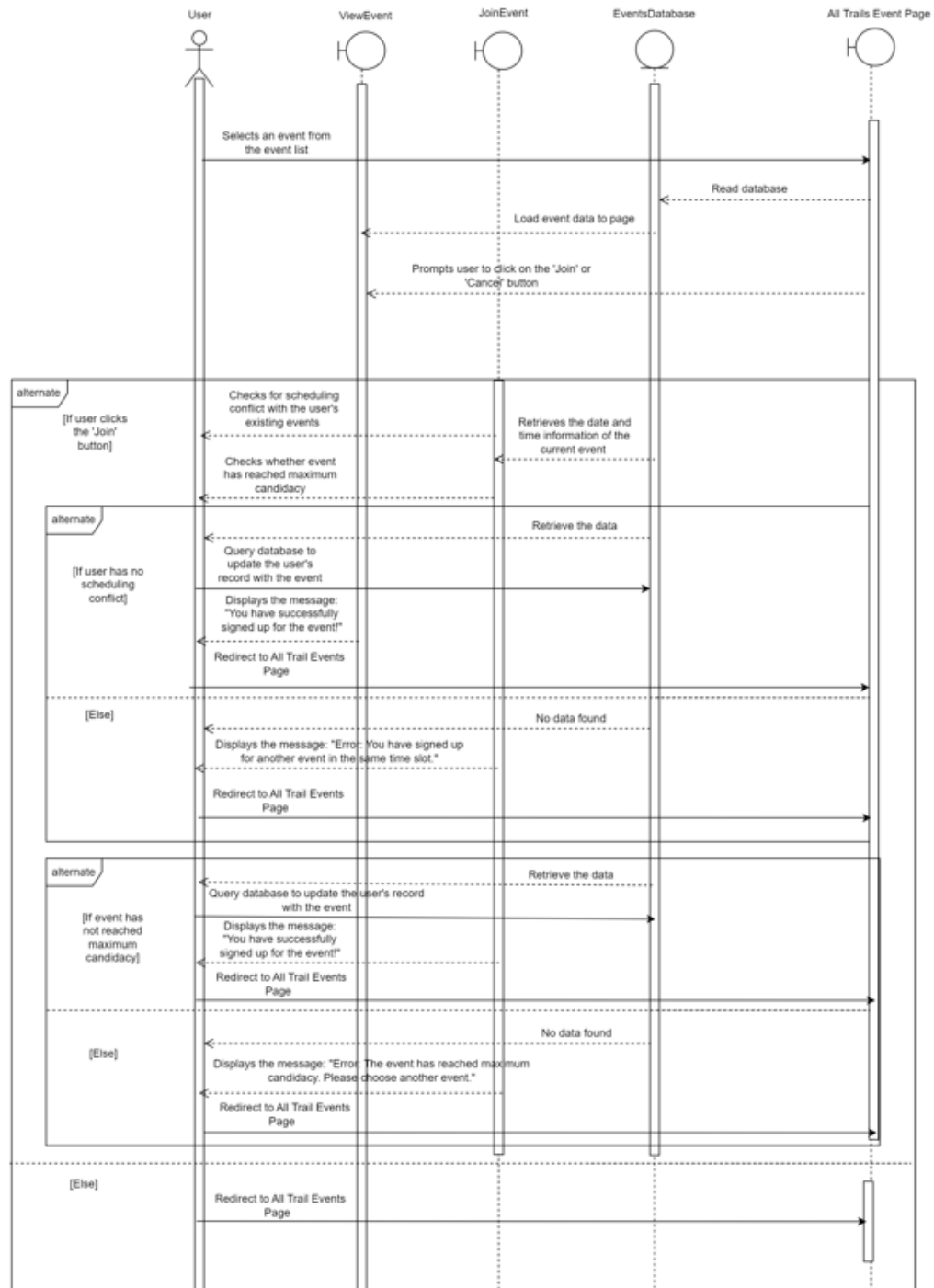
## 4.2. SearchTrail and ViewTrail Sequence Diagram



### 4.3. SearchEvent Sequence Diagram



#### 4.4. ViewEvent and JoinEvent Sequence Diagram



## 5. Initial Dialog Map (State Machine Diagram)

