

Project Report

AI Coach Application



Prepared For
Jamila Alamri
by
kholod althbeny 2110471
Ghadi Saeed 2215923
raghad alghamdi 2114852
ayah ibrahim alhazmi
2115144
Alya Omar 2010265

Table of content:

2.....	introduction / Aim.
3	Training coach interview.
4	Athlete interview
5	Interview analysis
9	Interview summary
10	purpose of the project
11	Preliminary report
13	cost and estimates
16	feasibility study
21	project plan
22	stockholder definition
23	context of the work
24	business event list
25	functional requirements
26	non-functional requirements
28	use case diagram
29	list of scenarios
32	sequence diagram
38	class diagram



Building an Ai personal trainer application

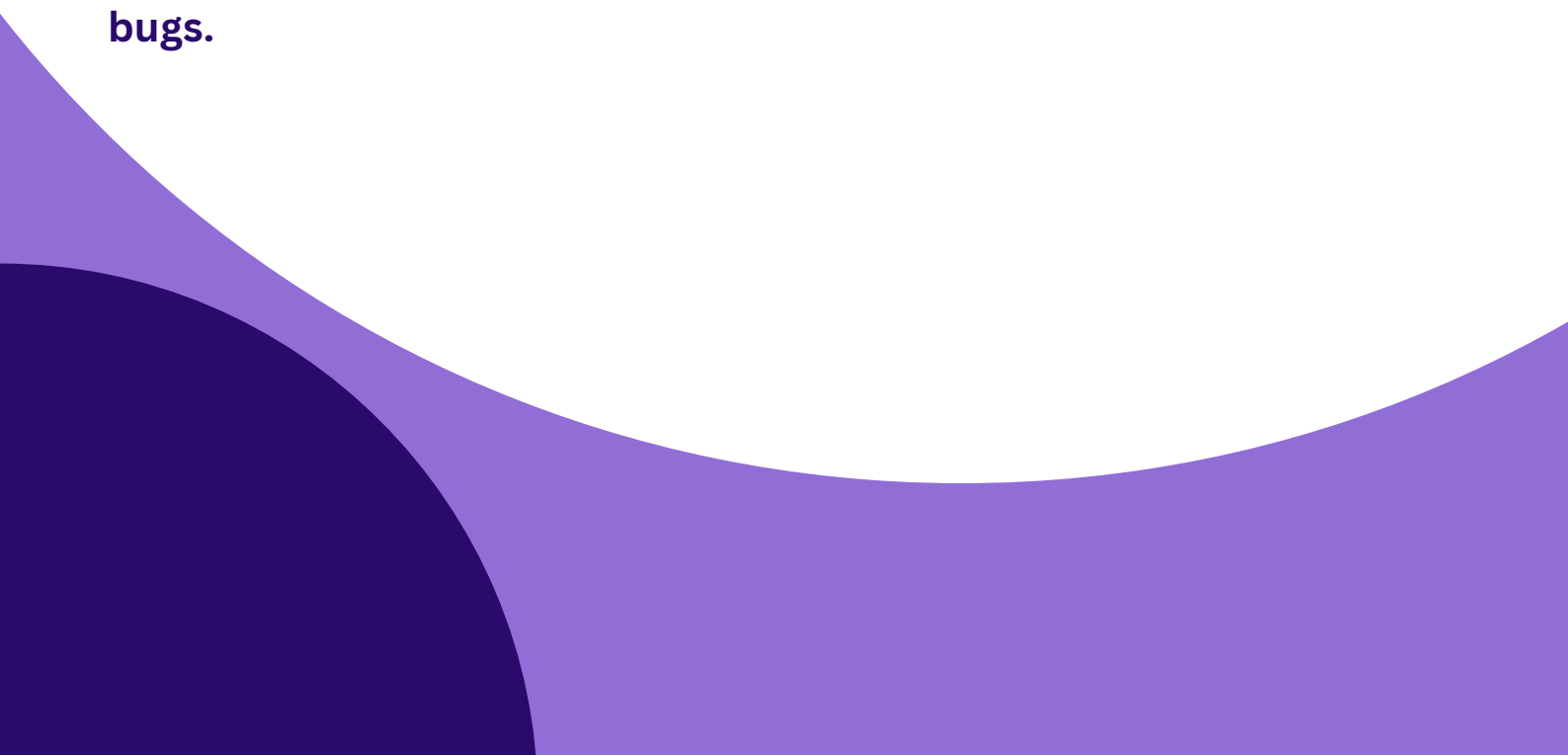
In the generation of the development of everything using technology and artificial intelligence, we must develop a program that allows all those who wants to communicate with a personal trainer easily to reach their goals, which is to lose weight, increase it or even maintain it.

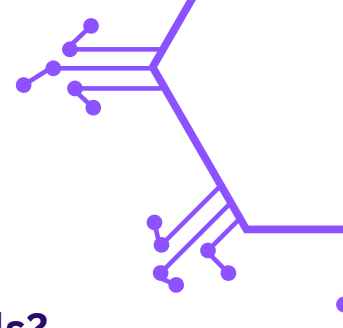
Ai personal trainer application is an application that helps users to lose or increase their weight accurately and healthily according to their body needs without compromising their health. It also helps those people who are unable to cost traditional personal training.

Interview Description

Aim:

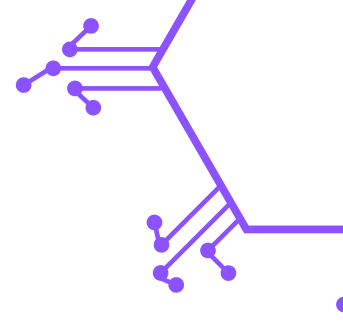
-The aim of this software engineering project is to train an AI app that enhances software testing and quality assurance processes. The performance of the trained AI app will be evaluated based on its ability to accurately identify and prioritize critical software bugs.





Training Coach interview:

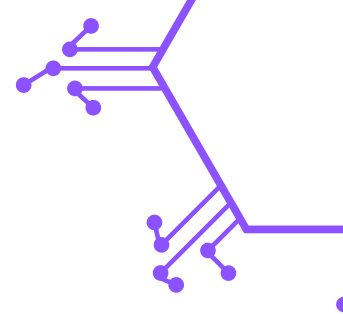
- 1- Can you explain the process of onboarding new clients?
How do you help them get started and set appropriate goals?**
- 2- How do you stay up-to-date with the latest coaching methodologies and practices?**
- 3- How do you maintains a positive and supportive coaching environment for clients throughout the journey?
Can you suggest any techniques?**
- 4- How could deal with client injuries?**
- 5- Have you previously conducted training sessions?**
- 6- Do you have experience with creating customized training content tailored to the needs of the client?**
- 7- How do you handle client feedback and suggestions for improvement?**
- 8- Is your training certification up to date?**
- 9- What challenges or obstacles do you encountered?**
- 10- Can you share any success stories or memorable moments from your previous training experiences?**



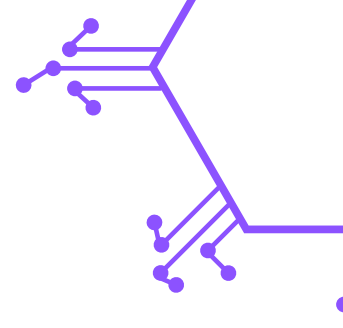
Athletic interview:

- 1- Do you warm up before starting your workout?
- 2- How do you rate yourself in commitment?
- 3- what is the timeframe you expect to achieve your goal?
- 4- How do you typically approach learning new concepts or acquiring new skills?
- 5- What specific skills or knowledge do you hope to gain?
- 6- How important is it for you to have access to personalized feedback and guidance throughout your training?
- 7- Do you prefer group classes or one-on-one training sessions?
- 8- Are there any specific areas of your body or muscle groups that you would like to prioritize or focus on in your fitness training program?
- 9- Are you tracking your heart rate during your workout?
- 10- Do you prefer the online training rather the traditional training way?

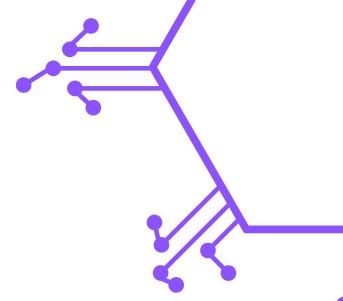
Interview Analysis



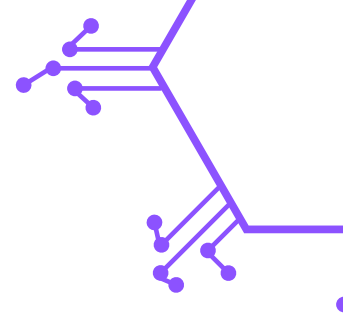
Interviewer	Interviewee	Analyst Comment
Ghadi Saeed	Qamar, coach training, 8/9/2023	<ul style="list-style-type: none">- The interviewee discusses the importance of a multifaceted approach to attracting clients, mentioning factors such as experience, training, results, reputation, and marketing. They also mention the need to reconcile a client's specific goals with what is realistic and suitable for their body and health status.- The interviewee mentions staying current through their academy, social media, and real-life client experiences.
	Mohammed, athlete, 9/9/2023	<ul style="list-style-type: none">- The interviewee acknowledges the importance of warming up before a workout, showing an understanding of the necessity of preparing the body for physical activity.- The interviewee rates their commitment to fitness as 10/10, expressing a strong passion for sports and fitness since childhood. This high level of commitment suggests they are likely dedicated to their fitness goals.- The interviewee expresses a continuous approach to goal-setting in fitness, indicating that they do not set specific timeframes for achieving goals but view fitness as an ongoing journey of improvement.



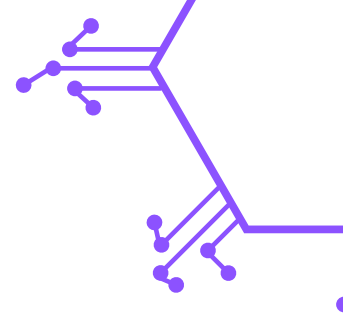
Interviewer	Interviewee	Analyst Comment
Alya Omar	Lamar, coach training, 1/9/2023	<ul style="list-style-type: none">- The interviewee shares a success story about a client achieving their weight loss and muscle gain goals within the agreed timeframe.- the interviewee demonstrates knowledge of fitness training principles, safety considerations, and the importance of adapting training to individual client needs. They also appear receptive to client feedback and continuous learning, which are positive qualities for a fitness trainer
	Qusai, athlete, 2/9/2023	<ul style="list-style-type: none">- The interviewee emphasizes trusting the process and being committed to learning, implying a patient and persistent attitude toward acquiring new skills and knowledge.- The interviewee aims to gain a comprehensive understanding of how the human body works in fitness, particularly in training and nutrition. They also express a desire to help others develop skills and a love for sports, emphasizing a holistic approach to fitness education.



Kholod Mabrouk	<p>Raoeih Alzahrani, coach training,10/9/2023</p> <p>Amal Alsubaie, athlete, 9/9/2023</p>	<ul style="list-style-type: none">- Focusing on attracting clients by offering factors such as experience marketing results.- Training requires being knowledge about basic skills, have experience with techniques- Gathering information to make clients diet plan and exercise schedule fit their goals a good period.- gathering information about clients' medical conditions to avoid injuries- Offering a positive and supportive environment by encouraging them, give them advice to develop themselves so they can achieve their goals- Importance of setting goals and warming your body and mind before the workout
Raghad alghamdi	<p>Dunia, coach training,5/9/2023</p> <p>Dareen, athlete, 6/9/2023</p>	<p>- The interviewee describes creating a positive environment through active listening, encouragement, addressing concerns, and motivating clients. They also acknowledge the psychological impact of training and its role in motivation. Dealing with Client Injuries.</p> <p>- The interview discusses Online vs. Traditional Training: The interviewee is currently engaged in online training due to the location of their coach but expresses a preference for traditional in-person training if given the choice. This indicates a preference for the physical presence and interaction inherent in traditional training methods.</p>



Interviewer	Interviewee	Analyst Comment
Ayah Alhazmi	Hatem, coach training,1/9/2023	<ul style="list-style-type: none">- The coach emphasized attracting clients through experience, reputation, and marketing in the training field. He mentioned staying informed through academics and social media based on his client experiences. Psychological support and client well-being were underscored. He welcomed client input and confirmed his certification's validity. He also mentioned field challenges and shared a client success story.
	Anas, athlete, 2/9/2023	<ul style="list-style-type: none">- The trainee emphasizes the importance of warming up before exercise and commits well to his goals by setting a specific time frame, showing planning and future thinking. Personal guidance and customized nutrition are important to him, indicating his desire to improve his performance and health individually



Interview Summary

The interviews inform the development of an AI training app. Key insights include onboarding, goal setting, positive coaching environment, injury management, and client feedback. Individualization, staying updated, and passion for fitness are emphasized.

The app should prioritize user-friendly onboarding, goal-setting features, positive coaching, injury prevention, and incorporating client feedback. Personalization, continuous learning, progress tracking, and access to experienced coaches are essential for the app's success.

The purpose of the project

a. The User Business or Background of the Project Effort Content

AI training coach is an application to train people's with goals to achieve, whether it is losing weight, gain weight or gain muscle. the user can have their own diet program and exercise plan based on their needs also they can count calories. they will have full attention in their journey so they can have recommendations to develop themselves, advices when they need, encouragement to continue.

Motivation

You can keep your workout with your flexible and smart coach at any time, anywhere and at the lowest cost. Get ready to achieve the best version of yourself.

Considerations

Individuals who live in areas far from cities face difficulty in accessing gyms, and some gyms have a very high cost for the incomer individual, especially if there is a coach dedicated to you, our program will solve the problem of this distance and cost

b. Goals of the Project

AI coach applications aim to make fitness and nutrition guidance readily available to individuals who are looking to improve their health and wellness. By leveraging AI technology, these applications offer a personalized approach to fitness and nutrition, helping users achieve their goals in a way that suits their lifestyle.

Preliminary report

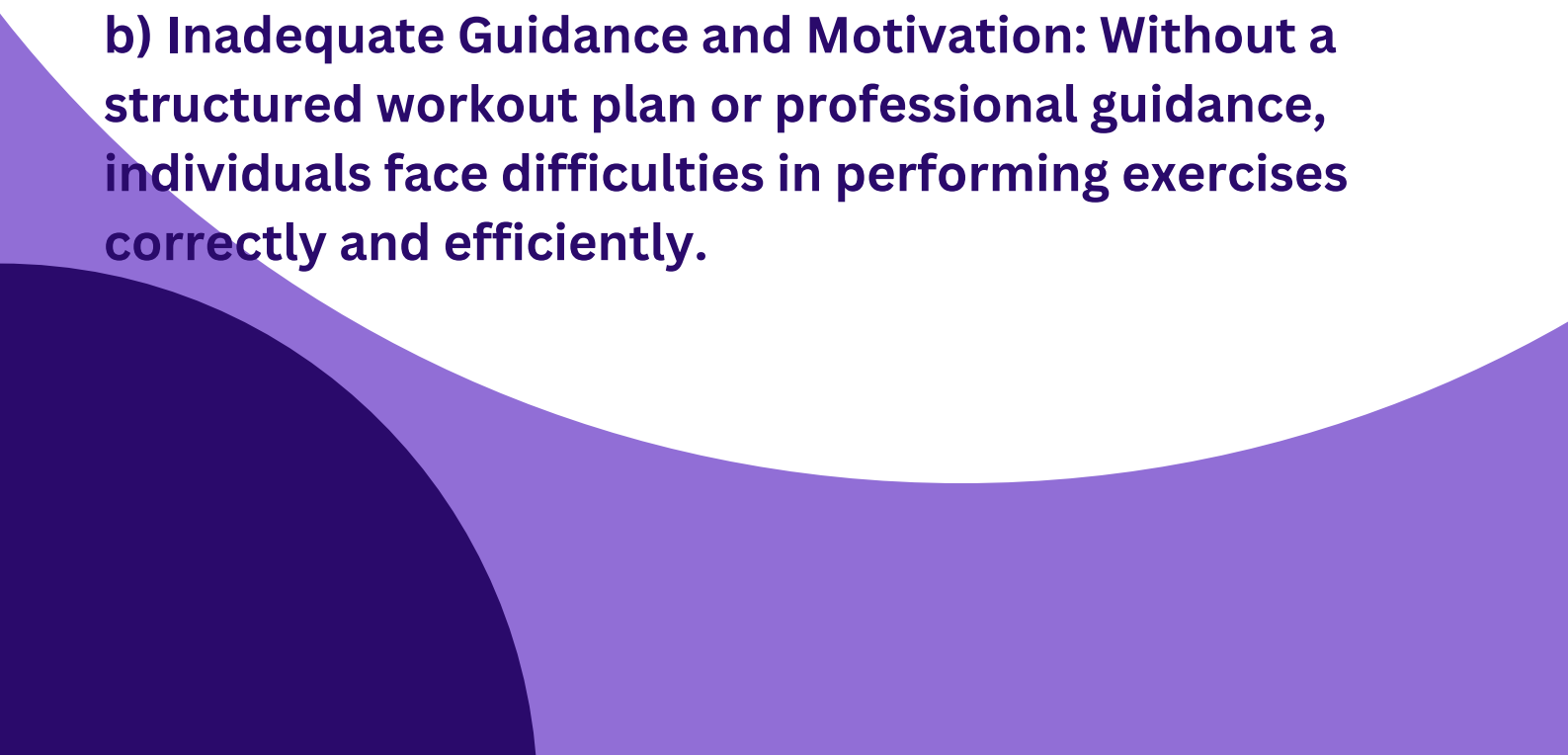


The problem:

The current system fails to provide an effective solution for remote fitness training, limiting accessibility and exercise variety. This leads to decreased physical fitness and engagement, increasing the likelihood of routine abandonment. An accessible and engaging remote fitness solution is needed to address these challenges and provide personalized guidance and motivation.

Findings:

Upon further examination, the following problems in the current system have been identified:

- a) **Accessibility Challenges:** Many individuals encounter obstacles in accessing traditional gym or fitness center settings due to factors like distance, time constraints, or physical limitations.
 - b) **Inadequate Guidance and Motivation:** Without a structured workout plan or professional guidance, individuals face difficulties in performing exercises correctly and efficiently.
- 

Recommendation or proposed solution:

One possible solution to address the mentioned problems is the development of a mobile application powered by artificial intelligence (AI) that enables individuals to engage in workouts anytime and anywhere. The app would offer the following features:

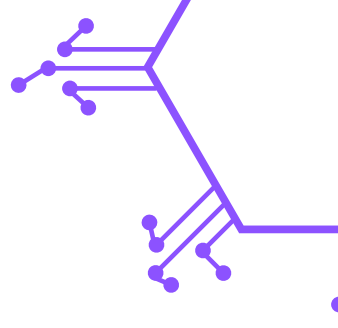
1. Personalized workout plans: The app would generate customized workout plans based on users' specific goals, fitness levels, and equipment availability. Users would receive detailed instructions for each exercise to ensure they perform them correctly and safely.

2. Interactive virtual training: Using advanced AI technology, the app would provide interactive virtual training sessions. Users could follow along with virtual trainers who would demonstrate exercises and offer real-time feedback, helping users improve their technique and performance.

3. The app tracks users' progress, including workout duration, repetitions, and intensity.

It provides personalized feedback and motivational messages to keep users engaged and committed.

4. Workout location flexibility: The app allows users to choose their preferred workout locations, including home, outdoors, or a gym. This flexibility caters to individual preferences and circumstances for a personalized fitness experience.



Cost & schedule estimates:

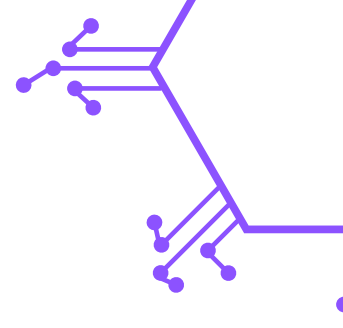
The cost and schedule estimates for developing the AI training app will depend on various factors, such as the app's complexity, required features, and development resources. A detailed analysis and consultation with development experts would be necessary to provide accurate cost and schedule estimates for the project. And this will costs approximately around 260,00\$.

Project Estimated Cost

Resources	Estimated cost
Hardware	100\$ per month or 1000\$.
Data Training data / data storage	100\$ per month or 1000\$
Model development / labor costs	100\$ per month or 50\$
User interface (UI) and user experiment (UX)	1000\$ or it can cost more based on complexity and features.
Security Security measures / compliance cost	100\$ per month or 1000\$ per month and more
Maintenance and updates.	100\$ per month.
Marketing	Based on marketing strategy 1500\$ <u>ore</u> more.
Insurance / Legal services	Liability insurance. 1000\$ or more.

It's challenging to provide an exact estimated cost because it depends on various factors, including the complexity of your AI model, the size of your user base, and the specific features you want to offer.

Project Estimated Schedule:



Tasks	Estimated duration	Start date	End date
- Define project scope, objectives	1 day	Sun 1/10/24	Sun 1/10/24
- Define project preliminary - Secure core resources	2 day	Mon 2/10/24	<u>Tue</u> 3/10/24
- Research and implement AI algorithms for generating workout plans.	10 days	Wed 4/10/24	Fri 13/10/24
- Analysis / software requirements	8 days	Sat 14/10/24	Sat 21/10/24
- Develop features for personalized meal plans and dietary recommendations.	9 days	Sun 22/10/24	Mon 30/10/24
- Establish a preliminary budget	3 days	Tus 31/10/24	Thu 2/11/24
- Design	15 days	Fri 3/11/24	Thu 16/11/24
- develop functional specification	7 days	3/11/24	9/11/24
- review functional specification	4 days	9/11/24	12/11/24
- incorporate feedback into functional specifications	4 days	12/11/24	16/11/24

Feasibility study

Problem Definifon :

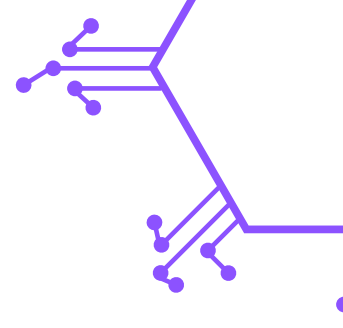
The traditional way to training become expensive and boring and waste a lot of time. AI coach applications also strive to provide an easy way to train people at the lowest cost possible. By leveraging technology, these applications can offer accessible and affordable solutions that can be used anywhere and at any time like an online workouts and diet plans based on individual needs and goals. This convenience allows users to receive guidance and support without the constraints of location or expensive personal training fees. AI coach applications make fitness and nutrition guidance readily available to individuals seeking to improve their health and wellness.

3 -Scope Objectives of AI coach training:

The AI training coach program is designed to help individuals achieve their fitness goals, whether it's weight loss, muscle gain, or weight gain.

Our program distinguished by letting users :

- 1-Personalize their diet and exercise plans to suit their needs
- 2-Track calories intake
- 3-receive personalized recommendations
- 4-get advice when necessary
- 5-stay motivated throughout their fitness journey with our encouragement.



4- Alternative Solutions:

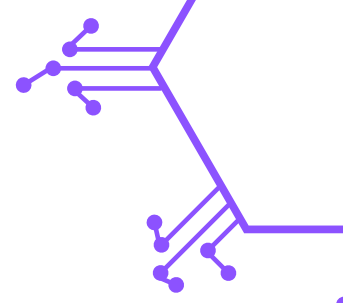
1. Fitness Apps: Many mobile apps, like MyFitnessPal and Nike Training Club, offer workout plans and coaching using AI-driven algorithms but they don't match the level of customization and interactivity we're looking for.

2- Wearable Fitness Tech: Devices like Fitbit and Apple Watch track your workouts and provide real-time feedback and coaching but they limit ability for specific systems.

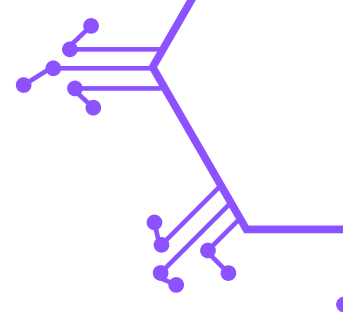
3- Online Videos: Platforms like YouTube have a vast library of workout videos with virtual trainers and coaches but you can't choose the time you want because they offer the classes in specific time.

5 -Cost And Benefits of Alternative :

Cost category	Discreption	Estimated cost
Development and IT Costs	Expenses related to platform/app development and IT infrastructure.	\$500,000
Content Creation	Costs associated with creating a diverse library of workout routines and videos.	\$100,000
Marketing and Promotion	Expenses for marketing the platform and acquiring users.	\$150,000
Personnel	Hiring certified fitness trainers and AI developers for platform support.	\$200,00
Maintenance and Updates	Ongoing costs for server maintenance, software updates, and content expansion.	\$50,000 per year.
Accessibility Features	Implementing features for accessibility compliance.	\$20,000
Customer Support	Providing customer support for users.	\$30,000 per year.
Total Costs		\$1,050,000



- **Subscription Revenue:** By offering a subscription-based model, you can generate recurring revenue from users who subscribe to access the platform's premium features. Over time, this steady stream of income can significantly outweigh the initial development costs.
- **User Growth and Retention:** An engaging and accessible platform is likely to attract more users and encourage them to stick with their fitness routines. Higher user retention rates can lead to more consistent subscription revenue.
- **Upselling Opportunities:** You can introduce additional revenue streams by offering premium services or merchandise through the platform. For example, selling fitness equipment, supplements, or personalized coaching sessions.
- **Reduced Operational Costs:** As the platform matures, some operational costs, such as marketing and user acquisition expenses, may decrease relative to the revenue generated, resulting in improved profit margins.
- **Data Monetization:** Over time, you can analyze user data (while maintaining privacy compliance) to gain insights into fitness trends and user behavior. This data can be valuable to third-party companies or advertisers, creating additional revenue opportunities.
- **Brand Partnerships:** As your platform gains popularity, you can explore partnerships with fitness brands or influencers, which can bring in sponsorship deals or collaborations further boosting revenue.



6 -Software Impacts:

Our program is different from the rest of the gyms, channels and applications in that it is characterised by accuracy and accurate monitoring through your data, and this therefore reflects its impact on the speed of your development and performance.

7 -Potential Changes in the Organization :

Users will be encouraged to start preserving their bodies because they find it easy to deal with the application at anytime and anywhere at the lowest cost and with good motivation.

8-Recommended Alternative of the Course of Action:

YouTube is the most effective option and a very rich platform with great experiences that will benefit the user in developing his body effectively.

Project plan

Using MS Project show your plan to achieve your software project.

Specify:

- Task list
- Resource names

Useful link for MS Project (<https://youtu.be/rWxUX2So-H4>) Example





Stockholder Definition

1 The Client

Sport organisations like Nike, ministry of sports.

The Customer

Athletes, sportsman, gymnastic.

2 Other Stakeholder


- 1- Coach's whose give us information about the workouts and exercises plan.:
- 2- Athlete's whose information records in the system and analysis.:
- 3- sport organisations whose infested in the application.
- 4- Data scientists whos collect and analyse trainer data.
- 5- Developers whose responsible for building and maintaining the AI app.

The scope of the work

1 -The Current Situation

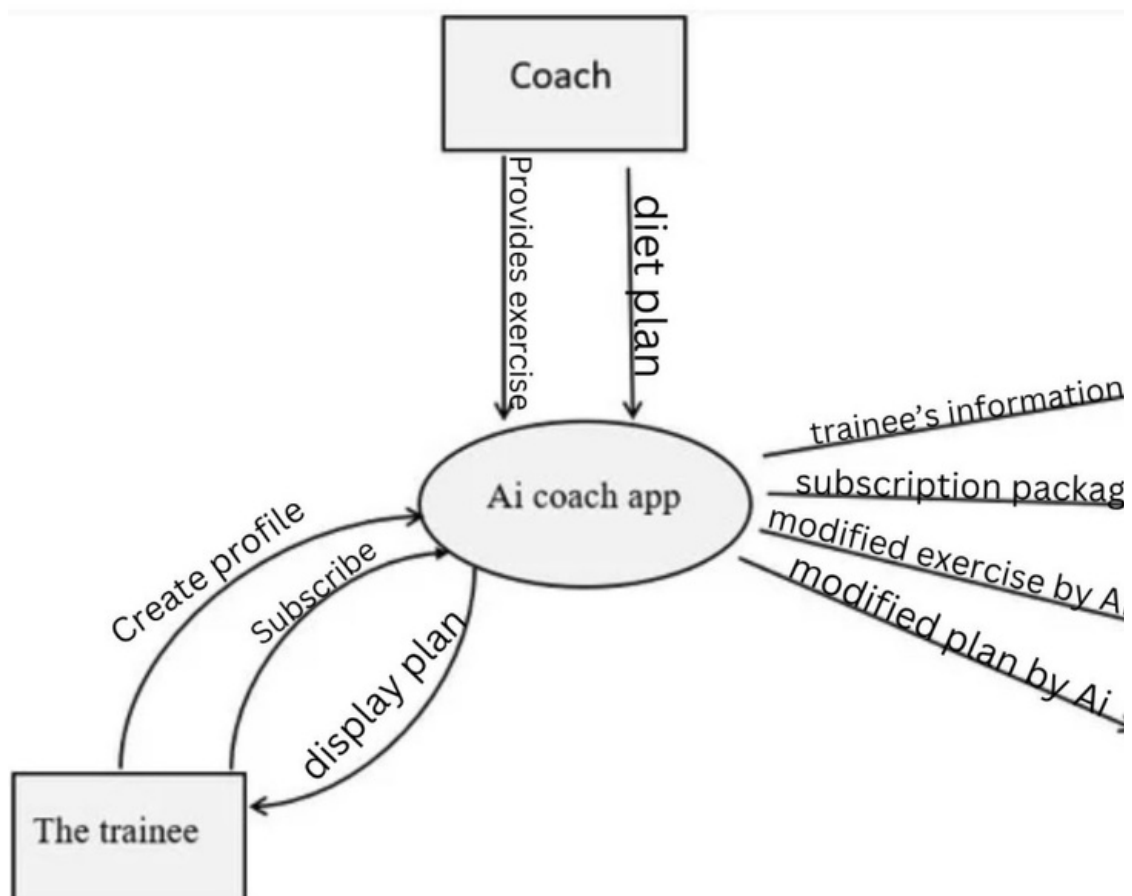
The traditional way to training become expensive and boring and waste a lot of time.

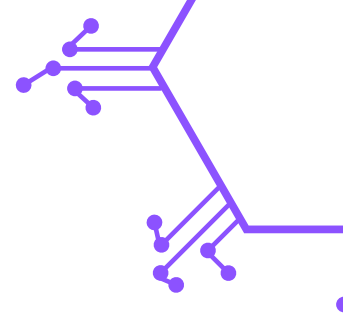
Our application AI training coach is an application to train people's with goals to achieve, whether it is losing weight, gain weight or gain muscle. the user can have their own diet program and exercise plan based on their needs also they can count calories. they will have full attention in their journey so they can have recommendations to develop themselves, advices when they need, encouragement to continue.



The Context of the Work

Context Diagram





Business Event List

Event Name	Input and Output	Summary
1-Trainer's Information	Information (Out)	Learn about personal information And goals
2- subscribe package	Subscribers package (out)	Provide additional features for The subscribers.
3. Display the plan	Display plan (Out)	Display the plan based on Trainer answers.
4. Diet plans	Diet plans (in)	provides different diet plans
5. Provides exercises	Provide exercises (in)	provides different exercise plans
6. Create profile	Create profile (in)	create trainer profile to put his information
7. Modified exercises by AI	Exercise by AI (out)	exercises based on trainer preference
8. Modified diet plans by AI	Diet plans by AI (out)	modified diet plan based on trainer preference
9. Subscribe	Subscribe (in)	subscribe to additional features with cheap price

Functional requirements:

- The trainee must log in into the application.
- The coach should create and send diet plan that he made to the application.
- The application turns the diet plan into an AI plan.
- The application presents the diet plan to the trainee.
- The coach should send his experience to the application.
- The user should be able to choose what language the mobile application should be English, Arabic Spanish and French.
- The app should provide a trainee registration feature that allows trainee to create accounts with unique usernames and passwords
- The app should provide functionalities for dataset organization, including creating trainee plans, editing, and deleting datasets.
- The app should update the metrics and visualizations dynamically, allowing users to track the progress of the training and make informed decisions based on the observed trends.
- The app should initiate the training process using the selected model and dataset
- The application should provide efficient and effective customer support or assistance
- The app should be able to communicate with the user through text or voice-based interfaces.
- The application should automate and streamline repetitive processes and tasks.
- The app should be able to provide detailed demonstrations and explanations of various exercises to ensure that the user performs them correctly and safely.
- The app should be able to provide real-time feedback and guidance during workouts to ensure that the user maintains proper form and technique.
- Trainee should be able to update their profiles as needed
- The application should track trainee progress by recording fitness metrics, changes in health parameters, and achievements.
- The application shall allow trainee to provide feedback and ratings on coaching recommendations, exercises, and recipes to improve the AI coach's performance.
- The application should Provide detailed instructions, videos, or animations demonstrating proper exercise techniques to ensure trainee safety and effectiveness.
- The application shall employ machine learning algorithms to continually adapt recommendations and guidance based on trainees feedback.

Non- functional requirements:

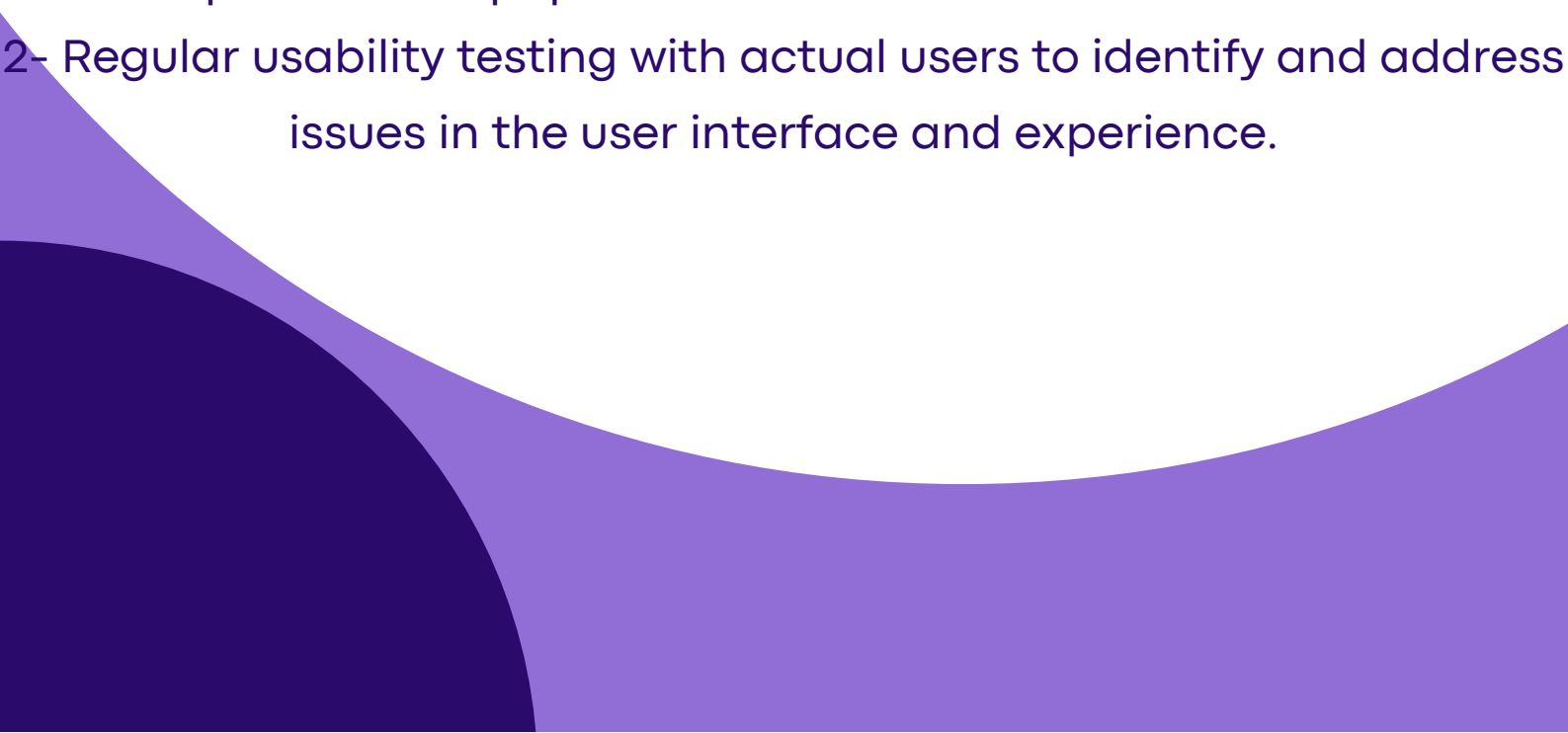


- 1- The application must respond to user queries within 2 seconds to provide a seamless user experience.
- 2- The application able to support at least 10,000 concurrent users without significant degradation in performance.
- 3- A user who already identify their needs and goals should be able to view their deit and exercises plans within 10 seconds.

Security:

- 1- The application shall apply password protection scheme for the accounts
- 2- The application Adhere to ISO 27001 standards for information security.
- 3- The application provides the two -factor authentication feature.

Usability:

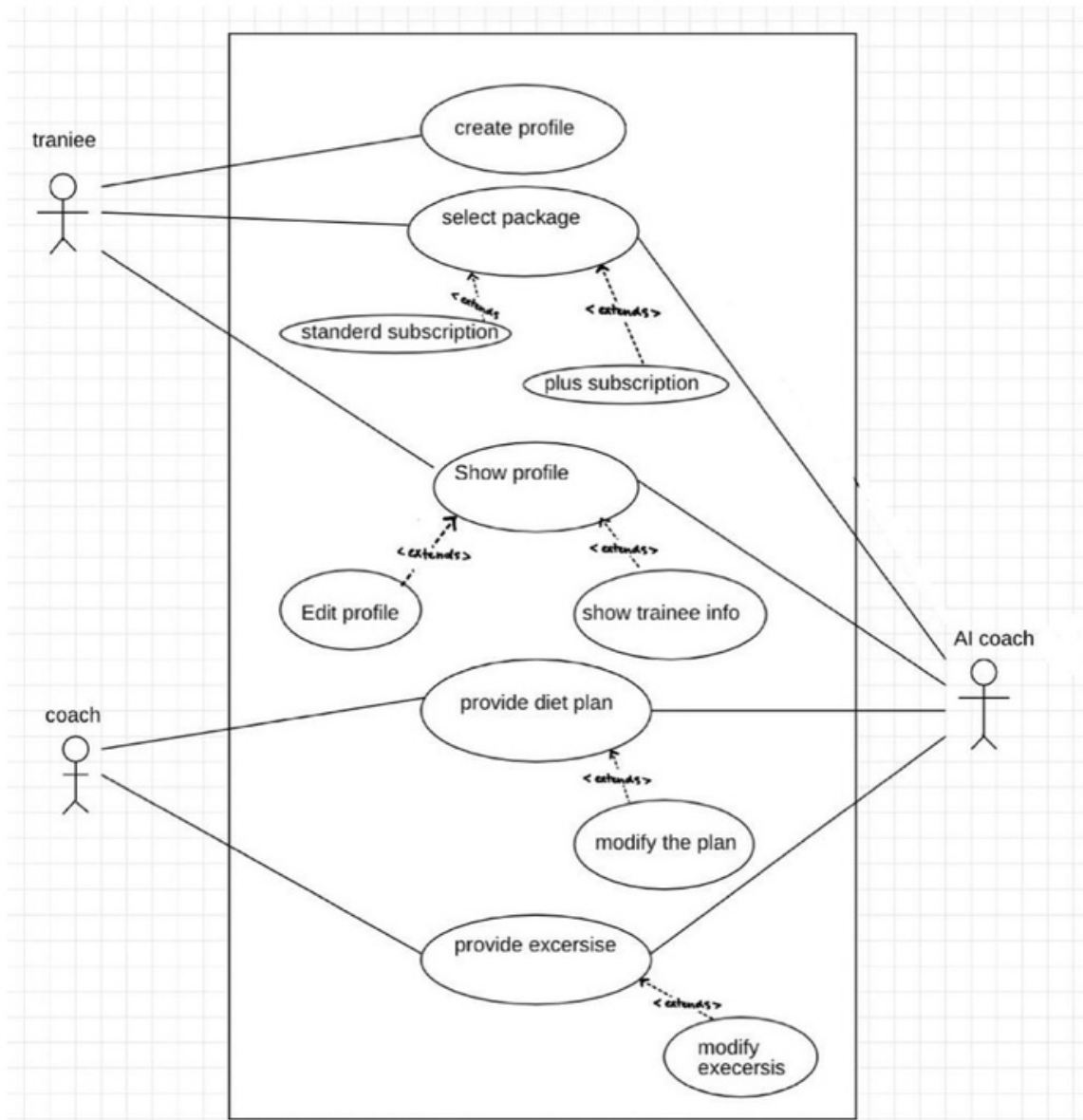
- 1- The application provides user interface intuitive, responsive, and compatible with popular web browsers and mobile devices.
 - 2- Regular usability testing with actual users to identify and address issues in the user interface and experience.
- 

Non-Functional requirements:

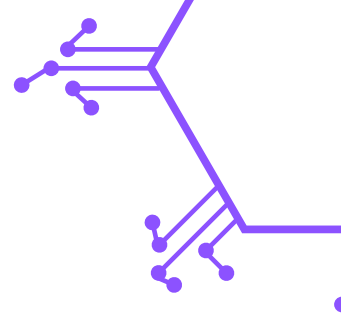
Availability:

- 1- The application available 99.9% of the time, allowing for a maximum of 8.76 hours of downtime per year.
- 2- The application should support localization for different regions, including language and cultural adaptation.
- 3- The Down time after a failure shall not exceed 2 hours.

Use case diagram :

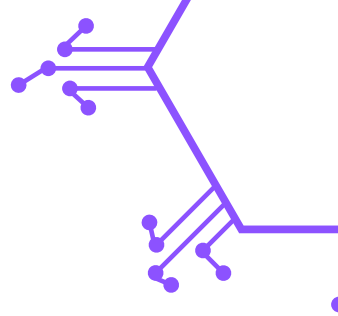


List of scenarios :



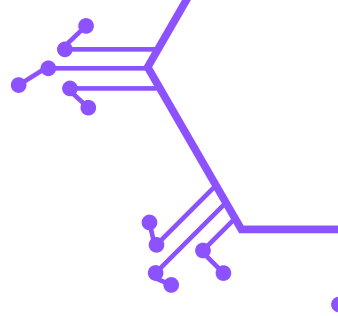
name	create profile
Id	trainee, AI coach app.
Precondition	None
Path	<p>Step 1- trainee create a profile</p> <p>Step 2- ai coach app asks the trainee for a username and a password</p> <p>Step 3- trainee creates a username and a password for the selected field.</p> <p>Step 4- ai coach app asks for the height and the weight of the user.</p> <p>Step 5- ai coach app asks the user for the goal whether they want to choose to gain weight or lose weight.</p> <p>Step 6 / trainee write down their own height and weight and goal to simplify the required plan.</p>

List of scenarios :



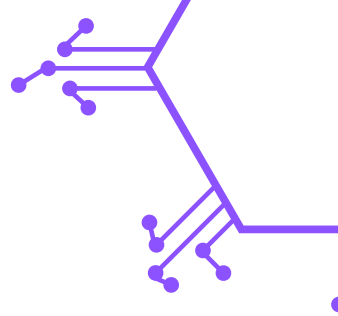
name	select package
Id	trainee, AI coach app.
Precondition	AI coach app
Path	<div>Step 1- trainee request to subscribe</div> <div>Step 2- AI coach ask trainee to choose one of the packages plans (standard, plus)</div> <div>Step 3- trainee select package plan</div> <div>Step 4- AI coach app active the trainee subscription</div>

List of scenarios :



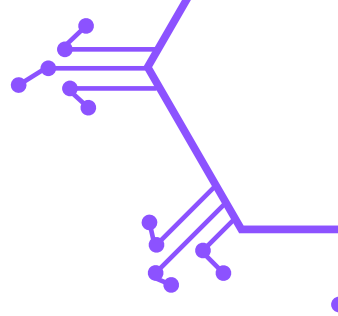
name	Show profile
Id	trainee, AI coach app.
Precondition	after profile created
Path	<div>step 1- coach provides diet plan to the AI coach app</div> <div>Step 2- AI coach app receives the plan</div> <div>Step3-AI coach app modify the plan</div>

List of scenarios :



name	Provide plan
Id	Coach ,AI coach app
Precon dition	after package plan selected
Path	step 1- coach provides diet plan to the AI coach app Step 2- AI coach app receives the plan Step3-AI coach app modify the plan

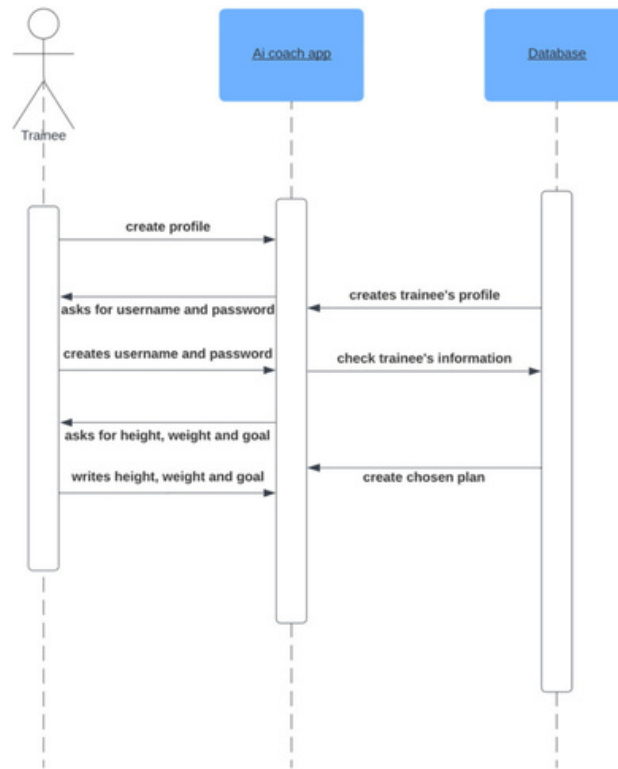
List of scenarios :



name	provide exercises
Id	Coach,ai coach app
Precondition	after package plan is selected
Path	<p>step 1- coach provides exercises to the Ai coach app</p> <p>Step 2- AI coach app receives the exercises</p> <p>Step 3- AI coach modify the exercises</p>

sequence Diagram:

UC1:

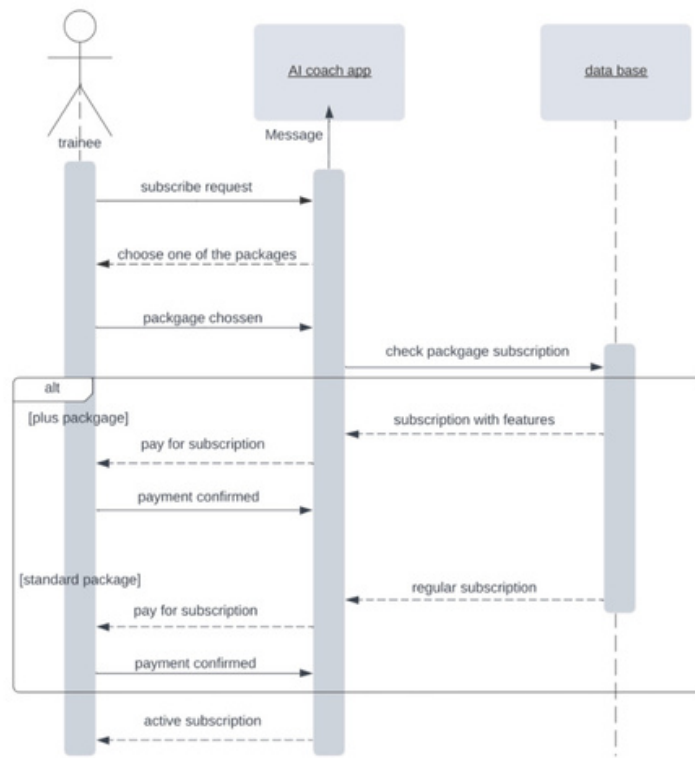


Description process:

- trainee creates profile
- Ai coach app asks for username and password
- Trainee creates username and password
- Store trainee information into the app
- Ai coach app check validity of the information
- Ai coach app asks for height, weight and the goal for the required plan.
- Trainee writes the height, weight and the goal to simplify the plan.
- Create chosen plan.

sequence Diagram:

UC2:

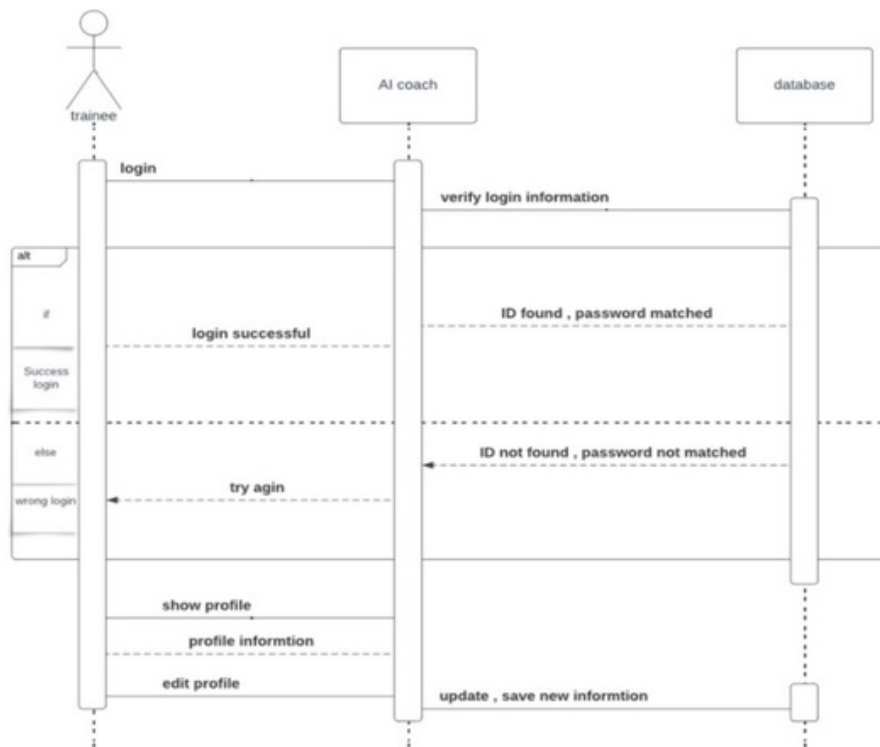


Description of proses:

- 1- trainee send subscribe request to the app
- 2- trainee choose one of the subscriptions packages
- 3- package will be chosen by trainee
- 4- check the subscription package
- 5- if it's plus subscription will include extra features
- 6- pay for subscription
- 7- payment confirmed
- 8- if it's standard subscription will be regular
- 9- pay for subscription
- 10- payment confirmed
- 11- active subscription

sequence Diagram:

UC3:

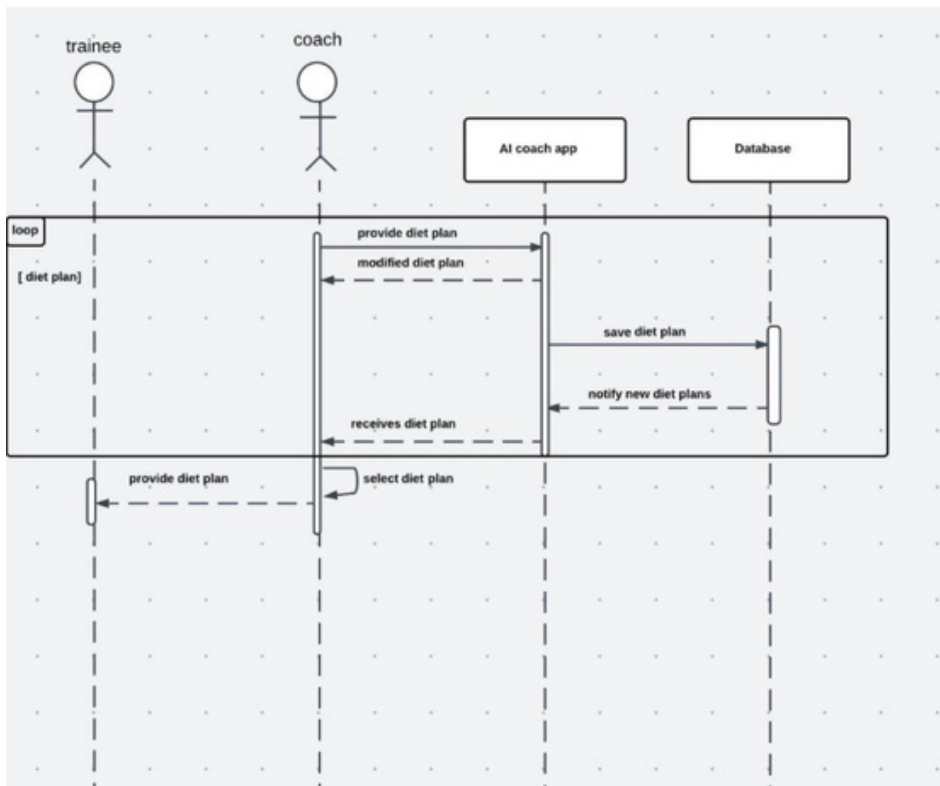


Description of proses:

1. trainee enter his/her account (login)
2. AI Coach send to database to Verify Login information
3. database check if the ID Found and Password match
4. Login successful and trainee enter account
5. if database not found ID or password is not match
6. ask trainee to try again
7. the trainee requests to show profile
8. AI Provided profile information
9. trainee want to edit some info
10. database update and save new info

sequence Diagram:

UC4:

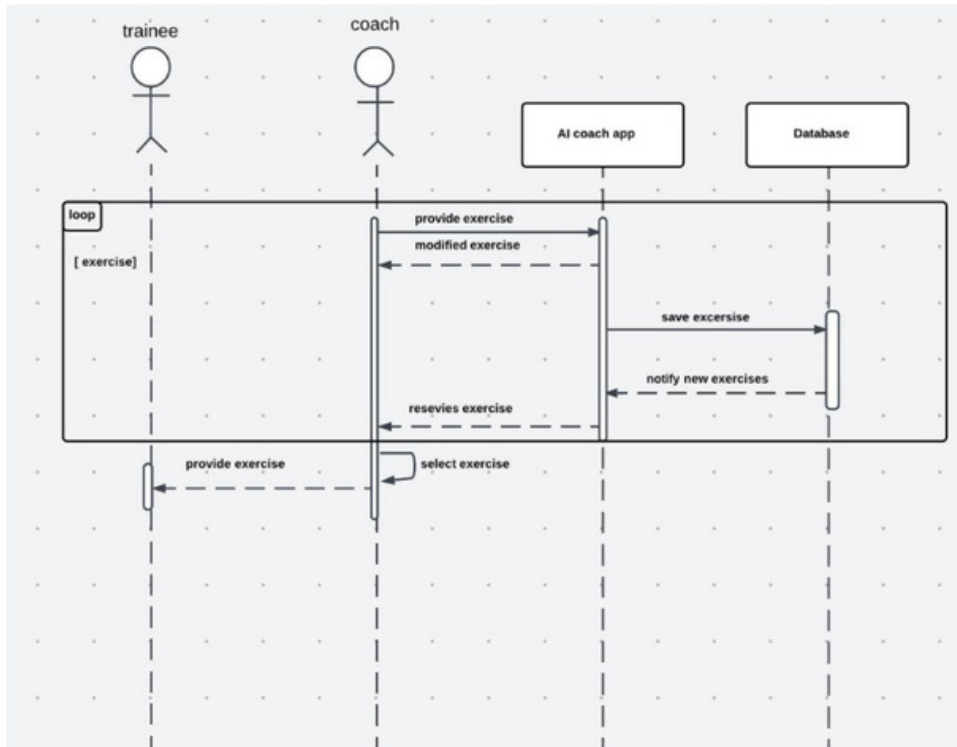


Description of proses:

- 1- coach provide diet plan to Ai coach app
- 2-Ai coach app modifies diet plan while coach provide diet plan
- 3-database save diet plan
- 4-database notify coach of new diet plan
- 5-coach receives and select diet plan
- 6-coach provide diet plan to trainee

sequence Diagram:

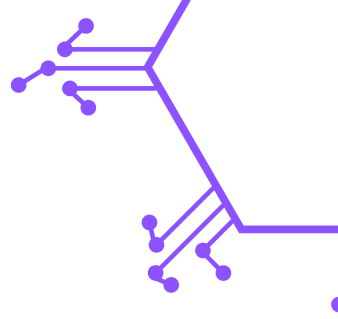
UC5:



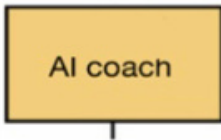
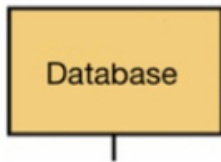
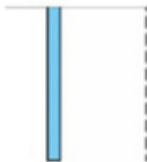
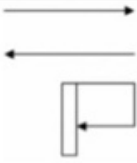


Description of process:

- 1- coach provide exercise to Ai coach app
- 2-Ai coach app modifies exercises while coach provide exercises
- 3-database save exercises
- 4-database notify coach of new exercises
- 5-coach receives and select exercises
- 6-coach provide exercise to trainee

Sequence Diagram:



Notation	Display	Description
Actor	 Trainee	The first element in sequence diagram, customer who interact with the system.
Actor	 coach	The coach who provide diet plan and exercise.
Object		The system that provide modified coaching plan.
Object		The system that saves the trainee information.
Lifeline		Identify the existing of the objects by the time.
Message		Identify the relationships between objects.

Class diagram:

