

NUTRITION ASSISTANT APPLICATION A PROJECT REPORT

Submitted by

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Erode

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1. INTRODUCTION

1.1 Project Overview

- 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.
- 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.
- 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.

1.2 Purpose

The Purpose of our Project is

- Nutrition assistant application helps dieticians with providing proper nutrition at healthcare facilities.
- It determine nutritional needs and assets risk factors.
- Nutrition apps can help make life easier for individuals who need to track their food intake for health reasons.
- 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.

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. 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.
2. Alisha Lalani, Md. Riyazudin, Mousmi Ajay Chaurasia, Salva Fathima, Syed Ibrahim Ibaad (2022) "Estimation of
3. Quantity and Nutritional Information Using Image Processing", International Journal Of Scientific And Engineering Research.
4. 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.
5. 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.

2.3 Problem Statement definition :

- 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 process improvement project.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 Ideation & Brainstorming

[illegible]

Brainstorm

Four members team



TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!



Mohammed zubairali

Get the medical conditions of the user to create diet plan

Give some recipes for diet plan to the user

creating a dashboard to show health and diet plan

Show the dashboard to the user for health tips

Bayas Abdul Rahiman

User uploads image and name of the food they eat

Find the nutritional content in the food

Give feedback about the food in the image

Apply the change in their dashboard

Mohamed Suhail manas

Get all the user requirements

Create a best Diet plan according to user

Recommend good and healthy foods to user

Show the diet plan in Dashboard

Shajahan

Tracking the diet goals

Recommend healthy foods

Recommend some exercises

Keep monitoring user progress

3.3 Proposed Solution

S .No	Parameter	Description
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: · The proposed system would be able to determine the ingredients from the provided image. · 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, · An individual can use this application to take care of their diet. · 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

Project Title: Nutrition Assistant Application

Project Design Phase-I - Solution Fit Template

Team ID: PNT2022TMID06215

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS <ul style="list-style-type: none"> People of all ages who want to monitor their calories intake. People who is passionate about Fitness People who want to lose weight in a healthy way 	6. CUSTOMER CONSTRAINTS CC <ul style="list-style-type: none"> Don't know the fat content in the food. Not able to control cravings and end up eating unhealthy and high calorie foods. 	5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none"> Personal diet tracking app or website which helps to maintain their diet. Suggest Exercise to lose weight and reduce the unwanted fat calorie added because of unhealthy 	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P <ul style="list-style-type: none"> To calculate calories and nutrients present. Worry of being slim or obese. Health issues. 	9. PROBLEM ROOT CAUSE RC <ul style="list-style-type: none"> Due to shortage of time. More addiction towards fast food. 	7. BEHAVIOUR BE <ul style="list-style-type: none"> Provide healthy supplements diet plan. Working out daily. Following good diet plan and consuming nutritious foods. 	

Identify triggers

Identify

3. TRIGGERS TR <ul style="list-style-type: none"> BMI based food/diet plans will be provided for users. When obesity and consumption of unhealthy foods leads to health issues. 	10. YOUR SOLUTION SL <ul style="list-style-type: none"> Our aim is to provide a fit and healthy life to our Customers. 	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE Users can scan the food and get the nutrition value of the food they eat every day. Follow people who give healthy and nutritious food recipes.
4. EMOTIONS: BEFORE / AFTER EM They scared of declining health, so they get motivated towards eating healthy foods and move to healthy lifestyle.	Claire's AI Driven Food Detection Model is used for getting accurate food identification and API's to give the nutritional value of the identified food.	8.2 OFFLINE Notice people around you who follows healthy habits in both consumption of food and workouts.

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

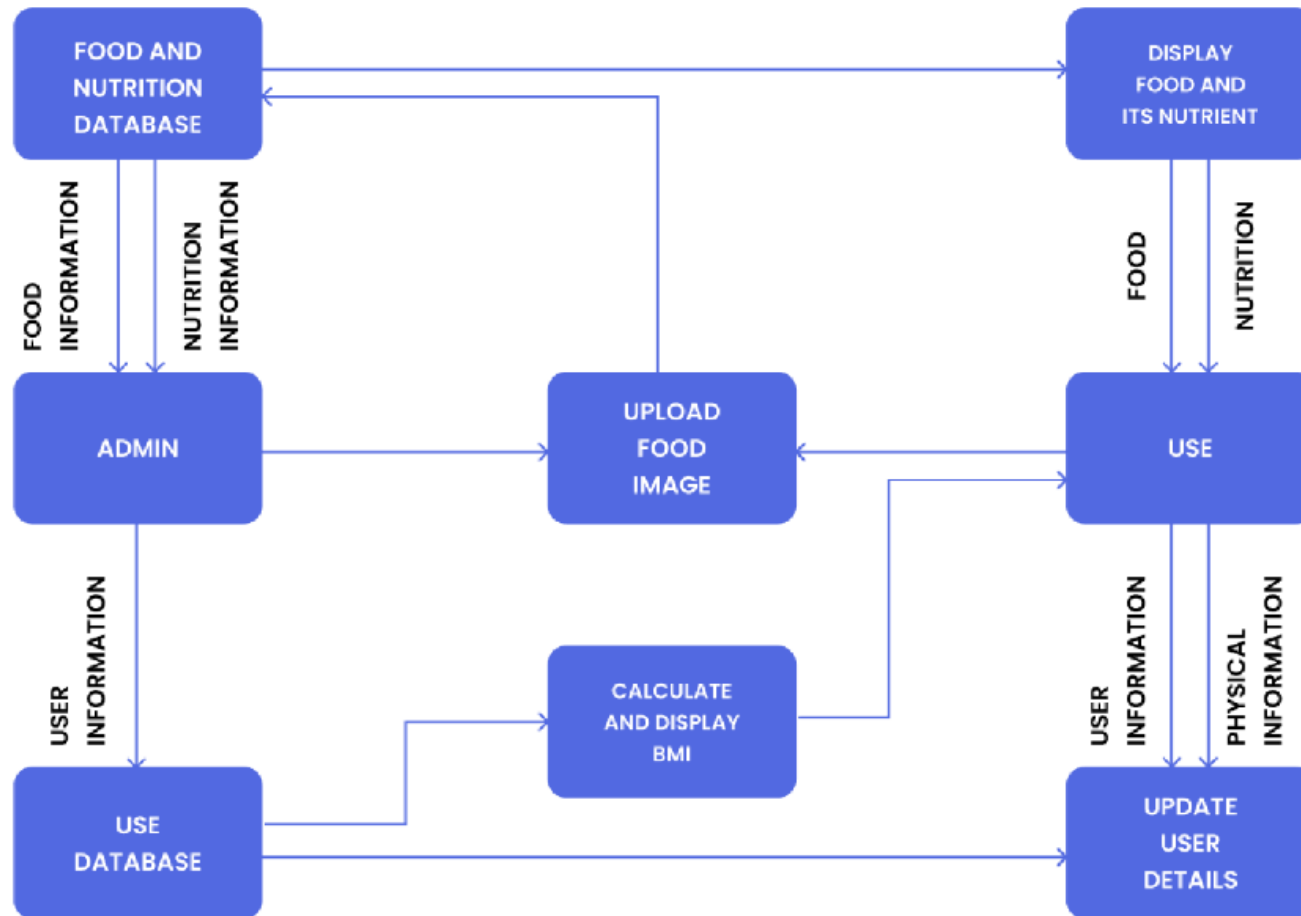
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Gmail Registration through Form Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Diet Plan	can customize based on user needs
FR-4	My Nutrition	Can add or update the existing food plan based on user needs
FR-5	Workout	walking, gym
FR-6	Nutrients Display	Display nutrients through IBM Cloud
FR-7	Consultation	User can get consultation with doctor whenever the user want

4.2 Non-Functional requirement

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 provide smooth user experience.
NFR-5	Availability	The Service are available for 24 /7.
NFR-6	Scalability	It is easy to scalable size for users.

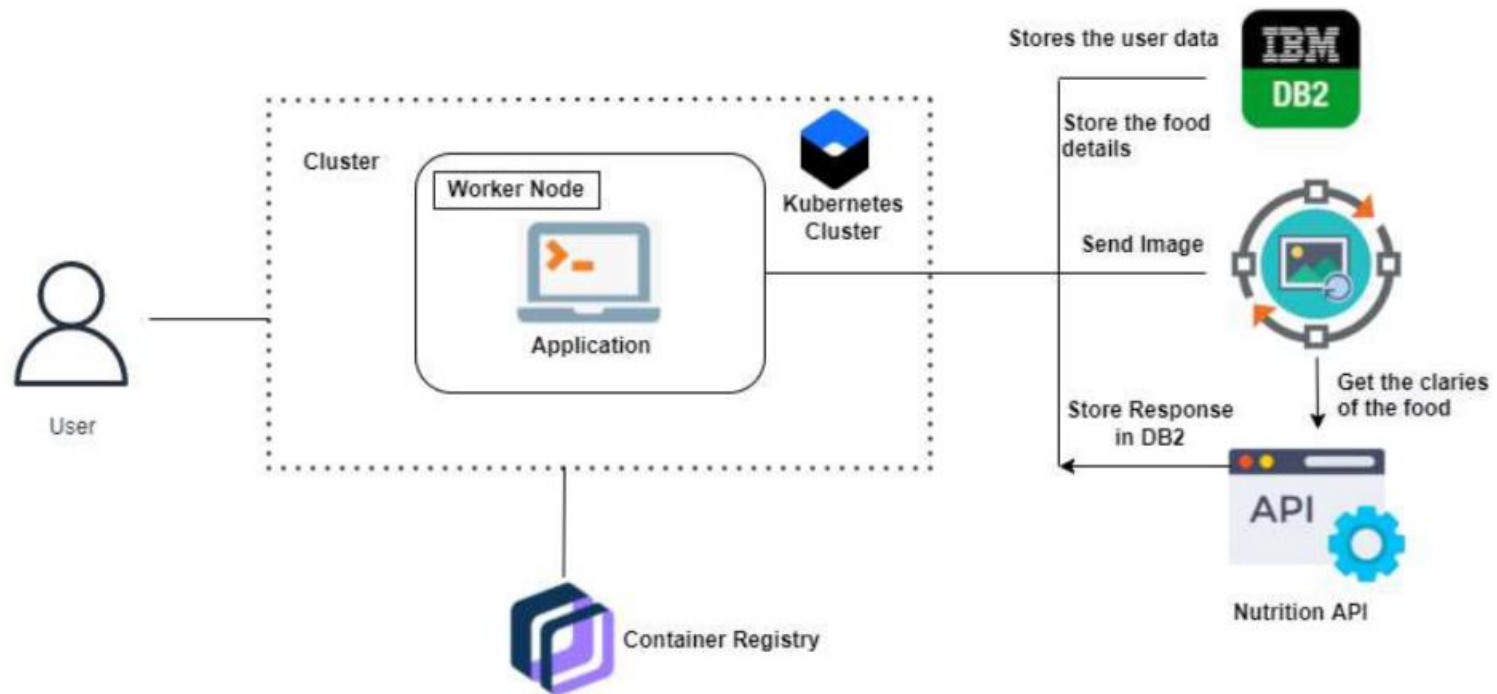
5. **PROJECT DESIGN**

5.1 Data Flow Diagram

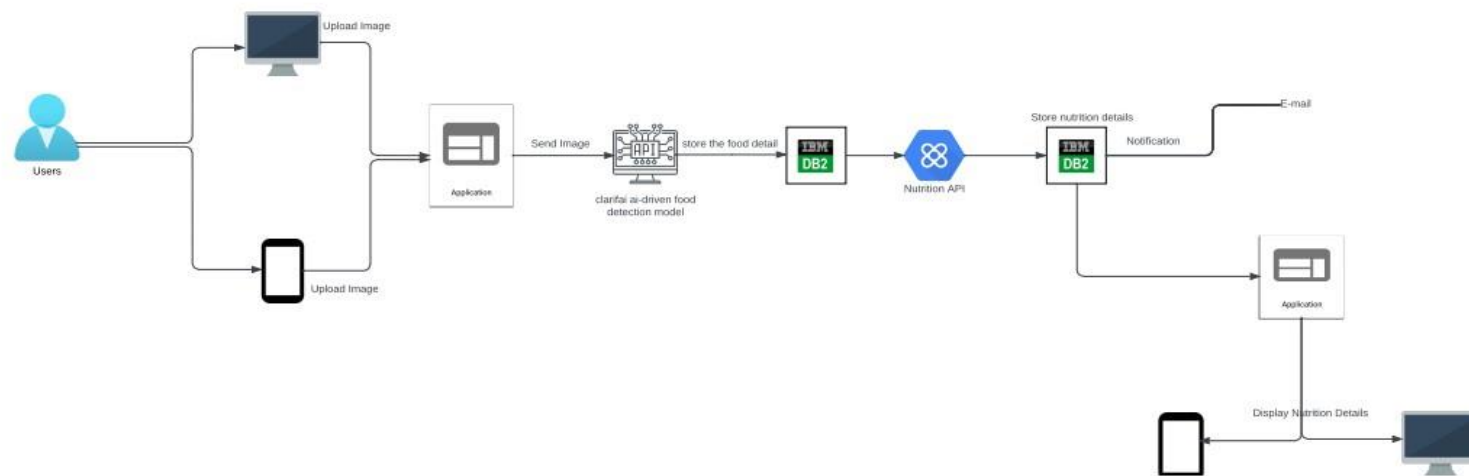


5.2 Solution and Technical Architecture

Solution Architecture:



Technical Architecture:



5.3 User Stories

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.	As a user, I feel the site is very secure.	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

Data Flow Diagrams	Draw the data flow diagrams and submit for review.	09 OCTOBER 2022
Sprint Delivery Plan	Allocate time for each and every Functions	20 OCTOBER 2022
Prepare Milestone & Activity List	Prepare the milestones & activity list of the project	21 OCTOBER 2022
Project Development - Delivery of Sprint1, 2, 3 & 4	Develop & submit the developed code by testing it.	IN PROGRESS..

6.2 Sprint Delivery Schedule:

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	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	07 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	10 Oct 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	15 Oct 2022

6.3 Reports from JIRA:

The screenshot displays the Jira Software interface for a project named "Smart Solutions for Railways". The main view is the "Sprint 2" board, which is part of the "Website Backend Process". The board is organized into three columns: "TO DO", "IN PROGRESS", and "DONE 4 ISSUES". The "DONE 4 ISSUES" column contains three tasks, each with a description and a status icon (a green square with a white checkmark). The tasks are:

- As a developer, I can provide a verification mechanism to check the integrity of QR code and the passenger details. (SSFR-9)
- As a developer, I can provide a feature to view the passenger details which are stored in the Cloud and are retrieved and displayed in the webpage. (SSFR-8)
- As a Developer, I can create the login page for TTE with email and password using the Node- (SSFR-7)

The interface also includes a sidebar on the left with navigation options: "PLANNING" (Roadmap, Backlog, Board) and "DEVELOPMENT" (Code, Project pages, Add shortcut, Project settings). The top navigation bar shows the Jira Software logo, navigation links (Your work, Projects, Filters, Dashboards, People, Apps), a "Create" button, and a search bar. A banner at the top of the board area reads: "Does your team need more from Jira? Get a free trial of our Standard plan."

Jira Software

Your work

Projects

Filters

Dashboards

People

Apps

Create

Search

🔔

?

⚙️

👤

Does your team need more from Jira? [Get a free trial of our Standard plan.](#)

Projects / Smart Solutions for Railways

Backlog

🔍

👤

👥

Epic

Insights

▼ Sprint 2 11 Nov – 18 Nov (4 issues)

Website Backend Process

0 0 0 Complete sprint

55FR-9 As a developer,I can provide a verification mechanism to check the integrity of QR code and the passenger details. DONE

55FR-8 As a developer,I can provide a feature to view the passenger details which are stored in the Cloud and are retrieved and displayed in the webp... DONE

55FR-6 As a Developer,I can create the login page for TTE with email and password using the Node-red app. DONE

55FR-7 As a Developer,I can create a drop down box for the number of passengers on boarded and remaining number of passengers yet to be board... DONE

+ Create issue

Jira Software

Your work

Projects

Filters

Dashboards

People

Apps

Create

Search

🔔

?

⚙️

👤

Does your team need more from Jira? [Get a free trial of our Standard plan.](#)

Projects / Smart Solutions for Railways

Backlog

🔍

👤

👥

Epic

Insights

▼ Sprint 3 7 Nov – 12 Nov (4 issues)

Testing and verification

0 0 0 Start sprint

55FR-18 As a developer, I will provide a smooth way to book the ticket through a website and also to refund if the... DONE

55FR-19 As a developer, I will check whether the passenger is taking his/her journey with a proper confirmed ticket. DONE

55FR-20 As a developer, I will make sure that the on-boarded passenger is not involved in any travel fraudulently. DONE

55FR-21 As a developer, I will scan the QR code generated by python code to extract and verify the passenger det... DONE

+ Create issue

Smart Solutions for Ra...
Software project

PLANNING

Roadmap

Backlog

Board

DEVELOPMENT

Code

Project pages

Add shortcut

You're in a team-managed project
Learn more

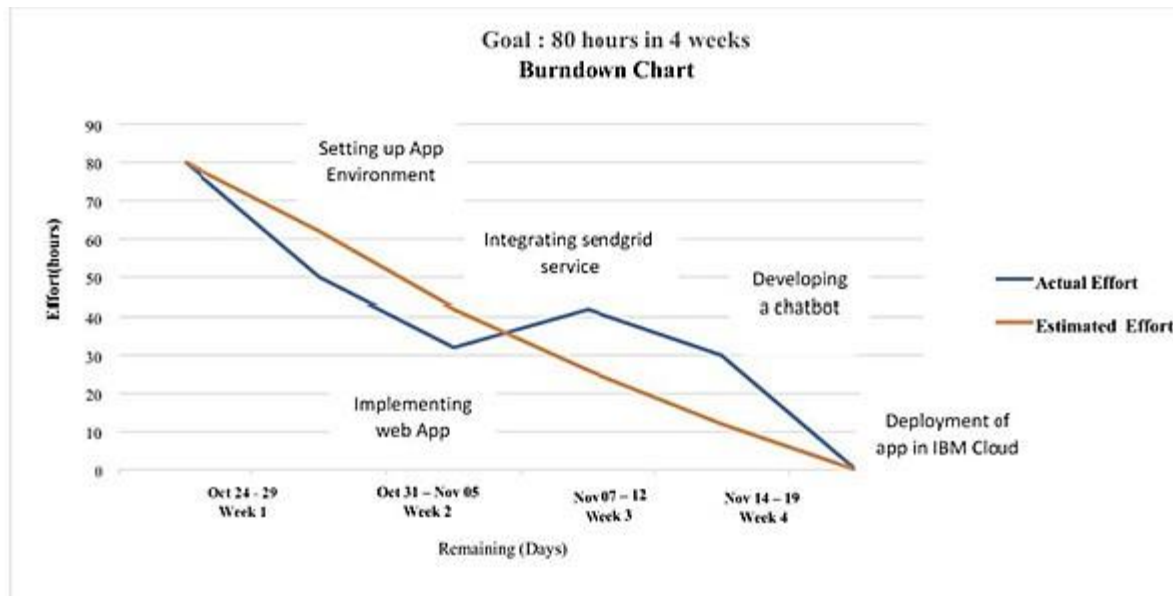
The screenshot displays the Jira Software interface. At the top, the navigation bar includes 'Jira Software', 'Your work', 'Projects', 'Filters', 'Dashboards', 'People', 'Apps', and a 'Create' button. A search bar is located on the right. A banner at the top of the main content area asks, 'Does your team need more from Jira? Get a free trial of our Standard plan.' The left sidebar shows the project 'Smart Solutions for Railways' with a 'Software project' icon. Under the 'PLANNING' section, 'Roadmap' and 'Backlog' are listed, with 'Backlog' selected. Under the 'DEVELOPMENT' section, 'Board' and 'Code' are listed. Below these are 'Project pages' and 'Add shortcut'. A note at the bottom of the sidebar states, 'You're in a team-managed project. Learn more.' The main content area shows the 'Backlog' for the 'Smart Solutions for Railways' project. It includes a search bar, a filter icon, and a dropdown menu set to 'Epic'. An 'Insights' button is on the right. The backlog is organized by 'Sprint 4' (14 Nov – 19 Nov) with 4 issues. The issues are listed as follows:

Issue ID	Description	Status	Assignee
55FR-22	As a developer , I can create web page to view train status using Node RED	DONE	[User Icon]
55FR-23	As a developer I can extract details from IoT device using python code and IBM watson.	DONE	[User Icon]
55FR-24	As a developer, I can upload the details to cloud and display it to user by connecting it with Node RED a...	DONE	[User Icon]
55FR-25	As a passenger ,I would like to receive updates over my train status during my journey via fast SMS or Ap...	DONE	[User Icon]

At the bottom of the sprint list is a '+ Create issue' button.

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 & SOLUTIONING

7.1 Feature 1

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

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

```

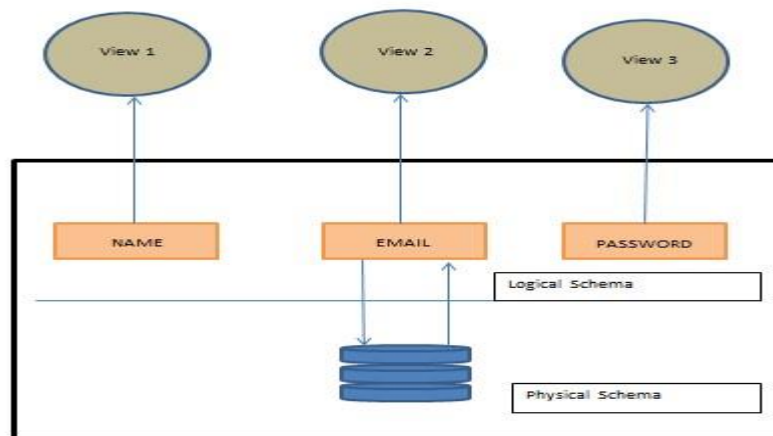
insert_sql = "INSERT INTO PERSON VALUES (?, ?, ?, ?)"
prep_stmt = ibm_db.prepare(conn, insert_sql)
ibm_db.bind_param(prepare_stmt, 1, session['name'])
ibm_db.bind_param(prepare_stmt, 2, session['email'])
ibm_db.bind_param(prepare_stmt, 3, complete_value)
ibm_db.bind_param(prepare_stmt, 4, current_time)
ibm_db.execute(prepare_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 content type
    def test_index_content(self):
        tester = app.test_client(self)
        response = tester.get("/")
        self.assertEqual(response.content_type, 'text/html; charset=utf-8')

    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()
```

8.2 User Acceptance Testing

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [Smart Solutions for Railways] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

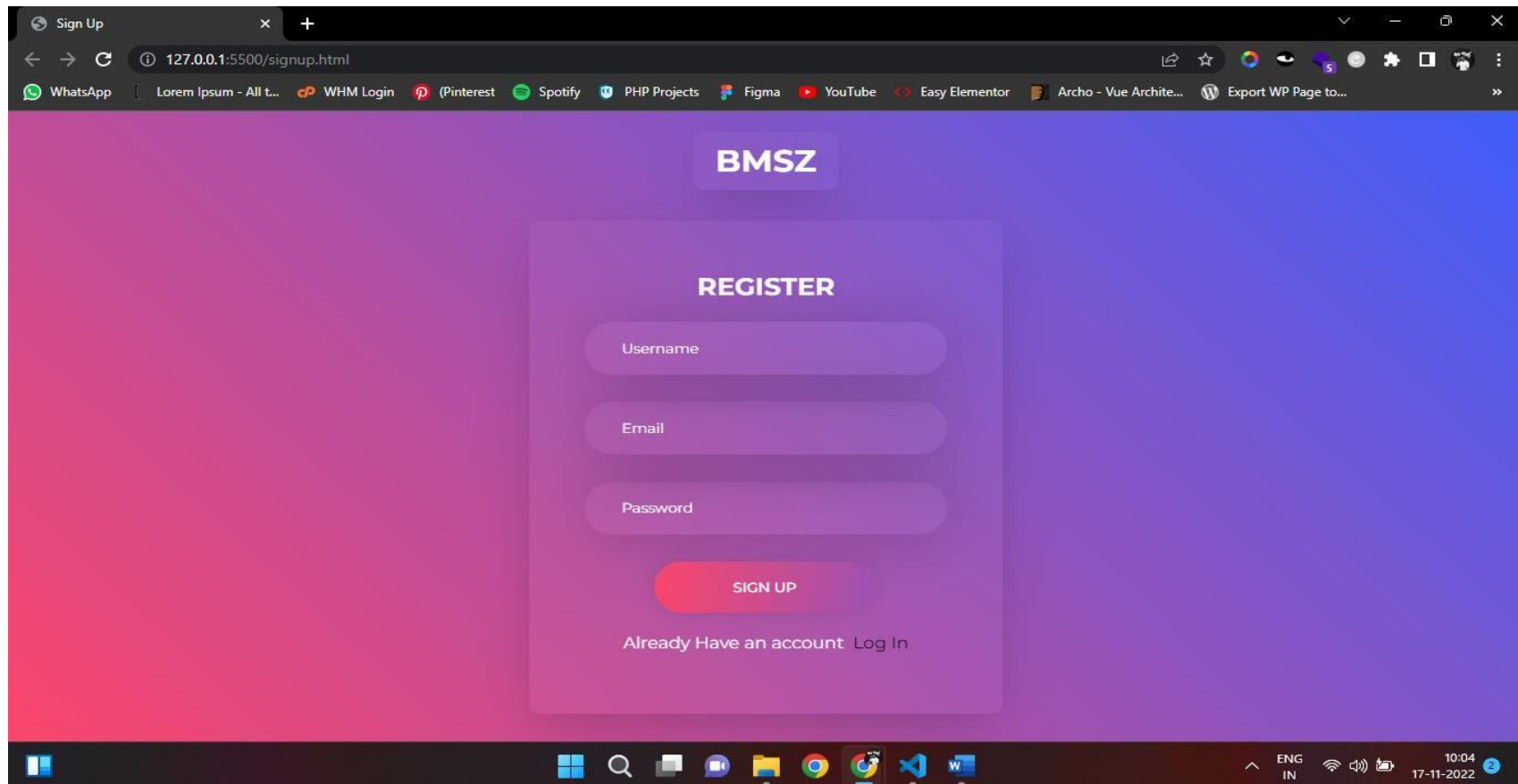
This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

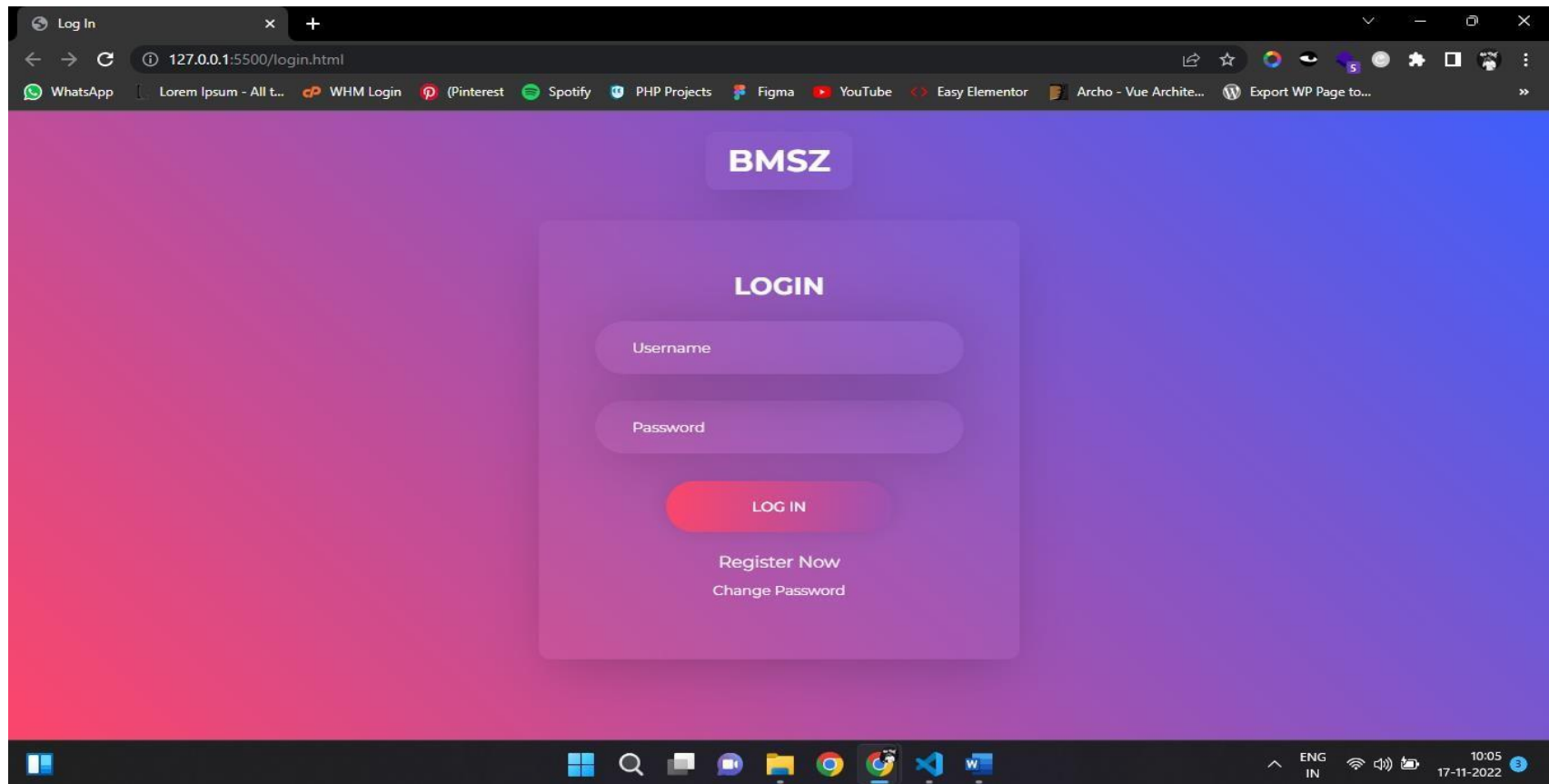
Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	5	2	3	1	11
Duplicate	1	1	0	0	2
External	2	1	0	0	3
Fixed	9	4	5	2	20
Not Reproduced	0	0	1	0	1
Skipped	0	1	0	2	3
Won't Fix	1	0	1	0	2
Totals	18	9	10	5	42

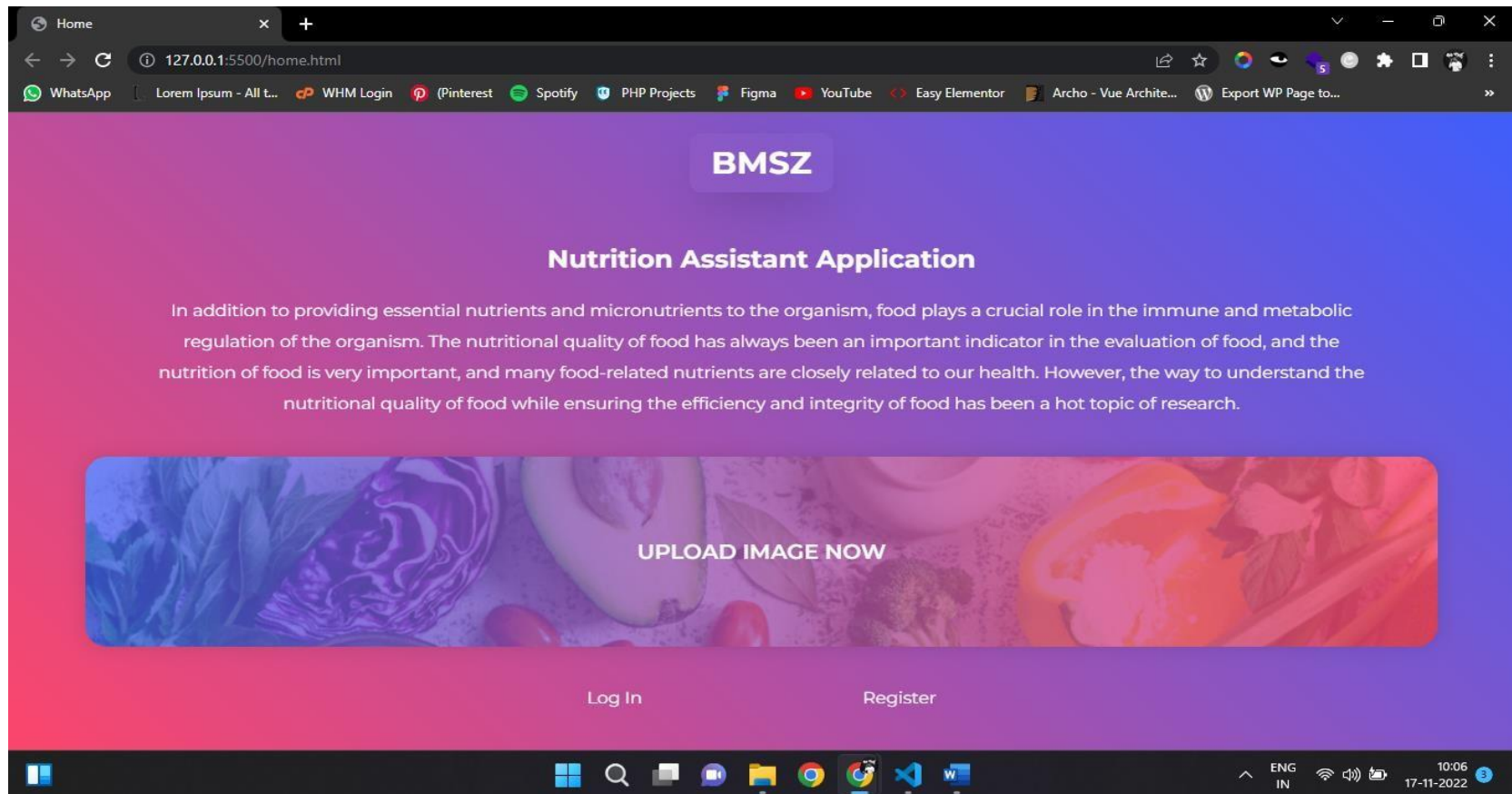
The defect analysis was resolved by,

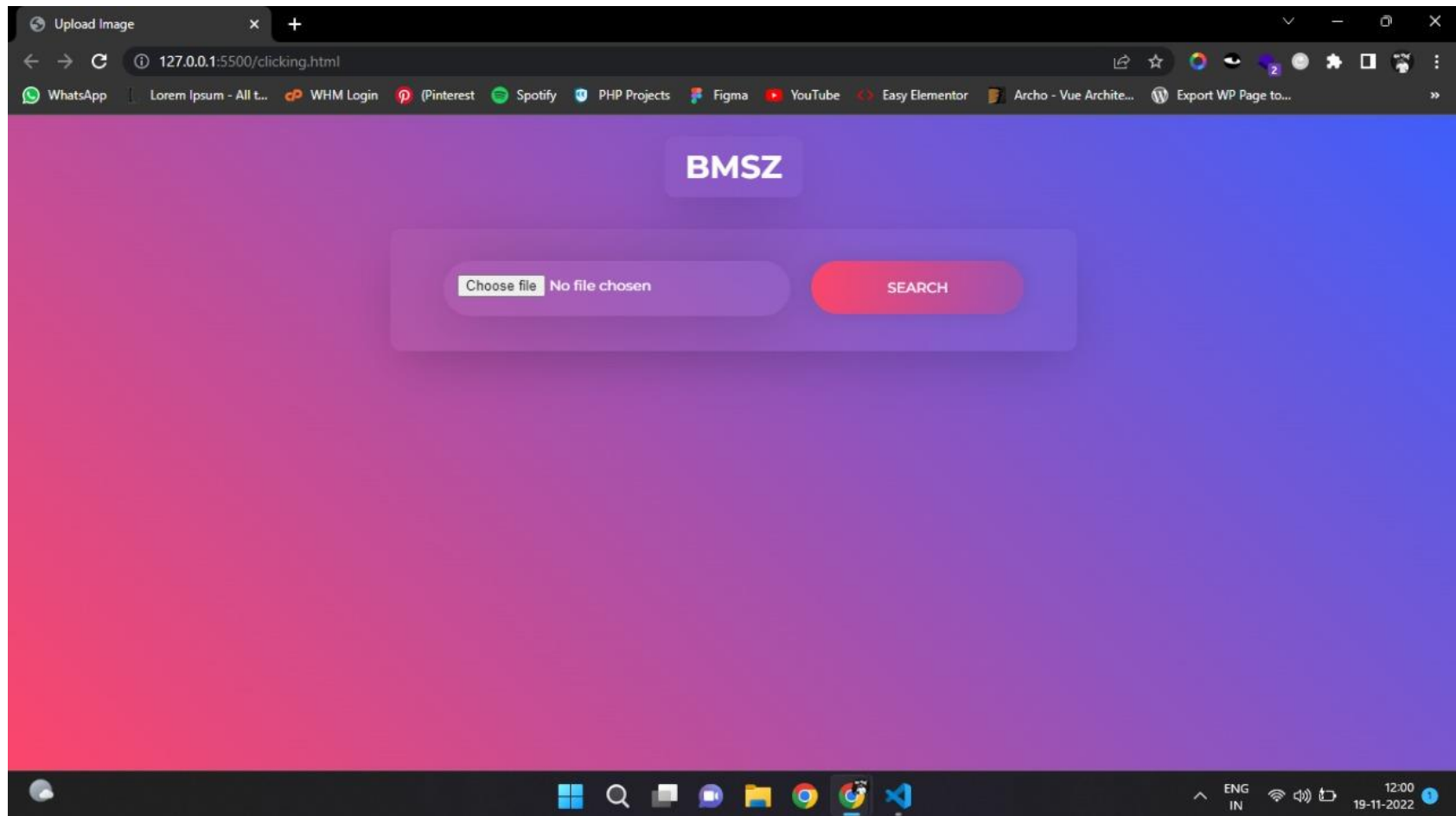
1. Reviewing the code and establishing checkpoints.
2. Debugging window.
3. By working in pairs and conducting team window.
4. By developing action plans to cope with specific issues.
5. Defect resolution process.
6. Prioritize and resolving defect.
7. Validating the corrective action presented.

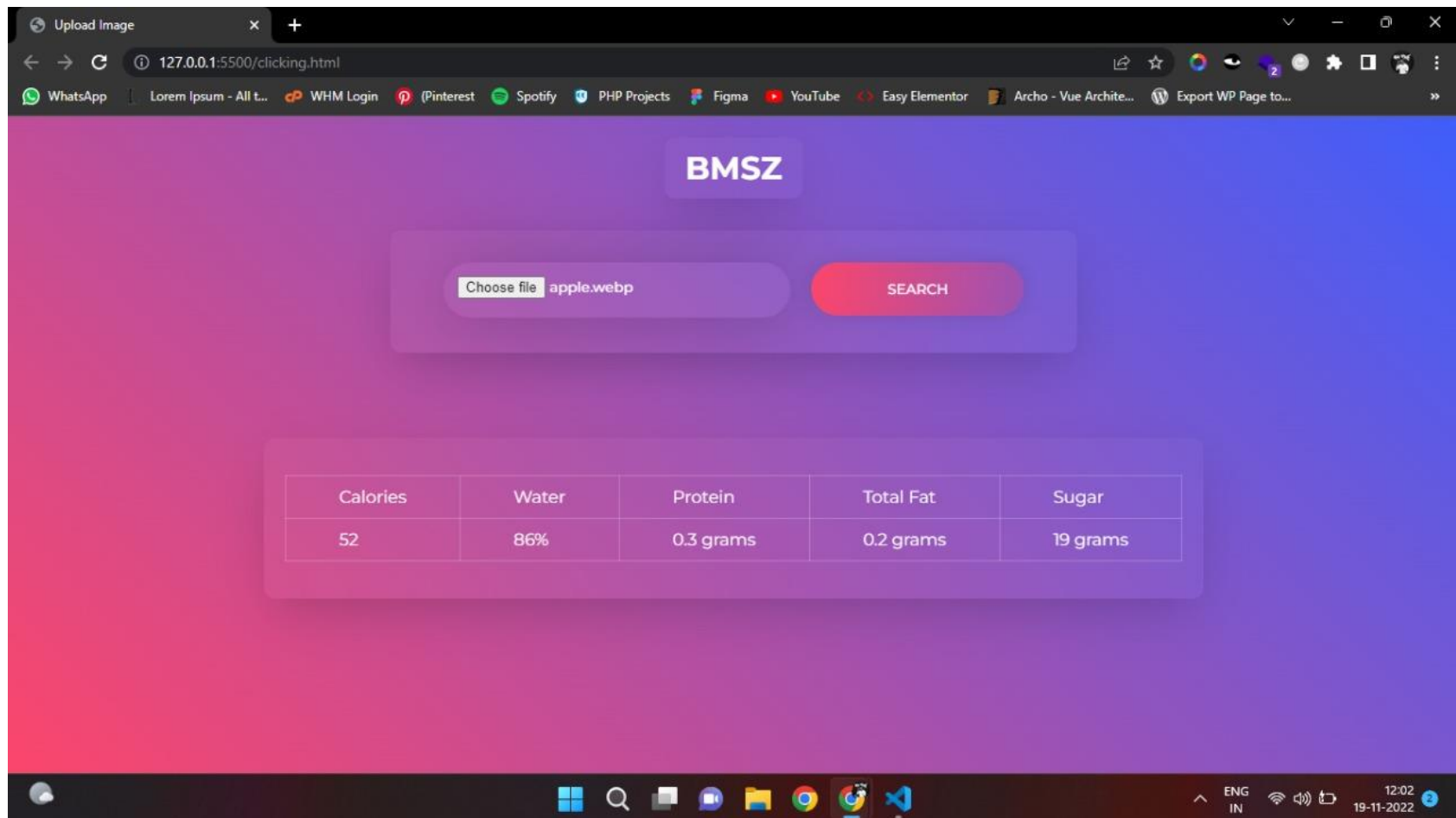
9. RESULTS











10. ADVANTAGES :

- Works Under Low Data Connection.
- Low Energy Consumption.
- User Friendly Web Application.
- Data Privacy.
- Easy to Understand.

DISADVANTAGES:

- It Cannot be Used Without Internet Connection.
- Usage of 3rd party API may cause the time delay.

11. 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.
- We developed a cloud based nutrition application which detects the nutrition in food. It clarifies the calories in the food which affects our health.
- 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.

12.Future Scope

- 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.
- 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.
- 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.

13. APPENDIX

Source Code

<https://github.com/IBM-EPBL/IBM-Project-4384-1658730743/>

Demo Link