# Project Report

# NUTRITION ASSISTANT APPLICATION

**PROJECT ID: PNT2022TMID43697**

**Submitted By-**

**Team Members:**

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# 1.INTRODUCTION:

## 1.1 PROJECT OVERVIEW:

Good nutrition promotes not only better physical health and reduced susceptibility to disease, but has also been demonstrated to contribute to cognitive development and academic success. Left to their own devices, children will not automatically select healthy foods.

Nutrition is the process of consuming, absorbing, and using nutrients needed by the body for growth, development, and maintenance of life. To receive adequate, appropriate nutrition, people need to consume a healthy diet, which consists of a variety of nutrients the substances in foods that nourish the body.

Living a healthy lifestyle can help prevent chronic diseases and long-term illnesses. Feeling good about yourself and taking care of your health are important for your self-esteem and self-image. Maintain a healthy lifestyle by doing what is right for your body.

At last I want to conclude that food and health both are related to each other. Our health depends upon what food we eat and how much we eat. Therefore we should be careful while eating.

For all these needs our platform supports to lead a healthy life.

## 1.2 PURPOSE:

Nutrition assistant application helps dieticians with providing proper nutrition at healthcare facilities. It determine nutritional needs and assets risk factors. Nutritional assessment allows healthcare providers

to systematically assess the food diagnose malnutrition, identify underlying pathologies in food that lead to malnutrition, and plan necessary interventions.

Nutrition apps can help make life easier for individuals who need to track their food intake for health reasons. Eating a balanced diet is not always easy, especially when eating out, trying to cook new recipes, or managing the demands of a busy life.

# 2. LITERATURE SURVEY:

## 2.1 EXISTING PROBLEM:

In this pandemic situation, we need to lead a healthier life by means of taking healthier intake of foods. But in our fast moving world while we taking food we can't find a chart and check whether the food is nutritional food or not. Thus to overcome that risky we created a application known as nutrition assistant application.

## 2.2 REFERENCES:


1. Adnan Shehzad, Hui Su, Jin Lui, Si Chin, Zhidong Shen (2019) "Machine Learning Based Approach on Food Recognition and `Nutrition Estimation", International Conference on Identification, Information And Knowledge In The Internet Of Things (IOT)(IIKI2019).

2. Alisha Lalani, Md.Riyazudin, Mousmi Ajay Chaurasia, Salva Fathima, Syed Ibrahim Ibaad (2022) "Estimation of Quantity and Nutritional Information Using Image Processing", International Journal Of Scientific And Engineering Research.

3. Bojia Qiu, Chenxi Huang, Kunhui Lin, Landu Jiang, Xue Liu (2022) "Deep Food: Food Image Analysis and Dietary Assessment via Deep Model", International Journal of Scientific And Engineering Research.

4. Djilani Kebaili, Eric Antoine Scuccimarra,Gaurav Singhal, Harris Heritier,Marcel Salathe, Sharada Prasanna Mohanty, Victor Boulanger (2016) “The Food Recognition Benchmark: Using Deep Learning to Recognize Food in Images”, International Conference On Identification And Knowledge On IOT.

5. Hazum Kemal Ekenel , Marwa Qaraqe , Seymanur Aktr (2016) “A Mobile Food Recognition System for Dietary Assessment”, International Conference On Identification And Knowledege On IOT.

6. Hui Deng, Jianbo Wu, Xianghui Zeng, Ying Wang (2021) “A Comprehensive Survey of Image-Based Food Recognition and Volume Estimation Methods for Dietary Assessment”, International Conference on Journal Publication.

7. Manpreetkour Basantsingh Sardar, Dr. Sayyad D.Ajij (2016) “Fruit Recognition and its Calorie Measurement: An Image Processing Approach”, International Journal Of Engineering And Computer Science.

## 2.3 PROBLEM STATEMENT DEFINITION:

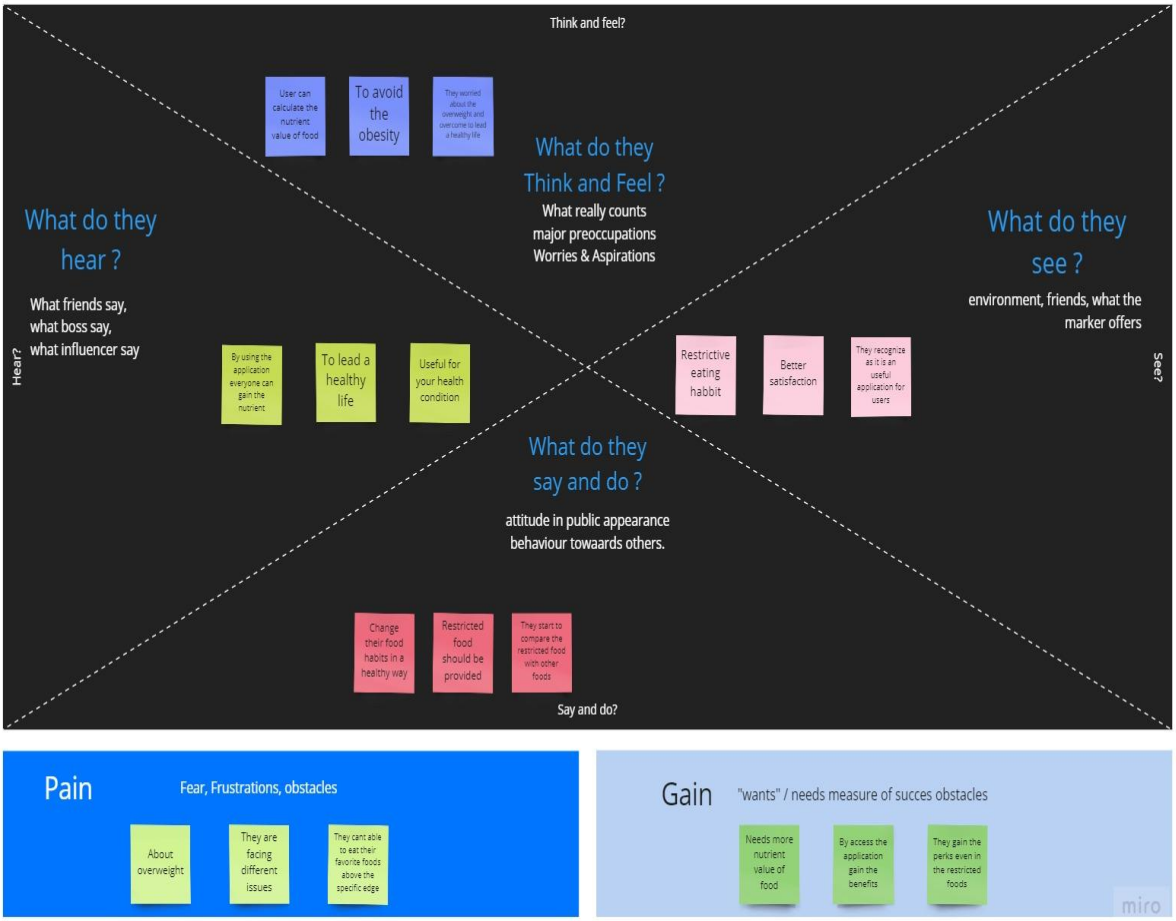
A problem statement is a concise description of the problem or issues a project seeks to address. The problem statement identifies the current state, the desired future state and any gaps between the two. A problem statement is an important communication tool that can

help ensure everyone working on a project knows what the problem they need to address is and why the project is important.

A problem statement is important to a process improvement project because it helps clearly identify the goals of the project and outline the scope of a project. It also helps guide the activities and decisions of the people who are working on the project. The problem statement can help a business or organization gain support and buy-in for a process improvement project.

# 3.IDEATION AND PROPOSED SOLUTION:

## 3.1 EMPATHY MAP CANVAS:




An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.

## 3.2 IDEATION AND BRAINSTORM:

Define your problem statement:

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

PROBLEM

In this pandemic situation, we are in need to eat a healthy food. But in this fastest world we can't carry a nutrition chart to every place to identify the healthy food.

**BRAINSTORM:**

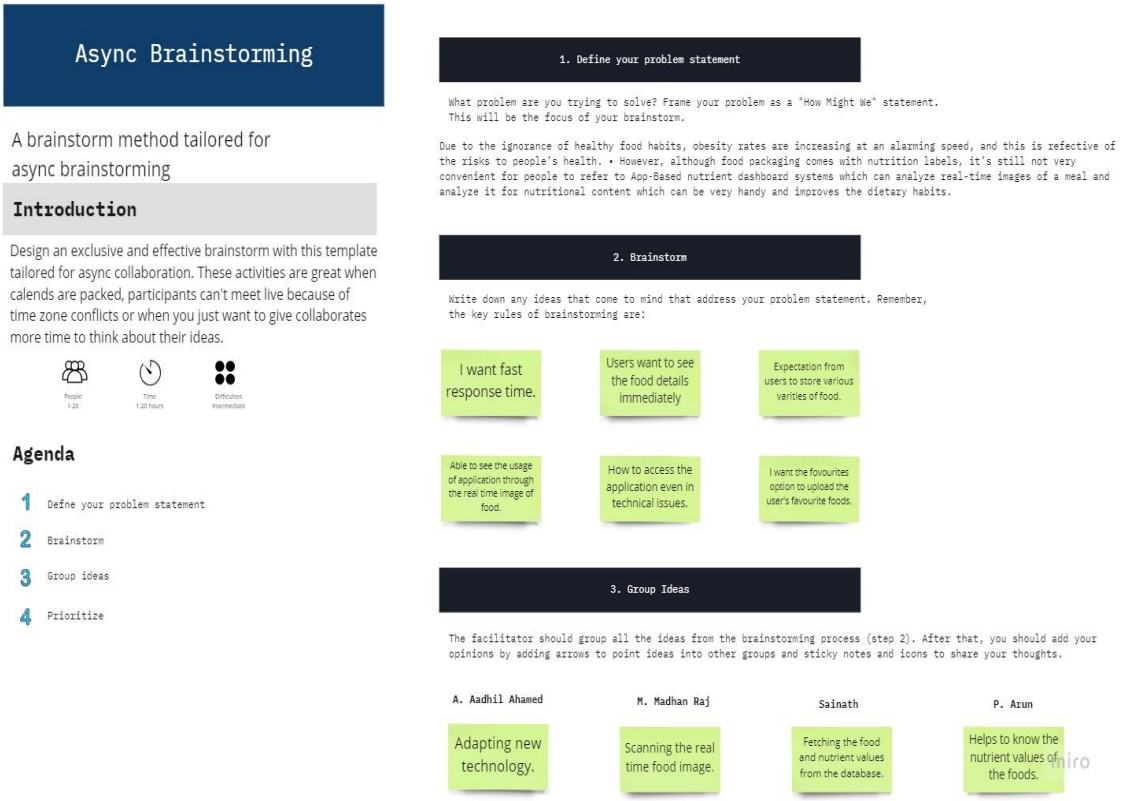
Write down any ideas that come to mind that address your problem statement.

**GROUP IDEAS:**

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

**PRIORITIZE:**

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.



## 3.3 PROPOSED SOLUTION:

Proposed Solution Template: Project team shall fill the following information in proposed solution template.

| S. No | Parameter | Parameter |
|---|---|---|
| 1 | Problem Statement (Problem to be solved) | Due to the ignorance of healthy food habits, obesity rates are increasing at an alarming speed, and this is reflective of the risks to people's health. People need to control their daily calorie intake by eating healthier foods, which is the most basic method to avoid obesity. However, although food packaging comes with nutrition (and calorie) labels, it's still not very convenient for people to refer |
| 2 | Idea / Solution description | The key research objectives are as follows:<br>• The proposed system would be able to determine the ingredients from the provided image.<br>• The proposed system also consists of a nutrition API, which provides the amount of nutrition present in the food. |
| 3 | Novelty / Uniqueness | The current system is capable of calculating nutrition, but the user must provide food item details manually. We are adding a system |

| | | |
|---|---|---|
| | | that is capable of detecting food items from an image, and this is a uniqueness we made here besides from project constrain. |
| 4 | Social Impact / Customer Satisfaction | Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child, and maternal health; stronger immune systems; safer pregnancy and childbirth; a lower risk of non-communicable diseases (such as diabetes and cardiovascular disease); and longevity. |
| 5 | Business Model (Revenue Model) | It has multiple business models Some of it,<br>• An individual can use this application to take care of their diet.<br>• Nutrition assistants help dieticians with providing proper nutrition at healthcare facilities. |
| 6 | Scalability of the Solution | It provides access to a large number of users at a time with accurate information about nutrition. It can handle a large variety of food items. |

## 3.4 PROBLEM SOLUTION FIT:

1. **CUSTOMER SEGMENT(S)**

   People who are highly careless about eating healthy food for their health condition and who wish to balance the nutritional content of their daily consumption.

2. **JOBS-TO-BE-DONE / J&P PROBLEMS**

   Obesity and the user's anxiety about developing health-related problems are his or her problems. If they don't see results right away, they'll get impatient and find it difficult to finish laborious chores. They lack confidence as a result of their appearance.

3. **TRIGGERS**

   People who practice healthy eating habits tend to be successful and fit

4. **EMOTIONS: BEFORE / AFTER**

   They will take good care of their bodies by eating healthy foods because they are afraid of becoming obese and because their physical condition makes them feel insecure.

## 5. AVAILABLE SOLUTIONS

Although food packaging includes nutrition (and calorie) labels, customers still find it difficult to accept or believe them. Making a nutrition helper application is therefore preferable.

## 6. CUSTOMER

The user must upload a clear photo of the food, which can be a menu item from a restaurant that provides a clear context for the food picture or the picture they took when they received the food, in order to have the nutrition content of the food image posted.

## 7. BEHAVIOUR

Everybody has the long-term objective of living a healthy life. One must maintain a daily pattern of a balanced diet that includes all nutrition in order to achieve them

## 8. CHANNELS of BEHAVIOUR

### 8.1 ONLINE

From the website, customers can get the nutrition level of the food.

### 8.2 OFFLINE

Conducting offline awareness program for healthy life standard.

## 9. PROBLEM ROOT CAUSE

Nowadays, eating unhealthy food, such as fast food, is common. Fast food is frequently consumed by people for reasons other than their health.

**10. YOUR SOLUTION**

The user must upload the food image first, after which the meal's calories and nutritional information will be presented. User activities are also recorded for future use.

# 4. REQUIREMENTS:

## 4.1 FUNCTIONAL REQUIREMENTS:

Following are the functional requirements of the proposed solution.

| FR No | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | User Registration | Registration through Form. |
| FR-2 | User Confirmation | Confirmation via Email. |
| FR-3 | Image Uploading | Calculation of Nutrition level. |
| FR-4 | View History | Enable to view the old result. |
| FR-5 | Delete History | Enable to delete the old result. |

## 4.2 NON-FUNCTIONAL REQUIREMENTS:

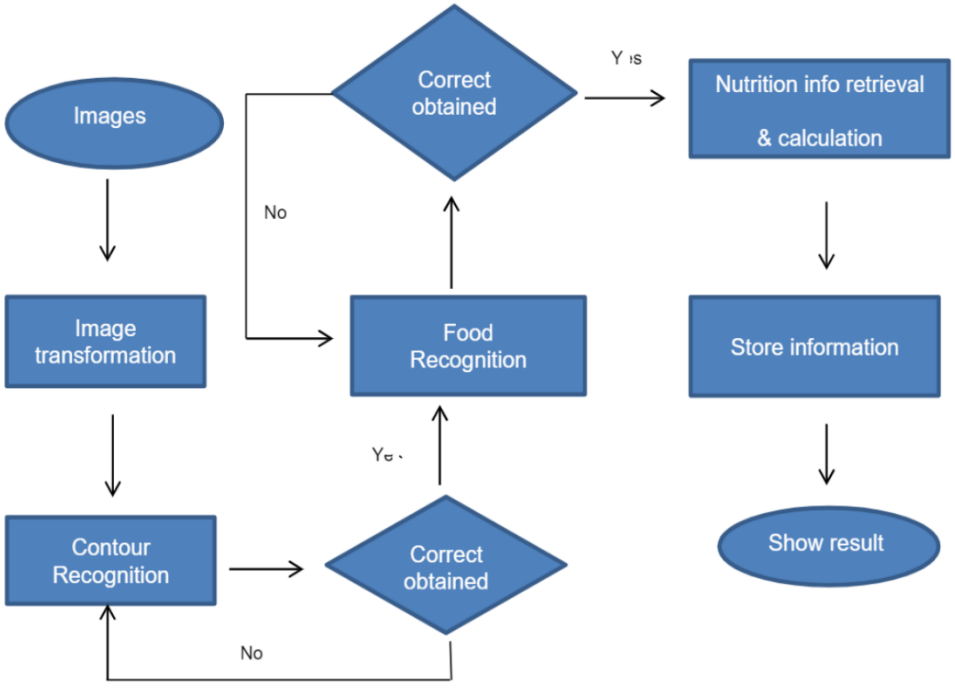
Following are the non-functional requirements of the proposed solution.

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | Usability | Using Android or IOS or windows application. |
| NFR-2 | Security | The user data is stored securely in IBM Cloud |
| NFR-3 | Reliability | The Quality of the Service are trusted. |
| NFR-4 | Performance | It provides smooth user experience. |
| NFR-5 | Availability | The Service are available for 24 /7. |
| NFR-6 | Scalability | It is easy to scalable size for users |

# 5. PROJECT DESIGN:

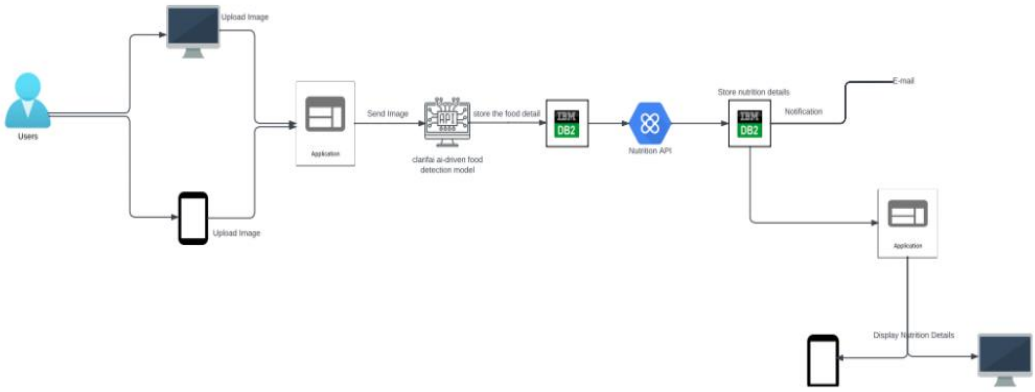
## 5.1 DATA FLOW DIAGRAMS:

A Data Flow Diagram is a way of representing a flow of data through a process or a system. A Data Flow Diagram is a traditional visual representation of the information flow within a system.it shows how data enters and leaves the system, what changes the information, and where data is stored.

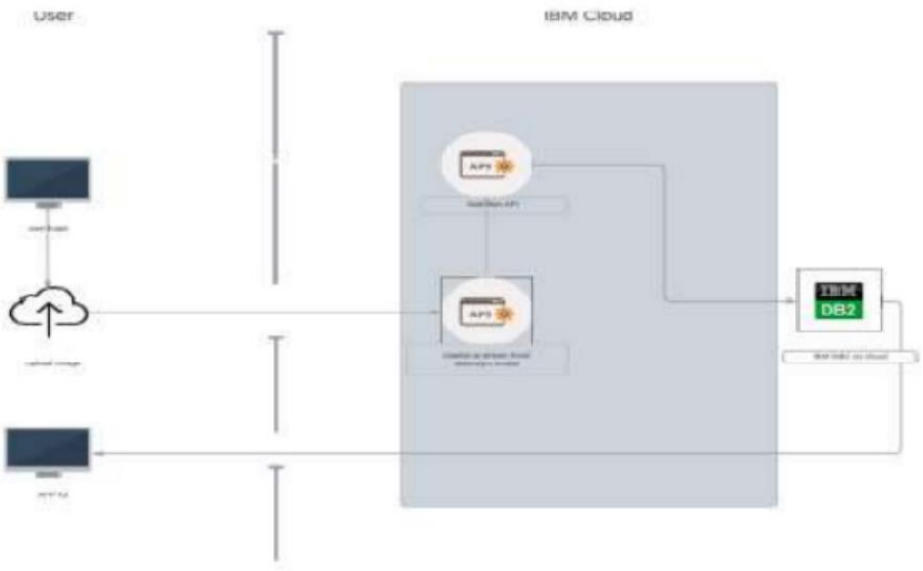


## 5.2 SOLUTION & TECHNICAL ARCHITECTURE:

Solution Architecture:




Technical Architecture:



## 5.3 USER STORIES:

Use the below template to list all the user stories for the product.

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|---|---|---|---|---|---|---|
| Customer | Registration | USN-1 | As a user, I can register for the application by entering my name, e-mail and password. | I can access my account / dashboard. | High | Sprint-1 |
| | Registration | USN-2 | As a user, I will receive confirmation email once I have registered for the application. | I can receive confirmation email & click confirm. | Medium | Sprint-1 |
| | Login | USN-3 | As a user, I can login to the application through e mail and password. | I can access my account /dashboard. | Medium | Sprint-2 |
| | Database | USN-4 | As a user, I can upload image of the meal. | I can get the nutritional value of that particular meal. | High | Sprint-3 |
| Administrator | Maintaining details for users | USN-5 | Maintaining details for users. | I can access database. | High | Sprint-4 |
| | Security | USN-6 | As a user, I feel the site is very secure. | I can access my account with my login credentials. | High | Sprint-1 |

# 6.PROJECT PLANNING & SCHEDULING

## 6.1 sprint planning & Estimation

| Title | DESCRIPTION | DATE |
|---|---|---|
| Literature Survey & Information Gathering | Literature survey on the selected project & gathering information by referring the, technical papers, research publications etc. | 23 SEPTEMBER 2022 |
| Prepare Empathy map | Prepare Empathy Map Canvas to capture the user Pains & Gains, Prepare list of problem statements | 24 SEPTEMBER 2022 |
| Ideation | List the by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance. | 25 SEPTEMBER 2022 |
| Proposed Solution | Prepare the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc. | 30 SEPTEMBER 2022 |
| Problem Solution fit | Prepare problem - solution fit document. | 01 OCTOBER 2022 |
| Solution Architecture | Prepare solution architecture document. | 02 OCTOBER 2022 |
| Customer Journey | Prepare the customer journey maps to understand the user interactions & experiences with the application (entry to exit). | 07 OCTOBER 2022 |
| Functional Requirement | Prepare the functional requirement document. | 08 OCTOBER 2022 |

## 6.2 SPRINT DELIVERY SCHEDULE

Product Backlog, Sprint Schedule, and Estimation

Use the below template to create product backlog and sprint schedule

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Create UI to interact with application | USN-1 | As a users, they can interact with application. | 1 | Low | Sainath |
| Sprint-2 | Create IBM DB2 with python | USN-2 | As a user, should connect the database and python for stores the information about food. | 1 | Medium | Aadhil Ahamed |
| Sprint-3 | Integrate Nutrition API | USN-3 | As a user, should integrate the nutrition API to see the results. | 1 | Low | Aadhil Ahamed, Sainath |
| Sprint-4 | Output | USN-4 | As a user, will see the result as the selected food and its nutrient values. | 2 | Low | Aadhil Ahamed, Sainath, Arun, Madhan Raj |

## 6.3 REPORTS FROM JIRA

Project Tracker, Velocity & Burndown Chart:

**Project Tracker, Velocity & Burndown Chart: (4 Marks)**

| Sprint | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
|---|---|---|---|---|---|---|
| Sprint-1 | 20 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 20 | 30 Oct 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 20 | 06 Nov 2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 20 | 15 Nov 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 20 | 19 Nov 2022 |

## VELOCITY:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit

## BURNDOWN CHART:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.

# 7.CODING AND SOLUTIONING:

## 7.1 FEATURE -1 – E MAIL SERVICE

To the project, we incorporated an email service. This service sends email messages with nutrition-related information directly to customers' inboxes.

```
def custom_send_mail(email, data):
    sg = sendgrid.SendGridAPIClient(SENDGRID_API_KEY)
    from_email = Email("nutritioninyourlife.foryoy@gmail.com")
   to email = To(email) # Change to your recipient
   subject = "Nutrition is a basic human need and a prerequisite for healthy life"
   content = Content ("text/plain", f"'{data}'")
   mail = Mail (from_email, to_email, subject, content)
   # Get a JSON-ready representation of the Mail object
   mail_json = mail.get()
   sg.client.mail.send.post(request_body=mail_json)
```

## 7.2 FEATURE – 2 KEEPING RECORDS

We store the nutrition-related information on the database, so users can access the data when they need it.

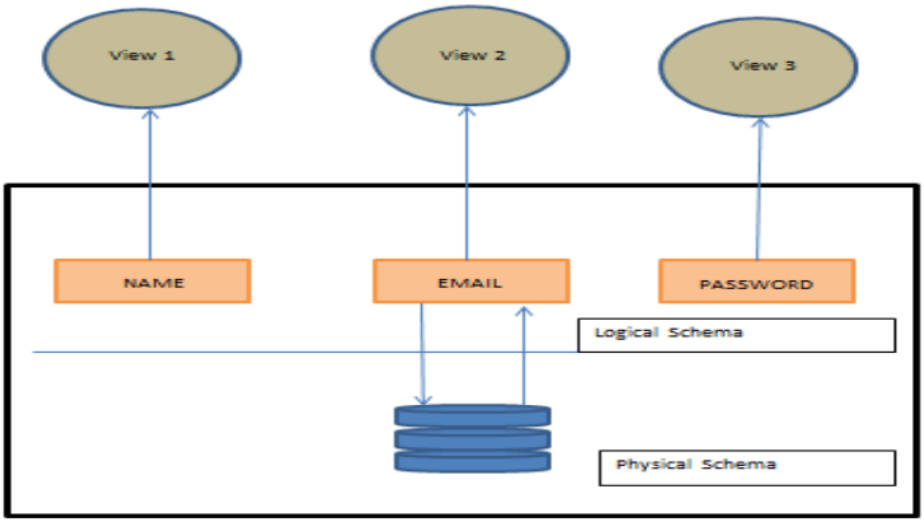
## Adding result into database,

```
insert_sql = "INSERT INTO PERSON VALUES (?,?,?,?)"
prep_stmt = ibm_db.prepare(conn, insert_sql)
ibm_db.bind_param(prep_stmt, 1, session['name'])
ibm_db.bind_param(prep_stmt, 2, session['email'])
ibm_db.bind_param(prep_stmt, 3, complete_value)
ibm_db.bind_param(prep_stmt, 4, current_time)
ibm_db.execute(prep_stmt)
```

## Getting information from the database

```
def get_history():
    history = []
    sql = f"SELECT * FROM PERSON WHERE email = '{session['email']}'"
    stmt = ibm_db.exec_immediate(conn, sql)
    dictionary = ibm_db.fetch_both(stmt)
    while dictionary:
        history.append(dictionary)
        dictionary = ibm_db.fetch_both(stmt)
    return history
```

## 7.3 DATABASE SCHEMA




# 8.TESTING:

```
import unittest
try:
    from app import app
except Exception as e:
    print('Some modules missing {}'.format(e))
class FlaskTest(unittest.TestCase):
    # check if response is 200
    def test_index(self):
```

```
    tester = app.test_client(self)
    response = tester.get("/")
    statuscode = response.status_code
    self.assertEqual(statuscode, 200)
# check if response is 200
def test_index(self):
    tester = app.test_client(self)
    response = tester.get("/")
    statuscode = response.status_code
    self.assertEqual(statuscode, 200)
def test_register(self):
    tester = app.test_client(self)
    response = tester.post('/register',
    data=dict(email='username', password='password'),
    follow_redirects=True)
    self.assertTrue(b'email' in response.data)
 # check log in
    def test_login(self):
        tester = app.test_client(self)
        response = tester.post('/',
       data=dict(email='username',
       password='password'), follow_redirects=True)
       self.assertTrue(b'email' in response.data)
# checking forgot function
    def test_forgot(self):
        tester = app.test_client(self)
```

```
    response = tester.post('/', data=dict(email='username'),
    follow_redirects=True)
    self.assertTrue(b'email' in response.data)


      if __name__ == '__main__':
          unittest.main()
```

# 9. ADVANTAGES:

1. Low Energy Consumption.

2. Works Under Low Data Connection.

3. User Friendly Web Application.

4. Data Privacy.

5. Easy to Understand.

# DISADVANTAGES:

1. It Cannot be Used Without Internet Connection.

2. Usage of 3rd party API may cause the time delay.

# 10.CONCLUSION:

Nutritional support is the provision of adequate nutrients to maintain a healthy body weight and avoid malnutrition. The continuous delivery of high-quality and cost-effective nutritional care to patients has been shown to be an increasingly difficult task.

It is observed that dieticians are requested to carry out the nutritional assessment, to manually calculate the nutritional needs and to design the everyday meal plan for each patient. In most cases, these time-consuming tasks are not completed due to lack of time or inadequate number of person.

We developed a cloud based nutrition application which detects the nutrition in food. It clarifies the calories in the food which affects our health.

## 11. FUTURE SCOPE:

Associations and effects of foods and nutrients on health. Dietary patterns and health. Molecular nutrition. Health claims on foods.

The scope of a study explains the extent to which the research area will be explored in the work and specifies the parameters within the study will be operating. Basically, this means that you will have to define what the study is going to cover and what it is focusing on.

Project scope is a way to set boundaries on your project and define exactly what goals, deadlines, and project deliverables you'll be working towards. By clarifying your project scope, you can ensure you hit your project goals and objectives without delay or overwork. Defining your project scope isn't a one-person job.

Future Scope is for the Undergraduates, Graduates and the Working Professionals. They may want to review or reconsider their future options and goals in terms of its suitability now; may be with a different perspective of their options in terms of time, resources, inclination etc.

You can work as a Nutritionist/Dietitian there and take control of the food intake and also the food quality consumed by the people. With a degree in food and nutrition, you can act as a Public Health Nutritionist in non-governmental organizations and play your part in spreading some good in the world.

The scope of this field is as follows: Graduates can work as a project assistant, project associate at an organization like PHFI, WHO, UNICEF, health organizations. Work as a chief nutritionist in NGO or private organizations.

# 12.APPENDIX:

Demo Link Video:

https://drive.google.com/file/d/1FGjU1GMV4G7QM1WnX9BgXNjaQa9fluJS/view?usp=drivesdk