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Analysis Report

1.INTRODUCTION

1.1. PURPOSE

The purpose of this system is to introduce a new nutrition tracking app that caters to the needs of people with specific nutritional requirements or diseases. The app aims to fill a gap in the market by offering a more inclusive platform that considers the needs of all individuals, regardless of their medical condition.

The system highlights the importance of customized nutrition plans and the limitations of existing nutrition tracking apps that fail to accommodate people with nutritional diseases such as celiac disease, beriberi, rickets, diabetes, high blood pressure, Crohn’s disease, and others. By addressing these limitations, the app aims to provide a comprehensive solution that takes into account the unique nutritional needs of every individual.

The system also aims that the app is integrated with other medical records, which allows for a more comprehensive tracking system that includes information about patients' diets, meals, and medical examinations. This integration enables healthcare providers to monitor patients' nutrition more

effectively and provide customized recommendations to improve their overall health.

In summary, the purpose of this system is to introduce a new nutrition tracking app that aims to provide an inclusive solution for individuals with specific nutritional requirements or diseases. The app is designed to consider every individual's needs and provide customized nutrition plans while also integrating with other medical records for a more comprehensive tracking system.

1.2. BACKGROUND

1.2.1. Introduction

Domain analysis is an important step in developing well-structured software. It has a huge effect on understanding the research area and has beneficial effects on developing a better system.

The field that we are working on is nutrition and anyone who wants to track a healthy lifestyle. This app also takes account of individuals that need a special nutrition diet. We know that some nutrition tracking apps do not consider who has nutritional diseases such as celiac disease, beriberi, rickets, diabetes, high blood pressure, Crohn’s disease etc. It’s our mission to fix this ignorance and offer an app that does not exclude anyone.

1.2.2. General Knowledge About the Domain

There are tons of people who need special diet due to their nutritional diseases. Therefore, this nutrition tracking app is designed for individuals with

nutritional diseases who need special treatment. Here are some of the considerations we are putting on:

- This app provides personal information such as medical history, health status, examinations etc. In this manner doctors and dietitians could write reports, diets or prescriptions.
- This app has the knowledge of the any nutritional disease and includes data of the specific nutrients which are triggering for that specifical disease and compose a diet considering these information. For example, individuals who suffer from celiac disease require a gluten-free diet.
- This app follows medical guidelines in matter of users to have a correct diet. Based on this point, the nutrition tracking app has an integration with medical care.

1.2.3. Customers and Users

This app has a wide range of users with different purposes. Starting from fitness enthusiasts who are interested in calorie intake for their fitness goals to individuals with specific nutritional needs. But the main and common purpose is improving a healthy lifestyle with nutrition and diets. Here are some of the predicted users intents headers:

- People who are into healthy calorie tracking: Some people attach importance to their daily calorie consumption necessary for their body.
- Professionals in medical area and food consumption (doctors, dietitians etc.) : Medical field is in need of a collective platform in order to help their clients track their food intake and medical history in case being aware of any disease for their client.

- Individuals with specific nutritional needs: People who suffer from specific nutritional needs face a lot of difficulties in their daily life. The human body is in need of certain nutrients, but some people should pay more attention to the content of the food they take into their bodies due to their diseases.

1.2.4. The Environment

This nutrition tracking app is easy to use, understandable, accessible and user friendly. It can be downloaded on any mobile device.

Our aim is to consider every individual and customize their needs. This app is also integrated with other medical records for a common platform to track patients' diets, meals, examinations etc.

Firstly, when a new user opens this app, there will be appearing a sign-up page. After giving some personal information, medical history, and the aim of using the app, the user profile will be created. Not sharing these informations with third parties is our most important priority in order to ensure the trust between us and the user. This will be the users personalized page and there will be their medical records, recommendations, meal plans, calorie tracking.

There is a food database that includes nutritional information such as calories, allergies, ingredients etc. It's an essential topic for clients to have some knowledge about the food they take into their bodies.

The app also keeps track of client's nutritional goals. If the client is under the nutritional goal or passing the calorie limit for that day, they will receive a notification because of the imbalance. But this limit will be decided by the

medical professionals. Putting the health of our users at risk is the last thing we want.

This app also provides users with educational resources. Users can look up information about their disease and could learn how to manage them. Also because this app has a wide range of users with different purposes, everyone can find tips and learn about healthy eating habits for themselves.

1.2.5. Tasks and Procedures Currently Performed

There are various tasks that are currently performed in this domain, most common ones are:

- Showing the nutritional value of a meal
- Composing an automatic diet list
- Having users choose their dietary needs
- Suggest certain exercises
- Take into account some of the general information about the user. (Age, Height, Gender)

1.2.6. Competing Software

There are tons of softwares in this market because a lot of people are looking to live healthier, to have better looks or to keep track of their eating habits. Most of the softwares are very similar to each other with only few differences, some of them have wider range of use. However, our application offers a set of unique solutions that any user can benefit from. Most of the diet applications on the market right now, focuses on having their users choose their

needs, likes and dislikes and give them an automatically prepared diet list. While that is useful, there are lots of important points that are missing. Here is an example of what the other applications are missing:

- Doctor/Dietitian control: Doctors and Dietitian are not a part of current nutritional tracking application market. If someone wants their dietitian or doctor to keep track of what they are eating, they have to keep calling them or text them. While this might seem simple, it is both disturbing and not efficient. Also having an expert to prevent possible algorithm mistakes can make the user feel safer.
- Localization: Different areas have different eating habits. For instance, hotdogs might be a very popular food in USA, but it is not common in Turkey, so it would be irrelevant to suggest hotdogs to a Turkish user.
- Flexibility: Even if an automatically created diet list may fits completely to the user's health status and needs, the user may not want to eat what is in that list that day. So the application should have a certain amount of flexibility to not overwhelm the user. Users should be able to replace certain meals with some other meal with similar nutritional values.

1.2.7. Similarities Across Domains and Organizations

As technology advances, we create more problems and more solutions to the current problems every day. New markets and new domains are created for our unnoticed needs consistently. Similar to our domain, there are a lot of domains that have the same gaps that our domain has. Most of the applications of most of the domains suffer from the lack of localization and that makes them irrelevant to -maybe- billions of people.

Expert control is also a very uncommonly used option in applications even though it can be very beneficial.

Flexibility is an issue which can be incredibly hard to perfect. Some of the most frequently used websites like YouTube and Instagram give users the choice to manipulate the algorithm to change the content they show them a little bit, however even those applications are still trying to find the right balance.

1.3. MOTIVATION

1.3.1. Statement of Problems with the Existing System

There are a variety of calorie tracking systems on the market, but they don't meet people's needs. Most of the apps on the market are focused on the people who tries to gain muscle and get a better form. However, there are a lot of human beings who need to track what they eat and try to help their diseases with their diet. The problems we are going to solve and the features that we will add this app are:

- There is no variety of cuisine : The apps on the market provide only certain food's calories and people have to calculate exactly that they take in a daily basis. If we need to give an example Turkish cuisine contains a lot of nutrition and we cannot just simplify them with only certain goods.

- Doctors and dieticians can't track their patients: People who have diabetes or want to gain/loss weight often apply professional help and in this timeline tracking what they eat and try to understand the problem is the key. None of the apps on the market are focused on this problem.

- Users cannot choose a certain diet program: most of the applications we checked only calculates body mass index and create a certain calorie amount for the user can consume. Nevertheless, everybody needs different types of eating habits and calorie deflect.

- Users cannot add their special diet list to the program: People who get professional help for their diseases usually are handed with a piece of paper that they should track. Moreover, they stick with a program for almost a month. It is inconvenient for both patients and doctors/dietitians.

1.3.2. The New System

Considering the shortcomings of its competitors in the market, we have prepared a new system. In order to progress more fluently in both Android and iOS operating systems, you can use Flutter. Preferred dishes in world cuisine will also be added to the application. However, in order to prevent the possibility of missing meals, the patient or dietitian will be able to add a new meal and how many calories the meal is to the practice. Meals can be searched by filtering. New dishes entered into the system will also appear in the admin panel. Thus, it is aimed to keep the dishes up-to-date and to increase the variety. The problem of doctors or dietitians not being able to follow their patients will be overcome by matching the profile of the patients with the profile of their consultants. Thus, the consultants will be able to easily update the weight gain

or weight loss method followed by examining the patient's profile in detail, reviewing the necessary data, seeing the update of the data, and following the daily nutrition. Dietitians or doctors who wish will be able to offer their patients not only a list, but also several lists for the patient to choose. The application will also present various recommendations to the user, approved by experts, based on the user's personal data. Users will be able to provide the nutrition program they want by editing their diet lists daily according to the expert's recommendation. Users will be able to see the calorie calculation in their profile by marking the products they consume at each meal. After this calculation, they will be able to see the evaluation of their daily calorie target on their profile. In addition, after this calculation, doctors or dietitians will be able to easily follow up their clients daily.

1.4. STRUCTURE OF THE DOCUMENT

The analysis report consists of 4 main sections which are introduction, functional requirements, non-functional requirements and system models, respectively.

The introduction, which is the first section, contains a description of the document's aim. This section is supported by a background that provides a synopsis of the subject. In this part also discusses the rationale by describing the current system's flaws and the suggested system's promise to address them by including new features. In-depth explanations of these supplementary features' advantages for the system are provided.

The functional requirements are included in the second section. Use Case diagrams are used to illustrate and provide a full description of the system's

features as they are presented in this section. A priority list is also made since some functionality could have higher importance than others. In this section, which describes use case specifications, the requirements are given in detail.

The non-functional requirements are mentioned in the third section. These requirements are supported with Volere templates for the purpose of ease of use. These templates provide in-depth details on the associated needs, including stating their nature, the justification for them, and their importance.

System models are shown in the final section. Models for objects and classes are built in this section. This section also includes a description of user interface.

2. FUNCTIONAL REQUIREMENTS

2.1. SYSTEM FUNCTIONALITIES

2.1.1. Profile Creation

The system shall enable user to put in personal information.

2.1.2. Search with Identifiers

The system shall allow user browse meals with unique identifiers.

2.1.3. Manuel Search

The system shall allow user to search the results with browsing events.

2.1.4. Filtering Searches

The system shall allow user to filter desired searches according to users wish.

2.1.5. Water Consumption Tracking

The system shall allow tracking of the water consumed by the user.

2.1.6. Progress Tracking

The system shall keep track of progress made.

2.1.7. Display of Values

The system shall show nutritive values for the meals.

2.1.8. Specifying Portions

The system shall enable user to specify the portion for meals.

2.1.9. Selecting a Meal

The system shall allow user to select a meal.

2.1.10. Meal Plan Requests

The system shall allow user to request a meal plan suitable for a certain diet.

2.1.11. Meal Plan Creation

The system shall prepare a meal plan according to the entered request.

2.1.12. Setting Limits

The system shall allow user to set a calorie limit.

2.1.13. Setting Limits 2

The system shall allow user to set a limit for the hours to eat.

2.1.14. Social Features

The system shall allow user to connect with other users to share their user experience.

2.1.15. Support

The system shall provide users with access to nutrition experts to provide guidance and support for their nutrition goals.

2.1.16. Menu

The system shall provide a guidance system that will provide in-app navigation.

2.1.17. Input Medical Record

The user shall enter medical records into the system

2.1.18. Medical Record

System shall display personal medical records to admin.

2.2. Description of the System Users

The system users for a nutrition tracking app can be divided into two categories: End Users and Administrators.

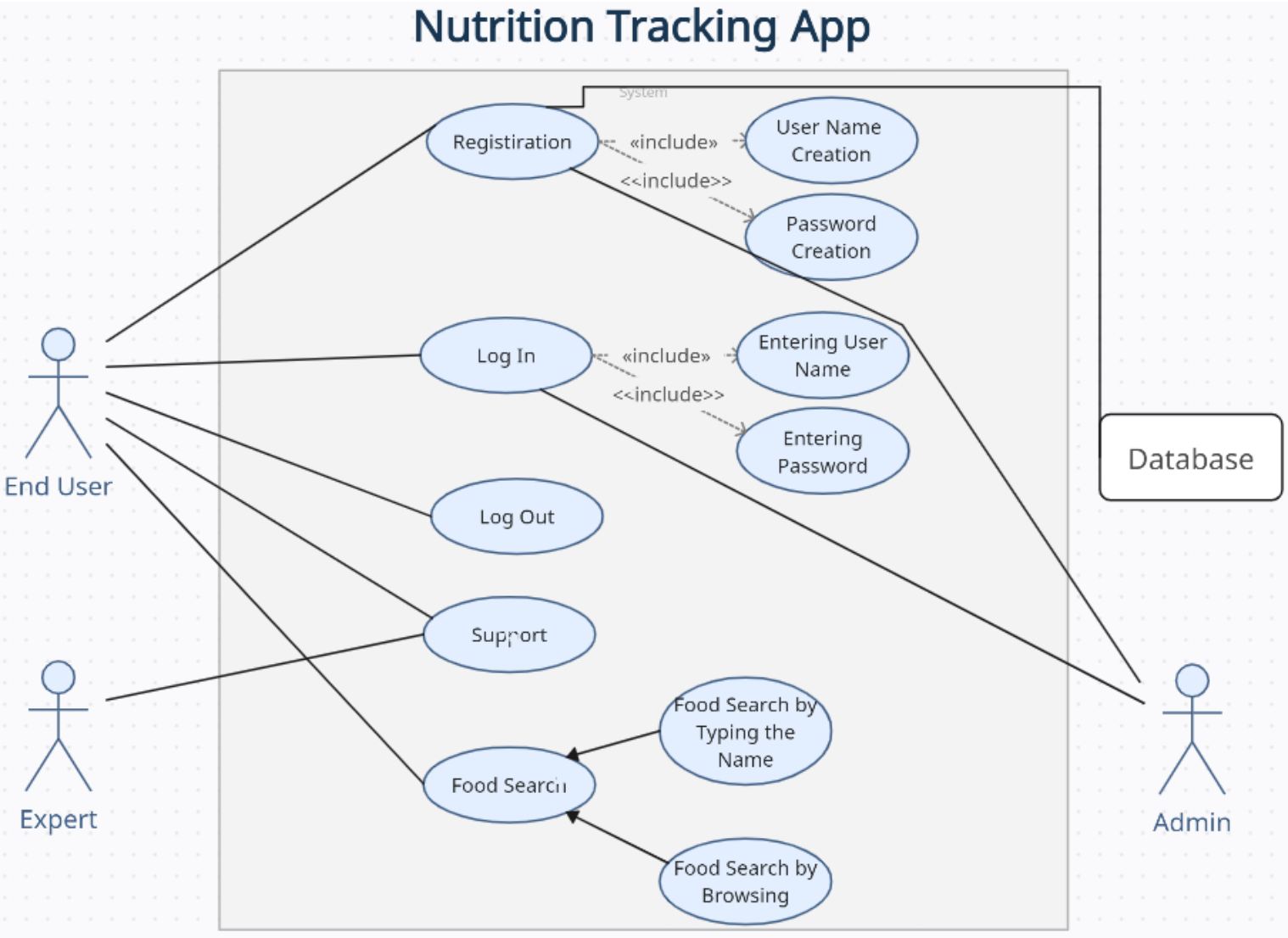
End users are the people who will regularly use the app to keep tabs on their nutritional intake, log their food intake, create objectives, and monitor their progress. End users may utilize the software to achieve a variety of objectives,

including weight loss, muscle gain, and diet maintenance. Users might be classified as professional athletes, amateur athletes, dietitians, fitness enthusiast or as sedentary people. They may also have unique dietary requirements, such as food allergies, vegetarianism or veganism, or medical issues that necessitate adhering to a certain diet. The system appeals to all age groups and has no age restrictions.

Administrators are in charge of app maintenance and management, including updating the food database, guaranteeing data security, and controlling user accounts. Software developers, database administrators, and other IT experts who are in charge of the app's technical components may be considered administrators.

2.3. Specific Requirements

2.3.1 Use Case Diagram



2.3.2. Use Case Priority List

2.3.2.1. High Priority

- Registiration
- Log in
- Food search
- User name Creation
- Password Creation
- Entering User Name
- Entering Password

2.3.2.2. Midium Priority

- Log out
- Food Search by Typing the Name
- Food Search by Browsing

2.3.2.3 Low Priority

- Support

2.3.3.Use Case Specifications

USE CASE ID: UC1
USE CASE: Registiration
ACTORS: End User, Admin, Database
RELATED USE CASES: Includes: User Name Creation, Password Creation
PRECONDITION: The user has opened the application.
MAIN FLOW: 1. The end user opens the “Registiration” and clicks to registration button. 2. The end user chooses the “Name Bar” and “Password Bar”. 3. The end user clicks to “Verify Button” and completed this level.
POST CONDITION: The end user is registered in the system.

USE CASE ID: UC2
USE CASE: Log In
ACTORS: End User, Admin
RELATED USE CASES: Includes: Entering User Name, Entering Password
PRECONDITION: The user has opened the application.
MAIN FLOW: 1. The end user opens the application and click to “log in” button. 2. The end user enters the “User Name Button” and enters “Password Button” . 3. The end user clicks to “Enter Button” and completes this level.
POST CONDITION: The end user is logged in to the system.

USE CASE ID: UC3
USE CASE: Log Out
ACTORS: End User
RELATED USE CASES: Includes: -
PRECONDITION: The user has opened the application and selected “Menu”.
MAIN FLOW: 1. The end user opens the application and clicks to “Exercise” button from the menu. 2. The end user enters exercise information. 3. The system displays exercise outputs. 4. The system creates an exercise plan if desired.
POST CONDITION: The end user has past exercise information on display and an exercise plan.

USE CASE ID: UC4
USE CASE: Support
ACTORS: End User and Expert
RELATED USE CASES: Extend: Payment
PRECONDITION: The user has opened the application and selected “Menu”.
MAIN FLOW: 1. The end user opens the application and clicks to “Support” tab from the menu. 2. The system directs the user to the expert. 3. The expert deals with the user's problem and gives feedback.
POST CONDITION: The end user recieves a response to the support request.

USE CASE ID: UC5

USE CASE: Food Search
ACTORS: End User
RELATED USE CASES: Related Entities: Food Search by Typing Name, Food Search by Browsing
PRECONDITION: The user has opened the application and selected “Menu”.
MAIN FLOW: 1. The end user opens the application and clicks to “Search” button from the top. 2. The end user decides how to perform the "search" action. 3. The end user searches either by browsing or by typing.
POST CONDITION: The end user completes the “searching” action.

USE CASE ID: UC6
USE CASE: User Name Creation
ACTORS: End User
RELATED USE CASES: Related Entities: Registration
PRECONDITION: The user has opened the application and selected “Registration”.
MAIN FLOW: 1. The end user opens the application and clicks to “Registration” button. 2. The end user chooses the “Name Bar”. 3. The end user enters a name.
POST CONDITION: The end user completes the “Name Creation” action.

USE CASE ID: UC7
USE CASE: Password Creation
ACTORS: End User
RELATED USE CASES: Related Entities: Registration
PRECONDITION: The user has opened the application and selected “Registration”.
MAIN FLOW: 1. The end user opens the application and clicks to “Registration” button. 2. The end user chooses the “Password Bar”. 3. The end user enters a password.
POST CONDITION: The end user completes the “Password Creation” action.

USE CASE ID: UC8
USE CASE: Entering User Name
ACTORS: End User
RELATED USE CASES: Related Entities: Log In
PRECONDITION: The user has opened the application and selected “Log In”.

MAIN FLOW: 1. The end user opens the application and clicks to “Log In” button. 2. The end user chooses the “User Name Bar”. 3. The end user enters his/her user name.
POST CONDITION: The end user completes the “Entering User Name” action.

USE CASE ID: UC9
USE CASE: Entering Password
ACTORS: End User
RELATED USE CASES: Related Entities: Log In
PRECONDITION: The user has opened the application and selected “Log In”.
MAIN FLOW: 1. The end user opens the application and clicks to “Log In” button. 2. The end user chooses the “Password Bar”. 3. The end user enters a his/her password.
POST CONDITION: The end user completes the “Entering Password” action.

3.Non-functional Requirements

3.1.1

The system shall allow the user to login in 30 seconds.

3.1.2

The system must be presented in Turkish-English.

3.1.3

The system shall be able to host a 100.000 users at the same time.

3.1.4

The system must be fully protected by privacy policies.

3.1.5.

System shall record previous activities for 3 years.

3.1.6.

The system shall allow registered users to contact the requested expert.

3.1.7.

The system shall be compatible with a wide range of devices and platforms.

3.1.8.

The system shall be available 7/24

3.1.9.

The system shall guide using colors and arrows for data entry.

3.1. Volere Tamplate

Requirement ID: 1	**Requirement Type**: NFR (Performance)	**Event/Use case #**
Description: The system shall allow the user to login in 30 seconds.		
Rationale: The system should provide to user to be able to access their account quickly. Extended waiting times during account login may cause the customer to abandon the login. This problem is solved if the cooldown is limited to 30 seconds.		
Fit Criteria: If the waiting time exceeds 30 seconds, the user must be re-entered with a message informing the user.		
Priority: High		

Requirement ID: 2	**Requirement Type**: NFR (Accessibility)	**Event/Use case #**
Description: The system must be presented in Turkish-English.		
Rationale: The system should have languages in Turkish and English that users can be reached from many different languages. Thus, the number of users will be higher and it will be an application that is beneficial to more people and can be made into an application with increased usability.		
Fit Criteria: There should be both Turkish and British flags in the upper right part of the application. In this way, the user can choose which language to use.		
Priority: Desirable		

Requirement ID: 3	**Requirement Type**: NFR (Performance)	**Event/Use case #**
Description: The system shall be able to host a 100.000 users at the same time.		
Rationale: The system should allow 100.000 users to login to the application at the same time. In this way, many users can log into the application and there will be no loss of users.		
Fit Criteria: If the number of simultaneous users exceeds 100 000, a message should be sent to both the admin and the user stating that the user limit has been exceeded.		
Priority: Low		

Requirement ID: 4	**Requirement Type**: NFR (Security)	**Event/Use case #**
Description: The system must be fully protected by privacy policies.		
Rationale: The system shall protect the user information according to the privacy policy. If it is not protected, it may be possible to disclose and misuse user information. In order to prevent this from happening, cyber security measures should be kept at the highest level.		
Fit Criteria: As soon as a cyber attack is detected, an urgent warning message should be sent to the admin. and the system must take immediate action.		
Priority: High		

Requirement ID: 5	**Requirement Type**: NFR (Archiving)	**Event/Use case #**
Description: System shall record previous activities for 3 years.		
Rationale: Visibility of historical data is essential for tracking progress and development. On top of that, this can help ensure compliance, aid in audit and traceability efforts, and support forensic investigations in case of a security breach.		
Fit Criteria: Accessibility and documentation of past records		
Priority: Desirable		

Requirement ID: 6	**Requirement Type**: NFR (User Experience)	**Event/Use case #**
Description: The system shall allow registered users to contact the requested expert.		
Rationale: This can be useful in scenarios where users require expert advice or assistance with a particular task or problem. By providing this functionality, the system can enhance the user experience and increase the value of the service being provided.		
Fit Criteria: Enabling users to provide feedback on their experience when contacting an expert, which can help improve the quality of the service over time.		
Priority: Desirable		

Requirement ID: 7	**Requirement Type**: NFR (Compatibility)	**Event/Use case #**
Description: The system shall be compatible with a wide range of devices and platforms.		
Rationale: Users may access the system using different devices, such as desktops, laptops, tablets, and mobile phones, and may use different operating systems, such as Windows, Mac, iOS, or Android. By ensuring compatibility, the system can increase its reach and accessibility, and provide a consistent user experience regardless of the device or platform being used.		
Fit Criteria: The system running smoothly and efficiently on all devices and platforms, without significant lag or delays.		
Priority: High		

Requirement ID: 8	**Requirement Type**: NFR (Performance)	**Event/Use case #**
Description: The system shall be available 7/24		
Rationale: This is very important for users to access the system. Users should be able to access the system at any time of the day. By providing this performance, the system can improve the user experience and increase the value of the service provided.		
Fit Criteria: To ensure that users can log in and out of the system at any time. This can help improve service performance over time.		
Priority: High		

Requirement ID: 9	**Requirement Type**: NFR (Compatibility)	**Event/Use case #**
Description: The system shall guide using colors and arrows for data entry		
Rationale: It is very important especially for users who have just started using the system in terms of explaining how validity is. In this way, users can quickly adapt their systems.		
Fit Criteria: The system allows users to use the system in the best possible way by adapting the users to the operation quickly.		
Priority: High		

4. SYSTEM MODELS

4.1. Object And Class Models

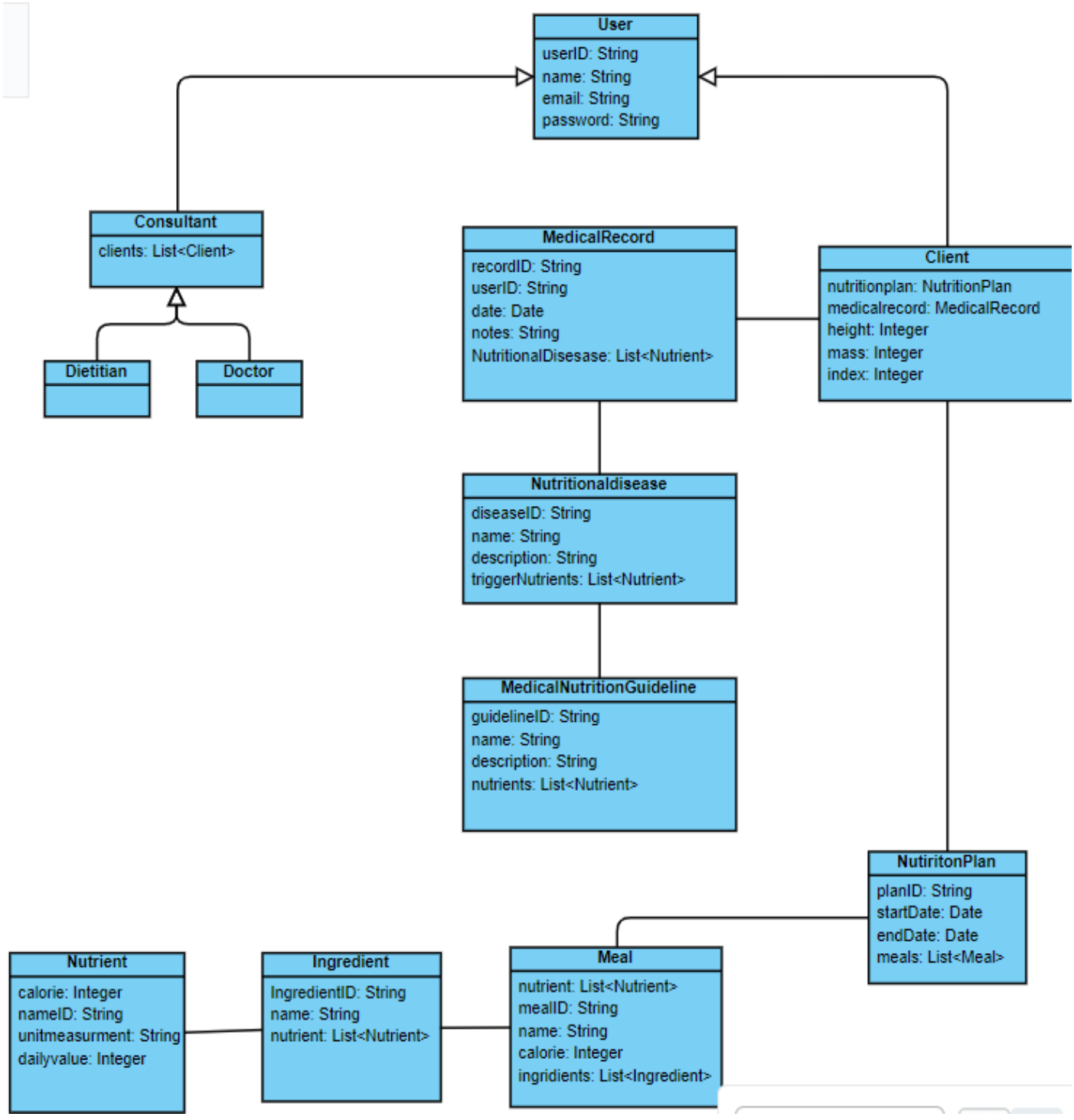


Figure (4.1) Object and Class Model

4.2. User Interface – Navigational Paths and Mock-ups

4.2.1. User Interface

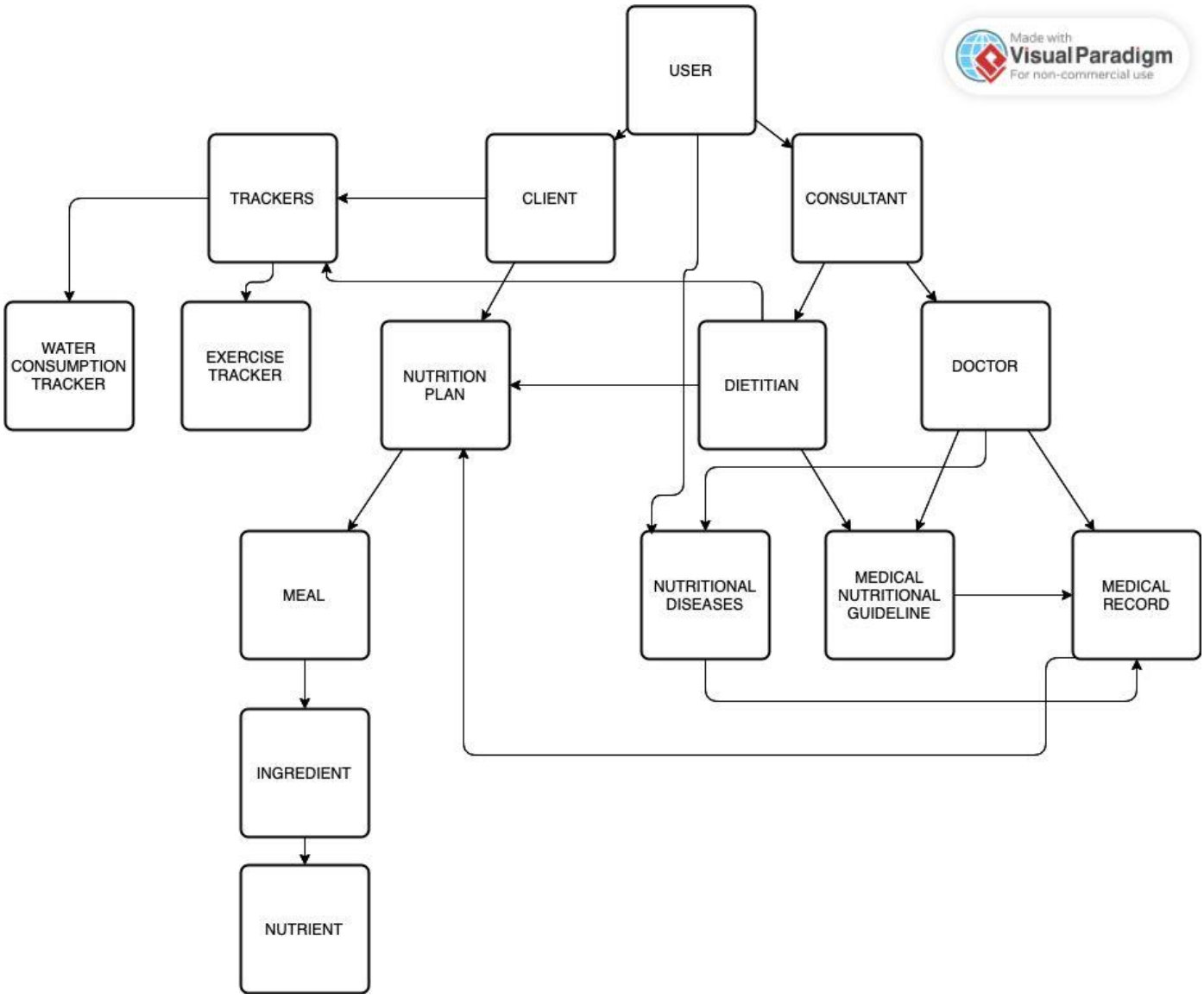


Figure (4.2.1) User interface

4.2.2. Screen Mock-up

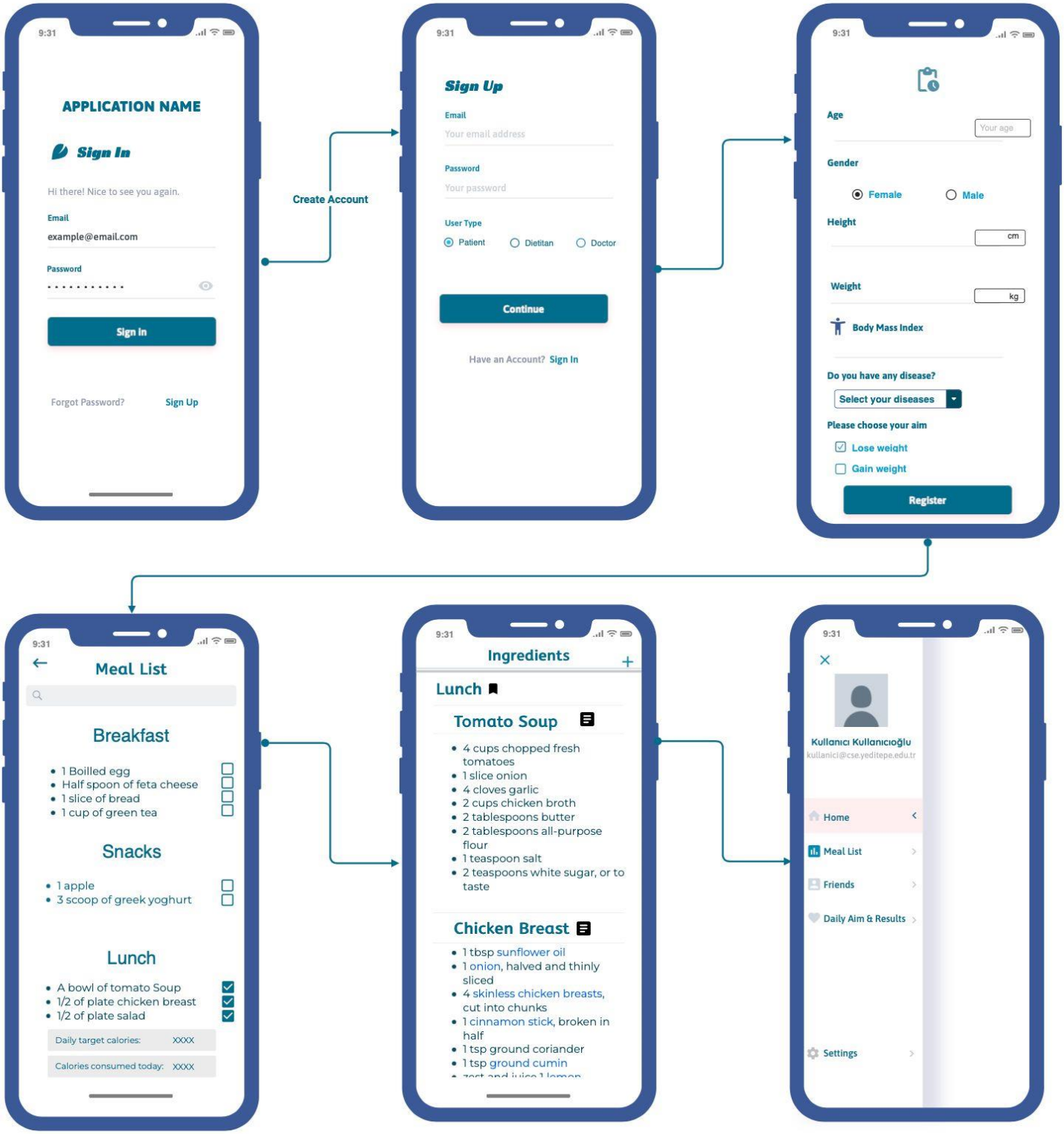


Figure (4.2.2) Screen mock-up

5.Definitions, Acronyms and Abbreviations

- **Expert:** Dietitian, doctor, etc., who support the user requesting help.
- **User:** End user who wants to get nutrition tracking service.
- **Competing Software:** Apps which are in the market with the same functionalities like this app.
- **Gluten-Free:** Gluten-free refers to a diet that does not include gluten, which is a type of protein found in certain grains, including wheat, barley, and rye. Gluten can cause digestive issues and other health problems for some people, particularly those with celiac disease, gluten sensitivity, or wheat allergy.
- **Domain:** A domain is a name that identifies a website or a network of computers on the internet. It is essentially the address that people use to access a website.
- **Celiac Disease:** Celiac disease is an autoimmune disorder that affects the small intestine in response to gluten consumption. Gluten is a type of protein found in wheat, barley, and rye.
- **Beriberi:** Beriberi is a disease caused by a deficiency of thiamine (also known as vitamin B1) in the body. Thiamine is an essential nutrient that plays a key role in converting food into energy and maintaining a healthy nervous system.
- **Rickets:** Rickets is a disease that is usually seen in children and is caused by a lack of vitamin D, calcium or phosphorus in the body.
- **Crohn's Disease:** Rickets is a disease that is usually seen in children and is caused by a lack of vitamin D, calcium or phosphorus in the body.
- **Sedentary People:** A sedentary person is someone who spends a lot of time sitting or lying down and engaging in activities that require very little physical activity. This can include things like working at a desk, watching TV, playing video games, or using a computer.

- **Medical Record:** Medical record is a document that contains an individual's health-related information, including medical history, diagnostic tests, treatment plans, and outcomes.