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CZ2006 SOFTWARE ENGINEERING

BCS3 Team WomenInTech

LAB #1 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, locate nearby gyms, 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 on both government data, Map APIs and other external APIs - Spotify, Youtube and Gym 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.
   1. The app must prompt users for their username.
   2. The app must prompt users for their password.
3. The app must prompt first time users for their personal details.
   1. The app must prompt users for their first name.
   2. The app must prompt users for their last name.
   3. The app must prompt users for their email.
   4. The app must prompt users for their birthday.
   5. The app must prompt users for their gender.
   6. The app must prompt users about the presence of any physical injuries.
      1. The app must prompt users about the type of physical injuries.
      2. The app must prompt users about the area of injuries.
   7. The app must prompt users about the presence of any pre-existing health conditions.
   8. The app must prompt users about their fitness goals.
   9. If the user is female, the app must prompt users about the date of their last period.
      1. The app shall provide the option to skip this step if they are unsure of the date of their last period.
      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.
   1. If users already have an account and forgotten their password, users must be allowed to change their password.

## GymFinder

1. The app must request for permission to access the user’s location.
   1. If permission is granted by the user, the app must show a map of all gyms within a certain kilometre radius of the user’s location.
      1. Users must be able to specify the desired kilometre radius.
         1. If no kilometre radius is specified, the app shall use 5km radius as the default.
      2. The app must show a list of all gyms within this radius of the user’s location.
         1. The list of gyms must state the brief details of each gym.
            1. The app must show the name of each gym.
            2. The app must show the address of each gym.
            3. The app must show the operating hours of each gym.

The app must show whether the gym is open

* + - * 1. The app must show the current distance of each gym from the user.
        2. The app must show the rating of each gym.
      1. The list of gyms must be sorted in ascending distance from the user.
    1. If no gym is within the radius, the app must display that no gyms are within the radius.
  1. If permission is not granted by the user, the app must show a map of all gyms in Singapore.
     1. The app must also show a list of all gyms.
        1. The list of gyms must state the brief details of each gym.
           1. The app must show the name of each gym.
           2. The app must show the address of each gym.
           3. The app must show the operating hours of each gym.
           4. The app must show the current distance of each gym from the user.
           5. The app must show the rating of each gym.
        2. The list of gyms must be sorted in ascending alphabetical order.

1. The app must display an interactive map.
   1. Users must be able to manually scroll through the list of gyms.
   2. Users must be able to click and drag to navigate the map.
2. Users must be able to search for gyms of their choice.
   1. The app shall filter the list of gyms as the user types.
   2. The list of gyms must be able to be filtered by the name of the gym.
   3. The list of gyms must be able to be filtered by the address of the gym.
   4. The list of gyms must be able to be filtered by the planning area of the gym.
3. Users must be able to select one of the gyms from the list of gyms.
   1. When a gym is selected, users must be able to see detailed information regarding the selected gym.
      1. The app must display the name of the gym.
      2. The app must display the address of the gym.
      3. The app must display the planning area of the gym.
      4. The app must display the contact details of the gym.
      5. The app must display the operating hours of the gym everyday from Sunday to Monday.
         1. The app must display if the gym is open, relative to the current time on the user’s phone.
      6. Users must be able to copy the gym details to the clipboard with a single button.
      7. The app must display the reviews of the gym by other users.
         1. The app must display the average total rating from 1 to 5 stars.
         2. The app must display the total number of reviews in each rating scale from 1 to 5 stars.
         3. The app must display a list of reviews.
         4. Users must be able to sort the list of reviews.
            1. The app must be able to sort the list of reviews by date.
            2. The app must be able to sort the list of reviews by rating.
         5. Users must be able to scroll through the list of reviews.
         6. Each review on the app must display the name of the reviewer.
         7. Each review on the app must display the date or the number of days since the post was made.
         8. Each review on the app must display a rating scale from 1 to 5 stars.
         9. Each review on the app must display the comments made on the gym, if it exists for that review.
   2. Users must be able to select a gym to navigate to.
      1. Users must be able to set their preferred method of travel.
      2. The app shall prompt the user for their preferred navigation application, in which the app shall be redirected to.
4. Users must be able to submit a review of a gym.
   1. Users must select a rating scale from 1 to 5 stars in the review.
   2. Users shall include a comment in their review.

## Workout Planner

1. If the user has input their fitness details, the app must prompt an update on the user’s health condition.
   1. The user must select any changes to their health condition.
      1. If the user did not select an option, the app shall prompt the user to create a workout.
      2. If the user selects any option(s), the app shall prompt the user to make the changes.
         1. The app must remember the user’s updated changes.
2. Users must be able to create their own customised workout routine.
   1. Users must be able to enter a workout routine title.
   2. Users shall enter a description of their workout routine.
   3. Users must be allowed to select the intensity of their workout based on the metabolic equivalents.
   4. Users must be allowed to select the duration of the workout.
   5. Users must be allowed to select the location to do their workout.
   6. Users must be allowed to select the type of equipment they have.
3. The app must display the workout information before they start.
   1. The app must display the title of their workout routine.
   2. The app must display the workout description.
   3. The app must display the duration of the workout.
   4. The app must display the location that the workout will take place.
      1. If the user selects to workout at the gym, the user must be able to find the closest gym to them.
   5. The app must display the full workout routine and the time taken for warm-up, exercise and cool-down. each segment.
   6. If an exercise aggravates the user’s previous injuries, the app must highlight the exercise in red.
4. Users must be able to manually start the workout.
   1. The app must display a timer to show the length of their workout.
      1. Users must be able to pause and start the timer.
   2. The app must display the selected warm up video from Workout API.
      1. Users must be able to play the video from the app.
      2. The app must prompt the users to finish their warm-up so they can move on to the exercises.
   3. The app must display the exercise that the user should perform.
      1. The app must display the name of the exercise
      2. The app must display the image or video of the exercise.
      3. Users must be able to see detailed information regarding the selected exercise.
      4. The app must display the recommended number of sets and reps the user should perform.
         1. Users must be able to add more sets and reps.
         2. Users must be able to edit the number of reps for the current set.
         3. If the exercises involve weight, users must be able to enter the weight of equipment.
      5. Users must be able to complete the set.
      6. Users must be able to move on to the next exercise after all sets are completed.
5. The app must be able to recommend music from Spotify API to be played throughout the workout routine.
   1. Users shall have the option to turn off or turn on music.
   2. Users shall have the option to play their own music through Spotify link up
6. The app must show the workout summary after the workout is complete
   1. The app will display the time and date the workout was completed
      1. The app will also display some basic statistics like total sets, total calories and duration of workout
   2. If workout was done at the gym, the user is able to leave a review for the gym
   3. User will be allowed to leave a workout note
7. The app must display a page displaying current and past workouts
   1. The user is able to edit on going workouts by making modifications to the number of repetitions
      1. The user is also able to delete past workouts from the record
8. The app must allow users to add completed workouts to their fitness progress calendar.
   1. The app calendar must display the date the workout was done.
   2. The app calendar must display the workout completed on that date.
      1. The app calendar must allow users to tap onto the workout.
         1. The app must display the workout details as per 6.1
         2. User is able to edit the workout details
            1. Use is able to repeat past workout
   3. For females, the app calendar must display the menstruation cycle.

## Find a gym buddy

1. The app must display a welcome message and prompt the user to agree with certain usage rules.
   1. The app must display a “Be Motivated” message.
   2. The app must display a “Build Your Own Community” message.
   3. The app must display a “Have Fun” message.
2. The app must request permission from the user to access their personal information and the user’s location.
   1. If this is the user’s first time using the interface, the app must prompt the user to create a gym buddy account.
      1. The app must display the user’s name based on their WITFIT account.
      2. The app must prompt the user to upload at least 1 photo of themselves.
      3. The app must prompt the user for the preferred gender of their buddy.
      4. The app must prompt the user to input a brief description of themselves.
      5. The app must prompt the user for their preferred workout timings.
         1. The app must allow users to select multiple blocks of timings.
      6. The app must prompt the user for the goals they want to achieve with their buddy.
         1. The app must display a list of goals.
         2. The app must allow the user to select up to 3 goals.
      7. The app must prompt the user for their strengths (area of expertise)
         1. The app must display a list of areas of strengths.
         2. The app must allow users to select up to 3 areas of strength.
      8. The app must prompt the user for their style of training.
         1. The app must display a list of styles of training.
         2. The app can allow the users to select up to two styles of training.
      9. The app must prompt the user to enter their preferred location of training.
         1. The app must display a list of potential training locations.
         2. The app must allow users to select up to 2 desired training locations.
      10. The app must prompt the user to enter the desired traits of their buddies.
          1. The app must display a list of traits for their buddies.
          2. The app must allow users to select up to 3 desired training traits.
      11. The app must prompt the user to enter the desired training styles of their buddies.
          1. The app must display a list of training styles for their buddies.
          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.
      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 must allow users to find a buddy.
   1. The app shall use an algorithm to suggest potential gym buddies.
      1. The algorithm shall include preferences of the user.
      2. The algorithm shall include the distance of the suggested buddy and user.
   2. The app must allow users to scroll through a list of suggested buddies manually.
      1. The app must show detailed information when the user taps into a suggested buddy.
         1. When the user taps on the photos section, the app must display all available uploaded photos by the buddy in ascending order of age of photos.
         2. The app must display a brief description of the buddy.
         3. The app must display the buddy’s name.
         4. The app must display the buddy’s gender.
         5. The app must display the buddy’s preferred workout timing.
         6. The app must display the buddy’s goals.
         7. The app must display the buddy’s strength (area of expertise).
         8. The app must display the buddy’s style of training.
         9. The app must display the preferred training location of the buddy.
4. The app must allow users to pair up with a suggested buddy.
   1. If the buddy has already opted to pair up, then there is a match.
      1. The app must display a message “Match successful” if there is a match.
      2. The app must display the buddy in the user’s buddy list interface.
      3. The app must also display the user in the buddy’s buddy list interface.
   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.
      1. The suggested buddy will be removed from the user’s list of suggested buddies.
   3. If the buddy opts to pair up subsequently, there will be a match.
      1. The app must display the buddy in the user’s buddy list interface.
5. The app must display a list of buddies that are successful matches.
   1. The app must allow users to chat and send messages freely if a match is made.
      1. The app must display the exchange of messages between the user and the buddy in real time.
6. The app must allow users to have an option to remove the buddies.
   1. The app shall display a message “Buddy removed”.
   2. The app must remove the buddy from the user’s buddy list display.
   3. The app must remove the user from the buddy’s buddy list display as well.

# Non-functional Requirements

## Usability:

1. The app (including help messages) shall all be in English.
2. After account creation, 80% of first-time users must be able to enter a simple query such as searching for nearby gyms within 2 minutes of starting to use the system.
3. 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.
4. The updating process must finish within 3 hours so data is available by 8 a.m. local time after an overnight update.

## Performance:

1. Each page must load within 2 seconds.
2. The app must provide up-to-date information regarding available gyms refreshed every minute.
3. The application must be able to service up to 100 concurrent users.
4. The application must control up to 2 drill presses concurrently.

## 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.

## Compatibility:

1. The app must be compatible on Android 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.

## Reliability:

1. Users must be able to use the app without any issues, 24 hours a day, 7 days a week.
2. The app must meet minimally 95% uptime.

## Maintainability:

1. The application design shall adhere to SOLID principles for code maintainability.
2. For relational databases, data shall be stored in third normal form for database maintainability.

## Security:

1. Passwords shall be hashed using SHA256.
2. The mobile 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.