CSE3310 Fundamentals of Software Engineering

(Fall 2024 – Section 004)

System Requirements Analysis (SRA) Document

Project Topic: Personal Health and Fitness Tracker (PHFT)

<mark>Team Number: Team 3</mark>

<mark>Date: 10/22/2024</mark>

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Revision History

Version	Date	Originator Name(s)	Reason for Change	High-level Description of changes
v1.0				

Table of Contents

1. Introduction and Project Overview

The purpose of this document on the Personal Health and Fitness Tracker app is to outline the development of our mobile fitness application. It is designed to assist users to record and monitor the user's fitness activities and provide a platform to audit their workouts and goals.

This application will be available only to the Android platform, providing a user-friendly interface for the user. The application will provide fitness activities in which the user can participate, and track the user's progress and social features to showcase their progress to their peers.

2. Objectives

2.1 BUSINESS OBJECTIVES

The following is a list of business objectives:

Objective 1: User Registration: General User and Personal Trainer members must provide the following information prior to using the system:

  Ø First Name, Middle Name {Optional}, Last Name

  Ø General User/ Guest User {Optional} / Personal Trainer

  Ø Home and mailing addresses

  Ø E-mail address

Objective 2: Login functionality: General User and Personal Trainer members must log in to the system with a username and password established during the Member registration stage. Guest users can skip the login step with limited features.

Objective 3: Activity Categories: The following Service categories will be supported initially:

  · Running

  · Walking

  · Cycling

  · Yoga

·   High-intensity interval training (HIIT)

·   Weightlifting

Objective 4: Goal Setting: Users must be able to set personal fitness goals. Examples include:

- Running 5 miles a week
- Burning 2000 calories a week
- Lose/gain 10 lbs. a month

Objective 5: Tracking: Users must be able to track metrics depending on the exercise. Imported data from wearable devices will be supported. The following metrics will be measured for each activity type:

- Running metrics: calories burned, heart rate, distance, steps
- Walking: calories burned, distance, steps
- Cycling: calories burned, heart rate, distance
- Yoga: duration, heart rate
- High-intensity interval training: calories burned, heart rate
- Weightlifting: calories burned, heart rate

Objective 6: Progress Monitoring: Users must be able to view their fitness progress. Fitness progress will be visually displayed using graphs and/or charts. Graphical representations will be categorized by activity type. These graphical representations will be formed based on the data collected in accordance with Objective 5.

Objective 7: Exercise Plans: Users must be able to follow pre-set workout routines or custom workout routines.

Objective 8: Review of Trainer: A review feature must be available to the user to provide feedback to the personal trainer.

Objective 9: Subscription: Users must be registered to pay for a subscription, see Objective 1. App subscription must include zero ads, special training videos, and personal trainer instructions. Subscription terms can be monthly or annually with a discount.

Objective 10: Payment Integration: Users must pay with debit/credit card or PayPal. In-app purchases include:

- Subscriptions
- Personalized workout plans
- Virtual trainers

Objective 11: Social Feature: Users must be allowed to share fitness achievements, fitness challenges, and updates on social media via a one-button-share function

Objective 12: Communication: Users may receive notifications for activity reminders, progress updates, and social interactions via email and/or text. Users may select this preference under their profile.

Objective 13: Advertisement: The application must advertise workout plans, personal trainer programs, and fitness equipment within the app. The application must also allow health-related businesses to advertise within the app.

2.2 SYSTEM OBJECTIVES

The following is a list of system objectives:

Objective 1: System will be an Android based Mobile system

Objective 2: Wearable device API will be utilized

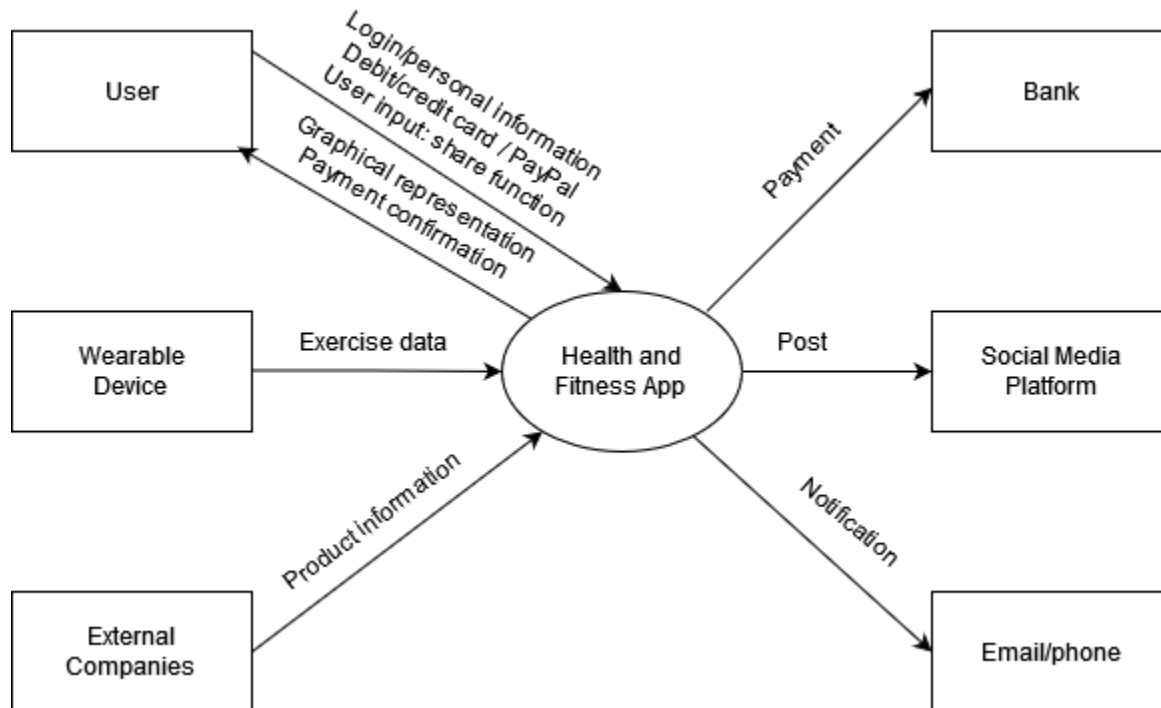**Objective 3:** SQLite will be used to store data

Objective 4: Application will be built with Java

Objective 5: In-payment methods will support debit/credit card and PayPal

Objective 6: System will have a user-friendly interface, graphical interfaces will be used, such as Java Graphics

Objective 7: One-button-share function will support multiple social media platforms (ie. X, Facebook, Instagram, messaging, email)

3. Project Context Diagram

4. Systems Requirements

4.1 "User Registration" Requirements

Requirement Title:	Registration
Sequence No:	001
Short description:	Register New User
Description	New users must register before accessing the application. The following information will be collected: - Name {First, Last name} - Email address - Phone Number - Select an ID {at least 8 characters long, alphanumeric, special character not allowed} - Select a password {Must include letters, at least one number, at least one capital letter, one special character} - Select a security question/answer (to be use for password reset)

	User can press:
	    - Submit
	    - Cancel (i.e discard changes)
	    - Exit (or close)

Pre-Conditions:	- Application must be loaded already - Duplicate registration not allowed
Post Conditions:	- All "Saved" changes will be kept permanently
Other attributes:	- None

4.2 "Login" Requirements

Requirement Title:	Login
Sequence No:	002
Short description:	Login Existing User

Description:	Enter User Id and Password (already established during registration) and press Submit
	
	User can press:
	    - Submit
	    - Forgot ID or Password
	    - Cancel(i.e discard changes)
	    - Exit Screen (or close)

Pre-Conditions:	- User must have already registered
Post Conditions:	- Keep a log of the date and time of login
Other attributes:	- Allow maximum of 3 tries, then recommend using "Forgot Password"

Requirement Title:	Forgot Password / ID
Sequence No:	003

Short description:	Account Recovery for Existing User
Description:	Ask for the user's email address and the answer to the security question selected during registration. If both are correct, the system will email the user a temporary password to reset their login credentials User can press: - Submit - Cancel (i.e discard changes) - Exit Screen (or close)
Pre-Conditions:	- The user must have already registered - The system validates both the email address and security question
Post Conditions:	- The system sends a temporary password, and the user is recommended to change it after logged in
Other attributes:	- None

4.3 "Tracking" Requirements

Requirement Title:	Tracking
Sequence No:	004
Short description:	Tracking and Progress Monitoring
Description:	The system allows users to track their fitness and health progress through a dashboard interface. Data is stored in a database and may be imported from external devices, such as Samsung Galaxy watch or a fitness tracker.
Pre-Conditions:	- Users must be logged in to view and track their progress.
Post Conditions:	- Progress is continuously monitored and updated based on the user's activities, and the information is stored in the database. - Users can view their history of workouts and other activities.
Other attributes:	- None.

4.4 "Activity Categories" Requirements

Requirement Title:	Activity Categories
Sequence No:	005
Short description:	Activity Categories
Description:	Users can access and choose from predefined Activity Categories such as workout plans, cardio exercises, strength training, and flexibility exercise. The system allows users to select a category, log their activity, and track their progress. User can press: - Select Activity Category - Start Activity - Log Activity Completion
Pre-Conditions:	- The user must be logged in.
Post Conditions:	- The system tracks the user's activity under the selected category and updates progress toward their goals.
Other attributes:	- Users can view statistics and history of each activity category. - New categories may be added over time with system updates.

4.5 "Goal Setting Request" Requirements

Requirement Title:	Goal Setting
Sequence No:	006

Short description:	Goal Setting
Description:	Users can set goals related to their health and fitness within the app. The system will track their activity and update progress toward the goal in real-time. Once the goal is completed, it will be marked and sent out a notification. User can press: - Create new goal - View/Edit existing goal - Delete goal
Pre-Conditions:	- The user must be logged in to access the goal-setting function.
Post Conditions:	- The system continuously updates the user's progress toward goals based on completed activities. - When all tasks under a goal are finished, the goal is marked complete.
Other attributes:	- None.

4.6 "Progress Monitoring Request" Requirements

Requirement Title:	Progress Monitoring Request Reminders.
Sequence No:	007
Short description:	Progress Monitoring Request Reminders.
Description:	The system tracks the user's progress toward their goals and sends reminders if goals are not completed by a set time each day. Users can request reminders on specific goals they want to complete. For example, if a user has a daily workout goal, the system will check progress at the specific time, and if incomplete, send a reminder to encourage users to finish their workout.

	User can press: - Set reminder time - Dismiss reminder - Snooze reminder
Pre-Conditions:	- Users must have set a goal in the app. - The user must enable notifications and provide a reminder time.
Post Conditions:	- The system will check goal completion status daily at the reminder time. - If the goal is incomplete, the system sends a reminder to the user to finish the activity.
Other attributes:	- Users can adjust reminder settings, including frequency and time of day. - Reminders are sent via push notification, email, or SMS, depending on user preference.

4.7 "Exercise Plans" Requirements

Requirement Title:	Exercise Plans
Sequence No:	008
Short description:	Exercise Plans
Description:	The app will provide different workout plans for the users to choose and customize. Users can make their own workout plans and track their progress. User can press: - Select a workout plan - Create a workout plan - Edit workout plan - Start plan

Pre-Conditions:	- The user must be logged in to access exercise plans. - The user must have already bought a subscription to access exercise plans. - The user must select a plan or create a custom plan.
Post Conditions:	- The system will track the completion of each exercise within the selected plan. - Users can view their progress and modify plans based on their preference.
Other attributes:	- Users receive reminders to complete exercise if progress is incomplete. - Exercise plans can be shared with friends or on social media.

4.8 "Review of Trainer" Requirements

Requirement Title:	Review of Trainer
Sequence No:	009
Short description:	Making a review of a trainer
Description:	The system asks/displays reviews of the trainer to the user. Reviews are made up into 2 parts, the rating and the comment that came from other users that had been under the trainer prior. What user can press: - Select the rating between 1-5 stars (1-10) - Comment box to type in up to [enter amount of char] characters - Next button - Cancel
Pre-Conditions:	- User must be logged in - The user must have been under the trainer prior. - The user must be on the trainer's page.
Post Conditions:	- The system will add the user review to a database. - The review will be displayed under the trainer reviews.

Other attributes:	- None

4.9 "Subscription" Requirements

Requirement Title:	Subscription
Sequence No:	010
Short description:	Paying/enabling or disabling subscription plan
Description:	A subscription model that allows the user to pay a set amount per month (or annual) to the subscription plan. The subscription plan will disable advertisements for the user while it's active and enable premium trainer support for the user. If the user is in a subscription plan there is a prompt to cancel the plan if needed. User can press: - Selection tab to either the monthly or annual plan displaying the price. (when **not** in a subscription plan) - Confirm button (when **not** in a subscription plan) - Cancel button (when in a subscription plan) - Back button
Pre-Conditions:	No subscription plan - User must be logged in and online in the application - When the user isn't in a plan Cancelation - To cancel user must be in a subscription plan already
Post Conditions:	No subscription plan - System will open the the payment screen (payment integration) Cancelation - System will send a cancellation request to the database to disable the subscription till the next payment.
Other attributes:	- The pricing will change spending on the user's country and their regional currency

4.10 "Payment Integration" Requirements

Requirement Title:	Payment Integration.

Sequence No:	011
Short description:	Payment Integration.
Description:	Users can purchase personalized workout plans or hire virtual trainers via in-app payment. Payments methods should support debit/credit cards and Paypal.
Pre-Conditions:	- The user must have an active account and add a payment method.
Post Conditions:	- Payment details are securely stored, and services are unlocked after successful payment.
Other attributes:	- None.

4.11 "Social Media Sharing" Requirements

Requirement Title:	Social Feature
Sequence No:	012
Short description:	Social Media Sharing.
Description:	Users can share their fitness achievements, compete in challenges with friends, and post updates on social media platforms through a share button function that connects apps like Snapchat, Instagram, Facebook, Thread, X, etc. User can press: - Share button - Icons of social medias that is supported
Pre-Conditions:	- Users must link their social media account within the app.
Post Conditions:	- Activity updates are posted on the selected social media platform.
Other attributes:	- None.

4.12 "Communication" Requirements

Requirement Title:	Notification
Sequence No:	013
Short description:	Creating/Sending Notification
Description:	Users can enable notifications within the settings, the system will create and send notifications to the user, notifying the user any updates and reminders from trainers or user goals. What user can press: - The notification pop up outside the application - Enabling Notification (in the setting)
Pre-Conditions:	- The 'Allow notification permissions' in the user's systems. - System sending the message notification
Post Conditions:	- Open the application.
Other attributes:	- Users must enable notification settings in their application.

4.13 "Advertisement" Requirements

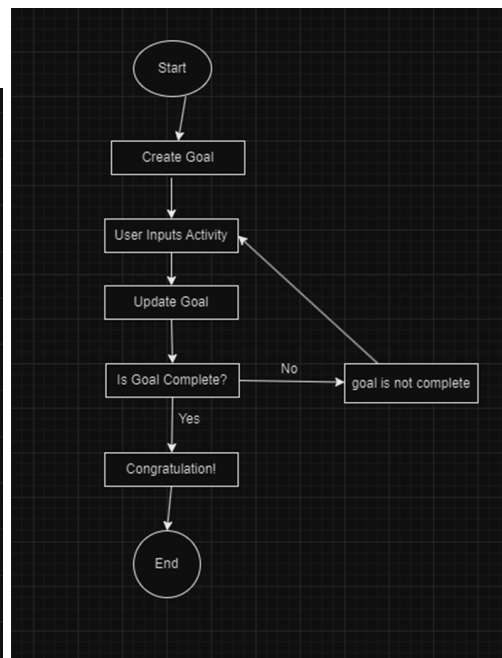|	
Requirement Title:	Advertisement
Sequence No:	014
Short description:	Displaying advertisements to the user
Description:	At a certain point of time or at a specific menu within the application it will display internal advertisements (directly points to the in app monetization) and external advertisements (leading towards health products that are outside the application). User can press: - The popup advertisement - The exit button of the advertisement
Pre-Conditions:	- Advertisements must be active on the screen. - The user must not be in the subscription plan. - User must be in the application
Post Conditions:	- Open the towards the in app monetization for internal

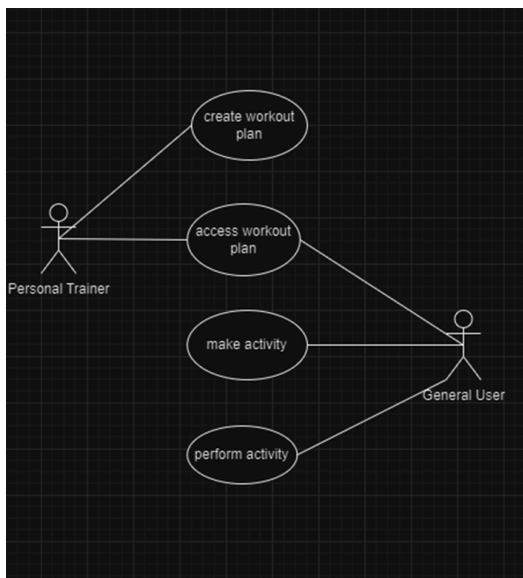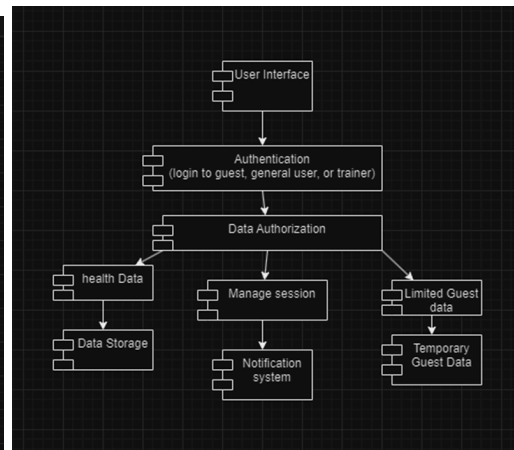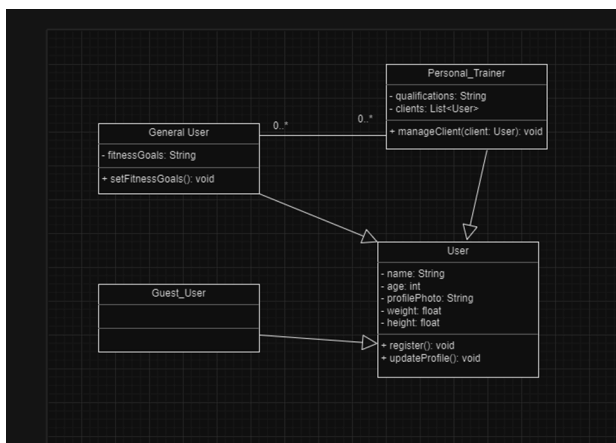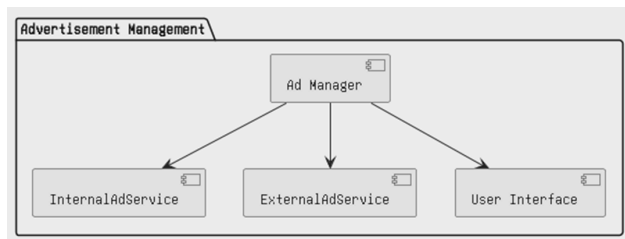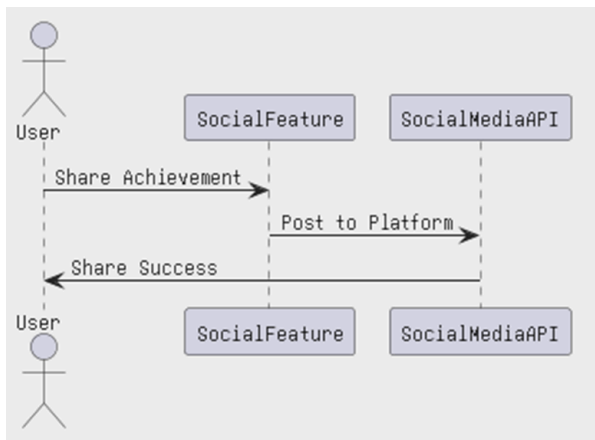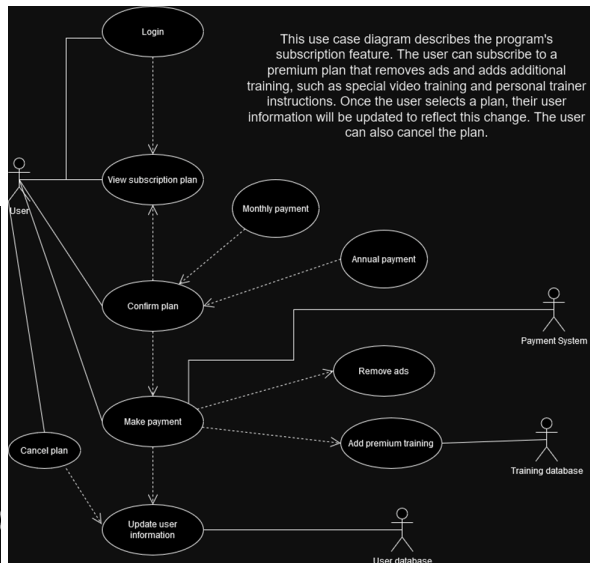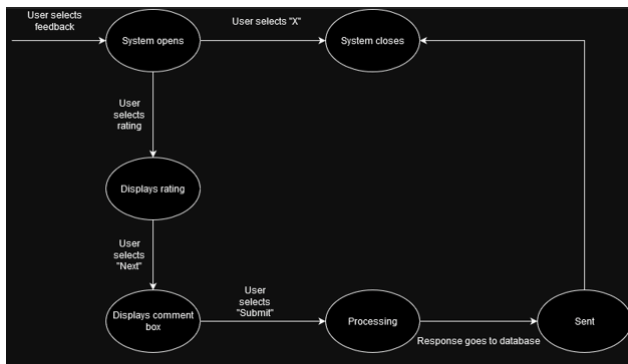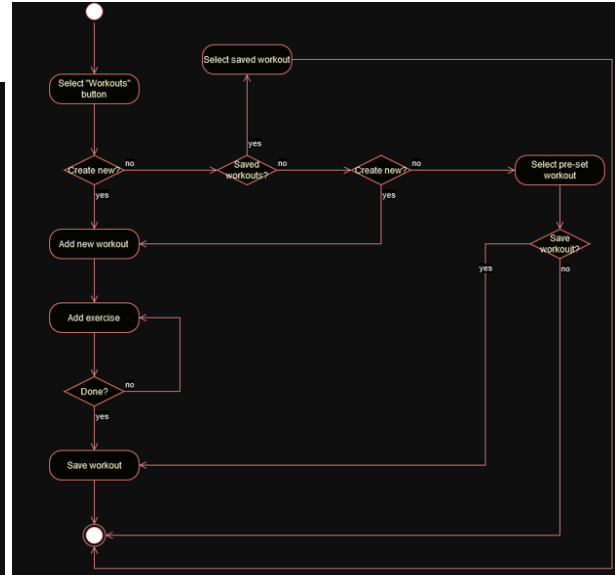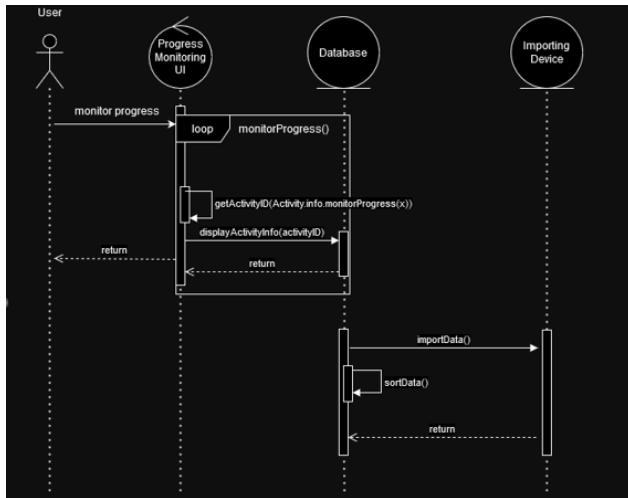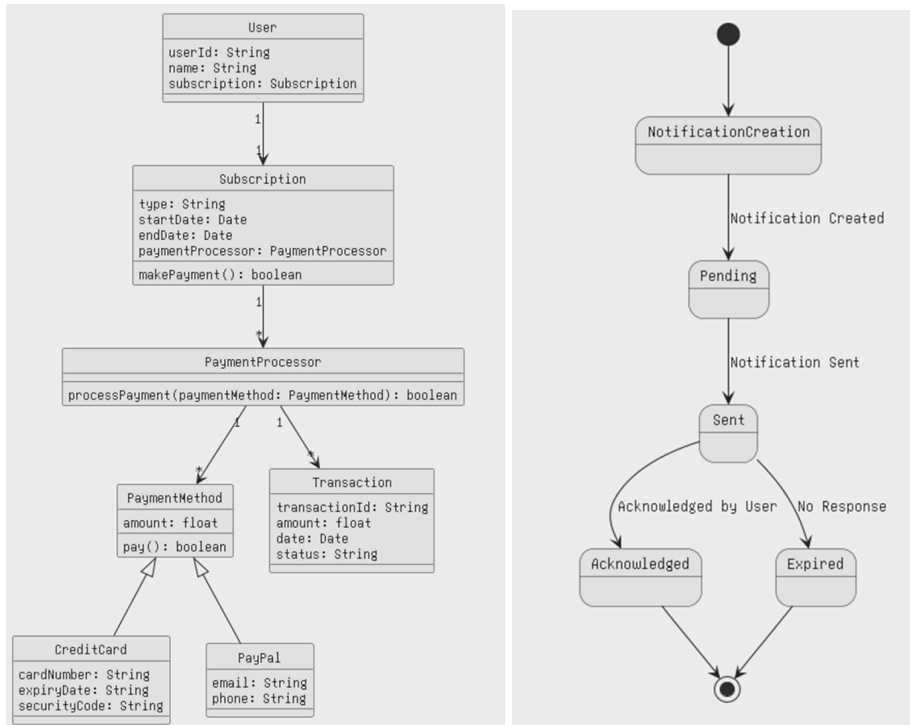|	
	advertisements - Open the browser leading to the outside product for external advertisements - Close advertisements when closing the advertisement
Other attributes:	- None

5. Software Processes and Infrastructure

5.1 Hardware and Infrastructure

Android versions might not be compatible with our program or our program will not be up to date with new releases.

5.2 UML Diagrams

Diagram 1 — Sequence diagram (Progress Monitoring)

User — Progress Monitoring UI — Database — Importing Device

- monitor progress
- loop: monitorProgress()
- getActivityID(Activity.info.monitorProgress(x))
- displayActivityInfo(activityID)
- return
- return
- importData()
- sortData()
- return

Diagram 2 — Activity diagram (Workouts)

- Select "Workouts" button
- Select saved workout
- Create new? — no / yes
- Saved workouts? — no
- Create new? — no / yes
- Select pre-set workout
- Add new workout
- Save workout? — no / yes
- Add exercise
- Done? — no / yes
- Save workout

Diagram 3 — State/Activity diagram (Feedback)

- User selects feedback → System opens
- User selects "X" → System closes
- User selects rating → Displays rating
- User selects "Next" → Displays comment box
- User selects "Submit" → Processing → Sent
- Response goes to database

Diagram 4 — Use case diagram (Subscription)

This use case diagram describes the program's subscription feature. The user can subscribe to a premium plan that removes ads and adds additional training, such as special video training and personal trainer instructions. Once the user selects a plan, their user information will be updated to reflect this change. The user can also cancel the plan.

- Login
- View subscription plan
- Monthly payment
- Annual payment
- Confirm plan
- Remove ads
- Make payment
- Add premium training
- Cancel plan
- Update user information
- User
- Payment System
- Training database
- User database

Diagram 5 — Sequence diagram (Social Feature)

User — SocialFeature — SocialMediaAPI

- Share Achievement
- Post to Platform
- Share Success

Diagram 6 — Component diagram (Advertisement Management)

Advertisement Management

- Ad Manager
  - InternalAdService
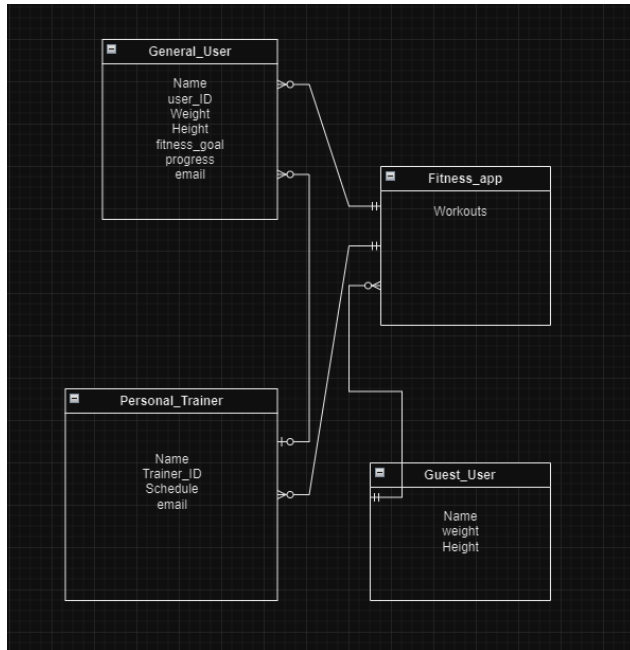 - ExternalAdService
  - User Interface

5.3 Conceptual Data Model

There will be a database that we will use SQLite to access and store data.

Android Studio will be used to create and test the program.

5.4 Screen Shots

None available at this time.

5.5 Test Plan

A test plan will be provided in a later stage of the project.

6. Assumptions and Constraints

6.1 Assumptions

The following is a list of assumptions:

Ø Assume all users over the age of 18 (for under 18 clients, an adult guardian is needed).

Ø Ignore any international shipping for users.

Ø Ignore any cross-platform wearable devices compatible issues.

Ø Ignore any legal issues, assume all personal trainers pass background check.

Ø No need to do real debit/credit card validation, just make sure Credit card number is 16 digits, Card Expiration date has the format "mmyy" and the Security code is 3 digits.

6.2 Constraints

The following is a list of constraints:

Ø Team lacks Android development skills

Ø Limited engagement of some team members

Ø Team lacks Android device to test implementation of system

6.3 Out of Scope Material

The following is a list of "out of scope" material:

Ø Post Project maintenance is not covered

Ø Payment verification is not covered

Ø Social media implementation is not covered

Ø Importation of data from external systems is not covered

7. Delivery and Schedule

{List all tasks/milestones from start of the project to the end with specific dates for both Anticipated Start & End Dates. Status includes Complete, In Progress, and To Be Completed (TBC)

Task Description	Anticipated Start Date	Anticipated End Date	Status	Comments
Prepare UML diagrams	09/20/2024	10/01/2024	Complete	Deliverable UML document
SRA document (Includes project objectives, Requirements and UML diagrams)	10/02/2024	10/22/2024	In Progress	Deliverable will be the SRA document. All stakeholders agree on the content of the SRA by signing in section 8.
Application Homepage design			TBC	
Login and Registration			TBC	
… List all tasks …				
Test Plan Delivery		10/29/2024		Deliverable will be the Test plan document.
Final Report Delivery		11/26/2024		Deliverable will be the final report plus Team Presentation

8. Stakeholder Approval Form

Stakeholder Name	Stakeholder Role	Stakeholder Comments	Approval Signature	Signature Date
Chenxi Wang	Client			
Pujan Budhathoki	Client Project Manager			
Austin Mitchell	Developer		*Austin Mitchell*	10/21/2024
Thien Nguyen	Developer		*Thien Nguyen*	10/21/2024
Emma Slonaker	Developer		*Emma Slonaker*	10/21/2024
Huy Nguyen	Developer		*Huy Nguyen*	10/21/2024
Raza Inthanongsack	Developer		*Raza Inthanongsack*	10/21/2024

Appendix

None