

Final project for SW Engineering Class CSC648/848 Section 1 Summer 2024
 Team 03

FitNutri Hub

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Demo URL: <http://13.57.220.69/>

MILESTONE 5
Date: 07/31/2024

History Table

Milestone	Version	Date Submitted
Milestone 1	V1	6/19/24
Milestone 1	V2	7/8/2024
Milestone 2	V1	7/8/2024
Milestone 3	V1	7/24/2024
Milestone 3	V2	7/29/2024
Milestone 4	V1	7/29/2024
Milestone 4	v2	7/31/2024
Milestone 5	v1	7/31/2024

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1. Product Summary

FitNutri is a platform where fitness meets nutrition. What does that mean and what do we provide? Our platform is dedicated to enhancing your health and wellness journey. Unlike conventional fitness apps, FitNutri integrates personalized workout plans and dietary guidance tailored to your individual goals and preferences. With our approach here at FitNutri, it will ensure that you will receive the support you need to achieve your fitness and nutrition objectives. We focus on user-centered design, providing an intuitive and engaging experience for every user. Whether you're a fitness enthusiast or a beginner, FitNutri accommodates all levels, allowing you to create a profile, track your progress, and stay motivated. Users can securely sign up, log in, and manage their accounts, ensuring a smooth and secure experience.

You may ask: How might we stand out from other applications? With FitNutri, we have personalized plans that generate customized nutrition and workout plans based on your health information and goals. Second, activity tracking monitors calories burned and steps taken throughout the day. Third, we have a library where we have access to a wide range of recipes, exercises, and educational resources. Fourth, we have a place for community engagement. You will be able to join live streaming and on-demand classes led by professional trainers. This way, you will feel a sense of motivation! Lastly, we have interactive features where users can share, edit, and print their fitness and nutrition progress, and engage with other users through posts and feedback. Unlike other “similar” fitness health applications, FitNutri combines real-time interaction with professional trainers and advanced algorithms to provide a personalized and motivating experience with these living streaming and on-demand classes. We help bring an interactive and supportive environment, making fitness accessible and enjoyable for everyone.

FitNutri is where our fitness goes with health and nutrition. Explore [FitNutri](#) where you will have everything you need to gain that healthy lifestyle. Take the first step towards achieving your health and fitness goals!

2. Milestone 1 version 2

SW Engineering CSC648-848-05
Summer 2024

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MILESTONE 1
Date: 06/11/2024

History Table

Milestone	Version	Date Submitted
Milestone 1	V1	6/19/24
Milestone 2	V2	7/8/2024

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1. Executive Summary

FitNutri is dedicated to providing a comprehensive and personalized wellness platform. Unlike traditional fitness apps, FitNutri integrates customized workout plans and dietary guidance. With this integration, customers will receive complete support on their journey to better health. With the use of FitNutri, we use an advanced algorithm to offer a unique and engaging user experience. This algorithm has fitness routines and diet plans for each user's goals and preferences, maximizing results and motivating customers.

One of the standout features of FitNutri is its Live Streaming and On-Demand Classes. Members can join live workout sessions led by professional trainers. These streams are interactive and motivating! This creates a sense of community, enhancing user engagement and accountability. Additionally, a comprehensive library of on-demand classes allows customers the flexibility to work out at their convenience, fitting fitness into their busy schedules. FitNutri offers a wide range of features, including personalized workout plans, dietary guidance, activity tracking, community engagement, and educational resources.

FitNutri plans to expand its offerings by incorporating advanced technologies such as virtual reality workouts and enhanced AI-driven insights. Future updates will also feature collaborations with renowned fitness and nutrition experts, providing customers with exclusive content and deeper insights. FitNutri's vision is to become the destination for those seeking a balanced and healthy lifestyle, continuously evolving to meet the needs of its growing community.

2. Main Use Cases

1. Diabetes Management

Actors: Phil (Diabetic), Dr. Lane (Phil's Doctor), FitNutri (Company)

Assumptions:

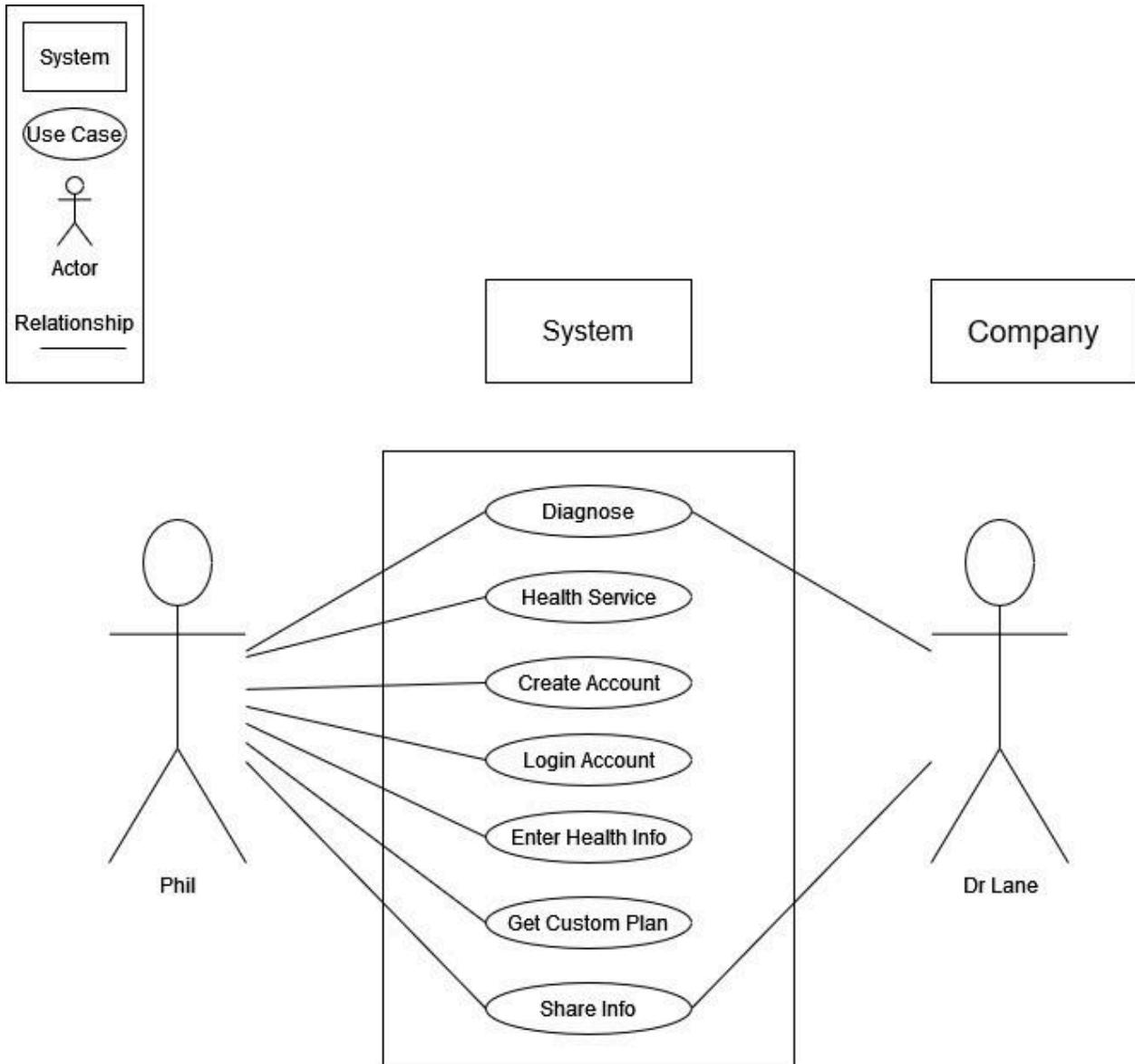
- Phil has access to a computer and an internet connection
- Phil has an account with FitNutri

Use Case:

Phil receives a diabetes diagnosis from Dr. Lane who explains the need for a diet with decreased sugar intake and a more balanced nutrition plan. Dr. Lane recommends Phil find a platform to track his carbohydrate intake and manage his diet effectively. Phil starts searching online and discovers that most websites focus more on tracking calories and vitamins rather than carbohydrates. After some searching, he found FitNutri, a platform that allows customers to target specific macros and provides explanations on the importance of tracking these macros for diabetes management. Phil decides to sign up for an account on FitNutri, where he inputs his health information, including his recent a1c reading and dietary restrictions. During the onboarding process, FitNutri explains the importance of tracking specific macros for managing diabetes. Phil selects "Diabetes Management" from the list of available nutrition plans, and FitNutri generates a personalized plan highlighting key macros like carbohydrates, fiber, and healthy fats. Phil can read research-driven data to understand which macros are pertinent to his diet. In addition to the nutrition plan, FitNutri suggests a generalized exercise plan tailored for diabetes patients. Phil customizes the exercise plan to fit his schedule, opts for manageable workouts, and saves his customized routine in his account. Phil also has the option to share his progress with Dr. Smith for additional medical advice. This comprehensive approach helps Phil feel more confident in managing his diabetes, knowing he has a structured plan that integrates both diet and exercise.

Benefits for Phil:

- Provides the whys instead of the whats
- Tracks diet and exercise in one convenient place
- Customizable plans to accommodate Phil's specific health needs
- Feels more confident he can manage his diabetes after understanding it better



2. Keto Diet Management

Actors: Sarah (Keto Dieter), FitNutri (Company)

Assumptions:

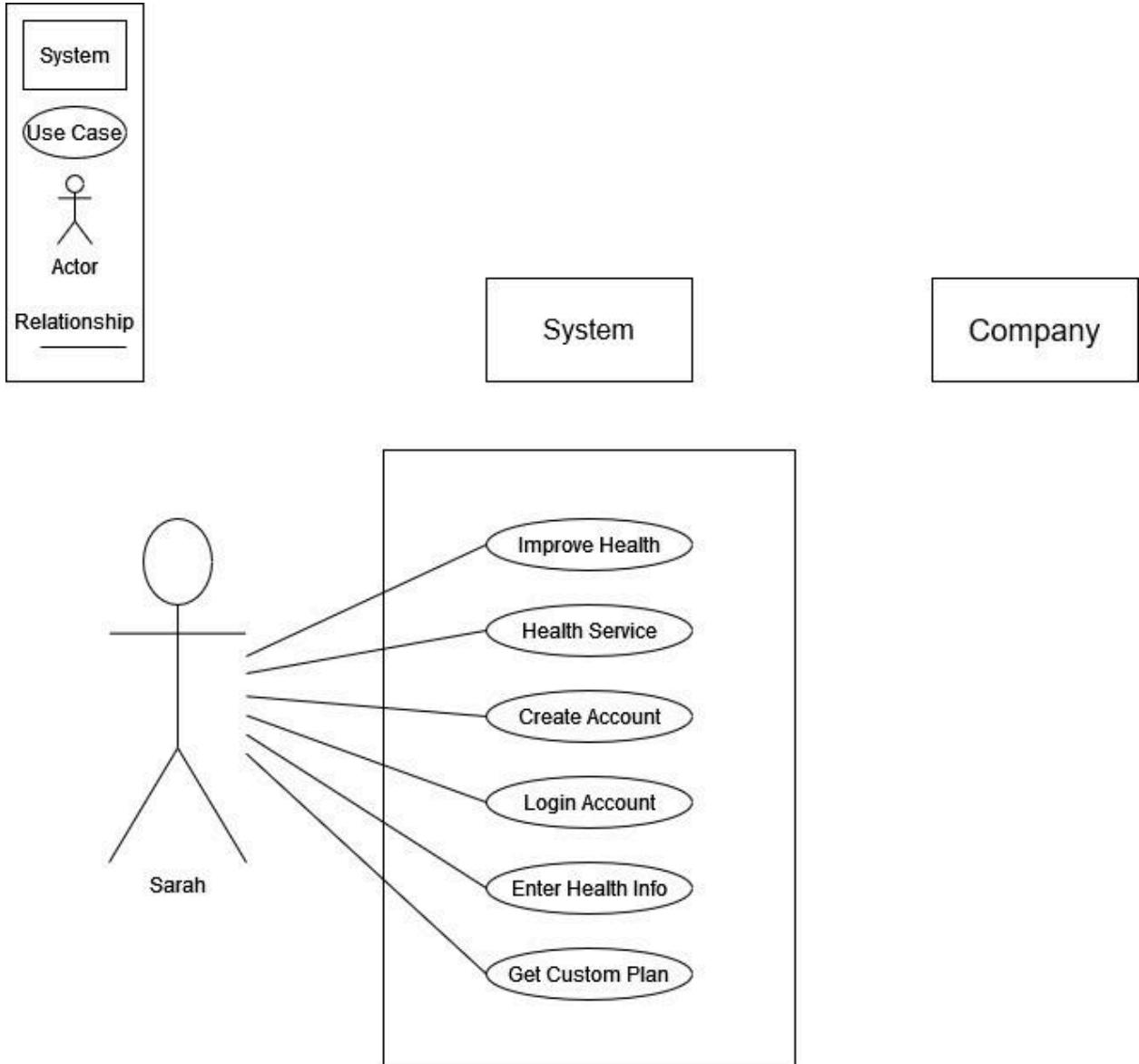
- Sarah will use the website daily
- Sarah is a beginner in fitness and nutrition

Use Case:

Sarah has decided to follow a keto diet to improve her health and manage her weight. She starts searching for online platforms to help with tracking her diet and it can help her stay within macronutrient ranges for ketosis. After reviewing several websites, Sarah finds FitNutri which allows her to put emphasis on which macros she needs to track to follow her ketogenic diet. Sarah signs up for a FitNutri account and inputs her health information. Sarah is given several popular diets to choose from, one of which is the keto diet. FitNutri explains the principles of the keto diet, highlighting the need for high fat, moderate protein, and low carbohydrate intake to sustain ketosis. A recommendation of specific foods is provided for recommendations of meals and snacks to help stay in ketosis. To complement her diet, FitNutri provides a generally recommended amount of exercise to help with weight loss. Sarah finds the exercise routines to be manageable and decides to plan her workouts following what is recommended. FitNutri provides feedback daily for weight loss and macro goals. By following the data-driven plans provided to her, Sarah feels confident she can follow her diet and exercise plan to lose weight and get healthier.

Benefits for Sarah:

- Explains in depth what the keto diet is
- Tracks diet and exercise in one convenient place
- Customizable plan to accommodate Sarah's specific health needs
- Feels more confident she can manage her weight with a customizable plan



3. Nutrition Information & Accessibility

Actors: Jarvis Johnson (Vegan), FitNutri (Company)

Assumptions:

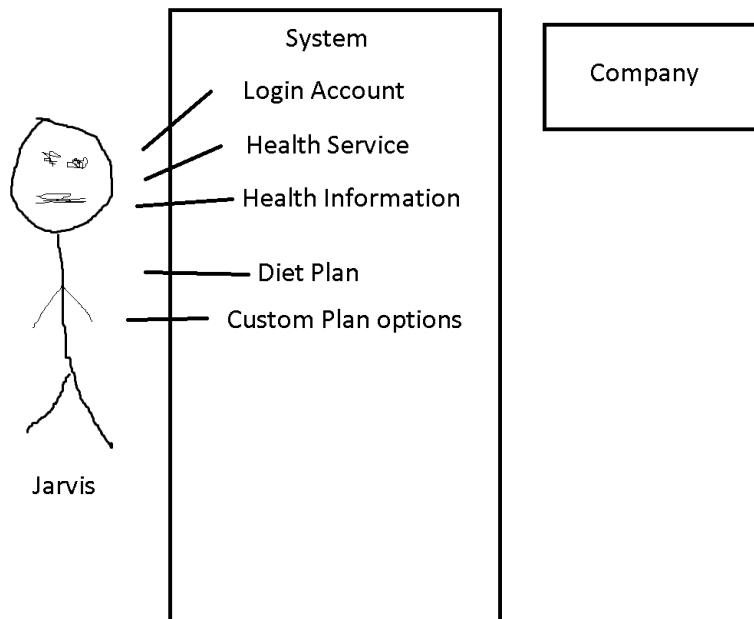
- The user doesn't have easy accessibility
- The user has a phone with data

Use Case:

Jarvis had a long day at work, so he decided to open the FitNutri application from his smartphone. He noticed that his medications weren't on time. Jarvis navigates through the website to find all the necessary information needed for his vegan diet. However, he recognizes that he isn't keeping up with his usual diet, so he proceeds to enter that section. He was able to automatically log in, check his health services, and diet plan, as well as an option to customize his diet options. He figured out that he wasn't getting all the necessary nutrients needed to become a full-time vegan. It's an all-in-one app where fitness and nutrition are at the touch of your fingertips.

Benefits:

- Able to access his health information from his smartphone
- Recognizes that his diet wasn't on point
- Notices that he isn't getting all the nutrients for his vegan diet



4. Diet Information & Schedule

Actors: William Johnson (New User), FitNutri (Company)

Assumptions:

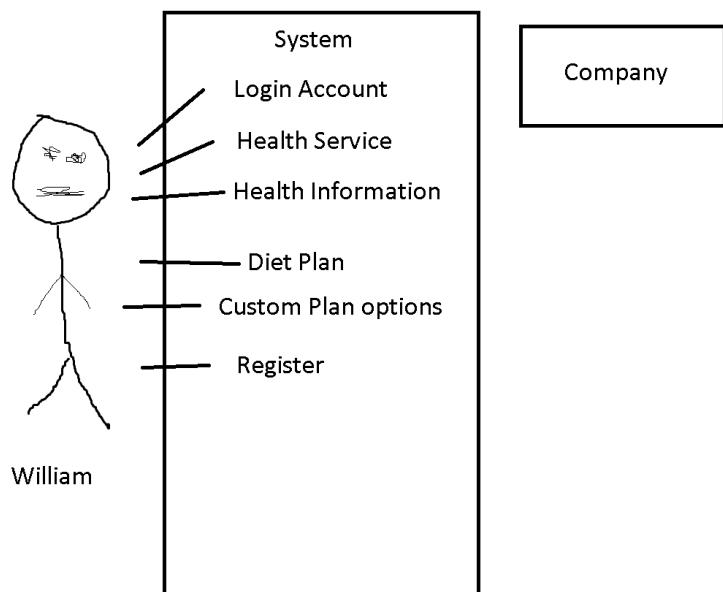
- William realizes that going to the gym isn't helping
- William doesn't have an account with FitNutri

Use Case:

After working out for a long time, William realizes that his diet isn't on par with his workout routine, so he decides to find a modern app that will identify all the problems of his current diet. He decides to use FitNutri. FitNutri will provide information, such as diet plans, specific details about that diet plan, and a provided schedule. The app will notify the user on whether they want to cut or bulk. The user will have information about daily caloric intake.

Benefits:

- A user shall have a provided diet
- A user shall have a scheduled plan for the diet
- A user shall have a scheduled diet for the bulk or cut



5. Weight Loss Journey

Actors: Sam (Marketing Manager), FitNutri (Company)

Assumptions:

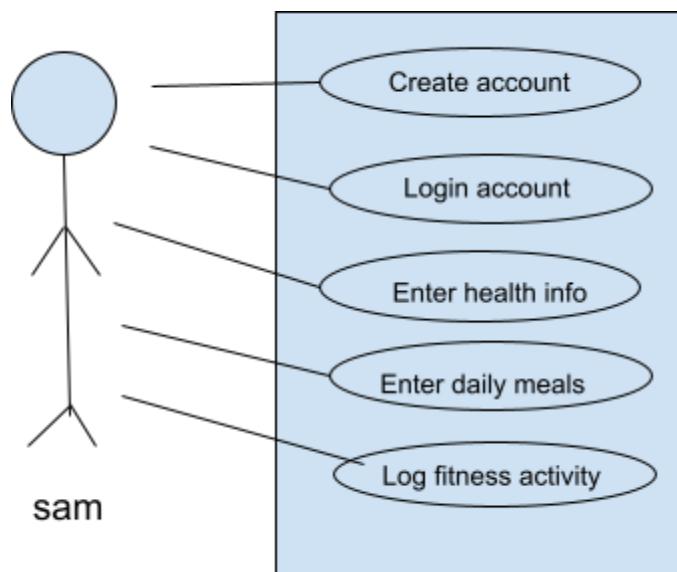
- Sam is unhealthy and gaining weight from sitting all-day
- Sam wants to become healthy by using an app on her phone

Use Case:

Sam is a marketing manager and she has long work hours where she just sits at her computer. She is 35 years old and she noticed that she has gained a lot of weight since she was hired for this position about 6 months ago. She decided she would download FitNutri and create an account because one of her close friends recommended the app to her after they had a positive experience using it. Sam wants to lose 20 pounds in 6 months to improve her cardiovascular health and to feel better about herself. She has tried to start a diet before but she lacks a solid understanding of nutrition and portion control. FitNutri will help her with her struggles because she will be able to log her meals, monitor her calorie intake, and make sure she's getting balanced nutrition. The app also offers workout plans that she can fit into her busy schedule. Sam will be able to exercise effectively without needing to spend hours at the gym.

Benefits for Sam:

- Sam will be able to integrate healthy habits into her daily routine and accomplish her goal of losing 20 pounds in 6 months.
- Sam will feel better about herself physically and mentally.
- Sam will be able to track her health, nutrition, and fitness all in one app on her phone that she can access anytime.



6. Marathon Training with FitNutri

Actors: Theo (Software developer), FitNutri (Company)

Assumptions:

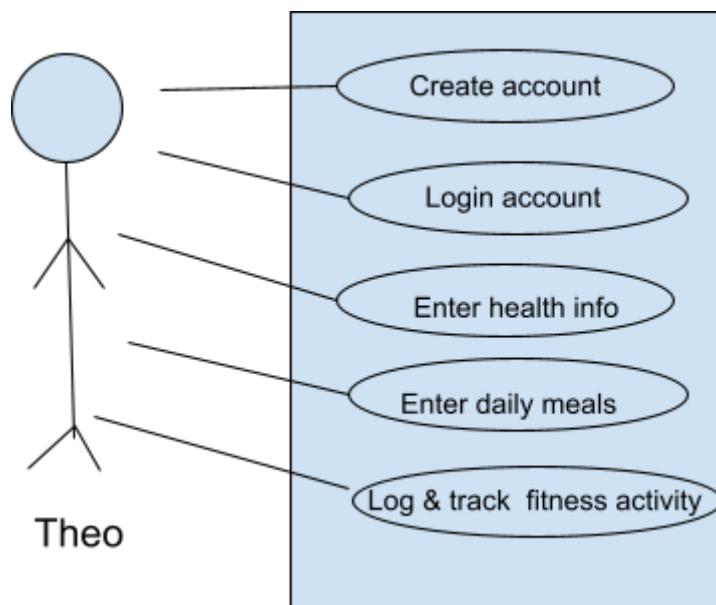
- Theo wants to train for his first running marathon
- Theo needs help with his training so he wants to download an app

Use Case:

Theo is a software developer and he is 32 years old. He has decided to join his first marathon ever but he realized that it would be a good idea to train for it ahead of time. He sets a goal to complete the race in under 4 hours. Theo decided to download FitNutri because it is the only app that he found that will help him track his fitness and nutrition during his training period. Theo is not only focused on building endurance and strength, but he also wants to ensure he is eating a balanced diet to support his training. Theo will track his daily food intake to make sure he is consuming the right balance of macronutrients and he will track his daily workouts like his running. By using FitNutri, Theo will stay organized, motivated, and informed on the journey to his marathon goal.

Benefits for Theo:

- He will be able to track his daily food intake and his macronutrients.
- He will be able to track his daily workouts and his runs.
- Theo will be able to track his diet, nutrition, and fitness all in one app on his phone which he can access anytime.



7. Vitamins Intake

Actors: Isabelle (Model), FitNutri (Company)

Assumptions:

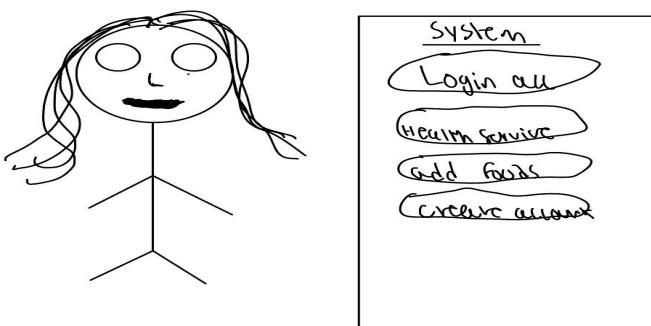
- Isabella needs to track their vitamins.
- She needs something quick and easy to use with no hassle.

Use Case:

Isabella is a super famous model who wants to use FitNutri to track their vitamin intake with the foods they eat. She wants to make sure she's meeting all her vitamins for the week and to make sure they're not missing any vitamins. After further research and talking to colleagues, they mentioned to her: "FitNutri is the best to watch your vitamin intake! You type the food you're eating or the ingredients and it'll give you all the vitamins you are receiving, and if it's too much!". FitNutri's interface displays a breakdown of essential vitamins along with minerals such as calcium, iron, and potassium. Isabella can easily see if she is meeting her recommended daily intake for each nutrient or if adjustments are needed in her diet. The platform also alerts Isabella if she exceeds recommended limits for certain vitamins, helping her maintain a balanced diet without overconsumption. This feature will help Isabella, as it enables her to make informed decisions about her dietary choices to support her demanding career and maintain optimal health. By using FitNutri, she will have an easy time tracking the exact vitamins and how much she is consuming.

Benefits for Isabella:

- Easy tracking of vitamins from the food she eats.
- Isabella will know if she'll have too much or too little or if she needs to increase her intake.
- Provides real-time feedback on whether she is meeting her nutritional goals.



8. Beginner Fitness

Actor: Engfa (Beginner Fitness Girl), FitNutri (Platform)

Assumptions:

- 25-year-old recent college graduate.
- Engfa never worked out in her life.
- Engfa doesn't know where to start or even how to.

Use Case:

Engfa decides to kickstart her fitness journey to improve her overall health and well-being. Being new to fitness, she feels overwhelmed by the amount of information available online and seeks a structured approach to starting her workout routine and improving her diet. Engfa hears about FitNutri through a friend and decides to give it a try.

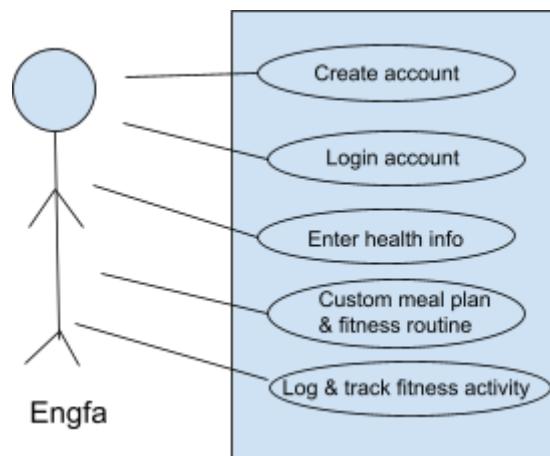
When signing up for an account, Engfa completes her profile by entering basic information such as her age, weight, and fitness goals. She indicates her interest in beginner-friendly workout routines and dietary advice. FitNutri prompts Emily to take an introductory fitness assessment, which assesses her current fitness level, preferences, and any health considerations.

Based on Engfa's assessment, FitNutri generates a personalized beginner workout plan that includes simple exercises targeting different muscle groups and incorporates basic cardio activities. The app provides instructional videos and tips on correct exercise forms to help Emily learn each workout safely and effectively. Additionally, FitNutri suggests a balanced diet plan tailored to Engfa's goals, focusing on nutritious meals that support her fitness journey.

Engfa uses FitNutri to track her daily workouts and meals. The app sends reminders to keep her motivated and consistent with her routine. As Engfa progresses, FitNutri adjusts her workout intensity and dietary recommendations to ensure continuous improvement.

Benefits for Engfa:

- Receives a structured beginner workout plan tailored to her fitness level and goals.
- Learns basic exercise techniques and correct form through instructional videos.
- Follows a balanced diet plan designed to support her fitness journey.



9. Finding a Community for motivation

Actor: Anastasia (looking for similar passions), FitNutri (Platform)

Assumptions:

- A lonely new person in town who is looking for a community to talk to.
- Anastasia wants to look for motivation and tips on a healthy lifestyle.
- Want a new routine in life and looking for a community to talk about their stories.

Use Case:

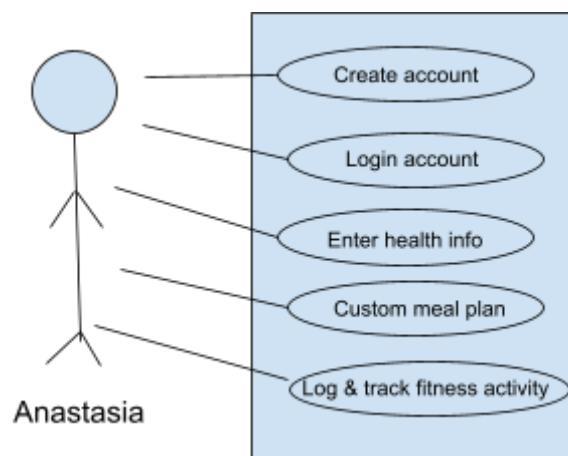
Anastasia doesn't have any friends that work out. She also recently moved into a new city where she doesn't have any buddies to work out with or learn any healthy lifestyle. She found an app called FitNutri which has community features to enhance her motivation, make a community, and share her fitness journey. She regularly participates in community forums and group challenges offered by the app.

Anastasia starts her day by logging into FitNutri and checking the latest discussions in the community forums. She joins conversations about workout tips, nutrition advice, and personal achievements with other customers. Anastasia shares her progress updates, including milestones she has achieved in her fitness journey, such as completing a marathon training program or reaching a weightlifting goal.

FitNutri's community platform highlights popular topics and upcoming challenges to keep Anastasia engaged. She explores new workout routines recommended by other customers and encourages beginners who are just starting their fitness journeys.

Benefits for Anastasia:

- Stays motivated and inspired by connecting with a supportive community of fitness enthusiasts.
- Receives valuable tips, advice, and encouragement to improve his fitness journey further.
- Explores new workout ideas and challenges to keep his routine diverse and exciting.



3. List of Main Idea Items & Entities

- 1. Users:** Describes the group of individuals that will utilize the application. Users are categorized in two ways: registered and unregistered.
- 2. Registered User:** A user who created an account and has all of the application's capabilities accessible to them.
- 3. Unregistered User:** A user with restricted access to the application's functionality who hasn't made an account.
- 4. User's Account:** The user's data needed to set up and modify a user account.

Name: The full name of the user creating a user account.

Email: The user's email address to log in to a user account.

Password: The password set by the user for authentication.

Age: The age of the user to provide a personalized meal plan.

Gender: The gender of the user to customize meal plans.

Weight: The user's weight to customize the meal and exercise plans.

Height: The height of the user to calculate BMI.

Healthline: The health conditions of the user that might affect the user's diet and exercise.

Treatment: The user's treatment if there are any restrictions for the user's exercise and diet plan.

- 5. User Meal Plan:** A diet customized to the user's interests and nutritional requirements.

Food Item: The specific food item used in a user's meal plan.

Serving Size: The portion size of the food item in a user's meal plan.

Macro-nutrient: The amount of macro-nutrient used in the user's meal plan.

Micro-nutrient: The amount of micro-nutrient used in the user's meal.

Calories Count The total calorie count from food and beverages in the user's meal plan.

Name of Plan: The type of meal plan, such as a weekly plan or weight loss plan in the user's meal plan.

Schedule Plan: The organization of meals throughout the day (breakfast, lunch, snack, and dinner) in the user's meal plan.

Diets: The dietary restrictions or preferences of users (e.g., vegan, vegetarian, ketogenic, paleo).

Nutritional Goals: The distribution of nutrients in each meal (like high protein and low carb) to meet the user's dietary goals.

6. Nutrition Information: The nutrients in the user's diet for monitoring and enhancing the user's health.

Macro-nutrients: The list of proteins, carbohydrates, and fats in the user's diet.

Micro-nutrient: The list of vitamins (A, B, C, D, E, and K) and minerals (Ca, Mg, Zn, Fe) in the user's diet.

Dietary Fiber: The list of high-fiber foods and meals included in the user's diet.

7. Recipe: A comprehensive guidelines and dietary data for user's meal preparation.

Recipe: The name of the recipe set up in the app.

Ingredients: The list of ingredients required to prepare the recipe.

Instructions: The step-by-step guide on how to prepare the recipe.

Nutrition: The total nutrition breakdown per serving of the recipe including micronutrients and macronutrients

Calories: The total calorie count per serving of the recipe.

8. Login Activity: A log of the user's physical activities to track the user's calorie intake and workout regimens.

Day: The specific day when the user logs in for an activity or exercise.

Activity Type: The type of exercise or activity done by the user.

Duration: The length of time that the user spent in the activity.

Calories Burned: The total number of calories burned during the activity or exercise.

4. Initial List of Functional Requirements

1. User account management

- 1.1. A user should have a unique User ID.
- 1.2. A user shall be able to log in using their username and password.
- 1.3. If a user forgets their password, they shall be able to change it given they confirm their identity.
- 1.4. A user shall have a profile that includes personal information such as age, gender, height, weight, fitness goals, dietary preferences, and restrictions.
- 1.5. A user shall be able to create their account.
- 1.6. A user shall be able to update their account.
- 1.7. A user shall be able to delete their account.
- 1.8. A user shall be able to upload and manage profile pictures.
- 1.9. A user shall receive personalized recommendations based on their profile information and goals.
- 1.10. A user shall have the ability to set privacy settings for their profile and data sharing preferences.
- 1.11. A user shall be able to join community forums.
- 1.12. A user shall be able to participate in group challenges.
- 1.13. A user shall be able to interact with other customers.

2 . Action

- 2.1. A user shall be able to like other posts.
- 2.2. A user shall be able to comment on other posts.
- 2.3. A user shall be able to share other posts.
- 2.4. A user shall be able to create a post.
- 2.5. A user shall be able to edit their post.
- 2.6. A user shall be able to delete posts related to their fitness progress, achievements, and challenges.
- 2.7. Comments shall display the date and time they were posted.
- 2.8. customers shall be notified of likes and comments on their posts.
- 2.9. A doctor should have the capability to request patient medical examinations.
- 2.10. A doctor shall be able to send messages to patients.
- 2.11. A doctor should possess the capacity to refer patients to different specialists.

3. Tracking Nutritional Intake

- 3.1. A user shall be able to log their meals and snacks throughout the day.
- 3.2. The app shall provide feedback on nutritional intake (calories, macronutrients carbohydrates, proteins, fats, vitamins, and minerals).
- 3.3. Customers shall receive alerts or reminders if their nutritional intake deviates from their goals or recommended limits.

3.4. A user shall have access to a database of food items with nutritional information, including serving sizes and ingredients.

4. Workout Planning

- 4.1. A user shall be able to create personalized workout plans based on their fitness goals.
- 4.2. The app shall suggest pre-designed workout routines categorized by fitness level (beginner, intermediate, advanced) and specific goals (weight loss, muscle gain, endurance).
- 4.3. Customers shall be able to schedule workouts.
- 4.4. Customers shall be able to set reminders in the app.
- 4.5. Customers shall be able to track completed exercises.
- 4.6. A user shall have the option to follow live-streaming workout sessions led by fitness instructors.
- 4.7. A user will be able to save an activity with its associated data.

5. Community Engagement

- 5.1. Customers shall be able to participate in community forums and share fitness tips, progress updates, and motivational content.
- 5.2. The app shall feature group challenges and competitions.
- 5.3. The app shall feature events to encourage user engagement and motivation.
- 5.4. Customers shall be able to create groups based on common fitness interests and goals or location.
- 5.5. Customers shall be able to join groups based on common fitness interests and goals or location.
- 5.6. The app shall provide moderation tools to manage community interactions and ensure a positive and supportive environment.
- 5.6. The app shall provide a feedback option so that the developers would be able to update the program.

6. Monitoring Fitness and Health

- 6.1. The app must work with other fitness tracker apps and devices.
- 6.2. The customers' physical activity must be tracked by the app.
- 6.3. The customers' physical activity must be linked to their dietary intake.
- 6.4. Taking into account the customers' activity levels, the app ought to offer insights and suggestions.
- 6.5. Customers should be able to establish and monitor fitness goals with the app.
- 6.6. The software ought to alert customers to their accomplishments and activity benchmarks.
- 6.7. customers should be able to check their overall health and nutritional status on a dashboard provided by the app.
- 6.8. The app needs to provide pointers and guidance on keeping an active lifestyle and a balanced diet.

- 6.9. Physical activity manual entry should be supported by the app.
- 6.10. customers ought to be able to record their physical dimensions and weight on the app.

7. Planning Meals and Offering Suggestions

- 7.1. Based on the user's tastes and dietary constraints, the app needs to offer customized meal recommendations.
- 7.2. The application shall produce meal plans.
- 7.3. Customers should be able to personalize their meal plans using the app.
- 7.4. All meal nutritional information must be provided by the app.
- 7.5. Cooking directions and recipe recommendations must be included in the app.
- 7.6. Using meal logs, the app needs to keep track of customers' nutritional intake.
- 7.7. Grocery lists based on the meal plans ought to be provided by the app.
- 7.8. The app needs to allow customers to track their meals and read barcodes on packaged goods.

8. Cookbooks

- 8.1. Customers shall be able to peruse and look up recipes based on meal types.
- 8.2. Customers shall be able to peruse and look up recipes based on their dietary requirements.
- 8.3. The app shall allow customers to bookmark their favorite recipes for quick access.
- 8.4. Detailed cooking directions and prep timeframes ought to be included in recipes.
- 8.5. All recipes need to list the nutritional values per serving.
- 8.6. Customers shall be given an option to submit their recipes for the app to include.
- 8.7. Customers will be given an option to submit their recipes for the app to include.

9. Analytics

- 9.1 The app shall provide information about the user's health.
- 9.2. The user will be able to self report basic health data each day.
- 9.3. The app will show the user's trends in reported health categories over time.

10. Notifications

- 10.1 The app shall provide messages in intervals to check up on the user.
- 10.2 The app will notify the user to remind them to track their daily health goals

11. Content management

- 11.1. A user shall insert images.
- 11.2. A user shall delete images.
- 11.3. A user shall be able to view statistics about their health & workout.

5. List of Non-Functional Requirements

1. User Information

- 1.1. The application shall have data encrypted and saved to the database.
- 1.2 Data in the application must be encrypted and stored in the database.
- 1.2 The login process of the Application System requires Two-factor authentication.
- 1.3 The app must guarantee the privacy of user data by following laws like GDPR and CCPA.
- 1.4 The app will allow customers to see, change, and remove their personal information while following privacy laws.
- 1.5 The app will allow customers to keep their information private

2. Application Database

- 2.1. The application System should perform regular data backups.
- 2.2. The application shall log customers' activity.
- 2.3. The database should support high availability and automatic failover to ensure continuous operation.
- 2.4. The application shall provide data recovery procedures in case of data loss or corruption.
- 2.5. The database shall be optimized for both read and write operations to ensure quick access and storage of user data.
- 2.6. The database shall be designed to handle a growing volume of data as the user base increases.

3. Performance

- 3.1. Application response time should load the App within 3 seconds
- 3.2. Application Systems should maintain detailed logs of application usage, errors, and security events to support troubleshooting and improve system reliability.
- 3.3. The system should have a 99.9% uptime, excluding scheduled maintenance.
- 3.4. The system should implement caching strategies to reduce load on the database and improve response times.
- 3.5. The application should support concurrent usage by a large number of customers without significant performance degradation.
- 3.6. The application shall be stress-tested to ensure it can handle peak loads and high traffic periods.
- 3.7. The application shall be designed to handle an expected load of up to 1 million users concurrently.

4. Notifications

- 4.1. The application should implement robust error handling and user-friendly error messages to ensure the user experience is minimally impacted during failures.
- 4.2. The application shall send timely notifications to customers for important events, such as reminders for workouts, meal plans, or health tips.
- 4.3. The notification system should be configurable to allow customers to choose their preferred notification methods (e.g., push notifications, emails, SMS).
- 4.4. The application shall support localization of notifications to cater to customers in different regions and languages.

5. User Interface

- 5.1. The application shall ensure responsiveness and an intuitive user interface that works seamlessly across various devices and screen sizes.
- 5.2. The application should be designed to scale horizontally to accommodate increasing user loads without significant changes to the underlying architecture.
- 5.3. The application shall have an FAQ for customers to answer their own questions.
- 5.4. The application shall include a helpdesk or support ticketing system to handle user inquiries and issues effectively.
- 5.5. The application shall be built using a modular architecture to facilitate easier updates and maintenance.
- 5.6. The application shall adhere to accessibility standards to ensure it is usable by people with disabilities.
- 5.7. The user interface shall be visually appealing and customizable to enhance user engagement and satisfaction.

6. Security

- 6.1. The application shall conduct regular security audits and vulnerability assessments to identify and mitigate potential security risks.
- 6.4. The application shall enforce strong password policies, including complexity requirements and regular password updates.

7. Compatibility

- 7.1. The application shall be compatible with the latest versions of major operating systems, including iOS and Android.
- 7.2. The application shall be tested across a variety of devices and browsers to ensure compatibility and optimal performance.
- 7.3. The application shall support the latest versions of major web browsers, including Chrome, Firefox, Safari, and Edge.
- 7.4. The application shall support major desktop operating systems, including Windows, macOS, and Linux, ensuring functionality across different environments.

7.5 The application shall be designed to leverage OS-specific features and optimizations, such as widgets on iOS and Android, to enhance the user experience.

7.6 The application shall provide seamless updates through app stores (Apple App Store, Google Play Store) and support for over-the-air updates to ensure users always have the latest version.

8. Maintainability

- 8.1. The application shall be developed using clean code principles and best practices to facilitate easy maintenance.
- 8.2. The application shall include comprehensive documentation for developers, including API documentation, user guides, and troubleshooting guides.
- 8.3. The application shall use version control for source code management to track changes and facilitate collaboration among developers.

9. Localization

- 9.1. The application shall support multiple languages and regional settings, allowing customers to select their preferred language and units of measurement.
- 9.2. The application shall provide localized content, including region-specific health tips, dietary recommendations, and exercise guidelines.
- 9.3. The application shall adjust time zones automatically based on the user's location to ensure the accuracy of logs and reminders.

10. Regulatory Compliance

- 10.1. The application shall comply with all relevant local, national, and international laws and regulations concerning health, fitness, and nutrition data.
- 10.2. The application shall provide clear and accessible terms and conditions, including a privacy policy, which customers must accept before using the app.

11. Storage

- 11.1 The application shall provide scalable storage solutions to accommodate increasing amounts of user data.
- 11.2 The application shall use data compression techniques to optimize storage usage and improve performance.
- 11.3 The application shall ensure data integrity and prevent data loss through robust storage management practices.

12. Fault tolerance

- 12.1 The application shall include mechanisms to detect, report, and recover from software and hardware failures with minimal impact on the user experience.

12.2 The application architecture shall support redundancy to ensure service continuity in case of component failures.

12.3 The application shall include automated failover processes to switch to backup systems in case of primary system failure.

6. Competitive Analysis

Feature/Company	Fitness Blender https://www.fitnessblender.com/	Muscle & Fitness https://www.muscleandfitness.com/	FitOn https://fitonapp.com/	Nike Training Club https://www.nike.com/ntc-app/training
Strengths	-Ease of use -Very welcoming -Customizable workout searches	-No sign-in is required -Science-backed articles -Breaks down workouts into manageable chunks	-Wide variety of workout types -Easy to create a workout schedule -Can connect to fitness accessories like Apple Watch or Fitbit	-Ability to share workouts with phone contacts or on social media -Easy to swap between exercises using different equipment -Able to save workouts for later use
Weaknesses	-Focuses on quantity over quality -Monetization seems to include odd things but excludes obvious ones -Meals seem to be included as an afterthought	-Routines sometimes include workouts with no examples -Have to use browser bookmarks to save routines -Home page lacks in design	-Difficult to see exercises without the pro version -Too many ads for the paid version -No workouts on the website	-Website is through the Nike store -Social media is tied to Nike products -Does not provide much customization in workouts
Pricing	\$79.99 per year	Free	\$130 per year	Free
Social Media	-YouTube -Facebook -Instagram	-Facebook -X	-Instagram -Tiktok	-Facebook -X -Tiktok
Onboarding Experience	Fast sign up	No account and quick access	Lengthy signup process	Short sign-up and directed to workouts

Evaluation Table (-&&+)

Feature	Fitness Blender https://www.fitnessblender.com/	Muscle & Fitness https://www.muscleandfitness.com/	FitOn https://fitonapp.com/	Nike Training Club https://www.nike.com/ntc-app/training	FitNutri
Workouts	++	+	++	+	++
Personal Tracking	+	-	+	-	++
Community	+	-	+	+	++
Nutrition	+	+	+	+	+
VR	-	-	-	-	+

Common Features:

- Workouts
- Nutrition
- Wellness
- Articles
- Workout searching
- Community features
- Scheduled routines
- Sharable routines
- Accessory shop
- Personal tracking

Competitive Analysis & Summary

With the Fitnutri application, customers can identify what problems they are facing. With all the features included in our full-stack project, it's clear that everyone would benefit from this website. Fitnutri is about fitness and health giving a broad overview of someone's diet and mental health. With Fitnutri customers can manage workouts and nutrition. It can have helpful features, such as an accessory shop, personal tracking, wellness, and more. A unique feature this application would have is a personalized diet plan for any customer who wants to choose their plan and the optional workout plans.

Fitness Blender

<https://www.fitnessblender.com/>

Pricing:

Free with ads/\$8.99 per month/\$79.99 per year

Strengths:

- Welcoming website
- Easy to navigate
- Sense of community (message boards, comments on exercises, checkmarks for those who liked the workout, badges for those who completed works or admins for the site)
- Many different exercises with filters to find based on difficulty, materials needed, body part focus, and time it takes to finish
- Can add custom workouts and routines (paid only)
- It has programs spanning several days to target different parts of the body and a calendar that allows you to schedule a program in advance
- Articles relating to stress management, improvement in exercising, changing bad habits, and other life tips for generally being more healthy (plenty of free ones)
- About pages have qualifications of who you clicked on along with the various workouts or articles written by the person
- Free 1-week trial
- Trainers look like average people

Weaknesses:

- Joining goes to account settings instead of activities
- Focuses on paid exercises with more difficulty finding free ones
- Meal plans (not single recipes) are all require payment
- Recipes do not have calories or other macros
- Repetitive video subjects, especially many meditation videos which are in similar length and look similar to each other

- Blog posts focus around sales mostly, feeling greedy rather than community-driven
- The store lacks merchandise for members who want to purchase accommodating workout equipment, water bottles, etc.
- No mobile app

Social Media Usage:

- YouTube (6.6M) - At least one video per month, sometimes several
- Pinterest (46.9K) - Very active with links directly to pinned workouts and ads for various sales
- Facebook (434.7K) - At least one post per day with what seems like short clips specifically for Facebook
- Instagram (294.2K) - Follows the same content as Facebook with at least one post per day
- X (36.6K) - Posts videos similar to Facebook
- Tiktok (375) - No posts

Onboarding Experience:

Short sign-up into a dashboard to create a workout routine with not much hand-holding

Muscle and Fitness:

<https://www.muscleandfitness.com/>

Pricing:

Free with ads

Strengths:

- Associates specific routines and meals with celebrities and include articles of diets they follow or interview them for the website
- Has workouts that target specific body parts and have different difficulty ratings
- Routines have links to specific exercises that show how to do the particular exercise it recommends
- Has a print button above the routine
- Can sometimes use one exercise to find routines which use it to adjust sets when wanting to change up what exercises are being done
- Does not require an account (easy to get to the meat of the program)
- Has many articles spanning from improvements to exercises, yoga times, mindfulness, and data-driven medical advice
- Has nutrition articles that link to peer-reviewed science articles and are broken down into general topics like weight loss or muscle gain
- Has a section for older people and women

Weaknesses:

- The home page does not make use of space well
- Can not search based on equipment usage and does not show times of exercise regiment
- Some routines have exercises which do not have examples of how to do them
- The print button does not format the routine into a nice-looking document
- Does not require an account (no way to track which exercises and routines you like)
- Clickbait article titles
- Can seem like a gossip rag at times
- Seems to be targeting too many audiences at one time (has skincare articles and how to play pickleball)
- Has a random YouTube-like link that has random shows and another link to a live show with no explanation of what it is

Social Media Usage:

- Facebook (6.6M) - Multiple posts per day with links to articles and videos
- X (1.1M) - Infrequent posts but a variety of content like interviews, workouts, and articles
- YouTube (74.3K) - Upwards of 10 videos per month, but mostly podcast-type videos
- Pinterest (14.8K) - Many pins related to targeted exercises, routines, meals, and interviews
- Tiktok (480) - Only 5 posts

Onboarding Experience:

No login is needed but also no guidance that leads the user to explore the sit

FitOn:

<https://fitonapp.com/>

Pricing:

Articles and guides are free. Courses have variable costs. \$100 for 6 months and \$130 for yearly access for pro.

Strengths:

- Categories for various exercises, meals, and wellness articles are easy to find
- Articles are well written and have scientific back behind why exercising and other fitness routines are important
- Suggest specific routines and articles based on your goals given during sign-up
- Has a reminder to open the app each day to begin working out
- Has groups people can join and comment on for a sense of community

- Provides a calendar that tracks which workouts have been done that day
- Has a weight tracker
- Can connect to various fitness accessories like Fitbit
- Has many different types of workouts like kickboxing, dancing, yoga, and strength to provide a wide variety for those who join
- Has a shop to provide accessories customers can buy

Weaknesses:

- Has articles split arbitrarily between articles and guides with no insight as to why they are in separate categories
- Meal plans are mostly paid with difficult-to-find free versions
- Four prompts to sign up for the subscription during sign-up
- Workouts are only in the phone app and have to pay for the subscription to cast to the tv
- 10-second ad every time you try to use a premium section with no way to exit unless you close the app
- Very small FAQ section

Social Media Usage:

- Instagram (841.1K) - Almost daily posts and more tailored like a user rather than a corporate entity. Has short videos and nice-looking pictures.
- Facebook (55.7K) - Similar to Instagram. Has short videos, some inspirational quotes, and links to the app.
- YouTube (48.2K) - 3+ year old videos of workouts only
- Pinterest (16.3K) - Lots of pins related both to their own content and other sections linking to other sites with recommendations for meals and workouts
- Tiktok (161.9K) - Daily posts which feature advice, product reviews, and memes

Onboarding Experience:

A lengthy questionnaire followed by a 15-second unskippable ad about their pro subscription, followed by a jump into workouts

Nike Training Club:

<https://www.nike.com/ntc-app/training>

Pricing:

Free

Strengths:

- Fast sign up with a short questionnaire to get an idea of your experience

- Goes straight to workouts after signing in
- Have exercises classified by difficulty and times
- Different approaches to exercises with videos for more in-depth workouts or a whiteboard approach that shows an outline of the workout and includes videos on how to do each step
- Able to search based on equipment used with the ability to swap among the choices
- Easy to find saves for workouts that the user likes
- Have reminders tied to workouts if you want to set up a schedule
- Short articles that provide tips for general fitness, nutrition, and wellness
- Provides recipes with times for preparation and provides some of the more tracked macros
- Bios of trainers have a more personalized approach with fun facts about the trainer and links to the programs and workouts they did
- Tracks which workouts have been done with the ability to add workouts of some outside activities
- Has programs with span several weeks and outline what will be done each week
- Can share the programs with contacts

Weaknesses:

- The website only provides articles, everything else is in the app
- The website is tied to the Nike store
- Recipes are not categorized by things like snacks or meals
- Outside workouts are limited to a small number of activities
- Home in the app is just new workouts rather than workouts tailored to the user
- Social media accounts are about the brand rather than the fitness

Social Media Usage:

- Facebook(39.3M) - Posts somewhat infrequently with posts about launches of products or athletes using Nike
- Pinterest (1.1M) - Pins are mostly about product lines and very infrequent <100 pins
- X (10.1M) - Similar to Facebook with infrequent tweets and the tweets being about launches of products or athletes who are sponsored by Nike
- YouTube (1.9M) - Sparse posting with months in between some posts. Mostly inspirational videos or ads
- Tiktok (6.2M) - Almost daily videos with the same use cases as Facebook

Onboarding Experience:

Somewhat pleasant in the short sign-up and a jump straight into the workouts page

7. Checklist

NO.	Tasks	Status	Comments
1	The team found a time slot to meet outside of the class	DONE	Tuesdays and Thursdays @7:30 pm And whenever the team lead needs at 7:30 pm-10 pm
2	GitHub master chosen	DONE	Ali A
3	Team decided and agreed together on using the listed SW tools and deployment server	DONE	Shoutout Eduardo for helping us understand!
4	Team ready and able to use the chosen back and frontend frameworks and those who need to learn are working on learning and practicing	DONE	
5	Team lead ensured that all team members read the final M1 and agree//understand it before submission	DONE	An Excel sheet is created and at every meeting, the team leads ask what was done and show their finished product.
6	Github is organized as discussed in class (e.g.masterbranch, development branch, folder for milestone documents etc.)	DONE	Went over everything in the meeting and asked the Professor for clarification.

8. High-level system architecture and technologies used

Server Host: Amazon Web Service (AWS) Express

Operating System: Ubuntu 22.04

Database: MySQL 8.0.35

Web Server: Apache

Server-Side Language: Python and Java

Additional Tech:

Web Framework: React and Node

Backend Framework: Java and Springboot

Frontend Framework: JavaScript

IDE: Visual Studio Code, MySQL Workbench

9. List of Team Contributions

NO.	Member	Contribution	Rating
1	Michelle Nguyen	<ul style="list-style-type: none"> - Organized meetings and made an Excel sheet to keep track of tasks. - Formatted the Google doc along with feedback to the team. - Helped out on two Main Use Cases. - Grammar checked. - Added more functional requirements. - Helped write the Executive Summary. - Submitted the team's contract. - Developed the About page. - Created a template for the About page for the team. 	
2	Mitchell Caine	<ul style="list-style-type: none"> - Executive Summary main idea. - Added two main use cases - Included the drawings for the main causes - Completed the competitive analysis summary and table. - Helped SSH set up. - Helped add more to the page code. 	10
3	Shreejana Bartaula	<ul style="list-style-type: none"> - Added the list of Main idea Items & Entities - Added more to functional requirements. - Formatted the Functional and Non-Functional Requirements. 	3
4	Ali Almusawi	<ul style="list-style-type: none"> - Added two Main Use Cases - Included the drawing for the main causes. - Added a bit to functional requirements. 	10
5	Eduardo Enrique Muñoz Alvarez	<ul style="list-style-type: none"> - Added one main use case. - Included the drawing for the main causes. - Help write out the credentials on GitHub. - Created the AWS and security group. - Set up the SSH. - Strong communication with others. - Deployed the team's website URL. - Created the database. Database URL, 	10

		Username, Password.	
6	Nilofar Ali	<ul style="list-style-type: none">- Added two main use case.- Included the drawings for the main causes- Added more to non-functional requirements.	10

Milestone 2 Version 1

SW Engineering CSC648-848-05
Summer 2024

FitNutri Hub

Team 03

Student	Full Name	SFSU Email	Role
# 1	Michelle Nguyen	mnguyen62@sfsu.edu	Team-Lead
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MILESTONE 2

Date: 06/11/2024

History Table

Milestone	Version	Date Submitted
Milestone 2	V1	7/9/2024

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1. Data Definitions

1. User Data

- 1.1. User ID: A unique identifier for each user.
- 1.2 Username: The chosen display name of the user.
- 1.3. Email: The user's email address for communication and account recovery.
- 1.4. Password: A hashed string used for user authentication.
- 1.5. Date of Birth: The user's date of birth.
- 1.6. Gender: The user's gender.
- 1.7. Height: The user's height.
- 1.8. Weight: The user's weight.

2. Activity Data

- 2.1. Activity ID: A unique identifier for each recorded activity.
- 2.2. Activity date: The Time and date when the activity took place
- 2.3. Activity type: The type of physical activity.
- 2.4. Activity duration: How long the user was doing the activity for.
- 2.5. Activity distance: The distance covered during the activity.
- 2.6. Calories burned: Estimated number of calories burned during the activity.
- 2.7. Heart rate: The user's average heart rate during the activity.

3. Nutrition Data

- 3.1. Meal ID: A unique identifier for each meal entry.
- 3.2. Meal type: The type of meal (breakfast, lunch, dinner, snack).
- 3.3. Food item: The name of the food item consumed.
- 3.4. Calories consumed: The number of calories in the food item.
- 3.5. Macronutrients: The amount of carbohydrates, proteins, and fats in the food item.
- 3.6. Micronutrients: List of Vitamins (A, B, C, D, E, and K) and Minerals (Ca, Mg, Zn, Fe) plus fiber content

4. Recipe Data

- 4.1. Recipe ID: A unique identifier for each recipe.
- 4.2. Recipe name: The name of the recipe.
- 4.3. Description: A description of the recipe.
- 4.4. Category: The recipe category (dessert, appetizer, main course).

- 4.5. Preparation time: The time required to prepare the ingredients.
- 4.6. Cooking time: The time required to cook the dish.
- 4.7. Total time: The total time required to prepare and cook the recipe.
- 4.8. Servings: The number of servings the recipe yields.
- 4.9. Ingredients: the name of the ingredients.
- 4.10. Nutrition information: nutritional information (calories, carbohydrates, proteins, fats, fiber, sodium).

5. Health Metrics

- 5.1. Health Goal: Defined health goal for the user (Health, Fitness, Performance, etc. goal)
- 5.2. Healthline: User health condition or treatments, if any restrictions
- 5.3. BMI: Simplistic measurement of a healthy range of weight related to height
- 5.4. RHR: The resting heart rate of the user
- 5.5. A1C Reading: Measure of the average level of blood sugar over a given time
- 5.6. Dietary Restrictions: List of foods that must be left out of a person's diet
- 5.7. Diet Plans: Categories and quantities of food that a person eats for a health outcome
 - Diabetes Management: Specific diet to manage diabetes
 - Ketogenic: A diet high in fats influences metabolism
 - Vegan: Diet consisting of no animal products
 - Vegetarian: Diet consisting of mainly plant sources
 - Paleo: Diet focussing on whole foods with high protein, low carbohydrates

6. Health Recommendations

- 6.1. Nutrition recommendation: A list of nutrients that will help user achieve their set goal
- 6.2. Meal recommendation: A list of meals or recipes that contain recommended nutrition
 - Daily Recommendation: Recommendation for that day
 - Weekly Recommendation: Recommendation for that week
 - Monthly: Recommendation for that Month
- 6.3. Workout recommendation: A prepared workout that will help the user achieve their goal

7. Tracking/Logging/Analytics

- 7.1. Weight: The weight that the user registered that day
- 7.2. Daily Calories: The number of calories the user consumed that day
 - Daily Protein: The amount of protein consumed that day

- Daily Carbohydrate: The amount of carbohydrates consumed that day
- Daily Fat: The amount of fat consumed that day

7.3. Exercise time: The amount of time the user exercised that day

7.4. Stress level: A 1-10 rating of the level of stress the user experienced that day

2. Prioritized Functional Requirements

1. User Account Management

- 1.1. A user shall securely sign up.
- 1.2. A user shall securely sign in.
- 1.3. A user should be able to create their profile (age, weight, height, fitness goals).
- 1.4. A user should be able to do password recovery/reset.
- 1.5. A user should be able to update their account.
- 1.6. A user should be able to delete their account.
- 1.7. A user shall be able to upload and manage profile pictures.
- 1.8. Users should be able to establish and monitor fitness goals with the app.

2. Social Features

- 2.1. Users shall be able to like, comment and share other user's posts.
- 2.2. A user shall be able to create posts.
- 2.3. A user shall be able to go back and edit posts.
- 2.4. A user shall be able to go back and delete posts.
- 2.5. Users should receive notifications when other users like their posts.
- 2.6. Users should receive notifications when other users comment on their posts.
- 2.7. The app shall provide moderation tools to manage community interactions and ensure a positive and supportive environment.

3. Tracking

- 3.1. A user shall be able to track their calories burned throughout their day.
- 3.2. A user shall be able to track their total steps throughout their day.
- 3.3. A user should be able to log their meals and snacks throughout their day.
- 3.4. The app shall provide feedback on the user's nutritional intake (calories, macronutrients carbohydrates, proteins, fats, vitamins, and minerals).

4. Analytics

- 4.1. The app shall provide information about the user's health.
- 4.2. The app shall provide messages in intervals to check up on the user.
- 4.3. A user shall be able to view statistics about their health & workout.
- 4.4. The app will provide an option for feedback so that the developers would be able to update the program.

5. Meal planning

- 5.1. The app shall offer customized meal recommendations based on the users' tastes and dietary constraints.
- 5.2. The application should produce meal plans.

- 5.3. Users should be able to personalize their meal plans using the app.
- 5.4. All meal nutritional information should be provided by the app.
- 5.5. Cooking directions and recipe recommendations should be included in the app.
- 5.6. The app shall allow customers to track their meals and read barcodes on packaged goods.
- 5.7. The app should provide users recipes.
- 5.8. All recipes shall list the nutritional values per serving.

6. Workout Planning

- 6.1. A user shall be able to create personalized workout plans based on their fitness goals.
- 6.2. The app shall suggest pre-designed workout routines categorized by fitness level (beginner, intermediate, advanced) and specific goals (weight loss, muscle gain, endurance).
- 6.3. Customers shall be able to schedule workouts.
- 6.4. Customers shall be able to set reminders in the app.
- 6.5. Customers shall be able to track completed exercises.
- 6.6. A user shall have the option to follow live-streaming workout sessions led by fitness instructors.

7. Monitoring Fitness and Health

- 7.1. The app must work with other fitness tracker apps and devices.
- 7.2. The customers' physical activity must be tracked by the app.
- 7.3. The customers' physical activity must be linked to their dietary intake.
- 7.4. Taking into account the customers' activity levels, the app ought to offer insights and suggestions.
- 7.5. Customers should be able to establish and monitor fitness goals with the app.
- 7.6. The software ought to alert customers to their accomplishments and activity benchmarks.
- 7.7. customers should be able to check their overall health and nutritional status on a dashboard provided by the app.
- 7.8. The app needs to provide pointers and guidance on keeping an active lifestyle and a balanced diet.
- 7.9. Physical activity manual entry should be supported by the app.
- 7.10. Customers ought to be able to record their physical dimensions and weight on the app.

3. UI Mockups and Storyboards (high level only)

1. Use case 1:

Panel 1: Initial Diagnosis

Phil, You have been diagnosed with diabetes. It's important to follow a balanced nutrition plan.

Dr. Lane

Phil

Panel 2: Researching FitNutri

After some searching, Phil finds FitNutri, a platform focused on targeting specific macros for diabetes management.

FitNutri

Panel 3: Sign Up and Health Info

Phil signs up and inputs his health information. FitNutri explains the importance of tracking specific macros for managing diabetes.

Health info

Panel 4: Personalized Plan Selection

Phil selects the diabetes plan and receives a personalized nutrition plan. Phil also customizes his exercise plan and saves it.

Goals

Panel 5: Sharing Progress

Phil shares his progress with Dr. Lane for additional medical advice.

FitNutri

Panel 6: Home Screen

Home screen showing fitness progress, nutrition progress, and various video options.

Log In

Home

About

Contact

Start your Journey Today!

Fitness Progress

Nutrition Progress

View Details

img

Fitness

Nutrition

View Details

Video

Video

Video

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Panel 7: Signup

Sign up form for new users.

Name:

Email:

password:

confirm password:

Create Account

Already have account?

Login

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Panel 8: Personalized Diabetes Management Plan

Personalized Diabetes Management Plan

Goals:

Health Structure:

Breakfast: _____

Lunch: _____

Dinner: _____

Nutrition Guidelines:

Carbohydrates: _____

Protein: _____

Fat: _____

Recipes

Workout

Article

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Panel 9: Recipe Details

Diabetes Management Recipes

Video

Video

Prep time

Cook time

Servings

Ingredients

Directions

Save plan

Workout

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Panel 10: Exercise Details

Diabetes Management Exercises

Video

Video

Duration:

Duration:

Duration:

Duration:

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Panel 11: Fitness Progress

Fitness progress

Activity

workout

minutes

days

Food intake tracker

Breakfast

Lunch

Dinner

Macro

Calories

Carbs

Fat

Protein

Cal

edit

print

share

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Panel 12: Home Screen (Final)

Home screen showing fitness progress, nutrition progress, and various video options.

Log In

Home

About

Contact

Start your Journey Today!

Fitness Progress

Nutrition Progress

Food intake tracker

Breakfast

Lunch

Dinner

Macro

Calories

Carbs

Fat

Protein

Cal

edit

print

share

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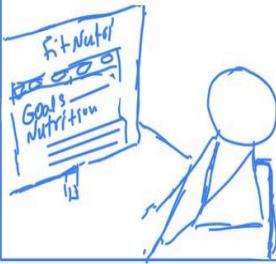
UFE Capr 1

Use case 2:

Sarah has decided to follow a keto diet to improve her health and manage her weight.



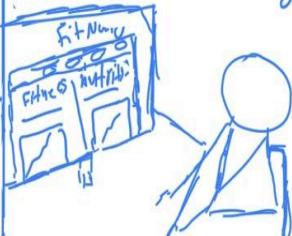
Sarah Signs up and enters her health information and is fascinated by its emphasis on macro tracking for keto.



FitNutri explains the Keto diet principles and how it helps her achieve Keto.

Personalized Keto diet plan
Goals:
Nutrition Guidelines
Fat _____
Carbs _____

Sarah tracks her progress daily feeling confident about managing her weight.



Home Screen

Logo Home about contact Q ☰

Fitness Progress Nutrition Progress

start your Journal Today!

View Details

Video Video Video

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Signup Screen

Logo Home about contact Q ☰

Sign up

Name: _____

Email: _____

password: _____

confirm password: _____

Create Account Already have Account Login

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Personalized Keto Diet Plan Screen

Logo Home about contact Q ☰

Personalized Keto diet plan

Health info: Age Weight Height

Diabetic Keto diet

high fat, low carbs

3 days per week

Weight loss

Genetic plan

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Keto Diet Recipes Screen

Logo Home about contact Q ☰

Keto diet Recipes

video video

video video

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Keto Diet Exercise Plan Screen

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Keto diet Exercise plan

Goals:

Weekly Schedule:

- 1. weight loss
- Frequency: 3 days per week
- Duration: 30 minutes

Benefits:

Workouts Article

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Keto Diet Exercises Screen

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Keto diet Exercises

video video

video video

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Dashboard Screen

Logo Home about contact Q ☰

Name

Activity

Exercise Progress

Nutrition Progress

Food intake tracker

Breakfast Lunch Dinner

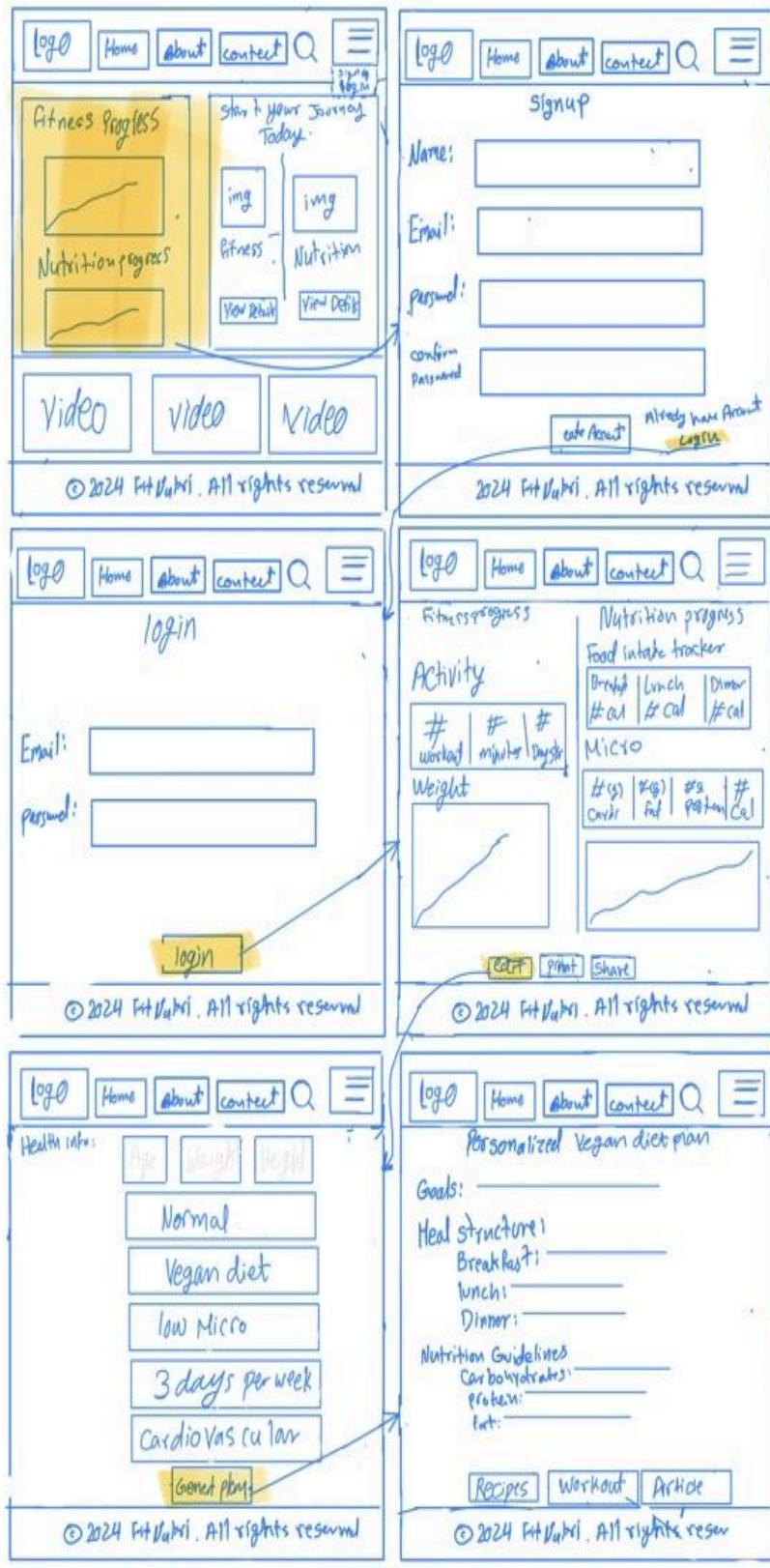
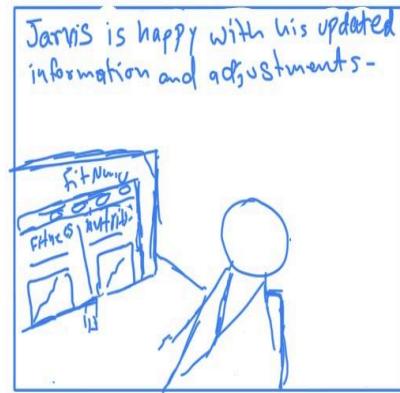
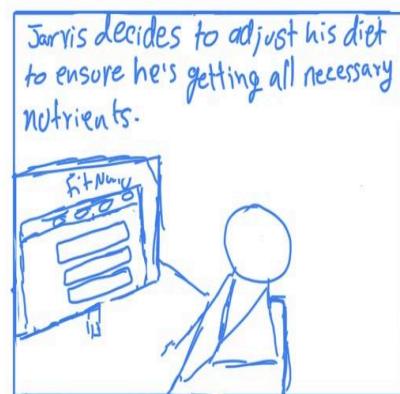
Calories Carbs Fats Protein

Weight

edit print share

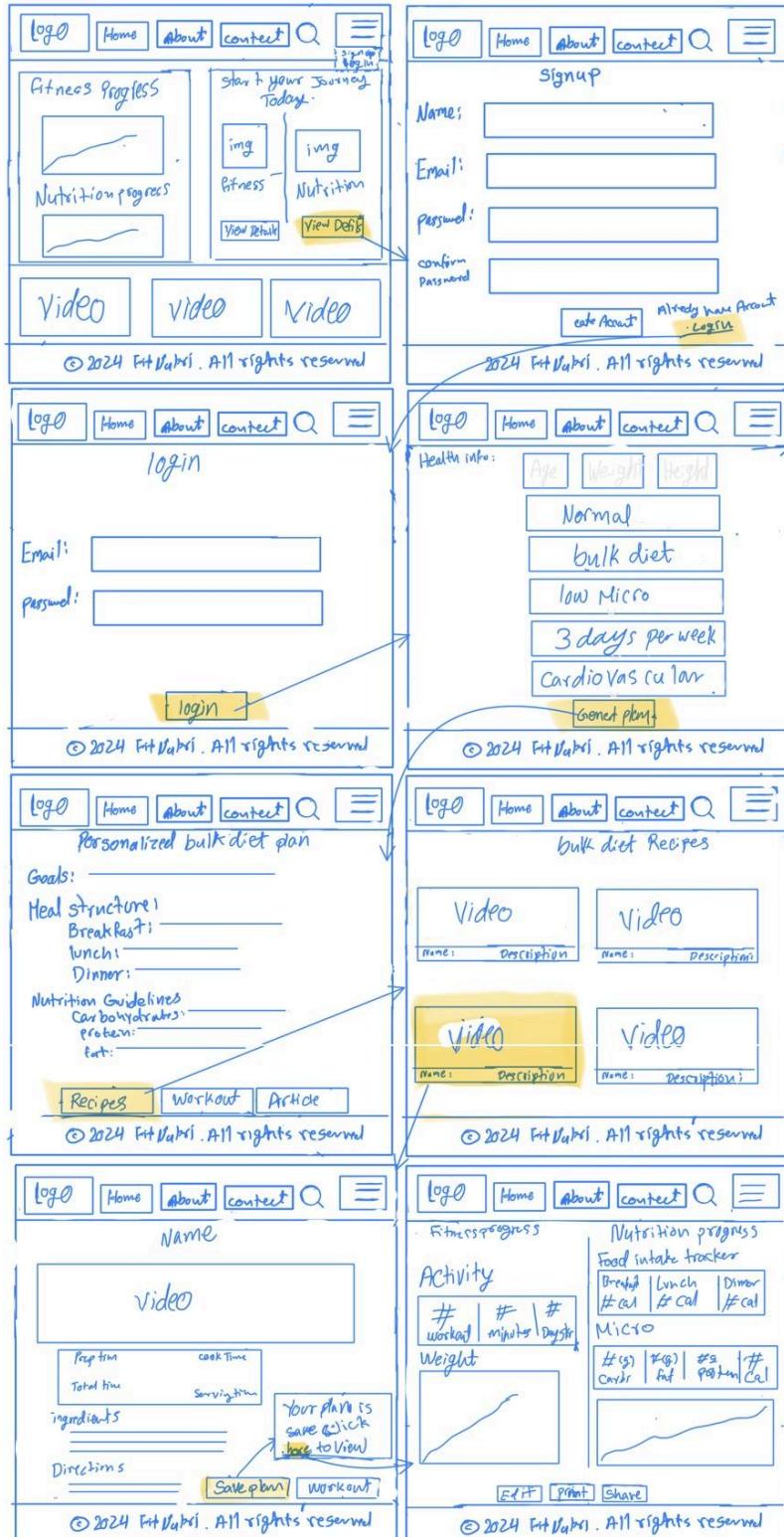
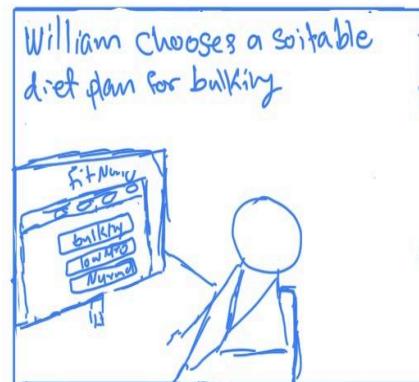
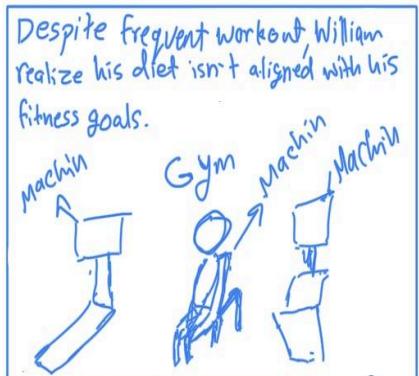
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Use case 3:



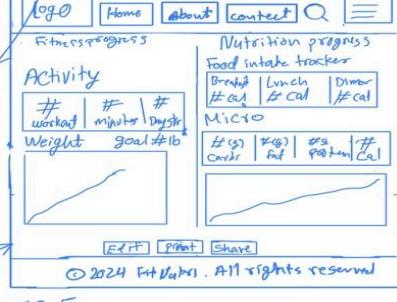
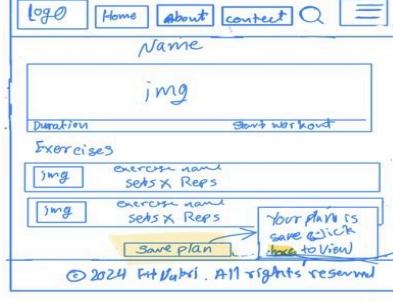
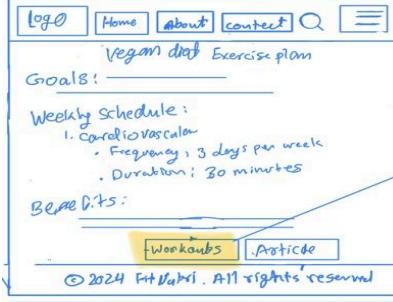
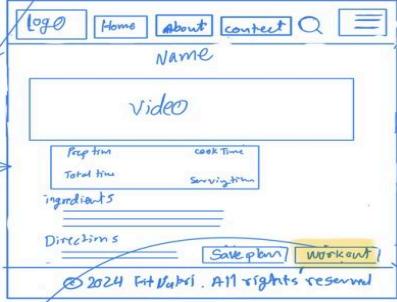
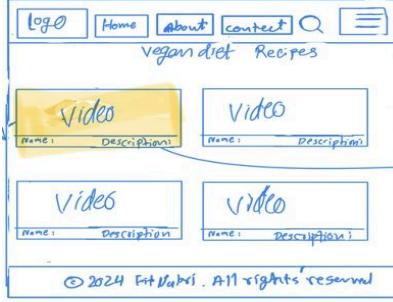
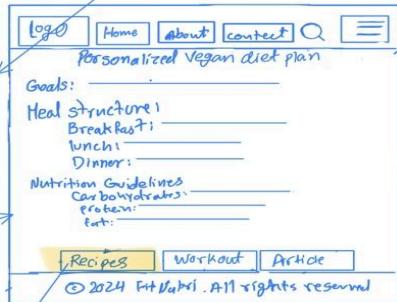
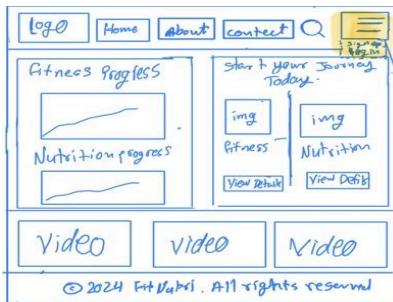
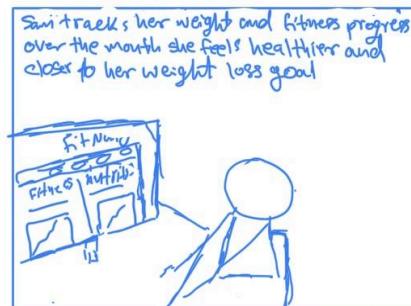
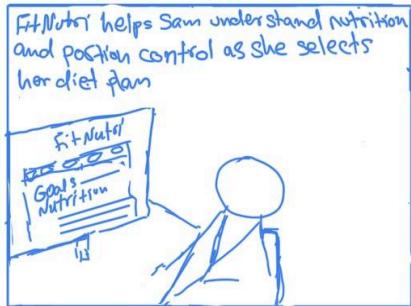
Use Case 3

Use case 4:



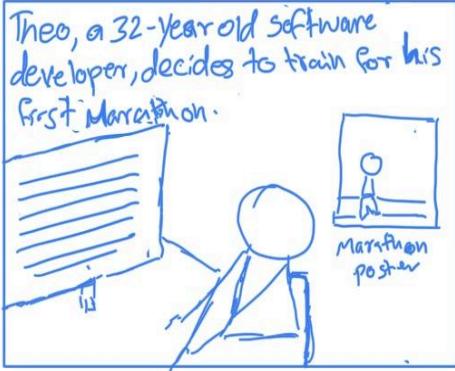
UOS Case 4

Use case 5:

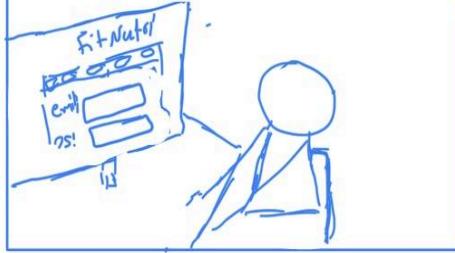


Use Case 5

Use case 6:



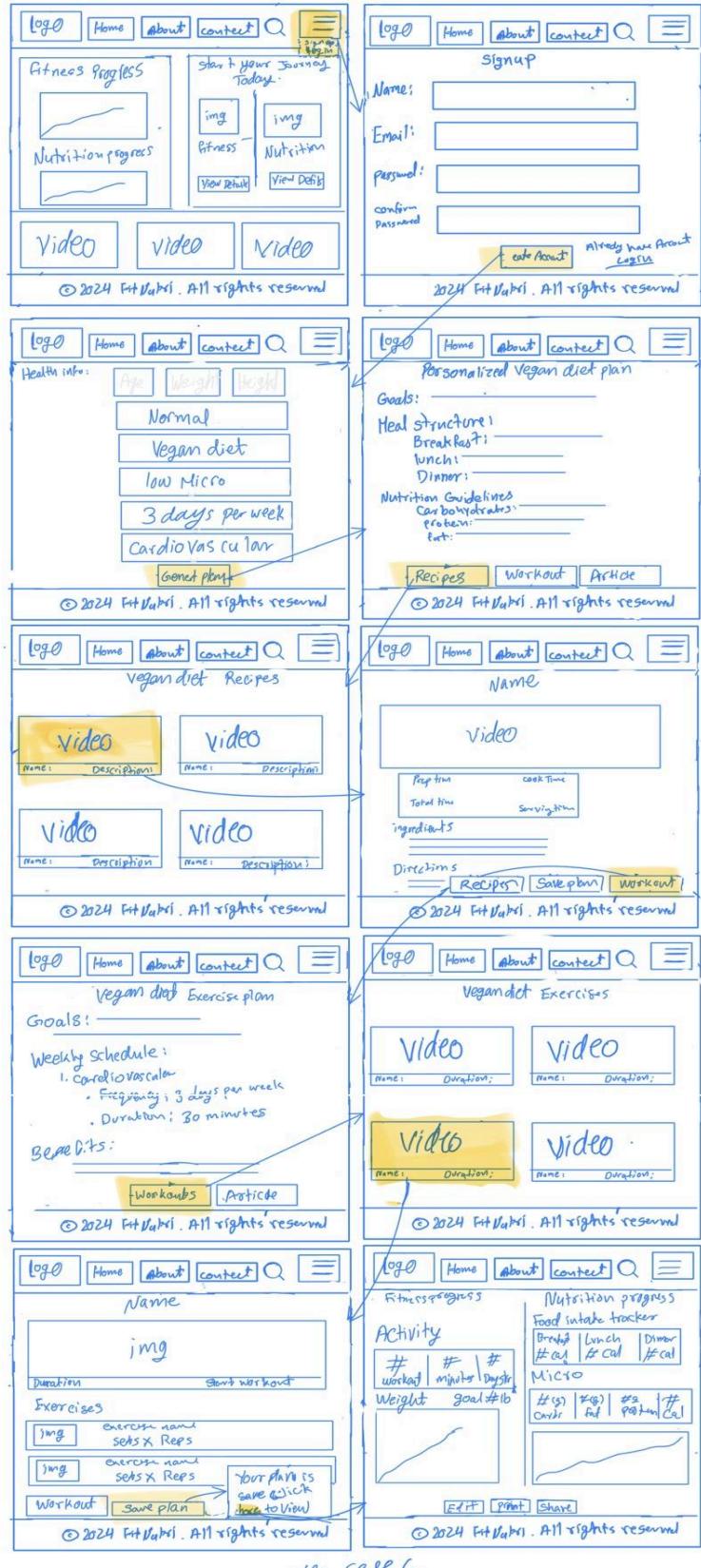
Theo, navigates through FitNuts, discovering its fitness and nutrition tracking capabilities.



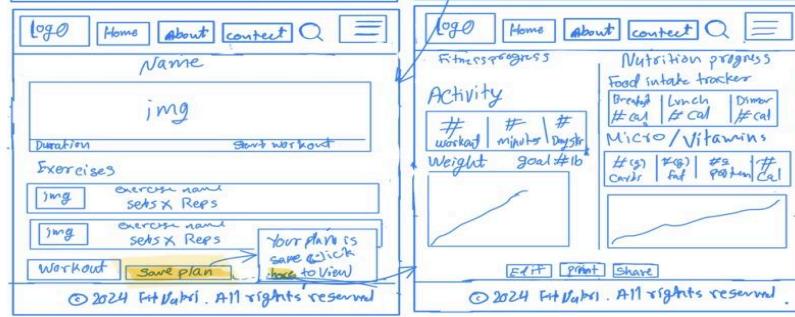
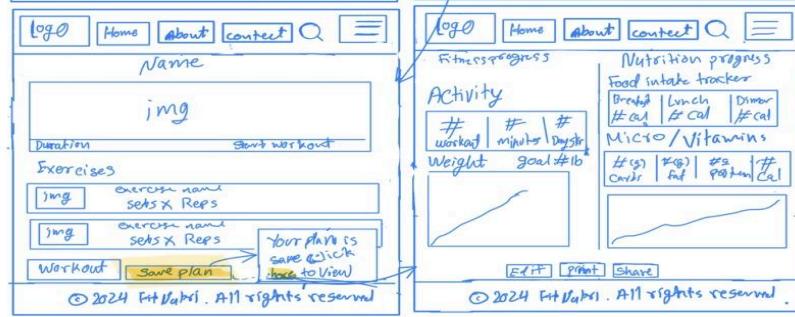
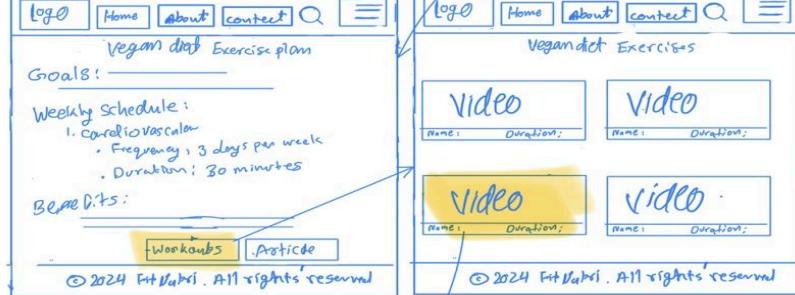
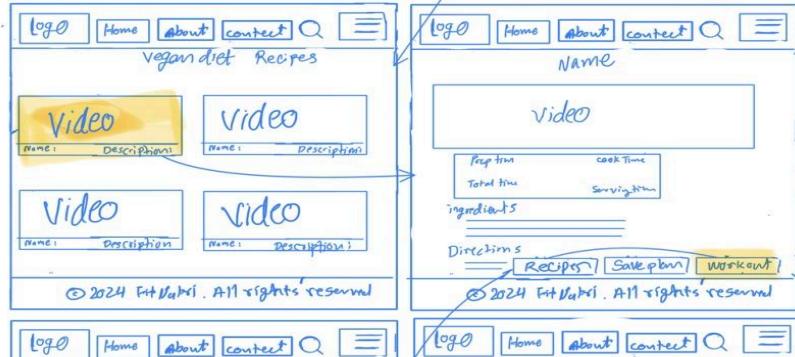
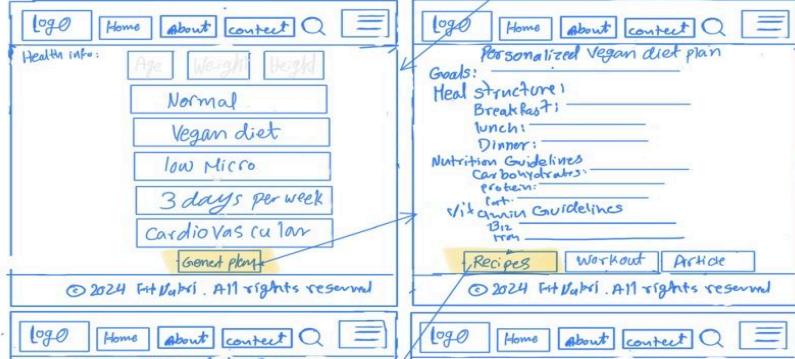
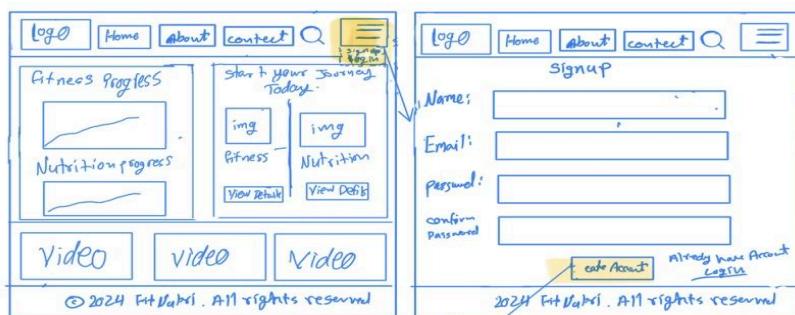
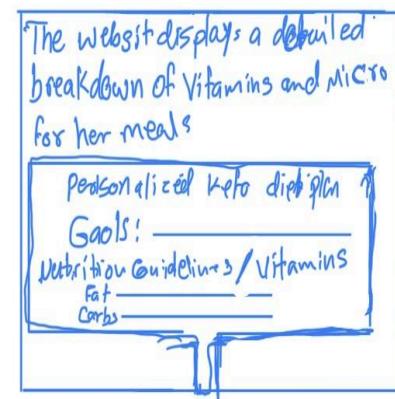
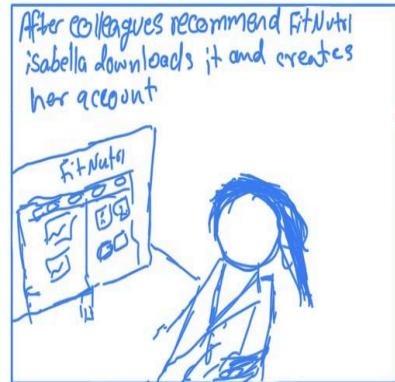
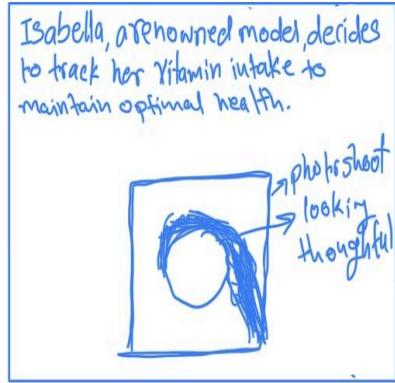
Theo uses fitNutri to plan meals that balance his macro needs for endurance.



As the race day approaches, Theo reviews his comprehensive training and nutrition data and found out that he is confident to finish the marathon.

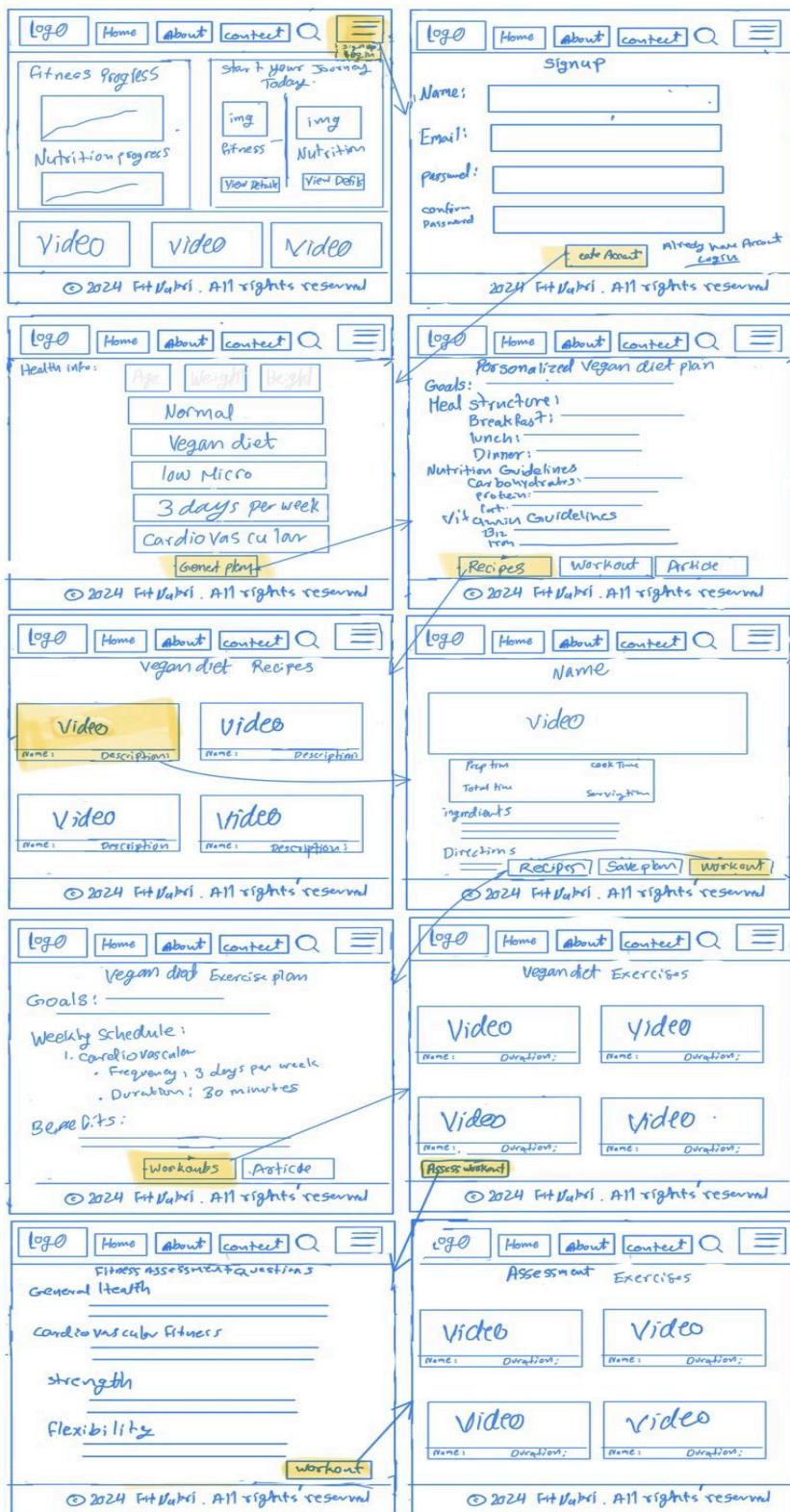
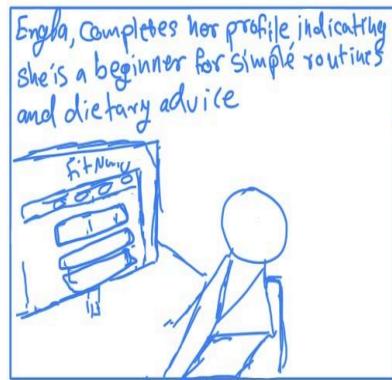


Use case 7:



life case 7

Use case 8:



Use case 8

Use case 9:



Home Screen

Logo Home About Contact Q

Fitness Progress: Nutrition progress

start your journey Today

Video Video Video

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Signup Screen

Logo Home About Contact Q

signup

Name:

Email:

Password:

Confirm Password:

Already have Account? [Log In](#)

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Login Screen

Logo Home About Contact Q

login

Email:

Password:

login

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Profile Screen

Logo Home About Contact Q

Fitness progress Nutrition progress

Activity

worked # minutes # days

Weight goals: #lb

Food intake tracker

Breakfast Lunch Dinner

Cal # Cal # Cal

Micronutrients / Vitamin

(g) # (g) # (g)

Carbs Fat Protein

Achievements

edit print share

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Community Screen

Logo Home About Contact Q

FitNutri's Community

Nutrition advice

Attachments [Choose file]

Submit

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Discussions Screen

Logo Home About Contact Q

Community discussions

User ID

Helpful

User ID

Helpful

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4. High-Level DB Architecture & Organization

a. User (Strong)

i. Attributes:

UserID(PK)/Username/Email/Password/DateOfBirth/Gender/AccountID(FK)

1. Each user shall have exactly one account
2. A user shall log into their account using secure authentication.
3. A user shall fill out one health information form.
4. A user shall be able to choose many types of nutrition
5. A user shall be able to choose many types of workouts
6. Users shall write many dietary restrictions
7. A user shall generate one personal nutrition plan
8. A user shall generate one personal workout plan
9. A user shall be able to share many personal workout plans on social media.
10. A user shall be able to share many personal nutrition plans on social media.
11. A user shall view many recipes
12. A user shall view many exercises
13. Users shall submit many forms and attach files to these forms.
14. Users shall view forms from other users.
15. Users shall like and receive notifications for many posts.
16. Users shall customize their notification settings.
17. Users shall search for recipes and workouts using keywords.
18. Users shall be able to share, edit and print fitness and nutrition progress many times.

b. Account (Strong)

i. Attributes:

AccountID(PK)/UserID(FK)/Email/Password/RecoveryEmail/RecoveryPhone/ProfileUpdateTime

1. An account shall belong to one user at most
2. An account shall be associated with one email at most

c. 3. Health Information(weak)

i. Attributes:

HealthInfoID(PK)/UserID(FK)/CurrentWeight/GoalWeight/FitnessLevel/DietaryPreferences/NutritionTypeID(FK)/WorkoutTypeID(FK)

1. A health information shall be filled by one user
2. A health information shall contain many Types of Nutrition
3. A health information shall contain many Types of workout
4. A health information shall contain one article base on personal nutrition plan

- 5. A health information shall contain one article base on personal fitness plan
- 6. A Health information shall include a history of user health data over time.
- 7. A Health information shall include user goals related to weight, fitness level, and dietary preferences
- d. Types of Nutrition(weak)
 - i. Attributes: NutritionTypeID (PK)/Description/RecommendedCalories
 - 1. A type of Nutrition shall be chosen by many users
 - 2. A type of Nutrition shall contain one article
- e. Types of Workout(weak)
 - i. Attributes: WorkoutTypeID (PK)/Description/ExpectedCalorieBurn
 - 1. A type of workout shall be chosen by many users
 - 2. A type of workout shall contain one article
- f. Exercises(Weak)
 - i. Attributes: WorkoutID
(PK)/WorkoutName/Duration/IntensityLevel/CaloriesBurnedEstimate, WorkoutTypeID (FK)
 - 1. An exercise shall include instructional videos and images
 - 2. An exercise shall provide estimated calories burned
 - 3. An exercise shall be viewed by many users
- g. Recipe(Weak)
 - i. Attributes: RecipeID(PK)/DietType/PreparationTime/CookingTime/IngredientList/UserRatingAverage/NutritionTypeID(FK)
 - 1. A recipe shall consist of many dishes
 - 2. A recipe shall be categorized by diet type (ex., keto, vegan)
 - 3. A recipe shall allow users to comment and rate its effectiveness and taste
 - 4. A recipe shall be viewed by many users
 - 5. A recipe shall include instructional videos and images
- h. Personal nutrition plan(weak)
 - i. Attributes: PlanID (PK)/UserID (FK)/PlanDetails/CreationDate
 - 1. A personal nutrition plan shall be generated by many users
 - 2. A personal nutrition plan shall be shared by many users
- i. Personal fitness plan(weak)
 - i. Attributes: FitnessPlanID (PK)/UserID
(FK)/WorkoutDetails/StartDate/EndDate
 - 1. A personal workout plan shall be generated be many users
 - 2. A personal workout plan shall be shared be many users and social media

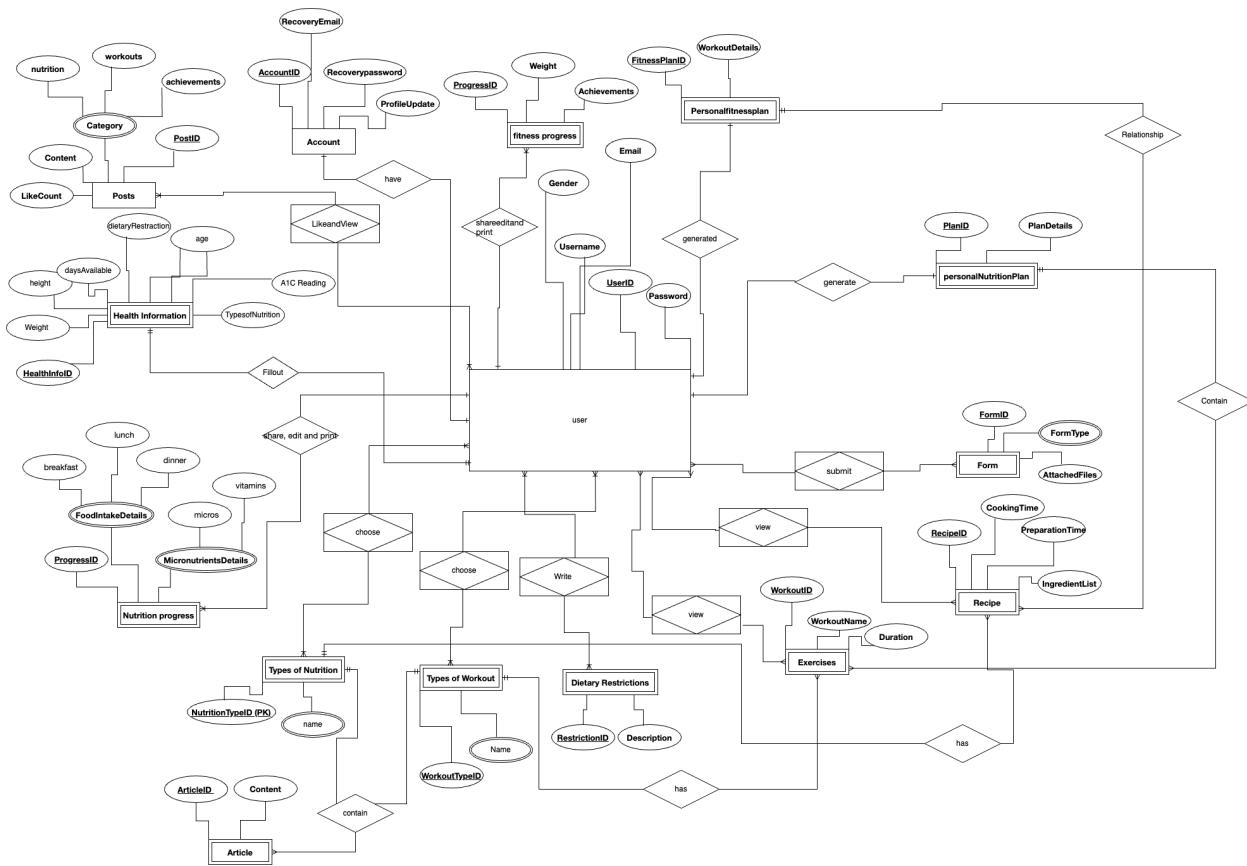
- j. Dietary Restrictions(weak)
 - i. Attributes: RestrictionID (PK)/UserID (FK)/RestrictionType/Description
 - 1. A Dietary Restrictions shall be written by many users
- k. Assess(weak)
 - i. Attributes: AssessID (PK)/UserID (FK)/DateAssessed/AssessDetails
 - 1. An assess shall be generated by many users
- l. Form(weak)
 - i. Attributes:FormID(PK)/UserID(FK)/SubmissionDate/FormType/Attached Files (count of files attached)
 - 1. A form shall be submitted by one users
 - 2. A form shall contain many files sent by the users
 - 3. A form shall be categorized by topic (ex., nutrition, workouts, achievements)
 - 4. A form shall allow users to request support or submit feedback directly to the service team
- m. Posts(strong)
 - i. Attributes: PostID (PK)/UserID (FK)/PostDate/Content (textual content of the post)/Category (e.g., nutrition, workouts, achievements)/LikeCount (number of likes received)
 - 1. A post shall be liked by many users
 - 2. A post shall allow users to engage through comments and replies
 - 3. Posts can be categorized by topic (Ex, nutrition, workouts, achievements)
- n. Notifications(strong)
 - i. Attributes: NotificationID (PK), UserID (FK), NotificationType, NotificationDate, NotificationContent
 - 1. Notifications shall be received by many users for likes and comments on their posts
- o. Article(weak)
 - i. Attributes:ArticleID (PK), RelatedToNutritionTypeID (FK), RelatedToWorkoutTypeID (FK), Content
 - 1. An article shall contain one type of nutrition
 - 2. An article shall contain one type of workout
- p. Nutrition progress
 - i. Attributes: ProgressID (PK), UserID (FK), Date, FoodIntakeDetails, MicronutrientsDetails
 - 1. Nutrition progress shall be editable by one user
 - 2. Nutrition progress shall display food intake(ex., breakfast, lunch ,dinner), micros and vitamins to one user
- q. Fitness progress

- i. Attributes: ProgressID (PK), UserID (FK), Date, ActivitiesDetails, Weight, Achievements
 - 1. Fitness progress shall be editable by one user
 - 2. Fitness progress shall display activity(ex. number of workout, minutes and days of strike), weight, lb and achievements to one user

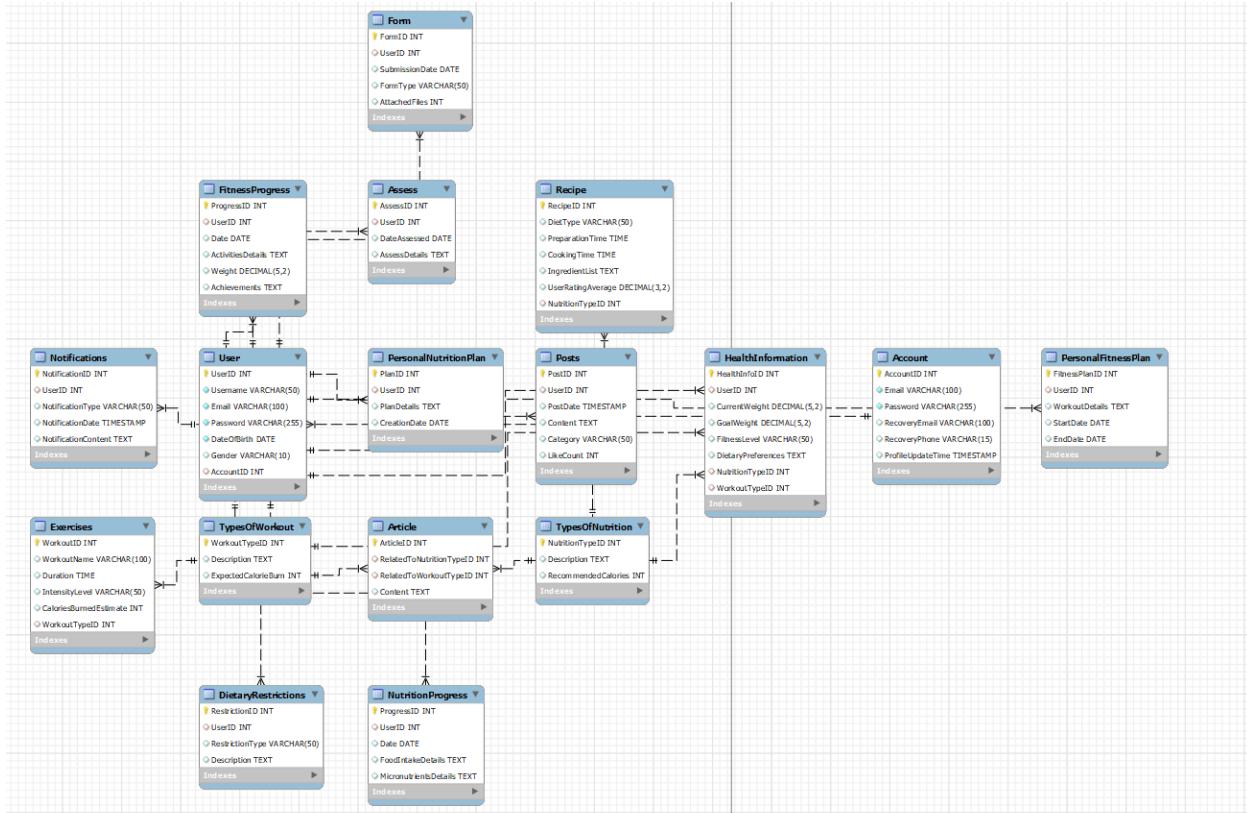
Define the DBMS

We decided to use MYSQL as the database management system for the project due to its simplicity and ease of use. Integration of anything needed is a breeze and very smooth. Frameworks and programming languages are essentially global with MYSQL which makes using it very easy.

ERD:



EER:



5. High-Level APIs and Main Algorithms

5.1. APIs Exposed

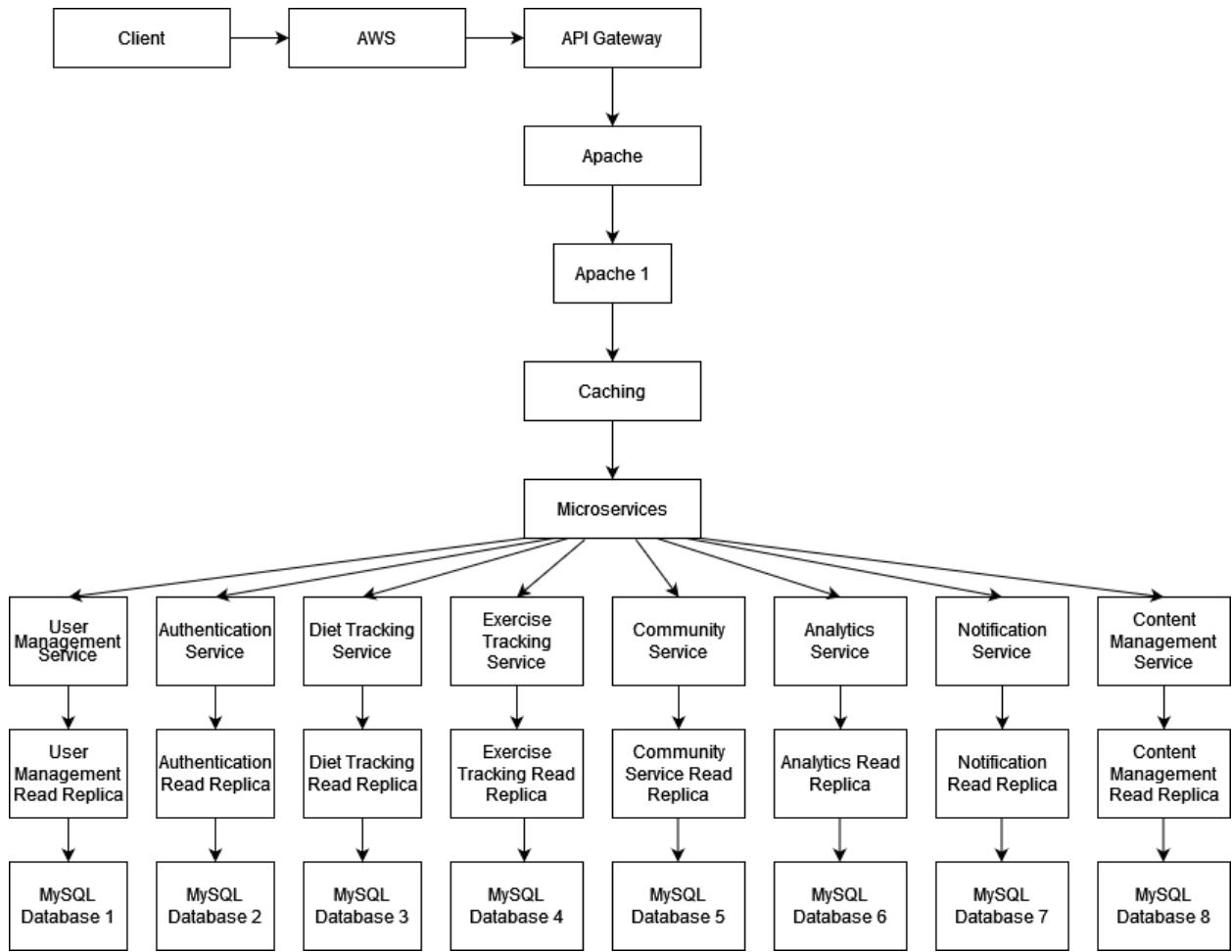
1. **User Management API:** This API will handle user related operations such as:
 - a. Endpoints for registration, login, profile retrieval, update, and deletion.
 - b. Authentication endpoints for user login and token management.
 - c. Authorization mechanisms to control access to user data.
2. **Nutrition Tracking API:** This API will manage food logging and nutrition data:
 - a. Endpoints for searching, retrieving, and logging food items.
 - b. Functionality to calculate and retrieve nutritional information based on logged food items.
 - c. Integration with external food databases or APIs for comprehensive food data.
3. **Workout Planning API:** This API will handle workout creation, scheduling, and tracking:
 - a. Endpoints for creating, retrieving, updating, and deleting workout plans.
 - b. Possible/future integration with wearable devices or fitness trackers to import and synchronize workout data.
4. **Community Engagement API:** This API will handle social interactions within the app:
 - a. Endpoints for creating, retrieving, updating, and deleting posts, comments, and likes/encouragements.
 - b. Functionality to manage user groups and group challenges (motivation inducing mechanism).
5. **Content Management API:** This API will handle the management of static content such as articles, recipes, and educational resources:
 - a. Endpoints for managing recipes and their ingredients, instructions, and nutritional information.

5.2 Main Algorithms

1. **Personalized Recommendations** that will deliver users specific workout plans, dietary insight, recommendations, and other experiences based on their experience and goals.
2. **Content-based filtering** so we can show the user things they might be interested in. By analyzing the user's workout history, dietary preferences, and stated goals, FitNutri could recommend similar workouts, recipes, or meal plans that align with their patterns or choices. Some users might have a preferred cuisine (subject to change) or type of workout.

3. **Keyword-Based Search** will allow users to search using keywords related to workouts, recipes, ingredients, dietary restrictions, and fitness goals.
4. **Faceted Search** will allow users to further refine their search results using multiple filters, enhancing the search experience. For example, users could filter recipes by dietary restrictions, cuisine (subject to change), ingredients, and calorie range.
5. **Trending Content** algorithms could be used to identify and highlight trending topics in the community section of FitNutri. This would surface engaging content and promote community involvement.
6. **Personalized Content Feeds** that, based on a user's interests, connections, and activity, could display a personalized community feed. This personalized feed would prioritize content from groups or users they follow and engage with.

6. System Design



Summary of Components:

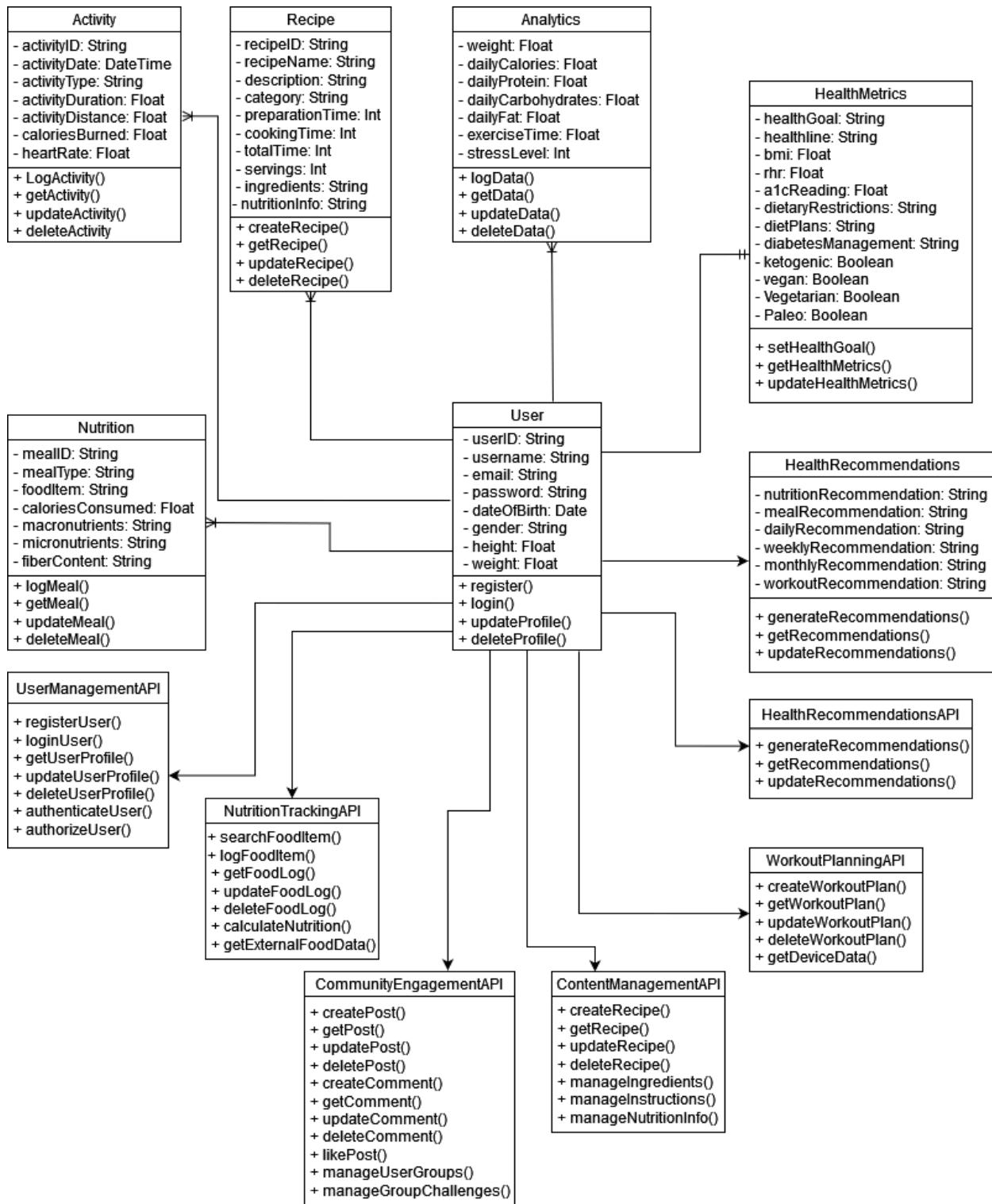
The FitNutri site will make use of several microservices which include user management, authentication, diet, and exercise. Breaking down the services in this way will allow for easier maintenance and scaling.

Load balancing will be handled using multiple servers and microservices so that servers will be able to distribute traffic as needed.

Caching will be used to prevent prevalent requests from always needing server response. By caching user information and other important features, the load on servers will be reduced further.

Database replication will be used to increase reliability by allowing data to still be available even if the original server disconnects.

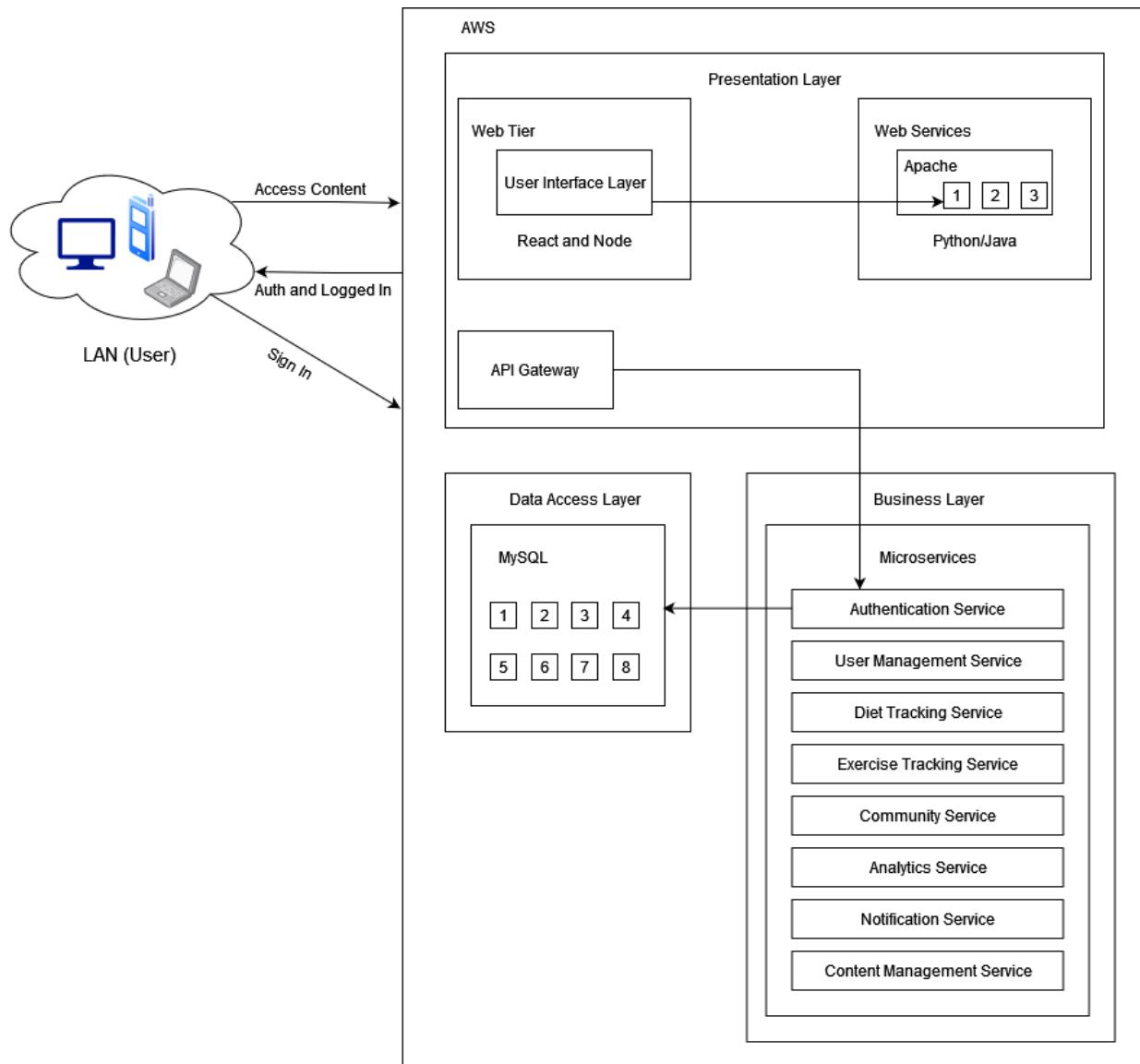
Authentication will be handled using an API Gateway making it so that data is encrypted while it is transmitted.



Summary of Design Patterns:

Of the various UML design patterns, three were specifically utilized because of their importance in reliability and consistency. First is the usage of the singleton pattern. This was important for making sure that there would not be multiple instances needed to perform their actions which reduces the overall resources required. Second is the factory pattern which allows for subclasses to create objects on their own. This is important for allowing the subclasses to make new objects as needed without having to rely on changing code. Third is the observer pattern which makes it so that all states of an object stay updated. This allows the objects to always be in sync so there is more consistency when relaying data.

7. High-Level App Network and Deployment Design



8. Identify Actual Key Risks

8.1 Skills Risks:

- FitNutri uses Java and Spring Boot for the backend and JavaScript and React for the frontend. This requires team members to quickly learn and adopt. Insufficient expertise could lead to delays, errors, and challenges in implementing features effectively.

8.2 Schedule Risks:

- A significant schedule risk is the shorter development time frame compared to teams during Fall and Spring semesters. This compressed schedule increases pressure and the likelihood of encountering delays and feature goals not being met.

8.3 Technical Risks:

- Integrating various technologies poses a technical risk. FitNutri leverages an impressive technology stack, including AWS, MySQL, Linux/Bash, Apache, and more. Ensuring seamless integration and compatibility among these technologies could be challenging and might lead to unforeseen technical issues, causing delays in development.
- FitNutri may face performance risk if the backend is not adequately optimized to handle high traffic as the user base grows. Ensuring the app scales effectively to accommodate a large number of users without degradation in performance is critical.
- Ensuring the app runs smoothly involves continuous monitoring and maintenance. Any downtime or operational failure can lead to a loss of user trust and revenue.
- Relying on third-party services (e.g., AWS, APIs) introduces a risk if those services experience outages, change terms, or discontinue services, potentially disrupting FitNutri's functionality.
- If the app is not user-friendly, it could lead to low retention rates and negative reviews.

8.4 Teamwork Risks:

- Effective collaboration and communication are important for a software development team, especially one that is fully remote like ours. Miscommunication, coordination issues, failure to attend meetings, and the lack of in-person interaction could lead to delay-inducing misunderstandings and decreased team cohesion.

8.5 Legal/Content Risks:

- Ensuring compliance with data privacy regulations like GDPR and CCPA is essential. Failure to adequately protect user information or obtain necessary consent could result in legal consequences.
- The reliance on user-created content within FitNutri, specifically on the topic of health and fitness, introduces a whole world of content risks. Ensuring the accuracy, reliability, and appropriateness of this content is vital to mitigate legal and reputational risks.
- Protecting user data from breaches and cyber-attacks is crucial. Any vulnerability can lead to data loss, which could damage the app's reputation and lead to legal repercussions.

8.6 Market Risks:

- There is a risk that the market demand for fitness and nutrition apps could change due to new trends, economic conditions, or changes in user preferences. This could affect the app's growth and profitability.

9. Project Management

To manage our M2 tasks, our team used Google spreadsheet and Notion as our primary task management tools. I (team lead) created our own channel called “FitNutri” to be able to keep track of our progress. Notion already gave me an outline of things I might need to keep everything organized. We have a task folder where we can add tasks, assign team members, add deadlines, and if it is a high or low priority. We are also able to update our status to say if we are “in progress” or “done”. This layout provides a clear overview of the workload and progress for each member and team lead. There is also a document area for important information that is needed when doing this milestone.

We think having questions when doing this milestone when we are not in a meeting is important. That’s why it is important to have our Discord channel for Team 03 to communicate in. This serves as our primary communication channel for discussions, questions, and collaboration. By having this Discord channel everyone is able to call and communicate.

Google Docs is also an essential tool for us because we write everything on a shared doc. We are able to collaborate and the team lead is able to write feedback. Having the doc ensures that everyone is on the same page regarding the details and expectations of the project. With docs, we are able to have all our work done on the same page. With all these tools we will continue utilizing Notion, Discord, and Google Docs for our task management and communication.

10. Detailed List of Contributions

NO.	Member	Contribution	Rating
1	Michelle Nguyen (Team Lead)	<ul style="list-style-type: none"> Helped work on the mockup drawings. Created a notion to keep track of tasks. Looked over the document for corrections and grammar, Planned meetings. Helped with the EDR. Wrote out the Project Management. 	
2	Mitchell Caine	<ul style="list-style-type: none"> The first 4 use cases for the UI/mockup. Helped Ali Hadwan with the storyboard and had a 1 on 1 meeting to discuss the design of the application/website. Worked on the flow chart diagram for our system design. The system design. Wrote out the summary components. Used mySQL to organize our functions on our application. Summary of the design pattern. 	10
3	Shreejana Bartaula	<ul style="list-style-type: none"> n/a 	0
4	Eduardo Enrique Muñoz Alvarez	<ul style="list-style-type: none"> Planned out the EDR diagram with Ali Hadwan. Worked on the high-level database architecture. Worked on mySQL to create the eer. Defined our DBMS. 	10
5	Nilofar Ali	<ul style="list-style-type: none"> Worked on data definitions. Worked on prioritized functional requirements 	8
6	Uzair Hamed Mohammed	<ul style="list-style-type: none"> programmed the backend of our prototype. Wrote out the high-level APIs and Main Algorithms. Collaborated with John to create the high-level app network and deployment design. Identify actual risks with John. 	10
7	John Collins	<ul style="list-style-type: none"> Worked on data definitions. Collaborated with Uzair to create the high-level app network and deployment design. Worked and collaborated with Uzair on the actual risks. 	8
9	Ali Hadwan	<ul style="list-style-type: none"> Planned out the application/website design. 	10

		<ul style="list-style-type: none">● Drew out the use cases.● UI Mockups and storyboards.● Drew all, planned, and collaborated with the team if everyone agreed with everything.● Worked on the erd on draw.io.● Programmed the front end of our prototype and collaborated with Uzair.	
10	Ali A	<ul style="list-style-type: none">● n/a	0

Milestone 3 Version 2

SW Engineering CSC648-848-05
Summer 2024

FitNutri Hub

Team 03

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#8	John Collins	jcollins9@sfsu.edu	Backend
#9	Ali Hadwan	hadwanali41@gmail.com	Frontend

MILESTONE 3

Date: 06/11/2024

History Table

Milestone	Version	Date Submitted
Milestone 3	V1	7/24/2024

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1. Data Definitions

1. User: Describes the group of individuals that will utilize the application. Users are categorized into two ways: registered and unregistered.

1.1 Registered User: A user who created an account and has all of the application's capabilities accessible to them.

1.1.1. Name: The full name of the user creating a user account.

1.1.2. User ID: A unique identifier for each user.

1.1.3. Username: The chosen display name of the user.

1.1.4. Email: The user's email address for communication and account recovery.

1.1.5. Password: A hashed string used for user authentication.

1.1.6. Date of Birth: The user's date of birth.

1.1.7. Gender: The user's gender for health metrics and recommendations.

1.1.8. Height: The user's height to calculate BMI.

1.1.9. Weight: The user's weight to calculate BMI.

1.2 Unregistered User: A user with restricted access to the application's functionality who still needs to make an account.

2. Activity Data: A user who created an account and has all of the application's capabilities accessible to them.

2.1. Activity ID: A unique identifier for each recorded activity.

2.2. Activity date: The Time and date when the activity took place

2.3. Activity type: The type of physical activity.

2.4. Activity duration: How long the user was doing the activity for.

2.5. Activity distance: The distance covered during the activity.

2.6. Calories burned: Estimated number of calories burned during the activity.

2.7. Heart rate: The user's average heart rate during the activity.

3. Nutrition Data: The distribution of nutrient intake in each meal (like high protein and low carb to meet the user's dietary goals).

3.1. Meal ID: A unique identifier for each meal entry.

3.2. Meal type: The type of meal (breakfast, lunch, dinner, snack).

3.3. Food item: The name of the food item consumed.

3.4. Calories consumed: The number of calories in the food item.

3.5. Macronutrients: The amount of carbohydrates, proteins, and fats in the food item.

3.6. Micronutrients: List of Vitamins (A, B, C, D, E, and K) and Minerals (Ca, Mg, Zn, Fe) plus fiber content.

4. Recipe Data: Guidelines and dietary data for the user's meal preparation to prepare the meal for the week.

4.1. Recipe ID: A unique identifier for each recipe.

4.2. Recipe name: The name of the recipe.

4.3. Description: A description of the recipe.

4.4. Category: The recipe category (dessert, appetizer, main course).

4.5. Preparation time: The time required to prepare the ingredients.

4.6. Cooking time: The time required to cook the dish.

- 4.7. Total time: The total time required to prepare and cook the recipe.
- 4.8. Servings: The number of servings the recipe yields.
- 4.9. Ingredients: the name of the ingredients.
- 4.10. Nutrition information: nutritional information (calories, carbohydrates, proteins, fats, fiber, sodium).

5. Health Metrics: The health condition of the user to indicate their health and vitality to organize healthy meal plans and exercise.

- 5.1. Health Goal: Defined health goal for the user (Health, Fitness, Performance, etc. goal).
- 5.2. Healthline: User health condition or treatments, if any restrictions.
- 5.3. BMI: Simplistic measurement of a healthy range of weight related to height.
- 5.4. RHR: The resting heart rate of the user.
- 5.5. A1C Reading: Measure of the average level of blood sugar over a given time.
- 5.6. Dietary Restrictions: List of foods that must be left out of a person's diet.
- 5.7. Diet Plans: Categories and quantities of food that a person eats for a health outcome.
- 5.7.1. Diabetes Management: Specific diet to manage diabetes.
- 5.7.2. Ketogenic: A diet high in fats influences metabolism.
- 5.7.3. Vegan: Diet consisting of no animal products.
- 5.7.4. Vegetarian: Diet consisting mainly of plant sources.
- 5.7.5. Paleo: Diet focussing on whole foods with high protein, low carbohydrates.

6. Health Recommendations: Personalized recommendations for the user according to their health condition.

- 6.1. Nutrition recommendation: A list of nutrients that will help the user achieve their set goal.
- 6.2. Meal recommendation: A list of meals or recipes that contain recommended nutrition.
- 6.2.1. Daily Recommendation: Recommendation for that day.
- 6.2.2. Weekly Recommendation: Recommendation for that week.
- 6.2.3. Monthly: Recommendation for that Month.
- 6.3. Workout recommendation: A prepared workout that will help the user achieve their goal.

7. Tracking/Logging/Analytics: A log of the user's physical activities to track the user's calorie intake and workout regimens.

- 7.1. Weight: The weight that the user registered on that day.
- 7.2. Daily Calories: The number of calories the user consumed that day.
 - 7.2.1. Daily Protein: The amount of protein consumed that day.
 - 7.2.2. Daily Carbohydrate: The amount of carbohydrates consumed that day.
 - 7.2.3. Daily Fat: The amount of fat consumed that day.
- 7.3. Exercise time: The amount of time the user exercised that day.
- 7.4. Stress level: A 1-10 rating of the level of stress the user experienced that day.

2. Functional Requirements

Priority 1 (Critical)

1. User Account Management

- 1.1 A user shall securely sign up.
- 1.2 A user shall securely sign in.
- 1.3 A user should be able to create their profile (age, weight, height, fitness goals).
- 1.4 A user should be able to do password recovery/reset.
- 1.5 A user should be able to update their account.
- 1.6 A user should be able to delete their account.
- 1.7 Each user shall have exactly one account.
- 1.8 A user shall log into their account using secure authentication.
- 1.9 A user shall fill out one health information form.
- 1.10 A user shall be able to choose many types of nutrition
- 1.11 A user shall be able to choose many types of workouts
- 1.12 Users shall write many dietary restrictions
- 1.13 A user shall generate one personal nutrition plan
- 1.14 A user shall generate one personal workout plan
- 1.15 A user shall view many recipes
- 1.16 A user shall view many exercises
- 1.17 Users shall search for recipes and workouts using keywords.
- 1.18 Users shall be able to share, edit and print fitness and nutrition progress many times.

2. Account

- 2.1 An account shall belong to one user at most.
- 2.1 An account shall be associated with one email at most.

3. Tracking

- 3.1. A user shall be able to track their calories burned throughout their day.
- 3.2. A user shall be able to track their total steps throughout their day.

4. Health information

- 4.1 A health information shall be filled by one user
- 4.2 A health information shall contain many Types of Nutrition
- 4.3 A health information shall contain many Types of workout
- 4.3 A health information shall contain one article based on a personal nutrition plan.
- 4.3 health information shall contain one article based on a personal fitness
- 4.4 Health information shall include user goals related to weight, fitness level, and dietary preferences

5. Types of Nutrition

- 5.1 A type of Nutrition shall be chosen by many users
- 5.2 A type of Nutrition shall contain one article

6. Types of Workout

- 6.1 A type of workout shall be chosen by many users
- 6.2 A type of workout shall contain one article

7. Exercises

- 7.1 An exercise shall include instructional videos and images
- 7.2 An exercise shall provide estimated calories burned
- 7.3 An exercise shall be viewed by many users

8. Recipe

- 8.1 A recipe shall consist of many dishes
- 8.2 A recipe shall be categorized by diet type (ex., keto, vegan)
- 8.3 A recipe shall be viewed by many users
- 8.4 A recipe shall include instructional videos and images

9. Personal nutrition plan

- 9.1 A personal nutrition plan shall be generated by many users
- 9.2 A personal nutrition plan shall be shared by many users

10. Personal fitness plan

- 10.1 A personal workout plan shall be generated by many users
- 10.2 A personal workout plan shall be shared by many users

11. Dietary Restrictions

- 11.1 A Dietary Restrictions shall be written by many users

12. Assess

- 12.1 An assess shall be generated by many users

13. Form

- 13.1 A form shall be submitted by one users
- 13.2 A form shall be categorized by topic (ex., nutrition, workouts, achievements)
- 13.3 A form shall allow users to request support or submit feedback directly to the service team

14. Post

- 14.1 shall be liked by many users
- 14.2 Posts can be categorized by topic (Ex, nutrition, workouts, achievements)

15. Article

- 15.1 An article shall contain one type of nutrition
- 15.2 An article shall contain one type of workout

16. Nutrition progress

- 16.1 Nutrition progress shall be editable by one user
- 16.2 Nutrition progress shall display food intake(ex., breakfast, lunch ,dinner), micros and vitamins to one user

17. Fitness progress

- Fitness progress shall be editable by one user
- Fitness progress shall display activity(ex. number of workout, minutes and days of strike), weight, lb and achievements to one user

Priority 2 (Important)

1. User Account Management

- 1.1 A user shall be able to upload and manage profile pictures.
- 1.2 Users should be able to establish and monitor fitness goals with the app.
- 1.3 A user shall be able to go back and edit posts.
- 1.4 A user shall be able to go back and delete posts.
- 1.5 A app shall provide moderation tools to manage community interactions and ensure a positive and supportive environment.
- 1.6 Users shall submit many forms and attach files to these forms.

2. Health information

- 2.1 Health information shall include a history of user health data over time.
- 3. Recipe**
 - 3.1 A recipe shall allow users to comment and rate its effectiveness and taste
- 4. Form**
 - 4.1 A form shall contain many files sent by the users
- 5. Posts**
 - 5.1 A post shall allow users to engage through comments and replies
- 6. Social Features**
 - 6.1 Users shall be able to like, comment and share other user's posts.
 - 6.2 A user shall be able to create posts.
 - 6.3 Users should receive notifications when other users like their posts.
 - 6.4 Users should receive notifications when other users comment on their posts.
 - 6.5 A user shall be able to share many personal workout plans/nutrition plans on social media
- 7. Tracking**
 - 7.1 A user should be able to log their meals and snacks throughout their day.
- 8. Analytics**
 - 8.1 The app shall provide information about the user's health.
 - 8.2 The app shall provide messages in intervals to check up on the user.
 - 8.3 A user shall be able to view statistics about their health & workout.
- 9. Meal Planning**
 - 9.1 The application should produce meal plans.
 - 9.2 Users should be able to personalize their meal plans using the app.
 - 9.3 All meal nutritional information should be provided by the app.
- 10. Workout Planning**
 - 10.1 A user shall be able to create personalized workout plans based on their fitness goals.
 - 10.2 The app shall suggest pre-designed workout routines categorized by fitness level (beginner, intermediate, advanced) and specific goals (weight loss, muscle gain, endurance).
 - 10.3 Customers shall be able to schedule workouts.
 - 10.4 Customers shall be able to set reminders in the app.
 - 10.5 Customers shall be able to track completed exercises.
- 11. Monitoring Fitness and Health**
 - 11.1 The app must work with other fitness tracker apps and devices.
 - 11.2 The customers' physical activity must be tracked by the app.
 - 11.3 The customers' physical activity must be linked to their dietary intake.
 - 11.4 Customers should be able to establish and monitor fitness goals with the app.
 - 11.5 customers should be able to check their overall health and nutritional status on a dashboard provided by the app.
 - 11.6 Physical activity manual entry should be supported by the app.
 - 11.7 Customers ought to be able to record their physical dimensions and weight on the app.

12. Notification

- 12.1 Users shall like and receive notifications for many posts.
- 12.2 Users shall customize their notification settings.
- 12.3 Notifications shall be received by many users for likes and comments on their posts

Priority 3 (Opportunistic)

1. Tracking

- 1.1 The app shall provide feedback on the user's nutritional intake (calories, macronutrients carbohydrates, proteins, fats, vitamins, and minerals).
- 1.2 Users shall track forms from other users.
- 1.3 Users shall view forms from other users.

2. Analytics

- 2.1. The app will provide an option for feedback so that the developers would be able to update the program.

3. Meal Planning

- 3.1. The app shall offer customized meal recommendations based on the users' tastes and dietary constraints.
- 3.2. Cooking directions and recipe recommendations should be included in the app.
- 3.3. The app shall allow customers to track their meals and read barcodes on packaged goods.
- 3.4. The app should provide users with recipes.
- 3.5. All recipes shall list the nutritional values per serving.

4. Workout Planning

- 4.1. A user shall have the option to follow live-streaming workout sessions led by fitness instructors.

5. Monitoring Fitness and Health

- 5.1. Taking into account the customers' activity levels, the app ought to offer insights and suggestions.
- 5.2. The software ought to alert customers to their accomplishments and activity benchmarks.
- 5.3. The app needs to provide pointers and guidance on keeping an active lifestyle and a balanced diet.

4. Wireframes Based on Mockups/Storyboards

You can find our **FULL** mockups here: [FitNutri's Figma](#)

FitNutri

Sign in | Register | Community | Home | About | Contact | Hints search text |

Sign up

Name:

Email:

Password:

Confirm Password:

[Create Account](#) Already have an account? [Log in](#)

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FitNutri

Sign in | Register | Community | Home | About | Contact | Hints search text |

Login

Email:

Password:

[Login](#)

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FitNutri

Fitness Progress

Activities

of workout: Value # of Minutes: Value # of Days: Value

Weight: Goal: #IB

Achievements:

Nutrition Progress

Food Intake Tracker

Breakfast(Cal): Value Lunch(Cal): Value Dinner(Cal): Value

Micro/Vitamin: Carbo(g): Value Fats(g): Value Protein(g): Value

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FitNutri

Start Your Journey Today

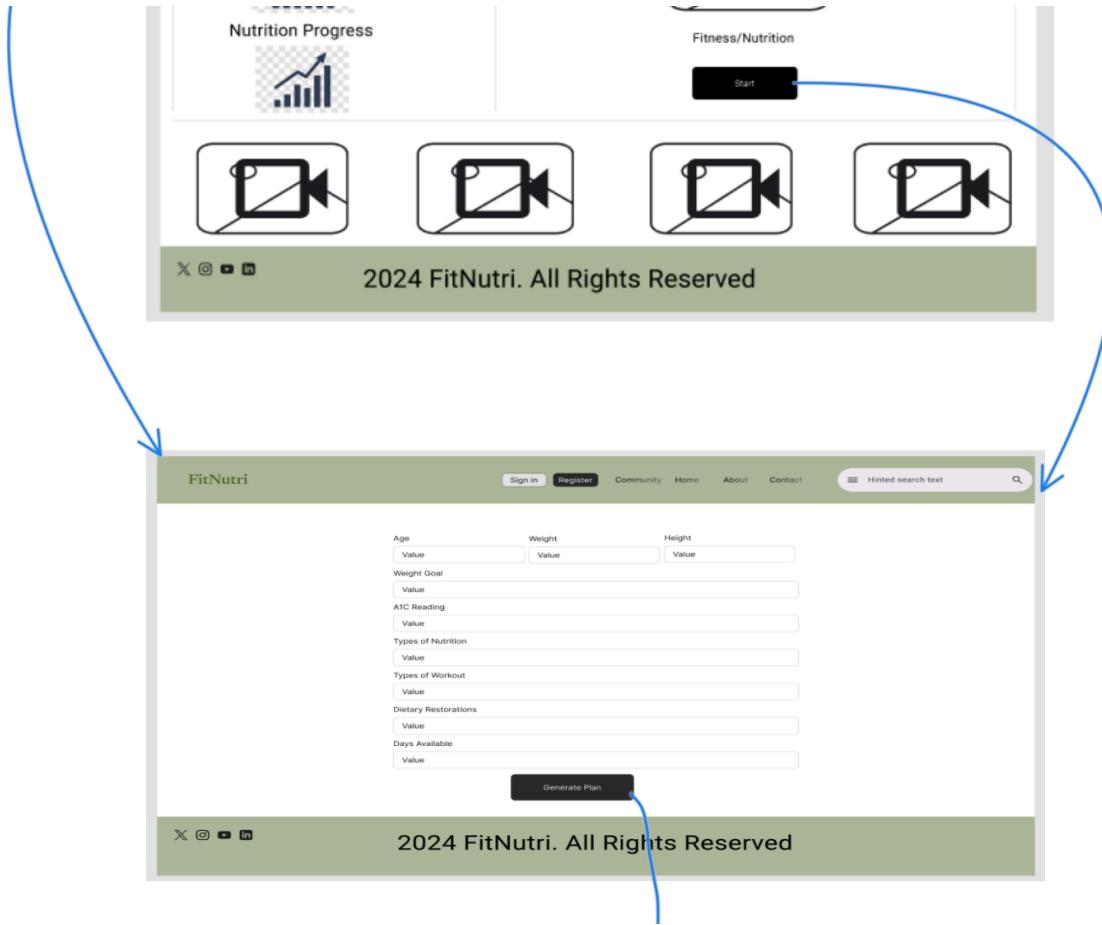
Fitness Progress:

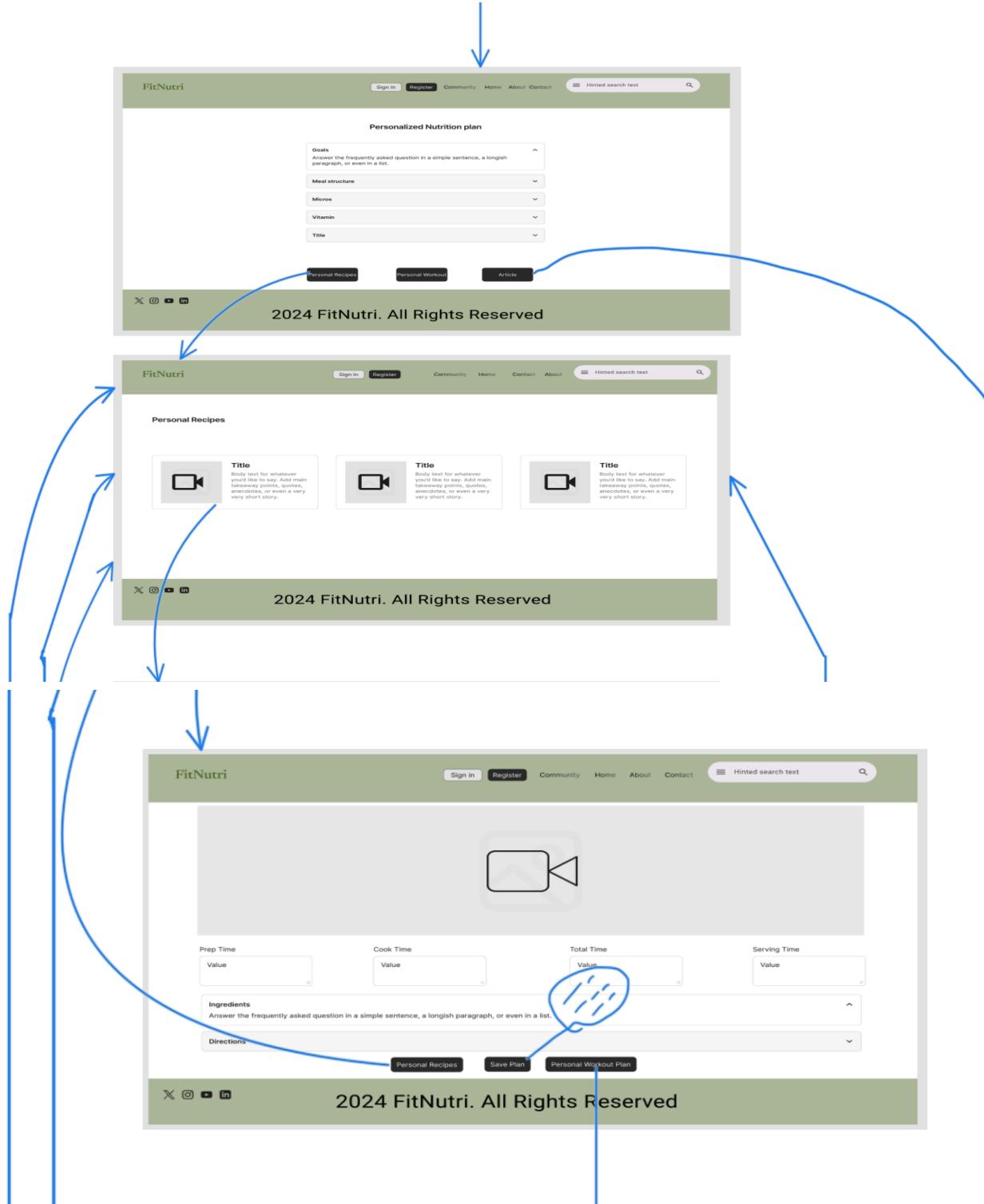
Nutrition Progress:

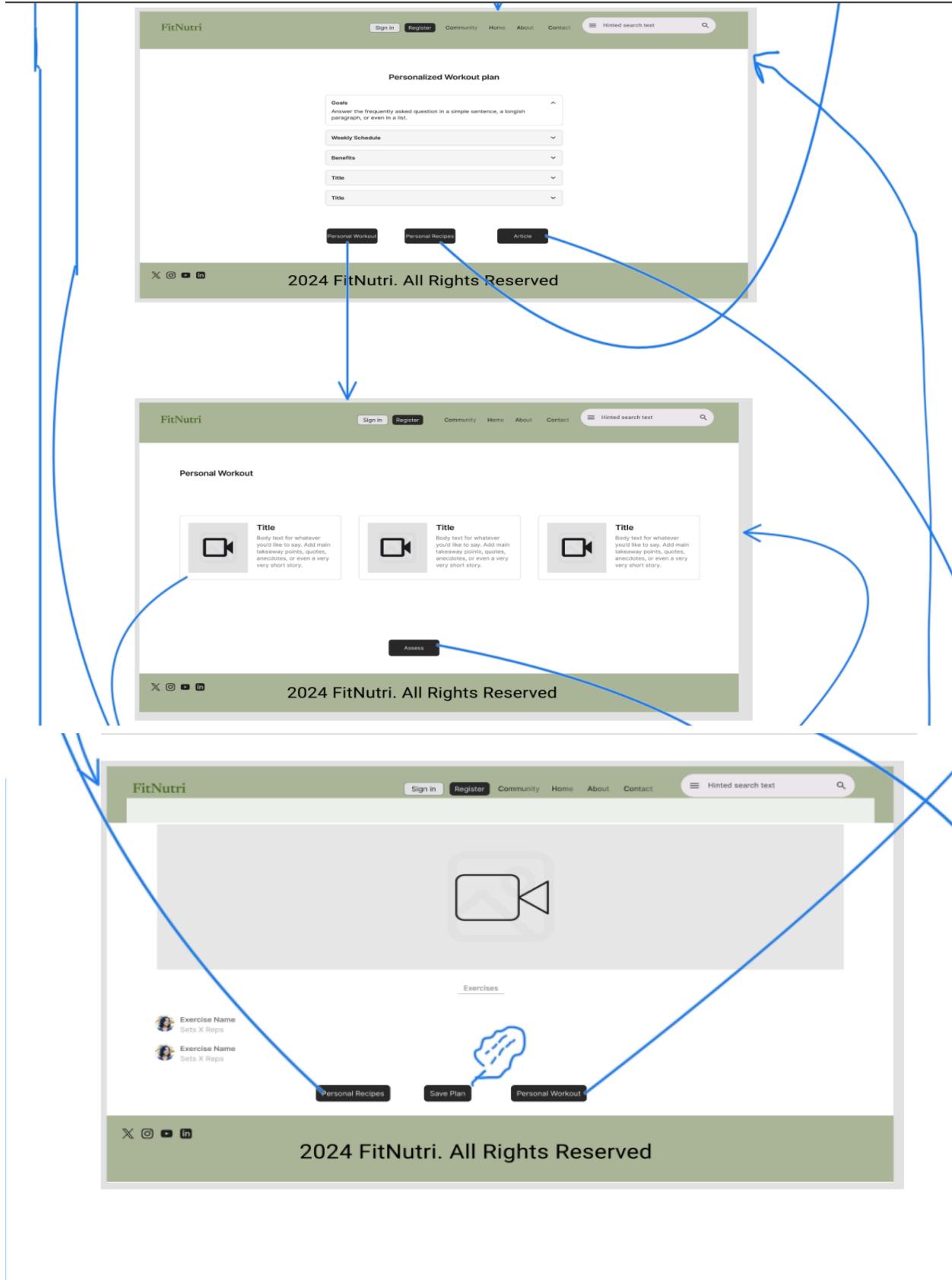
Fitness/Nutrition:

Start

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FitNutri

Sign in Register Community Home About Contact Hinte search text

Fitness Assessment Q's

General Health

How many days per week do you engage in physical activity?

What is the average duration of your physical activity sessions?

Do you have any chronic health conditions that affect your physical activity(e.g., asthma, diabetes, heart conditions)?

Cardiovascular Fitness

How quickly do you feel out of breath during physical activity?

Can you briskly walk or jog a mile, and if so, how do you feel afterwards?

How does your body respond to climbing several flights of stairs?

Strength

How many push-ups can you do in one go?

How many sit-ups can you perform in one minute?

Are you able to carry groceries or heavy objects comfortably?

Assess Workout

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Assessment Workout

Title
Body text for whatever you like to say. Add main takeaway points, quotes, anecdotes, or even a very very short story.

Title
Body text for whatever you like to say. Add main takeaway points, quotes, anecdotes, or even a very very short story.

Title
Body text for whatever you like to say. Add main takeaway points, quotes, anecdotes, or even a very very short story.

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The screenshot shows a web page titled "FitNutri's Community" under the heading "Nutrition Advice". A large text input field is labeled "user input". Below it is a button labeled "Add attachments". At the bottom right is a "Submit" button. The footer contains social media icons and the text "2024 FitNutri. All Rights Reserved".

FitNutri

Sign in Register Community Home About Contact Hinted search text

FitNutri's Community

Nutrition Advice

user input

Add attachments

Submit

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The image displays two wireframe prototypes of a fitness application interface, likely for a mobile device, arranged vertically. A blue curved arrow points from the top prototype down to the bottom one, suggesting a transition or comparison between the two screens.

Top Prototype: Community Discussions

- Header:** FitNutri, Sign In, Register, Community, Home, About, Contact, Hinted search text, magnifying glass icon.
- Content:** A list of user messages. Each message item includes a placeholder profile picture labeled "UserID", a placeholder message box labeled "user message", and a small circular icon with a person icon.
- Footer:** Social media icons (X, @, YouTube, LinkedIn) and the copyright notice "2024 FitNutri. All Rights Reserved".

Bottom Prototype: About FitNutri

- Header:** FitNutri, Sign In, Register, Community, Home, About, Contact, Hinted search text, magnifying glass icon.
- Content:** A section titled "About FitNutri" with the text "FitNutri is dedicated to helping you maintain a healthy lifestyle through personalized nutrition and fitness plans." Below this, there are four "Team Member" cards, each featuring a placeholder profile picture, a title, and a brief body text placeholder.
- Footer:** Social media icons (X, @, YouTube, LinkedIn) and the copyright notice "2024 FitNutri. All Rights Reserved".

The image displays two screenshots of the FitNutri website, each with blue arrows pointing from the top right towards the bottom right corner of the page.

Screenshot 1: Contact Form Submission

This screenshot shows a contact form with fields for Name, Surname, Email, and Message. A "Submit" button is at the bottom. A success message box is displayed on the right side of the form area, stating "Your form has been submitted successful". The page footer reads "2024 FitNutri. All Rights Reserved".

Screenshot 2: Article Page

This screenshot shows an article page titled "Article". Below the title is a placeholder image icon. At the bottom of the page are two buttons: "Personal Recipes Plan" and "Personal Workout Plan". The page footer reads "2024 FitNutri. All Rights Reserved".

5. High-Level DB Architecture & Organization

1. User (Strong)

Attributes/types

UserID (PK): numerical

Username: alphanumerical

Email: textual (format: email)

Password: textual

DateOfBirth: date

Gender: categorical (e.g., male, female)

AccountID (FK): numerical

Relationships

- 1.1 Each user shall have exactly one account
- 1.2 A user shall log into their account using secure authentication.
- 1.3 A user shall fill out one health information form.
- 1.4 A user shall be able to choose many types of nutrition
- 1.5 A user shall be able to choose many types of workouts
- 1.6 Users shall write many dietary restrictions
- 1.7 A user shall generate one personal nutrition plan
- 1.8 A user shall generate one personal workout plan
- 1.9 A user shall be able to share many personal workout plans on social media.
- 1.10 A user shall be able to share many personal nutrition plans on social media.
- 1.11 A user shall view many recipes
- 1.12 A user shall view many exercises
- 1.13 Users shall submit many forms and attach files to these forms.
- 1.14 Users shall view forms from other users.
- 1.15 Users shall like and receive notifications for many posts.
- 1.16 Users shall customize their notification settings.
- 1.17 Users shall search for recipes and workouts using keywords.
- 1.18 Users shall be able to share, edit and print fitness and nutrition progress many times.

2. Account (Strong)

Attributes/types

AccountID (PK): numerical

UserID (FK): numerical

Email: textual (format: email)

Password: textual

RecoveryEmail: textual (format: email)

RecoveryPhone: numerical

ProfileUpdateTime: datetime

Relationships

- 2.1 An account shall belong to one user at most
- 2.2 An account shall be associated with one email at most

3. Health Information(weak)

Attributes/types

HealthInfoID (PK): numerical

UserID (FK): numerical

CurrentWeight: numerical (unit: kg or lbs)

GoalWeight: numerical (unit: kg or lbs)

FitnessLevel: categorical (e.g., beginner, intermediate, advanced)

DietaryPreferences: textual

NutritionTypeID (FK): numerical

WorkoutTypeID (FK): numerical

Relationships

- 3.1 A health information shall be filled by one user
- 3.2 A health information shall contain many Types of Nutrition
- 3.3 A health information shall contain many Types of workout
- 3.4 A health information shall contain one article based on a personal nutrition plan.
- 3.5 Health information shall contain one article based on a personal fitness plan.
- 3.6 Health information shall include a history of user health data over time.
- 3.7 Health information shall include user goals related to weight, fitness level, and dietary preferences.

4. Types of Nutrition(weak)

Attributes/types

NutritionTypeID(PK): numerical

Description: textual

RecommendedCalories: numerical (unit: calories)

Relationships

- 4.1 A type of Nutrition shall be chosen by many users
- 4.2 A type of Nutrition shall contain one article

5. Types of Workout(weak)

Attributes/types

WorkoutTypeID(PK): numerical

Description:textual

ExpectedCalorieBurn: numerical (unit: calories)

Relationships

5.1 A type of workout shall be chosen by many users

5.2 A type of workout shall contain one article

6. Exercises(Weak)

Attributes/types

WorkoutID (PK): numerical

WorkoutName: textual

Duration: numerical (unit: minutes)

IntensityLevel: categorical (e.g., low, medium, high)

CaloriesBurnedEstimate: numerical (unit: calories)

WorkoutTypeID (FK): numerical

Relationships

6.1 An exercise shall include instructional videos and images

6.2 An exercise shall provide estimated calories burned

6.3 An exercise shall be viewed by many users

7. Recipe(Weak)

Attributes/types

RecipeID(PK):numerical

DietType: categorical (e.g., vegan, keto)

PreparationTime: numerical (unit: minutes)

CookingTime: numerical (unit: minutes)

IngredientList: textual

UserRatingAverage: numerical (scale 1-5)

NutritionTypeID (FK): numerical

Relationships

7.1 A recipe shall consist of many dishes

7.2 A recipe shall be categorized by diet type (ex., keto, vegan)

7.3 A recipe shall allow users to comment and rate its effectiveness and taste

7.4 A recipe shall be viewed by many users

7.5 A recipe shall include instructional videos and images

8. Personal nutrition plan(weak)

Attributes/types

NutritionPlanID (PK): numerical
 UserID (FK): numerical
 PlanDetails: textual

Relationships

8.1 A personal nutrition plan shall be generated by many users
 8.1 A personal nutrition plan shall be shared by many users

9. Personal fitness plan(weak)

Attributes/types

FitnessPlanID (PK): numerical
 UserID (FK): numerical
 WorkoutDetails: textual

Relationships

9.1 A personal workout plan shall be generated by many users
 9.1 A personal workout plan shall be shared by many users and social media

10. Dietary Restrictions(weak)

Attributes/types

RestrictionID (PK): numerical
 UserID (FK): numerical
 RestrictionType: categorical (e.g., dietary, physical)
 Description: textual

Relationships

10.1 A Dietary Restrictions shall be written by many users

11. Assess(weak)

Attributes/types

AssessID (PK): numerical
 UserID (FK): numerical
 DateAssessed: date
 AssessDetails: textual

Relationships

11.1 An assess shall be generated by many users

12. Form(weak)

Attributes/types

FormID (PK): numerical
 UserID (FK): numerical
 SubmissionDate: date
 FormType: categorical (e.g., feedback, survey)
 Attached: textual (format: file type)

Relationships

- 12.1 A form shall be submitted by one users
- 12.2A form shall contain many files sent by the users
- 12.3 A form shall be categorized by topic (ex., nutrition, workouts, achievements)
- 12.4 A form shall allow users to request support or submit feedback directly to the service team

13. Posts(strong)

Attributes/types

PostID (PK): numerical
 UserID (FK): numerical
 PostDate: date Content: textual
 Category: categorical (e.g., nutrition, workouts, achievements)
 LikeCount: numerical

Relationships

- 13.1 A post shall be liked by many users
- 13.2 A post shall allow users to engage through comments and replies
- 13.3 Posts can be categorized by topic (Ex, nutrition, workouts, achievements)

14. Notifications(strong)

Attributes/types

NotificationID (PK): numerical
 UserID (FK): numerical
 NotificationType: categorical (e.g., reminder, alert)
 NotificationDate: datetime NotificationContent: textual

Relationships

- 14.1 Notifications shall be received by many users for likes and comments on their posts

15. Article(weak)

Attributes/types

ArticleID (PK): numerical

RelatedToNutritionTypeID: numerical
 RelatedToWorkoutTypeID (FK): numerical
 Content: textual

Relationships

- 15.1 An article shall contain one type of nutrition
- 15.2 An article shall contain one type of workout

16. Nutrition progress

Attributes/types

ProgressID (PK): numerical
 UserID (FK): numerical
 Date: date
 FoodIntakeDetails: textual
 MicronutrientsDetails: textual

Relationships

- 16.1 Nutrition progress shall be editable by one user
- 16.2 Nutrition progress shall display food intake(ex., breakfast)microsand vitamins to one user

17. Fitness progress

Attributes/types

ProgressID (PK): numerical
 UserID (FK): numerical Date: date
 ActivitiesDetails: textual
 Weight: numerical (unit: kg or lbs)
 Achievements: textual

Relationships

- 17.1 Fitness progress shall be editable by one user
- 18.2 Fitness progress shall display activity weight, lb and achievements to one user

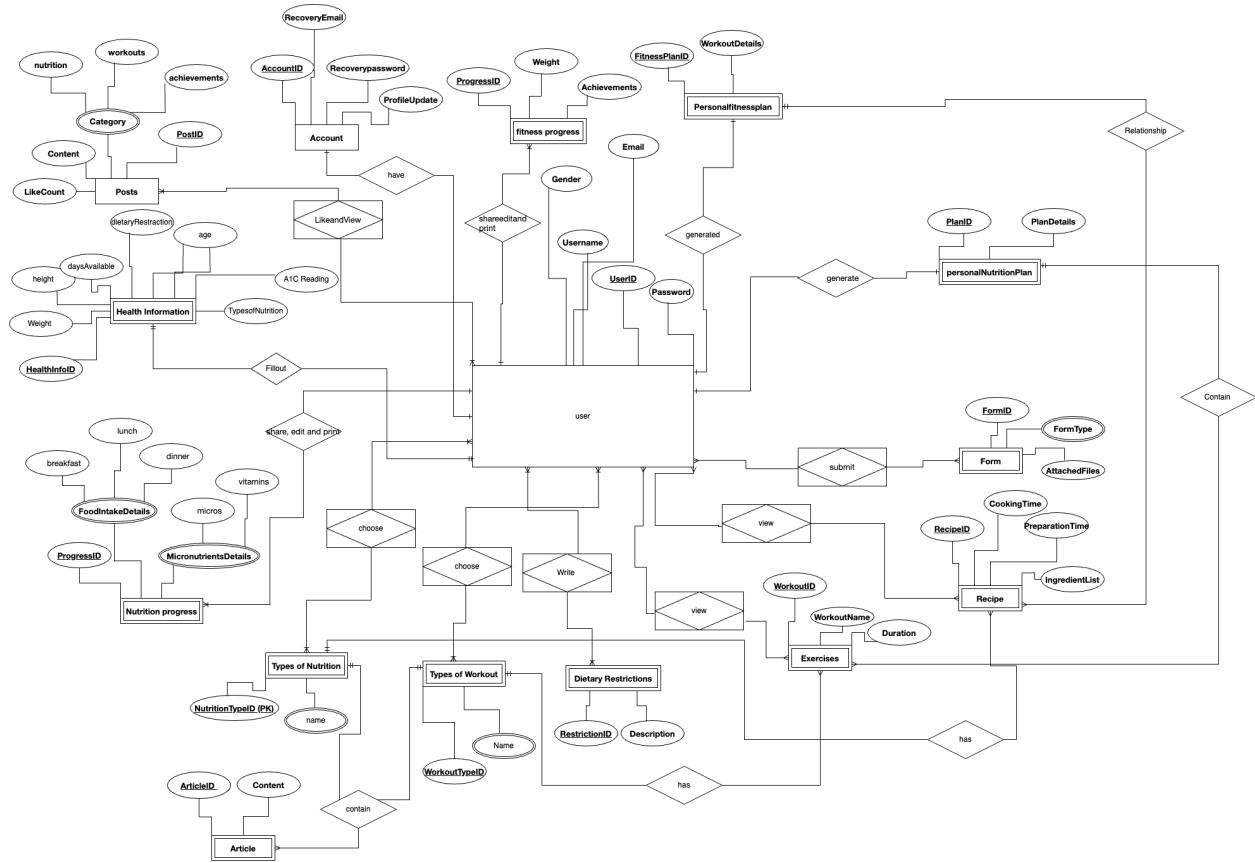
Define the DBMS

We decided to use MYSQL as the database management system for the project due to its simplicity and ease of use. Integration of anything needed is a breeze and very smooth. Frameworks and programming languages are essentially global with MYSQL which makes using it very easy

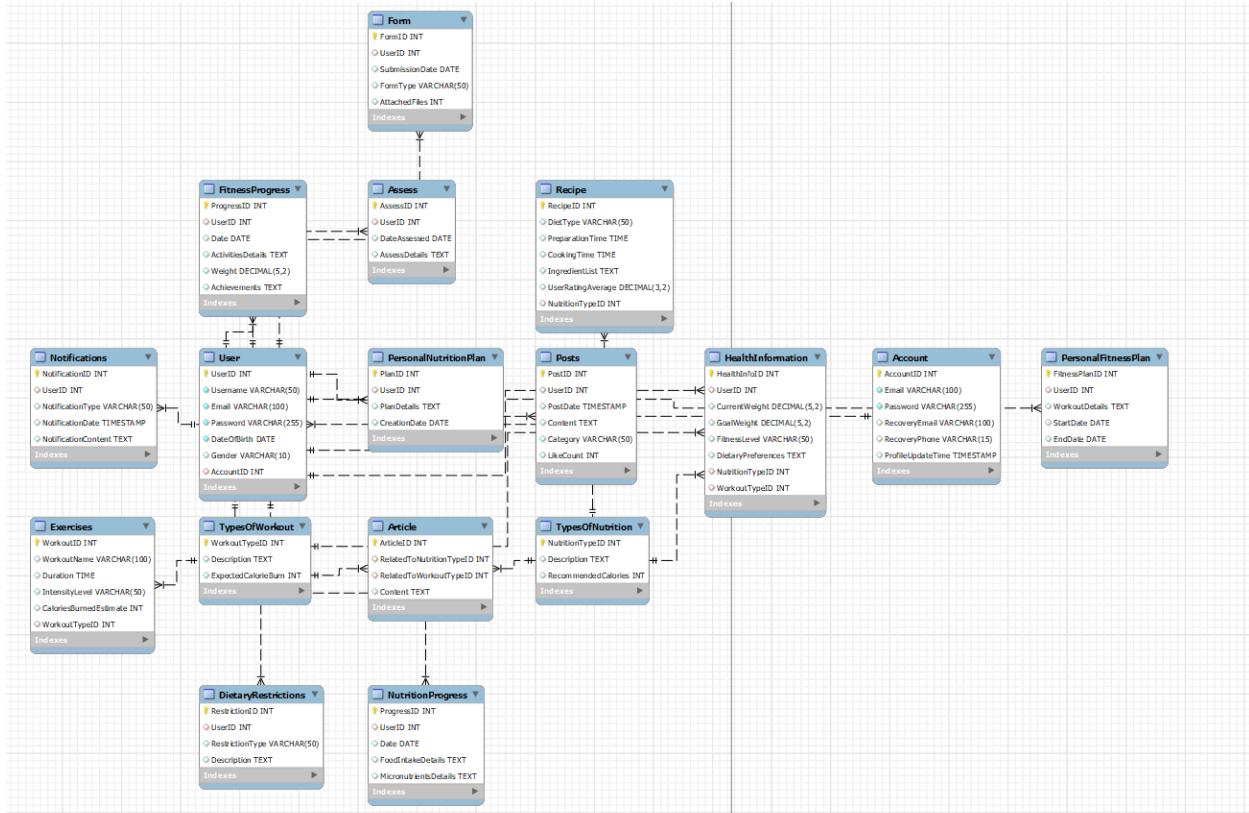
Media Storage

To store media files such as images, videos, recipes, etc, we plan on using MySQL database. And to store the files, we plan on using BLOBS, MediumBLOBS, or LargeBLOBS depending on the file size of the media. We will have to choose carefully what type of media we will allow because media files can be quite big and can really slow down the database if we're not careful with the size.

An Entity Relationship Diagram (ERD)

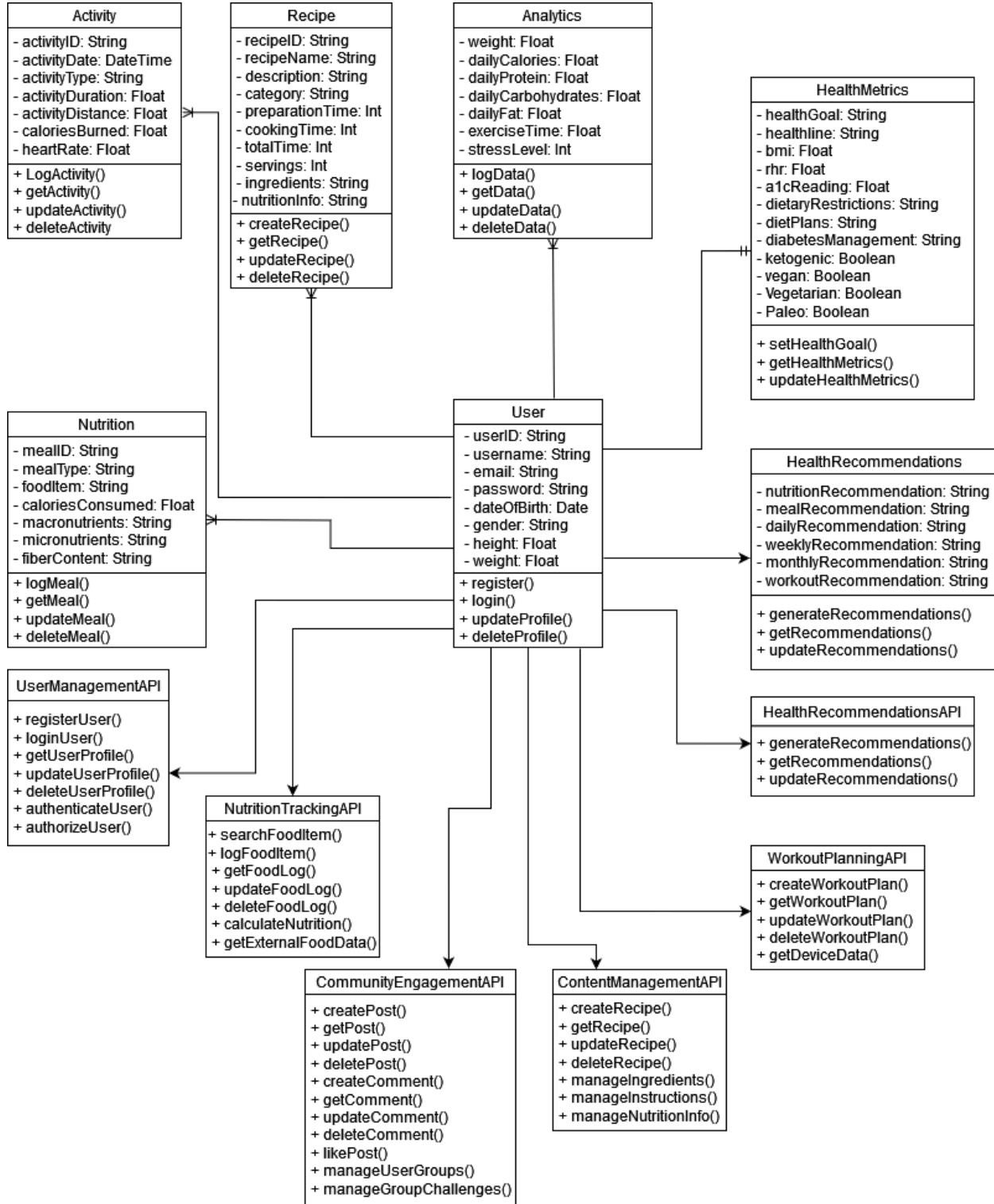


An Entity Establishment Relationship Diagram (EER)

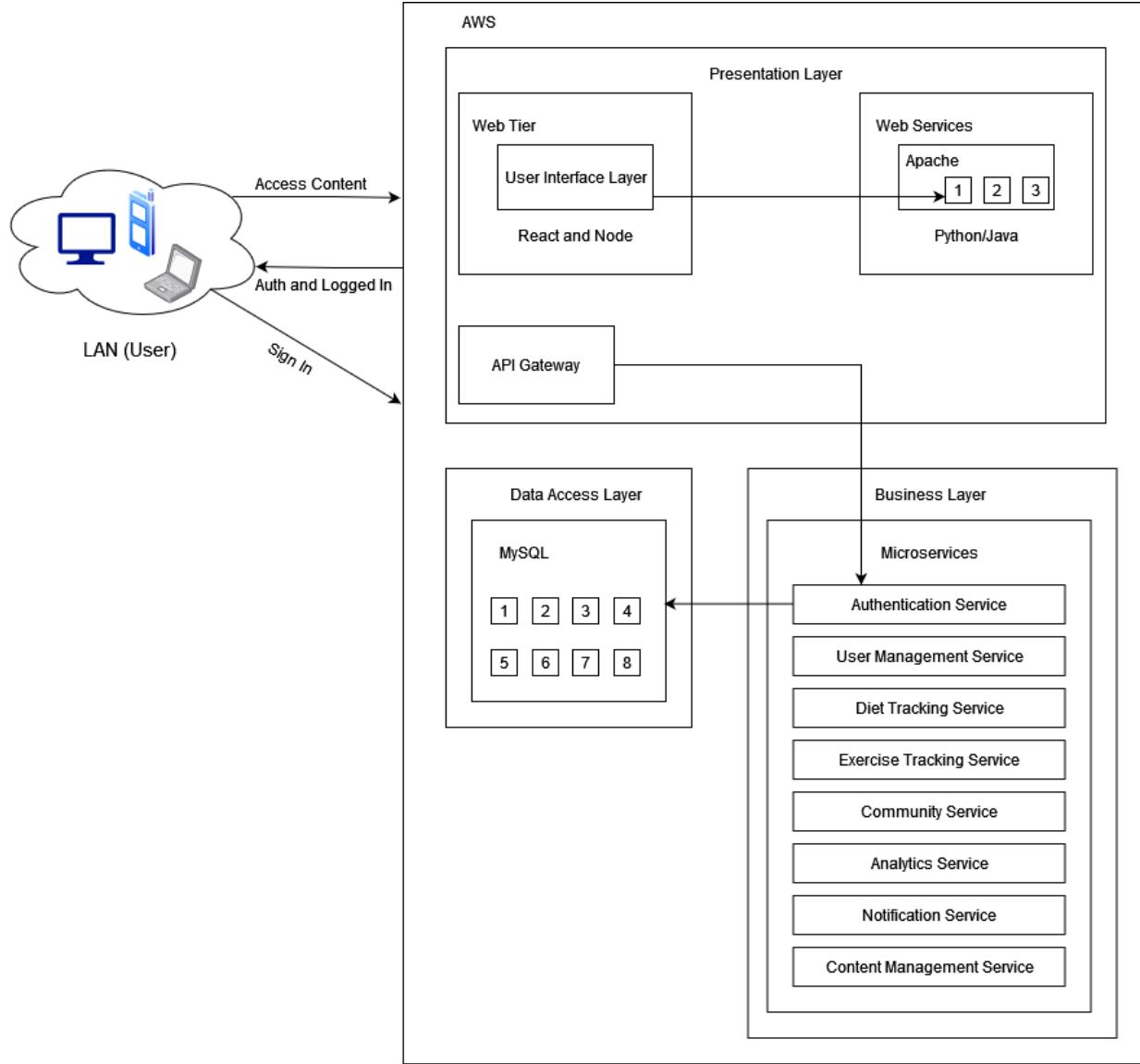


3. High-Level Diagrams

UML Class Diagram



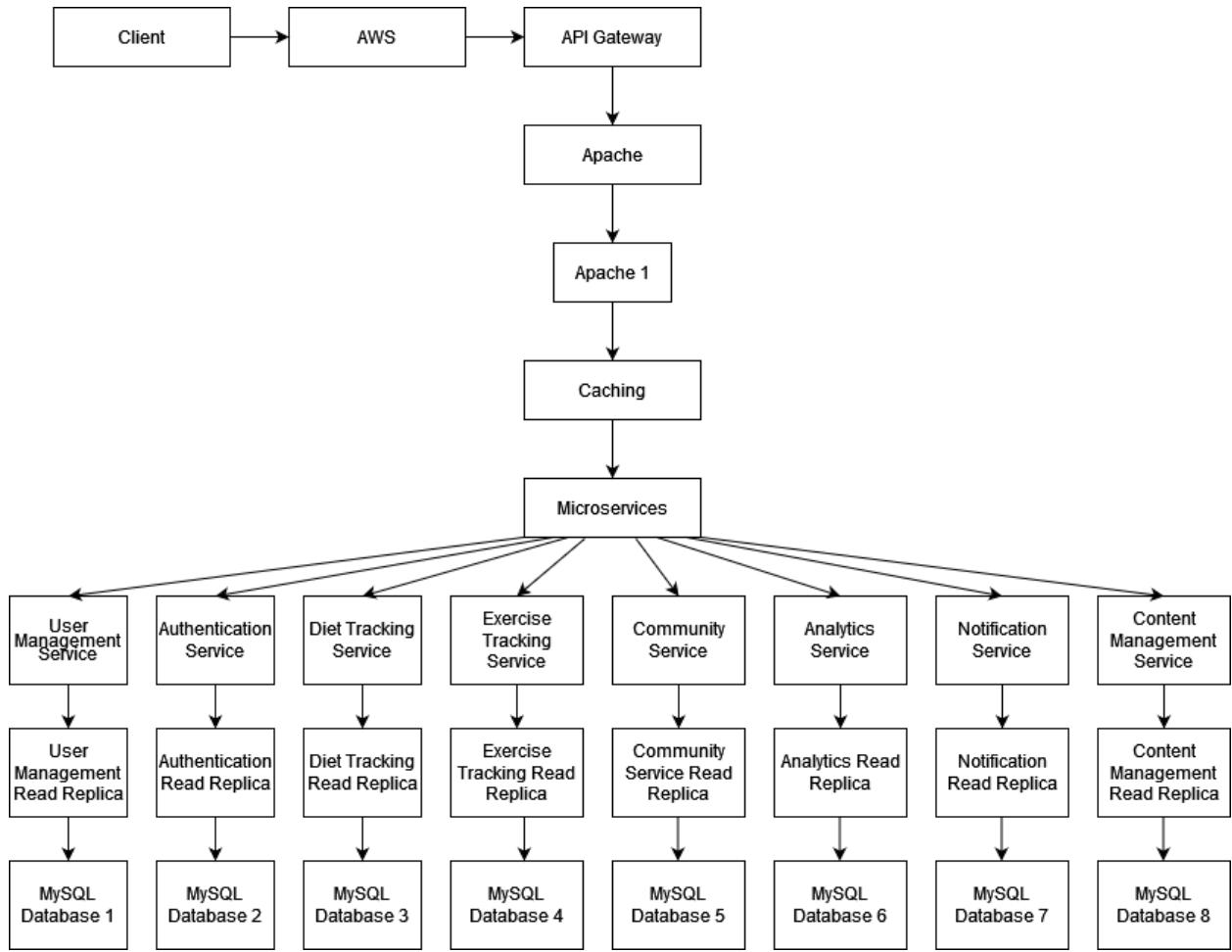
App Network and Deployment Design



Summary of Components:

The FitNutri site will make use of several microservices which include user management, authentication, diet, and exercise. Breaking down the services in this way will allow for easier maintenance and scaling. Load balancing will be handled using multiple servers and microservices so that servers will be able to distribute traffic as needed. Caching will be used to prevent prevalent requests from always needing server response. By caching user information and other important features, the load on servers will be reduced further. Database replication

will be used to increase reliability by allowing data to still be available even if the original server disconnects. Authentication will be handled using an API Gateway making it so that data is encrypted while it is transmitted



Summary of Design Patterns:

Of the various UML design patterns, three were specifically utilized because of their importance in reliability and consistency. First is the usage of the singleton pattern. This was important for making sure that there would not be multiple instances needed to perform their actions which reduces the overall resources required. Second is the factory pattern which allows for subclasses to create objects on their own. This is important for allowing the subclasses to make new objects as needed without having to rely on changing code. Third is the observer pattern which makes it

so that all states of an object stay updated. This allows the objects to always be in sync so there is more consistency when relaying data.

Horizontal prototype feedback

1. Resize the front end to work on all devices (phones, laptop, iPad, desktop)
2. make sure images show up.
3. make the home page more clear with a good hook and state what our website is about.
4. explain what the videos are for.
5. Make sure the user is forced to accept policies and terms before creating an account.
6. Include a link to policies and procedures for the user to look at.
7. The full name on the sign up page should not take up the whole screen. (Make sure everything is the same length)
8. Explain why the user has to create an account on the sign up page.
9. Make sure the user cannot input negative numbers.
10. Make sure the numbers make sense (example: goal weight should not be 1,000 pounds)
11. Make sure all the buttons work on the website.
12. Make sure the search bar is not misaligned and make sure the search bar is larger and more clear.
13. UI needs more work.

Wireframes:

14. After a user creates an account, the user has to get confirmation that they successfully created an account.
15. Make sure all the pages are linked properly.
16. Include arrows for the figma.
17. Make sure to follow the wireframes and make sure everything matches.
18. Make the whole website more clear and easy to use for users.
19. Why does the user have to click on start? Make sure the user can use the website easily.
20. Explain why we need the users health information and explain how we will protect all of their health information (user info is secure).

10. Detailed List of Contributions

NO.	Member	Contribution	Rating
1	Michelle Nguyen (Team Lead)	<ul style="list-style-type: none"> ● Set up documents, organized Notion for task management for M3V1. ● Grammar checked and cleaned document ● Reviewed all tasks of everyone every week ● Plan the meeting and next tasks in general to Discord. ● Set up Figma and worked on the wireframes for all pages by using Figma. ● Completed the detailed list of contributions section on the document. ● Pushed finish touches to application prototype. 	
2	Mitchell Caine	<ul style="list-style-type: none"> ● Worked together as a team for the functional requirements. ● Worked on the frontend prototype. ● Lead discussions on a final meeting about finishing touches to frontend organization. 	10
3	Shreejana Bartaula	<ul style="list-style-type: none"> ● Worked together with Nilo and John on the data definition. ● Lead and scribe the team discussion on the data definitions. ● Worked together as a team for the functional requirements. ● Joined every single meeting and gave excellent insights and collaboration. ● Worked on the front end of the prototype. ● Organized and gave insight into the priority functional requirements. ● Strong communication with others. 	10
4	Eduardo Enrique Muñoz Alvarez	<ul style="list-style-type: none"> ● Fixed the database architecture. ● Worked on instance issues from the M2 prototype. ● Took main responsibility for the instance and deployment app. ● Strong communication with others. ● Organized the database content and M3 documentation. 	10
5	Nilofar Ali	<ul style="list-style-type: none"> ● Worked together as a team for the functional requirements. ● Worked together with Shreejana and John on the data definition. ● Strong communication with others. 	10

		<ul style="list-style-type: none"> • Helped on Figma wireframes. • Implemented frontend for Milestone 3 prototype with Ali, Mitchell and Shreejana. 	
6	Uzair Hamed Mohammed	<ul style="list-style-type: none"> • Collaborated and helped work on instance issues from the M2 prototype. • Strong communication with others. • Implemented and improved the backend for the prototype. 	10
7	John Collins	<ul style="list-style-type: none"> • Worked on the data definitions with Shreejana and Nilofer • Implemented models for the backend based on the data definitions and entities 	10
8	Ali Hadwan	<ul style="list-style-type: none"> • Worked together as a team for the functional requirements. • Added finish touches to priority function; requirements. • Worked on the Figma design in collaboration with Nilo. • Implemented frontend for Milestone 3 prototype. • Strong communication with others. 	10
9	Ali A	N/A	0

Milestone 4 Version 2

SW Engineering CSC 648/848 Summer 24
Summer 2024

FitNutri Hub

Team 03

Student	Full Name	SFSU Email	Role
# 1	Michelle Nguyen	mnguyen62@sfsu.edu	Team-Lead
#2	Mitchell Caine	mcaine@sfsu.edu	Frontend-Lead
#3	Shreejana Bartaula	sbartaula@mail.sfsu.edu	Docs-editors and Frontend
#4	Ali Almusawi	aalmusawi@mail.sfsu.edu	
#5	Eduardo Enrique Muñoz Alvarez	emunozalvarez@sfsu.edu	Database-admin
#6	Nilofar Ali	nmohammadali@mail.sfsu.edu	Frontend-Lead
#7	Uzair Hamed Mohammed	umohammed@sfsu.edu	Backend
#8	John Collins	jcollins9@sfsu.edu	Backend
#9	Ali Hadwan	hadwanali41@gmail.com	Frontend

MILESTONE 4

Date: 07/25/2024

History Table

Milestone	Version	Date Submitted
Milestone 1	V1	6/19/24
Milestone 1	V2	7/8/2024
Milestone 2	V1	7/8/2024
Milestone 3	V1	7/24/2024
Milestone 3	V2	7/29/2024
Milestone 4	V1	7/29/2024
Milestone 4	v2	7/31/2024

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3. Product Summary

FitNutri is a platform where fitness meets nutrition. What does that mean and what do we provide? Our platform is dedicated to enhancing your health and wellness journey. Unlike conventional fitness apps, FitNutri integrates personalized workout plans and dietary guidance tailored to your individual goals and preferences. With our approach here at FitNutri, it will ensure that you will receive the support you need to achieve your fitness and nutrition objectives. We focus on user-centered design, providing an intuitive and engaging experience for every user. Whether you're a fitness enthusiast or a beginner, FitNutri accommodates all levels, allowing you to create a profile, track your progress, and stay motivated. Users can securely sign up, log in, and manage their accounts, ensuring a smooth and secure experience.

You may ask: How might we stand out from other applications? With FitNutri, we have personalized plans that generate customized nutrition and workout plans based on your health information and goals. Second, activity tracking monitors calories burned and steps taken throughout the day. Third, we have a library where we have access to a wide range of recipes, exercises, and educational resources. Fourth, we have a place for community engagement. You will be able to join live streaming and on-demand classes led by professional trainers. This way, you will feel a sense of motivation! Lastly, we have interactive features where users can share, edit, and print their fitness and nutrition progress, and engage with other users through posts and feedback. Unlike other “similar” fitness health applications, FitNutri combines real-time interaction with professional trainers and advanced algorithms to provide a personalized and motivating experience with these living streaming and on-demand classes. We help bring an interactive and supportive environment, making fitness accessible and enjoyable for everyone.

FitNutri is where our fitness goes with health and nutrition. Explore URL([FitNutri](#)) where you will have everything you need to gain that healthy lifestyle. Take the first step towards achieving your health and fitness goals!

Functional Requirements - Priority 1

1. User Account Management

- 1.1 A user shall securely sign up.
- 1.2 A user shall securely sign in.
- 1.3 A user should be able to create their profile (age, weight, height, fitness goals).
- 1.4 A user should be able to do password recovery/reset.
- 1.5 A user should be able to update their account.
- 1.6 A user should be able to delete their account.
- 1.7 Each user shall have exactly one account.
- 1.8 A user shall log into their account using secure authentication.
- 1.9 A user shall fill out one health information form.
- 1.10 A user shall be able to choose many types of nutrition
- 1.11 A user shall be able to choose many types of workouts
- 1.12 Users shall write many dietary restrictions
- 1.13 A user shall generate one personal nutrition plan
- 1.14 A user shall generate one personal workout plan
- 1.15 A user shall view many recipes
- 1.16 A user shall view many exercises
- 1.17 Users shall search for recipes and workouts using keywords.
- 1.18 Users shall be able to share, edit and print fitness and nutrition progress many times.

2. Account

- 2.1 An account shall belong to one user at most.
- 2.1 An account shall be associated with one email at most.

3. Tracking

- 3.1. A user shall be able to track their calories burned throughout their day.
- 3.2. A user shall be able to track their total steps throughout their day.

4. Health information

- 4.1 A health information shall be filled by one user
- 4.2 A health information shall contain many Types of Nutrition
- 4.3 A health information shall contain many Types of workout
- 4.3A health information shall contain one article based on a personal nutrition plan.
- 4.3 health information shall contain one article based on a personal fitness
- 4.4 Health information shall include user goals related to weight, fitness level, and dietary preferences

5. Types of Nutrition

- 5.1 A type of Nutrition shall be chosen by many users
- 5.2 A type of Nutrition shall contain one article

6. Types of Workout

- 6.1 A type of workout shall be chosen by many users
- 6.2 A type of workout shall contain one article

7. Exercises

- 7.1 An exercise shall include instructional videos and images
- 7.2 An exercise shall provide estimated calories burned

7.3 An exercise shall be viewed by many users

8. Recipe

8.1 A recipe shall consist of many dishes

8.2 A recipe shall be categorized by diet type (ex., keto, vegan)

8.3 A recipe shall be viewed by many users

8.4 A recipe shall include instructional videos and images

9. Personal nutrition plan

9.1 A personal nutrition plan shall be generated by many users

9.2 A personal nutrition plan shall be shared by many users

10. Personal fitness plan

10.1 A personal workout plan shall be generated by many users

10.2 A personal workout plan shall be shared by many users

11. Dietary Restrictions

11.1 A Dietary Restrictions shall be written by many users

12. Assess

12.1 An assess shall be generated by many users

13. Form

13.1 A form shall be submitted by one users

13.2 A form shall be categorized by topic (ex., nutrition, workouts, achievements)

13.3 A form shall allow users to request support or submit feedback directly to the service team

14. Post

14.1 shall be liked by many users

14.2 Posts can be categorized by topic (Ex, nutrition, workouts, achievements)

15. Article

15.1 An article shall contain one type of nutrition

15.2 An article shall contain one type of workout

16. Nutrition progress

16.1 Nutrition progress shall be editable by one user

16.2 Nutrition progress shall display food intake(ex., breakfast, lunch ,dinner), micros and vitamins to one user

17. Fitness progress

Fitness progress shall be editable by one user

Fitness progress shall display activity(ex. number of workout, minutes and days of strike), weight, lb and achievements to one user

2. Usability Test Plan

Usability Test Procedure

1. A user should be able to fill in their health information
2. A user should be able to generate a nutrition plan
3. A user should be able to generate a workout plan
4. A user should be able to view a recipe
5. A user should be able to view a workout

Test for FitNutri

Filling in Health Information

- Objective:

The objective of this test is to check how usable filling health information is on our website. The test will involve finding how easy it is for users to fill out the health information section with prompts for what to fill out and if the overall experience of inputting their data is easy to accomplish.

The importance of inputting user data is because our website aims to create accurate suggestions for both exercise and recipes. Without being able to properly input this information, the user would not have a custom plan tailored to what they provided.

In testing this metric, our team is able to properly assess the usability of this function in order to create their custom workout and recipe plans so that they are happy with the regimen given to them and so it will be more effective in helping them do what the website was designed to do.

- Description:

System Setup - The setup assumes that the user is on the web page and been directed to the health information page.

Starting Point - The user will be on the health information page and directed to the top most textbox of the page.

Intended Users - People who wish to manage their health and get custom plans to manage it.

URL - <http://13.57.220.69/HealthInfo>

Measurement - Amount of time to fill out health information, if the user is able to enter information incorrectly, and user happiness while filling out the form.

Generating a Nutrition Plan

- Objective:

The purpose of this test is to find out how accurate the plan generation is. This will show the process of how accurate a plan will be after entering in health information.

Creating a personal plan is one of the cornerstones of the FitNutri application. By tailoring recommendations to our users, we are able to provide a means of reaching the health goals users are looking for. The test will find any problems with generating a plan which could be caused by difficult navigation or unclear instructions.

In measuring the time it takes to generate the plan, the users' understanding of what is happening, and the satisfaction of the plan given, we are able to address the needs of our users and help them achieve the goals they set out to do.

- Description:

System Setup - Health information has already been input by the user.

Starting Point - The user moves to and presses the generate plan button.

Intended Users - Users who have input their health information and who want a custom Personal nutrition plan.

URL - <http://13.57.220.69/HealthInfo>

Measurement - Time from button press until the plan is generated and happiness with the generated plan

Generate a Workout Plan

- Objective:

We are doing this test in order to check the usability of the workout plan generation. This test will attempt to figure how easily a user will create a workout plan after inputting their health data. We wish to understand how intuitive the interface is, the ease of use, and user experience.

Being able to have custom workouts generated for our users will help them reach the specific goals they want to achieve. By testing against this case, we will identify any problems with generating a workout plan which might be caused by unintuitive steps or slow processing times.

The overall goal is to make sure users can properly generate a workout plan which is made based on their preferences. The test will watch for any errors when generating a plan, the time it takes to generate, and how happy the user is with the generated plan.

- Description:

System Setup - Health information has already been input by the user.

Starting Point - The user moves to and presses the generate plan button.

Intended Users - Users who have input their health information and who want a custom nutrition plan.

URL - <http://13.57.220.69/PersonalWorkouts>

Measurement - Time from button press until the plan is generated and happiness with the generated plan.

View a Recipe

- Objective:

For this test, we are testing the experience of viewing the recipe page. The focus will be on how easy it is for users to access recipes and understand how to use them. The clarity of the instructions as well as finding recipes will be key.

Viewing recipes is an imperative aspect of our website because it is part of the custom nutrition plan generated during sign up. We aim to find problems users might run into when navigating to and interacting with the page.

Our test will determine if users are able to find recipes and view them. The recipes should be easy to follow and meet their dietary needs. The test will measure how long it takes to find a recipe, the ease of following the recipe, and how the user feels about the navigation and viewing experience.

- Description:

System Setup - The website has a list of recipes ready.

Starting Point - The user will start on the recipes section and select a recipe to view.

Intended Users - Users who wish to pair their workouts with nutrition which helps with their goals.

URL - <http://13.57.220.69/PersonalRecipes>

Measurement - Amount of time to find and view a recipe, ease of understanding recipe instructions, and user happiness with the experience.

View a Workout

- Objective:

This test will be understanding how usable the workout page is. We will be testing how easy it will be for users to access the workout routines and understand how to do them.

The ease of navigation and instructions will be the focus of this test.

Being able to find and use the workout routine is one of the most important aspects of our website. We plan to identify any problems which might cause problems preventing them from access to the workouts they need. The issues include difficulty getting to the workout page and understanding the workout routine.

The goal is to make sure users are able to view and understand their routines so that they may follow along. We will be measuring the time it takes to navigate to the workouts, the effectiveness of reading the workout, and how happy the user is from viewing the workout.

- Description:

System Setup - The website has a list of workouts ready.

Starting Point - The user will start on the workouts section and select a workout to view.

Intended Users - Users who wish to pair their nutrition with workouts which helps with their goal.

URL - <http://13.57.220.69/PersonalWorkouts>

Measurement - Amount of time to find and view a workout, ease of understanding workout instructions, and user happiness with the experience.

Usability Test Table (Effectiveness & Efficiency)

Test/Use Case	% Completed	Errors	Time	Comments	Satisfaction (Likert Questionnaire)
1 Filling in Health Information	100%	None	00:54:19	height requested is in ft	<p>1. The process of creating an account was straightforward and easy to follow. AGREE</p> <p>2. I found the health profile questions to be relevant and comprehensive. AGREE</p> <p>3. I felt confident that my personal</p>

					health information was secure during the account creation process. <u>AGREE</u>
<u>2</u> Generating a Nutrition Plan	100%	None	00:50:00	Choose from drop menu, easy access	<p>1. The nutrition plan generated by the app meets my dietary needs and preferences.</p> <p><u>AGREE</u></p> <p>2. I found the nutrition plan easy to understand and follow.</p> <p><u>AGREE</u></p> <p>3. The app provided sufficient variety in the nutrition plans offered.</p> <p><u>AGREE</u></p>
<u>3</u> Generate a Workout Plan	100%	None		Also, drop menu which is convenience	1. The workout plan generated by the app aligns with my fitness

					<p>goals.</p> <p><u>AGREE</u></p> <p>2. I found the workout plan to be appropriately challenging for my fitness level.</p> <p><u>AGREE</u></p> <p>3. The app provided clear instructions and demonstrations for the exercises given in the workout plan.</p> <p><u>AGREE</u></p>
4 View a Recipe	100%	None	00:30:00	Easy to understand navigation, but lacks variety.	<p>1. The recipe has easy to follow instructions.</p> <p><u>AGREE</u></p> <p>2. The recipe matched the personal nutrition plan provided.</p> <p><u>AGREE</u></p> <p>3. The recipe has macros or vitamins and</p>

					minerals. <u>DISAGR</u> <u>EE</u>
<u>5</u> View a Workout	100%	None	00:22:00	Easy to navigate and pictures related to the designated sections of the workout made it more appealing.	<ol style="list-style-type: none"> 1. Easy to understand the video exercise. <u>AGREE</u> 2. Breaking down the workout into simple sections makes the workout easy to understand <u>AGREE</u> 3. Able to navigate to a recipe for after the workout. <u>AGREE</u>

3. QA Test Plan :

1. Objective: Information related to the user such as their password, daily activity data (steps, average heart rate, etc..), recorded workout data shall be encrypted and appear unreadable without the decryption key.

HW/SW setup: AWS EC2 instance running Ubuntu and Apache Web Server. MySQL database paired with the MySQL workbench application. <http://13.57.220.69/>

No.	Test	Description	Test Input	Expected Output	Test Results
1	Fitness Data Encryption	Check database for successful encryption of user fitness data	Logged fitness data of user	Data appears encrypted in database	Pass
2	Workout Data Encryption	Check database for successful encryption of user workout data	Recorded workouts of user	Data appears encrypted in database	Pass
3	Activity Data Encryption	Check database for successful encryption of user activity data	Daily activity data of user	Data appears encrypted in database	Pass

2. Objective: The application shall load reasonably quickly regardless of what device form factor (phone, tablet, laptop, etc.) is being used to access the application.

HW/SW setup: Android device running Android 14 and using the Samsung Internet browser.

Windows 11 device using Firefox 128.0.3. <http://13.57.220.69/>

No.	Test	Description	Test Input	Expected Output	Test Results

1	Access dashboard on Android	Measure the amount of time it takes for a user's populated dashboard to load on an Android device	Various bits of data from a user's day, such as their steps, average heart rate, and calories burned	<2 seconds	Pass
2	Access dashboard on Windows	Measure the amount of time it takes for a user's populated dashboard to load on a Windows device	Various bits of data from a user's day, such as their steps, average heart rate, and calories burned	<2 seconds	Pass
3	Access workout summary on Android	Measure the amount of time it takes for the summary of a single recorded workout to load on an Android device	Data collected during a user's workout, such as their step count and heart rate, combined with calculated data such as calories burned, displayed in a neat summary	<4 seconds	Pass

3. Objective: The application should have a 99.9% uptime and always be available to the user, except during times of scheduled maintenance.

HW/SW setup: AWS EC2 instance running Ubuntu and Apache Web Server. Server has 16 GB RAM at disposal. <http://13.57.220.69/>

No.	Test	Description	Test Input	Expected Output	Test Results
1	Android access test during midday	Users, especially office workers, tend to take a lunch break and go for a walk. The result is a large group of users recording activities. An Android device shall attempt to access the application during these hours	Activity data collected from users	Application loads successfully	Pass
2	Android access test during early morning hours	Early morning hours see low levels of users recording workouts. An Android device shall attempt to access the application during these hours	Activity data collected from users	Application loads successfully	Pass
3	Linux access test during evening hours	Evening hours see moderate to high levels of user activity. A Linux	Activity data collected from users	Application loads successfully	Pass

		device shall attempt to access the application during these hours			
--	--	---	--	--	--

4. Objective: User Interface

5.7 The user interface shall be visually appealing and customizable to enhance user engagement and satisfaction.

HW/SW setup: AWS EC2 instance running Ubuntu and Apache Web Server. Server has 16 GB RAM at disposal. <http://13.57.220.69/>

No.	Test	Description	Test Input	Expected Output	Test Results
1	Appealing test visual	Look at the aesthetic quality of the user interface.	Visual inspection	Interface should be visually	Pass (Chrome)
2	Customization Options	Test the availability and functionality of customization options.	Modify UI settings such as theme layouts.	Users can/should customize the interface easily.	Pass (Firefox)
3	Consistency Test	Navigate through a different page	Navigate through pages	Pages should have a consistent design and layout.	Pass (Safari)

5. Objective: User Interface

The application shall have an FAQ for customers to answer their own questions.

HW/SW setup: AWS EC2 instance running Ubuntu and Apache Web Server. Server has 16 GB RAM at disposal. <http://13.57.220.69/>

No.	Test	Description	Test Input	Expected Output	Test Results
1	FAQ Availability test	FAQ should be able to be accessible from the main menu.	Navigate to the FAQ section from the main menu.	FAQ section should be easily accessible from the main menu.	PASS
2	FAQ Content test	This section should contain a review for the content of the FAQ section.	Review the content of the FAQ section.	It should be accurate, helpful and comprehensive answers.	PASS
3	FAQ Search	Use search functionality within FAQ	User search functionality within FAQ.	Search should return relevant results based on the query.	PASS

4. Code Review

They need a better layout/design of their application. Compared to our team03, we chose the MVC design pattern for the backend, and thanks to it, our files are very organized and easy to find. We are not sure how javascript projects work, but it looks like they dumped everything in one file.

Email Exchange:

 Michelle Nguyen
To:  Sabrina Diaz-Erazo

 UsersController.java 2 KB  Progress.js 15 KB

2 attachments (17 KB)

Hello Sabrina,

Hi Team 4,

I will be conducting your team's external code review.

Attached, you will find the file that our team would like your team to review. Please review our code for the back and front end. The files should be called: "progress.js" and "UserController.java".

We appreciate your time and effort in reviewing our code. Your feedback is valuable to us, and we look forward to your constructive comments.

Best,
Michelle
Team03

CSC 648: External Code Review for M4

Sabrina Diaz-Erazo
To: Michelle Nguyen

[Reply](#) [Reply all](#) [Forward](#) [Print](#) [...
Sun 7/28/2024 3:57 PM](#)

[ae0421c6-97c4-42ff-aa39-8c...](#) 57 KB [recipeRoutes_BE.txt](#) 15 KB

2 attachments (72 KB) [Save all to OneDrive - San Francisco State University](#) [Download all](#)

Hello Michelle,

My name is Sabrina (from Team 4) and I will be conducting your team's external code review. I have attached the file that our team would like for your team to review to this email (I had to change the extension from .js to .txt since outlook wouldn't let me send it). I have also included a document outlining the coding and design conventions we followed.

Best,
Sabrina Diaz-Erazo
GitHub Master
Team 4

[Attach a file](#) [Received, thank you.](#) [Thank you!](#)

[Reply](#) [Forward](#)

Feedback

Michelle Nguyen
To: Sabrina Diaz-Erazo
Cc: Uzair Hamed Mohammed

[Reply](#) [Reply all](#) [Forward](#) [Print](#) [...
Mon 7/29/2024 11:20 PM](#)

Hello Sabrina,

Our team (Uzair and I) reviewed your code that you gave us and here are some feedback we saw in your code. You all need a better layout/design of your application. For example we chose the MVC design pattern for the backend, and thanks to it, our files are very organized and easy to find. We are not sure how javascript projects work, but it looks like you all dumped everything in one file?

Additionally...

- 1. 1. Avoid hardcoding credentials in the code.
- 2. 2. Use environment variables or a secure vault to manage sensitive information
- 3. 3. The error message in the res.status(400).json response should be more user-friendly and avoid exposing internal error codes directly to the user. Consider logging the detailed error internally and providing a generic message to the user
- 4. 4. The comments are helpful, but ensure they are up-to-date and accurate. The comment about IS_LOGGED_IN is unclear without additional context.

I hope we were able to help you review your code. Let us know (Uzair and I) if you have any concerns or questions.

Best,
Michelle & Uzair
Team03

[Reply](#) [Reply all](#) [Forward](#)

```
const connection = mysql.createPool({
  host: 'csc648database.cfgu0ky6ydzi.us-east-2.rds.amazonaws.com',
```

```

    user:      'backend_lead',
    password: 'password',
    database: 'ScholarEats'
});
```

Avoid hardcoding credentials in the code. Use environment variables or a secure vault to manage sensitive information

```

if (userUniversityInfo == 0) { // No user info
    return res.status(400).json({ error: 'There was an error
retreving user data. Please try again later. Error code: RR_BE:47' }) // // Error code references which line tripped
}

const userUniversity = userUniversityInfo[0].university; // // User's university

// Find the user's university ID from the univeristy name
const universityIdQuery = `SELECT university_id FROM
university WHERE name = ?`;
const [universityIdInfo] = await
connection.execute(universityIdQuery, [userUniversity]);

if (universityIdInfo === 0) {
```

The error message in the res.status(400).json response should be more user-friendly and avoid exposing internal error codes directly to the user. Consider logging the detailed error internally and providing a generic message to the user.

```

/*
* Reserve a recipe and send a notification to the admin of the university
* MERGED FROM reserveRecipeButton_BE.js, since this file is already
* hooked up to the individual recipes page.
*/
```

```
router.post('/:id', IS_LOGGED_IN, async (req, res) => {
  try {
    const recipeId = req.params.id; // Recipe ID
    debugMsg(recipeId);
```

The comments are helpful, but ensure they are up-to-date and accurate. The comment about IS_LOGGED_IN is unclear without additional context.

5. Self Check on Best Practices for Security

5.1: Protected Assets:

- 5.1.1: User password
- 5.1.2: User vitals data
- 5.1.3: User daily activity data
- 5.1.4: User workout data
- 5.1.5: User personalized recipes
- 5.1.6: User nutrition plan
- 5.1.7: User height, weight, gender, and medical conditions

5.2: Password Encryption in Database: When a new user is created or an existing user's password is updated, the password is encoded using a **PasswordEncoder** before being saved to the database. Additionally, during the login process, the provided password is compared with the stored encoded password using the **PasswordEncoder** object's **matches** method. As the name suggests, this method checks if the provided password, when encoded, matches the stored encoded password.

```
@Configuration
@EnableWebSecurity
public class SecurityConfig {

    @Uzair Mohammed
    @Bean
    public PasswordEncoder passwordEncoder() {
        return new BCryptPasswordEncoder();
    }
}
```

```
@Uzair Mohammed *
@PostMapping("/createUser")
public ResponseEntity<User> addUser(@Valid @RequestBody User user){
    user.setPassword(passwordEncoder.encode(user.getPassword()));
    return ResponseEntity.ok(userService.createUser(user));
}

new *
@PostMapping("/updateUser/{id}")
public ResponseEntity<User> updateUser(@PathVariable Long id, @Valid @RequestBody User userData){
    userData.setPassword(passwordEncoder.encode(userData.getPassword()));
    return ResponseEntity.ok(userService.updateUser(id, userData));
}
```

```
@Uzair Mohammed
@PostMapping("/login")
public ResponseEntity<?> loginUser(@RequestBody LoginRequest loginRequest){
    User user = userService.findByEmail(loginRequest.getEmail());
    if(user != null && passwordEncoder.matches(loginRequest.getPassword(), user.getPassword())){
        return ResponseEntity.ok().body("User authenticated successfully");
    }else{
        return ResponseEntity.status(HttpStatus.UNAUTHORIZED).body("Invalid email or password");
    }
}
```

5.3: Input Data Validation: User input is validated using Hibernate Validator, which is integrated with Spring Boot. Hibernate makes available annotations such as `@NotNull`, `@Size`, and `@Email` as defined by the JSR-303/JSR-380 APIs. These annotations ensure that the input data

meets the specified criteria before it is processed or stored. Provided below is an example of validation in the User model and controllers.

```

    @NotNull
    @Size(min = 1, max = 50)
    private String first_name;

3 usages
@Size(min = 1, max = 50)
private String last_name;

3 usages
@NotNull
@Email
private String email;

```

👤 Uzair Mohammed *

```

@PostMapping(@PostMapping("/createUser"))
public ResponseEntity<User> addUser(@Valid @RequestBody User user){
    user.setPassword(passwordEncoder.encode(user.getPassword()));
    return ResponseEntity.ok(userService.createUser(user));
}

```

6. Self Check: Adherence to Original Non-Functional Specs

1. User Information

- 1.1. The application shall have data encrypted and saved to the database. **DONE**
- 1.2 Data in the application must be encrypted and stored in the database. **DONE**
- 1.2 The login process of the Application System requires Two-factor authentication.
ISSUE: We have not reached this part of the prototype to implement this feature.
- 1.3 The app must guarantee the privacy of user data by following laws like GDPR and CCPA.

ISSUE: We cannot find any engines to be able to implement to the system to stick to the GDPR and CCPA regulations, well there are engines but it is a bit difficult to install them and figured it would be best to skip this portion of the document.

- 1.4 The app will allow customers to see, change, and remove their personal information while following privacy laws.

ISSUE: We have not been able to reach this part of the prototype to be able to do this.

1.5 The app will allow customers to keep their information private. **DONE**

2. Application Database

- 2.1. The application System should perform regular data backups. **ON TRACK**
- 2.2. The application shall log customers' activity. **DONE**
- 2.3. The database should support high availability and automatic failover to ensure continuous operation. **DONE**
- 2.4. The application shall provide data recovery procedures in case of data loss or corruption. **DONE**
- 2.5. The database shall be optimized for both read and write operations to ensure quick access and storage of user data. **DONE**
- 2.6. The database shall be designed to handle a growing volume of data as the user base increases. **DONE**

3. Performance

- 3.1. Application response time should load the App within 3 seconds. **DONE**
- 3.2. Application Systems should maintain detailed logs of application usage, errors, and security events to support troubleshooting and improve system reliability. **DONE**
- 3.3. The system should have a 99.9% uptime, excluding scheduled maintenance. **DONE**
- 3.4. The system should implement caching strategies to reduce load on the database and improve response times. **DONE**
- 3.5. The application should support concurrent usage by a large number of customers without significant performance degradation. **DONE**
- 3.6. The application shall be stress-tested to ensure it can handle peak loads and high traffic periods. **DONE**
- 3.7. The application shall be designed to handle an expected load of up to 1 million users concurrently. **DONE**

4. Notifications

- 4.1. The application should implement robust error handling and user-friendly error messages to ensure the user experience is minimally impacted during failures. **DONE**
- 4.2. The application shall send timely notifications to customers for important events, such as reminders for workouts, meal plans, or health tips. **ON TRACK**
- 4.3. The notification system should be configurable to allow customers to choose their preferred notification methods (e.g., push notifications, emails, SMS). **ON TRACK**
- 4.4. The application shall support localization of notifications to cater to customers in different regions and languages. ISSUE: As mentioned earlier in an earlier issue, we have not been able to reach this part of the prototype to initialize something like this.

5. User Interface

5.1. The application shall ensure responsiveness and an intuitive user interface that works seamlessly across various devices and screen sizes. **DONE**

5.2. The application should be designed to scale horizontally to accommodate increasing user loads without significant changes to the underlying architecture. **DONE**

5.3. The application shall have an FAQ for customers to answer their own questions. **ON TRACK**

5.4. The application shall include a helpdesk or support ticketing system to handle user inquiries and issues effectively.

ISSUE: As a team we realized this was unobtainable and decided to leave this for last and see if we are able to implement this as there were more important issues to deal with.

5.5. The application shall be built using a modular architecture to facilitate easier updates and maintenance. **DONE**

5.6. The application shall adhere to accessibility standards to ensure it is usable by people with disabilities.

ISSUE: As a group we also realized that implementing features for the disabled would take up a lot of our time and decided to leave this for last as well and if we were able to get to it we would implement it.

5.7. The user interface shall be visually appealing and customizable to enhance user engagement and satisfaction. **DONE**

6. Security

6.1. The application shall conduct regular security audits and vulnerability assessments to identify and mitigate potential security risks. **DONE**

6.4. The application shall enforce strong password policies, including complexity requirements and regular password updates. **DONE**

7. Compatibility

7.1. The application shall be compatible with the latest versions of major operating systems, including iOS and Android.

ISSUE: Too much of our time is being spent on creating the prototype, we are not going to be able to create a application for the website

7.2. The application shall be tested across a variety of devices and browsers to ensure compatibility and optimal performance. **DONE**

7.3 The application shall support the latest versions of major web browsers, including Chrome, Firefox, Safari, and Edge. **DONE**

7.4 The application shall support major desktop operating systems, including Windows, macOS, and Linux, ensuring functionality across different environments. **DONE**

7.5 The application shall be designed to leverage OS-specific features and optimizations, such as widgets on iOS and Android, to enhance the user experience.

ISSUE: Too much of our time is being spent on creating the prototype, we are not going to be able to create a application for the website

7.6 The application shall provide seamless updates through app stores (Apple App Store, Google Play Store) and support for over-the-air updates to ensure users always have the latest version.

ISSUE: Too much of our time is being spent on creating the prototype, we are not going to be able to create a application for the website

8. Maintainability

8.1. The application shall be developed using clean code principles and best practices to facilitate easy maintenance. **DONE**

8.2. The application shall include comprehensive documentation for developers, including API documentation, user guides, and troubleshooting guides. **DONE**

8.3. The application shall use version control for source code management to track changes and facilitate collaboration among developers. **ON TRACK**

9. Localization

9.1. The application shall support multiple languages and regional settings, allowing customers to select their preferred language and units of measurement.

ISSUE: We have been focusing our attention mostly on getting the prototype up and running and focusing on the main issues of the prototype, we hope to implement this by the next milestone.

9.2. The application shall provide localized content, including region-specific health tips, dietary recommendations, and exercise guidelines. **DONE**

9.3. The application shall adjust time zones automatically based on the user's location to ensure the accuracy of logs and reminders. **DONE**

10. Regulatory Compliance

10.1. The application shall comply with all relevant local, national, and international laws and regulations concerning health, fitness, and nutrition data. **DONE**

10.2. The application shall provide clear and accessible terms and conditions, including a privacy policy, which customers must accept before using the app. **ON TRACK**

11. Storage

11.1 The application shall provide scalable storage solutions to accommodate increasing amounts of user data. **DONE**

11.2 The application shall use data compression techniques to optimize storage usage and improve performance. **DONE**

11.3 The application shall ensure data integrity and prevent data loss through robust storage management practices. **DONE**

12. Fault tolerance

12.1 The application shall include mechanisms to detect, report, and recover from software and hardware failures with minimal impact on the user experience.

ISSUE: We were not able to implement an engine to automate the report process for software and hardware failures.

12.2 The application architecture shall support redundancy to ensure service continuity in case of component failures. **DONE**

12.3 The application shall include automated failover processes to switch to backup systems in case of primary system failure.

ISSUE: Creating and finding a way to do this while not using too much storage is a bit difficult, time consuming and also costly. Unsure if we will be able to proceed with this.

10. Detailed List of Contributions

NO.	Member	Contribution	Rating
1	Michelle Nguyen (Team Lead)	<ul style="list-style-type: none"> ● Wrote the product summary for FitNutri. ● Help create and push the nutrition page for the prototype. ● Shared and created the M4 Doc. ● Organized, edited, and assigned tasks for the milestone. ● Collaborated with Ali H to edit the document and go over the code. ● Code review with team 4. ● Worked with Uzair to fix the QA testing. ● Asked family and friends to test the application. 	
2	Mitchell Caine	<ul style="list-style-type: none"> ● Lead discussion for what needs to be done for the prototype. ● Set up dates and meetings for the prototype. ● Helped troubleshoot back and front end. ● Worked with the frontend team to connect the backend to the frontend. 	10
3	Shreejana Bartaula	<ul style="list-style-type: none"> ● In meetings trying to fix the front-end frames. ● Update about page and added css. ● 2 full vegan recipe diet to implement for the front end. ● Updated workout frames content to Ali H. ● Found images for keto diet and workouts. ● QA test plan with Nilo. 	10
4	Eduardo Enrique Muñoz Alvarez	<ul style="list-style-type: none"> ● Troubleshoot the back and front end of the prototype. ● Implement controllers ● Worked with the frontend team to connect the backend to the frontend. ● Helped get the prototype going. ● Self Check: Adherence to Original 	10

		Non-Functional Specs	
5	Nilofar Ali	<ul style="list-style-type: none"> • Wrote the QA test plan with Shree. • Worked on frontend. • Added and pushed code to the prototype. • Collaborated with Shree on doc and prototype work. 	10
6	Uzair Hamed Mohammed	<ul style="list-style-type: none"> • Troubleshoot the back and front end of the prototype. • Implement controllers • Worked with the frontend team to connect the backend to the frontend. • Worked with team lead with QA testing. • Asked family and friends to test the application. • Worked with code review. 	10
7	John Collins	<ul style="list-style-type: none"> • Implement controllers • Worked with the frontend team to connect the backend to the frontend. • Helped troubleshoot back and front end. 	10
8	Ali Hadwan	<ul style="list-style-type: none"> • Troubleshoot the back and front end of the prototype. • Helped with the front end. • Lead the front-end discussions. • Worked on the front end. • Worked with the team lead to ensure the doc is ready to submit. • Code review making sure our code is efficient. • Helped and collaborated with the team lead to make sure we are on track. 	10
9	Ali A	N/A	0

4. Post Analysis - Lessons Learned

What a semester! As a team lead, I didn't expect the amount of tears and sweat to go into our application. We learned that summer classes are not for the weak lol. We had constant work coming our way and had to stay on top of things. In the beginning, I wanted to get on top of things. I made sure our document was well organized and that tasks were assigned accordingly. For milestone 1, I believe that everything went smoothly for the first couple of days. Tasks were fairly easy and simple. The problem was this was new for everyone. I don't think I have ever had a class that was very team based. I never even lead a team before! It was lot and we have been through A LOT. Especially for M3 and M4. I had problems with members of my team not communicating, being active, or even doing their tasks on time. It was frustrating in the beginning for me as the lead. I sent many complaints and all I could do was wait for things to get better and it did. I am very proud of my team, Team 3! With the growth and how far we have come. We solved many issues throughout the milestones. We learned how to create secure APIs with a popular Java framework (Spring Boot) and how to connect an application to a database instance for quick and secure access. At the end we learned how to work with another. It took a lot of sleepless to get our application to run and work. I believe we are a very start team because we had a lot of people contribute to something. As a lead, I would want to work with everyone who have taken our application seriously. We made A LOT of mistakes and one point I felt very discouraged and felt like we won't pull through. My team truly surprised me because without them we wouldn't have gotten far. Everyone used their knowledge to solve many problem and issues throughout the milestone. One mistake was that it was not a good idea to add unnecessary validation to items, because they can cause issues during testing and production. We got lots of feedback on our data definitions so we learned about writing proper data definitions which plays major role to ensure data consistency. Learned about clear specification of what functional and non-functional documents does. We learned how to deploy applications to a cloud instance like Amazon Web Services' EC2 and make access to the application public. Perhaps it would be a good idea to reimplement this in Rust, because currently Spring/Java/Gradle are a little too heavy for the server. We had to upgrade TWICE.

For the project, I think the start was a bit hectic because we lost a member and had 3 more added. This led to our tech stack needing to be changed and several members had to be caught up on the project. Too focused on the document than the prototype and we didn't really

start prototype until m3. It was hard to get people to work in the beginning, but towards the end people started working really hard and I think that is what caused us to stay up to make up for those days that we didn't focus on.

On a positive note, in Java, unit tests and integration tests are a godsend. The most I learned as a team lead was to be positive. There were moments where I showed a sign of weakness and latched out on my team. I believe now to never underestimate yourself because you're smarter than you think. We could've saved so much time if we weren't afraid of trying things a little recklessly. We had issues for the front end, a general .css pattern was not established and that led to some .css overwriting other .css files causing our horizontal prototype to look different than the wireframes we submitted. We also had a lack of understanding what the backend code was doing led to a significant amount of time being devoted to figuring out that the frontend code was not configured correctly for sign up. Being in a team, it was NOT a good idea to communicate with other subteams without having proper documentation. I probably caused more confusion when trying to explain things. Understanding the entirety of the milestone and breaking down even the smaller details in the beginning of working would have helped more towards organization and progression rather than a few larger tasks which seemed a bit more ambiguous. I believe that our group meeting to help each other on the tasks that were hard and long to do. What I feel I lacked on was dividing the task among the team because I chose the best people to work on certain things but also add more work on top for them. This caused burn out. I feel that everyone can contribute to something and that is the most important thing.

In conclusion, I believe that the BIGGEST lesson learned from this project is how important milestones are. We learned to not wait until the last minute. As team, we agree to give feedback to the grader. Getting feedback from milestones faster, even if during a weekend, would have made later milestones less stressful because the later milestones relied on that feedback from earlier milestones. There were moments of sleepless nights trying to connect issues. Didn't fix these problems in m1. I think part of that is because we got new people on our team after m1 that created problems because we had to change our tech stack.

5. Team Member Contributions

NO.	Member	Contribution	Rating
1	Michelle Nguyen (Team Lead)	<ul style="list-style-type: none"> - Helped with changes on the document. - Checked errors and grammar for the document. - Wrote the post analysis. - Communicative with team members through milestones. - Host meetings and lead group discussion for assigning tasks. - Provided an insight on how the data can be used when creating a functionality function that would correlate with the database. - Helpful when organizing and assigning tasks for the project. - Organized the documents for the team and the roles for everyone. - Made a comfortable working environment by creating breakout rooms for the team, so that way the team can progress without any problems. - Helped with understanding the diagram logic. 	
2	Mitchell Caine	<ul style="list-style-type: none"> - Helped finish the sign up page to make it more clean. - Did the CSS for the sign up prototype. - Host meetings and lead group discussion for assigning tasks during m4 and m5. - Provided an insight on how the data can be used when creating a functionality function that would correlate with the database, such as creating an object that will be attributed from the database. - Used a navigation method to provide specific information about recipes. - Spent a lot of time trying to research why the errors occur when trying to compile the program. 	10
3	Shreejana Bartaula	<ul style="list-style-type: none"> - Created the M5 document, organized, and finished parts that were assigned in M5. - Shared document with team lead. - Efficiently used the react library to embed a video onto a page. - Helped with the creation of the page that provides specific diet health information, such as keto, vegan, and personal workout plan. 	10

		<ul style="list-style-type: none"> - Created useful and creative prototype for the new page that was being worked on last night. 	
4	Eduardo Enrique Muñoz Alvarez	<ul style="list-style-type: none"> - Troubleshoot the errors we get from our prototype. - Troubleshoot the backend. - Dealt with the issue of back end. - The network was not cooperating with the backend team. Had to switch from different ports and tried to connect to the sign-up page using 'Post'. It was the sign-up page that we had to repeatedly debug the issue. - Changing port number wouldn't work, rather it was from the function itself. Spent time debugging the react library when trying to build the framework. I've had several problems trying to link the function with the data from the database, but ended up fixing everything. - Paid for us to get our application running! Thanks Eduardo! 	10
5	Nilofar Ali	<ul style="list-style-type: none"> - Created the M5 document, organized, and finished parts that were assigned in M5. - Took notes on our prototype feedback. - Worked on figuring out the dependencies and packages when trying to compile the program. - Created several UI designs that helped shape the website. The pages are creative and useful. It helps the user easily navigate to where they want to go. - Organized the structure of how the website is displayed. - Provided ideas that helped the backend team understand what functionalities to use. 	10
6	Uzair Hamed Mohammed	<ul style="list-style-type: none"> - Helped review our document before submission. - Troubleshoot the backend. - Provided useful information when trying to fetch calls. - Provides useful , recipe controller, APIs, and user controller APIs. - Worked on several backend issues with Eduardo as well. - Helped with understanding the 'POST' calls with Eduardo. Had to enter data manually at first, so the data can get parsed and picked up by one of the functionalities. 	10

7	John Collins	<ul style="list-style-type: none"> - Provided an insight on using the spring boot software to understand the perspective from a Linux point of view. This is because we need to start the server using 'Apache2'. - Talked about working on the services, repository, and controllers. - Made us realize that we need to debug the controller using the methods provided by a certain library. 	8
8	Ali Hadwan	<ul style="list-style-type: none"> - Helped review our document before submission. - Troubleshoot the backend. - Great front-end user. - Provided insight on how to add unique body elements when an event listener is called. - Helpful when trying to add pages, so that way the UI designs correlate with the frames. - Creative with the design of the website by trying to create a certain notification when a user tries to interact with a button. This would be relatable to the page that uses several health diet options. 	10
9	Ali A	Worthless team member.	0