Principle of Software Engineering

[CEN 4010]

**GymBro**

**Group: Team 9**

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Milestone 1

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**Executive Summary**

There are many fitness apps that will offer many of the same benefits as all the others. This can anything form a diet plan all the way to full workout plans. Each of these apps can cost a fortune just to get some information and, even then, there have been instances where the person running the service ends up being a scam artist that was only in it for the money. Other apps will sell you information that has not been scientifically backed but would convince the majority of people that it was true. This is where our fitness app: GymBro, comes in.

GymBro is meant to be a grand solution to all the problems that a fitness app could have. This can go from lack of a BMI calculator to lack of good information. Our app will feature a multitude of features such as the ones mentioned before with science backed information, a gym locater to make it easy to find a gym in your area, etc. It will provide dietary plans to help reach the necessary weight needed to look they the way they want to.

Each person will have a personalized page based on their needs and wants. For example, if you are on the slim side and want to get fit but not buff, it will recommend you a more calorie heavy diet with exercise that don’t go overboard. It will also have a section where you can calculate how many calories you burn after each workout completed. This will help users keep track that everything they are doing is eventually leading up to their goal. Our app will also have the option of having a maintaining state. In other words, if you are happy where you are fitness wise, it will give you exercises that will help you maintain your fitness level in order not to lose all your progress.

Our app will also feature a recipe section that will not only tell you about your diet plant, but also teach you how to cook your own meals in order to succeed at your fitness goals. This will help users not only stay in shape but also provide a guide in how they can prepare their meals in order to maintain their required weight and protein levels.

Going to the gym and buying equipment can be expensive of some. So, in order to solve this dilemma, the app will also offer a budget plan. If the user is unable to pay for the gym or buy equipment, it will offer more Calisthenics exercises, which does not require any equipment in order to them. The same will be done in terms of the diet plan. If the user feels they are paying too much for food, it will offer an alternative to the diet.

Our goal in making this application is to help those who want to stay healthy and fit in their lives at without selling an arm and a leg in order to do so. This app will be completely free and will not keep any features or services behind a pay wall. This will ensure that it will be accessible to all who want to use it.

**Competitive Analysis**

In order to determine the competitive advantage our application against our competitors, we will focus on six general features that every website has and two additional features that is unique to our application.

Scaling:

1 – Bad

2 – Fair

3 – Average

4 – Good

5 - Great

Unique Features to our app:

* BMI calculator
* Gym Locater

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **GymBro** | **MyFitnessPal** | **Strava** | **Jefit** |
| **Homepage** | 4 | 3 | 4 | 4 |
| **Design** | 4 | 3 | 4 | 5 |
| **Navigation** | 5 | 2 | 3 | 5 |
| **Content** | 5 | 4 | 4 | 4 |
| **Accessibility** | 5 | 3 | 3 | 3 |
| **Helpfulness** | 5 | 5 | 5 | 5 |
| **BMI Calculator** | 5 | 0 | 0 | 0 |
| **Gym Locator** | 5 | 0 | 0 | 0 |
| **Average Score** | 4.75 | 2.5 | 2.875 | 3.25 |

**GymBro**

The homepage for GymBro will display the most important piece of information that the user needs such as BMI, Fitness Goals, Recipes, etc. This will make the navigation of our website more intuitive as most of what you need will already be in front of you. All other features will be accessible through a button or some other functionality that will make it easy to traverse the website.

**MyFitnessPal**

MyFitnessPal needs a log in before using their website, which covers any curious user from exploring before choosing their service. The UI is simple, but it may be challenging to find out where everything is. Extra features not included in the free version cost an additional $10 a month. This makes in inaccessible to anyone on a limited budget but wants to stay fit using free resources.

**Strava**

Strava is a fitness app mostly focuses on distance, elevation gain, calories, heart rate, etc. This is mostly useful for people like runners and cyclists. It may not be as useful for people doing other exercises such as calisthenics, weightlifting, etc. The website does not allow you to view anything before making an account which does not allow for users to explore before deciding.

**Jefit**

Just like with the other fitness apps on this list, Jefit does offer all services for free. If one were to want to access all features provided by this app, they would need to pay an additional $12.99 a month. Jefit also has a simple design to a fault. It’s simple to the point where the design choices begin to suffer for it. According to some users who have used the app, the routines and techniques may not be very comprehensive and more so if you’re just starting out in the field of fitness.

**Planned Advantages**

The planned advantages over our competitors are three things: BMI calculator, Gym Locator, and no subscription fees. Our app will be completely free for those looking for the best service for fitness without the additional costs that most other apps provide. The gym locator will help people find the nearest gym in order for them to find the nearest area to workout. The BMI calculator will help keep track and make sure the user stays within a healthy BMI making sure to be under or overweight.

**Data Definition**

The fitness app is a state-of-the-art application designed to facilitate users' improvement in their physical health by offering them personalized workout and dietary plans. The app is available free of cost and does not require any subscription fees. The key terminologies of the application are as follows:

1. ***User Profile:***

* First Name: The user's first name.
* Last Name: The user's last name.
* Email: The user's email address used for account verification and communication.
* Password: The user's password used for account login and security.
* Gender: The user's gender (male, female, non-binary).
* Age: The user's age in years.
* Height: The user's height in centimeters or feet/inches.
* Weight: The user's weight in kilograms or pounds.
* Fitness Goals: The user's fitness goals (lose weight, build muscle, improve endurance).
* Fitness Level: The user's current fitness level (beginner, intermediate, advanced).
* Activity Level: The user's typical activity level (sedentary, moderately active, very active).
* Medical Conditions: Any relevant medical conditions that may affect the user's ability to exercise (asthma, diabetes, pregnancy).
* Preferences: The user's workout and nutrition preferences (e.g. workout type, time of day, equipment).

1. ***Workout Data:***

* Workout Name: The name of the workout.
* Workout Type: The type of workout (cardio, strength, HIIT).
* Duration: The length of time the workout should take.
* Difficulty Level: The difficulty level of the workout (beginner, intermediate, advanced).
* Targeted Muscle Groups: The muscle groups targeted by the workout.
* Equipment Needed: Any equipment required for the workout.
* Video Demonstrations: The format and maximum size of any video demonstrations included in the workout.
* Audio Cues: The format and maximum size of any audio cues included in the workout.
* Written Instructions: Written instructions for performing the exercises in the workout.
* Images: The format and maximum size of any images included in the workout.

1. ***Nutrition Data:***

* Meal Name: The name of the meal.
* Meal Type: The type of meal (breakfast, lunch, dinner, snacks).
* Ingredients: The ingredients used to prepare the meal.
* Nutrition Information: The nutritional information for the meal, including calories, macronutrients (protein, carbohydrates, and fats), and micronutrients (vitamins and minerals).
* Recipe Instructions: Instructions for preparing the meal.
* Images: The format and maximum size of any images included in the recipe.

1. ***Progress Tracking:***

* Weight Tracking: The user's weight over time.
* Body Measurements: The user's body measurements (waist, hips, chest) over time.
* Fitness Assessment Scores: Scores from fitness assessments (VO2 max, strength tests) taken over time.
* Goal Setting and Progress Tracking: The user's fitness goals and progress towards those goals over time.

1. ***Social Features:***

* User Following/Friend System: The ability for users to follow/friend other users.
* Workout Sharing: The ability for users to share workouts with other users.
* Meal Sharing: The ability for users to share meals with other users.
* Community Support and Interaction: The ability for users to interact with each other for community support.

1. ***User Privileges:***

* Admin, Trainer, and User Roles: The different roles available for users (e.g. admin, trainer, user).
* Access Levels and Permissions: The different levels of access available for each role, and the permissions associated with each level.

1. ***Registration Info:***

* User Signup Information: The information collected from users during signup, including name, email, and password.
* Email Verification: The process of verifying a user's email address during registration.
* Account Activation: The process of activating a user

***Data Structures:***

1. User Profile: A collection of data about the user, including personal information such as name, age, gender, and weight.
2. Workout Plan Data: A collection of data that describes the workout plan, including the type of exercises, duration, and intensity.
3. Dietary Plan Data: A collection of data that describes the dietary plan, including the type of foods, portions, and frequency of meals.
4. Exercise Data: A collection of data that describes each exercise, including the name, type, and intensity.
5. Meal Data: A collection of data that describes each meal, including the food items and portions.

**Overview, Scenarios and Use Cases**

*Overview:*

Our fitness app is designed to provide users with a comprehensive workout and dietary plan, all without requiring any subscription fees. The app is perfect for individuals who want to get in shape but don't have the budget to pay for expensive gym memberships or personal trainers.

Usage Scenarios:

* Scenario 1: Jane is a busy professional who wants to improve her fitness but doesn't have a lot of time to spare. She downloads our fitness app and creates an account. She inputs her weight, height, and fitness goals, and the app generates a personalized workout and dietary plan for her. She can access the plan anytime from her phone, and the app sends her reminders to stay on track.
* Scenario 2: Tom is a fitness enthusiast who wants to take his workouts to the next level. He downloads our fitness app and selects the advanced workout plan. The app provides him with detailed exercise descriptions and videos, as well as personalized nutritional recommendations to help him reach his goals.
* Scenario 3: Sarah is a beginner who has never worked out before. She downloads our fitness app and selects the beginner workout plan. The app provides her with simple, easy-to-follow exercises and nutritional recommendations that are perfect for someone just starting out.
* Scenario 4: John is a busy parent who wants to get in shape with his kids. He downloads our fitness app and selects the family workout plan. The app provides him with fun, interactive exercises that he can do with his children, as well as nutritional recommendations that are suitable for the whole family.

Overall, our fitness app is designed to be user-friendly and accessible to people of all fitness levels. Whether you're a beginner or an advanced fitness enthusiast, our app can help you achieve your goals without breaking the bank.

**High-level Functional Requirements**

Scenario 1

On Initial Launch

1. **START**  > **Home Page appears** > **User creates an account > Chooses to 1. Enter their fitness goals, 2. Calculate their BMI, 3. Explore food options, or 4. Find a gym near them**
   1. Choice 1: The user decides to enter their Fitness Goal. This consists of whether they are trying to a) bulk up, b) slim down, or c) maintain weight.
      1. IF a) is chosen, the user enters their current weight and then their goal weight. Then the user will be supplied with a workout plan and dietary plan to help them bulk up.
      2. IF b) is chosen, the user enters their current weight and then their goal weight they want to slim down to. The user will then be supplied with a workout plan and dietary plan to help them slim down.
      3. IF c) is chosen, the user will enter their current weight and since their goal is to maintain, there will be no prompt for current weight. The user is then supplied a workout and dietary plan, which our website will have to calculate the user’s calorie maintenance.
2. Choice 2: The user wants to calculate their Body Mass Index (BMI). BMI is a person’s weight / the square of height in meters or feet. Once our application calculates the user’s BMI it will display the results and send recommendations based on that result.
   1. IF BMI is in the 18.5 to 24.9 range, you are considered to be in ‘Healthy Weight range’ and GymBro will suggest to maintain.
   2. IF BMI is in the 25.0 to 29.9 range, you are considered to be in ‘Overweight range’ and your body consists of a lot of fat. GymBro will suggest to slim down.
   3. IF BMI is in the 30.0 or higher range, you are considered to in the ‘Obese range’ and GymBro will suggest to slim down or seek medical help.
   4. IF BMI is lower than 18.5, you are considered to be in the ‘Underweight range’ and GymBro will suggest to bulk up.
3. Choice 3: Our ‘Food’ or ‘Recipe’ option. The user will be shown a list of foods to eat based on their dietary plan, which will also include the required nutrition (carbohydrates, protein, etc.). The user will also be supplied recipes so they can learn how to cook their meals.
4. Choice 4: The user wants to locate a gym near them. Our gym locater will list a collection of gyms in the user’s area.

After the choices are made and the information is inputted, everything will be collected in the User Profile.

Fulfilling User Profile

1. **User prompted to create account**  > **Enters e-mail, username, and password** > **Enters full name, age, gender, and weight** > **Account and profile complete**

Prioritization of Requirements

1. **User Account Access -** The user is able to create/log into their account with ease and indulge in a more personalized experience.

**1.1** Should user enter their current on “Signup”?

1. **Section Allocation for User Choice -** Depending on what the user chooses for their fitness goal, there will be allocated space for meals and workout plans for said choice.

**2.1** Maybe have windows for each category (bulk, slim, maintain) where all information regarding that choice is held. Similar to the ‘Actual.html’ set up.

1. **BMI Calculations -** BMI calculations are precise and provide the correct advice, depending on the number.

**3.1** BMI Calculator can be located in one of those ‘Example’ containers.

1. **Food/Recipe Set Up -** The foods and recipes are displayed in a presentable manner on the webpage and not an overflow of information. Dietary plans and nutrition facts are detailed and presented in readable fashion.

**4.1** One side of the page can have the food names partnered with a picture of the food and directly across (left to right) have the recipe for said food.

**4.2** Important to consider if the user has allergies. Maybe in this section prompt the user a “Do you have any food allergies?” Question and document response.

1. **Gym Locator -** No need for overkill. Specify a range and collect gyms within said range. Ex: We decide on a 10 mile radius and only find gyms within 10 miles of user. User’s city/state could be warranted here as well.

These are priority levels for the apps functionality. Focusing from top to bottom.

**List of Non-Functional Requirements**

*1. Performance:* GymBro’s landing page will have 5 seconds or less response time under a max load of 5,000 users. Throughout the entire site, users will not have to worry about poor loading times. As the platform grows, we plan on expanding the max load while maintaining immediate response times.

2. *Usability:* Creating an account and receiving a personalized plan takes less than 5 minutes. After this is completed, users will find videos, diet plans, and information all immediately in their personalized page. Anytime a user has made progress in their health goal, the app will check off the workout/meal for users to keep note of what they have and haven’t done. The site will be gentle to the users’ eyes and not filled with unnecessary information.

3. *Accessibility:* Users from all around the world will be able to access their personalized page and track their progress through their account which can be logged in if they have an internet connection.

4. *Security requirements:* Our app will ask users to create an account with their own private email and a personalized password. Due to the app being completely free, there will be no additional security required such as payment processing gateways.

5. *Storage:* Any storage will be done through the users account and will not require users to create more space on their devices.

**High-level system architecture and database organization**

**Cen4010-sp23-g09 lamp server:** The developers project will be hosted on our group lamp server.

**MySQL database:** The developers will store and manage data for the project using mySQL database.

**GitHub:** The developers will be making use of GitHub to store files and code. Each developer will be able to add files/code and will be able to access the files/code that has been posted by other team members.

**Discord:** Discord is where the developers will primarily be communicating with one another. This includes voice chats, direct messages, and group chats.

**Jira:** Jira is where the developers will keep track of the tasks that need to be completed for each milestone. Each developer will be able to see which tasks have been completed and who has completed them.

**Browser Compatibility:** The developers will be developing a web-based application that is compatible with Google Chrome, Firefox, and Microsoft Edge.

**Languages:** The developers will be making use of JavaScript, HTML, CSS, bootstrap, and PHP to create the web page.

**Visual studio:** The developers will be using visual studio to create the webpage.

**External code and licenses:** The developers will make use of the free bootstrap template provided by bootstrapemade.com.

<https://bootstrapmade.com/gp-free-multipurpose-html-bootstrap-template/>

**UML Class Diagram**

**Diagram

Description automatically generated**

**DB organization:** The database will give each user a user ID. The user ID will be linked with their other personal information. Such as name, BMI, location, workout plans, and diet plans.

**Media Storage:** Images, videos, and audio will be stored in file systems. With some assets being linked or embedded into the webpage.

**Search/filter architecture and implementation:** The database will be searched using user IDs. The user IDs will be linked to their personal information. With the user ID serving as a key to access each piece of information.

**Your own APIs:** We have embedded an interactive google map and a BMI calculator into our webpage.

**Identify Actual Key Risks for Your Project at This Time**

**Skill Risks**: Our main skill risk is the back-end development of our program. Our team does not know much about back-end development which makes anything in that department hard to finish.

**Schedule Risks**: As of right now, it is a bit difficult to fit everything we want within a given time limit. Our team had to sacrifice design over functionality in order to make sure by the time we implement the design, all components will behave the way we want.

**Technical Risks**: At this time, we do not have any serious technical risks to report.

**Teamwork risks**: Because everyone has other classes to take care of (homework or tests), it might be difficult at times to coordinate when we finish things. But when everyone has time, we get it done to the best of our ability.

**Legal/content risks**: As far as we are concerned, everything that we are planning on implements does not need any licensing in order to use.

In terms of how we are going to resolve all of the risks, we can start by better coordinating when we are going to do things by setting a date that everyone can abide by. In terms of the time limit, we can finish the bigger or hardest components first in order to finish everything else much faster. As for the back-end development, our team is committed to learning as much as we can in order to help each other in the process.

**Team Roles:**

**Team Leader and Front-End Developer:**

Sharon Nir

**Front End Developers:**

Juan Reyes, Luis Timana, Chris Anastasis

**Back End Developers:**

Romeo Francois