CZ2006 SOFTWARE ENGINEERING

BCS3 Team WomenInTech

FINAL DELIVERABLE:

FUNCTIONAL & NON-FUNCTIONAL REQUIREMENTS

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Project Mission Statement

Wellness is on the rise in Singapore, with gym enthusiasts becoming more prevalent. For entrepreneurs in WomenInTech, this presents an opportunity for us to develop a gym workout tracking application by fitness enthusiasts for fitness enthusiasts. We will develop an Android application for gym-goers to keep track of their gym routine, find a gym buddy or provide an all-in-one personalised gym routine catered to each individual's personal goals.

Unlike most existing applications, that are men-biased, our application aims to also promote gender equality and an inclusive society by including features specific to females. The application aims to capitalise Map APIs and other external APIs Youtube and Workout API data to allow individuals to achieve their personal goals. This application aims to promote the Healthy Living Master Plan by the Health Promotion Board (HPB SG).

Functional Requirements

Login

1. Users must be able to create an account if it's their first time using the app.
2. The app must prompt first time users for their login details.
   2.1. The app must prompt users for their username.
   2.2. The app must prompt users for their password.
   2.3. The app must prompt users to confirm their password.
3. The app must prompt first time users for their personal details.
   3.1. The app must prompt users for their first name.
   3.2. The app must prompt users for their last name.
   3.3. The app must prompt users for their email.
   3.4. The app must prompt users for their birthday.
   3.5. The app must prompt users for their gender.
   3.6. The app must prompt users for their height and weight.
   3.7. The app must prompt users about the presence of any physical injuries.
      3.7.1. The app must prompt users about the type of physical injuries.
      3.7.2. The app must prompt users about the area of injuries.
   3.8. The app must prompt users about the presence of any pre-existing health conditions.
   3.9. The app must prompt users about their fitness goals.
   3.10. If the user is female, the app must prompt users about the date of their last period.
      3.10.1. The app shall provide the option to skip this step if they are unsure of the date of their last period.
      3.10.2. The app shall provide the option to skip this step if the user is pregnant.
4. If users already have an account, users must be able to log in. After logging in, users must be able to sign out whenever they want.

Workout Planner

1. The app must be able to allow users to update their details prior to each workout
   1.1. The app must showcase previously inputted details.
   1.2. The app must allow users to update their height and weight.
   1.3. The app must allow users about the presence of any physical injuries.
      1.3.1. The app must prompt users about the type of physical injuries.
      1.3.2. The app must prompt users about the area of injuries.
   1.4. The app must allow users to update their fitness goals.
   1.5. If the user is female, the app must allow users to update the date of their last period.
      1.5.1. The app shall provide the option to skip this step if they are unsure of the date of their last period.
      1.5.2. The app shall provide the option to skip this step if the user is pregnant.
   1.6. The user shall be able to proceed even if there are no changes.
      1.6.1. The app shall store the user's updated changes.
2. Users must be able to create their own customised workout routine.
   2.1. Users must be able to enter a workout routine title.
   2.2. Users shall enter a description of their workout routine.
   2.3. Users must be allowed to select the intensity of their workout based on the metabolic equivalents.
   2.4. Users must be allowed to select the duration of the workout.
   2.5. Users must be allowed to select the location to do their workout.
   2.6. Users must be allowed to select the type of equipment they have.
3. The app must display the workout information before they start.
   3.1. The app must display the title of their workout routine.
   3.2. The app must display the workout description.
   3.3. The app must display the duration of the workout.
   3.4. The app must display the location that the workout will take place.
      3.4.1. If the user selects to workout at the gym, the user must be able to find the closest gym to them.
   3.5. The app must display the full workout routine and the time taken for warm-up, exercise and cool-down.
   3.6. The app shall display the sets and reps suggested for each exercise.
   3.7. The app shall display the option to start the workout now, later or delete the workout recommended.
4. Users must be able to manually start the workout.
   4.1. The app must display a timer to show the length of their workout.
      4.1.1. Users must be able to pause and start the timer.
   4.2. The app must display the selected warm up video from the Youtube API.
      4.2.1. Users must be able to play the video from the app.
      4.2.2. Users shall be able to hear the audio if sound is enabled.
      4.2.3. The app must prompt the users to finish their warm-up so they can move on to the exercises.
   4.3. The app must display the exercise that the user should perform.
      4.3.1. The app must display the name of the exercise
      4.3.2. The app must display a description of the exercise.

4.3.3. The app must display the recommended number of sets and reps the user should perform.

      4.3.3.1. Users must be able to add more sets or remove sets.

4.3.4. Users must be able to complete the set.

4.3.5. Users must be able to move on to the next exercise after all sets are completed.

4.3.6. Users must be able to pause the workout at any time and go to the edit workout interface to edit the number of reps.

4.4. The app must display the selected cool down video from the Youtube API after finishing all the exercises.

      4.4.1. Users must be able to play the video from the app.

      4.4.2. Users shall be able to hear the audio if sound is enabled.

      4.4.3. The app must prompt the users to finish their cool-down to complete their workout.

5. The app must show the workout summary after the workout is complete

5.1. The app will display the time and date the workout was completed.

      5.1.1. The app will also display some basic statistics like total sets, total reps, total calories and duration of workout

5.2. User will be allowed to leave a workout note

6. The app must display a page displaying current and past workouts

6.1. The user is able to edit workouts by making modifications to the number of repetitions.

      6.1.1. The user is also able to delete past workouts from the record

7. The app shall display the workouts the user has created in the main workout interface.

7.1. The app must prompt users to create a workout if they have never created a workout.

7.2. The user shall be able to filter workouts that are not yet started.

7.3. The user shall be able to filter workouts that are in progress.

7.4. The user shall be able to filter workouts that are completed.

7.5. The user shall be able to filter My Buddy's Workouts, which will be highlighted in a blue border.

7.6. The user shall be able to show tags of the workout corresponding to the options they selected when creating the workout.

7.7. The app shall display the completion status of each workout.

8. The app shall display a weekly workout progress chart on the home page based on completed workouts.

8.1. Users shall be able to toggle the chart to see their weekly workout progress summary.

      8.1.1. Users shall be able to see more of their progress when they click on the 'See More' button which will display their completed workouts.

9. The app shall display Youtube video recommendations based on the user's most recent workouts.

9.1. Users should be able to click on the videos which will route the user to youtube directly.

Find a gym buddy

1. The app shall prompt the user to create a gym buddy account for first time gym buddy users.
    1.1. The app must display the user's name based on their WITFIT account.
    1.2. The app must prompt the user to upload at least 1 photo of themselves.
        1.2.1. The user's profile shall be displayed with a default male or female image based on their gender if no image is uploaded.
    1.3. The app must prompt the user for the preferred gender of their buddy.
    1.4. The app must prompt the user to input a brief description of themselves.
    1.5. The app must prompt the user for their preferred workout timings.
        1.5.1. The app must allow users to select multiple blocks of timings.
    1.6. The app must prompt the user for the goals they want to achieve with their buddy.
        1.6.1. The app must display a list of goals.
        1.6.2. The app must allow the user to select up to 3 goals.
    1.7. The app must prompt the user for their strengths (area of expertise)
        1.7.1. The app must display a list of areas of strengths.
        1.7.2. The app must allow users to select up to 3 areas of strength.
    1.8. The app must prompt the user for their style of training.
        1.8.1. The app must display a list of styles of training.
        1.8.2. The app can allow the users to select up to two styles of training.
    1.9. The app must prompt the user to enter their preferred location of training.
        1.9.1. The app must display a list of potential training locations.
        1.9.2. The app must allow users to select up to 2 desired training locations.
    1.10. The app must prompt the user to enter the desired traits of their buddies.
        1.10.1. The app must display a list of traits for their buddies.
        1.10.2. The app must allow users to select up to 3 desired training traits.
    1.11. The app must prompt the user to enter the desired training styles of their buddies.
        1.11.1. The app must display a list of training styles for their buddies.
        1.11.2. The app must allow users to select up to 2 desired training styles.
2. If this is not the user's first time using the interface, the app must display an option to allow the user to edit their preference.
    2.1. The app must proceed to the "edit my preference interface" described in 2.1, if the user selects to edit their preference.
3. The app shall display the user's profile if a gym buddy account has been created before.
    3.1. The app shall display the user's uploaded image.
        3.1.1. The app shall display a default image depending on gender if no image was uploaded.
    3.2. The app shall display the user's name and age.
    3.3. The app shall display the user's brief introduction.
    3.4. The app shall display the user's preferred workout time.
    3.5. The app shall display the user's goals.
    3.6. The app shall display the user's strengths.
4. The app must allow users to find a buddy.

4.1.   The app must display a welcome message and prompt the user to agree with certain usage rules.
    4.1.1.   The app must display a "Be Motivated" message.
    4.1.2.   The app must display a "Build Your Own Community" message.
    4.1.3.   The app must display a "Have Fun" message.
4.2.   The app shall use an algorithm to suggest potential gym buddies.
    4.2.1.   The algorithm shall include preferences of the user.
    4.2.2.   The algorithm will place priority on gender preference.
4.3.   The app must allow users to swipe right to match a buddy for swipe left to not match the recommended match.
    4.3.1.   The user must swipe pass a certain horizontal distance before the app will display the next match.
    4.3.2.   The app shall display a green interface while the user is swiping right.
    4.3.3.   The app shall display a red interface while the user is swiping left.
    4.3.4.   The app shall display detailed information of the suggested buddy.
        4.3.4.1.   The app shall display the recommended buddy's profile picture.
        4.3.4.2.   The app shall display the recommended buddy's name and age.
        4.3.4.3.   The app shall display the recommended buddy's brief introduction.
        4.3.4.4.   The app shall display the recommended buddy's goals.
        4.3.4.5.   The app shall display the recommended buddy's strengths.
        4.3.4.6.   The app shall display the recommended buddy's style of training.
        4.3.4.7.   The app shall display the recommended buddy's favourite hours.
        4.3.4.8.   The app shall display the recommended buddy's preferred location.
    4.3.5.   The app must allow users to go back at any point in time.
5.   The app must allow users to pair up with a suggested buddy.
5.1.   If the buddy has already opted to pair up, then there is a match.
    5.1.1.   The app must display a new chat tagged as new in the buddy list interface.
    5.1.2.   The app must display the buddy in the user's buddy list interface.
    5.1.3.   The app must also display the user in the buddy's buddy list interface.
5.2.   If the buddy has yet to opt to pair up or the buddy has already opted not to pair up, there will not be a match.
    5.2.1.   The suggested buddy will be removed from the user's list of suggested buddies.
5.3.   If the buddy opts to pair up subsequently, there will be a match.
    5.3.1.   The app must display the buddy in the user's buddy list interface.
6.   The app must display a list of buddies that are successful matches.
6.1.   The app shall display the buddy's profile picture, last message, full name and timestamp of last message for each chat.
6.2.   The app must allow users to click into each chat and send messages freely if a match is made.

      6.2.1.   The app must display the exchange of messages between the user and the buddy in real time.

7. The app must allow users to have an option to remove the buddies.
    7.1.   The app shall display a confirmation removal message.
        7.1.1.   The user shall be given the option to proceed.
            7.1.1.1.   The app must remove the buddy from the user's buddy list display.
            7.1.1.2.   The app must remove the user from the buddy's buddy list display as well.
        7.1.2.   The user shall be given the option to go back.
    7.2.   The app shall return to the chat list display and exclude the chat that has been removed.

8. The app must allow users to have an option to share their workouts.
    8.1.   The app shall display a confirmation share workout message.
        8.1.1.   The user shall be given the option to proceed.
            8.1.1.1.   The app must share non-duplicated workouts with the buddy.
            8.1.1.2.   The buddy must be able to see the shared workouts in the Workout home user interface with the shared workouts highlighted by a blue border.
        8.1.2.   The user shall be given the option to go back.

Non-functional Requirements

Usability:

1. The app (including help messages) shall all be in English.

2. First time users must be able to learn how to use the different functionalities within the application within 5 minutes.

3. After account creation, 80% of first-time users must be able to enter a simple query such as creating a workout or finding a buddy within 2 minutes of starting to use the system.

4. If the user's network connection is poor or unavailable, the app must display a toast prompting the user to try again with a stable network connection.

5. The user should receive meaningful alerts like 'User created', 'Workout saved' in the application flow to aid user experience.
*Example shown in the next page
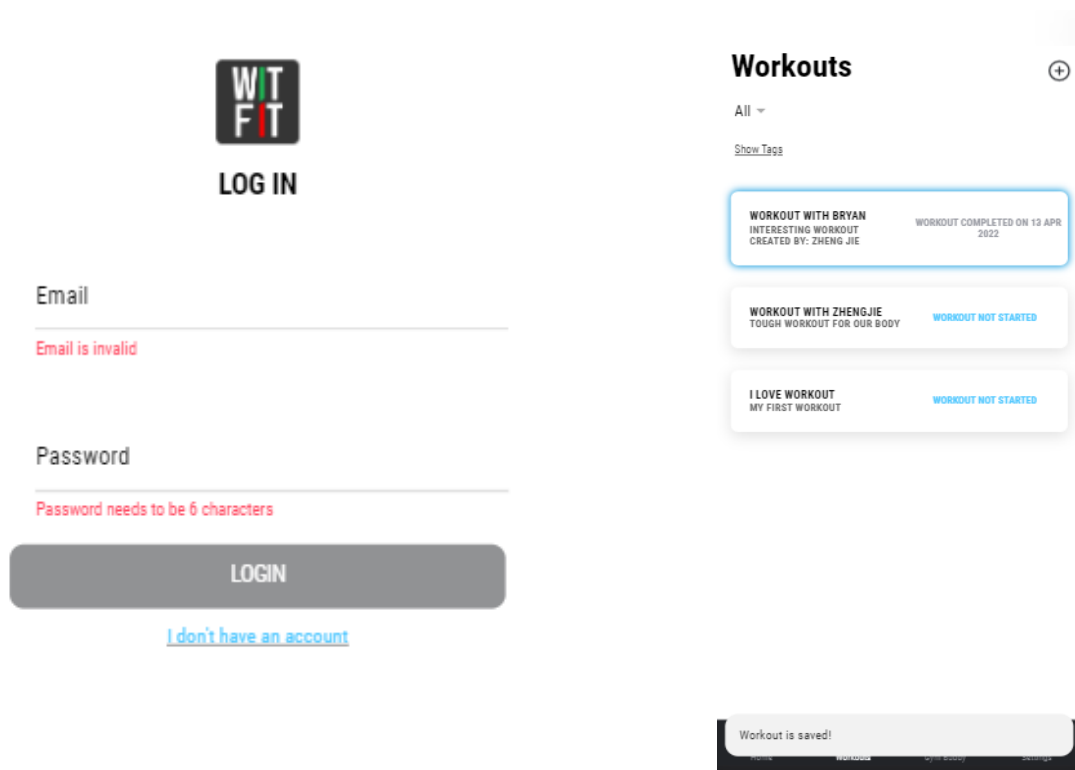
Performance:

1. Each page must load within 2 seconds, with the exception of the creation customised workout option.
2. The application must be able to service up to 100 concurrent users.
3. The application must control up to 2 drill presses concurrently.

4. Assuming a good internet connection, the chat messages shall be displayed for each user within 1 second of sending the message.

Infrastructure:

1. The database shall be stored in the Firebase cloud platform using Cloud Firestore
2. All platforms must interface with the database to get user information
3. All user input must be stored in the database upon exiting the program.
4. All user input shall be stored locally on the device during application runtime.
5. The app shall be developed using the Ionic Angular Framework which uses Typescript.

Portability & Scalability:

1. The database used to store information shall be able to migrate information to other devices easily.
2. The system should be able to handle a load of up to 100 users at any one time.

Compatibility:

1. The app must be compatible on Android and iOS devices.

2. The app must interface with the application programming interface from data.gov.sg to fetch gym information
3. The app must interface with Youtube and workout applicable programming interfaces to fetch exercises and workout information.
4. The app must interface with Spotify's applicable programming interface to get music playlist information.

Safety:

1. The app must provide workout recommendations that prevent aggravation of existing injuries.
2. The app must provide workout recommendations that will not result in physical injury to the user.
3. The app must provide overall safety guidelines regarding workouts.
4. The app must recommend users to perform a warm up prior to the actual workout to reduce the risk of injury.
5. The app must recommend users to perform a cool down after the actual workout to reduce the risk of injury.
6. The app must inform users of the proper guidelines when using the find a buddy feature

Reliability:

1. Users must be able to use the app without any issues, 24 hours a day, 7 days a week.

Maintainability:

1. The application design shall adhere to SOLID principles for code maintainability.
2. The application shall adhere to design patterns - Observable for the chat interface, Singleton-for Youtube API & largely MVC pattern, for software extensibility.
3. The app shall be documented using JSDocs to ensure that developers can easily take over code, for maintainability.
4. The code used in the application prototype must conform to ESLint Conventions for readability.

Supportability:

1. The app must be able to support new features or upgrades in the future.
2. The app must have monthly updates to resolve bug fixes.

Security:

1. Passwords shall be hashed using SHA256, and must contain at least 6 characters.
2. The app shall use Firebase Authentication and Firestore Security Rules to handle serverless authentication, authorisation and data validation.
3. The app shall use Identity and Access Management (IAM) to manage access to the database.