Requirements

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1. Project Aim

To design and implement a software solution focused on helping users achieve their fitness objectives. This involves developing a user-friendly platform for creating and customising workout routines, monitoring nutrition and workout progress, and offering health and fitness guidance. The main aim is to build an engaging and efficient fitness tool that encourages users to live healthier, more active lives.

2. Project Objectives

Please note all requirements will be marked by MoSCow Prioritization technique.

ID	Objective	Description	Created
O1	Develop a Scalable and Secure Database Management System (DBMS)	Develop a scalable MySQL DBMS, including a central database for 2,000+ records and a local database for user data and watch data. Improve database performance and security and ensure GDPR compliance.	09/10/2023
O2	Build the Alistana Fitness & Nutrition Tracker (AFNT) Application	Develop the AFNT application with features for workout and nutrition tracking, body progress and measurement tracking. Should be connected to DBMS, Admin Management website (only for Admins), and Arduino watch.	09/10/2023
O3	Design a User-Centric Admin Management (AM) Website	Develop a responsive website with secure login and allows Admins to edit the central database (user login data and preset workout and meal data) and app push updates to the AFNT application. The website will prioritize a user-friendly design, encrypted communication, and security measures.	09/10/2023
O4	Design and develop a Fitness Watch using Arduino	Create an Arduino-based Fitness watch to measure blood oxygen level, heart rate and step count, and investigate ways of connecting the Arduino watch to the AFNT and store body data in the local database via AFNT.	16/10/2023
O5	Enhance Code Quality and Performance	Implement clean, maintainable code with 80% code coverage. Optimize application and website response times to under 2 and 3 seconds, respectively.	25/10/2023

3. Pictures and Scenarios

3.1. Alistana Fitness and Nutrition Tracker Application

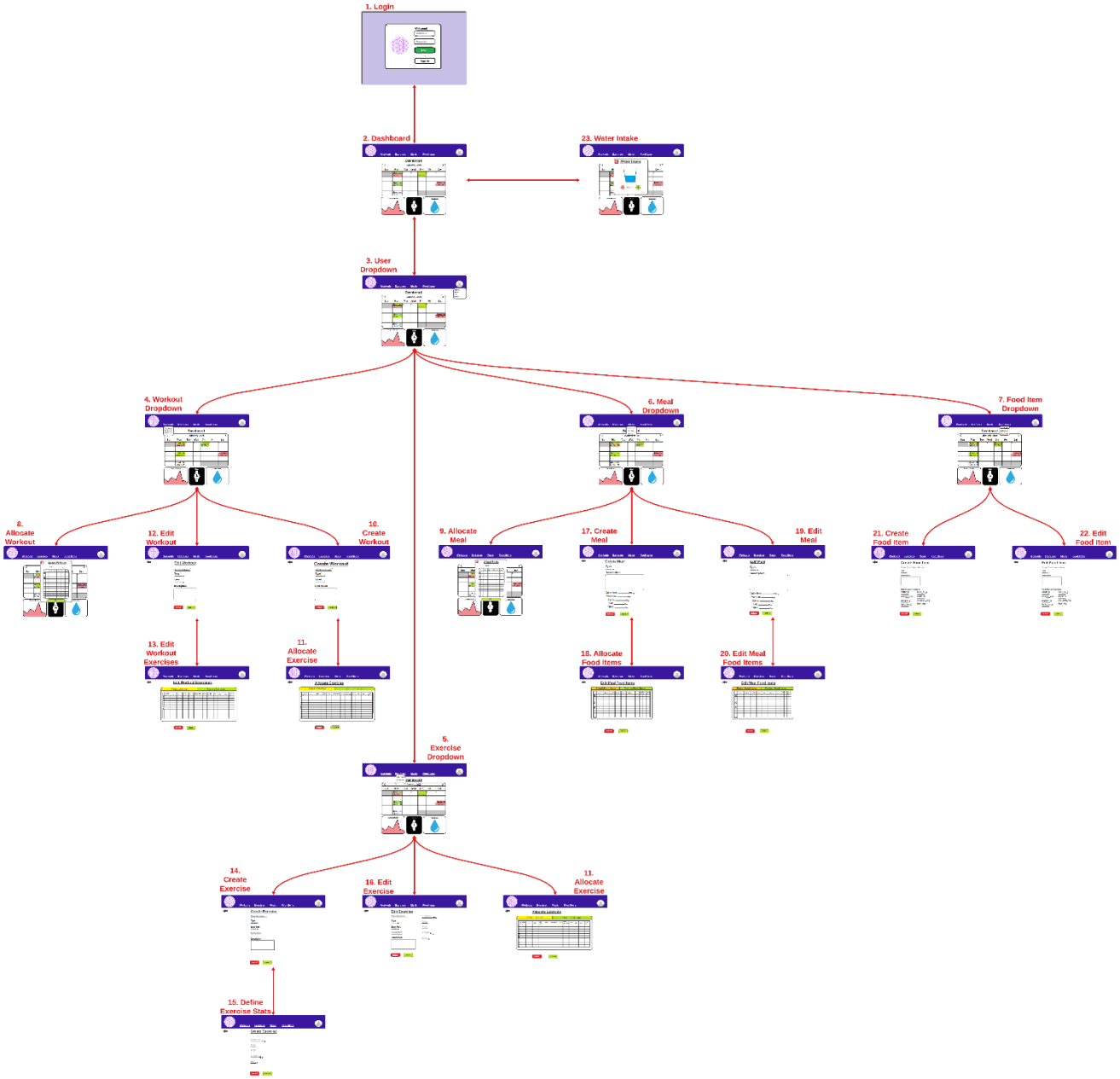

Figure 1: AFNT UI Sketches.

3.2. Admin Management Website

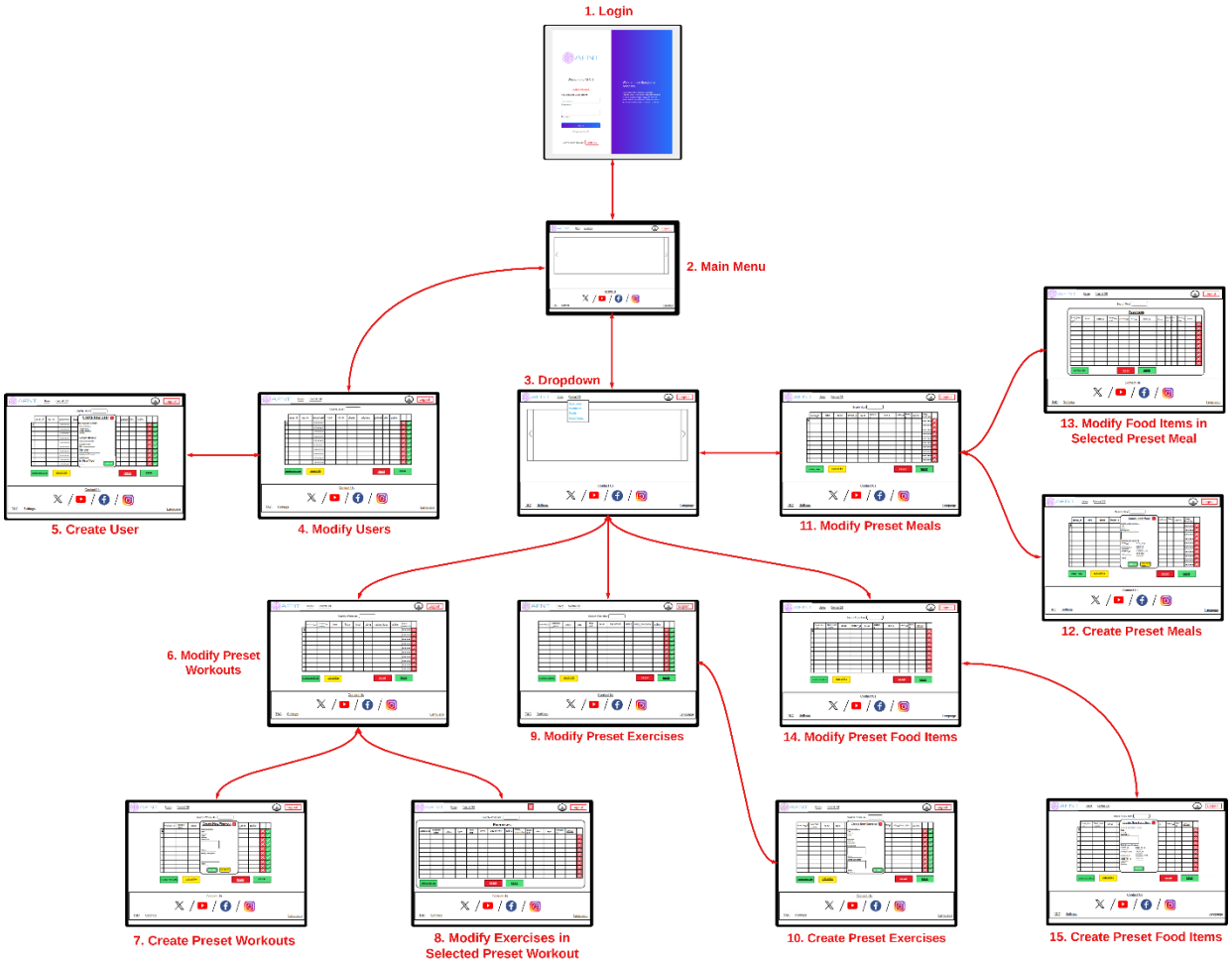

Figure 2: AM Website UI Sketches.

4. Usecase Diagrams

4.1. AFNT Application

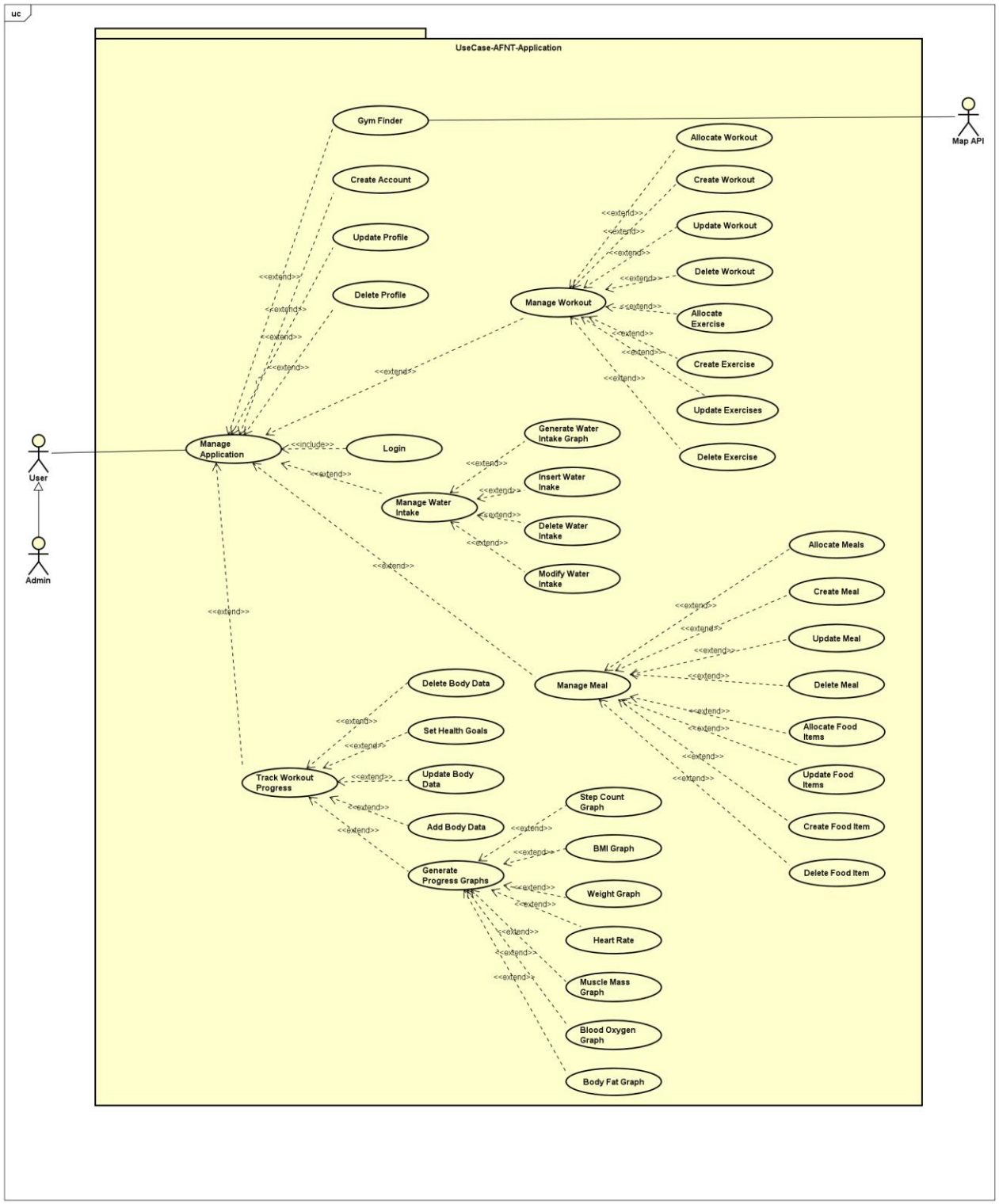

Figure 3: AFNT App UseCase Diagram.

Table 1: Usecase Manage Workout and the <<extend>>.

Use Case Diagram	AFNT Application
Use Case Identifier	Manage Workout and the <<extend>>
Goal	Manage Workouts and Exercises (Add/Update/Delete)
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	Details of Workouts and Exercises are stored in the LocalDB database and to access its contents and modify data, the User must be in the "Workout" tab.
Post-conditions	Details of Workouts and Exercises are displayed to the User/Admin
Basic Flow of Events	1. User navigates to the 'Workout' tab. 2. App displays all workouts planned for the current week. 3. User can change the date range to see workouts in the past and future 4. User can select the workout and view the exercises allocated in the selected workout. 5. The page includes buttons that allow user to allocate, create, edit, and delete workouts and exercises.
Alternative Flow	None

Table 2: Usecase Manage Meal and the <<extend>>.

Use Case Diagram	AFNT Application
Use Case Identifier	Manage Meal and the <<extend>>
Goal	Manage Meals and Food Items (Add/Update/Delete)
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	Details of Meals and Food Items are stored in the LocalDB database and to access its contents and modify data, the User must be in the "Meal" tab.
Post-conditions	Details of Meals and Food Items are displayed to the User/Admin
Basic Flow of Events	1. User navigates to the 'Meal' tab. 2. App displays all meals planned for the current week. 3. User can change the date range to see meals in the past and future 4. User can select the meal and view the food items allocated in the selected meal. 5. The page includes buttons that allow user to allocate, create, edit, and delete meals and food items.
Alternative Flow	None

Table 3: Usecase Manage Water Intake and the <<extend>>.

Use Case Diagram	AFNT Application
Use Case Identifier	Manage Water Intake and the <<extend>>
Goal	Manage Water Intake (Add/Update/Delete)
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	Details of Water Intake (ml) are stored in the LocalDB database and to access its contents and modify data, the User must be in the "Water Intake" tab.
Post-conditions	The screen contains a foam where the User can select the date and the amount of water drank. The use can also generate graphs of water intake per selected month/selected year
Basic Flow of Events	1. User navigates to the 'Water Intake' tab. 2. App displays a form for adding water intake in the selected date (default date is the current date). 3. User can change the date to update/add the water intake and click 'Submit' to add/update records. 4. The page also contains a button to delete all water intake data. 5. The page also contains a button to generate two water intake graphs, one for per selected month, and one for the selected year
Alternative Flow	None

Table 4: Usecase Gym Finder.

Use Case Diagram	AFNT Application
Use Case Identifier	Gym Finder
Goal	Find nearest gym relative using user's location data.
Priority	M
Updated	21/03/2024
Participating Actors	User Admin MapAPI
Pre-conditions	User must consent to share their location
Post-conditions	The screen displays the nearest gym to users' location around a 10-mile radius
Basic Flow of Events	1. User navigates to the 'Gym Finder' tab. 2. App uses user's location data and fetches the nearest gyms to the user's location. 3. User can generate a path to the selected gym and can download/save the location and directions.
Alternative Flow	None

Table 5: Usecase Create Account.

Use Case Diagram	AFNT Application
Use Case Identifier	Create Account
Goal	Users can create a new account.
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	User must navigate to the 'Register' screen
Post-conditions	The user must enter their details like username, password, gender, dob email, phone number and postcode (optional)
Basic Flow of Events	1. User launches the AFNT app. 2. The app displays a login page, user needs to select the 'Register' button. 3. User needs to provide the details stated in post-conditions. 4. After entering valid data, then press 'Register'. 5. A success popup will be displayed, and the user can now login using the new account.
Alternative Flow	None

Table 6: Usecase Update Profile.

Use Case Diagram	AFNT Application
Use Case Identifier	Update Profile
Goal	Users can update their profile (Add/Update)
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	User must navigate to the 'Profile' screen by clicking the profile icon in the 'Dashboard' screen
Post-conditions	The user can modify details like username, password, gender, dob email, phone and postcode (optional)
Basic Flow of Events	1. User opens the AFNT app 2. User logs in. 3. User is sent to the dashboard screen. 4. User clicks on the profile icon and clicks 'Profile'. 5. User can now modify the account details stated in post-conditions
Alternative Flow	None

Table 7: Usecase Delete Profile.

Use Case Diagram	AFNT Application
Use Case Identifier	Delete Profile
Goal	Users can delete their profile
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	User must navigate to the 'Profile' screen by clicking the profile icon in the 'Dashboard' screen
Post-conditions	The user can delete their profile (and all the data associated with it)
Basic Flow of Events	1. User opens the AFNT app 2. User logs in. 3. User is sent to the dashboard screen. 4. User clicks on the profile icon and clicks 'Profile'. 5. There is a delete button in the bottom of the screen and clicking that will delete the profile and all the data associated with it. The user is then sent back to the login screen.
Alternative Flow	None

Table 8: Usecase Track Workout Progress and the <<extend>>.

Use Case Diagram	AFNT Application
Use Case Identifier	Track Workout Progress and the <<extend>>
Goal	Users can track their workout progress
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	User must navigate to the 'Body Stats' screen in the 'Dashboard' screen
Post-conditions	The user can monitor and modify their workout progress data like step count, BMI, weight, heart rate, muscle mass, blood oxygen level and body fat data.
Basic Flow of Events	1. User navigates to the dashboard screen. 2. User clicks on the 'Body Stats' tab. 3. Users can input their current body stat (weight, height, BMI etc.). User can also update and delete data. 4. User can also set health goals (i.e. set weight goal, step goal etc.)
Alternative Flow	None

Table 9: Usecase Generate Progress Graphs and the <<extend>>.

Use Case Diagram	AFNT Application
Use Case Identifier	Generate Progress Graphs and the <<extend>>
Goal	Users can generate graphs to track their workout progress
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	User must navigate to the 'Body Stats' screen in the 'Dashboard' screen. Then select one of the generate graphs button.
Post-conditions	The user can generate graph data for step count, BMI, weight, heart rate, muscle mass, blood oxygen level and body fat data.
Basic Flow of Events	1. User navigates to the dashboard screen. 2. User clicks on the 'Body Stats' tab. 3. User needs to input the month and year and then select which body stat to generate a graph for. 4. The app will then display a monthly and yearly graph for the selected body stat.
Alternative Flow	None

4.2. Admin Management Website

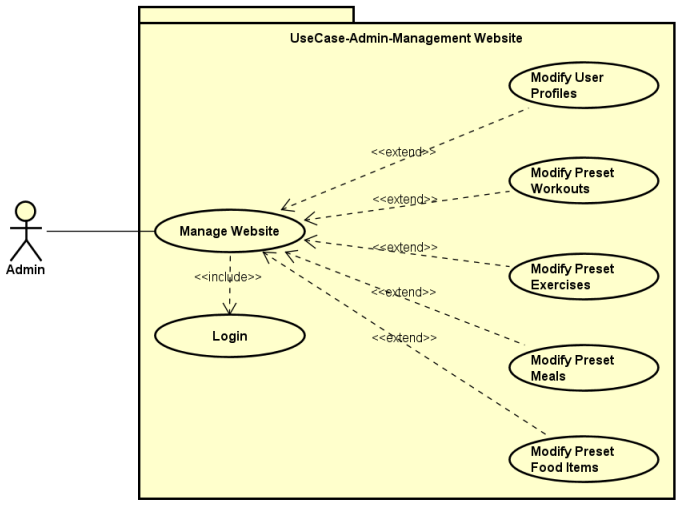

Figure 4: AM Website UseCase Diagram

Table 10: Usecase Manage Website and the <<extend>>.

Use Case Diagram	Admin Management Website
Use Case Identifier	Manage Website and the <<extend>>
Goal	Admins and modify the Central Database and push updates to AFNT app
Priority	M
Updated	21/03/2024
Participating Actors	Admin
Pre-conditions	Admins needs to login, upon a successful login Admins are directed to the admin dashboard
Post-conditions	Admins need to navigate to the 'Edit Central DB' tab
Basic Flow of Events	1. Admin logs on the website 2. Upon a successful login, admins are redirected to the Admin Dashboard. 3. Admins can navigate to 'Edit Central DB' and can modify its contents (consists of presets meals and workout data, and user login data). 4. After implementing successful changes, admins can push this and the LocalDB will import the new centralDB updates when user logins successfully.
Alternative Flow	None

4.3. Arduino Watch

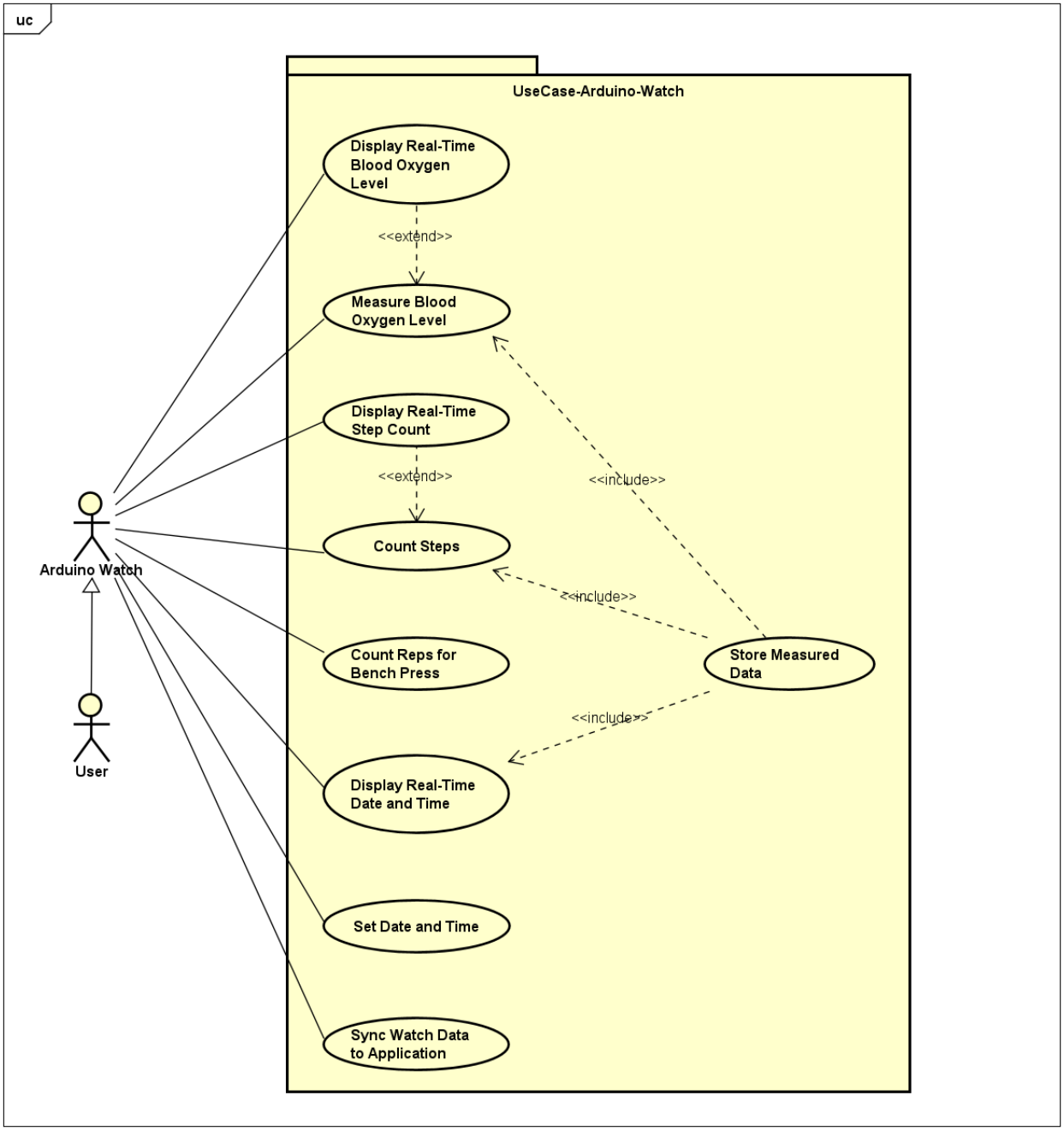

Figure 5: Arduino Watch UseCase Diagram

Table 11: Usecase Store Measured Data and the <<extend>>.

Use Case Diagram	Arduino Watch
Use Case Identifier	Store Measured Data and the <<extend>>
Goal	The Arduino Watch can store and measure body data (Step Count, Heart Rate, Blood Oxygen level, Count Reps, and current Date and Time)
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	User must have an Arduino Watch which is turned on and straped properly on the wrist.
Post-conditions	
Basic Flow of Events	1. Turn on the Arduino Watch 2. Properly wear the Arduino Watch around the wrist. 3. Arduino Watch should start measuring real time heart rate, blood oxygen, step count and the time data and store this data in the microSD card, which can be accessed to view the data collected.
Alternative Flow	None

Table 12: Usecase Sync Watch Data to Application.

Use Case Diagram	Arduino Watch
Use Case Identifier	Sync Watch Data to Application
Goal	The Arduino Watch shall send the collected user data to the AFNT App via Bluetooth, which can be accessed and viewed on the AFNT App live.
Priority	M
Updated	21/03/2024
Participating Actors	User Admin
Pre-conditions	User must have an Arduino Watch which is turned on and straped properly on the wrist.
Post-conditions	The Arduino Watch shall be linked to AFNT App via Bluetooth.
Basic Flow of Events	1. Turn on the Arduino Watch 2. Properly wear the Arduino Watch around the wrist. 3. On the AFNT App, go to 'Arduino Watch' tab and press sync. 4. The app should link with the Arduino Watch after successfully finding it, and the Arduino Watch shall start transmitting data to the AFNT App.
Alternative Flow	None

5. Functional Requirements

The functional requirements are divided into 4 categories: Database, Website, Application and Arduino Watch. These categories may be divided into further sub-categories to make them more readable, making it easier to track progress.

5.1. Database

Database Management System (DBMS)				
ID	**Summary**	**Priority**	**Status**	**Created**
Central Database (CDB)				
FD1	The central database should be stored in a MySQL Server.	M	Complete	25/10/2023
FD2	Should store preset meals, food items, exercises, and workouts with attributes such as meal_id, food_item_id, exercise_id, and workout_id.	M	Complete	11/10/2023
FD3	Store user information in CDB with attributes such as user, email, password hash, type (User or Admin), gender, phone, address, and date created.	M	Complete	25/10/2023
FD4	Support queries to retrieve preset meals, food items, exercises, and workouts based on various filters such as meal type, food category, exercise category, and workout difficulty.	M	Complete	25/10/2023
FD5	Provide data synchronization capabilities to update the local database with the latest preset data by comparing the timestamps of the local and central databases.	M	Partially Complete	25/10/2023
Local Database (LDB)				
FD6	The local database should be stored in the user drive using SQLite.	M	Complete	25/10/2023
FD7	Store both preset and custom (combined as one) in tables: meals, meal_logs food_items, food_item_logs. exercises, exercise_logs workouts, workout_logs, heart rate, blood oxygen level, and step count.	M	Complete	16/10/2023

FD8	Store user information in LDB with attributes such as user, email, password hash, type (User or Admin), gender, phone, address, and date created.	M	Complete	16/10/2023
FD9	Support updates to custom meals, workouts, exercises, and health metrics by allowing users to add, modify, and delete records.	M	Complete	09/10/2023
FD10	Store health metrics from the Arduino watch including step count, heart rate and blood oxygen level.	M	Complete	17/10/2023
FD11	Store other metrics such as height (meters), weight (kg), BMI, skeletal muscle (kg), body fat (%) and water intake (ml),	M	Complete	26/10/2023

5.2. Website

Admin Management Website (AM)				
ID	**Summary**	**Priority**	**Status**	**Created**
FW1	The AFNT App shall link to the AM website for Admin login.	S	Not Started	09/10/2023
FW2	The website should only be accessible to Admins and can be accessed Online or via AFNT App.	S	Partially Complete	09/10/2023
FW3	The website shall allow Admin users to log in securely with their credentials.	S	Complete	09/10/2023
FW6	The website shall allow admins to modify user personal details (i.e., profile picture, name, age, gender, dob, email, password, phone, address, and postcode.	C	Not Implementing	09/10/2023
FW7	The website shall allow admins to edit their own profiles (profile picture, name, age, gender, dob, email, password, phone, address, and postcode).	C	Not Implementing	09/10/2023
FW8	The website should allow admins to add/modify/delete preset workout data	M	Not Implementing	09/10/2023
FW9	The website should allow admins to add/modify/delete preset exercise data	M	Not Implementing	09/10/2023
FW10	The website should allow admins to add/modify/delete preset meal data	M	Not Implementing	09/10/2023
FW11	The website should allow admins to add/modify/delete preset food item data	M	Not Implementing	09/10/2023
FW12	The website shall allow admins to push database updates to the AFNT application.	M	Not Implementing	10/10/2023

5.3. Application

Alistana Fitness & Nutrition Tracker Application (AFNT)				
ID	**Summary**	**Priority**	**Status**	**Created**
Login and Registration				
FA41	The application shall allow users to login using their username and password credentials.	M	Complete	17/10/2023
FA42	The application shall allow users to register, and they must provide details such as username, email, password, phone number, email address, address, date of birth and gender.	M	Complete	17/10/2023
User Profile				
FA43	The application shall allow users to modify their personal data such as profile picture, username, email, password, phone number, email address, address, date of birth and gender.	M	Partially Complete	17/10/2023
FA44	The application shall allow users to delete their personal data.	M	Partially Complete	17/10/2023
FA45	The application shall allow users to delete their account and all the data associated with it.	M	Partially Complete	17/10/2023
Workout Tracker				
FA1	The application shall allow users to create their own workout plans.	M	Complete	09/10/2023
FA2	The application shall allow users to customize their own workout plans.	M	Complete	09/10/2023
FA3	The application shall allow users to choose pre-designed workout plans based on their goals.	M	Complete	09/10/2023
FA4	The application shall allow users to receive suggested workouts based on fitness goals.	S	Partially Complete	09/10/2023
FA5	The application shall allow users to track their workouts by recording exercises, sets, reps, and weights (For custom exercises).	M	Complete	09/10/2023

FA6	The application shall allow users to rate their performance for each exercise (For both preset and custom).	M	Complete	09/10/2023
FA7	The application shall allow users to rate their performance for each workout (For both preset and custom).	M	Complete	09/10/2023
FA8	The application shall allow users to view their workout logs (For both preset and custom).	M	Complete	09/10/2023
FA9	The application shall allow users to view their exercise logs (For both preset and custom).	M	Complete	09/10/2023
FA10	The application shall allow users to display graphs of each exercise progress (i.e., Bench press max weight every month).	M	Partially Complete	09/10/2023
FA11	The application shall allow users to display graphs of cardio-related exercises (i.e., Step/Distance for treadmill session) by manually inputting the information.	M	Complete	23/10/2023
FA12	The application shall allow users to display graphs of cardio-related exercises (i.e., Step/Distance for treadmill session) provided by the Arduino watch.	M	Complete	23/10/2023
FA13	The application shall produce charts for weight in kilogram (per day).	M	Complete	26/10/2023
FA14	The application shall allow users to set goals for workouts.	C	Not Started	24/10/2023
Nutrition Tracker				
FA15	The application shall allow users to select preset food items.	M	Complete	09/10/2023
FA16	The application shall allow users to select preset meals.	M	Partially Complete	09/10/2023
FA17	The application shall allow users to create custom food items and define their nutritional contents (i.e., calories, protein, carbs, fats etc.)	M	Partially Complete	09/10/2023
FA18	The application shall allow users to create custom meals and add food	M	Partially Complete	26/10/2023

	items (Both custom and preset) to the custom meal.			
FA19	The application shall allow users to modify custom food items.	M	Partially Complete	09/10/2023
FA20	The application shall allow users to modify custom meals.	M	Partially Complete	09/10/2023
FA21	The application shall allow users to input daily water intake in milliliters (per day).	M	Complete	09/10/2023
FA22	The application shall allow users to generate a daily calorie intake graph based on a selected date range.	M	Not Started	24/10/2023
FA23	The application shall allow users to generate a daily nutritional content intake (i.e., Carbs, fat, protein intake per day) graph based on a selected date range.	M	Not Started	24/10/2023
FA24	The application shall allow users to generate a daily water intake graph based on a selected date range.	M	Complete	24/10/2023
FA25	The application shall allow users to set goals for nutritional intake.	C	Not Started	25/10/2023
FA26	The application shall allow users to set goals for their water intake	C	Partially Complete	25/10/2023
Body Measurements Tracker				
FA27	The application shall allow users to input their daily weight in kilograms (per day).	M	Complete	26/10/2023
FA28	The application shall allow users to input their daily height in meters (per day).	M	Complete	26/10/2023
FA29	The application shall allow users to input Skeletal muscle data in kilograms (per day).	M	Complete	26/10/2023
FA30	The application shall allow users to input Body fat data in percentage (per day).	M	Complete	26/10/2023
FA31	The application shall use weight and height data and calculate user's BMI (per day).	M	Complete	26/10/2023
FA32	The application shall produce charts for weight in kilogram (per day).	M	Complete	26/10/2023

FA33	The application shall produce graphs for height change.	M	Complete	26/10/2023
FA34	The application shall produce charts for BMI change.	M	Complete	26/10/2023
FA35	The application shall allow users to set goals for step counts/distance covered per day.	M	Complete	26/10/2023
FA36	The application shall allow users to generate a heart rate graph provided by the Arduino watch.	M	Complete	26/10/2023
FA37	The application shall allow users to generate a blood oxygen chart provided by the Arduino watch.	M	Complete	26/10/2023
Gym Locator				
FA38	The application shall allow users to get a list of the nearest gyms based on a mapping API.	S	Partially Complete	24/10/2023
Health & Nutrition Advice				
FA39	The application shall allow users to access health-related advice.	W	Not Implementing	09/10/2023
FA40	The application shall allow users to access fitness-related advice (i.e., correct exercise forms etc.).	W	Not Implementing	09/10/2023

5.4. Arduino Watch:

Arduino Fitness Watch				
ID	**Summary**	**Priority**	**Status**	**Created**
FAW1	The watch shall display the current date and time.	M	Complete	16/10/2023
FAW1	The watch shall have an oximeter module attached to measure heart rate and blood oxygen levels in real-time.	M	Complete	16/10/2023
FAW2	The watch shall have an accelerometer module attached to measure steps in real-time.	M	Complete	16/10/2023
FAW3	The watch shall also use the accelerometer to count reps for the bench press in real-time.	M	Partially Complete	18/10/2023
FAW4	The watch shall have a microSD storage unit to store body measurements in real-time.	M	Complete	18/10/2023
FAW5	The watch shall compile, and store measured data in a CSV file type.	M	Complete	18/10/2023
FAW6	The watch shall use a Bluetooth (low energy) module to transfer data to the application.	M	Partially Complete	18/10/2023
FAW7	The watch shall also use a wired connection via a micro-USB port to transfer watch data to the application.	M	Partially Complete	18/10/2023
FAW8	The application shall process and store watch data in the local database.	M	Partially Complete	18/10/2023

6. Non-Functional Requirements

The non-functional requirements are divided into 9 categories: Application, Performance, Efficiency & Sustainability, Data Storage Optimization, Privacy & Security, Reliability, Usability, Data Backup & Recovery, and Third-Party Service Integration. These categories may be divided into further sub-categories to make them more readable, making it easier to track progress.

6.1. Application:

Alistana Fitness & Nutrition Tracker Application (AFNT)				
ID	**Summary**	**Priority**	**Status**	**Created**
Workout Tracker				
NFA1	Users can add an unlimited number of custom exercises	M	Complete	25/10/2023
NFA2	Users can add an unlimited number of custom workouts	M	Complete	25/10/2023
NFA3	Users cannot modify preset workouts and exercises.	M	Complete	25/10/2023
NFA4	Users can allocate three workouts per day.	M	Complete	25/10/2023
NFA5	Users can choose up to 20 exercises (incl. custom exercises) per workout.	M	Complete	25/10/2023
NFA6	Users cannot modify preset workouts and exercises.	M	Complete	25/10/2023
Nutrition Tracker				
NFA8	Users can add an unlimited number of custom food items	M	Partially Complete	25/10/2023
NFA9	Users can add an unlimited number of custom meals	M	Partially Complete	25/10/2023
NFA10	Users cannot modify preset food items and meals.	M	Partially Complete	25/10/2023
NFA11	Users can modify meal logs and food item serving size in that meal (Can be both custom or preset meal and food item.)	M	Partially Complete	26/10/2023

NFA12	Users can only select up to 4 meals (Morning, Afternoon, Evening, and Dinner) per day.	M	Not Started	25/10/2023
NFA13	Users can choose up to 8 food items (incl. custom food items) per meal.	M	Not Started	25/10/2023
NFA14	Users cannot modify the nutrition content of preset meals and food items.	M	Partially Complete	25/10/2023

6.2. Performance:

Performance				
ID	**Summary**	**Priority**	**Status**	**Created**
NFP1	The AM website should load in under 5 seconds, ensuring optimal user experience	S	Complete	09/10/2023
NFP2	The AM website shall respond to user input within 200 milliseconds, providing a smooth and responsive interaction.	S	Partially Complete	09/10/2023
NFP3	The application shall load within a 5-second time frame, ensuring users can access the features promptly.	S	Complete	09/10/2023
NFP4	The Arduino watch should display heart rate, blood oxygen level, steps count in real time on the watch display.	M	Complete	17/10/2023

6.3. Efficiency & Sustainability:

Efficiency & Sustainability				
ID	**Summary**	**Priority**	**Status**	**Created**
NFES1	The AM website should have a memory usage of no more than 500 MB and a CPU usage of no more than 10% under normal operating conditions.	C	Complete	09/10/2023
NFES2	The application should have a memory usage of no more than 250 MB and a CPU usage of no more than 5% under normal operating conditions.	C	Complete	25/10/2023
NFES3	The watch should collect and store data with a latency of no more than 100 milliseconds and a storage usage of no more than 50 MB.	C	Complete	24/10/2023
NFES4	The watch should transfer data to the application with a latency of no more than 200 milliseconds and a data transfer rate of at least 1 Mbps.	C	Partially Complete	24/10/2023
NFES5	Ensure database consistency and integrity by implementing ACID (Atomicity, Consistency, Isolation, Durability) properties in database transactions.	C	Complete	25/10/2023

6.4. Data Storage Optimization:

Data Storage & Optimization				
ID	**Summary**	**Priority**	**Status**	**Created**
NFDS1	Implement efficient data storage techniques such as indexing, partitioning, and normalization to ensure that the average database query time is no more than 200 milliseconds for read queries and no more than 500 milliseconds for write queries.	S	Complete	09/10/2023

6.5. Privacy & Security:

Privacy & Security				
ID	**Summary**	**Priority**	**Status**	**Created**
NFPS1	The system shall implement features such as data minimization, purpose limitation, data portability, and the right to be forgotten, to comply with GDPR guidelines.	C	Partially Complete	09/10/2023
NFPS2	The system shall implement role-based access control, secure authentication and authorization mechanisms, and regular security audits to ensure data privacy and security for user personal and health data.	W	Partially Complete	09/10/2023
NFPS3	User data, both at rest and in transit, shall be encrypted using industry-standard encryption algorithms (e.g., AES-256) to ensure data is stored and transmitted safely.	C	Partially Complete	24/10/2023
NFPS4	The Bluetooth or wired data transfer from the Arduino watch to the app shall use secure protocols (e.g., TLS/SSL) and industry-standard encryption algorithms (e.g., AES-256) to ensure the data is transferred securely and encrypted.	S	Not Started	24/10/2023

6.6. Reliability:

Reliability				
ID	**Summary**	**Priority**	**Status**	**Created**
NFR1	The AM website will have an uptime of at least 99.9% by implementing robust error handling and failover mechanisms.	S	Partially Complete	10/10/2023
NFR2	The application shall implement robust error handling to ensure that any errors are gracefully handled, and logged for analysis and that the application recovers without crashing.	M	Partially Complete	24/10/2023
NFR3	The database and server shall implement robust error handling to automatically recover from failures and backup mechanisms to ensure data is backed up at least once a day and can be restored within 24 hours in case of data loss.	M	Partially Complete	09/10/2023
NFR4	The Arduino hardware shall be constructed with materials that meet industry standards for wearables.	C	Partially Complete	16/10/2023
NFR5	The smartwatch shall have a power management system that optimizes battery usage to ensure at least 12 hours of continuous operation on a single charge under normal usage conditions.	C	Partially Complete	16/10/2023

6.7. Usability:

Usability				
ID	**Summary**	**Priority**	**Status**	**Created**
NFU1	The AM website shall follow WCAG 2.1 AA compliance, as verified by automated testing tools.	C	Partially Complete	09/10/2023
NFU2	The application shall have a user-friendly interface with a System Usability Scale (SUS) score of at least 70, indicating good usability.	C	Partially Complete	24/10/2023
NFU3	The AM website UI shall have a navigation menu that is clearly visible and accessible from all pages, and a user flow that requires no more than three clicks to reach any page.	S	Partially Complete	25/10/2023
NFU4	The website and application shall implement features such as screen reader compatibility, keyboard navigation, and text alternatives for non-text content to enhance accessibility for users with disabilities.	W	Not Implementing	25/10/2023
NFU5	The application shall synchronize health data from the smartwatch to the app by pressing a sync button, ensuring that the data is up-to-date and accurate.	M	Not Started	16/10/2023
NFU6	The application shall display clear and informative error messages in case of data transfer issues from the watch and provide a troubleshooting guide in the help section of the app.	S	Not Started	16/10/2023
NFU7	The application should be compatible with mobile platforms, providing seamless functionality and usability across various mobile devices. The responsiveness and compatibility standards should adhere to modern design principles, facilitating accessibility and usability for users on different devices.	S	Partially Complete	16/10/2023

6.8. Data Backup & Recovery:

Data Backup & Recovery				
ID	**Summary**	**Priority**	**Status**	**Created**
NFDBR1	The system shall have an automated backup and recovery system that creates daily backups of the database and stores them in a secure location, with the ability to restore data within 24 hours in case of data loss.	M	Complete	09/10/2023
NFDBR2	The program's source code shall be backed up regularly to GitHub, with automated daily backups to OneDrive for additional redundancy. The backup system should support version control, allowing for the recovery of specific versions of the code if needed.	M	Complete	09/10/2023

6.9. Third-Party Service Integration:

Third-Party Service Integration				
ID	**Summary**	**Priority**	**Status**	**Created**
NFTPS1	The system shall integrate with mapping APIs to provide location-based services such as gym locator. The integration should be seamless, with real-time data synchronization and minimal latency.	C	Complete	09/10/2023