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An Undergraduate Internship on La Santé

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An Undergraduate Internship on La Santé

By

Hasin Anzum Mehtaj

Student ID: **1830947**

Autumn, 2022

Supervisor:

Rubayed Mehedi

Research and Development Officer

Department of Computer Science & Engineering

Independent University, Bangladesh

February 1, 2023

Dissertation submitted in partial fulfillment for the degree of Bachelor of Science in Computer Science and Engineering

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

This is to certify that the report titled La Santé is completed by me, Hasin Anzum Mehtaj (1830947), submitted in partial fulfillment of the requirement for the Degree of Computer Science and Engineering from Independent University, Bangladesh (IUB). It has been completed under the guidance of Mr. Rubayed Mehedi (Supervisor). I also certify that all my work is original which I have learned during my internship. All the sources of information used in this project and report have been duly acknowledged in it.



1st February 2023

_____ _____

Signature Name Date

Hasin Anzum Mehtaj

_____

Name

Acknowledgment

First and foremost, I desire to express my deepest sense of gratitude to Almighty Allah, it is because of His mercy and blessing that I have come so far. It has been a great privilege to work for Techdojo Limited as an Intern. I have received so much support and encouragement from the entire Techdojo team who have years of experience in Software Development. I would like to thank the members of Techdojo for sharing their valuable time and knowledge which was essential for the completion of this report.

I express my gratefulness to my internal supervisor, Rubayed Mehedi. Research and Development Officer, Department of Computer Science and Engineering, Independent University, Bangladesh (IUB), for his invaluable instructions, continuous guidance, support, and motivation during my internship period, and preparation of this report.

I likewise, want to express my deepest gratitude to my external supervisor and my mentor Ms. Shama Hoque for allowing me to be a part of this organization. Her support and leadership ability led to the driving force of this project.

My gratitude also extends to all other employees of Techdojo who helped me learn so much in my skill development process and made me fit right in the environment. Many Thanks to the co-developers of this project, Mohammad Abdullah Omar, Munjerin Hossain, and Sabah Ashraf for their time, effort, and expert skills.

Finally, I proudly acknowledge the great sacrifices, good wishes, moral support, fruitful advice, inspiration, and encouragement from my family members, relatives, and friends.

Hasin Anzum Mehtaj
February 2023

Letter of Transmittal

1st February 2023
Rubayed Mehedi
Research and Development Officer
Department of Computer Science and Engineering,
Independent University, Bangladesh

Subject: Letter of Transmittal for Internship Report, Autumn 2022

Dear Sir,
This is to inform you that I, Hasin Anzum Mehtaj (1830947) from the Internship Course of the Autumn 2022 Semester, Section 1, would like to submit my Internship report that is based on my internship program and the project I have worked on. My internship was conducted from 22nd September 2022 to 8th January 2023, and it has been completed at Techdojo Limited.

This report is based on my experience and the work I did at Techdojo Limited during my internship program. The primary goal was to gain experience from working in the software engineering industry and familiarize me with all the different technical fields of the company, including research and development, and software development, and to get acquainted with development processes and practices.

Over the period of my internship at Techdojo Limited, I had to learn and adapt to the evolving technologies being used in different situations and requirements and to be able to apply them in real-life projects. I hope the following report can achieve your approval and is adequate.

Sincerely,
Hasin Anzum Mehtaj, 1830947
Department of Computer Science and Engineering
Independent University, Bangladesh

Evaluation Committee

.....

Signature

Sabrina Alam

Name

Sabrina Alam

Internal Examiner-1 / Panel Member-1

.....

Signature

Syed.

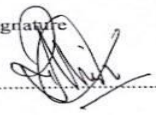
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Md Abu Sayed

External Examiner-2 / Panel Member-2

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Signature



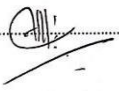
Name

Rubayeed Mehedi

Supervisor of the intern

.....

Signature



Name

.....

Head, Department of Computer Science & Engineering

Abstract

With the development of so many efficient applications out there in the mobile application market, people are spending more time on their phones than ever. While this does seem like a good way to spend time; it does put human health at high risk as their bodily movements have declined, to top it off ever since the start of the Coronavirus pandemic, people are being asked to stay home which has brought in a bigger decline in bodily movements; some people do exercise at home to stay healthy but significant others have become lazy and have put their health at a greater risk.

To deal with such a situation, a certain group of developers at Techdojo; including myself, have decided to work on a web application that involves the users staying involved in healthy exercise as well as being fit. It has been decided to call the app, "La Santé". The background, scope, objectives, and other analytical points about this fitness tracker will be discussed in detail in this report. The Company Profile of Techdojo will also be addressed.

Contents

	Attestation	**1**
	Acknowledgment	**2**
	Letter of Transmittal	**3**
	Evaluation **Committee**	**4**
	Abstract	**5**
1	**Introduction**	**14**
	1.1 Background of the Work	14
	1.2 Objectives	15
	1.3 Scopes	15
	1.4 Company Profile	16
	1.5 Problem Analysis	18
2	**Literature Review**	**22**
	2.1 Relationship with Undergraduate Studies	22
	2.2 Related works	23

Contents **Contents**

3	**Project Management & Financing**	**31**
	3.1 Work Breakdown Structure	31
	3.2 Process/Activity wise Time Distribution	32
	3.3 Gantt Chart	33
	3.4 Process/Activity-wise Resource Allocation	35
	3.5 Estimated Costing	37
4	**Methodology**	**39**
5	**Body of the Project**	**44**
	5.1 Work Description	44
	5.2 Requirement Analysis	46
	5.3 System Analysis	51
	5.3.1 Six-Element Analysis	51
	5.3.2 Feasibility Analysis	52
	5.3.3 Problem Solution Analysis	54

5.3.4 Effect and Constraints Analysis 55

5.4 System Design 55

5.5 Implementation 62

5.6 Testing 63

6 Results & Analysis 65

7 Project as Engineering Problem Analysis 76

7.1 Sustainability of the Project/Work 76

7.2 Social and Environmental Effects and Analysis 77

7.3 Addressing Ethics and Ethical Issues 78

8 Lesson Learned 80

8.1 Problems Faced During this Period 80

8.2 Solution to those Problems 80

9 Future Work & Conclusion 80

9.1 Future Works 81

9.2 Conclusion 82

Bibliography **83**

List of Figures

1.1 Company Logo 16

2.1 HIIT Workouts Screenshot 23

2.2 Abs Workout Screenshots 24

2.3 Sworkit Fitness and Workout 25

2.4 Next.js Logo 26

2.5 Node.js and Express Logo 27

2.6 MongoDB Logo 28

2.7 Git Logo 29

2.8 Heroku Dashboard 30

3.1 Work Breakdown Structure for La Santé 31

3.2 Critical Path Method for La Santé 32

3.3: Process-wise Time Distribution Chart 33

3.4: Gantt Chart for La Santé 34

3.5: Chart for Estimated Costing 39

Contents **Contents**

4.1: Software Development Life Cycle (SDLC) 40

4.2: Extreme programming Methodology 42

5.1 Rich Picture of La Santé 55

5.2: Use Case Diagram for Registration/Login 56

5.3: Use Case Diagram for BMI Calculation 56

5.4: Use Case Diagram for Diet Chart Generation 57

5.5: Use Case Diagram for Workout Routine 57

5.6: Use Case Diagram for Progress Report 58

5.7: Activity Diagram for User 59

5.8: The architecture of system 60

5.9: Data model of La Santé 61

6.1 SWOT Analysis 68

6.2: Landing Page of La Santé 69

6.3: Login Page of La Santé 70

6.4: About Section La Santé 71

6.5: BMI Calculation Page of La Santé 72

6.6: Chart and Routine Page of La Santé 73

6.7: Diet Chart of La Santé 74

6.8: Workout Routine of La Santé 75

6.9: Track Progress Page of La Santé 76

List of Tables

1.1: Problem Analysis 21

3.1: Table for Activity-wise Resource Allocation 36

3.2: Table for Estimated Costing 39

5.1: Functional Requirement- Registration 47

5.2: Functional Requirement- Login 47

5.3: Functional Requirement-BMI Calculation 48

5.4: Functional Requirement- Diet Chart 48

5.5: Functional Requirement- Workout Routine 49

5.6: Functional Requirement- Progress Report 49

5.7: Six-Element Analysis 52

5.8: Input of The System 63

5.9: Output of The System 64

6.1: Testing Results for Users 66

Chapter-1

1.1 Background of the work

Background with the development of so many addictive applications out there in the mobile app market, people are spending more time on their phones than ever. While this does seem like a good way to spend time; it does put the n health at high risk as their bodily movements are reduced. Also, their posture is affected as people tend to sit and look down at the phone screen or lie down on their side, resting the upper torso on their arm. These affect the joint areas of a person, especially a nape area.

To make matters worse ever since the start of the Coronavirus pandemic, people are being asked to stay home which has brought in a bigger decline in the bodily movement since their daily activity outside has come to a halt. While some people are conscious about their health and do adequate exercise to stay healthy, significant others have become lazy and have put their health at a greater risk. Even if they are not spending time on their mobile phone, they are still spending a lot of time doing something while sitting or lying down as they don't have any reason to move around in their homes.

To mediate such a situation, a group of developers from Techdojo; which also includes me, have decided to work on a mobile application that acts as a fitness tracker. The idea of the application is to help the users get his/her BMI calculated, receive a suitable diet chart and workout routine, and track their progress regularly.

The application will allow to user to initially register/log in and then go to the BMI calculator page and provide his/her mass in kilograms, and height in feet, which will get his/her BMI (Body Mass Index) calculated using the formula:

BMI=mass/(height*height)

The user then will be able to choose the type of plan he/she wants to view now, and a diet chart or workout routine will get generated right then based on the respective BMI that has been calculated for that individual user. The user will follow the chart and routine planned accordingly and will be

able to mark the checkboxes placed next to all the plans, which will calculate the calorie gained/lost based on the number of days the user is following the plans. This will be demonstrated with the help of a line chart of calories gained/lost against time per week.

1.2 Objectives

● **Make Users physically active:** The game will make users follow workout plans and stay fit and fine.

● **Keep track of Users' Following the Plans:** While the users are following the plans, that is the diet chart and workout routine, they'll be able to record their progress by marking the checkboxes placed next to all the plans of the week.

● **Progress Report:** There will be progress reports for both diet charts and workout routines generated as an authentic consequence of the user records. The progress reports will be calorie gained/lost against time per week line charts (following 7 days for diet charts will be equivalent to intaking 16800 calories, and for workout routines will be equivalent to burning 2000 calories).

1.3 Scopes

Features available to the user after the development of this mobile application:

➔ Homepage

➔ Get one's Body Mass Index (BMI) calculated.

➔ Receive a suitable diet chart

➔ Receive a suitable workout routine.

➔ View progress

➔ Edit user details

1.4 Company Profile



Figure-1.1: Company Logo

Background of the Company:

Techdojo [1] is a software consulting company based in Dhaka, Bangladesh. It was founded in the year of 2014. Techdojo is comprised of a small team of software craftsmen who learn, collaborate, and innovate together. They host regular live events (workshops, meetups & talks) that are geared towards sharing with the local community. Techdojo is a partner company of Tilosh Inc - a tech start-up in Silicon Valley.

Mission, Vision, and Values:

The company was set up to produce high-quality software products by training software engineers who can contribute locally and internationally. To engage local developer communities and encourage a culture of knowledge and skill transfer, Techdojo offers mentorship and internship programs besides hosting regular workshops and tech sessions.

Company Departments:

Techdojo maintains a flat organizational structure. Teams and responsibilities are generally formed and assigned around the nature and requirements of specific projects.

Product and Services:

Web Application Development: Full-stack JavaScript web application development and hosting

Mobile Application Development: Hybrid mobile application development for Android/iOS

Event Hosting: Host events aimed at sharing with the local community.

Operation Details:

The nature of work conducted at Techdojo is research and development-focused, using both cutting-edge and proven technologies as required for a given project. The Techdojo team works on a range of projects which include developing voting technologies for the US government, considerate video-audio conferencing apps, 3D reconstruction medical software, complex web, and mobile applications, and mobile-based games.

Advisors:

Dr. Ted Selker Inventor- HCI expert, IBM Fellow, Carnegie Mellon, Stanford, UC Berkeley, MIT Media Lab. Rodrigo Valdes- Geo Data and Maps Expert, Maps Administrator at Apple, Data Specialist at Google.

Partners of the Company:

Selker Design Research (USA), Tilosh, Inc. (USA), Tiempometa (Mexico).

Address and Contact Information:

Address: Jasimuddin, Uttara, Dhaka, Bangladesh.
Contact: contact@tech-dojo.org

1.5 Problem Statement (Analysis)

Process	Stakeholders	Concerns (Problems)	Analysis (Reason for the problems)	Proposed Solution
1. Calculating Body Mass Index (BMI).	1. User	1. The process might need some time and require privacy.	1. Calculations may need some time. 2. Everyone will be able to see the information that the user will initially provide.	1. Calculation will be immediate. 2. Data provided by the user will remain encrypted. 3. The data provided by the user will be visible to him/her only.

2. Generating diet chart.	1. Dietician 2. User	1. The process is lengthy. 2. The process is time-consuming. 3. The process consists of mundane tasks.	1. Making the chart may require some time as a lot of factors should be kept in mind (for example age, pregnancy, diseases, etc.). 2. Providing the chart to the user may also be time-consuming due to factors like technical glitches and internet issues.	1. The system will be connected to professional dieticians who will get notified as soon as a new user provides information for BMI calculation. 2. The user can directly communicate with the dietician and view the chart as soon as it is made.

3. Generating workout routine.	1. Fitness Trainer 2. User	1. The process is lengthy. 2. The process is time-consuming. 3. The process consists of mundane tasks.	1. Making the routine may require some time as a lot of factors should be kept in mind (for example age, pregnancy, diseases, etc.). 2. Providing the routine to the user may also be time-consuming due to factors like technical glitches and internet issues.	1) The system will be connected to professional fitness trainers who will get notified as soon as a new user provides information for BMI calculation. 2. The user can directly communicate with the trainer and view the routine as soon as it is made.

4. Generating progress report	1. The system 2. User	1. The process is lengthy. 2. The process is time-consuming. 3. The process consists of mundane tasks. 4. The report generated will not be interactive as there is no way to make a comparison with previous data.	1. Making the report may require some time as it involves calculation. 2. Providing the report to the user may also be time-consuming due to factors like technical glitches and internet issues. 3. Everyone will be able to see the report.	1. Report generation will be immediate. 2. The report provided by the system will be visible to the user only.

Table-1.1: Problem Analysis

Chapter-2

Literature Review

2.1 Relationship with Undergraduate Studies

The courses that I studied while pursuing my CSE degree are assisting me in implying the internship project. A few such courses are as follows:

1. Data Structure (CSE203): This course was about teaching how to handle and manipulate complex arrays, objects, classes, objects of the array, nested arrays, nested objects, etc. As “La Santé” involves many complex data structures, the skills gained from this course made handling them much easier.

2. Object-Oriented Programming (CSE213): This courthouse a deep dive into classes and their object of programming. It also taught me how to write modular programs which made codes less repetitive and more reusable. It helped to design the “La Santé” code in a modular format. Also, as the application grew bigger, this practice helped avoid writing new modules from scratch by using parts of old modules and adding new functions to them.

3. Database Management (CSE303): This is the course that taught me to draw the Entity Relationship Diagram (ERD), which helps me to understand how all the entities/parties are connected. It also taught me the rich picture, which is part of the internship project report and makes it simple to understand.

4. System Analysis and Design (CSE307): This is again a course that taught me activity diagrams, physical, logical, communication, sequence, state chart, and UML diagrams, which are all part of the internship report, and makes understanding easy.

5. Web Application and the Internet (CSE309): This is the most integral course taught as this taught me HTML, CSS, and JavaScript, which are what we use to build the structure of a general static website.

2.2 Related works

Since the internet is yet believed to be a luxury failing to cater to all people's needs in our country, not everyone is familiar with web applications in Bangladesh, that too about body fitness and well-being. Though the pandemic forced us to be all digital and independent, certain web applications have started gaining fame, and such few relatable ones are:

1. HIIT Workouts: This is a fitness planner and timer phone application that allows the user to choose what level of exercise that they want to do while using the app, and the user can choose from the options Easy, Medium, and Hard, based on the user's preference, the app will start demonstrating workout types, with names, the number of times they should be performed, the duration for the user to follow and workout while syncing in with the app itself. Breaks are included in the process when required.

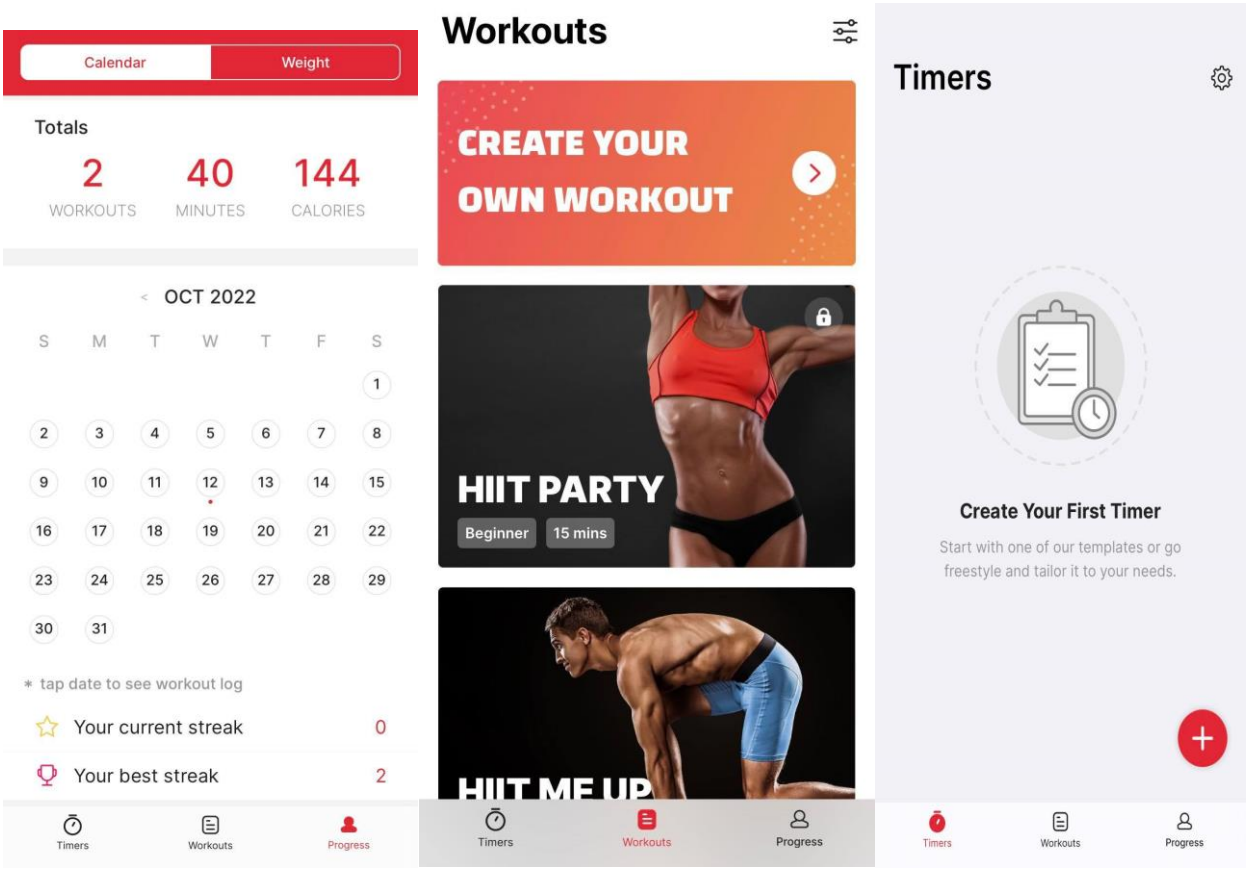


Figure-2.1: HIIT Workouts Screenshot

Link:

https://apps.apple.com/app/id891535485?fbclid=IwAR2ZuFZNxvlYdGJaJpfACCzDz8Dtrr9XqvxRETmoaHecoJghtqJgTxwXpOw

2. Abs Workout: This is also a phone application that allows the user to follow professionally designed workout routines and previously set up plans and generally track the progress without demonstrating any statistics or comparison.

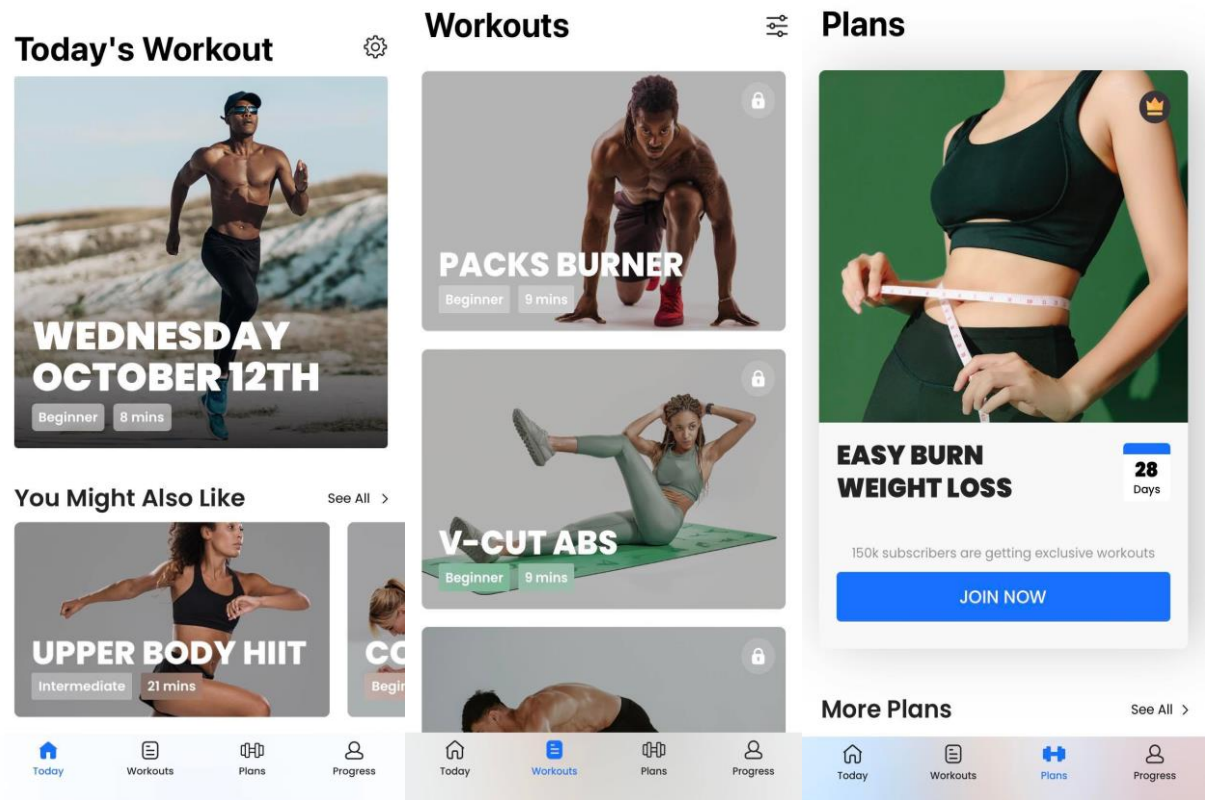


Figure-2.2: Abs Workout Screenshots

Link:

https://apps.apple.com/app/id860332805?fbclid=IwAR0EzbglEejXhchFcIJxx2BEHOnLOPnyZi2fL3hHnOonhGQEUGDXl3x_9fM

3. Sworkit Fitness and Workout: This is another phone application that allows users to work out based on their preferred duration and exercise materials they have, where they can follow a proper workout routine and previously set up plans.

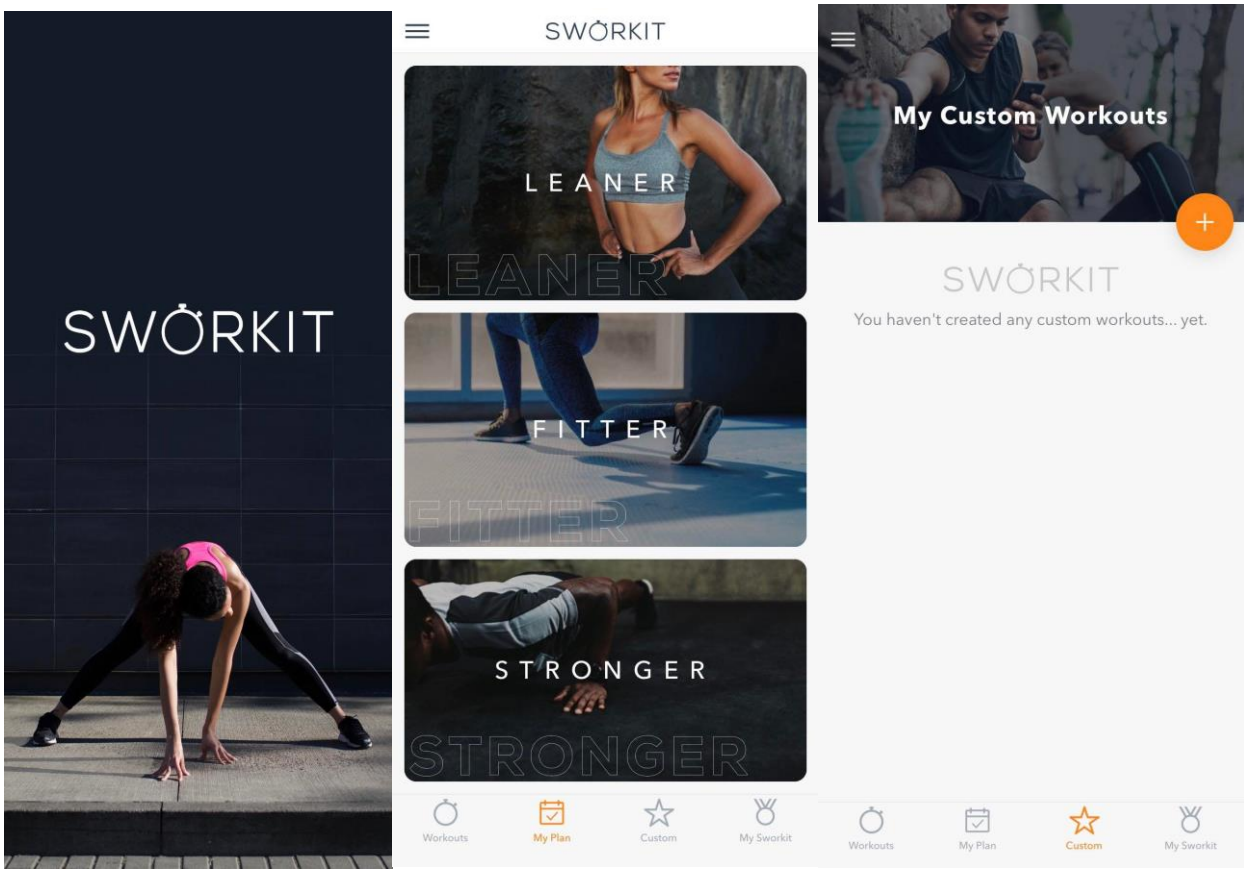


Figure-2.3: Sworkit Fitness and Workout

Link: https://apps.apple.com/app/id527219710?fbclid=IwAR27GdIWKDtowTkfJavHNiZ30kt1-XxjC2HqEUeEQTEgpt795NkXr3gg3X4

Development Tools

In the development of my project, “La Santé” several modern application development tools are being used, and they are:

Next.js:



Figure-2.4: Next.js Logo

Next.js is an open-source web development framework created by Vercel enabling React-based web applications with server-side rendering and generating static websites. React documentation mentions Next.js among "Recommended Toolchains" advising it to developers as a solution when "Building a server-rendered website with Node.js".[4] Where traditional React apps can only render their content in the client-side browser, Next.js extends this functionality to include applications rendered on the server side.[5]

Node.js and Express.js:



Figure-2.5: Node.js and Express Logo

Node.js (Node) [6] is an open-source development platform for executing JavaScript code server-side. It is useful for developing applications that require a persistent connection from the browser to the server and are often used for real-time applications such as chat, news feeds, and web push notifications.

Node.js is intended to run on a dedicated HTTP server and to employ a single thread with one process at a time. Node.js applications are event-based and run asynchronously. Code built on the Node platform does not follow the traditional model of receive, process, send, wait, and receive. Instead, Node processes incoming requests in a constant event stack and sends small requests one after the other without waiting for responses.

Express.js (Express) [7] is a web framework that lets us structure a web application to handle multiple different HTTP requests at a specific URL. Express is a minimal, open-source, and flexible Node.js web app framework designed to make developing websites, web applications, &

APIs much easier. It helps to respond to requests with route support so that responses can be written to specific URLs.

MongoDB:



Figure-2.6: MongoDB Logo

MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL) which is deemed non-free by several distributions.[8]

Git:



Figure-2.7: Git Logo

Git[9] is a free, open-source distributed version control system. It is used for tracking changes in source code during software development. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files. Its goals include speed, data integrity, and support for distributed, non-linear workflows Version control is a system that records changes to a file, or set of files, over time so that specific versions can be recalled later.

Other Non-Development Tools

These are tools that are helping us to ease communication, keep track of workflow, repository hosting, etc.

Heroku:

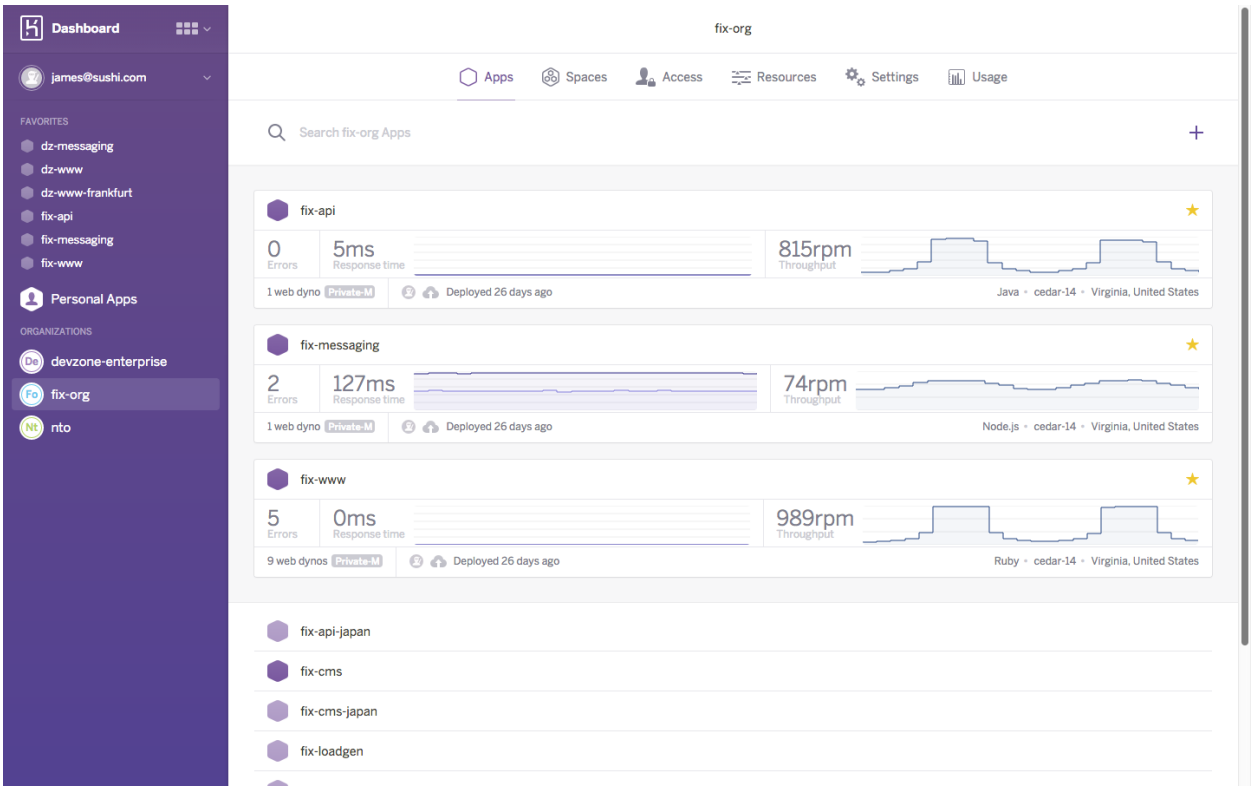


Figure-2.8: Heroku Dashboard

Heroku[10] is a platform as a service (PaaS) that enables developers to build, run, and operate applications entirely in the cloud.

As “La Santé” is developing, we need to deploy our node server to the cloud for testing and development purposes. Another main reason to deploy to the cloud is so that while in development, our mobile devices can interact with the server endpoints. Heroku was our best choice as it is very fast to set up and completely hassle-free when deploying our server code to the cloud.

Chapter-3

Project Management Plan and Financing

3.1 Work Breakdown Structure (WBS)

Work Breakdown Structure (WBS) is a classified structure that demonstrates a project's breakdown into smaller segments. We will introduce a WBS for our project so that the work is coordinated. WBS covers a visual of all the scopes, risks, points of communication, responsibilities, and costs, and guarantees that it does not skip essential deliverables. For brainstorming and collaboration, it is the ideal tool for the team. In our WBS, we will use the top-down approach, which is given below:

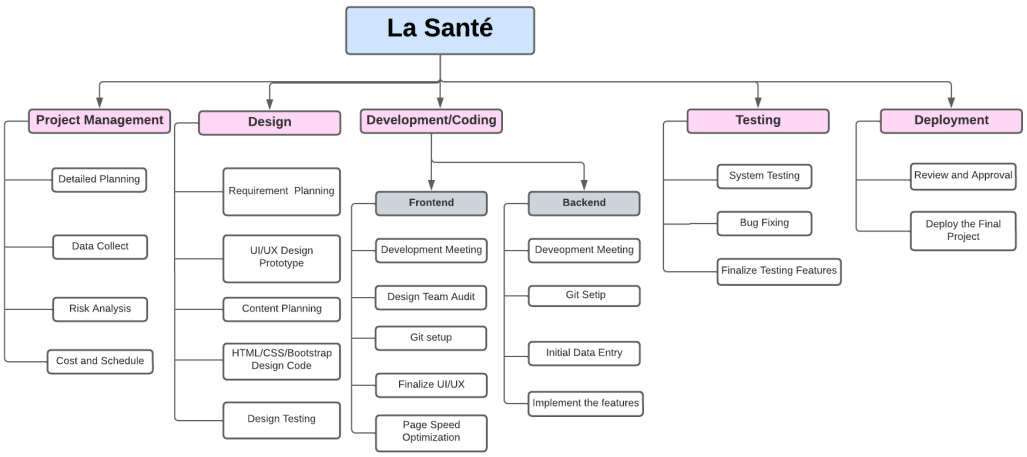


Figure-3.1: Work Breakdown Structure for La Santé

3.2 Process/Activity-wise Time Distribution

The estimated time required to end a project successfully defines process-wise time distribution which helps the developers to create a mind map about meeting deadlines. The most significant challenge in perfectly designing an application is time management. So, first and foremost, the features must be fixed beforehand, and implementation must be based on the context. Good time management allows an individual to complete more tasks in less time, reduces stress, and leads to professional success. Time distribution is greatly needed to complete any project.

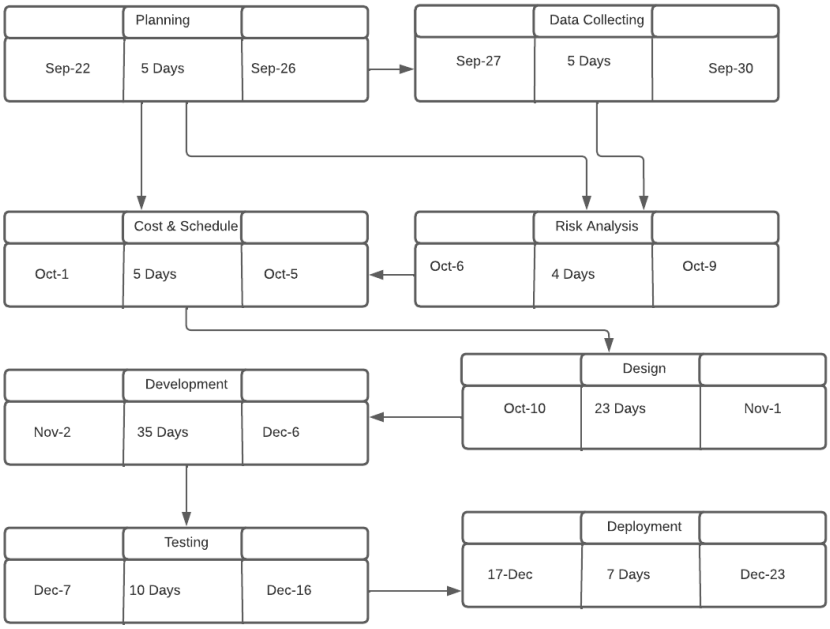


Figure-3.2: Critical Path Method for La Santé

The critical path method illustrates the following plan:

- Project planning: 4 days
- Data collection: 4 days

- Risk analysis: 4 days
- Cost and schedule: 2 days

Project management consists of four parts in total, and this is considered to be 16.7% of the total work. Next on we need 23 days for designing, which is 24.73% of the total work, and 35 days for development/coding which is 37.63% of the whole project. Then 10 days are required (10.75% of the work) for testing the project and lastly, 7 days (7.53% of the work) for the Deployment of the project.

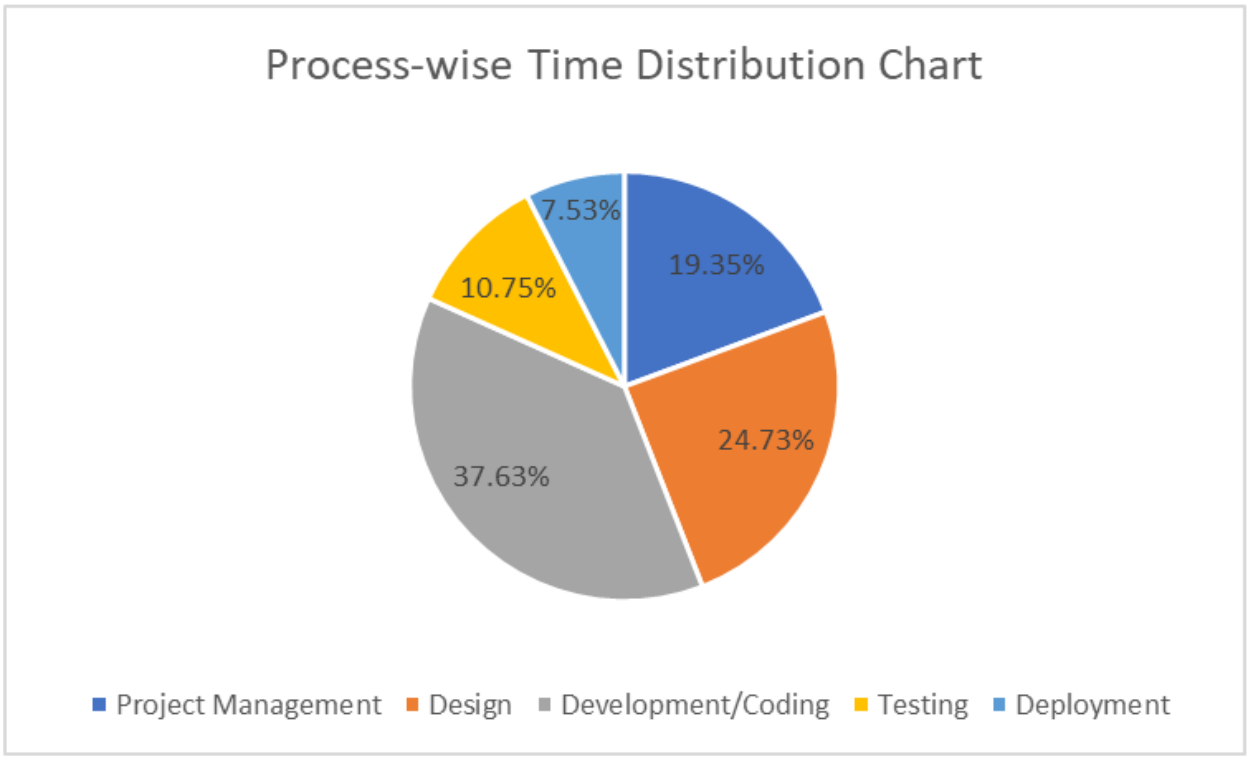


Figure-3.3: Process-wise Time Distribution Chart

3.3 Gantt Chart

Gantt charts provide a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format. It helps to determine how long the project should take to get implemented, which resources are needed, and plan tasks. It helps track the progress of the project. Also because of the pandemic situation, it is

very effective for remote teams. In this Gantt chart, the project activities are listed according to the start and finish dates. This Gantt chart includes Activity wise time distribution as well as resource allocation. A Gantt chart is used for the following activities:

- Establish the initial project schedule - who is going to do what, when, and the duration.
- Allocate resources - ensure everyone knows the tasks they are assigned to.
- Make project adjustments - the initial plan needs many adjustments.
- Monitor and report progress - helps to stay on schedule.
- Control and communicate the schedule - clear visuals for stakeholders and participants.
- Display milestones - shows key events.

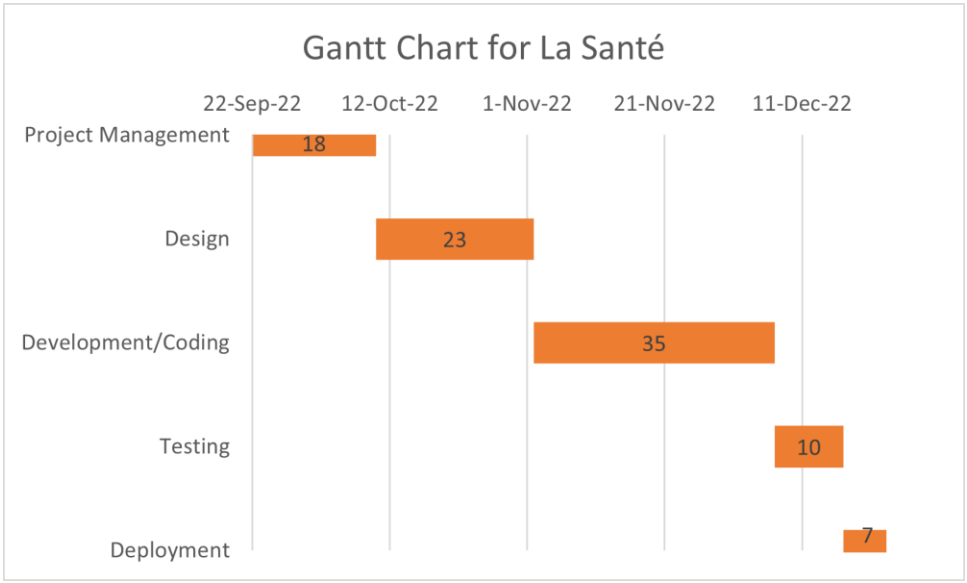


Figure-3.4: Gantt Chart for La Santé

In this Gantt chart, we have highlighted 5 steps of the development process:

- Project management: 18 days
- Designing: 23 days
- Development/Coding: 35 days
- Testing: 10 days
- Deployment: 7 days

3.4 Process/Activity-wise Resource Allocation

It is the process of assigning assets in a manner that supports your team's goals. For this project, the developers are considered the primary resource followed by the computers used in the office, and the servers. Every employee has been assigned a particular assignment with certain deadlines, all of which collaborated on the entire production of the project. For this project, we need a total of 93 days for building the whole system. Following are the details of every step of the project:

• **Project Management:** This is the very first step of the project when the proposal is presented to the CEO of the company, and the general features and salient features are discussed and fixed. During the first few weeks, the CEO and the developers usually discuss how the project should begin from the zero point and what approaches should be taken, creating small goals for every week, setting deadlines, and discussing all the requirements for the completion of the project. This part is considered 19.35% of the total work.

• **Design:** This is the session when the two UI/UX designers work for almost 3 weeks designing the interface of the application, and the supervising team begins to work on the diagrams and system analysis to have the actual vision of the project. This part is 24.73% of the total work.

• **Development/Coding:** Designing will already be completed at this stage, and the developers will be initiating to write the frontend and backend codes, and the management team will make sure that the deadlines are met. The duration of the procedure is 35 days, which is 37.63% of the total work.

• **Testing:** Testing started as soon as a feature is added to the site. Hence the testing is a parallel process that is done simultaneously by the developers. After the application is completed, the final testing of the application is created, which will endure for 10 days straight, and is 10.75% of the work approximately.

•**Deployment:** Once the testing phase is finished properly, it is time for deployment, for which a VPS (Virtual Private Server) and a domain will be bought on a live server. This is a 7-day procedure which is 7.53% of the total work.

Activity-wise Resource Allocation		
Activity	**Days**	**Work Percentage**
Project Management	18	19.35%
Design	23	24.73%
Development/Coding	35	37.63%
Testing	10	10.75%
Deployment	7	7.53%
Total	93	100%

Table 3.1: Table for Activity-wise Resource Allocation

3.5 Estimated Costing

The cost was calculated based on the features the client demanded from the website. It depends on the size, requirements, functionalities, and design of the website, which includes pre-designed themes, logo design cost, the cost for home page sliders, search engine optimization, social media connection, SSL certificates, and many other tools that we plan to use while building this website. Every minor to major cost has been considered while calculating the net cost of the project, which approximately will be worth 1,84,500 (BDT). Any additional service support required within the first year of deployment will be added as an additional charge as part of hosting and domain.

Features	Cost
Internet Bills	4000
Domain Bills	3500
Hosting Bills	2000
Project Manager	45000
Frontend Developer	60000
Backend Developer	70000
Nutritionist	100000
Fitness Trainer	100000
Miscellaneous	20,000

Total Costs	404500

Table 3.2: Table for Estimated Costing

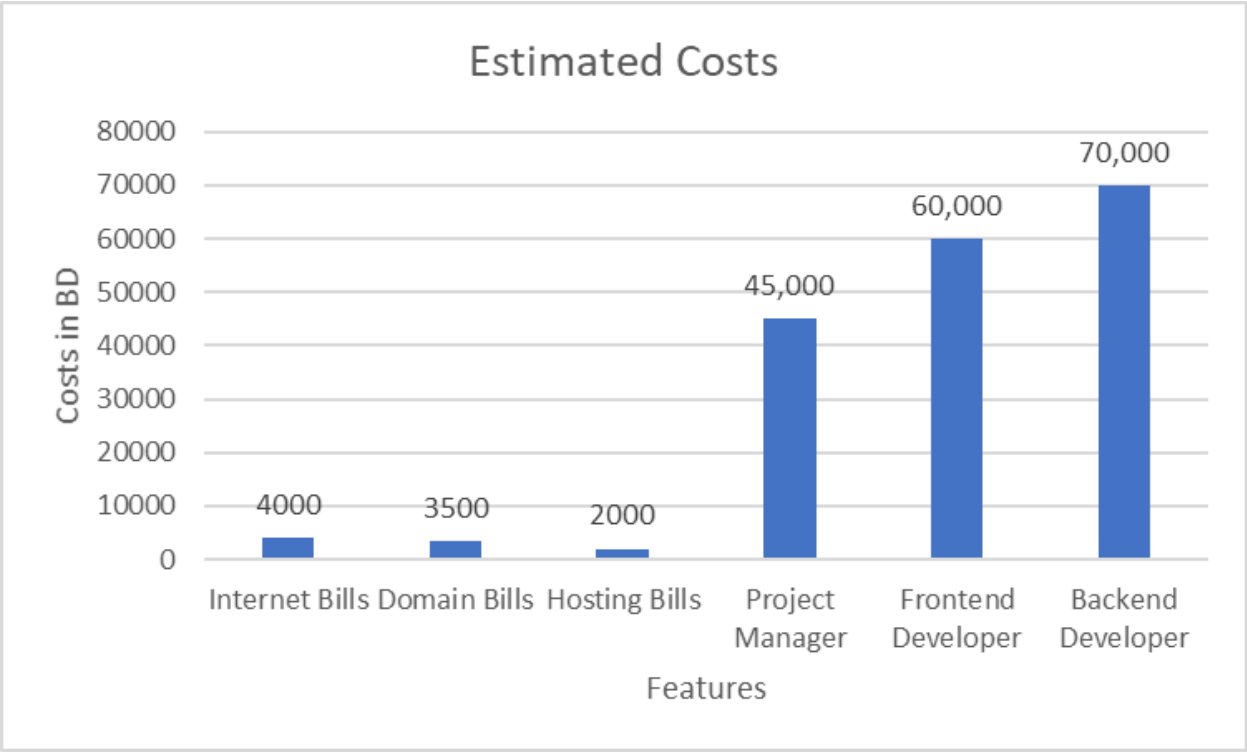


Figure-3.5: Chart for Estimated Costing

Chapter-4

Methodology

My project is known as La Santé, which means health in French. I named it so as it is a fitness-tracking web application, which will be one of its own for the unique features it has, including calculation of BMI, diet chart generation, workout routine generation, progress report, etc. I will use the following languages and frameworks to build the project:

Software Development Methodology

In software engineering, a software development process involves dividing the software development work into separate stages to improve design, product management, and project management. It is also known as a system development life cycle (SDLC)[2]. SDLC can be described as a framework that specifies the activities performed at all individual stages of a System Development Project that has to be followed during the development phase.

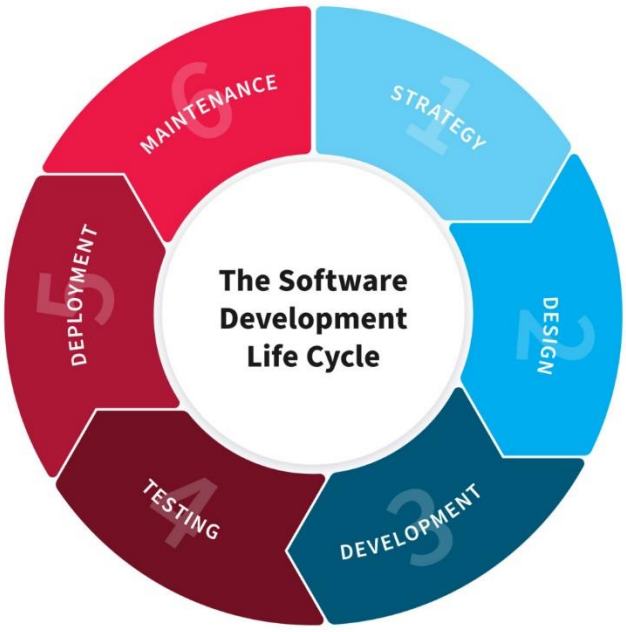


Figure-4.1: Software Development Life Cycle (SDLC)

The methodology may include the pre-definition of specific deliverables and artifacts that are created and completed by the project team to develop or maintain an application. Software or system development methodology is a framework that is used to structure, plan, and control the process of developing an information system. There are several system development methodologies or models that are used in development; among them, some of the most used are given below:

- Waterfall Model
- Prototyping

● Agile

● Spiral Model

● Rapid Application Development

● V-Model

● Incremental

● Evolutionary Model

Extreme Programming (XP) Methodology

For methods, Techdojo Limited developers follow the most current methods of system development, that is the Agile[3] method. Precisely, we follow the Extreme Programming (XP) method which is an agile software development framework that aims to produce higher-quality software and higher-quality life for the development team, as it is the most specific of the agile frameworks regarding appropriate engineering practices for software development. The teams are expected to be self-organized, hence Extreme Programming provides specific core practices where each practice is simple and self-complete & combination of practices produces more complex and emergent behavior.

The five values of XP are:

● Communication: XP emphasizes the importance of proper communication through team meetings and discussions.

● Simplicity: Only necessary things are done to keep the design of the system as simple as possible so that it is easier to maintain, support, and revise.

● Feedback: Through constant feedback about their previous efforts, teams can identify areas for improvement and revise their practices. It also supports simple design.

● Courage: raise issues that are hampering workflow, stop doing something that does not work and try something else, accept and act on unpleasant feedback, etc.

● Respect: members of the team need to respect each other to communicate with each other, provide and accept feedback, and work together to identify simple designs and solutions.

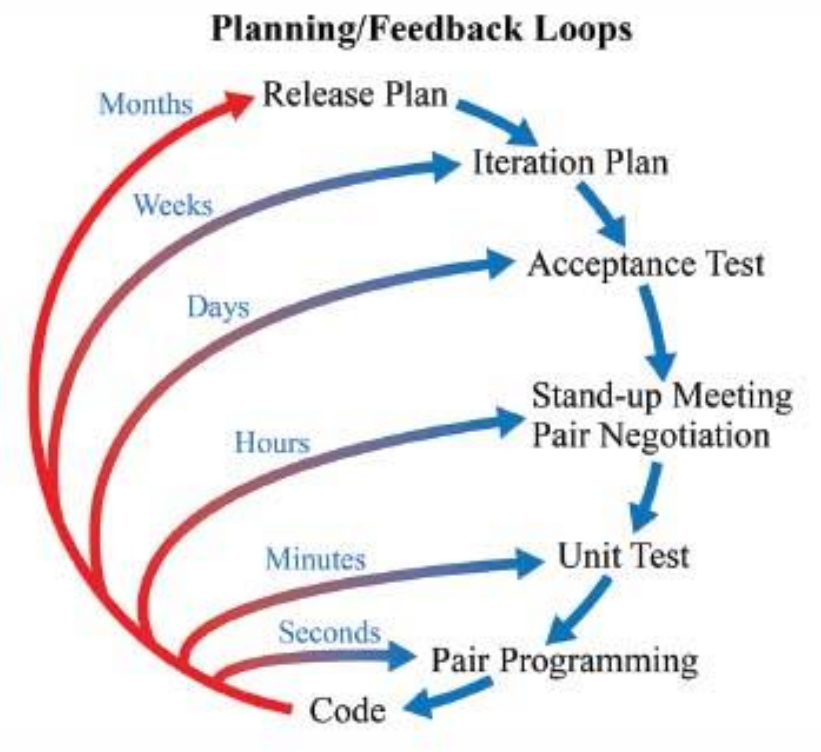


Figure-4.2: Extreme programming Methodology

Extreme Programming Advantages:

● Slipped Schedule: deliveries are on time.

● Cancelled projects: ensures transparency with the customer and immediate resolution of any issues if required.

● Costs incurred in changes: extensive and ongoing testing makes sure the changes do not break the existing functionality. A running working system always ensures sufficient time for accommodating changes such that the current operations are not affected.

● Production and post-delivery defects: the emphasis is on the unit tests to detect and fix the defects early.

● Misunderstanding the business and/or domain: making the customer a part of the team ensures constant communication and clarifications.

● Business changes: changes are inevitable and are accommodated at any point in time.

● Staff turnover: intensive team collaboration ensures enthusiasm and goodwill. The cohesion of multi-disciplines fosters team spirit.

Back-end Development

Back-end Development refers to the server side of development. It is the term used for the behind-the-scenes activities that happen when performing any action on a website or a web application. Backend development focuses on databases, scripting, and the architecture of the web and mobile applications. Code written in the back end helps to communicate the database information to the browser or the mobile app. Back-end Development involves:

● Web Development Languages: involves a series of server-side programming languages like Java, JavaScript, Python, Ruby, .Net, etc.

● Database: use of various Database Management System (DBMS) technology is another important part of backend development. MySQL, MongoDB, Oracle, SQL Server, and Redis are widely used for this purpose.

● Server: a computer or computer program which manages access to a centralized resource or service in a network. The current most popular servers are Apache, Nginx, IIS servers, and Microsoft IIS. Typically, Linux is used in administering servers.

● Application Programming Interface (API): a set of protocols, routines, functions, and/or commands that are used to develop software or facilitate interaction between distinct systems. APIs are available for both desktop and mobile use and are typically useful for programming

GUI (graphic user interface) components, as well as allowing a software program to request and accommodate services from another program.

Chapter-5

Body of the Project

The phrase Body of The Project describes and makes us pay a visit to all those aspects of the project that are not usually seen in transparent eyes and gives us a vivid comprehension of what procedure has been carried out during implementation, the tests carried out while manufacturing, the conclusions drawn, and finally the results.

5.1 Work Description

La Santé is a project that intends to make people health-conscious and disciplined in maintaining a healthy lifestyle. This is a convenient way for people to exercise regularly, eat healthily, have a balanced diet, and keep a track of their progress. The system is free of cost and is also time effective. This is a web-based application system that overcomes the issue of visiting a gym and spending a fortune on that.

This system consists of five modules, which are as follows:

1. Registration and Login: The user will be able to register by creating an account with their email id and password and logging in with the saved data.

2. Body Mass Index (BMI) Calculation: After the user is logged in, he/she will be able to provide the system his/her mass and height in pounds and feet respectively and the system will compute the BMI for the user.

3. Diet Chart Generation: The user's BMI will be saved in the database once it has been calculated, so whenever he/she lands on the Chart and Routine page and clicks to get a chart, she will be given the option to choose a certain month and week number that will lead the user to view the desired chart/diet plan.

4 Workout Routine Generation: The user's BMI will be saved in the database once it has been calculated, so whenever he/she lands on the Chart and Routine page and clicks to get a routine,

she will be given the option to choose it for a certain month and week number that will lead the user to view the desired chart/diet plan.

5. View Progress Report: The user's input will be saved in the database while them marking the boxes located right next to the task plans for days in which they follow a routine and a diet. The user will be able to track their progress by choosing the type of report they will view, that is whether it will be diet or routine, and can choose the required month, and week number, which will end up showing a graph based on his/her calorie intake/burnt.

6. Edit Profile: The user can update any information if he/she requires to do so only by clicking the edit profile option and visiting the respective page.

Description of all modules:

• **Registration and Login:**

1. User Account Creation: Users can create an account with their name, email, and password.

2. Login Process: The user will be able to log in just by providing the registered email and password, as that has already been saved in the database.

• **Body Mass Index (BMI) Calculation:** The user will just have to click on the BMI Calculation page, provide his/her mass and height, and click on compute. The system will return the calculated BMI value to the user using the formula:

BMI= mass/(height*height)

The value computed will then be saved in the database.

• **Edit Profile:** The user will be able to change his or her details by clicking the update profile button that will be on the top right corner of the UI as part of a dropdown button, that will have two options, one to just logout, and the other one to edit profile, clicking which will lead the user to the edit profile page, and the user will be able to provide all the information just like the one in the create profile/registration page, and then will just have to click the save button.

• **View and Follow Diet Chart:** Clicking on the chart and routine page from the navbar will lead the user to the corresponding page, which will make the user choose the diet option, and that will direct him/her to the page where she will only choose the month name and week number to get the diet chart generated.

• **View and Follow Workout Routine:** Clicking on the chart and routine page from the navbar will lead the user to the corresponding page, which will make the user choose the workout option, and that will direct him/her to the page where she will only choose the month name and week number to get the workout routine generated.

• **Track Progress:** The user will click on the track progress page and choose the type he/she wants to track then, that is whether the report for the calorie intake or the calorie burnt. Choosing the will direct the user to the report that has been generated with the help of his/her input that was saved in the database by him/her marking the checkboxes destined right next to the task plans (die or routine) before.

5.2 Requirement Analysis

Requirements

The software requirements [11] are descriptions of the features and functionalities of the target system. Requirements convey the expectations of users from the software product. The requirements can be obvious or hidden, known or unknown, expected, or unexpected from the client's point of view.

Requirements can be divided into two types: functional and non-functional requirements.

Functional Requirements

A functional requirement [12] is a function or feature that must be included in an information system to satisfy the business need and be acceptable to the users. A functional requirement defines what an application and its components are and what these components are supposed to accomplish. The following functional requirements were gathered with our decided requirements gathering methods. The inputs, processes, and output are discussed below:

1. **Functional Requirement- Registration:**

Function: User Registration		
Input: name, email, and password	**Process: s**ave registration details to the database	**Output:** new user created and added to the database
Precondition: Must have internet access.		
Postcondition: user gets directed to the login page		

Table 5.1: Functional Requirement- Registration

2. **Functional Requirement- Login**

Function: User Login		
Input: email, and password	**Process: s**aved registration details from the database allows the user to direct and access features	**Output:** directs the user to the BMI calculation page
Precondition: must have internet access and a registered account		
Postcondition: user gets directed to the BMI page		

Table 5.2: Functional Requirement- Login

3. Functional Requirement- BMI Calculation

Function: User BMI Calculation		
Input: mass, and height	**Process:** user's information allows the system to calculate and return the required value	**Output:** The user gets to learn his/her own BMI, and get suitable diet plans and workout routines
Precondition: Must have internet access, and must know one's current mass and height		
Postcondition: The user gets his/her BMI computed		

Table 5.3: Functional Requirement-BMI Calculation

4. Functional Requirement- Diet Chart

Function: User Diet Chart Generation		
Input: month and week number input	**Process:** user's previously calculated BMI and month and week number input allow the system to generate a suitable diet chart/plan for the user	**Output:** The user gets to view and follows the diet chart generated by the system
Precondition: Must have internet access, and BMI value calculated and must provide the system with the month and week number for which he/she wants the chart		
Postcondition: The user receives the chart		

Table 5.4: Functional Requirement- Diet Chart

5. Functional Requirement- Workout Routine

Function: User Workout Routine Generation		
Input: month and week number input	**Process:** user's previously calculated BMI and month and week number input allow the system to generate a suitable workout routine for the user	**Output:** The user gets to view and follows the routine generated by the system
Precondition: Must have internet access, and BMI value calculated and must provide the system with the month and week number for which he/she wants the routine		
Postcondition: The user receives the routine		

Table 5.5: Functional Requirement- Workout Routine

6. Functional Requirement-Progress Report

Function: User Progress Report Generation		
Input: mark the checkboxes next to all the charts and routines, and choose the type of report they wish to view for the time	**Process:** user's marked checkboxes will create and save data in the database to create the graph based on the user's regular activities to track progress.	**Output:** The user gets to view the reports and graphs generated by the system
Precondition: Must have internet access and marked checkboxes for the system to know about their activities.		
Postcondition: The user receives the reports generated and tracks his/her progress.		

Table 5.6: Functional Requirement- Progress Report

Non-Functional Requirements

Another type of requirement is non-functional requirements. A nonfunctional requirement is a description of the features, characteristics, and attributes of the system as well as any constraints that may limit the boundaries of the proposed solution. Non-functional requirements are briefly described below:

- **Performance:** represents the performance of the system which is required to exhibit and meet the needs of users. Performance describes the acceptable throughput rate and acceptable response time. This application should provide a smooth experience for the user and should have no input lag as long as the device has a certain minimum hardware specification.
- **Information:** represents the information that is pertinent to the users in terms of content, timeliness, accuracy, and format. Information is about the necessary inputs and outputs and how they will be managed, the types of the required data to be stored, how currently the information will be saved into the system, how the interfaces of external systems will work, etc.
- **Security & Control:** Security and administrations are always a concern for any system. All information on the server side and client side is secured. Only the application administrators and developers have access to the core code of the application to be able to directly manipulate any sort of information. In this project, node.js and express.js have been used for backend technology, which has various layers of security, where security requirements for this system have been taken care of. Control requirements represent the environment in which the system must operate, as well as the type and degree of security that must be provided. Access to the system or information must be controlled with the privacy requirements.
- Efficiency: represents the system's ability to produce outputs with minimal waste. We have tried to eliminate duplicate steps in the processes and to use the resources efficiently. Keeping our code nonrepetitive by using reusable code and components is how we achieved efficiency.
- Service: represents the need to make the system reliable, flexible, and expandable. It deals with
    - Who will use the system and where they are located?
    - How many types of users will be in this system?
    - The appropriate human factors.
    - What training materials will be included in the system

- Reliability/availability requirements
- How the system will be distributed
- What types of documentation are required

● **Extensibility and Maintainability Requirements:** There is one standard User interface designed for the look and feel of the application. The application can be expanded to accommodate many further modules without making any changes to any existing modules. The application is created in such a way that the developers can easily maintain both the server and client sides.

5.3 System Analysis

5.3.1 Six-Element Analysis

PROCESS	**SYSTEM ROLES**				
	Human	**Computing Hardware**	**Software**	**Database**	**Communications and Networks**
Landing Page	User	Computer/ Smartphone	Chrome, Opera, Microsoft Edge	MongoDB	WAN/LAN
Login/Registration	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN
BMI Calculation	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN
Viewing Diet Chart	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN

Viewing Workout Routine	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN
Viewing Progress Report	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN
Forgot Password	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN
Reset Password	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN
Edit Profile	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN
Logout	User	Computer/ Smartphone	Chrome, Opera, Firefox, Microsoft Edge	MongoDB	WAN/LAN

Table 5.7: Six-Element Analysis

5.3.2 Feasibility Analysis

A feasibility Study [13] is a study to evaluate the feasibility of a proposed project or system. A feasibility study is a feasibility analysis or a measure of the software product in terms of how beneficial product development will be for the organization from a practical point of view. A feasibility study is carried out based on many purposes to analyze whether software products will be right in terms of development, implantation, the contribution of the project to the organization, etc. Main parts of the Feasibility Study:

● **Technical Feasibility:** In Technical Feasibility, current resources; both hardware and software along with required technology are analyzed/assessed to develop the project. This technical feasibility study reports whether there exists correct required resources and technologies which will be used for project development. Along with this, the feasibility study also analyzes the technical skills and capabilities of the technical team, whether existing technology can be used or not, whether maintenance and up-gradation are easy or not for chosen technology, etc. “La Santé” is built using Next.js, Node.js, Express.js, and MongoDB. These are the technologies that are very popular in modern industry, and everyone involved in the making of this project had the skills to work with at least one of the technologies mentioned. Hence, it can be concluded that the project is Technically Feasible.

● **Operational Feasibility:** In Operational Feasibility degree of providing service to requirements is analyzed along with how easy the product will be to operate and maintain after deployment. Along with these, other operational scopes are determining the usability of the product and determining whether a suggested solution by the software development team is acceptable or not, etc. “La Santé” is a fitness tracker made with complex logic and technology but for any end user, it is quite self-explanatory.

● **Economic Feasibility:** In the Economic Feasibility study cost and benefit of the project are analyzed; a detailed analysis of what will be the cost of the project for development includes all required costs for final development like hardware and software resources required, design and development cost, operational cost, etc. After that, it is analyzed whether the project will be beneficial in terms of finance for the organization or not. In the development of “La Santé”, the services that needed to be paid for were frontend developer cost, backend developer cost, etc. Since the cost of these services had to be paid monthly, it can be easily covered by the estimated revenue gained from advertisements. Thus, in conclusion, it can be said that the project is Economically Feasible.

5.3.3 Problem Solution Analysis

One of the major problems that a web developer must deal with is that the requirements and features continuously keep on altering. According to a poll done by Stack Overflow Developer, 33% of respondents contemplate developing a website with no specified requirements.[14] There could be a few of the following proposed solutions to solve this:

- Project's scope description
- Assumptions should not be made about any future requirements
- Team members should always have good communication and coordination
- Clients should be involved and informed about everything from the start.

Project Management: Since the project is a combination of a lot of different phases, it is important to keep it as organized as possible from the very beginning, as otherwise, things always going unplanned may at times turn the project in vain.

Adapting to current market trends: The number of electronic device users is increasing every day, so keeping up with the trend could sometimes be tough. So having a good marketing team is extremely important, as it is also important always be informed about the latest market developments.

5.3.4 Effect and Constraints Analysis

Effect: As at times it's not feasible for a lot of people to go and visit the gym due to having a hectic schedule, and/or financial limitations, it is tough for them to maintain a healthy diet without a nutritionist, or to maintain a good exercise routine. This is when La Santé acts as a savior. As data remains stored in the database, and even the changes get saved, it's easy to track progress and get an altered chart/routine when required without even having to rush to the gym or a dietician.

Constraint: The most vivid problem with this software is that it can get costly when it comes to hosting, and domain, which might exceed the budget that has been set at the beginning of project

planning.

5.4 System Design

The design of the software is key when it comes to giving a legible idea to the user as to how to use it, and software architectures mostly use a variety of diagrams to give a clear vision to the targeted audience to make understanding of usage better. In our project ‘La Santé’, we are using Rich Picture, Use Case Diagrams and Activity Diagram. The diagrams are given below:

Rich Picture of Proposed System

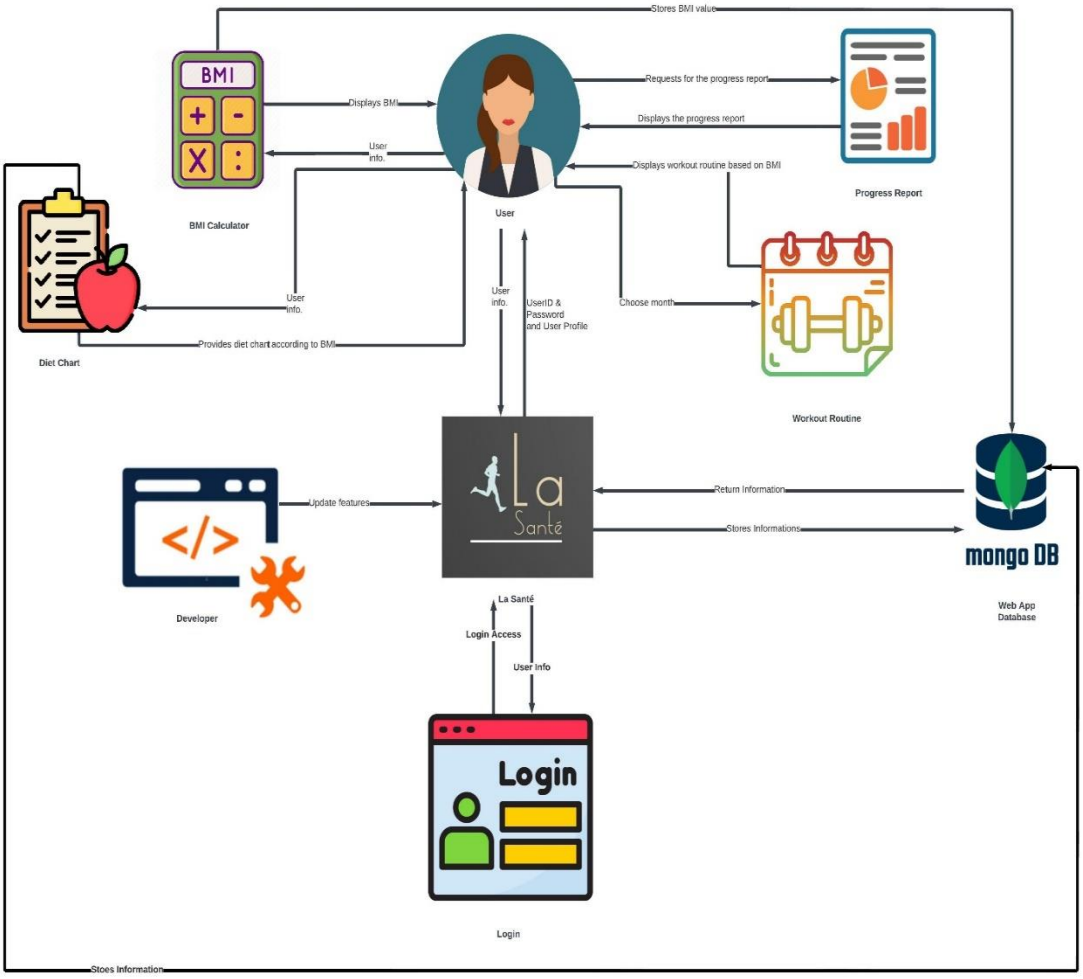


Figure 5.1: Rich Picture of La Santé

Use-case Diagrams:

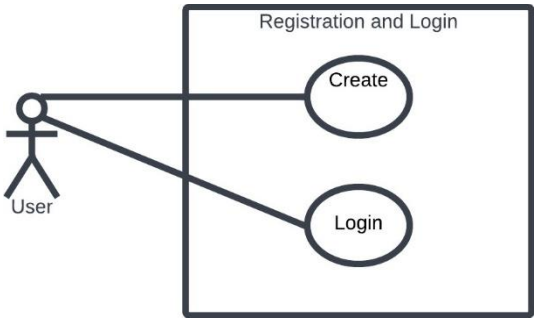


Figure: 5.2: Use Case Diagram for Registration/Login

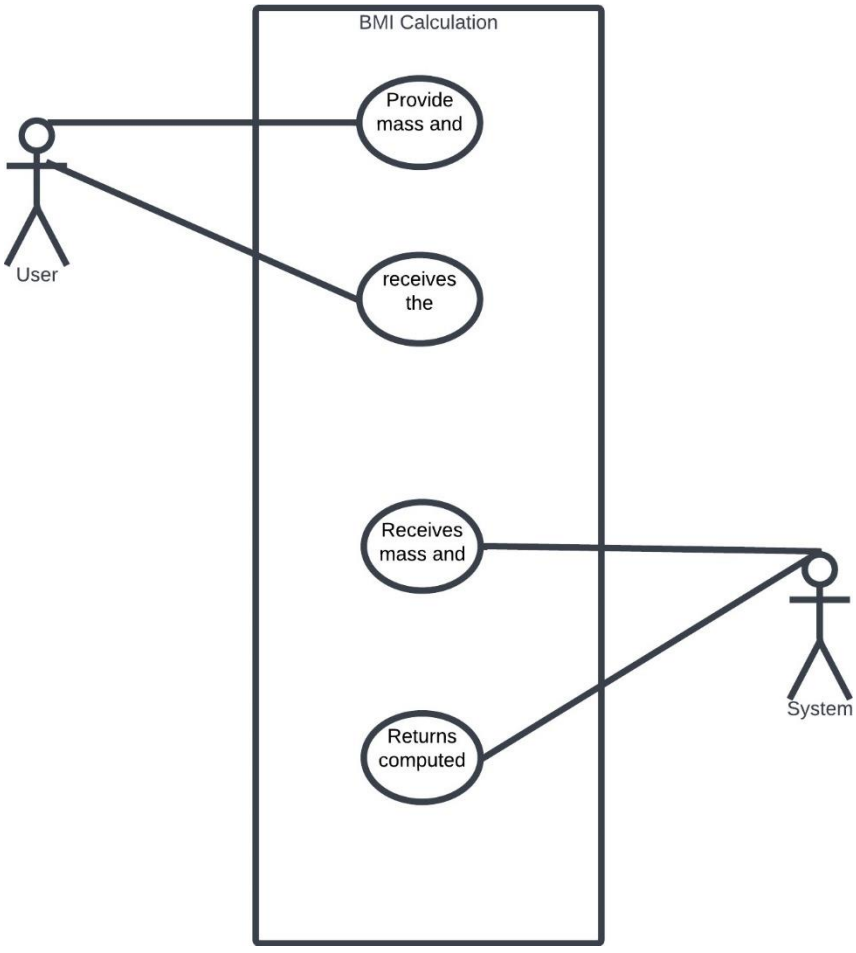


Figure: 5.3: Use Case Diagram for BMI Calculation

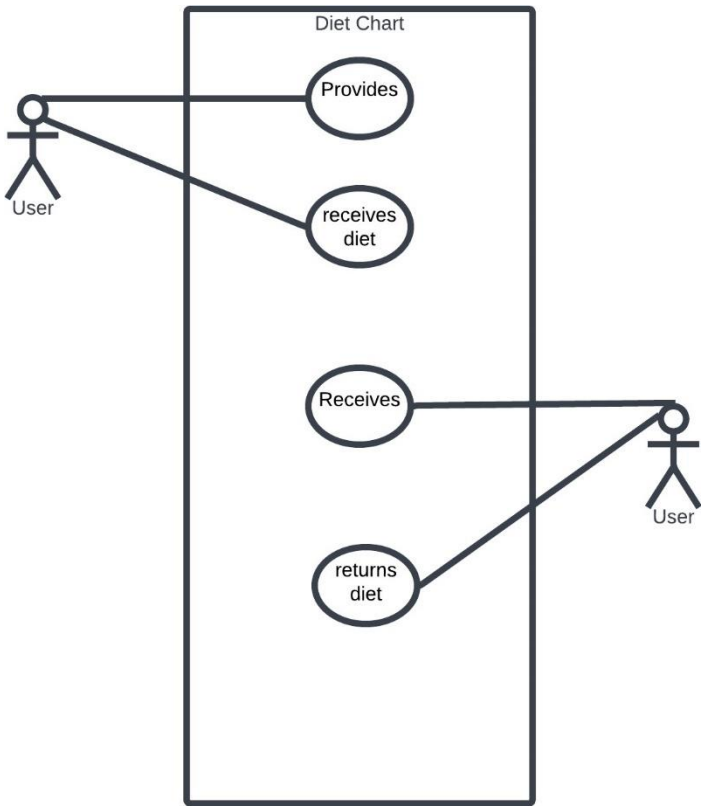


Figure: 5.4: Use Case Diagram for Diet Chart Generation

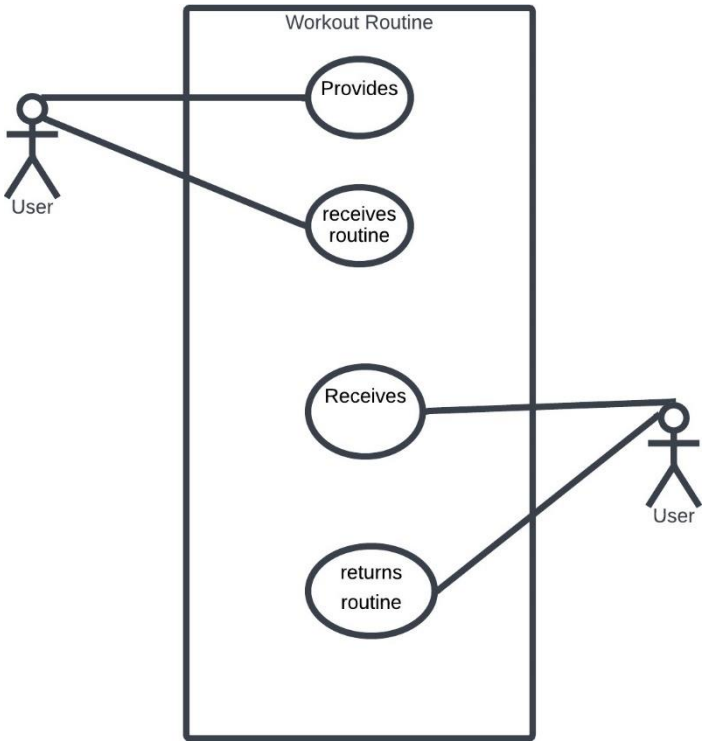


Figure: 5.5: Use Case Diagram for Workout Routine

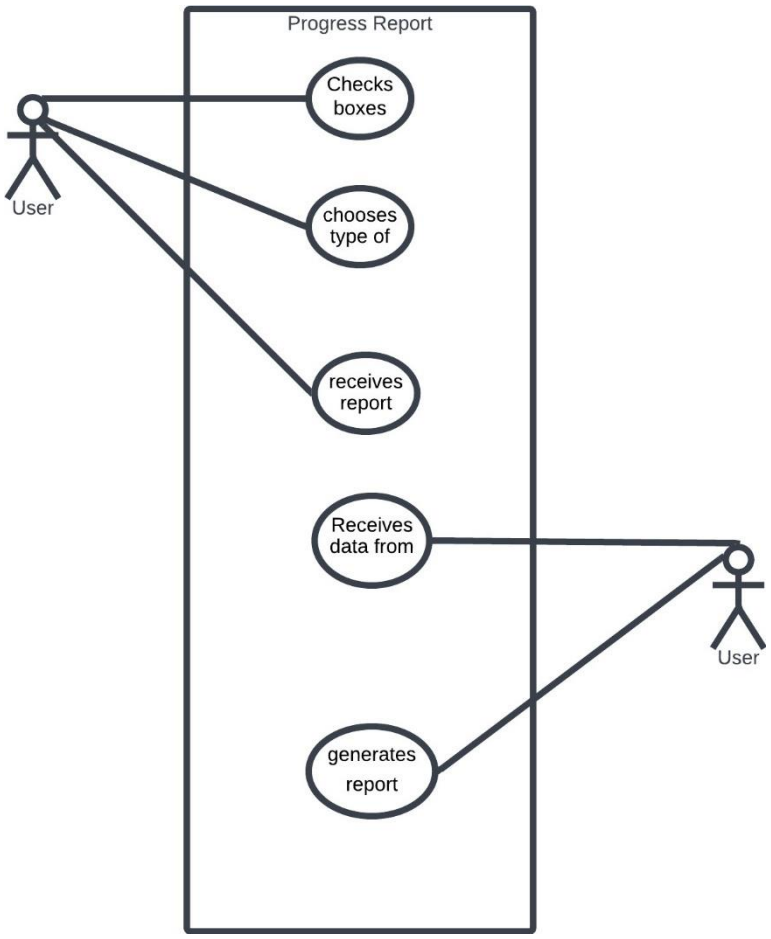


Figure: 5.6: Use Case Diagram for Progress Report

Activity diagram:

The activity diagram is another important diagram in UML to describe the dynamic aspects of the system. An activity diagram is a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. This flow can be sequential, branched, or concurrent. Activity diagrams deal with all types of flow control by using different elements such as fork, join, etc. [15] These are the activity diagram for my system:

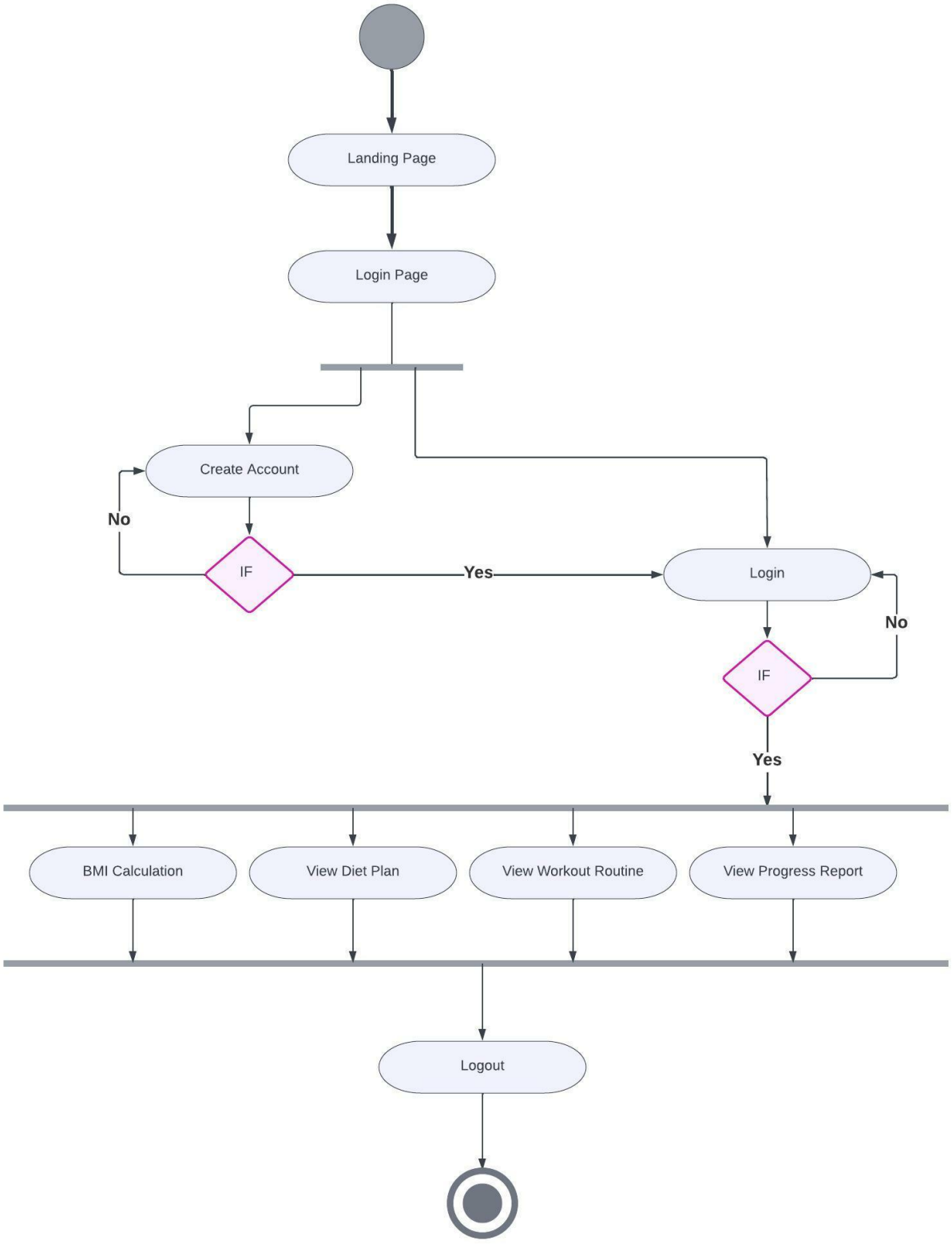


Figure: 5.7: Activity Diagram for Users

Architecture

As I mentioned earlier that designing is key, which spontaneously makes architecture the backbone of any structure. It is a model that demonstrated the structure of the web application, how it will function, how the data transfers, and the database where it will get stored.

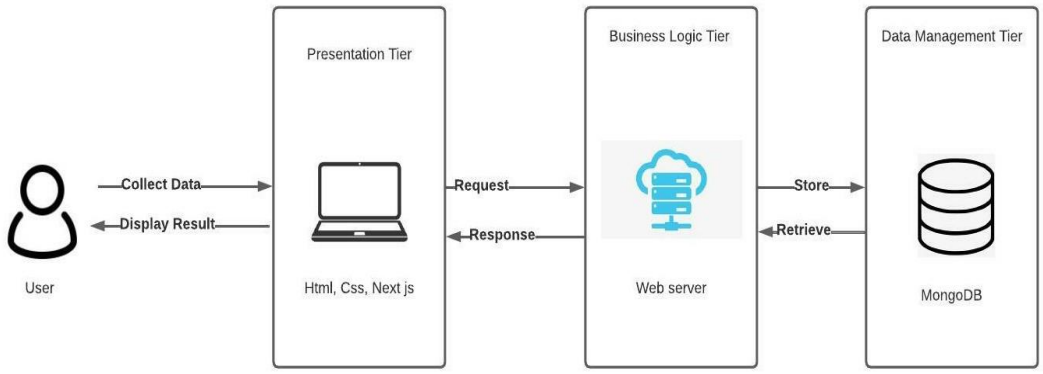


Figure:5.8: The architecture of the system

To be more precise, the architecture shown above tells us that the user will only have access to the front end of the application, which receives what the user requests, and transfers it to the web server, which then receives the requests/inputs, and stores the data, and send back the corresponding response to the user.

Data Model

The project I have worked on has a NoSQL data model diagram. The diagram is given below:

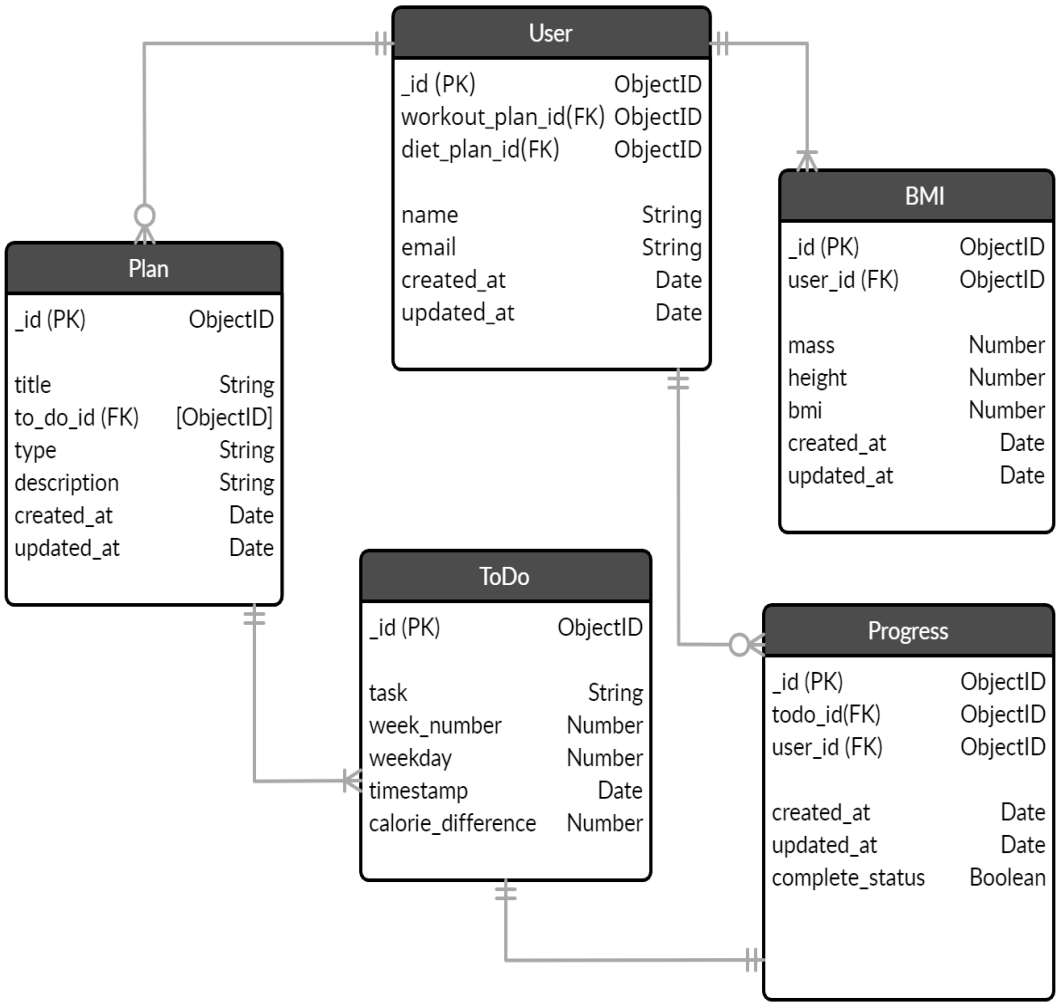


Figure 5.9: Data model of La Santé

5.5 Implementation

The user must have access to the internet to access the web application. The user can then simply turn on the application and will be ending up on the landing page, where they will have to click the login option, and not having an account will require them to go to the registration page which they can access from the login page itself. They will then have to provide the system with their email id, name, and the desired password with which they can, later, log in to the system.

Now for accessing any other service the user will have to get his/her Body Mass Index (BMI) calculated, which will remain saved in the database. After that, the user can go to the chart and routine page and choose whichever he/she wants to follow, and click on that. The option will direct the user to the respective page based on the user's previously calculated BMI, where the user will get to choose the month and week number, and there the user will end up receiving the chart/routine he/she wants to view and follow for that time. The diet and exercise plan with have checkboxes placed next to them, which the user will mark if they have accomplished a goal, and that will be recorded in the database, which will be used to generate the progress report later.

The user then can view the progress report to track his/her progress by clicking on the progress report UI, and choosing the type of report, that is, diet/routine, that they want to view. Choosing this option will lead the user to the respective report, calorie intake in case of diet report, and calorie burning in case of workout, and that's how the user will ultimately get to track his/her fitness progress.

5.6 Testing

Input for the system

The input of La Santé	
Process	**Field Types**
Login	email- string password- string
Registration	name - string email - string password – string
Calculate Body Mass Index (BMI)	mass-number height-number
View Diet Chart	month-string week number-number
View Workout Routine	month-string week number-number
Mark Checkboxes for Progress Input	complete task-Boolean
View Progress Report	type-string month-string week number-number

Table:5.8: Input of the system

Output for the system

The output of La Santé	
Process	**Field Types**
Login	**On success**- Redirect to user homepage. **On failure**- Show error message “Access denied”.
Registration	**On success**- Redirect to user homepage. **On failure**- Show error message “Invalid credentials”.
Calculate Body Mass Index (BMI)	**On success**- Shows computed BMI value. **On failure**- Show error message “Invalid credentials”.
View Diet Chart	**On success**- Redirect to the diet chart table. **On failure**- Will remain static.
View Workout Routine	**On success**- Redirect to the workout routine table. **On failure**- Will remain static.
Mark Checkboxes for Progress Input	**On success**- Redirect to the workout routine table. **On failure**- Will remain static.
View Progress Report	**On success**- Redirect to the report. **On failure**- Will remain static.

Table:5.9: Output of the system

Chapter-6

Result and Analysis

Software Testing

Software testing is a process of verifying the fact if the software is working properly or not, and how accurate and reliable it is, which mostly includes functioning according to the client's needs. Another reason for carrying out a software tester is to check and look for bugs (if any) in the system. The table below shows the results of the tasks that I have worked on based on my project features:

Testing Results for the user

Test ID	Test Case	Description	Steps to be Executed	Expected Result	Actual Result	Pass/Fail
T_1	Login	The user should be able to log in using a registered email id and password	1. The user needs to go to the create account page, provide his/her details, and register. 2. then go to the login page, provide the same details, and login	The user is supposed to get directed to the homepage if the details of login match with databases.	The user will get directed to the homepage if the details of login match with databases.	Pass

T_2	Calculate BMI	The user should learn his/her BMI value	1. Go to the BMI Calculator page. 2. Provide mass and height values. 3. Click on compute.	The BMI is supposed to get calculated.	The BMI gets calculated	Pass
T_3	View Diet Chart	The user should receive a diet chart based on his/her BMI value, and the month and week number that he/she chooses.	1. Get BMI calculated. 2. Go to the Charts and Routine page. 3. Click on charts. 4. Choose month and week numbers. 5. View the right-fit table.	The user is supposed to view the diet chart.	The user will be able to view and follow the suitable diet chart.	Pass
T_4	View Workout Routine	The user should receive a workout routine based on his/her BMI value, and	1. Get BMI calculated. 2. Go to the Charts and Routine page. 3. Click on routine.	The user is supposed to view the workout routine.	The user will be able to view and follow a suitable workout routine.	Pass

		the month and week number that he/she chooses.	4. Choose month and week numbers. 5. View the right-fit table.			
T_5	Mark Checkboxes	The user should mark the checkboxes placed right next to all the task plans.	1. View diet chart/workout routine. 2. Mark the checkboxes placed next to all the planned tasks in the table.	The database is supposed to save the input.	The database will save the user input to track progress.	Pass
T_6	View Progress Report	The user chooses the type of progress he/she wants to view/track.	1. The user should go to the progress UI. 2. The user should choose the type of progress he/she is willing to view and click on either diet/routine.	The user should be able to view a progress report.	The user gets to view a progress report	Pass

Table: 6.1: Testing Results for the user

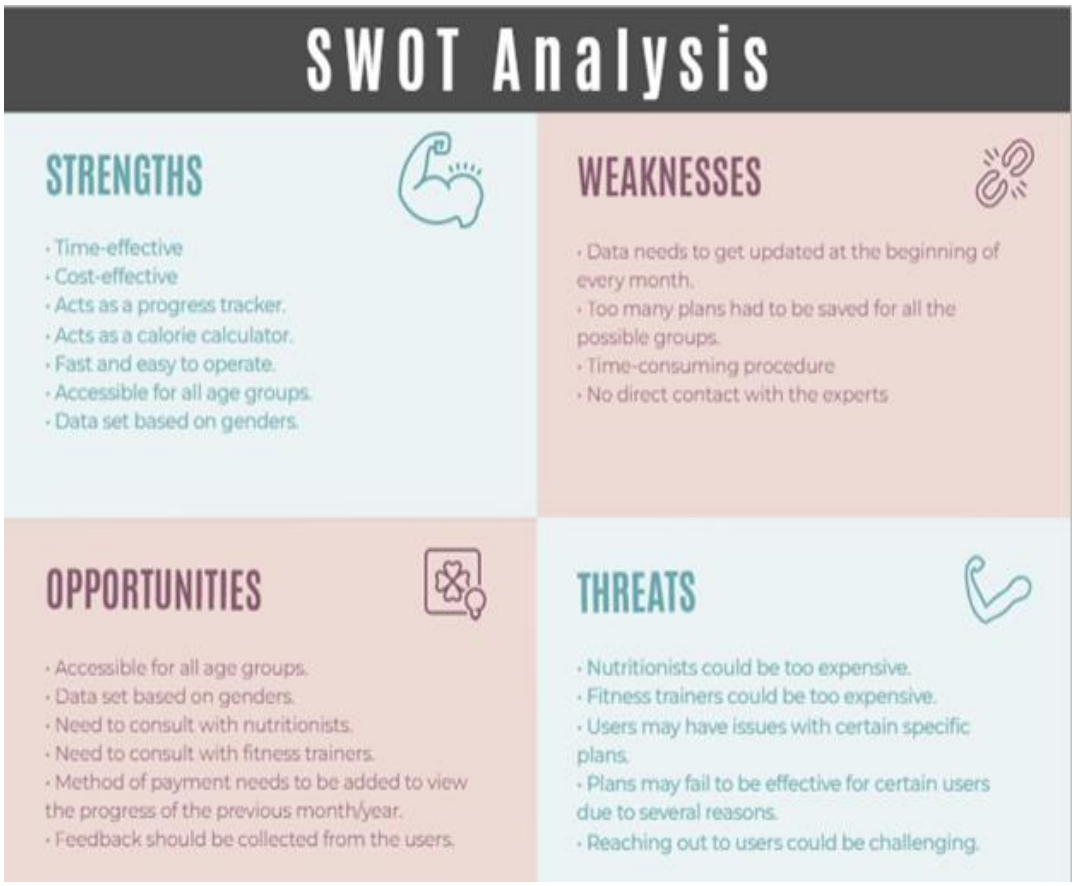


Figure: 6.1: SWOT Analysis of La Santé

Graphical User Interface Result

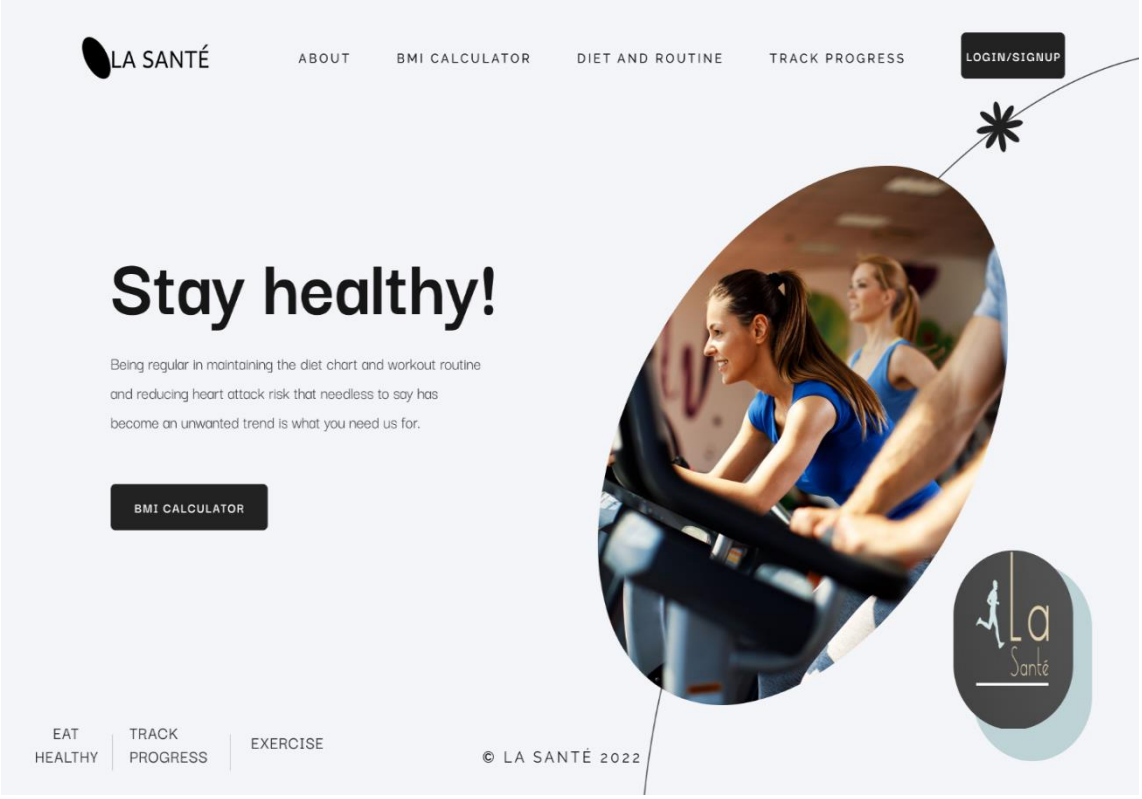


Figure: 6.2: Landing Page of La Santé

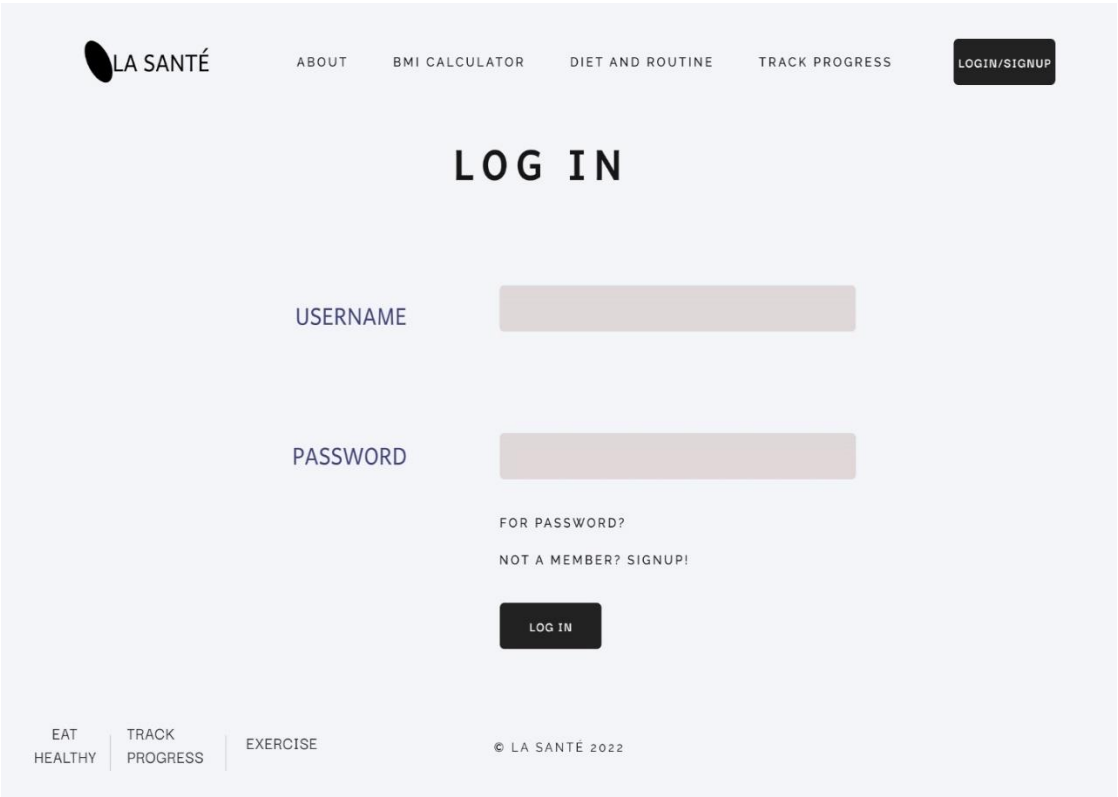


Figure: 6.3: Login Page of La Santé

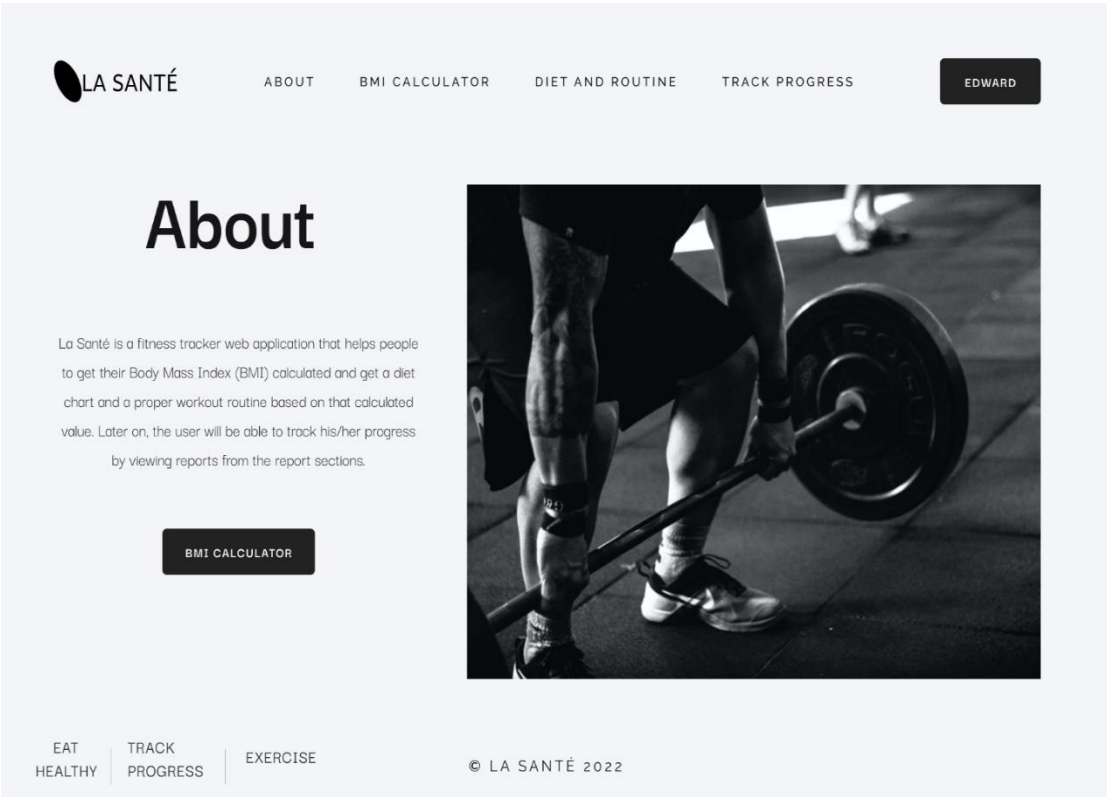


Figure: 6.4: About Section La Santé

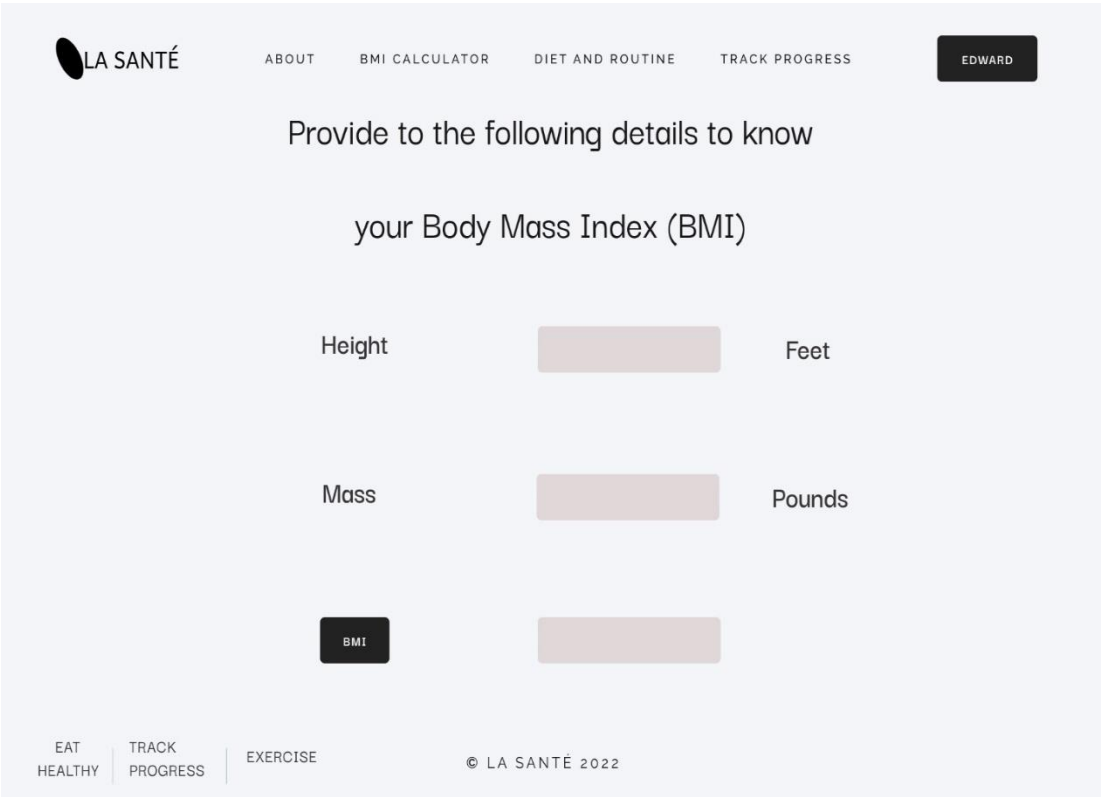


Figure: 6.5: BMI Calculation Page La Santé

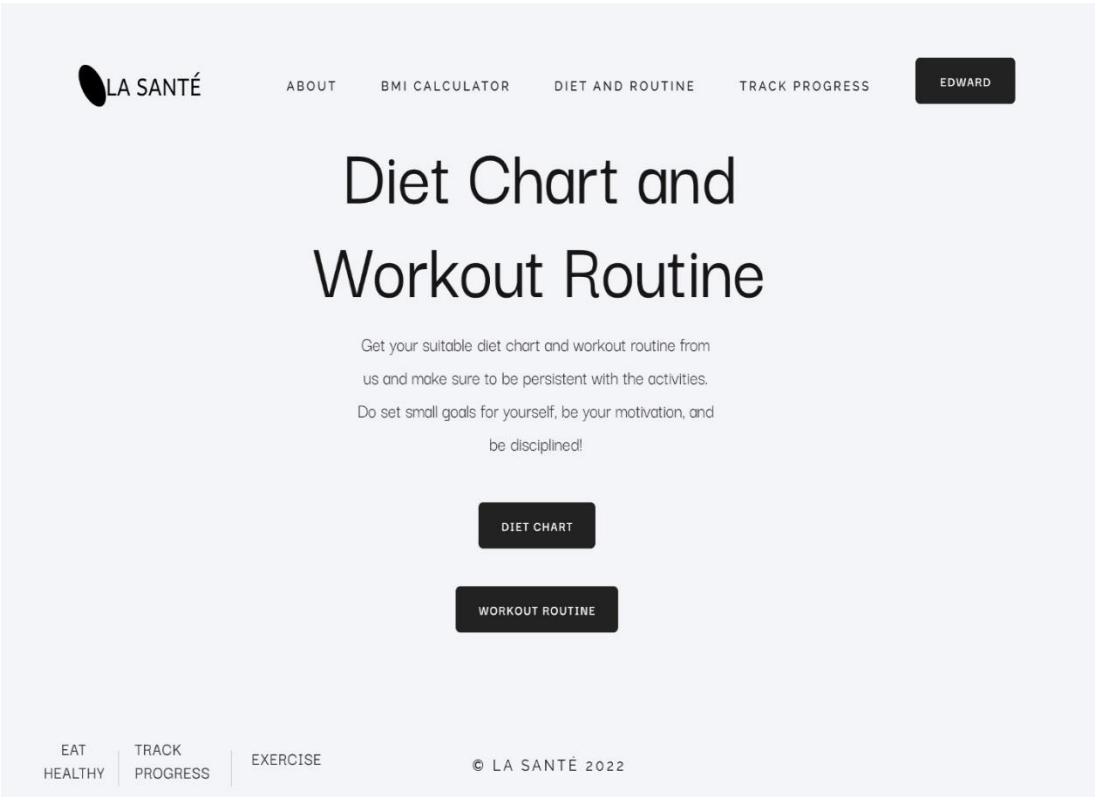
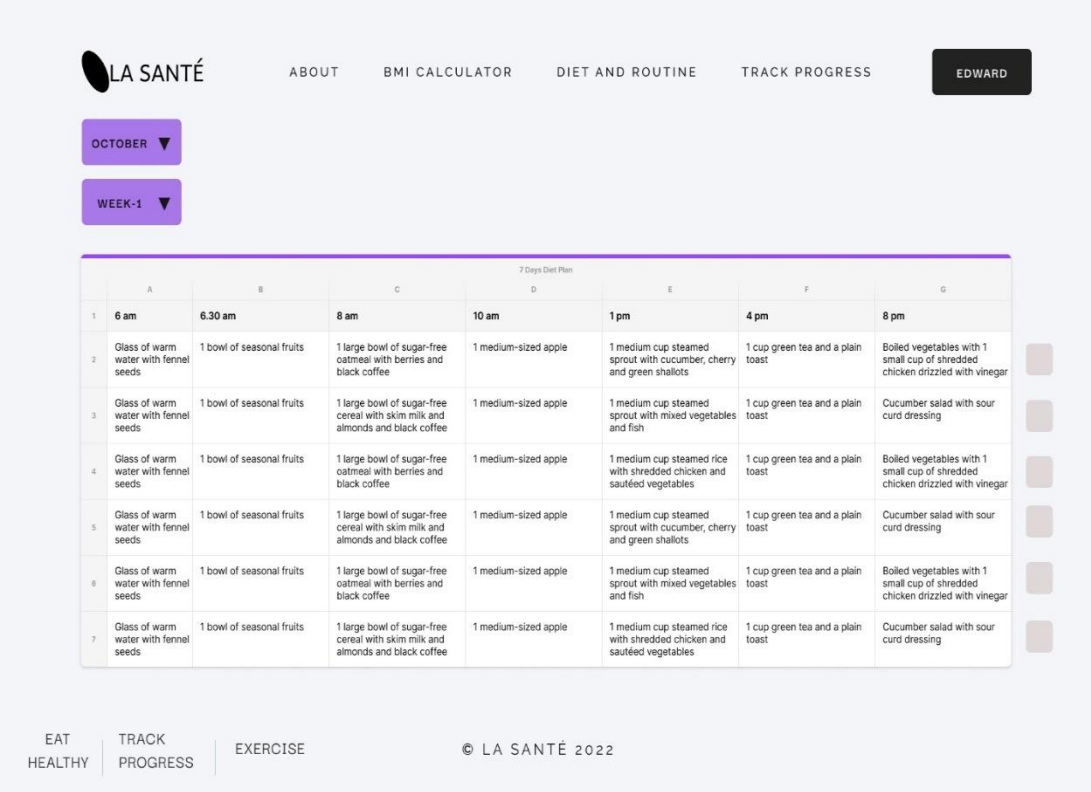


Figure: 6.6: Chart and Routine Page of La Santé



	A	B	C	D	E	F	G
1	6 am	6.30 am	8 am	10 am	1 pm	4 pm	8 pm
2	Glass of warm water with fennel seeds	1 bowl of seasonal fruits	1 large bowl of sugar-free oatmeal with berries and black coffee	1 medium-sized apple	1 medium cup steamed sprout with cucumber, cherry and green shallots	1 cup green tea and a plain toast	Boiled vegetables with 1 small cup of shredded chicken drizzled with vinegar
3	Glass of warm water with fennel seeds	1 bowl of seasonal fruits	1 large bowl of sugar-free cereal with skim milk and almonds and black coffee	1 medium-sized apple	1 medium cup steamed sprout with mixed vegetables and fish	1 cup green tea and a plain toast	Cucumber salad with sour curd dressing
4	Glass of warm water with fennel seeds	1 bowl of seasonal fruits	1 large bowl of sugar-free oatmeal with berries and black coffee	1 medium-sized apple	1 medium cup steamed rice with shredded chicken and sautéed vegetables	1 cup green tea and a plain toast	Boiled vegetables with 1 small cup of shredded chicken drizzled with vinegar
5	Glass of warm water with fennel seeds	1 bowl of seasonal fruits	1 large bowl of sugar-free cereal with skim milk and almonds and black coffee	1 medium-sized apple	1 medium cup steamed sprout with cucumber, cherry and green shallots	1 cup green tea and a plain toast	Cucumber salad with sour curd dressing
6	Glass of warm water with fennel seeds	1 bowl of seasonal fruits	1 large bowl of sugar-free oatmeal with berries and black coffee	1 medium-sized apple	1 medium cup steamed sprout with mixed vegetables and fish	1 cup green tea and a plain toast	Boiled vegetables with 1 small cup of shredded chicken drizzled with vinegar
7	Glass of warm water with fennel seeds	1 bowl of seasonal fruits	1 large bowl of sugar-free cereal with skim milk and almonds and black coffee	1 medium-sized apple	1 medium cup steamed rice with shredded chicken and sautéed vegetables	1 cup green tea and a plain toast	Cucumber salad with sour curd dressing

Figure: 6.7: Diet Chart of La Santé

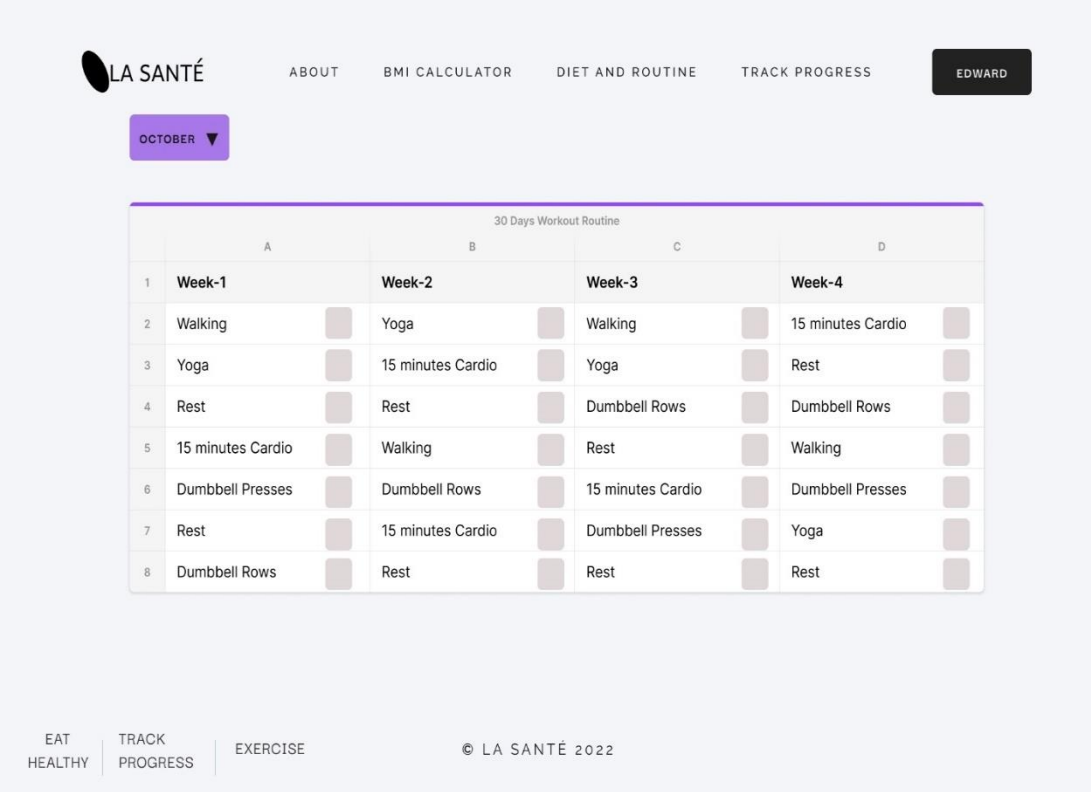


Figure: 6.8: Workout Routine of La Santé

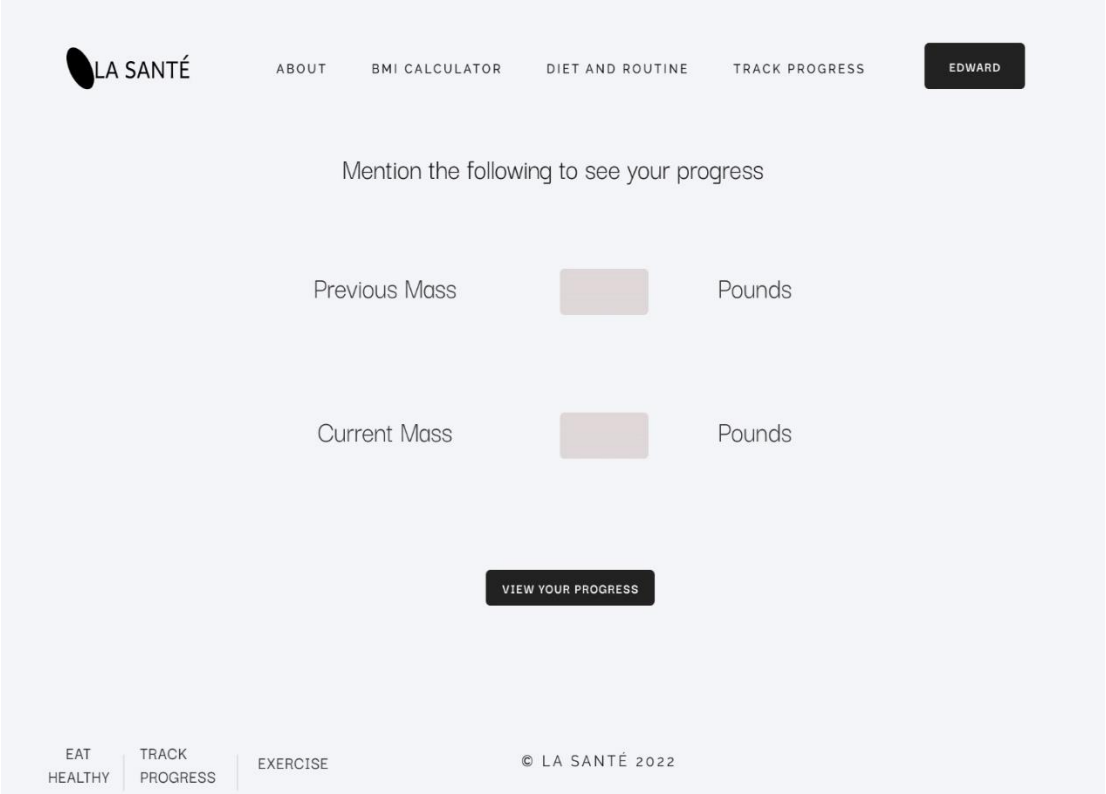


Figure: 6.9: Track Progress Page of La Santé

Chapter 7

Engineering Problem Analysis

7.1 Sustainability of the Product

The sustainability of the product[16] refers to its ability to be maintained and updated. In the modern world, every application being released needs to be maintained and continuously updated for its user base.

A product can be sustainable in three main ways:

- **Community Sustainability:** This signifies the extent to which the users will be supporting the project. Support again can be signified in different forms like downloading and

installing the application, using the application regularly, subscribing to paid services, giving ratings and feedback, etc. After launching La Santé, it is believed to have a good user base since it is quite a unique idea, and at current times people are quite watchful about their regular calorie consumption and calorie loss as well. And with the growing number of audiences, grows the community, which proves the system to be Sustainable in terms of Community.

- **Financial Sustainability**: This refers to how the application's running cost will be maintained after it has been released and whether it will generate enough revenue as acceptable profit. An application's running cost includes - server cost, database storage cost, third-party API cost, etc. When "La Santé" will get a full-fledged release into the application market, it will have advertisements to generate revenue, and a paid monthly subscription will be offered to the users to remove all advertisements to view data that are not recent from the application. This method of revenue generation is believed to be able to cover the costs to keep the application running after release. Thus, the project can be determined as Financially Sustainable.

- **Organizational Sustainability:** This relates to how the organization will continue to operate after the release of the application. After the release of an application, usually, the organization maintains the application via its current team, an extended team, or a fresh new team. Also, organizations update their project by adding newer features to them, and organizations may pivot to other projects, expand the teams, create new teams, etc.

"La Santé," has many more future-planned features to be worked on and released. Since it is a unique mobile app and a fitness tracker, the project will be maintained and updated after its release as well. Taking core features from "La Santé" and adding more ideas and features to it, another new project may also be planned and worked on. In conclusion, it can be said that the project is Organizationally Sustainable.

7.2 Social and Environmental Effects and Analysis

Smartphones are popular among people for the applications they offer to users. Smartphones make communication with people quite easier. People enjoy a lot of benefits in various forms of their daily work. Some advantages smartphones provide – better means of communication, learning options for users, great exposure to the latest things, ways to personality development,

simple ways to access applications, ideas to succeed in business, platforms to grow their applications, and more. The aim of "La Santé" in the world of smartphones is to simply help people to stay fit and healthy and maintain discipline while making them exercise.

Social Effect:

"La Santé" aims to keep people healthier and fit. People spending too much time on their phones browsing social media or playing games can cause serious health issues such as eye strain, dryness, irritation, back pain, neck pain, headaches, joint muscle pain, etc. "La Santé" will have a much more positive impact since the application will make people exercise or consume nutrition for good and use an electronic device for a safer purpose. People will want to use the application because it is cost-effective (at least not as expensive as gymnasiums are), and other than that is also time-effective for people who are professionally way too occupied. Hence the more people will use the more the people will spend energy moving and the lesser they will be health risks. Also, the more people are busy following the corresponding plans and progress, the lesser time they will spend on social media and other games. In a sense, "La Santé" will make people work hard to reach set goals.

Environmental effect:

Following "La Santé" regularly will make people more active and less lazy. Active people become more eager to do more physical tasks. These physical tasks include exercising, making their meals, eating on time, etc. This buildup of subconscious behavior is believed to be a good thing and hence it results in having a positive impact on the user's environment.

7.3 Addressing Ethics and Ethical issues.

In the world of smartphones with so much data collection, hacking, cybercrime, etc., some rules and ethics need to be followed when working on creating and releasing an application. The developers of "La Santé" believe that the application does not breach any code of conduct of

application release and development since they all have been taken into a serious concern. Some of them are:

- **Collecting only relevant User data:** The fitness tracker does collect user data, but those are strictly and only relevant to the application. The only data that is being collected are the user's Body Mass Index (BMI) and the number of days he/she is following the plan for a certain period to generate the progress report; other than these other data is neither collected nor stored.
- **Not Sharing or Selling any User data:** Even though the data collected may not be of any privacy concern for most users, the application does not let any service, any other application, or any third party have access to the previously recorded data collected.
- **Data Storage Security:** Only the lead developer and the owner of "La Santé" have access to the server and the database. Since they are hosted in the cloud and can only be accessed via the lead developer's and the owner's login credentials, the data stored can be deemed safe and secure.
- **No use of Profanity:** The project has been developed with no slang, swear words, offensive language, etc. The language and tone in the application are clean, clear, and to the point.
- **No Discrimination Policy:** Other than age concerns, "La Santé" does not discriminate of any kind based on race, sexuality, gender, religious beliefs, color, language, political or another opinion, national or social origin, property, birth, or another status.
- **Proper use of third-party Services and API:** "La Santé" does not violate any rules of the third-party services or the APIs that have been used in its development.
- **Clear Promotion:** "La Santé" only intends to promote the company that created it, itself, and people's health and goodwill. Other than what has been mentioned, "La Santé" has no intention of promoting anything or anybody else.
- **Clean Advertisement:** The advertisements that will be running in "La Santé" will only be the ones that are clean and clear which will have no negative impact on its users. Advertisements that will be filtered and will never be run on "La Santé" are the ones that contain violence, nudity, blood and gore, injury, disturbance, etc.

Chapter-8

Lesson Learned

8.1 Problems and challenges faced.

During my internship program, I faced lots of challenges, and they are as follows:

● **Understanding the Requirement**: It was initially a bit of a challenge to comprehend the requirements, but as time went on, I started to have a better understanding of the things that needed to get done within a certain time frame, and I did that instead of wasting my time on doing things which were not expected out of me and missing out on the real/actual ones.

● **Adapting to New Technologies:** Since this was the first time, I was working on a web application using the MERN stack, I had to learn and adapt to the new technologies, languages, and corresponding syntaxes. Although acquiring the skill set was possible it became hard to apply them in real-life situations, that too with perfection and precision.

● **Keeping up to Speed:** Learning new technologies and putting them to use was a slow process for me initially as it was the first time that I have ever used them. Hence, it was quite difficult to meet weekly deadlines, and this slowed down the overall pace at which the application was developing.

● **Identifying and Fixing Bugs:** Often, some bugs were very hard to find, and even after they have been found it became a big problem to fix them. Some bugs were so difficult to deal with that it would take a whole week to fix them.

8.2 Solution to those problems

Solutions to the problems that I faced are as follows:

● **Understanding the Requirement**: Being attentive and careful while following instructions were the key factors that I had to expertise in to avoid misunderstanding requirements and missing out on deadlines ever.

● **Adapting to New Technologies:** Being persistent and patient while implementing all features, especially the salient ones were required to keep steadfast at all times of building the project.
● **Keeping up to Speed:** Pacing up and matching other team members' speed was a bit tough at the beginning, however with time, it just got to be a day-to-day activity, and I believe being fast at task accomplishments always acts as a blessing when it's time.
● **Identifying and Fixing Bugs:** For debugging, it is a mandatory quality for all developers to be analytical and patient. Identifying the bug before fixing it is also extremely necessary and important, and the only feasible way to solve this was to learn the correct procedure and fix them patiently using the right syntaxes.

Chapter-9

Future Work and Conclusion

9.1 Future Works

This project, "**La Santé**" is still in its development phase, and there are many more planned features that are to be added shortly. Some of them are:

➔ Create a gender-based segregated diet and routine

➔ Create age based segregated diet and routine

➔ Create a diet and routine for pregnant women

➔ Collaborate with experts (dieticians and fitness trainers) for charts and routines.

➔ Add method of payment for viewing previous data.

➔ Update plans every month.

9.2 Conclusion

During the Internship, we worked on a web application called “La Santé”. In this application, people can get their BMI calculated, get a suitable diet chart and workout routine, and track their progress, that is how many calories have been gained and burnt in a certain week, and/or month.

Working in Techdojo as an intern has been an amazing experience. I have learned a lot about developing different kinds of applications and about development styles. Working with cutting-edge technology like Next.js, and MERN (MongoDB, Express.js, React.js, and Node.js) stack are among the major takeaways from the Internship Program. Through this program, I have been exposed to a developer's working life. Throughout my internship, I could understand more about the definition of a software engineer and programmer, and this helped prepare me to become a more responsible and innovative developer in the future. During my project, I cooperated with my mentors and seniors to solve the challenges faced. Moreover, the project indirectly helped me to learn independently, discipline myself, be patient, take initiative, and can solve problems. Besides, my communication skills have also strengthened as I had to give regular updates and was engaged in many pair programming sessions. As I had to face many problems, solving them developed my programming skills which made me sharpen my skills in JavaScript since React itself is a JavaScript library for creating user Interface, Node.js, and Express.js is also done in JavaScript. This internship opportunity has paved the way to investigate the development environment and marketplace. I would like to appreciate once again everyone who has made my life as an intern such a great experience.

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An Undergraduate Internship on La Santé

By

Hasin Anzum Mehtaj
Student ID: **1830947**

Autumn, 2022

Consent from Supervisor

The student modified the internship final report as per the recommendations made by his/her academic supervisor and/or panel members during and/or before final viva, and the department can use this version for archiving as well as the OBE course material for CSE499.

(Signature of the Supervisor)

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