

Software Engineering CSC648/848



iPlate

Team 02 / Section 01

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1. Executive Summary

“Your Diet is a bank account. Good food choices are good investments” – Bethenny Frankel

iPlate is an application that helps people to develop a healthy eating style without putting extra effort such as calculating calories or tracking macronutrients. Nowadays, more and more people on social media are promoting a healthy lifestyle. The main focus of their lifestyle is on fitness and eating habits. The popular eating tip for people who want to lose weight, maintain weight, or even gain weight, is to count their calorie intake. While many people succeed by creating the calorie deficit, there are some that are struggling with the numbers, especially females in the younger generation. Some developed an unhealthy relationship with foods and are experiencing eating disorders. Our mission is to help people to rebuild their relationship with food and develop life-long healthy eating habits so that they don't have to carry the calculator everywhere.

Instead of counting calories, we use The MyPlate method that is published by The U.S. Department of Agriculture. It is an alternative way of improving our eating habits, but it does not require any calculation! The main idea of the MyPlate method is to split the plate into several areas, vegetables, carbs, protein, fruits, and dairy. In each meal, we put our food according to these areas and so the food group we have is similar to the healthy ratio. **iPlate** adapts this idea and helps the users to record their meal. It provides an interface where the main focus is the plate that is split into areas, and the user can record their food by clicking the corresponding area. From the food that users record, we provide a brief analysis of how they can improve their eating habits. Besides the MyPlate, our food data that users could select is going to be mainly whole foods. We wish to help users to consume less processed food but more natural produce. By **iPlate**, we aim to give people easier access to build their healthy lifestyle and actually enjoy it.

The team working for **iPlate** comprises 6 aspiring software engineers who collectively are responsible for all the work necessary to produce, working, validated assets. Being students who have strong interests in programming as well as web development, our main goal is to establish an application, which, we believe, will definitely offer a helpful hand to a lot of people to have a healthy life-style by providing proper healthy habits.

2. Personas and User stories

Personas

Persona ID: 0001 – Shushruth K Nagavalli



Age: 26/ Male
Job Title: Project Engineer, Steve P Rados
Status: Married
Location: San Jose, California

General Behaviors:

Loves food, but wants to maintain a balanced diet.
Uses smartphone apps in daily life.
Workaholic and also cares about his body image.

Interests:

He likes to play sport especially Badminton, but doesn't find time
Love cooking- especially seafood.

Skills:

If given a task, complete it on time and motivate others to do so.
Socializes easily and makes everyone comfortable with his humorous nature.

Pain Points:

A 26-year-old enthusiastic civil engineer who has to work on site at least 5 hours a day and is supposed to travel to different locations as part of his job which in turn affects his daily meal routine.
His work schedule is designed in such a way that the login time is early in the morning and has to work for 8 hours a day. This working structure made him skip his breakfast almost every day and is afraid that this might lead him sleep deprived.

Persona ID: 0002 - Korina Lin



Age: 30/ Female
Job: Pharmacist in training/medical staff
Status: In relationship
Location: Livermore, California

General Behaviors:

Loves taking showers, and checking weight on scale
Uses android phone to read and watch things on YouTube
Night-owl, but tends to sleep in

Interest:

Manga
YouTube
Games on smartphone

Skills:

Keeps in contact with her friends/ social ability
Ability to keep working towards her goals

Pain Points:

A 30-year-old woman with an unstable work schedule who works at a hospital whenever they are in need of staff and is thus scheduled into the working hours. Due to the unknown work schedule she has to be able to work early morning or late at night, due to this she passes her time with short readings or videos online. When she eats it's either what she can find for leftovers or fast-food for ease of access. Due to covid, there's been a severe amount of people getting hours cut regardless of where they work including the medical field. Being unable to lead a stable/steady life-cycle, food intake has become somewhat random due to open-availability for on-call work call scheduling. As she ages, she knows it's going to be more difficult to maintain her body weight, but isn't prepared to make changes.

Persona ID: 0003 - Nakhil Prakash



Age: 28/ Male
Job: Assistant Film Director
Location: San Mateo, California

General Behaviors:

Works daily from 10 to 6 pm and occasionally during weekend.

Goes for short walks twice a week.

Interest:

Likes playing games on multiple gaming platforms
Movies
Hanging out or socializing with friends

Skills:

Flexibility
Social/Friendly

Pain Points:

A 28-year-old who has a body condition where it's hard to gain weight. He tends to eat slowly and in small quantities. He enjoys his time programming and going to sites to play-test new games and has experience in doing so for the past couple years. He aspires to become a Film Director who can lead a healthy life. Due to his body condition he tends to tire easily and have little to no energy, His body condition doesn't allow him to easily gain weight, and the amount he tends to eat is very little. Due to this, he tends to get tired easily, and would like to be able to try to eat more consciously.

Persona ID: 0004 – Leo Vasanth



Age: 25/ Male
Job: Student
Location: Ontario, Canada

General Behaviors:

Daily Physical activities to stay fit & Healthy.
Loves to take care of himself.
Avid user of Mobile Apps.

Interest:

Gyming is something that he likes and has been into since 17 years old.

Love to go on hikes and adventures.

Skills:

Motivates others and often gives health tips to others
Well known for his balanced life (He studies, works and at the same time he never gives up his fitness routine).

Pain Points:

Everything is good to him as far as health and wellness is considered. But is finding a right place where he can keep track of his daily fitness routine and food intake.
He is looking for something that will help him set a goal or task with a deadline that he can accomplish (basically some sort of fitness goals).

Persona ID: 0005 – Amy Watson



Age: 30/ Female
Job: Housekeeper
Location: Austin, USA

General Behaviors:

Amy is a wife and mother of 2 children and she is pregnant with the third child.

Every day she is busy because of housework and she doesn't have much time for herself.

Interests:

Rarely does fitness exercises.
Loves to cook and impress others with her skill.
Surf through the internet often to get healthy eating habits.

Skills:

Caring and well organized.
Dedicated and Empathetic.

Pain Points:

She doesn't have time to check and compare information in the net.
She doesn't know what kind of exercise she is able to do.

User Stories

User story ID #	Persona	Functionality needed	Benefit out of it	App Definitions
1	Shushruth	Keep track of the meal intake.	Monitor, understand and moderate how much he is eating, and what improvement he has to make.	input a function in our application which would help him log his everyday meal (intake of protein, carbs, etc).

2	Shushruth	Suggestions or tips.	Get health tips on regular basis to follow.	new tab in our application, which will load a list of tips that a user might need in order to lead a healthy life.
3	Korin	Consume a more nutritionally- balanced diet.	Maintain her body shape and track her progress.	Food choices can be given based on her previous history of food intake.
4	Nakhil	Gain weight, feel better in his body and be more active.	This will enable him to stay confident in the society and stay motivated.	The BMI of a person is calculated while registering for the app, which will allow our application to understand what the user needs, and act accordingly.
5	Vasanth	Wants to get breakdown of his calorie intake and nutrients.	So that, he can keep track of what he needs to improve or degrade.	Ability to have visual track of his progress towards fitness goals.
6	Vasanth	Need a point of contact or get in touch with health advisors for suggestions.	Consult regarding health, fitness and wellness.	New function with list of health advisors, which will navigate the users to directly email them their concerns.
7	Amy	Eat less processed food and take more of nutrients.	This will lead her and her children to have good knowledge on healthy food.	The app will categorize food types before they record their intakes, this way they can have better understanding and knowledge on varieties of products.

3. Data Definitions

Collection Name	Definition & Attributes	Usage
userRegister	Information about users on registration . Attributes- firstName, lastName, location, userName, email, password, platePreferences, bodyIndex	The user document is created when the user reaches the end of the registration. They can change the information such as password or body index in the setting (frontend form passed into the backend to rewrite the user document).
location	Dropdown which will state the list of countries, state and city (based on previous input). Attributes- city, state, country	This will enable the user to first select a country while registering in the app from a dropdown list, based on which the state, followed by city is populated in the respective DDL.
userLogin	login details of the user. Attributes- userName, password.	Login details for users are provided, which will inherit data from the above userRegister collection.
foodChoices	The different types of food items that the user wants to log. Attributes- name, Calories, carbs, protein, fat. Note: The nutrition is measured by 100g only, so it depends on the frontend to pass an accurate measure to calculate the real input.	In a food collection, different food (measured in 100g by default) has its own document. (The food documents may be input manually via Robo3T, or there would be an admin account, which can grab this collection via backend feature, to add or to modify the food data).
foodIntakeList	food intake history for different users. Attributes- userName, calories.	Enables users to view history or records of their previous food intake. Planned to view them in a grid using pagination.
advisorsList	Provides a list of advisors with whom users can connect in case of any health concerns. Attributes- advisorName, speciality, advisorEmail	Loads the list of health advisors and their specialization along with the user id, which will enable users to get in touch with them directly.
accountType	Type of an account which will allow users to perform operations based on access role. Attributes- accounttype, role, privilege.	The type of account describing what level of access a user has. Eg- owner, admin, moderator, user

4. Initial list of functional requirements

Priority Level and code:

High (***)

Moderate (**)

Low (*)

1. ***Create an account
 - a. Users are required to create an account
 - b. We will just ask for basic questions (username/email and password), if user prefer to have more accurate plan, then they can choose to do more questions which is the advanced mode (age, weight, height, BMI)
2. ***Record their daily meals
 - a. The recording (main) page would have the plate split into five areas. Users are able to record their food based on the food group that they had.
 - b. If users prefer, they can record the food with their desired unit. If not, we would use the recommended portion which is published by the U.S. Department of Agriculture.
3. **Edit/manage their past or future meals
 - a. Users are able to change or pre-plan their future meals
 - b. Users are able to revisit their past meals
4. **Analysis diagram
 - a. Help the users to keep aware of the ratio of the food that they ate
 - b. iPlate will also provide the calorie & macro-nutrient option, which will allow user to see their calorie intake and nutrients report (this feature is set to off in default)
5. **Diet suggestions
 - a. Based on the analysis diagram, iPlate will give suggestions on which food group the user should consume more. If users choose to turn on advanced mode, then their suggestion would include the numbers. If not, would be a general suggestion.
6. *Water Tracker
 - a. Allow user to track how much water they drink a day
 - b. Will design a easy-to-use interface
7. *Change the plate style
 - a. Users are able to customize their plate.
8. *Health Advisors connect
 - a. List the advisor and their specialization along with their contact so that users can directly click on the link and get in touch with them in case of any health concerns.

5. List of non-functional requirements

1. Application UI should be responsive so users can use it on their mobile or their PC, for example, the mobile version does not need to zoom in or zoom out compared to the PC version.
2. User-friendly UI. The UI should be clean for the users that they can focus each button they can click.
3. Users' data must be protected. After creating an account, the password would be encrypted first and then passed into the database.
4. Database: keep the general information for each food group, the nutrition information would be from FDA database <https://fdc.nal.usda.gov/>
5. The code will be maintained in the GitHub repository so that not only the developer, but even the team member can access and implement it in case of any additional features. Also, feature branches are created within the repo for easy code merge without conflicts.
6. The installation steps and other information (User manual) will be given in the GitHub repo at the release phase.
7. Redirecting or toggling between pages will be easy and processed at a rapid speed so that users can use the application without any hassle.
8. Our application will be compatible with different versions/types of browsers also with variety of operating systems.

6. Competitive analysis

Competitors Features	Our Planned Features
<p>Fooducate (https://www.fooducate.com/)</p> <hr/> <p>Pros:</p> <ul style="list-style-type: none"> Alphabetic grade scale that determine health <p>Cons:</p> <ul style="list-style-type: none"> Only available for use on Apple or Android app store Sign-up required Signing up requires series of questions to be answered 	<ul style="list-style-type: none"> Focus is on Website development Sign up will have few questions where some will be optional
<p>MyFitnessPal (https://www.myfitnesspal.com/zh-TW)</p> <hr/> <p>Pros:</p> <ul style="list-style-type: none"> Available on browser, ios, and android Very Clean UI <p>Cons:</p> <ul style="list-style-type: none"> Sign up requires too many questions to be answered Filled with Advertisements Different Features differing from English and Chinese website 	<ul style="list-style-type: none"> Sign up will have few questions where some will be optional No advertisements be able to look for the food (and its calories without needing to sign up)
<p>Noom (https://www.noom.com/)</p> <hr/> <p>Pros:</p> <ul style="list-style-type: none"> Different food recording system (not just calories) Gives users tips and diet instructions Has a one-one nutritionist Tracks water consumption UI easy to use <p>Cons:</p> <ul style="list-style-type: none"> Sign up requires too many questions to be answered Not free, requires payment Gives warning when user goes over their 	<ul style="list-style-type: none"> Sign up will have few questions where some will be optional Record Water consumption

calorie goal	
<p style="text-align: center;">LifeSum (https://lifesum.com/)</p> <hr/> <p>Pros:</p> <ul style="list-style-type: none"> • Website looks nice • App has water tracker along with customizable water container image, and users can define their own size of water in a container • Mobile version features facial emoticons for food health levels differentiating healthy and processed foods • The App allows conversion of units such as grams, ml, etc • App records physical activity • App records in terms of meals such as Breakfast, Lunch, Dinner, and Snack <p>Cons:</p> <ul style="list-style-type: none"> • Website features only include sign-up and settings • Website asks people who sign up to pay subscription fee • App additional food info requires subscription fees for details about proteins, fats, etc • Sign up is lengthy due to amount of questions 	<ul style="list-style-type: none"> • Sign up will have few questions where some will be optional • Record Water consumption • Fancy bowl features (like either plate or bowl?) • Track overall meal for the day(?) • the app will have for all platforms (PC/ mobile alongside various browsers)

Summary:

There's a notable pattern between these websites/applications where they require lengthy registration due to the sheer amount of questions asked to profile a user. In our website we will shorten this process by having less questions and optional categories for form registration. We also see many positive aspects about these competitors and aspire to take some positive aspects such as water intake, and maybe customizable sprites/images for our food containers for our meal tracking feature.

7. High-level system requirements

Cloud server: Amazon AWS EC2

Operating system and version: Ubuntu 20.04 server

Database and version: MongoDB v 4.4

Web server: Node.js

Web application framework: Express

Server-side Language: JavaScript

Client-side Framework: React.js

IDE: Microsoft Visual studio

8. Checklist

Task #	Task Description	Progress/Status	Remarks
1	Team found a time slot to meet outside of the class	DONE	We are meeting on Zoom every Wednesday from 11AM to 12 PM
2	Scrum Master shares the meeting minutes with everyone after each meeting.	ON TRACK	
3	GitHub master chosen	DONE	
4	Everyone sets up their local development environment from the team's git repo.	DONE	
5	Team decided and agreed together on using the listed SW tools and deployment server	DONE	
6	Team ready and able to use the chosen back and front-end frameworks.	ON TRACK	Javascript: Prathiba/Myat React: Tunni/Chris MongoDB: Jingxing Cloud server (AWS): Aung (See the note below for detailed plan)
7	Team lead ensured that all team members read the final M1 and agree/understand it before submission	DONE	

Note: Assigned team members will learn their technologies and share the source of discord. Also will tutor other team members with key elements (a 30min session) every 2 weeks once during Wednesday's team meeting.