

FRESHLENS

Sprint 3 - TEAM-4 Sierra



AGENDA

- Project Review
- Team members
- MVP
- Technologies
- Algorithms
- Diagrams
- Sprint 2 recap
- Product and Sprint 3 Backlog
- Metrics
- Retrospective
- Sprint 4 Plans
- Project demo
- Github
- App demo

TEAM MEMBERS



Chandu Pentela
Project Manager



Banoth Ashok
Backend Developer



**Jaya Venkata Vara Sai Prakash
Perumalla**
Backend Developer

TEAM MEMBERS



Ashish Padma
Machine Learning Engineer



Poojitha chinthala
Machine Learning Engineer



Sushmitha Reddy Poddaturu
Machine Learning Engineer

TEAM MEMBERS



Satish kumar reddy indla
Developer



Aishwarya Kongari
Developer

Changes based on Professor feedback

- Following the checklist order.
- Changes in user story, Product backlog and screenshots of the application.

PROBLEM STATEMENT

Many individuals want to maintain a healthy diet but they find it challenging to keep track of their diet and analyse it. The traditional way where keep logging food intake often time and it is prone to inaccuracies, which leads to poor diet choices and even demotivates the individual.

There needs to be a way for a more intuitive and efficient way to understand the nutritional values of fruits and easy to keep track of the intake. Which makes individuals to take healthy diet options.

PROJECT DESCRIPTION

Project Name:	FreshLens
Team:	Sierra
Project Description:	<p>FreshLens revolutionizes the tracking of diet by instant recognition and nutritional analysis of fruits and vegetables only by photo snap.</p> <p>For health conscious individuals who find traditional diet tracking inconvenient.</p> <p>the Freshlens is a mobile application that simplifies healthy eating by instantly identify fruits and vegetables through photo and provide nutritional insights, unlike traditional complicated manual tracking methods our application offers a seamless and effective way to understand and improve diet.</p>
Project Description	
Benefit Outcomes:	<p>User get an in depth understanding about the nutritional value of their fruits and vegetables, which helps them take perfect choices.</p> <p>It eliminates the manual logging, which makes the diet tracking efficient.</p> <p>It even educates the users about the food variety and nutritional benefits, promoting healthy choices.</p>
Github Link:	https://github.com/htmwm/2024S-Sierra

TEAM WORKING AGREEMENT

TEAM AGREEMENT

- If any individual faces any problem in their work, they can reach out to other individuals and request help and vice versa.
- There will be a team meeting held weekly once on Tuesday and all individuals must participate in the meeting and we will discuss the update about the project (workflow) during the call.
- A recurring meeting will be happening via Google Meet and will be getting mail prior day before the meeting starts.
- Everyone should respect each other and their decisions. We take a poll in the team meeting on the workflow and the majority will be the final decision from the team polls.
- Inappropriate behavior is not acceptable and will be informed to the professor immediately.
- Missing more than 4 calls is also not acceptable and will be informed to the professor.
- Everyone should give equal contribution to the project and should work as a team.
- All work should be done, prior 1 day before the due date.

Teammates signature

1. Ashish Padma
2. Poojitha chinthal
3. Jaya Venkata Vara Sai Prakash Perumalla
4. Chandu Pentela
5. Aishwarya Kongari
6. Sushmitha Reddy Poddaturu
7. Satish kumar reddy ~~indla~~
8. Banoth Ashok

PERSONAS



- **Name:** Emily
- **Age:** 30
- **Occupation:** Marketing Analyst
- **Interests:** Yoga, cooking, and reading health blogs
- **Goals:** Maintain a balanced diet
- **Challenges:** Struggles to find accurate nutritional info for fresh produce
- **How Your App Helps:** FreshLens offers instant nutritional content, supporting her balanced diet and culinary exploration.

PERSONAS



- **Name:** Alex
- **Age:** 35
- **Occupation:** Software Engineer
- **Interests:** Tech gadgets, hiking, fast cooking
- **Goals:** Eat healthily despite a busy schedule
- **Challenges:** Has limited time for meal prep and nutrition tracking
- **How Your App Helps:** FreshLens easily fits in busy lifestyle, it's designed for healthy eating with quick scan

PERSONAS

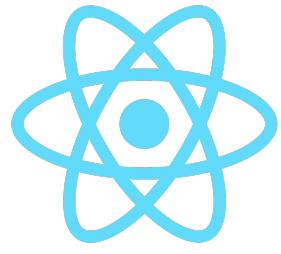


- **Name:** Jordon
- **Age:** 26
- **Occupation:** Personal Trainer
- **Interests:** Gym workouts, sports nutrition, bodybuilding
- **Goals:** Optimize diet for muscle gain and performance
- **Challenges:** Needs precise macro and micro intake from natural foods
- **How Your App Helps:** FreshLens helps in tracking nutritional values, enhancing his meal planning.

Minimum Viable Product (MVP)

- Photo-based food recognition.
- User-friendly interface design.
- Essential nutritional info display.
- User authentication system.
- Personal profile customization.
- Weekly dietary analysis.

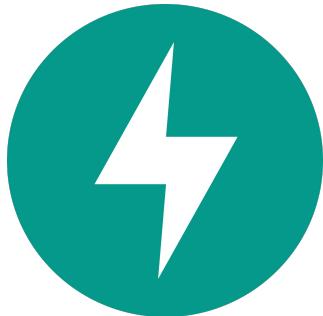
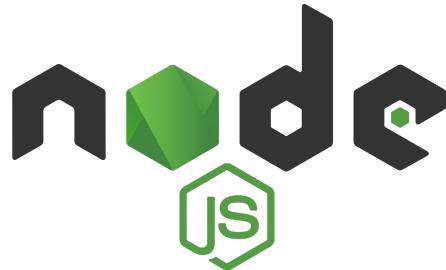
Technologies - Frontend



We will be using React native expo for developing UI for the mobile application and expo is wrapper around react native and it makes prototyping faster.

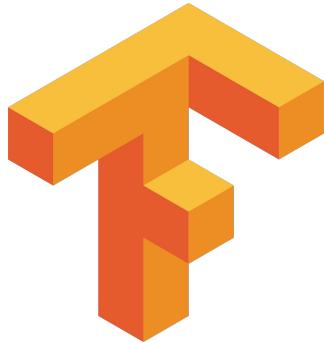


Technologies - Backend



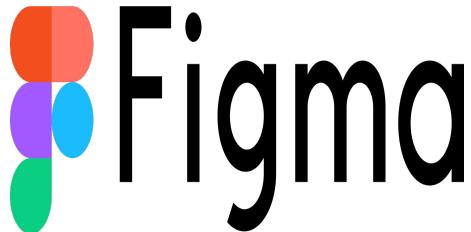
We will be using node js and fastapi for backend and mongodb as database and its nosql database and even firebase for Authentication and storing images using firebase cloud storage.

Technologies - Machine Learning



We will be using tensorflow to perform machine learning tasking and tensorflow is deep learning framework and it will be used for implementing CNN algorithm.

TECH STACK

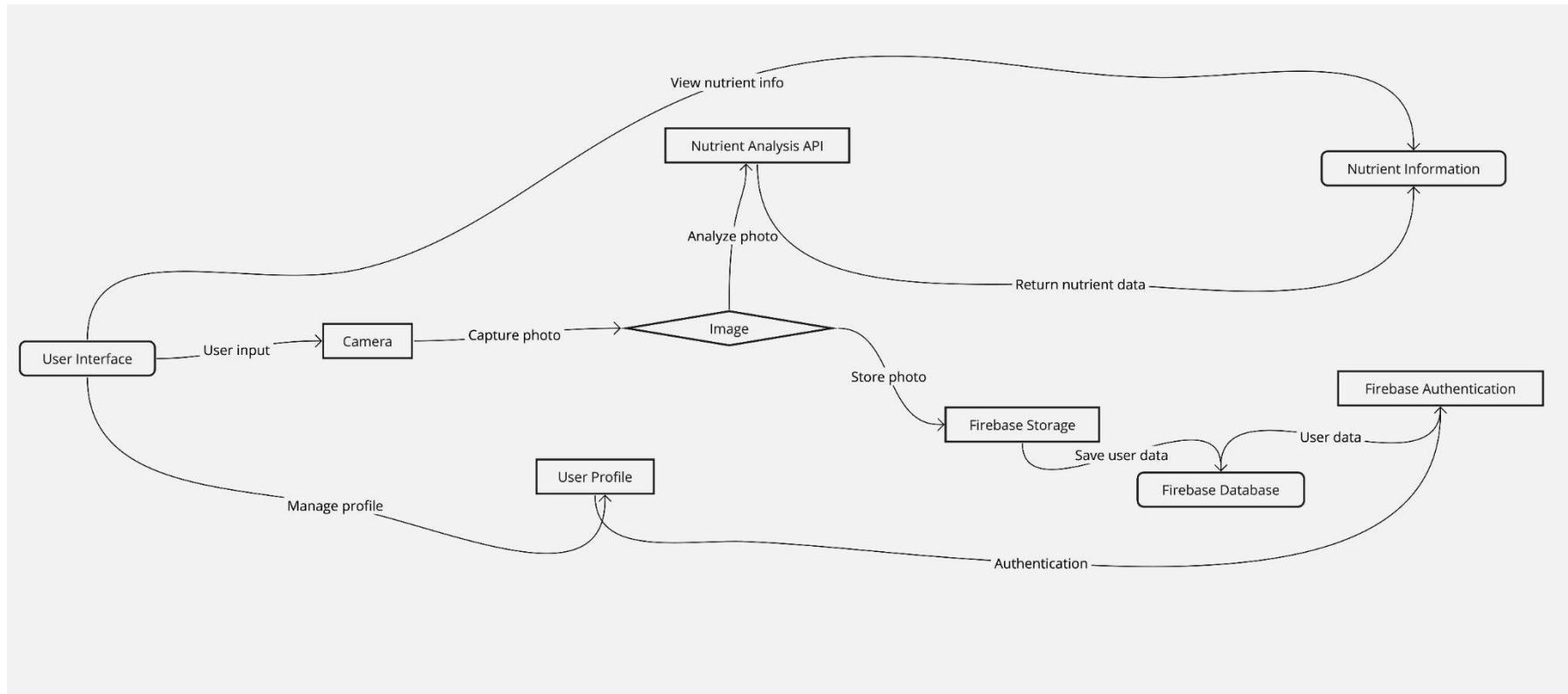


Figma is used for designing of the application and sharing the application ideas on how it should look like.

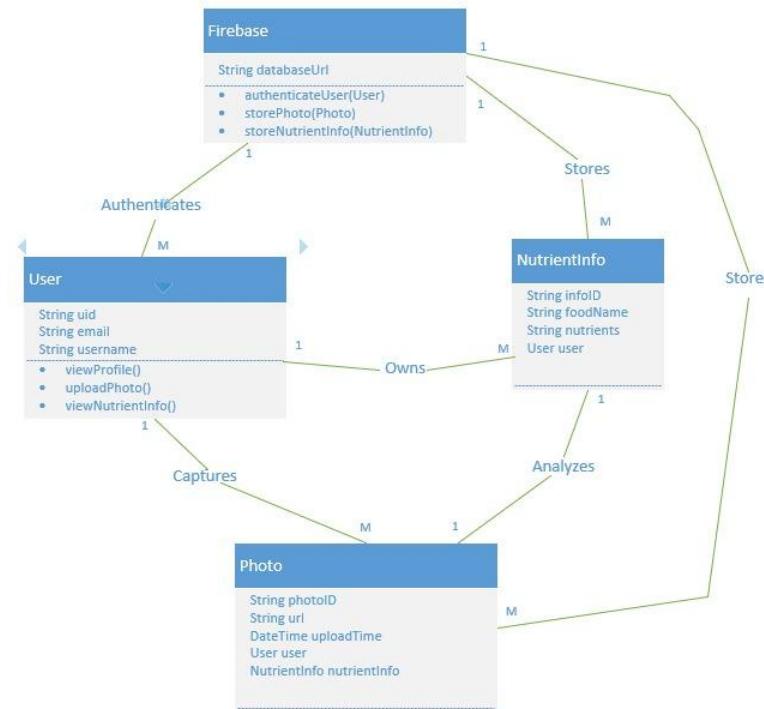
Machine Learning Algorithm

- CNN Architecture Algorithm .
- In CNN Algorithm. we use DenseNet121.
- The DenseNet model is trained using fruits and vegetables dataset. Due to its efficiency and high accuracy, DenseNet model effectively learns from the data and accurately identifies objects.

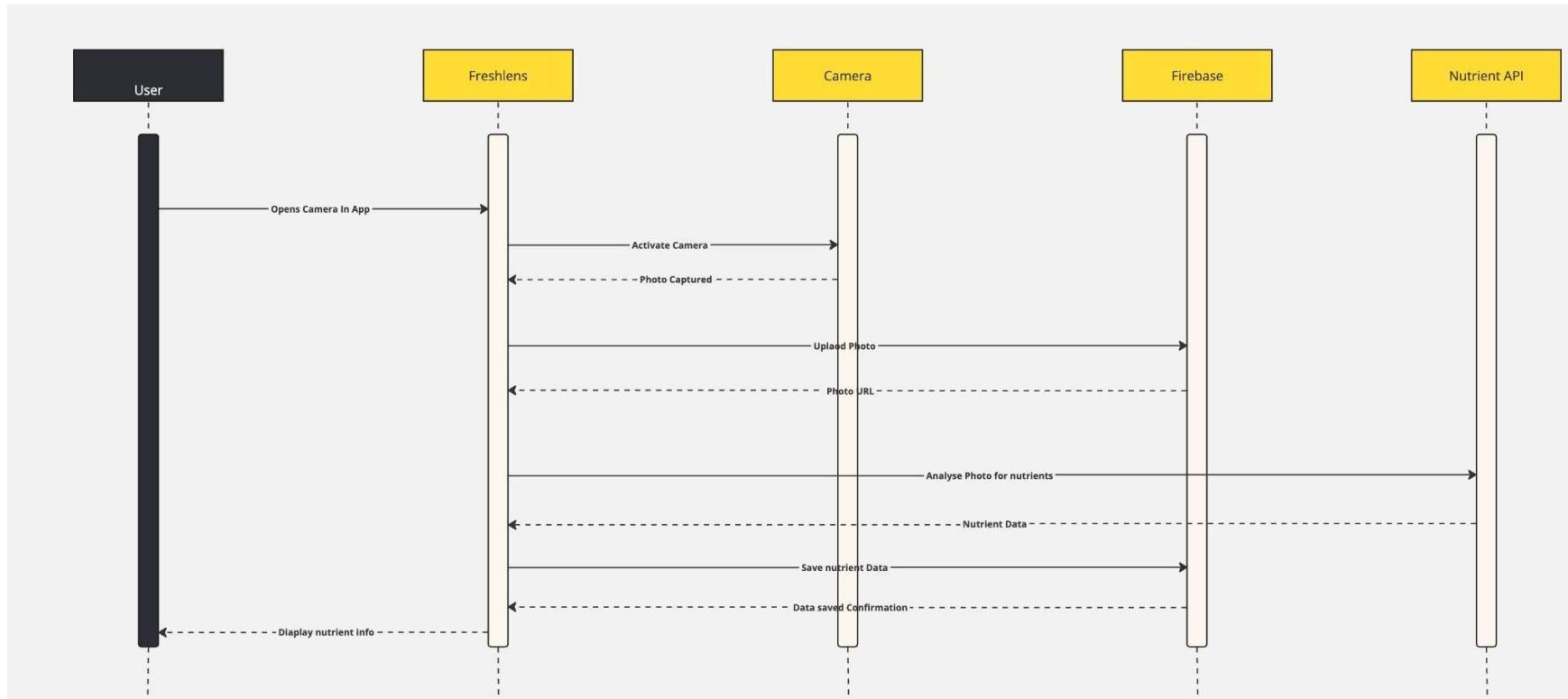
Conceptual Architecture Diagram



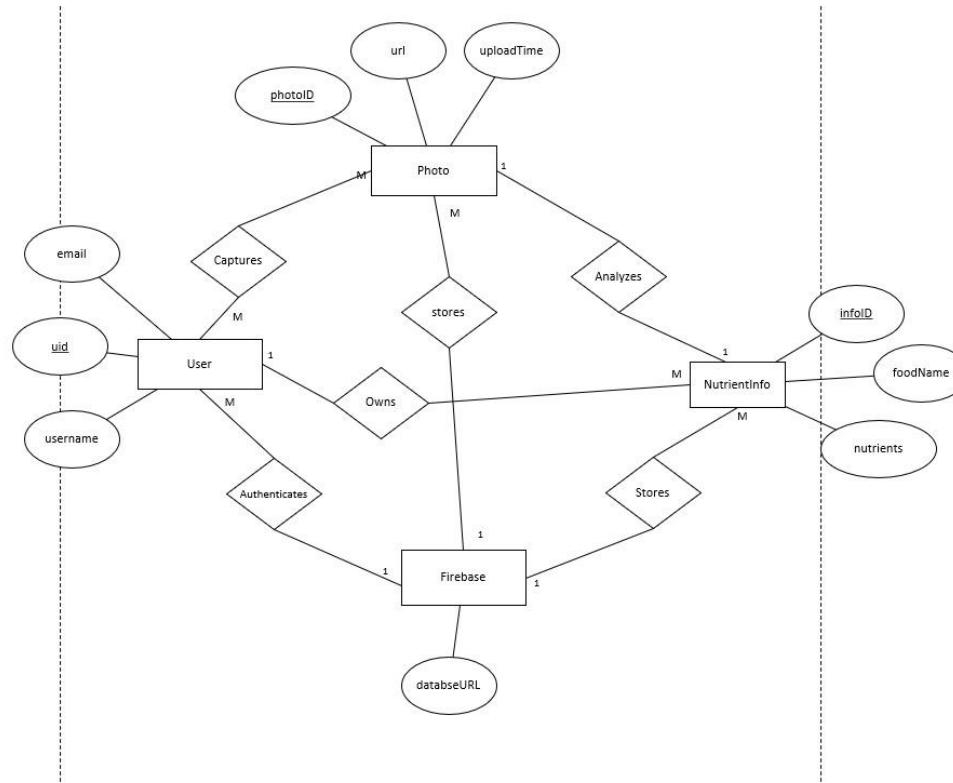
Class Diagram



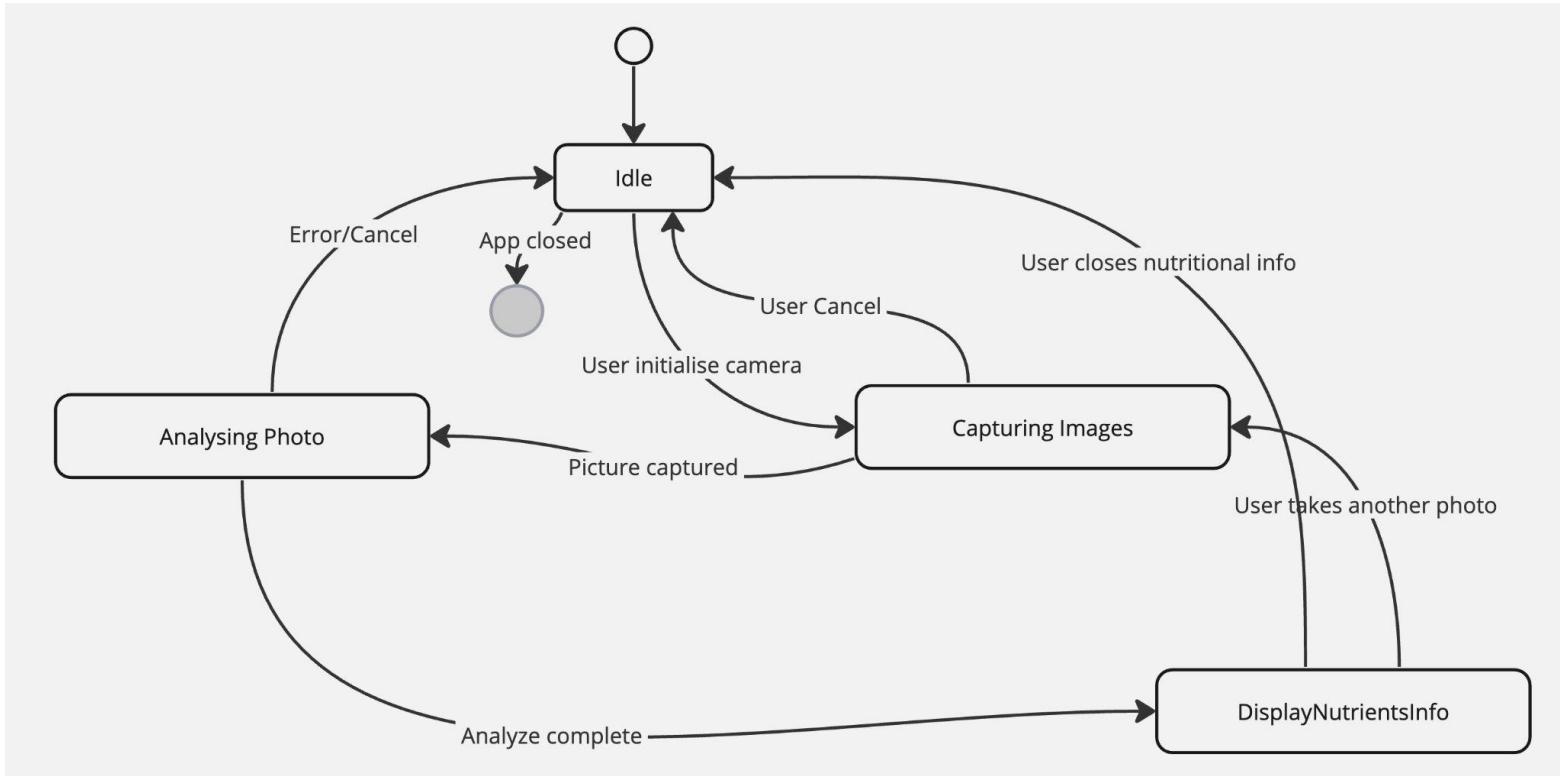
Sequence Diagram



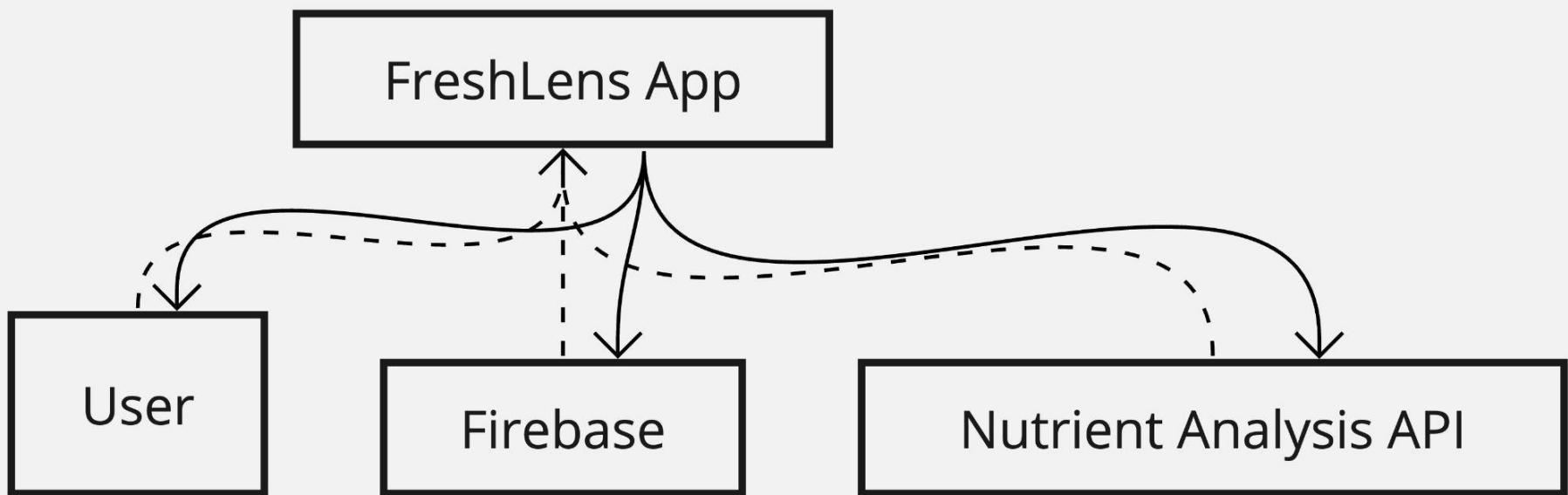
Entity Relationship Diagram



State diagram



Context Diagram



Sprint 2 backlog

- Basic implementation of all application screens such as camera , favourite and profile screens.
- Exploratory data analysis is performed for fruits dataset.

Product Backlog

S.No.	Feature	User Story	Points
1	Image Capture	As a user, I want to capture images of fruits	5
2	User Profile	As a user, I want to view a profile screen	3
3	Favorites	As a user, I want to have a favorites screen to save my preferred fruits	5
4	Fruit Recognition	As a user, I want the app to recognize fruits from the images I capture using ML	13
5	Nutritional Info	As a user, I want to view nutritional information for the recognized fruits	3
6	Intake Logging	As a user, I want to log my daily fruit intake	2
7	Database Storage	As a user, I want the logged fruit intake to be stored in a database	5
8	Fruit Reviews	As a user, I want to rate and review the fruits I consume	8
9	Multilingual Support	As a user, I want the app to provide multilingual support	3
10	Recipe Sharing	As a user, I want to contribute my own fruit-based recipes to the app	8
11	Challenges	As a user, I want to participate in fruit consumption challenges	13
12	Intake Reminders	As a user, I want to receive reminders to log my fruit intake	2

User Stories and Acceptance Criteria

S.No.	Feature	User Story	Points
	1 Image Capture	As a user, I want to capture images of fruit	5
The app should provide an option to capture or select fruit images, and display the captured/selected image.			
	2 User Profile	As a user, I want to view a profile screen.	3
The app should have a dedicated profile screen where users can view and update their information.			
	3 Favorites	As a user, I want to have a favorites screen.	5
The app should have a favorites screen for adding, removing, and persisting favorite fruits across sessions.			
	4 Fruit Recognition	As a user, I want the app to recognize fruit	13
The app should implement ML or integrate with a fruit recognition API to accurately identify fruits from user images and provide feedback.			
	5 Nutritional Info	As a user, I want to view nutritional information for recognized fruits.	3
The app should have access to a database or API to display nutritional information (e.g., calories, vitamins, minerals) for recognized fruits.			
	6 Intake Logging	As a user, I want to log my daily fruit intake	2
The app should allow users to log their fruit intake, including quantity/serving size, and maintain a log or history.			
	7 Database Storage	As a user, I want the logged fruit intake to be stored persistently	5
The app should have a database or storage mechanism to persist and retrieve the user's logged fruit intake across sessions and devices.			
	8 Fruit Reviews	As a user, I want to rate and review the fruit	8
The app should enable users to rate and review fruits, and display their ratings and reviews for each fruit.			
	9 Multilingual Support	As a user, I want the app to provide multilingual support	3
The app should support multiple languages, allow users to select their preferred language, and display all content in the selected language.			
	10 Recipe Sharing	As a user, I want to contribute my own fruit-based recipes	8
The app should provide a way for users to submit their own fruit-based recipes, including details like ingredients, instructions, and optionally, images or videos, and display a collection of user-contributed recipes.			
	11 Challenges	As a user, I want to participate in fruit consumption challenges	13
The app should offer various fruit consumption challenges, allow users to join and participate, track progress, and provide rewards or recognition for completing challenges.			
	12 Intake Reminders	As a user, I want to receive reminders to log my fruit intake	2
The app should allow users to enable reminders for logging fruit intake, set reminder frequency and timing, and send notifications or reminders accordingly.			

Black colour is highlighted for user stories and grey colour for Acceptance criteria

User Stories and Acceptance Criteria

10 Recipe Sharing	As a user, I want to contribute my own fruit-based recipes to the app.	8
The app should provide a way for users to submit their own fruit-based recipes, including details like ingredients, instructions, and optionally, images or videos, and display a collection of user-contributed recipes.		
11 Challenges	As a user, I want to participate in fruit consumption challenges.	13
The app should offer various fruit consumption challenges, allow users to join and participate, track progress, and provide rewards or recognition for completing challenges.		
12 Intake Reminders	As a user, I want to receive reminders to log my fruit intake.	2
The app should allow users to enable reminders for logging fruit intake, set reminder frequency and timing, and send notifications or reminders accordingly.		

Black colour is highlighted for user stories and grey colour for Acceptance criteria

Sprint 3 Backlog

S.No.	Feature	User Story	Points
4	Fruit Recognition	As a user, I want the app to recognize fruits from the images I capture using ML. The app should implement ML or integrate with a fruit recognition API to accurately identify fruits from user images and provide feedback.	13
5	Nutritional Info	As a user, I want to view nutritional information for the recognized fruits. The app should have access to a database or API to display nutritional information (e.g., calories, vitamins, minerals) for recognized fruits.	3
6	Intake Logging	As a user, I want to log my daily fruit intake. The app should allow users to log their fruit intake, including quantity/serving size, and maintain a log or history.	2
7	Database Storage	As a user, I want the logged fruit intake to be stored in a database. The app should have a database or storage mechanism to persist and retrieve the user's logged fruit intake across sessions and devices.	5

Black colour is highlighted for user stories and grey colour for Acceptance criteria

Test Cases

Test Case ID	User Story	Test Case Description	Expected Result	Pass/Fail
TC_FR_001	Fruit Recognition	Verify option to capture/select fruit image	App should have option to access camera/gallery	Pass
TC_FR_002	Fruit Recognition	Test recognition with various fruit images	App should accurately identify fruits	Pass
TC_NI_002	Nutritional Info	Test display of nutritional info for recognized fruit	App should display accurate nutritional info	Pass
TC_IL_001	Intake Logging	Verify UI/option for logging fruit intake	App should have way to log fruit intake	Pass
TC_IL_003	Intake Logging	Ensure maintenance of fruit intake log/history	App should maintain intake log/history	Pass
TC_DB_002	Database Storage	Test storage of logged fruit intake in database	App should store logged intake in database	Pass
TC_DB_003	Database Storage	Verify data retrieval across sessions/devices	Stored intake data should be retrievable	Pass

Stories Completed

User Story	Estimated Points	Completed (Yes/No)
As a user, I want the app to recognize fruits from the images I capture using ML.	13	Yes
As a user, I want to view nutritional information for the recognized fruits.	3	Yes
As a user, I want to log my daily fruit intake.	2	Yes
As a user, I want the logged fruit intake to be stored in a database.	5	Yes

Metrics

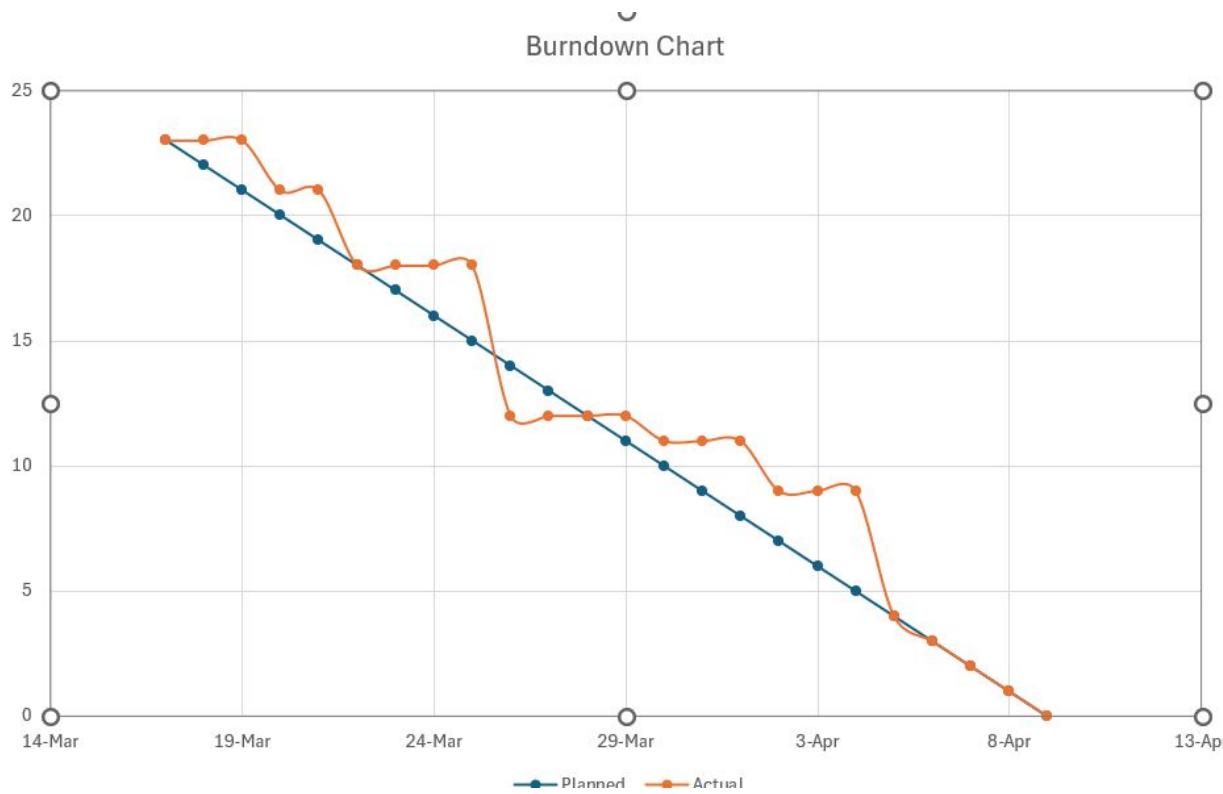
Team Velocity: 23 points

Average Velocity: 31.5 points

Completed Committed Ratio for Sprint 3:

23/23 - 100%

Burndown chart



RETROSPECTIVE

retrospective 3

what went well

Api is developed for ml part	. Back end part api developed successful integrated with fire base
+ 0	+ 0

ML team colbarated well	Cross team collaboration helped to work on project smoothly
+ 0	+ 0

Chose the right technologies for the app.	ML integration using TensorFlow was successful.
+ 0	+ 0

Making a user-friendly app with React Native that's fun and easy to use.	Effective teamwork and communication among project members
+ 0	+ 0

smooth coordination and progress tracking.	
+ 0	

what can be improved

Improve ML model accuracy.	. Conduct extensive user testing.
+ 0	+ 0

Enhance error handling.	Prioritize high-impact tasks.
+ 0	+ 0

time management	get everyone involved in meetings
+ 0	+ 0

more collab coding	github activity
+ 0	+ 0

double checking on presentation for issues	
+ 0	

Action items

Improve error handling mechanisms.	Plan and implement user-requested features.
+ 0	+ 0

Improve frontend usability.	review the presentation wikipage against the checklist and ensure they align.
+ 0	+ 0

Sprint 4 Planned and Committed Stories

User Story	Estimated Points	Planned for Sprint 4	Committed for Sprint 4
As a user, I want to rate and review the fruits I consume.	8 ✓	✓	
As a user, I want the app to provide multilingual support.	3 ✓	✓	
As a user, I want to contribute my own fruit-based recipes to the app.	8 ✓	✓	
As a user, I want to participate in fruit consumption challenges.	13 ✓		
As a user, I want to receive reminders to log my fruit intake.	2 ✓	✓	

Demo Screenshots

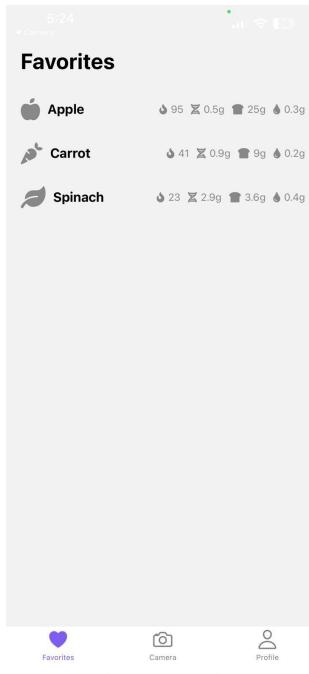


Favorite
Screen



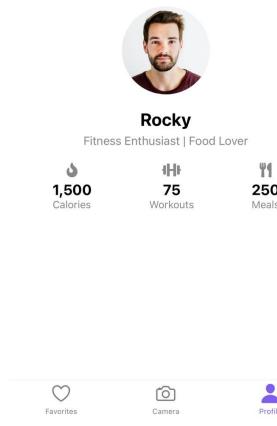
Capture
Modal

Demo Screenshots



Favorite Screen

Profile



Profile Screen

6:57



10

**Potato**

Model Confidence: 89%

About

The potato is a starchy, tuberous crop from the perennial nightshade *Solanum tuberosum*. It is a staple food in many parts of the world and is an excellent source of carbohydrates, vitamins, minerals, and antioxidants.

Nutrition Summary

Calories: 77 kcal

Protein: 2g

Carbs: 17g

Fat: 0.1g



Favorites



CameraStack



Profile

Application

Apple

Calories: 95

Protein: 0.5g

Carbs: 25g

Fat: 0.3g

About

The apple is a crisp, edible fruit that grows on apple trees. Apples are among the most popular fruits in the world and are packed with antioxidants, vitamins, and dietary fiber.

Back

FavoritesStack



CameraStack



Profile

FastAPI

```
@app.exception_handler(Exception)
async def exception_handler(request, exc):
    return JSONResponse(
        status_code=500,
        content={"message": "An error occurred while processing the request."}
    )

@app.post("/predict")
async def predict(file: UploadFile = File(...)):
    try:
        contents = await file.read()
        image = Image.open(io.BytesIO(contents)).convert('RGB')
        image = image.resize((100, 100))
        image_array = np.array(image) / 255.0
        image_array = np.expand_dims(image_array, axis=0)

        predictions = model.predict(image_array)
        predicted_class_index = np.argmax(predictions[0])
        predicted_class_label = class_labels[predicted_class_index]

        return {"fruit": predicted_class_label}
    except Exception as e:
        raise e
```

Node JS Api

```
const nutrients = results[0];
res.json({
  fruit,
  nutrients: {
    calories: nutrients.calories,
    carbohydrates: nutrients.carbohydrates,
    protein: nutrients.protein,
    fat: nutrients.fat,
    fiber: nutrients.fiber,
    vitaminC: nutrients.vitamin_c,
    calcium: nutrients.calculator,
    iron: nutrients.iron,
  },
});
});

pythonProcess.stderr.on("data", (data) => {
  console.error("Error from Python script:", data.toString());
  res.status(500).json({ error: "Internal server error" });
});
});

const port = process.env.PORT || 3000;
app.listen(port, () => {
  console.log(`Server is running on port ${port}`);
});
```

Firebase API

```
const firebaseConfig = {
    apiKey: FIREBASE_API_KEY,
    authDomain: FIREBASE_AUTH_DOMAIN,
    projectId: FIREBASE_PROJECT_ID,
    storageBucket: FIREBASE_STORAGE_BUCKET,
    messagingSenderId: FIREBASE_MESSAGING_SENDER_ID,
    appId: FIREBASE_APP_ID,
};

if (!firebase.apps.length) {
    firebase.initializeApp(firebaseConfig);
}

export default firebase;
```

Wikipage link

<https://github.com/htmw/2024S-Sierra/wiki>

Application Demo

THANK YOU