HealthHive

Final Year Project

Session 2019-2023

A project submitted in partial fulfillment of the degree of

BS in Computer Science

Department of Computer Science

Faculty of Computer Science & Information Technology

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Type (Nature of project)	[✔ **D**evelopment [] **R**esearch [] **R**&**D**			
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*The candidates confirm that the work submitted is their own and appropriate credit has been given where reference has been made to work of others

Plagiarism Free Certificate

This is to certify that, I Abdul Haseeb S/D of Abdul Waheed, group leader of FYP under registration no FYP-BCSM-F22-035 at Computer Science Department, The Superior College, Lahore. I declare that my supervisor checks my FYP report

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Name of Supervisor: **Ms. Mahreen Shahzadi** Co-Supervisor:

Designation: Lecturer Designation: Lecturer

Signature: _____ Signature: _____

HoD: Dr. **Irfan-ud-din**

Signature: _____

APPROVAL

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PROJECT SUPERVISOR

Comments: _____

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Name: _____

Date: _____ Signature: _____

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PROJECT MANAGER

Comments: _____

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Date: _____ Signature: _____

HEAD OF THE DEPARTMENT

Comments: _____

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Date: _____ Signature: _____

Dedication

This work dedicated to Allah Almighty who made us capable to perform this task. We would like to dedicate this to the blessings of our parents and teachers. Our supervisor guided us in problems to handle the situations.

Acknowledgements

I am thankful to my supervisor who has helped me a lot in the project. I am thankful to my teammates who worked as a real team and do not make me feel alone in the hard times. We would like to express our deepest gratefulness to all the individuals who had supported us.

Executive Summary

This web application operating system-based solution performs the role of a dietitian for your device just like a real one. Everyone wants to have a healthy body in today's hectic environment. Because organs and tissues require adequate nutrients to function properly, a balanced diet is crucial. The body is more prone to disease, infections, weariness, and subpar performance without sufficient nutrients. Offers. If you have dietary restrictions or allergies, it also offers a feature that lets you speak with a real dietitian. It also offers a page where viewers may read some eye-opening information about the human body and health. Users using this tool save a ton of time because they can complete everything on a laptop without having to go visit a dietician.

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Chapter 1

Introduction

Introduction

Web application called AI Diet Consultant Management System offers guidance on how to consume a healthy diet. You can get advice for a balanced diet from an AI dietitian. Users of the suggested program can consult a nutritionist and order meals with only one click thanks to its user-friendly layout. Additionally, users have the option to seek nutritional advice, adhere to a food regimen that has been recommended, and buy drugs for specific conditions like weight loss or gain or other issues.

1.1. Background

More problems relating to our fitness and health are emerging. To address the health difficulties, Seriou's demand compels us to sign up for an online application with an AI-based diet expert. Many businesses offer AI-based diet instructions to increase physical activity. But a complete packaged solution is still required. We offer a nutritionist to help with that.

1.2. Motivations and Challenges

We have all heard the adage "A healthy body has a healthy mind" since we were young. Technology is advancing rapidly today. It helps people save time. By employing our AI diet counselor application, we hope to provide consumers with a solution to improve their level of fitness and health.

1.3. Goals and Objectives

Today’s busy world to live healthy life cycle and healthy body is a dream for everyone, balanced diet is important because your body need proper nutrition to work effectively, every human need a healthy diet plan and proper guidelines to maintain their health

- Diet plan
- Diet suggestions
- Hire a Dietitian
- Appointment booking
- Search Dietitian
- Feed back

1.4. Literature Review/Existing Solutions

The current dietitian system mandates that you pay a nutritionist to offer you advice. Not only is hiring a nutritionist a waste of time and energy spent making calls and visiting him, but it also costs a sizable sum of money each month. They occasionally become unavailable.
Existing diet applications create diet regimens for users depending on their age and gender. These diet regimens might or might not work for the patient. If a diet plan doesn't work for you, no one is to blame. She supplemented her lifestyle by stating that poor meal patterns cause many people to become ill. Apps for counting calories have drawbacks. She believes that it isn't always correct. Even if you make a mistake when typing

1.5. Gap Analysis

In old systems people have to visit the dietitian for their suggestion. Hey have to pay them fees and it was a time-consuming process.

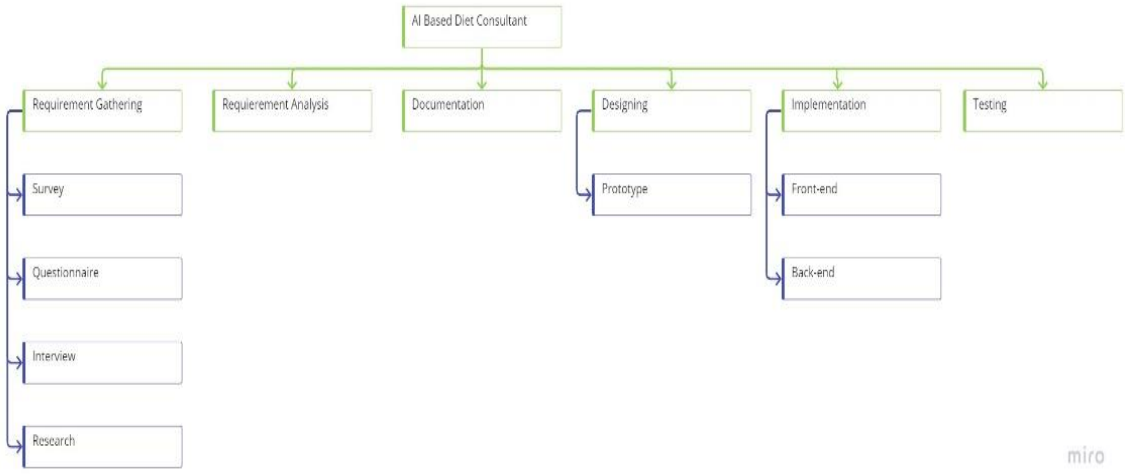
1.6. Proposed Solution

You can get all services through this program that are actually offered by a human nutritionist in this web application that proposes an AI diet counselor system. The time it takes consumers to visit a nutritionist and the cost of employing a dietician for a particular reason are both reduced when using this solo nutritionist web application. Users of the program can consult a nutritionist and order meals with only one click thanks to the user-friendly interface it offers. It also offers the option to speak with a real dietician, who should be able to offer services like creating events, adding achievements, and responding to user emails.

1.7. Project Plan

Elapsed time in (weeks) since starting of the project	Milestone	Deliverable
1-3 Week	Project Information Gathering	Project Proposal with all related information
4-8 Week	Business Analysis	Business Plan of Project
9-16 Week	Project Designing	Designed Project with proper functionalities
17-20 Week	Project Implementation	Project Prototype
21-24 Week	Project Marketing Plans	Design Marketing Strategy

1.7.1. Work Breakdown Structure

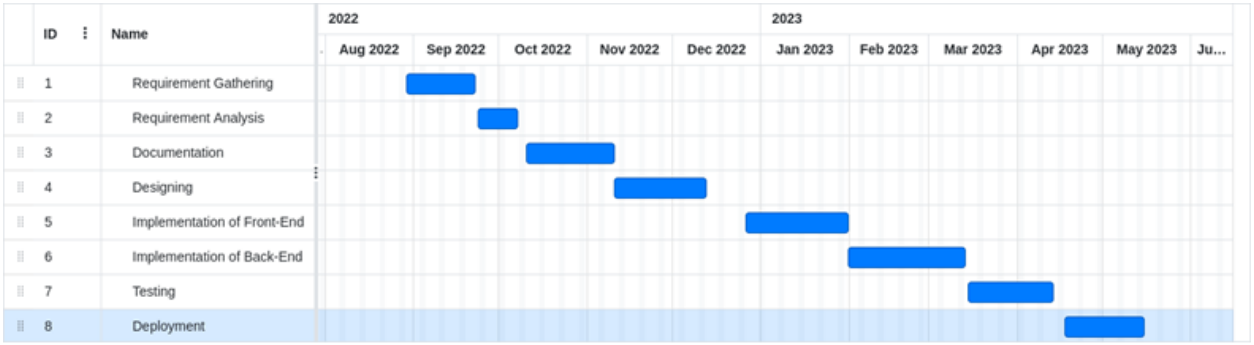


1.7.2. Roles & Responsibility Matrix

Determine who will be responsible for what using the roles and responsibilities matrix.

WBS #	WBS Deliverable	Activity #	Activity to Complete the Deliverable	Duration (# of Days)	Responsible Team Member(s) & Role(s)
1	Project Management	1	Analyze requirements and divide work	20	both
2	Development Environment	2	Selecting environment and version	15	both
3	Presentation Layer	3	Designing Front-end	60	Ahsan Asif
4	Data Management	4	Design Datasets	30	Abdul Haseeb
5	Business Logic	5	Coding of Project	90	both
6	Documentation	6	Report about the project	90	both
7	Marketing and Project Assurance	7	Assure the performance of project and deal the market	30	both

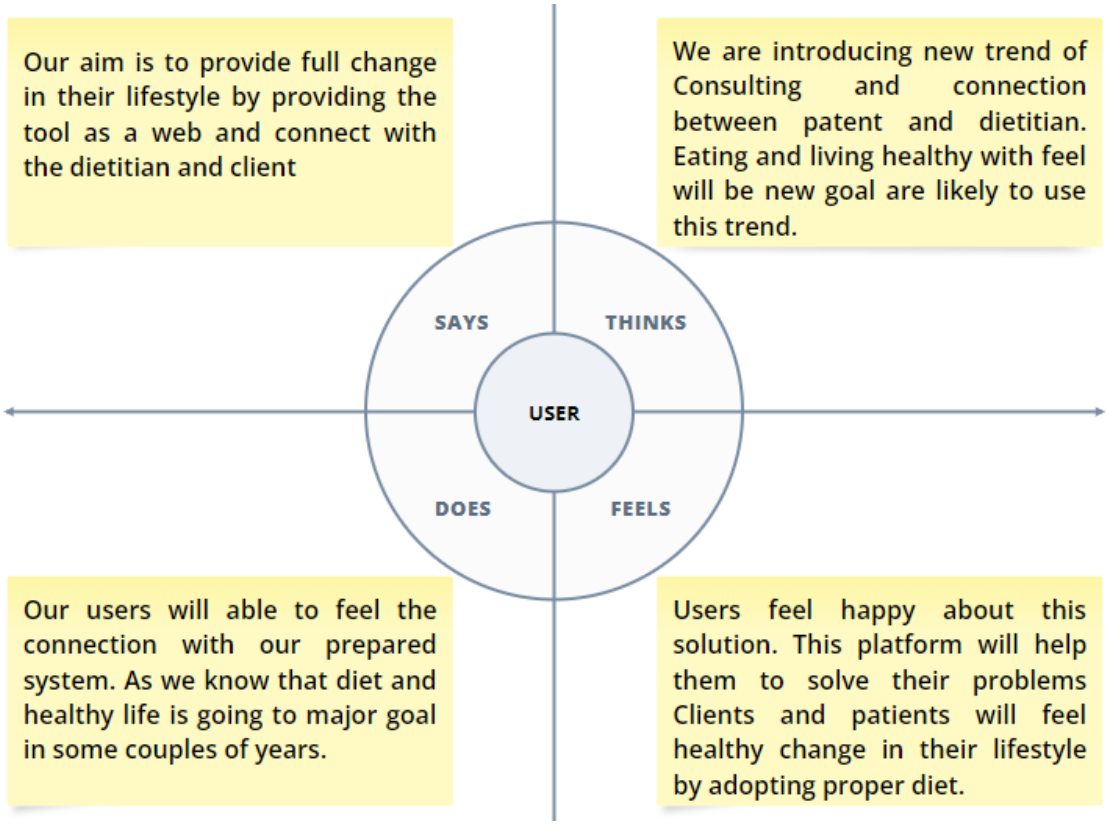
1.7.3. Gantt Chart



1.8. Report Outline

Creating an AI-based nutrition consulting service for anyone looking to get in shape, stay healthy, and be physically fit. They can alter their lives and become healthy thanks to this project idea..

1.9. Empathy Map



Chapter 2

Software Requirement Specifications

Software Requirement Specifications

1.1. Introduction

1.1.1. Purpose

The objective of this project was to research, analyze, design, and implement a database application to help patients create a personal nutritional plan based on a 'rotating diet'. This diet was specially devised for a patient with severe food allergies, requiring that every n day he eats only one specific food (where n is any number) and eats food from the same organic food family. foods should be eaten every n day.

1.1.2. Document Conventions

Document was created using Microsoft Word 2019 and Calibri font. The fixed font size used to write this document is 12pt with 1.5 line spacing. I used the Bold property to set the document heading.

1.1.3. Intended Audience and Reading Suggestions

The target group for this document is people who want to lead a healthy life. It provides them with a complete nutrition plan and a Dietitian to monitor the client. The documentation provides a clear idea of the website to be designed.

1.1.4. Product Scope

This project's goal is to help patients design a daily meal plan for their individual nutrition plan as well as help them establish their preferences and rules for nutrition plans, particularly rotation plans (3/5, 4/6, etc.). to have control over what food they can eat. Patients should not be permitted to consume foods that are prohibited by the meal plan.

1.1.5. References

https://core.ac.uk/download/pdf/217364526.pdf

1.2. Overall Description

1.2.1. Product Perspective

Following are the functions that Diet Web Application should perform:

1.2.2. User Classes and Characteristics

Following is the list of classes we will be using in our Project:

• **Dietitian:** Dietitian must register first on web site when he gives their services.

• **User**: All the Users get diet plan by just click one button and book appointment according to need, and contact to dietitian for consulting.

• **Admin:** Admin will have all the rights and Management Authority.

1.2.3. Operating Environment

- Windows 10 OS/ mac OS.
- Tool: vscode
- Server: Xampp Server
- Tool: vscode
- Web browser Google Chrome/Safari
- Database: Microsoft SQL Server, MySQL
- Language: HTML, CSS, Bootstrap, JavaScript, PHP

1.2.4. Design and Implementation Constraints

The Frontend Design and backend design in Laravel Farmwork and using VSCode IDE

1.2.5. Assumptions and Dependencies

- Usernames and passwords for admin, dietitian, and user should be created via db.
- To access website functions, the administrator must log in with the correct username and password.

1.3. External Interface Requirements

1.3.1. User Interfaces

The user interface is as straightforward as it can be. The user first completes a health form. A navigation bar in the user interface shows details about your program. All user data is contained on the dashboard.

1.3.2. Hardware Interfaces

The system is capable to run internet browser and have internet connection, you can use our website on Laptop, Smartphone and Desktop.

- Processor: Dual core
- Ram: 2.00 GB
- Internet connection

1.3.3. Software Interfaces

This website is an easy-to-use platform designed and developed for native use. Developed with React to design interfaces. The website run script is coded in Type Scrip and the theme is managed by CSS and Bootstrap. Website backend is done in WordPress PHP with SQL Server database.

1.4. System Features

Following are the Primary features of the product. These features should be implemented. Without implementation of these features our system would be useless.

1.4.1. System Feature 1

1.4.1.1. Login with Credentials

The dietitian must register first to create their profile and to give services to the users,

1.4.1.2. Description and Priority

This is the first step and the most crucial part. Without fill the appointment foam user will not able to connect with the dietitian. So, it is on the highest priority

1.4.1.3. Stimulus/Response Sequences

The user will open the website by searching it on any search engine. On opening user direct, go to home page where he has get all the services which we offer to put his credentials.

1.4.1.4. Functional Requirements

Admin: The functional requirement will be Admin's Email and password

Dietitian: Create profile by adding personal information and specialization

User: Fill appointment foam to communicate with dietitian.

1.4.2. System Feature 2

1.4.2.1. Registration

Registration is also an important part of this application. Dietitian has to register himself in order to provide the services provided by the application.

1.4.2.2. Description and Priority

User will register himself as a member to avail all services. All users will be registered as a member and given rights of only members.

1.4.2.3. Stimulus/Response Sequences

The registration page will have an option of new dietitian. The New user will click on that link and get registered as a member.

1.4.2.4. Functional Requirements

The Role given at the time of registration will only be of member. Only admin should have the authority to make another user with the roles of admin.

1.5. Nonfunctional Requirements

1.5.1. Performance Requirements

Performance should be very efficient. Chatbots and nutritional analysis are said to be very efficient. There should be no delay between processes. Otherwise, it is useless.

1.5.2. Safety Requirements

The data should be backed up on monthly bases, so there is no loss of data.

1.5.3. Security Requirements

Authentication and password management.

- Authorization and role management.
- Audit logging and analysis.
- Network and data security.
- Code integrity and validation testing.
- Cryptography and key management.
- Data validation and sanitization.

1.5.4. Business plan

Promotion and awareness are very important to connect the user with website, our team member running ads on social media on daily bases and doing SEO to rank the website on the top searches and contract the user physically as well.

1.6. Domain Requirements

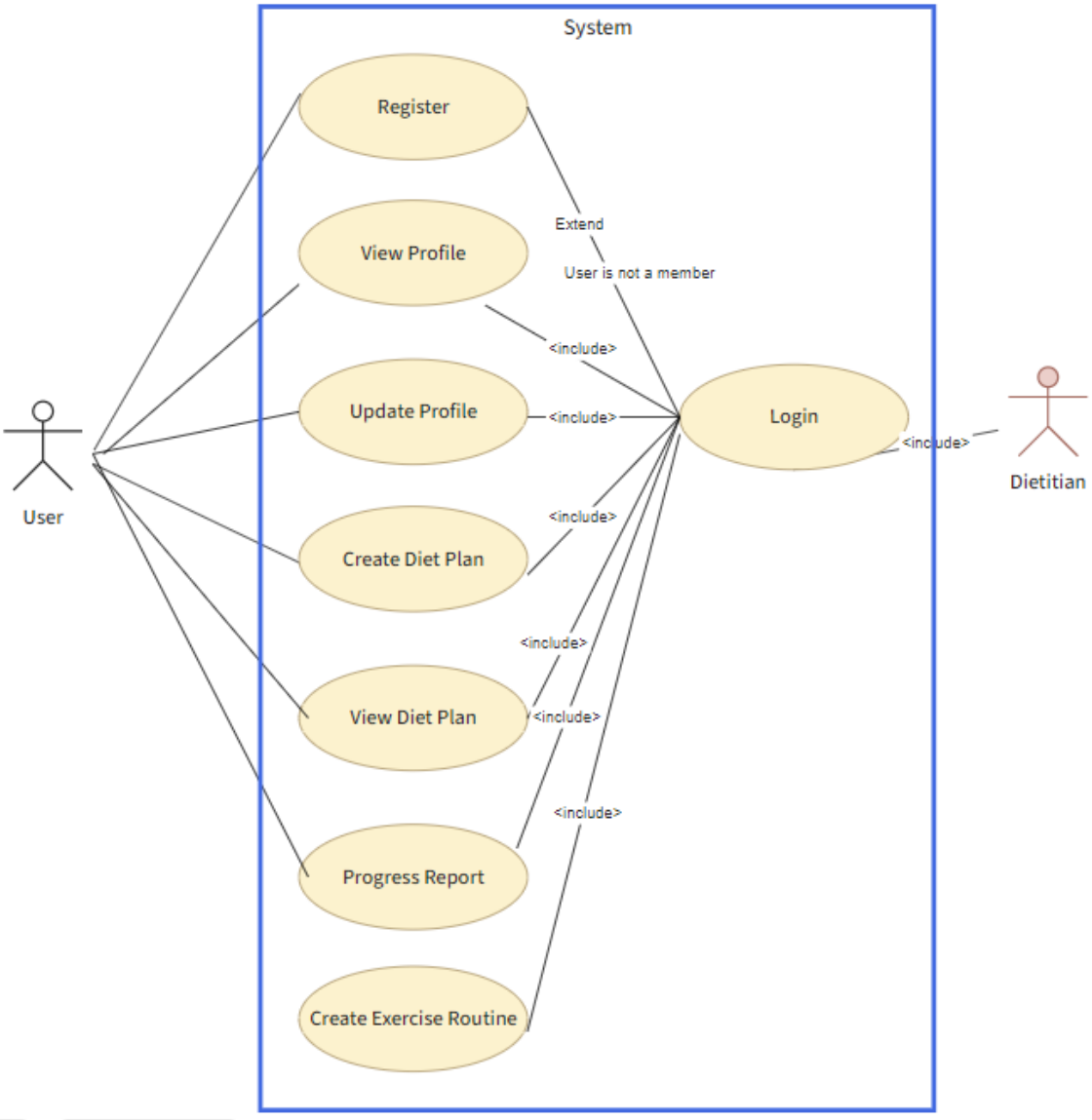
Domain of the website is authentic and secure.

Chapter 3

Use Case Analysis

Use Case Analysis

3.1. Use Case Model

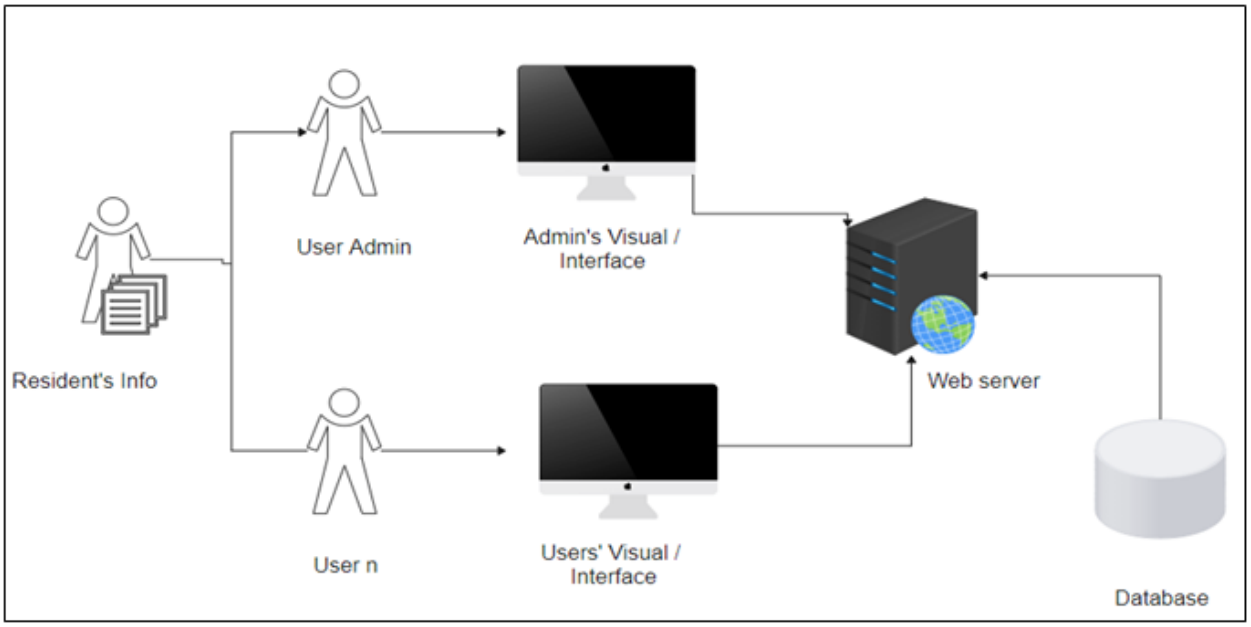


Chapter 4

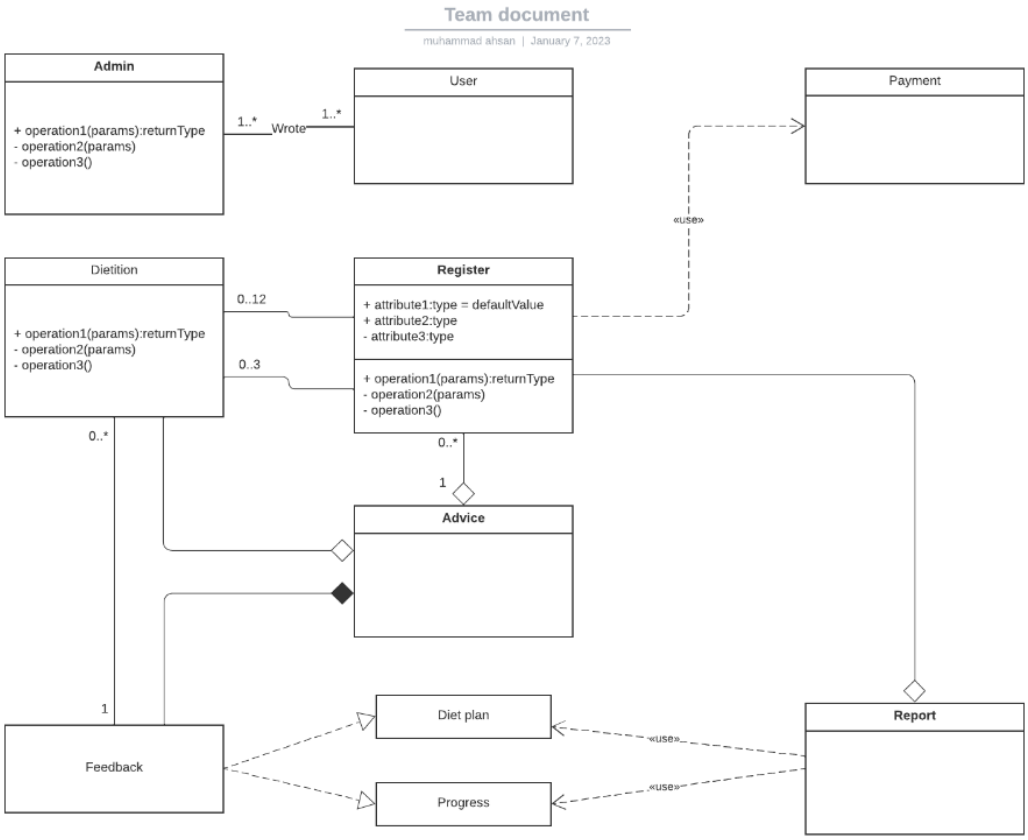
System Design

System Design

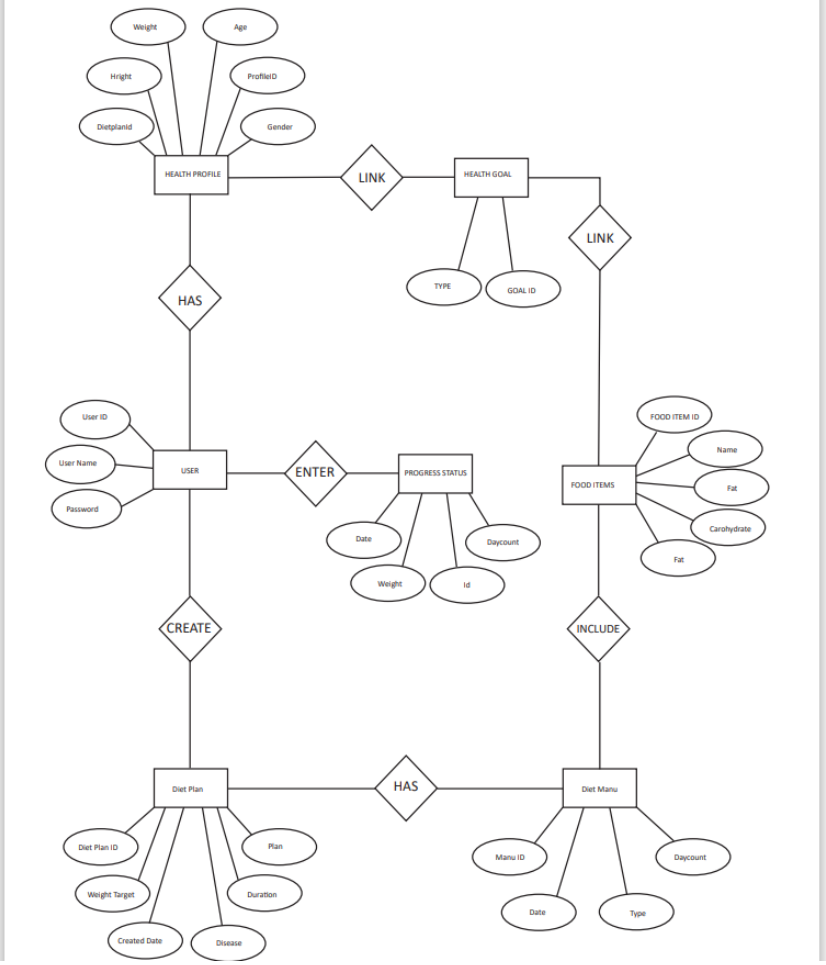
4.1. Architecture Diagram



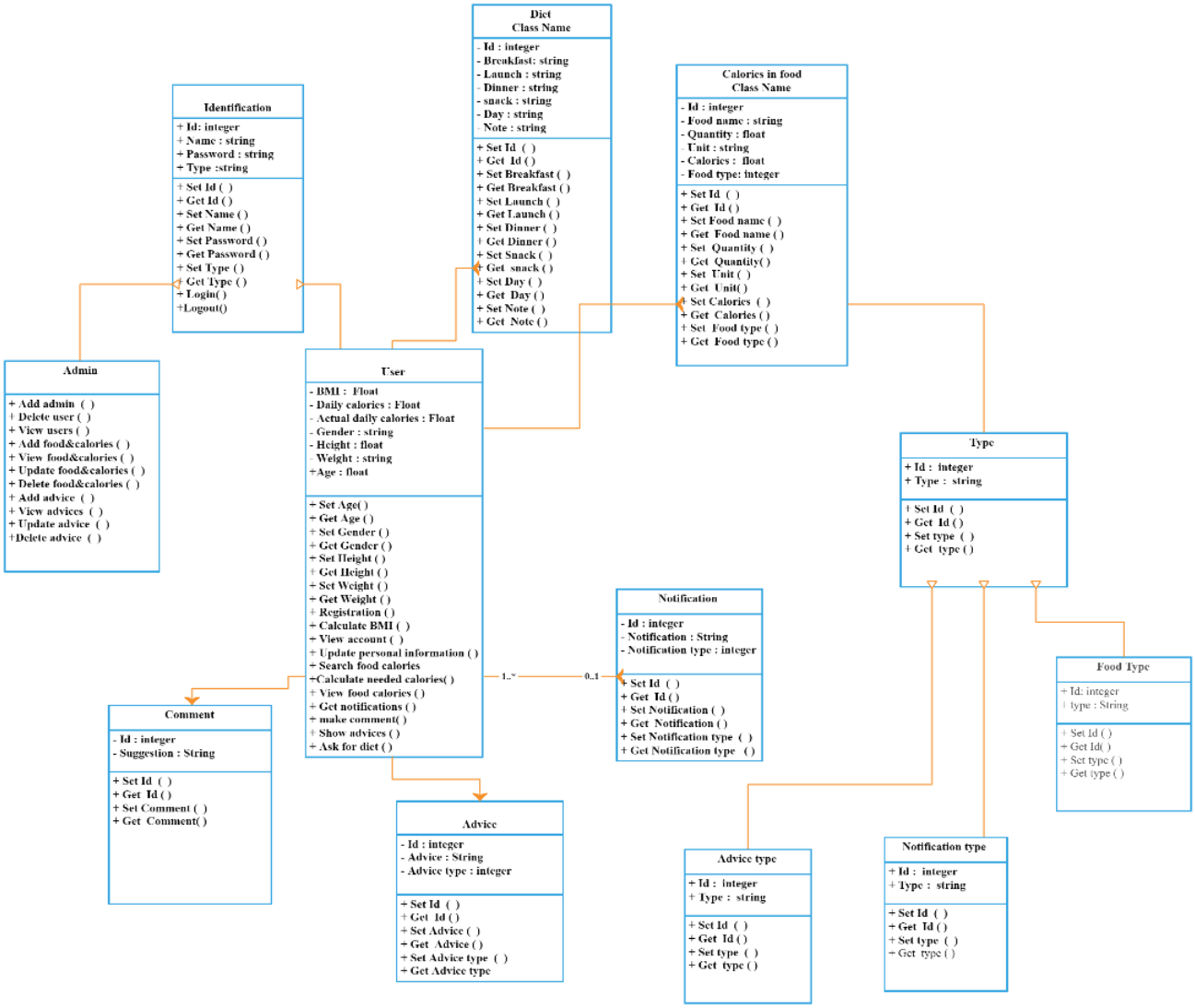
4.2. Domain Model



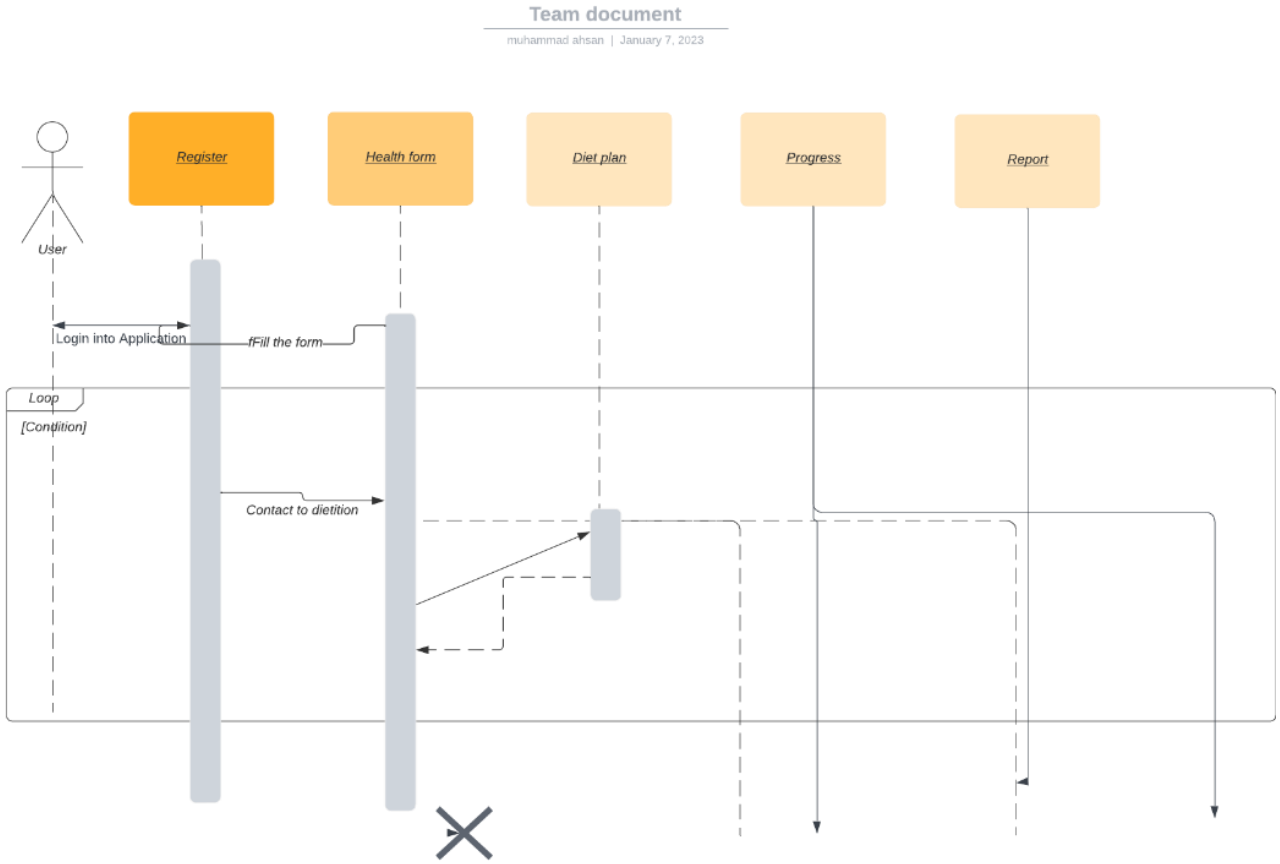
4.3. Entity Relationship Diagram with data dictionary



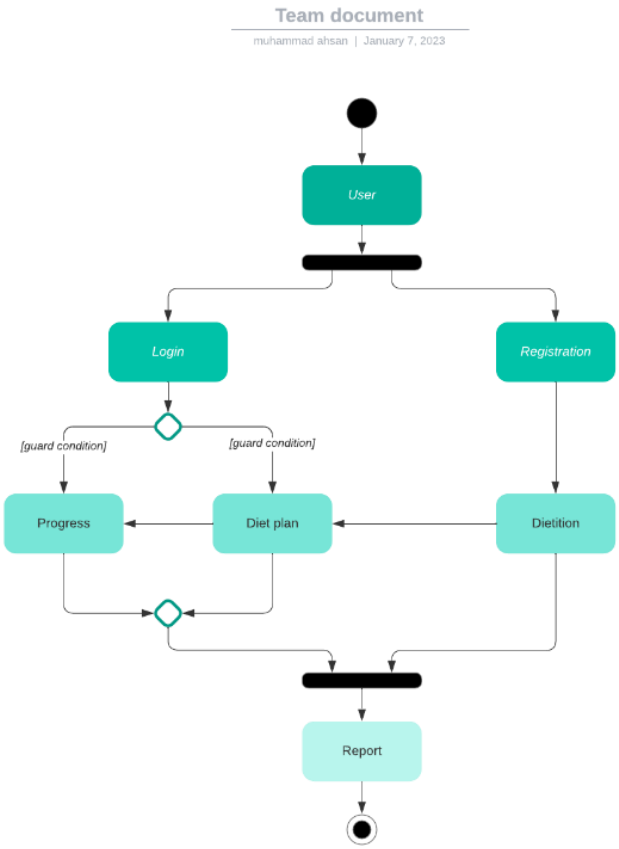
4.4. Class Diagram



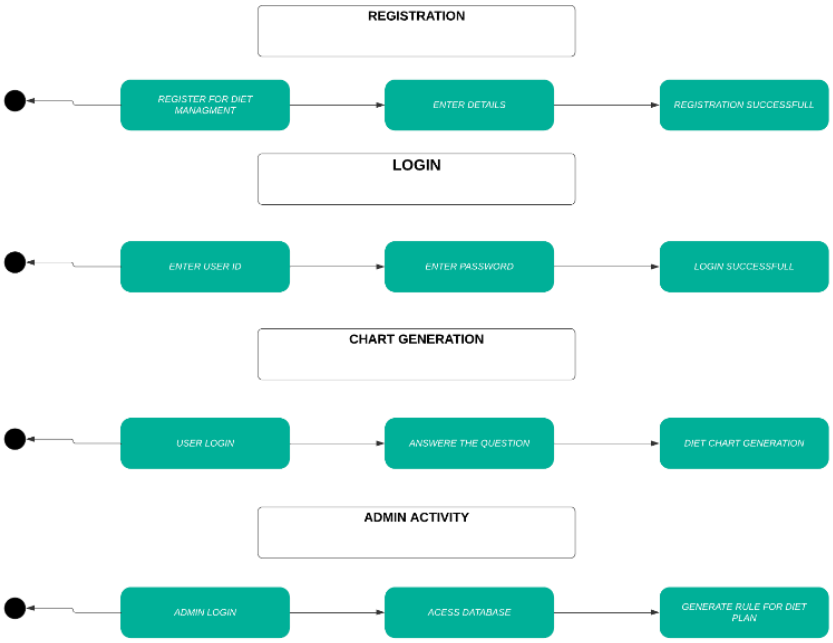
4.5. Sequence / Collaboration Diagram



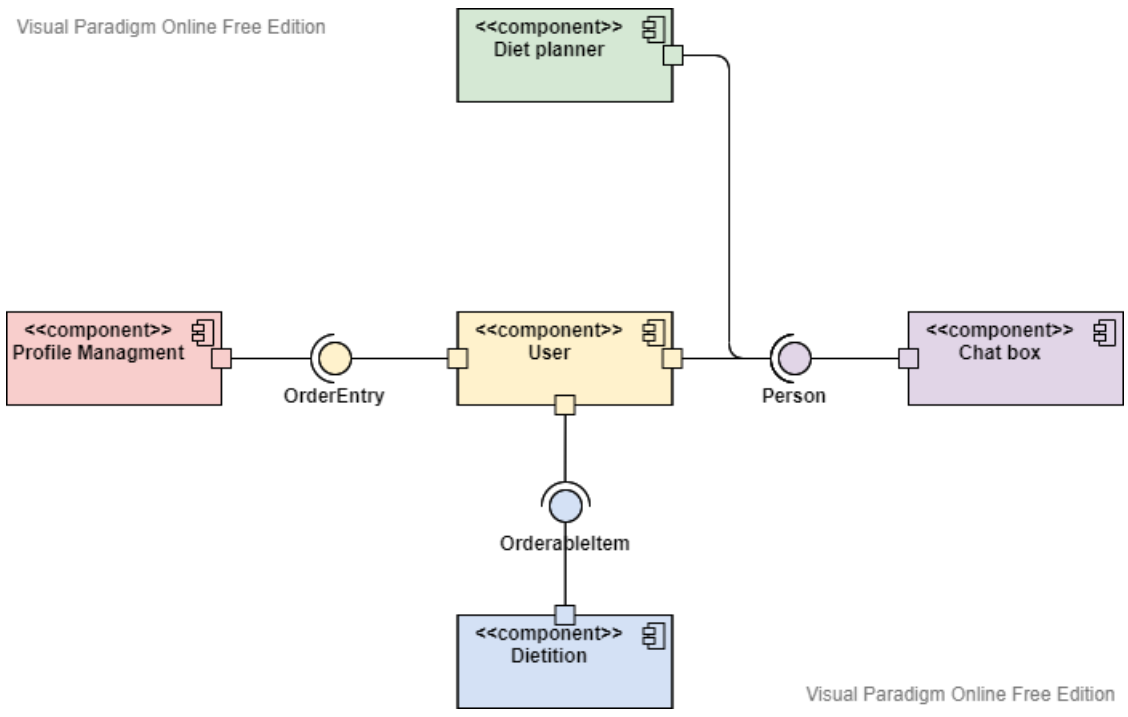
4.6. Activity Diagram



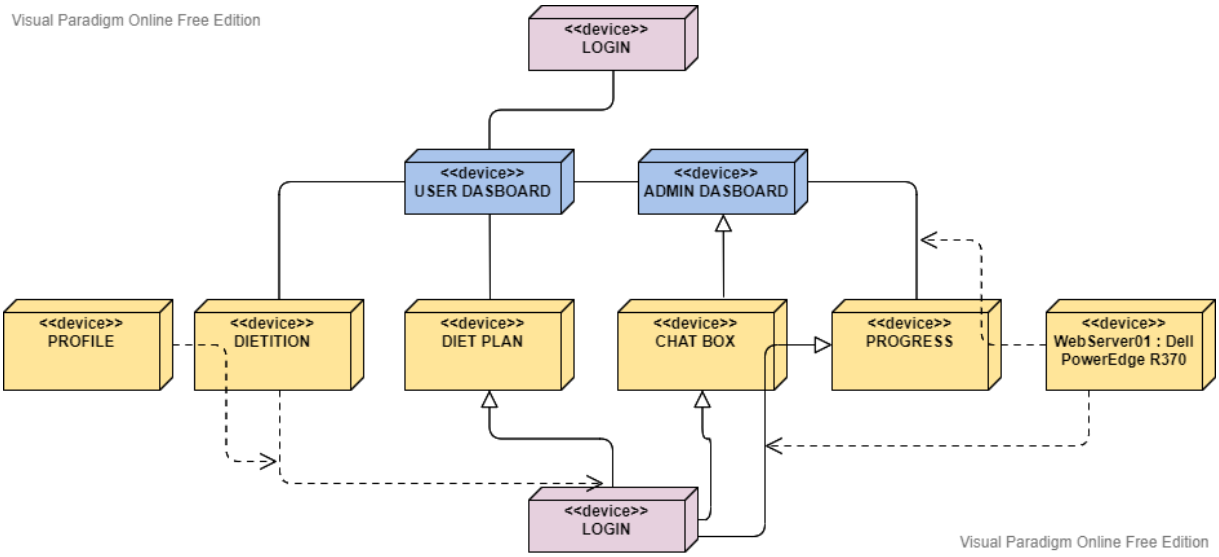
4.7. State Transition Diagram



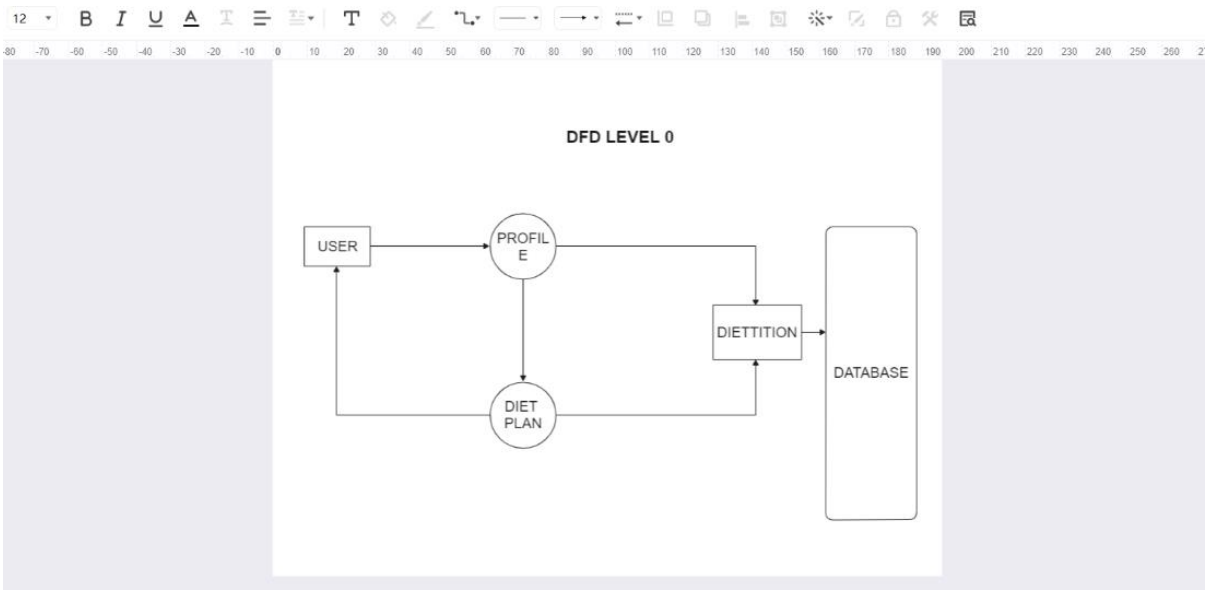
4.8. Component Diagram



4.9. Deployment Diagram



4.10. Data Flow diagram [*only if structured approach is used - Level 0 and 1*]



Chapter 5

Implementation

Implementation

This document describes a project implementation for developing a project website. The project implements laravel, PHP, HTML, CSS, JavaScript, and other analytics technologies. This project can be run on phones, laptops, and devices.

5.1. Important Flow Control/Pseudo codes

```
function generateDietPlan(userProfile):
    dietPlan = new DietPlan()

    // Calculate recommended calorie intake based on user profile
    calorieIntake = calculateCalorieIntake(userProfile)

    // Generate meals based on calorie intake and user preferences
    meals = generateMeals(calorieIntake, userProfile.preferences)

    // Add meals to diet plan
    dietPlan.addMeals(meals)

    // Apply any additional restrictions or modifications to the diet plan
    dietPlan.applyRestrictions(userProfile.restrictions)

    // Return the generated diet plan
    return dietPlan
```

5.2. Components, Libraries, Web Services and stubs

- **Server:** Server will the place where system is installed as well dashboard.
- **Android/PC**: These devices will be used to run application.
- **Internet browser**: IB will be the place where application will run.

5.3. Deployment Environment

The application will be installed on server of windows servers. The database will be SQL server 2014.Database can be managed by database manager in the SQL server.

5.4. Tools and Techniques

The tools that are required are Listed below:

1. PHP Laravel
2. SQL Server
3. jQuery, laravel, CSS, Html, Bootstrap

5.5. Best Practices / Coding Standards

Stable requirements and scope, defined organizational structure, systems, and roles, planned commitments, defined scope and mission, defined life cycle and milestones, ad placement, and structure data setup.

5.6. Version Control

laravel new version is used. The Microsoft SQL Server is2014 version.

Chapter 6

Testing and Evaluation

Chapter 6: Testing and Evaluation

Verifying that the AI Diet Consultant Management System (Health Hive) appropriately handles various scenarios and user interactions is done through use case testing. It seeks to verify that the program performs as planned and satisfies user requirements. Consider the following probable use cases while testing your project:

6.1. Use Case Testing

User Registration and Profile Creation:

- Test user registration process, including account creation, email verification, and login functionality.
- Verify that user profiles are created correctly with all necessary information stored accurately.

Input Data Validation:

- Test the system's ability to handle different inputs for user characteristics such as age, gender, height, weight, and physical activity level.
- Validate that the system handles invalid or out-of-range inputs appropriately and provides relevant error messages or notifications to the user.

Personalized Diet Recommendations:

- Test the AI Dietitian's ability to generate personalized diet recommendations based on user inputs.
- Verify that the system provides accurate and relevant recommendations aligned with the user's goals, dietary restrictions, and nutritional needs.

Prescribed Diet Plans:

- Test the generation and presentation of prescribed diet plans based on user information and AI recommendations.
- Verify that the diet plans include appropriate meals, portion sizes, nutritional information, and any specified dietary requirements.

Nutritionist Consultation:

- Test the functionality for users to request and schedule consultations with human nutritionists.
- Validate that the system properly handles the scheduling process, notifications, and communication between users and nutritionists.

Medication Recommendations and Purchase:

- Test the system's ability to provide recommendations for medications based on specific health concerns or goals.

Security and Privacy:

- Test the application's security measures, including data encryption, access controls, and protection against common vulnerabilities.
- Validate that user data is handled securely and that appropriate privacy settings are in place

6.2. Equivalence partitioning

In order to make sure that test cases cover representative scenarios, equivalence partitioning is a software testing approach that requires breaking the input data into groups or partitions. Here's an example of equivalence partitioning for the AI Diet Consultant Management System (Health Hive)

- Age: Below 18 years, 18 to 60 years, above 60 years.
- Gender: Male, Female, Other/Prefer not to say.
- Height: Below 150 cm, 150 to 180 cm, above 180 cm.
- Weight: Below 50 kg, 50 to 100 kg, above 100 kg.
- Physical Activity Level: Sedentary, Moderately Active, Active.

6.3. Boundary value analysis

A testing method known as boundary value analysis focuses on examining the borders and edge cases of input data. Here is a brief illustration of boundary value analysis for the Health Hive AI Diet Consultant Management System.

- Age: Minimum age (e.g., 0, 17), Maximum age (e.g., 150, 61).
- Height: Minimum height (e.g., 0 cm, 149 cm), Maximum height (e.g., 300 cm, 181 cm).
- Weight: Minimum weight (e.g., 0 kg, 49 kg), Maximum weight (e.g., 1000 kg, 101 kg).
- Physical Activity Level: Lowest activity level (e.g., no exercise, -1), Highest activity level (e.g., very high activity, 6).

6.4. Data flow testing

Certainly! Here's a concise version of data flow testing considerations for the AI Diet Consultant Management System (Health Hive):

- Input Data Validation: Test handling of different user inputs and validation of data integrity.
- Data Transformation and Processing: Verify accurate data transformation and calculations.
- Personalized Recommendations: Test flow from user inputs to AI Dietitian for generating personalized recommendations.
- Prescribed Diet Plans: Ensure accurate transformation of recommendations into prescribed diet plans.
- User Profiles and Database Interaction: Test proper storage, retrieval, and modification of user profile data.
- Nutritionist Consultation and Communication: Verify accurate handling of consultation requests and communication between users and nutritionists.
- Medication Recommendations and Purchase: Test accurate retrieval and presentation of medication data, as well as secure transaction handling.

- Error and Exception Handling: Test detection and handling of errors or exceptions related to data flow.

6.5. Unit testing

- AI Dietitian Component: Test the accuracy of the AI algorithms for generating diet recommendations.
- Diet Plan Generation Component: Validate the correctness of the diet plan generation algorithm based on user characteristics and goals.
- User Profile Management Component: Verify the functionality of creating, updating, and retrieving user profiles.
- Nutritionist Consultation Component: Test the scheduling and management of nutritionist consultations.
- Medication Recommendation Component: Validate the accuracy of medication recommendations based on specific health concerns or goals.
- Input Validation and Error Handling: Verify the system's ability to handle invalid inputs and error conditions gracefully.
- Integration Testing: Test the seamless interaction and data flow between different components.
- By conducting unit testing for each of these components, you can ensure their individual functionality, accuracy, and integration within the AI Diet Consultant Management System.

6.6. Integration testing

Check how well your system's various parts are integrated, including the AI model, database, user interface, and external services (if applicable). Check sure every component communicates effectively and functions as a single unit.

6.7. Performance testing

Check the system's performance under various loads and circumstances. To make sure it functions well even with many concurrent users, test its response time, processing speed, and resource utilization.

6.8. Stress Testing

Stress testing allows you to pinpoint performance concerns, assess system stability, and confirm that the system can withstand large loads without sacrificing usability or data integrity.

- Simulate high user loads to test concurrent user handling.
- Test performance under heavy data processing to evaluate system efficiency.
- Assess resource utilization to identify bottlenecks or limitations.
- Conduct long-duration testing to assess stability and robustness.
- Test error and exception handling to ensure graceful recovery.
- Evaluate scalability to handle increased loads.
- Test failover and recovery to ensure system resilience.

Chapter 7

Summary, Conclusion and Future Enhancements

Summary, Conclusion & Future Enhancements

7.1. Project Summary

AI based diet consultant management system called Health Hive offers individualized diet advice and consultation. Users give the system's AI Dietitian their age, gender, height, weight, and degree of physical activity in order for it to generate customized food recommendations. Additionally, the portal enables users to work with nutritionists, adhere to dietary guidelines, and buy drugs to address particular health issues or objectives. Health Hive has been thoroughly tested for accuracy and usefulness, prioritizes data security, and has an intuitive user interface. Through individualized recommendations, it seeks to improve users' overall health and well-being while empowering them to make informed nutrition selections.

7.2. Achievements and Improvements

Achievements of the Project:

- Personalized diet recommendations based on user inputs.
- Seamless integration of nutritionist consultation.
- Generation of customized diet plans for specific health goals.
- Medication recommendations for weight management and health concerns.

Improvements for Future Development:

- Enhance AI algorithms for more accurate recommendations.
- Expand nutritionist network for diverse expertise.
- Implement advanced tracking and monitoring features.
- Integrate with wearable devices for real-time data analysis.
- Incorporate user feedback and rating system for continuous improvement.

7.3. Critical Review

- Lack of transparency in underlying algorithms and methodologies.
- Limited availability of nutritionists for personalized consultation.

- Need for features to improve user engagement and motivation.
- Importance of thorough validation and diverse validation data.
- Integration with physical activity tracking for a holistic approach.

Addressing these areas would enhance the project's effectiveness, transparency, and user experience.

7.4. Lessons Learnt

- Prioritize user needs and feedback.
- Adopt iterative development for continuous improvement.
- Conduct rigorous testing and validation.
- Collaborate with domain experts for accuracy.
- Ensure data security and privacy.
- Emphasize continuous improvement.

Applying these lessons enhances project effectiveness and user satisfaction.

7.5. Future Enhancements/Recommendations

- Integration of a comprehensive nutritional database.
- Personalized meal planning based on dietary preferences.
- Allergen and ingredient tracking for dietary restrictions.
- Progress tracking and analytics for user monitoring.
- Social interaction and support features for community engagement.
- Integration with fitness apps and wearables for holistic health management.
- Multi-language support for broader accessibility.
- Development of a mobile application for on-the-go access.
- Implementation of long-term behavior change strategies.
- Continuous research and updates to align with current knowledge.

Implementing these enhancements would enhance the system's functionality, user experience, and long-term effectiveness.

Reference and Bibliography

Reference and Bibliography

https://www.youtube.com/watch?v=JUvtpBkz6RY
https://projectsgeek.com/2016/08/ai-diet-consultant-android-project.html
https://core.ac.uk/download/pdf/217364526.pdf

https://ijcrt.org/papers/IJCRT2104584.pdf

https://www.upgrad.com/blog/web-development-project-ideas-for-beginners/
https://www.teamwork.com/blog/web-development-projects/
https://theninehertz.com/blog/best-ideas/web-app-ideas
https://sdgs.un.org/goals
https://www.nhlbi.nih.gov/health/educational/lose_wt/eat/calories.htm

Appendices

Appendix A: Information / Promotional Material

A.1. Standee

Supervised by : Mahreen shahzadi

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ORIGINALITY REPORT

9%	5%	0%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

4%

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Internet Source

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	Off		