

# Nutrition assistant Application

## A PROJECT REPORT

*Submitted by*

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**SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY**  
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## **BONAFIDE CERTIFICATE**

Certified that this project report titled “**NUTRITION ASSISTANT APPLICATION**” is the bonafide work of “**NISHANTH M (20EUCS504),KRISHNAPRASADH S (19EUCS068),SAJRAMKISHO A(19EUCS116),ARVIND S H(20EUCS501)**” who carried out the project work under my supervision.

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**This project is submitted for the Autonomous Project viva-voce examination held on .....**

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**EXTERNAL EXAMINER**

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# **CHAPTER 1**

## **1.INTRODUCTION**

Chronic diseases such as diabetes, obesity, and cardiovascular diseases are becoming the dominant sources of mortality and morbidity worldwide and recently an epidemic in many Asia Pacific countries. Unhealthy diet is one of the key common modifiable risk factors in preventing and managing chronic diseases. Personalized dietary intake intervention showed significant impact on influencing people's choice and promoting their health. The feedback on nutrition intake is substantial and behavioural changing when patients track their dietary intake for a considerable length of time. However, the burden of logging food makes compliance a challenge. Clinical studies rely on patients to recall dietary intake, which is time-consuming and prone to underestimation

### **1.1 PROJECT OVERVIEW**

Tracking dietary intake is an important task for health management especially for chronic diseases such as obesity, diabetes, and cardiovascular diseases. Given the popularity of personal handheld devices, mobile applications provide a promising low-cost solution to tackle the key risk factor by diet monitoring. In this work, we propose a photo based dietary tracking system that employs deep-based image recognition algorithms to recognize food and analyze nutrition. The system is beneficial for patients to manage their dietary and nutrition intake, and for the medical institutions to intervene and treat the chronic diseases. To the best of our knowledge, there are no popular applications in the market that provide a high-performance food photo recognition like ours, which is more convenient and intuitive to enter food than textual typing.

### **1.2 PURPOSE**

Experiments on evaluating the recognition accuracy on laboratory data and real user data on food, which shed light on uplifting lab trained image recognition models in real applications. We have also conducted user study to verify that our proposed method has the potential to foster higher user engagement rate as compared to existing apps based dietary tracking approaches.

## **CHAPTER 2**

### **LITERATURE SURVEY**

#### **2.1 EXISTING PROBLEM**

With the rapid development of smart computing and Internet of Things (IoT), now we have a huge amount of data from social networks and mobile networks everyday. People keep uploading, sharing and recording what they do everyday in case of missing the chance of using them to improve our daily life. Food images, recipes and food diaries become the most popular information to be shared, we can learn the implication to build an automatic nutrition analysis system by taking the advantage of such large-scale datasets. With the help of food recognition and analysis systems, users are able to record their daily meals and assess dietary habits, as well as promote their health.

#### **2.2 REFERENCES**

1. P. Dollar and C. L. Zitnick, “Fast edge detection using structured forests,” *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 37, no. 8, pp. 1558–1570, Aug. 2014.
2. T. Ege and K. Yanai, “Image-based food calorie estimation using knowledge on food categories, ingredients and cooking directions,” in *Proc. Thematic Workshops ACM Multimedia-Thematic Workshops*, 2017, pp. 367–375.
3. Eldridge, C. Piernas, A.-K. Illner, M. Gibney, M. Gurinović, J. D. Vries, and J. Cade, “Evaluation of new technology-based tools for dietary intake assessment—An ilsi europe dietary intake and exposure task force evaluation,” *Nutrients*, vol. 11, no. 1, p. 55, 2019.
4. S. Fang, Z. Shao, R. Mao, C. Fu, E. J. Delp, F. Zhu, D. A. Kerr, and C. J. Boushey, “Single-view food portion estimation: Learning Image-to-Energy mappings using generative adversarial networks,” in *Proc. 25th IEEE Int. Conf. Image Process. (ICIP)*, Oct. 2018, pp. 251–255.
5. P. F. Felzenszwalb, “Representation and detection of deformable shapes,” *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 27, no. 2, pp. 208–220, Feb. 2005.

6. E. A. Finkelstein, J. G. Trogdon, J. W. Cohen, and W. Dietz, “Annual medical spending attributable to obesity: Payer-and service-specific estimates,” *Health Affairs*, vol. 28, no. 5, pp. w822–w831, Jan. 2009.
7. Z. Ge, C. McCool, C. Sanderson, and P. Corke, “Modelling local deep convolutional neural network features to improve fine-grained image classification,” in *Proc. IEEE Int. Conf. Image Process. (ICIP)*, Sep. 2015, pp. 4112–4116.
8. R. Girshick, “Fast R-CNN,” in *Proc. IEEE Int. Conf. Comput. Vis. (ICCV)*, Dec. 2015, pp. 1440–1448.
9. R. Girshick, J. Donahue, T. Darrell, and J. Malik, “Rich feature hierarchies for accurate object detection and semantic segmentation,” in *Proc. IEEE Conf. Comput. Vis. Pattern Recognit.*, Jun. 2014, pp. 580–587.
10. H. Hassannejad, G. Matrella, P. Ciampolini, I. De Munari, M. Mordonini, and S. Cagnoni, “Food image recognition using very deep convolutional networks,” in *Proc. 2nd Int. Workshop Multimedia Assist. Dietary Manage. (MADiMa)*, 2016, pp. 41–49.

## **2.3 PROBLEM STATEMENT DEFINITION**

This is based on the propose of a deep learning based system for food item detection and analyze the nutrition components of each meal image. Our model consists of three main steps.

- We first extract the regions of interests (ROIs) by applying the Region Proposal Network derived from the Faster R-CNN model. The ROIs would help to separate the food items from the background, and improve the detection model efficiency
- The second step is to apply a well designed Convolutional Neural Network (CNN) on selected RoIs and classify them into different food item categories. Meanwhile, a regression module is also used to locate the food coordinates in the image.
- The final step is to use modern technology-based dietary assessment tools for food nutrition analysis and generate a health report for users based on their meal images.

<b>I am</b>	Describe customer with 3-4 key characteristics - <i>who are they?</i>	Describe the customer and their attributes here
<b>I'm trying to</b>	List their outcome or "job" the care about - <i>what are they trying to achieve?</i>	List the thing they are trying to achieve here
<b>but</b>	Describe what problems or barriers stand in the way - <i>what bothers them most?</i>	Describe the problems or barriers that get in the way here
<b>because</b>	Enter the "root cause" of why the problem or barrier exists - <i>what needs to be solved?</i>	Describe the reason the problems or barriers exist
<b>which makes me feel</b>	Describe the emotions from the customer's point of view - <i>how does it impact them emotionally?</i>	Describe the emotions the result from experiencing the problems or barriers



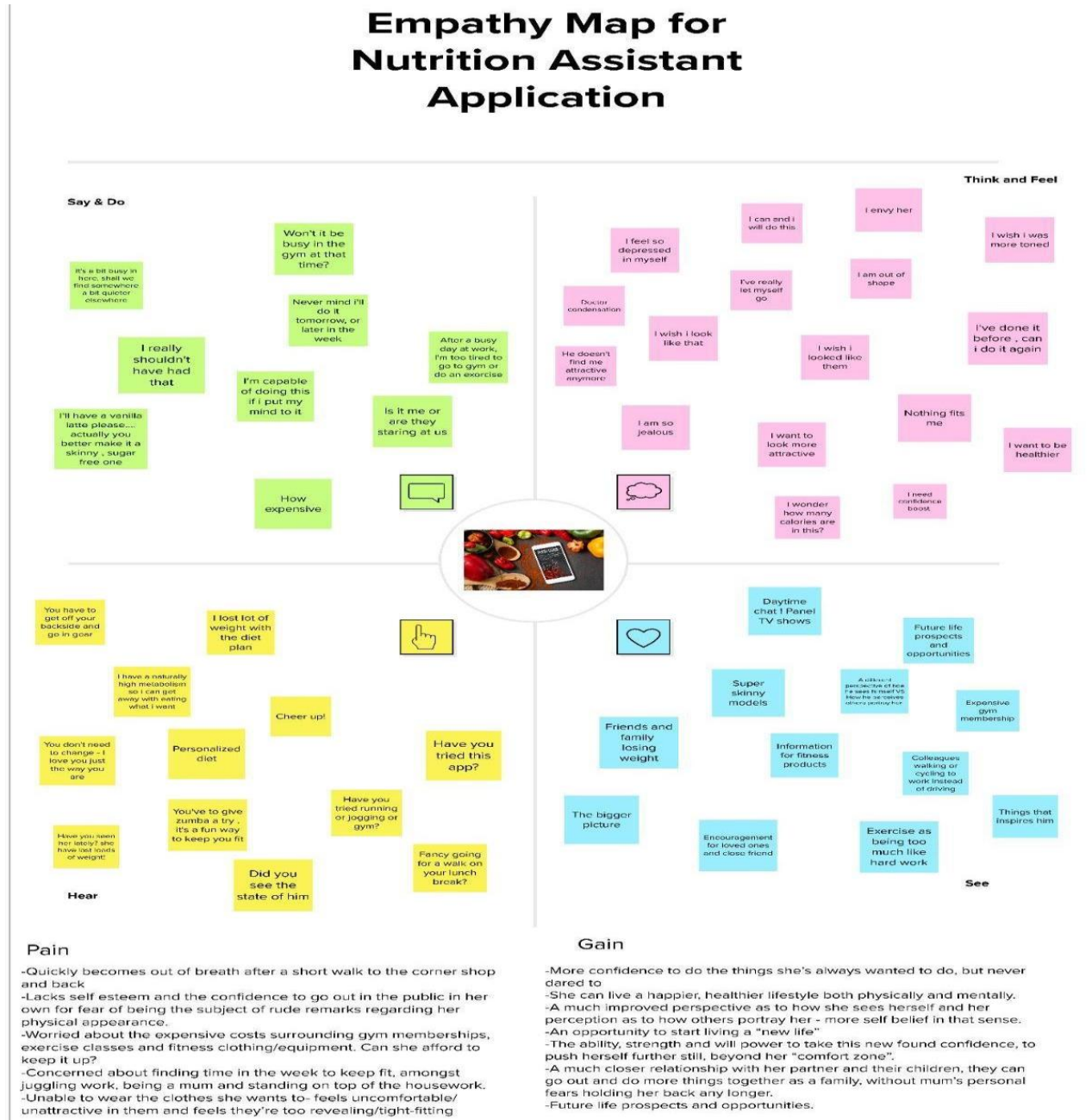


<b>Problem Statement (PS)</b>	<b>I am (Customer)</b>	<b>I'm trying to</b>	<b>But</b>	<b>Because</b>	<b>Which makes me feel</b>
PS-1	IT professional	Maintain a healthy and balanced diet.	I don't have time for that.	My job is a 9-5 hectic job and I stay at the same chair for the entire day.	Like I am overweight and lazy.
PS-2	Student	Improve the health and the memory power.	I am unaware of what to eat.	I don't have more knowledge about nutrition.	Like I am weak and I have less memory power.

# CHAPTER 3

## IDEATION AND PROPOSED SYSTEM

### 3.1 EMPATHY MAP CANVAS



## 3.2 IDEATION AND BRAINSTORMING

**1**

**problem statement**

A variety of medical problems can affect appetite. Your illness, medicines or surgery can cause these problems to suggest healthy foods and identify the **ingredients** and **outlets** in their food.

0.5 minutes

**2**

**Brainstorm**

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

10 minutes

**3**

**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 can break it up into smaller sub-groups.

20 minutes

**4**

**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.

20 minutes

**1**

**problem statement**

A variety of medical problems can affect appetite. Your illness, medicines or surgery can cause these problems to suggest healthy foods and identify the **ingredients** and **outlets** in their food.

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20 minutes

**4**

**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.

20 minutes

Team ID: PNT202TMD02790

### After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

### Quick add-ons

- Share the mural**  
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.
- Export the mural**  
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

### Keep moving forward

- Strategy blueprint**  
Define the components of a new idea or strategy.  
[Open the template](#)
- Customer experience journey map**  
Understand customer needs, motivations, and obstacles for an experience.  
[Open the template](#)
- Strengths, weaknesses, opportunities & threats**  
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.  
[Open the template](#)

[Share template feedback](#)

### **3.3PROPOSED SOLUTION**

#### **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 to App-based nutrient dashboard systems which can analyze real-time images of a meal and analyze it for nutritional content which can be very handy and improves the dietary habits, and therefore, helps in maintaining a healthy lifestyle.

#### **IDEA / SOLUTION DESCRIPTION**

This project aims at building a web App that automatically estimates food attributes such as ingredients and nutritional value by classifying the input image of food. Our method employs Clarifai's AI-Driven Food Detection Model for accurate food identification and Food API's to give the nutritional value of the identified food

#### **NOVELTY / UNIQUENESS**

In this project, User interacts with the Web App to Load an image. The image is passed to the server application, which uses Clarifai's AI-Driven Food Detection Model Service to analyze the images and Nutrition API to provide nutritional information about the analyzed Image. Nutritional information of the analyzed image is returned to the app for display.

#### **SOCIAL IMPACT / CUSTOMER SATISFACTION**

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 to App-based nutrient dashboard systems which can analyze real-time images of a meal and

analyze it for nutritional content which can be very handy and improves the dietary habits, and therefore, helps in maintaining a healthy life.

## **BUSINESS MODEL (REVENUE MODEL)**

A revenue model means understanding how a startup can make money. Our major revenue sources consist of sales, government funds, and public donations. The introduction of novel ideas increases revenue streams, such as special dietary needs, Clarifai's AI-Driven Food Detection Model, Food API's to give the nutritional value etc..

## **SCALABILITY OF THE SOLUTION**

Making use of cloud-native techniques is one way to automatically estimates food attributes such as ingredients and nutritional value by classifying the input image of food. IBM Cloud, for instance, is one of the cloud-based AI scalability options. Run and manage AI models, as well as optimise decisions at scale across any cloud, with the aid of IBM Cloud Build. The benefit of using the cloud to scale solutions is that we can install our AI programme there. the specific cloud environment that best supports our business needs. We can take advantage of built-in security capabilities and AI model monitoring. we can drive better business outcomes by optimizing our decisions and also make our solution scalable using cloud.

## **3.4 PROBLEM SOLUTION FIT**

The Problem solution aims at building a web App that automatically estimates food attributes

such as ingredients and nutritional value by classifying the input image of food.  
Our method

employs Clarifai's AI-Driven Food Detection Model for accurate food identification and Food

API's to give the nutritional value of the identified food..

### 3.4.1 PURPOSE:

- ☐ Solve complex problems in a way that fits the state of your customers.
- ☐ Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
- ☐ Sharpen your communication and marketing strategy with the right triggers and messaging.
- ☐ Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.
- ☐ Understand the existing situation in order to improve it for your target group.

Problem-Solution Fit canvas		Purpose / Vision Nutrition assistant Application	Version: TEAM ID:PNT2022TMD02790
Define CS, fit into CL	<b>1. CUSTOMER SEGMENT(S)</b> <b>CS</b> Who's your customer? eg. working parents of 0-5 y.o. kids 1. Health conscious Person 2. Curious Customer 3. Over or under Weight person 4. Sport person	<b>6. CUSTOMER LIMITATIONS</b> <b>CL</b> <small>EG. BUDGET, DEVICES</small> What limits your customers to act when problem occurs? Spending power, budget, no cash in the pocket? Network connection? Available devices? Some people are not willing to go to hospital because of financial constraints and some are in the remote locations. Many are too busy now a days	<b>5. AVAILABLE SOLUTIONS</b> <b>AS</b> <small>PLUSES &amp; MINUSES</small> Which solutions are available to the customer when, no, he is facing the problem? What had he/she tries in the past? Pluses & minuses? Visiting a experienced dietitian to verify
	<b>2. PROBLEMS / PAINS</b> <b>PR</b> <small>+ ITS FREQUENCY</small> Which problem do you solve for your customer? here could be more than one, explore different sides eg. existing solar solutions for private houses are not considered a good investment (1). How often does this problem occur? To help track the nutritional value of the food the customer eats and helps to personalize a diet with respect to the need of the customer	<b>9. PROBLEM ROOT / CAUSE</b> <b>RC</b> What is the root of every problem from the list? eg. People think that solar panels are bad investment right now, because they are too expensive (1.1), and possible changes to the law might influence the return of investment significantly and diminish the benefits (1.2). Users are in need of these kind of solutions because 1. Because some health problems are hereditary 2. Some people may be leading unhealthy lifestyles which might make them more susceptible to health issues 3. Many don't have the knowledge of what the food they eat can do to their body	<b>7. BEHAVIOR</b> <b>BE</b> <small>+ ITS INTENSITY</small> What does your customer do about / around / directly or indirectly related to the problem? eg. directly related: tries different "green energy" calculators in search for the best deal (1.1), usually chooses for 100% green provider (1.2). Indirectly related: volunteering work (Greenpeace etc.) How often does this related behavior happen? 1. Schedule an appointment 2. Search for the best dietitian online 3. Speak to family/friends regarding solutions
Focus on PR, tap into BE, understand RC	<b>3. TRIGGERS TO ACT</b> <b>TR</b> What triggers customer to act? eg. seeing their neighbor installing solar panels (1.1), reading about innovative, more beautiful and efficient solution (1.2) Discomfort and lack of physical strength. Users making sure that they are healthy	<b>10. YOUR SOLUTION</b> <b>SL</b> If you are working on existing business - write down existing solution first, fill in the canvas, and check how much does it fit you. If you are working on a new business proposition then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations solves a problem and matches customer behavior Our application helps the user in finding out about the nutritional value of their dietary intake. They can find out by entering details such as their heart rate, cholesterol blood pressure etc. A dashboard is also attached along with the results for better understanding where they can compare their blood pressure and similar metrics with other users. And also helps to keep track of it. And also derive a personalized	<b>8. CHANNELS OF BEHAVIOR</b> <b>CH</b> <b>ONLINE</b> Extract channels from Behavior block 1. Talk with family/friends 2. Browse through health websites <b>OFFLINE</b> Extract channels from Behavior block and use for customer development. Reach out to the nearest dietitian
	<b>4. EMOTIONS</b> <b>EM</b> <small>BEFORE / AFTER</small> Which emotions do people feel before/after this problem is solved? Use it in your communication strategy. eg. frustration, blocking (can't afford it) > boost, feeling smart, be an example for others (made a smart purchase) Before using this app, the user may not know the exact nutritional intake and track of it. And now they can keep track of it		<b>Identify strong, L, &amp; LIV</b> <b>Focus on PR, tap into BE, understand RC</b> <b>Explore AS, differentiate</b> <b>Focus on PR, tap into BE, understand RC</b> <b>Extract online &amp; offline CH of BE</b>

## **CHAPTER 4**

### **REQUIREMENT ANALYSIS**

#### **4.1 FUNCTIONAL REQUIREMENTS**

- Users have to register their personal details.
- User has to upload the image of the food
- The nutritional values of the food will be displayed

#### **4.2 NON-FUNCTIONAL REQUIREMENTS**

##### **PERFORMANCE**

Performance is measured in terms of the output provided by the application. Requirement specification plays an important part in the analysis of a system. Only when the requirement specifications are properly given, it is possible to design an application, which will fit into the required environment. The load for the user interface screens shall take no longer than 2 seconds. The login information shall be verified within 5 seconds. Queries shall return results within 5 seconds.

##### **SAFETY AND SECURITY REQUIREMENTS**

- User Identification:

The system requires the user to identify himself/herself User

- Login ID:

Any user who uses the system shall have a Login.

- Modification:

Any modification (insert, delete (or) update) for the Database shall be synchronized and done only by the admin in the ward.

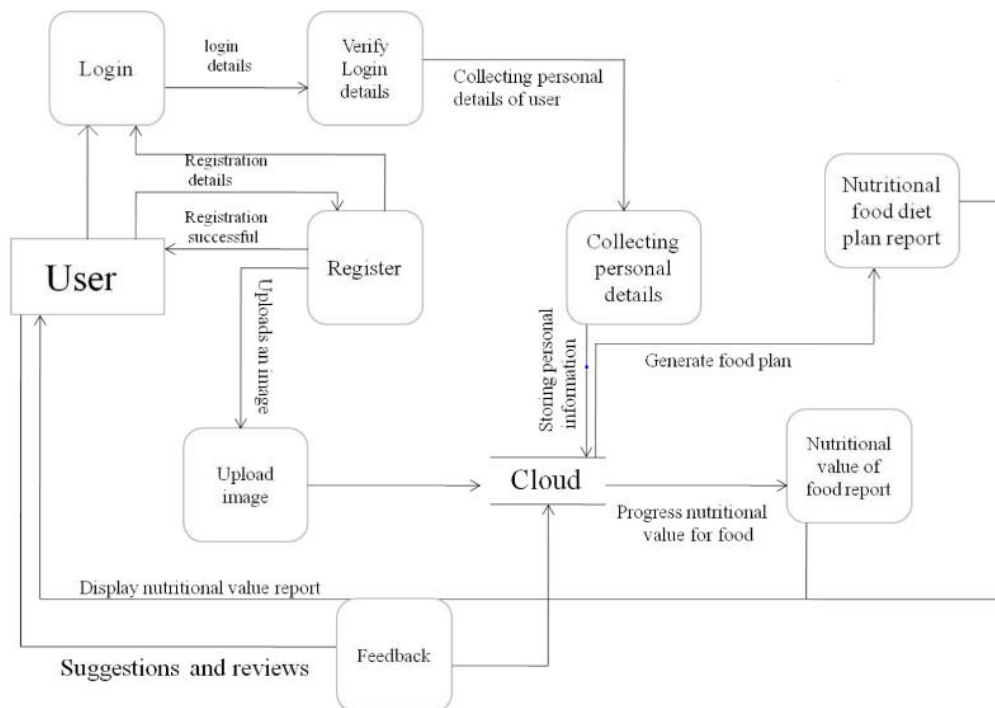
- Admin Rights: Admin shall be able to view and modify the information.

## CHAPTER 5

### PROJECT DESIGN

#### 5.1 DATA FLOW DIAGRAMS

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



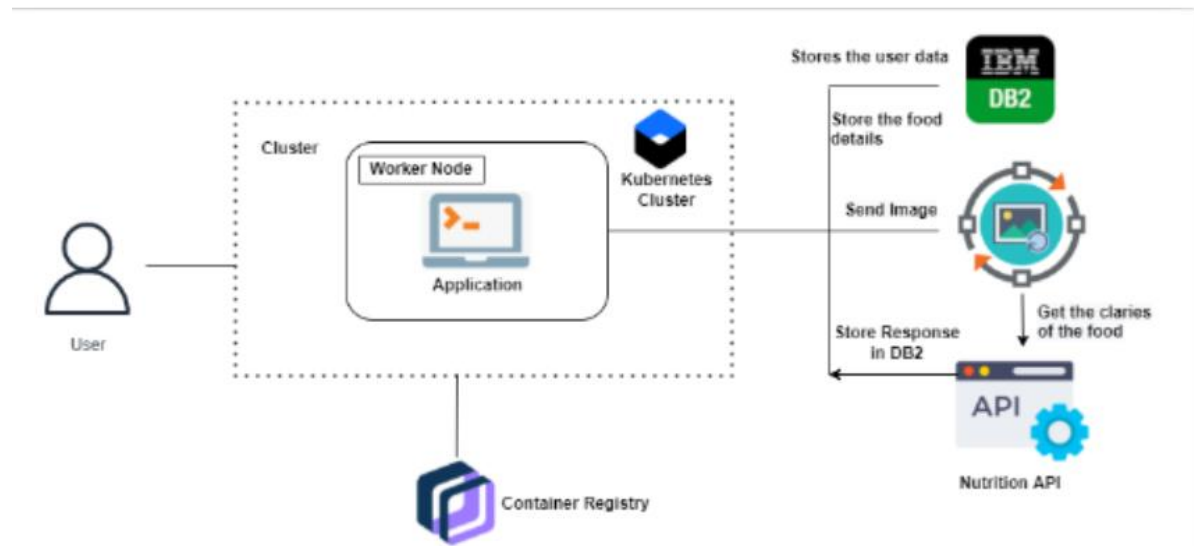


## **5.2 SOLUTION AND TECHNICAL ARCHITECTURE**

### **PROJECT DESCRIPTION:**

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 to App-based nutrient dashboard systems which can analyze real-time images of a meal and analyze it for nutritional content which can be very handy and improves the dietary habits, and therefore, helps in maintaining a healthy lifestyle. This project aims at building a web App that automatically estimates food attributes such as ingredients and nutritional value by classifying the input image of food. Our method employs Clarifai's AI-Driven Food Detection Model for accurate food identification and Food API's to give the nutritional value of the identified food.

## 5.3 TECHNICAL ARCHITECTURE



### 5.3.1 SOLUTION

- User interacts with the Web App to Load an image.
- The image is passed to the server application, which uses Clarifai's AI-Driven Food Detection.
- Model Service to analyze the images and Nutrition API to provide nutritional information about the analyzed Image.
- Nutritional information of the analyzed image is returned to the app for display.

### 5.3.2 PROCEDURE

#### 1. IMPLEMENTING WEB APPLICATION

- Registration (Push the registration data into the database)
- Login (Fetch the data upon login)

- Upload the food image and get the prediction
- Get Calories from the food items
- Add food data to the database

## 2. CREATE UI TO INTERACT WITH THE APPLICATION

- Registration Page
- Login Page
- Upload Image page
- Prediction results page for food items
- View history of items

## 3. CREATE IBM DB2 AND CONNECT WITH PYTHON

- Create the IBM Db2 service in the IBM cloud and connect the python code with DB.

## 4. INTEGRATE NUTRITION API

- Integrate the Nutrition API to the flask with API call.

### **5.4 APPROACH:**

Nutrition assistant application is designed to compress the broad knowledge that exists in nutrition, Many people will be attracted to Nutrition because they have special dietary needs. Some had food allergies or sensitivities; others were vegan or vegetarian; many were pregnant. A number of pregnant women reached out to us asking for more detailed information and guidance.

**KUBERNETES CLUSTERS** - Kubernetes clusters allow containers to run across multiple machines and cloud based application.

**IBM DB2-** Used for Backup & recovery. Comprehensive data resilience for physical and virtual servers.Cloud hosting. Dedicated, virtual private, and bare metal server options

**CONTAINER REGISTRY** - Container Registry is a single place for your team to manage Docker images, perform vulnerability analysis, and decide who can access what with fine-grained access control

**NUTRITION API** - A nutrition API acts as a container for information from thousands of products. When an application sends a GET request to the API, it returns the nutrition information about a given product.

## **RESULT:**

Despite processing, we do not believe that our outcomes are flawless. There is always opportunity for improvement in your procedure because cloud computing is a topic that is constantly developing. Additionally, there will always be new approaches that offer better results for the same problems. It has been done, the application. Clarifai's AI-Driven Food Detection Model Service, Nutrition API.

## 5.5 USER STORIES

User Type	Functional Requirement(Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user can register the application by entering email,password and confirm password.	I can access my account / dashboard	High	Sprint
	Registration	USN-2	As a user,will receive confirmation email once user have registered for the application	I can receive confirmation email & click confirm	High	Sprint
	Login	USN-3	As a user can log into the application by entering email & password	I can login when password and email are correct	High	Sprint
	Collecting personal details	USN-4	As a user can provide a personal information for processing	I can enter the personal details	Medium	Sprint
	Upload image	USN-5	As a user can upload an image for the processing of food.	I can upload a food image.	High	Sprint
	Feedback	USN-6	As a user can give feedback	I can give feedback about the application	Low	Sprint
Cloud	Nutritional value of report	USN-7	In cloud the food image is processed and provides the nutritional value of food.	It gives the nutritional value of food.	High	Sprint
	Nutritional Food diet plan report	USN-8	In cloud the food diet plan based on nutritional value is generated based on the personal information provided by the user.	It provides the diet nutritional plan.	Medium	Sprint

## CHAPTER 6

### PROJECT PLANNING & SCHEDULING

#### 6.1 SPRINT PLANNING & ESTIMATION

##### 6.1.1 PRODUCT BACKLOG, SPRINT SCHEDULE, AND ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	User Panel	USN-1	The user will login into the website and go through the products available on the website.	20	High	Nishanth Krishna Prasad S Sajramkisho Arvind
Sprint-2	Admin Panel	USN-2	The role of the admin is to check out the database about the stock and have a track of all the things that the users are purchasing.	20	High	Nishanth Krishna Prasad S Sajramkisho Arvind
Sprint-3	Chat Bot	USN-3	The user can directly talk to Chatbot regarding the products. Get the recommendations based on information provided by the user	20	High	Nishanth Krishna Prasad S Sajramkisho Arvind
Sprint-4	Final Delivery	USN-4	Container of applications using docker Kubernetes and development the application. Create the documentation and final submit the application	20	High	Nishanth Krishna Prasad S Sajramkisho Arvind

##### 6.1.2 PROJECT TRACKER, VELOCITY & BURNDOWN CHART

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	05 NOV 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 NOV 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 NOV 2022

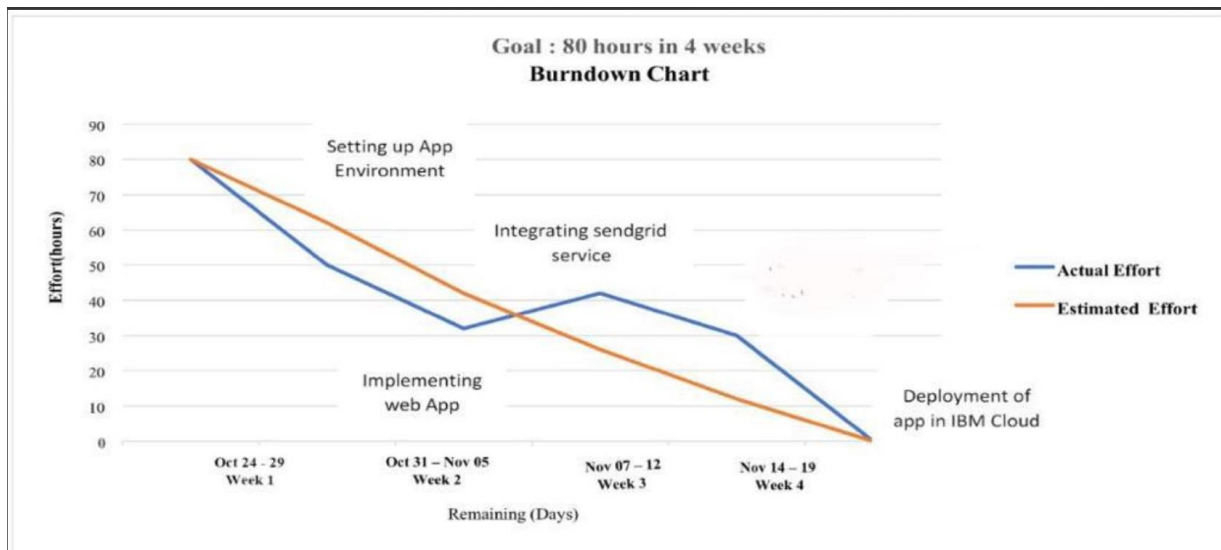
## 6.2 VELOCITY:

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

$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

## SPRINT DELIVERY SCHEDULE

### 6.3 REPORT FROM JIRA



## CHAPTER 7

## APPENDIX

### 7.1 SOURCE CODE

```
from flask import Flask,render_template,request,redirect,url_for ,session
import ibm_db
import re
import os
import math
import random
import smtplib
import requests
app=Flask(__name__,template_folder='templates',static_folder='static')
app.secret_key='a'
conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=ea286ace-86c7-4d5b-8580-3fbfa46b1c66.bs2io90l08kqb1od8lcg.databases.appdomain.cloud;PORT=3
print("successfully connected")
@app.route('/')
def home():
    return render_template('index.html')

@app.route('/login',methods=['GET','POST'])
def login():
    global userid
    msg=''

    if request.method=='POST':
        username=request.form.get('username',False)
        password=request.form.get('password',False)
        sql='SELECT * FROM USER WHERE username=? AND password=?'
        stmt=ibm_db.prepare(conn,sql)
        ibm_db.bind_param(stmt,1,username)
        ibm_db.bind_param(stmt,2,password)
        ibm_db.execute(stmt)
        account=ibm_db.fetch_assoc(stmt)
        print(account)
        if account:
            session['Logged in']=True
            session['id']=account['USERNAME']
            userid=account['USERNAME']
            session['username']=account['USERNAME']
            msg='logged in successfully'
```



```

        return render_template('dash.html')
    else:
        msg='Incorrect username/password'
    return render_template('login.html',msg=msg)

@app.route('/register',methods=['GET','POST'])
def register():
    msg=''
    if request.method == 'POST':
        username=request.form['username']
        email=request.form['email']
        password=request.form['password']
        Firstname=request.form['firstname']
        lastname=request.form['lastname']
        #phoneno=request.form['phoneno']
        sql='SELECT * FROM USER WHERE username=?'
        stmt=ibm_db.prepare(conn,sql)
        ibm_db.bind_param(stmt,1,username)
        ibm_db.bind_param(stmt,2,password)
        ibm_db.execute(stmt)
        account=ibm_db.fetch_assoc(stmt)
        print(account)
        if account:
            msg="Account already exist!"
        elif not re.match(r'[^@]+\@[^@]+\.[^@]+',email):
            msg="Invalid email address"
        elif not re.match(r'[A-Za-z0-9]+',username):
            msg="name must contain character and numbers"

        else:
            insert_sql='INSERT INTO USER values(?,?,2,2,2,?)'
            prep_stmt=ibm_db.prepare(conn, insert_sql)
            ibm_db.bind_param(prepare_stmt,1,username)
            ibm_db.bind_param(prepare_stmt,2,email)
            ibm_db.bind_param(prepare_stmt,3,password)
            ibm_db.bind_param(prepare_stmt,4,Firstname)
            ibm_db.bind_param(prepare_stmt,5,lastname)

```

```

        chgpwd_sql='UPDATE USER SET password = ? WHERE username = ?'
        prep_stmt=ibm_db.prepare(conn, chgpwd_sql)
        ibm_db.bind_param(prepare_stmt,1,newpassword)
        ibm_db.bind_param(prepare_stmt,2,username1)
        ibm_db.execute(prepare_stmt)
        msg="You have successfully changed password"
        return render_template('forgot password.html',msg=msg)
    return render_template('forgot password.html',msg=msg)

url = "https://low carb recipes.p.rapidapi.com"

headers = {
    "x-rapidapi-key": "ad933ea36amsh6b0a83e514b1a58p14bc9ejsne745a5851a1b",
    "x-rapidapi-host": "low-carb-recipes.p.rapidapi.com"
}

searchForRecipes = "/search"
getRecipe="/recipes/"
getImage="/images/2887982c-986a-4def-9e3a-153a3066af7a.jpeg"
getRandomRecipe="/random"

@app.route('/login/dash')
def dashboard():
    return render_template('dash.html')

@app.route('/login/dash/viewprofile')
def viewprofile():
    username=session['id']
    sql='SELECT * FROM USER WHERE username=?'
    stmt=ibm_db.prepare(conn,sql)
    ibm_db.bind_param(stmt,1,username)
    ibm_db.execute(stmt)
    account=ibm_db.fetch_assoc(stmt)
    print(account)
    if account:
        return render_template('viewprofile.html')
    else:

```

```

@app.route('/login/dash/viewprofile/personinfo', methods=['GET', 'POST'])
def per_info():
    msg = ''
    if request.method == 'POST':
        Name=request.form['Name']
        gender=request.form['gender']
        tar_weight=request.form['target Weight']
        Age=request.form['Age']
        Height=request.form['Height']
        Weight=request.form['Weight']
        email=request.form['email']
        location=request.form['location']
        phoneno=request.form['phoneno']
        sql='SELECT * FROM USER WHERE username=?'
        stmt=ibm_db.prepare(conn,sql)
        ibm_db.bind_param(stmt,1,Name)
        ibm_db.execute(stmt)
        account=ibm_db.fetch_assoc(stmt)
        print(account)
        if account:
            insert_sql='INSERT INTO USER values(?,?,?,?,?,?)'
            prep_stmt=ibm_db.prepare(conn, insert_sql)
            ibm_db.bind_param(prepare_stmt,1,Name)
            ibm_db.bind_param(prepare_stmt,2,gender)
            ibm_db.bind_param(prepare_stmt,3,Age)
            ibm_db.bind_param(prepare_stmt,4,Height)
            ibm_db.bind_param(prepare_stmt,5,Weight)
            ibm_db.bind_param(prepare_stmt,7,location)
            ibm_db.execute(prepare_stmt)
            msg="Your details are successfully stored"
            return render_template('viewprofile.html',msg=msg)
    elif request.method=="POST":
        msg="Please fill out the form"
        return render_template('personal info.html',msg=msg)

```

```

        if account:
            insert_sql='INSERT INTO USER values(?,?,?)'
            prep_stmt=ibm_db.prepare(conn, insert_sql)
            ibm_db.bind_param(prepare_stmt,1,Name)
            ibm_db.bind_param(prepare_stmt,2,email)
            ibm_db.bind_param(prepare_stmt,3,feedback)
            ibm_db.execute(prepare_stmt)
            msg="Your feedback has been stored"
            return render_template('ratings.html',msg=msg)
    elif request.method=="POST":
        msg="Please fill out the form"
        return render_template('ratings.html',msg=msg)

@app.route('/dash/view recipe')
def search_page():
    #session ['item']=request.form.get("ingridients", false)
    return render_template('search.html')
@app.route('/recipes')
def get_recipes():
    #food-session['item']
    if (str(request.args['ingridients']).strip() != ""):
        print(request.args['ingridients'])
        # If there is a list of ingridients -> list
        querystring = {"name":request.args['ingridients'], "tags":request.args['tag'], "includeIngredients":request.args['included'], "exclude":
        response = requests.request("GET", url + searchForRecipes, headers=headers, params=querystring)
        data=response.json()
        return render_template('recipes.html', recipes-data)
    else:
        # Random recipes
        response = requests.request("GET", url+ getRandomRecipe , headers=headers)
        data=response.json()
        return render_template('recipes.html', recipes-data)

@app.route('/recipe')
def get_recipe():
    recipe_id = request.args['id']
    recipe_info_endpoint = "/recipes/{0}".format(recipe_id)

```

```

        data=response.json()
        return render_template('recipes.html', recipes=data)

@app.route('/recipe')
def get_recipe():
    recipe_id = request.args['id']
    recipe_info_endpoint = "/recipes/{0}".format(recipe_id)
    print(recipe_info_endpoint)
    recipe_info = requests.request("GET", url + recipe_info_endpoint, headers=headers)
    data=recipe_info.json()
    return render_template('recipe.html', recipe=data)

@app.route('/logout')
def logout():
    session.pop('loggedin',None)
    session.pop('id',None)
    session('username',None)
    return render_template("index.html")

if __name__=="__main__":
    app.run(debug=True ,host='0.0.0.0',use_reloader=False)

```

```

        msg="You have successfully registered"
        return render_template('verify.html',msg=msg)
    elif request.method=="POST":
        msg="Please fill out the form"
        return render_template('register.html',msg=msg)

@app.route('/welcome')
def welcome():
    return render_template('welcome.html')

@app.route('/verify')
def verify():
    email=request.args.get('email', None)
    server=smtplib.SMTP('smtp.gmail.com',587)
    server.starttls()
    password="nsgeuedwbzptosyp"
    server.login(email,password)
    otp=''.join([str(random.randint(0,9))for i in range(4)])
    msg=' YOUR OTP IS'+str(otp)
    server.sendmail(email,email,msg)
    server.quit()
    if request.method=="POST":
        verify=request.method['code']
        if verify==otp:
            return render_template('login.html')
        return render_template('verify.html')

@app.route('/frgpwd', methods=['GET','POST'])
def frgpwd():
    msg = " "
    print(request.form)
    username1=request.form.get("uname", False)
    oldpassword=request.form.get("oldpassword", False)
    newpassword=request.form.get("newpassword", False)
    sql='SELECT * FROM USER WHERE username=?'
    stmt=ibm_db.prepare(conn,sql)
    ibm_db.bind_param(stmt,1,username1)
    #ibm_db.execute(stmt)

```

## CHAPTER 8

### TESTING

#### 8.1 TEST CASES

- 1.This application provides information about the nutritional content in the food.
- 2.This application monitors and tracks the goal and diet plans for the user based on the data collected.
- 3.This application calculates the micro nutrients from the macronutrient food source.
- 4.This application tracker helps in connection with automatically generated recommendations that fit individual cases.

#### 8.2 USER ACCEPTANCE TESTING

Our project is tested by the several end users to verify that the every component is working properly and these are the feedbacks from the user according to the testcases.

- 1.This application provides information about the nutritional content in the food -

**Passed**

- 2.This application monitors and tracks the goal and diet plans for the user based on the data collected - **Passed**

- 3.This application calculates the micro nutrients from the macronutrient food source - **Passed**

- 4.This application tracker helps in connection with automatically generated recommendations that fit individual cases - **Passed**

### 8.3 CONCLUSION

Dietary tracking is an essential task in chronic disease management and intervention. Food photo taking and image recognition significantly reduce the burden of food entering on personal mobile devices. In this work, we have developed a dietary tracking system that applies the deep-based image recognition to accurately and efficiently log food and nutrition intake. Through real user food photo testing and user study, we found that laboratory models form the foundation of the solution but miss out some of the key challenges. The diversity of real food photos is higher than the lab trained model. An ingredient based recognition is a promising way of tracking the free style and homemade food recognition problems in which training data is sparse and not representative. Moreover, the proposed photo based portion selection method is shown to be more accurate and engages the users better than the existing methods.