# NUTRITION ASSISTANT APPLICATION

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## 1. INTRODUCTION

Your access to knowledge supported by nutritional science and a range of resources that employ scientific evidence to promote health and prevent disease is one of the project's main objectives. This book was created to complement, improve, and enlarge the resources already available. This study aims to find mobile application deployment options for nutritional self-monitoring. Nutritional education is crucial for encouraging healthy eating practices since it guarantees that nutritional needs are met to prevent malnutrition.

## 2. PROJECT OVERVIEW

By identifying the supplied food image, this project attempts to create a web application that automatically calculates food qualities like ingredients and nutritional value. For precise food identification and to determine the nutritional value of the recognised item, our solution uses Clarifai's AI-Driven Food Detection Model.

## 3. PURPOSE

The users continue to demand to know the nutritional value that is in their food. The users learn about the effect of different foods on human health. Evidently, the ultimate aim of this application is to provide the ways in which one can lead a healthy life by maintaining his/her diet. The user can access the nutritional information by taking a photo of the food, uploading a photo from the gallery, or by entering manually.

Nutrition is more than just obtaining nutrients and calories from food. It's more than just eating the healthy stuff. It's more than just following the most recent fad diet. Nutrition, the food we eat and the way we eat it, is an integral part of life. Nutrition is an experience. It evokes memories, helps us celebrate good times, and is there for us in times of grief. I believe the purpose of nutrition is to nourish the body and soul.

The Nutrition Assistant Application helps the users to eat nutritional rich food which yield to lead a healthy life.

# 4. IDEATION PHASE

## 4.1 EMPATHY MAP

### What do they THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations

- A type of nutrition tracking app.
- It calculates the calorie level.
- They assist the users to follow a proper diet.
- People can check on their calorie intake.

### What do they HEAR?
what friends say
what boss say
what influencers say

- People say that this nutrition assistant app provides with good nutrition levels at any time.
- People say it is an advanced project to improve the healthcare.
- Nutrition Assistance App can help people to purchase nutritious food.
- People can focus on their diet.

### What do they SEE?
environment
friends
what the market offers

- People can see much advancement in this app in future.
- People can use or see this app from anywhere and internet.
- People can see better results by using this app.
- Creates new revenue streams for nutrition professionals all over the globe.

### What do they SAY AND DO?
attitude in public
appearance
behavior towards others

- The public can think that this is the best nutrition detection for future generation.
- It is useful for most of the people.
- The public should be happy to use this in the future.
- Does this effectively and efficiently work on..

### PAIN
fears
frustrations
obstacles

- It cannot quantify the exact level of nutrient deficiency.
- Difficult to use for people with no knowledge about the technology.
- It is not reliable in some cases.
- Approximate values are given for some.

### GAIN
"wants" / needs
measures of success
obstacles

- They assist the users to follow a proper diet.
- People can monitor the calorie intake even before they eat.
- To improve healthy population.
- People can keep track of what they eat.

# 4.2 BRAINSTORMING



# 4.3    LITERATURE SURVEY

DOMAIN: CLOUD ASSISTANT DEVELOPMENT

TOPIC : NUTRITION ASSISTANT APPLICATION

# LITERATURE SURVEY

| TITLE AND AUTHOR(S) | YEAR | TECHNIQUE(S) | FINDINGS | PROS AND CONS |
|---|---|---|---|---|
| Enhancing Cloud and healthy Food Nutrition Information Systems Practice-<br><br>Paul, PK and Aithal, PS and Bhuimali, A | 2017 | Cloud Computing ,Mobile Computing | Among the common mass food information systems are not yet popularized as a domain and thus there are huge potentialities to work on this. | P: Regarding manpower development there are a lot of things are pending and possible to work with. Hence cloud will do an attention on skill and manpower development for sophisticated development of food information systems. |
| Mobile cloud based system recognizing nutrition and freshness of food image-<br><br>Kumbhar, Diptee and Patil, Sarita | 2017 | Cloud Computing, Image Segmentation | Mobile cloud computing (MCC) has been introduced to be a potential paradigm for mobile health services to overcome the interoperability issues over distinctive information formats. In this, we propose a mobile cloud- based food calorie measurement framework. | P: Multiple Platform Support Cost-Efficient<br><br>C: Connectivity and Performance Issues |

| | | | | |
|---|---|---|---|---|
| Predicting calorific value for mixed foodusing image processing-<br><br>Kohila, R and Meenakumari, R | 2017 | Cloud Computing, Image Segmentation | The objective of this paper is to predict and to fix diet control for various diseases by measuring thecalorific value to help the patients and nutritionists. The image captured through a mobile phone/tablet camera will provide information concerning the calorierate of the food. | P:<br>Increased security<br>Reduced cost<br>C: Limited controlLacks Support |
| Use of artificial intelligence in precision nutritionand fitness-<br><br>de Moraes Lopes, Maria Helena Baena and Ferreira, Danton Diego and Ferreira, Ana Claudia Barbosa Honorio and da Silva, Giuliano Roberto  and Caetano, Aletha Silva and Braz | 2020 | Artificial Intelligence, Nutritional surveillance | Among the available computational tools, artificial intelligence (AI) has gained more and more attention recently, sinceit is able to learn and model linearand nonlinear relationships between variables by constructingan input-output mapping such thathidden and extremely useful information for decision-making is revealed and interprete. | P:  A large amountof data is collectedby these technologies<br>C:AI is not yet widely used in theareas of nutrition and fitness |

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Academicians and Practitioners' in Journal of Nutrition Education and Behavior On January 2022

[7] AntonellaSamoggiaBettinaRiedel 'Assessment of nutrition-focused mobile apps' influence on consumers' healthy food behaviour and nutrition knowledge' in Food Research International On February 2020

[8] PaolaIaccarino IdelsonDomenicoRendinaPasqualeStrazzullo 'Nutrition and the Covid-19 pandemic: Three factors with high impact on community health' in Nutrition, Metabolism and Cardiovascular Diseases On March 2021

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Reza 'Nutritional Mobile Applications for CKD Patients: Systematic Review' in Kidney International Reports On March 2019

# PROBLEM STATEMENTS

## WHY DO WE NEED NUTRITION ASSISTANTAPPLICATION ?

Nutrition assistant application has promoted a healthy diet throughout life promotes, supports normal growth, development and ageing, helps to maintain a healthy body weight, and reduces the risk of chronic disease leading to overall health and well-being

**OUR PLANS FOR NUTRITION ASSISSTANTAPPLICATION :**

- The 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 tothe app for display.

**ABSTRACT :**

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 toApp-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. REQUIREMNT ANALYSIS

## Functional Requirements:

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|--------|-------------------------------|------------------------------------|
| FR-1 | User Registration | Registration through Form<br>Registration through Gmail<br>Registration through LinkedIN |
| FR-2 | User Confirmation | Confirmation via Email Confirmation<br>via OTP |
| FR-3 | User Details | Can collect user details for future evaluation |
| FR-4 | Tracking System | Based on user data, reports can be downloaded or can be viewed. |

**Non-functional Requirements:**

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | Usability | Good UI and UX will be implemented to incorporate many users to use it as user-friendly. |
| NFR-2 | Security | Since we will be using IBM related data storage, secured data transitions will be done. |
| NFR-3 | Reliability | Necessary features will be added on demand. |
| NFR-4 | Performance | Performance will be good since we will transfer data asynchronously. |
| NFR-5 | Availability | Based on user's needs requirements will be available for all. |
| NFR-6 | Scalability | IBM storage and servers can react according to usage and can withstand multiple requests. |

# 6. PROJECT DESIGNS

## 6.1 PROBLEM SOLUTION FIT

**1. CUSTOMER SEGMENT(S)** — CS — Define CS, fit into
Who is your customer?

Who is your customer?
What limits your customer from acting when a problem occurs?
E.g. Spending power, network connection, available devices.

**6. CUSTOMER** — CC
What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.

Consumers need information such as nutrition tables to assess the nutritional value of a food product. Although a broad range of studies has examined consumers' attention, perception and use of nutrition tables.

**5. AVAILABLE SOLUTIONS** — AS — Explore AS,
Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons solutions have? i.e. pen and paper is an alternative to digital notetaking

your application has a marketplace and this feature, you can make them connected to each other, so food recommendations included information on vendors where they can buy these goods with no delays, see prices.

**2. JOBS-TO-BE-DONE / PROBLEMS** — J&P — Focus on J&P, tap into BE, understand RRC
Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

Nutrients have one or more of three basic functions: they provide energy, contribute to body structure, and/or regulate chemical processes in the body.

**9. PROBLEM ROOT CAUSE** — RC
What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.

projects are given such that it helps the researcher to gain maximum knowledge and experience. The institute has focused its work in developing products with enhanced nutrition, discovering innovative products utilizing byproducts, and implementing new methods to improve quality of food.

**7. BEHAVIOUR** — BE — Focus on J&P, tap into BE, understand RRC
What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)

Nutritional behavior is "the sum of all planned, spontaneous, or habitual actions of individuals or social groups to procure, prepare, and consume food as well as those actions related to storage and clearance.

**3. TRIGGERS** — TR — Identify strong TR & EM
What triggers customers to act? i.e. seeing their neighbour install energy panels, reading about a more efficient solution in the news.

Overweight is one of today's most urgent public health issues. It is related to a number of noncommunicable diseases.

**10. YOUR SOLUTION** — SL
If you are working on an existing business, write down your current solution first fill in the canvas, and check how much it fits reality.
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 behaviour.

When you are working on an existing solution (exploring growth strategies, problem with activation or solution adoption etc.), fill in this block first, and then see whether your solution is still relevant after all the blocks. are filled in.
useful, understandable and accessible.

**8. CHANNELS of BEHAVIOUR** — CH — Extract online & offline CH of BE
8.1 ONLINE
What kind of actions do customers take online? Extract online channels from #7

Complaints without actions and active public discussion mean nothing.

8.2 OFFLINE
What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

Workers in other professions and occupations nurses and community project workers can be given training in nutrition.

**4. EMOTIONS: BEFORE / AFTER** — EM
How do customers feel when they face a problem or a job and afterwards? i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

BEFORE: People cannot know how to maintain their health.
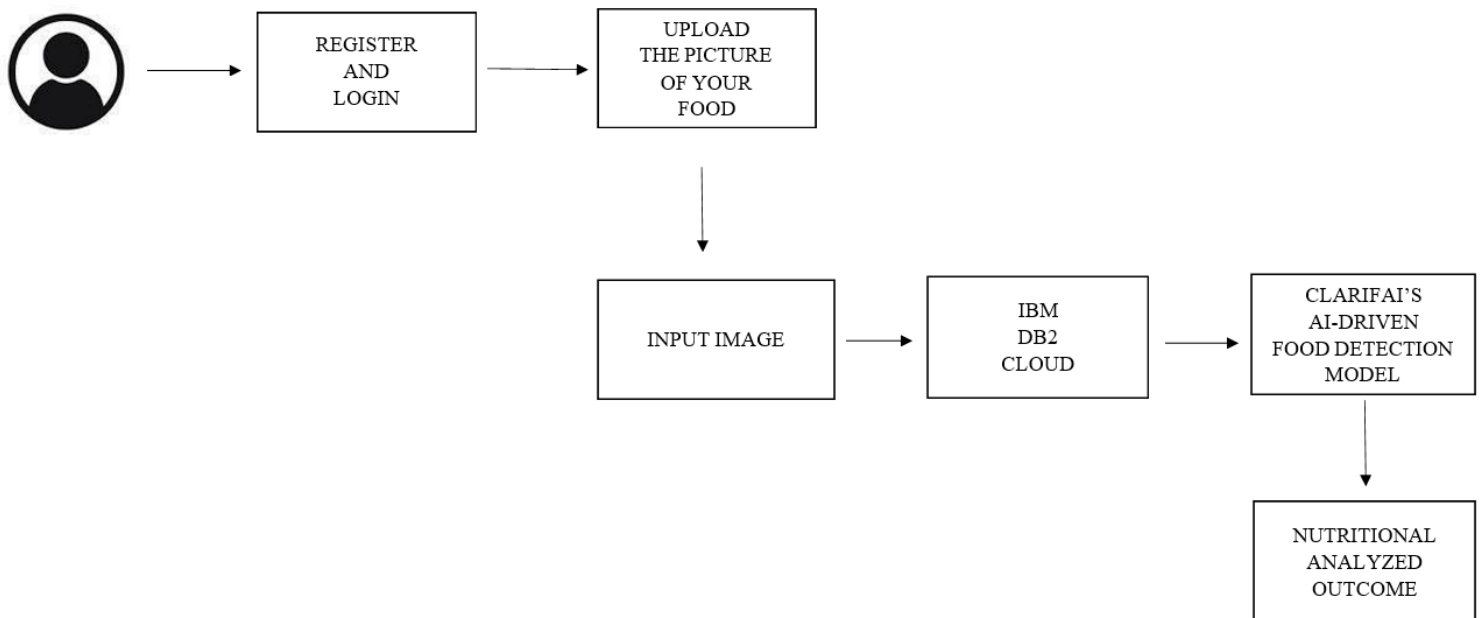AFTER: They consult their nutritionist easily.

## 6.2 PROPOSED SOLUTION

Project team shall fill the following information in proposed solution template.

| 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 isreflective of the risks to people's health. People needto control their daily calorie intake by eating healthy. |
| 2. | Idea / Solution description | Nutrition assistant application has promoted a healthy diet throughout life it promotes, supports normal growth,development and ageing, helps to maintain a healthy body weight, and reduces the risk of chronic disease. |
| 3. | Novelty / Uniqueness | Our method employs Clarifai's AI-Driven Food DetectionModel for accurate food identification and Food API's to give the nutritional value of the identified food. |
| 4. | Social Impact / Customer Satisfaction | People say that this nutrition assistant app provides withgood nutrition levels at any time. An advanced project toimprove the healthcare. Creates new revenue streams for nutrition professionals all over the globe. |
| 5. | Business Model (Revenue Model) | This project aims at building a web App that automatically estimates food attributes such as ingredients and nutritionalvalue by classifying the input image of food.Can analyze real-time images of a meal and analyze it for nutritional content. |
| 6. | Scalability of the Solution | People can monitor the calorie intake even before they eat.Assist the users to follow a proper diet. It calculates the accurate nutritional levels at most of the scenario's. |

## 6.3 SOLUTION ARCHITECTURE

Obesity rates are rising alarmingly quickly as a result of people's lack of knowledge about appropriate eating practises, which reflects the hazards to their health. The simplest way to prevent obesity is for people to limit their daily calorie consumption by eating healthier meals. Despite the fact that food packaging includes nutrition (and calorie) labels, it's still not very convenient for people to use app-based nutrient dashboard systems, which can analyse real-time images of a meal and analyse it for nutritional content. These systems are very useful and can help people improve their eating habits, which in turn helps them maintain a healthy lifestyle.

```
  ⬤      →   REGISTER      →   UPLOAD
              AND               THE PICTURE
              LOGIN             OF YOUR
                                FOOD
                                   │
                                   ↓
           INPUT IMAGE   →   IBM        →   CLARIFAI'S
                             DB2             AI-DRIVEN
                             CLOUD           FOOD DETECTION
                                             MODEL
                                                │
                                                ↓
                                             NUTRITIONAL
                                             ANALYZED
                                             OUTCOME
```
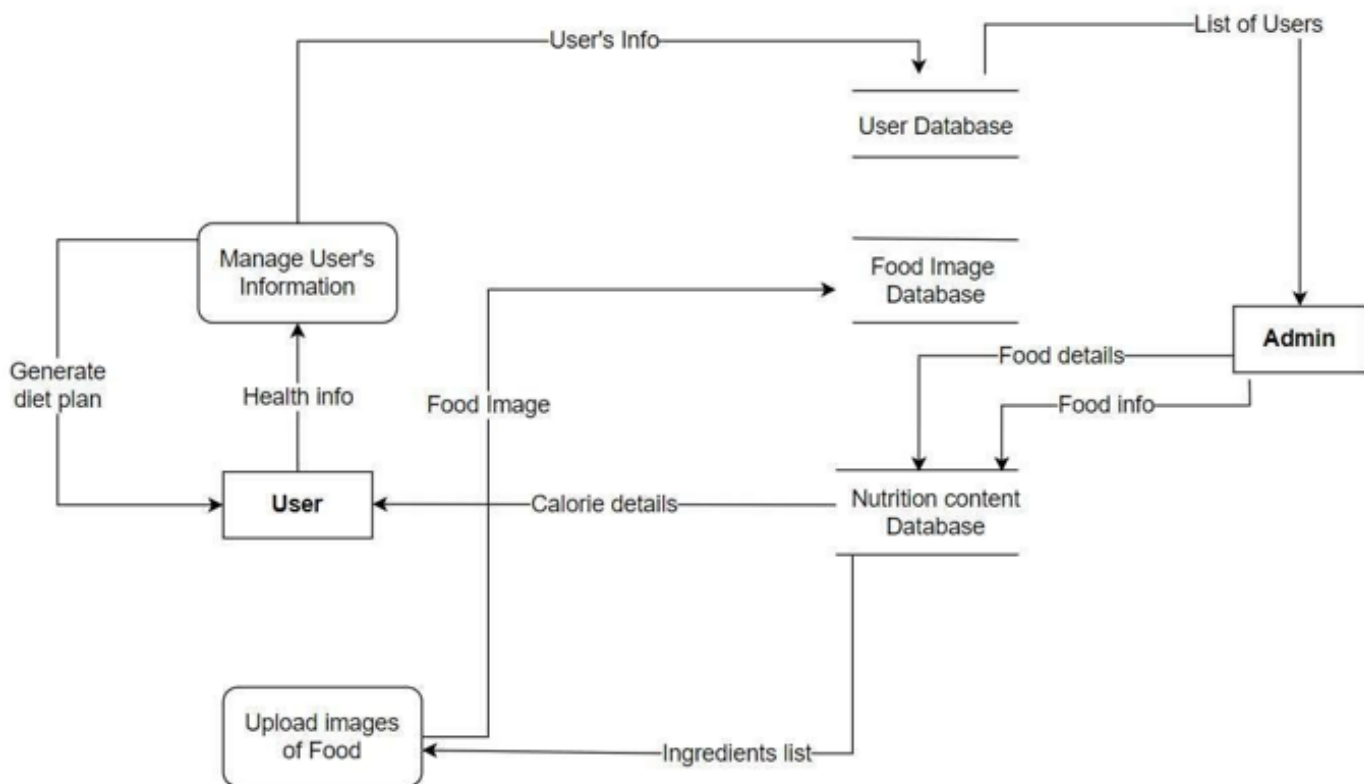
# 6.4 CUSTOMER JOURNEY

| Journey Steps Which step of the experience are you describing? | Discovery Why do they even start the journey? | Registration Why would they trust us? | | | Onboarding and First Use How can they feel successful? | | | | Sharing Why would they invite others? | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Actions** What does the customer do? What information do they look for? What is their context? | To become fit. | Add their credentials. | Connect their google account. | Set up a password. | Check on developer details. | Adds a profile picture. | Leaves feedback for training. | Clicks on learn more. | User friendly. | User experience is good. | Sharing is caring. |
| **Needs and Pains** What does the customer want to achieve or avoid? Tip: Reduce ambiguity, e.g. by using the first person narrator. | High rendering speed. | Avoid pop-ups. | Less exploitation of user information. | Avoid unnecessary access. | Simpler interface. | Allow posting resolution images. | Show detailed information of output. | Allow access to previous search history. | Enable to share as a link. | | |
| **Touchpoint** What part of the service do they interact with? | logo | E-mail | Free-trial | | Account settings. | Training interface. | Camera settings | Profile settings | New document | Sharing settings | |
| **Customer Feeling** What is the customer feeling? Tip: Use the *emoji app* to express more emotions | 🥴 | | 🤔 | | | 🙁 | | | 🥵 | | |
| Backstage | | | | | | | | | | | |
| **Opportunities** What could we improve or introduce? | Decrease loading | Minimize data | | | Recommend new | Show overall users number. | | | Share user's | | |

# 6.5 DATA FLOW DIAGRAM

## Nutrition Assistant Application

## 6.6 SOLUTION REQUIRMENTS

**Project description:**

This project is aimed at developing a desktop-based application named Nutrition Assistant Application for estimates food attributes such as ingredients and nutritional value by classifying the input images of food. The Nutrition Assistant Application refers to the systemand processes to help the user to analyse the intake of food with the involvement of a

Technology system. This system can be used to store the details of the user's health, calculating the BMI, Classifying the food image to know the nutritional value, update the status of their health condition based on the information provided, and generate health reportsweekly or monthly based. This project is categorizing individual health condition of the user. The Nutrition Assistant Application is important to control their daily calorie intake by eatinghealthier foods, which is the most basic method to avoid obesity. Without proper diet control,and this is reflective of the risks to people's health. A good Nutrition Assistant Application will alert the users when it is time to avoid. 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.

**Scope:**

- **Maintains good health**: The application can help in guiding them on how toremain healthy and how to take good nutrition. The application will help them without personally going to the doctor. Promote better nutrition in the community by educating about better diet and nutrition.
- **Functional limitation**: The user to be specific can't access the web or admin module, whereas the administrator has all the rights to modify andmanage the contents such as news, tips, etc
- **Improve Usability:** In the part of user's just the internet connection is enough in order to access the news, updates and other contents provided by the adminregarding their health condition.
- **Health conscious**: This will provide convenience to persons/users who wantsto learn about nutrition and other related health topics by just using the Nutrition Assistant Application

**Purpose:**

The users continue to demand to know the nutritional value that is in their food. The users learnabout the effect of different foods on human health. Evidently, the ultimate aim of this application is to provide the ways in which one can lead a healthy life by maintaining his/her diet. The user can access the nutritional information by taking a photo of the food, uploading aphoto from the gallery, or by entering manually.

Nutrition is more than just obtaining nutrients and calories from food. It's more than just eatingthe healthy stuff. It's more than just following the most recent fad diet. Nutrition, the food weeat and the way we eat it, is an integral part of life. Nutrition is an experience. It evokes memories, helps us celebrate good times, and is there for us in times of grief. I believe the purpose of nutrition is to nourish the body and soul.

The Nutrition Assistant Application helps the users to eat nutritional rich food which yield to lead a healthy life.

| IDENTIFIER | REQUIREMENTS |
|---|---|
| 1. Add health information | This application will allow to add health related information of the user. |
| 2. Delete health information | This application will allow to delete the unwanted details about their health. |
| 3. Categories of nutritional food | The categories of food. |
| 4. View of Dashboard | Application will allow user to view the dashboard containing nutrition details. |
| 5. Mail Notification | This application will allow to send mail notification to user when there are any issuesregarding their health |
| 6. Tracking System | The health can be tracked with this application. |
| 7. Graph analysis | This application will demonstrate health condition by means of nutritional content |
| 8. Identifying the high calorie food | The high calorie ingredients will be shown via this application. |
| 9. Identifying the low calorie food | The high calorie ingredients will be shown via this application. |
| 10. Passcode | This application has the option to set a passcode to keep their medical reports safe. |
| 12. Add multiple accounts | This application has the option of creating multiple accounts for the users. |
| 13. Selection of health report duration | This application has the ability to select the duration for displaying the health report asweekly or monthly. |
| 14. Update account | This application will allow the user to update |

| | |
|---|---|
| | their profile. |
| 15. Add account | This application will allow the user to add<br>their profile. |

| 16. Delete account | This application will allow the user to delete their profile. |
|---|---|
| 17. PDF report | This application will generate the pdf report of medical analysis. |
| 18. Pupation of nutritional trends | This application will allow constant review of nutritional trends and pupation. |

## 6.7 TECHNOLOGY ARCHITECTURE



**Guidelines:**

1. Include all the processes (As an application logic / Technology Block
2. Provide infrastructural demarcation (Local / Cloud
3. Indicate external interfaces (third party API's etc.)
4. Indicate Data Storage components / services
5. Indicate interface to machine learning models (if applicable

Table-1 : Components & Technologies:

| S. No | Component | Description | Technology |
|---|---|---|---|
| 1. | Essential guide to weight loss | Do not skip breakfast. Skipping breakfast will nothelp you lose weight. ... Eat regular meals. ... Eat plenty of fruit and veg. ... Get more active. ... Drink plenty of water. | steady aerobic exercise such as brisk walking for at least 30 minutes most days of theweek. Some people may require more physical activity than this to lose weight and maintainthat weight loss. Any extra movement helps burn calories. |
| 2. | Immunity Booster | Vitamin C is one of the biggest immune systemboosters of all. In fact, a lack of vitamin C can even make youmore prone to getting sick. Foods rich in vitamin C include oranges, grapefruits, tangerines, strawberries, bell peppers,spinach, kale and broccoli | Innate (non-specific) immune response Acquired (specific) immune response |
| 3. | Fitness | Writing down what you eat, how much you ate andwhen you ate it in a food diary Figuring out how many calories you need to eat tomaintain, gain or lose weight . Weighing and measuring your food to adjust portion sizes and ensure you're not eating toomuch at meal times. Switching from refined foods to unrefined foods.Drinking more water instead of sugary juices, sodas (even diet sodas) and alcoholic drinks. | technology can improve the way the worldgrows, produces, distributes and supplies food by using technology such as AI and automation. |
| 4. | Nutrition tracking feature | With nutrition tracking, you can get an idea of the calories you are consuming and how they compare to the amount needed for weight loss. | |

| | | You can also learn how various foods or nutrients may affect weight and health, which can put you ina better position to incorporate foods to help you maintain healthy habits. | Integration with 3rd party apps. Create custom exercise routines. Reminders to remind people to drink waterand take other food items.<br><br>Push notifications.Feedback system.<br>Create diet plans. |
|---|---|---|---|
| 5. | Food Medicine | patients to food is medicine interventions can change their ability to follow dietary recommendations, tackling several barriers to healthy eating, including the inability to afford oraccess recommended foods.<br><br> For food is medicine interventions to be most effective, the participant should be engaged and their experience evaluated. Qualitative research will better integrate individual perspectives into thedesign of food is medicine programmes and reveal how, why, and in what context they work best forparticipants | Personalised diets.<br><br>Vegetable proteins and synthetic meat.Snacking and upcycling.<br><br>Food traceability.<br><br>Automation in supermarkets andrestaurants |
| 6. | Diet chart | Fat-free and low-fat dairy products, such as low-fatyoghurt, cheese, and milk.<br>Protein foods, such as lean meat, fish, poultrywithout skin, beans, and peas.<br>Whole-grain foods, such as whole-wheat bread,oatmeal, and brown rice. ...<br>Fresh fruits, canned, frozen, or dried. | adequacy, balance, calorie (energy) control,nutrient density, moderation variety areimportant concepts in choosing a healthful diet. |

Table-2: Application Characteristics:

| S.No | Characteristics | Description | Technology |
|------|-----------------|-------------|------------|
| 1. | Open-Source Frameworks | Many common health problems can be prevented or alleviated with a healthy diet and good nutrition.For help, consider using some of the growing number of high quality, free open source and/or Diet & Nutrition | software for which the original source code is made freely available and may be redistributed and modified accordingto the requirement of the user. |
| 2. | Security Implementations | Security is achieved when it is ensured that all people, at all times, have physical, social and economic access to sufficient, safe and nutritiousfood which meets their dietary needs and food preferences for an active and healthy life". | The term food security revolves aroundthe terms of access to food, availabilityof food, and climate-smart farming. With SaaS technology and solutions related to them, all these factors can beresolved. |
| 3. | Scalable Architecture | Good health is the result of a healthy lifestyle, where caring about physical activity and nutritionare key concerns. However, in today's society, nutritional disorders are becoming increasingly frequent, affecting children, adults, and elderly people. | Scalability is the property of a system tohandle a growing amount of work by adding resources to the system. In other words, a scalable architecture supports higher workloads without any fundamental changes to it |
| 4. | Availability | Nutrition apps can help make life easier for individuals who need to track their food intake for health reasons. These apps can also help people find restaurants that are suitable for their dietary needs. | Available technology means technologies and methods for emplacing a permanent radon barrier on uranium mill tailings piles or impoundments. |

| 5. | Performance | to improve performance, with maximizing glycogen stores a key strategy for many. Carbohydrate intake during exercise maintains high levels of carbohydrate oxidation, | Technology helps contribute to patientcare by fostering communication between providers and patients via online portals, message, and email. It also increases access to information. which can improve self-monitoring and patient convenience |

# 6.8 USER STORIES

⇨ As a user, I can register for the application by entering my email, password,
and Confirming my password

⇨ As a user, I will receive confirmation email once I have registered for the application

⇨ As a user, I can log into the application by entering email & password

⇨ As a user, I can fill the details.

⇨ As a user, I will search the food items.

⇨ As a user, I can scan the food an get the nutrition details and recipe for related scanned food.

# PROJECT PLANNING AND SCHEDULING

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Registration | USN-1 | As a user, I can register for the application by entering my email, password, and confirming my password. | 2 | High | Thilak Aswin T Soundharya Bharani P |
| Sprint-2 | New user | USN-2 | As a user, I will receive confirmation email once I have registered for the application | 1 | High | Mohamed Faruk K Sanjith N |
| Sprint-2 | Gmail Registration | USN-3 | As a user, I can register for the application through Gmail | 2 | Medium | Thilak Aswin T Mohamed Faruk K |
| Sprint-3 | Login | USN-4 | As a user, I can log into the application by entering email & password | 2 | Medium | Thilak Aswin T Soundharya Bharani P |
| Sprint-3 | Suggestion | USN-5 | As a user, I can make some recommendation such as nutritive plan, etc. | 1 | High | Mohamed Faruk K Sanjith N |
| Sprint-4 | Image upload | USN-6 | As a user, I have to upload the images of the food items to find out the calories and alsosuggest healthy diet plan | 2 | High | Mohamed Faruk K SanjitH N |
| Sprint-4 | Dashboard | USN-7 | The details will be provided via nutrition API | 2 | High | Thilak Aswin T Soundharya Bharani P |

## 6.9 Sprint Delivery Schedule

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

## 7. CODING & SOLUTIONING

## 7.1 FEATURE 1

The user can upload any food image Nutrients present in the uploaded image will be displayed

## 8. TESTING

### 8.1 TEST CASES

Our code was tested on various food to check whether it gives the correct outputTo satisfy the customer's expectations we tested it fully.

### 8.2 USER ACCEPTANCE TESTING

Our project was tested by an end user to verify that it's working correctly.

### Defect Analysis

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

| Resolution | Severity 1 | Severity 2 | Severity 3 | Severity 4 | Subtotal |
|---|---|---|---|---|---|
| By Design | 5 | 4 | 6 | 5 | 20 |
| Duplicate | 0 | 1 | 3 | 0 | 4 |
| External | 1 | 1 | 0 | 4 | 6 |
| Fixed | 2 | 5 | 20 | 10 | 37 |
| Not Reproduced | 0 | 0 | 1 | 0 | 1 |
| Skipped | 0 | 0 | 1 | 1 | 2 |
| Won't Fix | 0 | 5 | 2 | 1 | 8 |
| Totals | 8 | 16 | 33 | 21 | 77 |

### Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

| Section | Total Cases | Not Tested | Fail | Pass |
|---|---|---|---|---|
| Print Engine | 7 | 0 | 0 | 7 |
| Client Application | 51 | 5 | 0 | 46 |
| Security | 2 | 0 | 0 | 2 |

| | | | | |
|---|---|---|---|---|
| Outsource Shipping | 3 | 0 | 0 | 3 |
| Exception Reporting | 9 | 0 | 0 | 9 |
| Final Report Output | 4 | 0 | 0 | 4 |
| Version Control | 2 | 0 | 0 | 2 |

## 9. RESULT

### PERFORMANCE METRICS

The proposed procedure was implemented and tested
set of images. The training database consists of various images of food
items. Once a food is recognized the equivalent Nutrition in shown on
the screen.

## 10. ADVANTAGES:

❖ It provides a maintained strategy of healthy eating habits.

❖ It delivers information on the nutritional value of foods
andhow balanced and healthy eating habits are
important for us.

❖ It limits the amount of unnecessary food such as fat
thatpeople consume a lot.

## 11. CONCLUSION
In conclusion, many people have become aware of their health. Moreover, they
are also informed how to live a healthy lifestyle. Most of the research related to these

themes aims to identify changes in healthy lifestyle behavior with web applications that are considered effective in dietary self-monitoring.

## 12. DESCRIPTION:

Nutrition assistants help dieticians with providing proper nutrition at healthcare facilities. They determine patients' nutritional needs, assess risk factors, and plan meals and menus. They also ensure proper sterilization of plates and utensils.

## 13. APPENDIX

**Source Code:**

```python
from flask import Flask,render_template,request, redirect

import os
import numpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
import requests
import ibm_db, ibm_db_dbi
import pandas as pd
from flask_mail import Mail, Message
from sendgrid import SendGridAPIClient
from sendgrid.helpers.mail import Mail

app = Flask(_name_,template_folder="templates")
model=load_model('nutrition.h5')
print("Loaded model from disk")

#ibm DB2 connection
connection = ibm_db.connect('DATABASE=bludb;'
                'HOSTNAME=8e359033-a1c9-4643-82ef-
8ac06f5107eb.bs2io90l08kqb1od8lcg.databases.appdomain.cloud;'
                'PORT=30120;'
                'PROTOCOL=TCPIP;'
                'SECURITY=SSL;'
                'SSLServerCertificate=DigiCertGlobalRootCA.crt;'
                'UID=zsy87446;'
                'PWD=CoV6JEBhlIYZGUfq;', '', ''
)

print("Connection with ibm db2 is successful.")

# sendgrid_api_key = 'SG.GI1duQzZTN-
YP7Fb1TgrGQ.W62v8fADyHvbQFpLBu664cGvjofml_51ViZH_47pG_s'
```

```python
# sender_email_address = 'vrpranesha1@gmail.com'
# #Sendgrid requirements
# app.config['SECRET_KEY'] = 'top-secret!'
# app.config['MAIL_SERVER'] = 'smtp.sendgrid.net'
# app.config['MAIL_PORT'] = 587
# app.config['MAIL_USE_TLS'] = True
# app.config['MAIL_USERNAME'] = 'apikey'
# app.config['MAIL_PASSWORD'] = sendgrid_api_key
# app.config['MAIL_DEFAULT_SENDER'] = sender_email_address
# mail = Mail(app)


# Home
@app.route('/')
def home():
    return render_template('index.html')

@app.route('/image1',methods=['GET','POST'])
def image1():
    return render_template("image.html")

#login
@app.route('/login', methods=['GET', 'POST'])
def login():
    count = 0
    if request.method == 'POST':
        username = request.form['username']
        password = request.form['password']
        sql = "SELECT USERNAME FROM userdata WHERE USERNAME = '"+username+"' AND
USERPASS = '"+password+"'"
        stmt = ibm_db.exec_immediate(connection, sql)
        while ibm_db.fetch_row(stmt) != False:
          print(ibm_db.result(stmt, 0))
          count = count + 1
        if count == 0:
            return render_template('login.html')
        else:
            return render_template('index.html')


        return render_template('index.html')
        # else:
        #     return render_template("login.html")
    return render_template("login.html")
```

```python
# Classification and Nutrition Suggestion
@app.route('/predict',methods=['GET', 'POST'])
def launch():
    if request.method=='POST':
        f=request.files['file']
        basepath=os.path.dirname('__file__')
        filepath=os.path.join(basepath,"uploads",f.filename)
        f.save(filepath)

        img=image.load_img(filepath,target_size=(64,64))
        x=image.img_to_array(img)
        x=np.expand_dims(x,axis=0)

        pred=np.argmax(model.predict(x), axis=1)
        print("prediction",pred)
        index=['APPLES','BANANA','ORANGE','PINEAPPLE','WATERMELON']
        result=str(index[pred[0]])

        x=result
        print(x)
        result=nutrition(result)
        # print(result)
        return render_template("0.html",showcase=(result),showcase1=(x))


@app.route('/checkall',methods=['GET','POST'])
def checkall():
    all = ['mango', 'apple', 'pineapple', 'guava', 'grapes', 'dosa', 'idly', 'rice',
'poori', 'tomato', 'carrot']
    data = []
    try:
        for each in all:
            d = nutrition(each)
            data.append(d)
    except:
        pass
    return render_template('checkall.html', data=data)

@app.route('/contact', methods=['GET', 'POST'])
def contact():
    if request.method == 'POST':
        from_email = request.form['fromemail']
        to_email = request.form['toemail']
        subject = request.form['subject']
```

```python
        message = Mail(
            from_email=from_email,
            to_emails=to_email,
            subject=subject,
            html_content='<strong>and easy to do anywhere, even with Python</strong>')
        try:
            sg = SendGridAPIClient('SG.GI1duQzZTN-
YP7Fb1TgrGQ.W62v8fADyHvbQFpLBu664cGvjofml_51ViZH_47pG_s')
            response = sg.send(message)
            print(response.status_code)
            print(response.body)
            print(response.headers)
        except Exception as e:
            return render_template('success.html', message = e)
        status = 'Mail sended to ' + to_email+ ' and status is : ' +
str(response.status_code)
        return render_template('success.html',message = status)
    return render_template('contact.html')

# Nutrition API
def nutrition(index):


    url = "https://calorieninjas.p.rapidapi.com/v1/nutrition"

    querystring = {"query":index}

    headers = {
        'x-rapidapi-key': "5d797ab107mshe668f26bd044e64p1ffd34jsnf47bfa9a8ee4",
        'x-rapidapi-host': "calorieninjas.p.rapidapi.com"
        }

    response = requests.request("GET", url, headers=headers, params=querystring)

    # print(response.text)
    return response.json()['items']

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

if __name__ == "__main__":
    # running the app
    app.run(debug=True)
# using SendGrid's Python Library
```

**Image prediction source code:**

```html
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8" />
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <link rel="preconnect" href="https://fonts.googleapis.com" />
    <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin />
    <link
      href="https://cdn.bootcss.com/bootstrap/4.0.0/css/bootstrap.min.css"
      rel="stylesheet"
    />
    <script src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popper.min.js"></script>
    <script src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js"></script>
    <script src="https://cdn.bootcss.com/bootstrap/4.0.0/js/bootstrap.min.js"></script>
    <link
      href="{{ url_for('static', filename='css/main.css') }}"
      rel="stylesheet"
    />
    <link
      href="https://fonts.googleapis.com/css2?family=Sono:wght@800&display=swap"
      rel="stylesheet"
    />
    <title>Predict</title>
  </head>
  <body>
    <div class="Container">
      <div class="Wrapper">
        <div class="header">
          <h1>Nutrition Assistant</h1>
        </div>
        <div class="nav">
          <ul>
            <li><a href="{{ url_for('home')}}"> Home</a></li>
            <li class="active"><a href="" class="active">Classify</a></li>
            <li><a href="{{ url_for('checkall')}}">Check All</a></li>
            <li>Signup/Login</li>
          </ul>
        </div>
        <div class="Wrapper2">
          <div class="left" id="content">{% block content %}{% endblock %}</div>

        </div>
      </div>
```

```
    </div>
    <!-- asdas -->
  </body>
  <footer>
    <script
      src="{{ url_for('static', filename='js/main.js') }}"
      type="text/javascript"
    ></script>
  </footer>
</html>
```

**Sample output:**

## Nutrition Assistant

Home   Classify   **Check All**   Contact   Signup/Login

[{'sugar_g': 13.6, 'fiber_g': 1.6, 'serving_size_g': 100.0, 'sodium_mg': 0, 'name': 'mango', 'potassium_mg': 14, 'fat_saturated_g': 0.1, 'fat_total_g': 0.4, 'calories': 61.6, 'cholesterol_mg': 0, 'protein_g': 0.8, 'carbohydrates_total_g': 14.8}]

[{'sugar_g': 10.3, 'fiber_g': 2.4, 'serving_size_g': 100.0, 'sodium_mg': 1, 'name': 'apple', 'potassium_mg': 11, 'fat_saturated_g': 0.0, 'fat_total_g': 0.2, 'calories': 53.0, 'cholesterol_mg': 0, 'protein_g': 0.3, 'carbohydrates_total_g': 14.1}]

[{'sugar_g': 9.9, 'fiber_g': 1.4, 'serving_size_g': 100.0, 'sodium_mg': 0, 'name': 'pineapple', 'potassium_mg': 8, 'fat_saturated_g': 0.0, 'fat_total_g': 0.1, 'calories': 50.8, 'cholesterol_mg': 0, 'protein_g': 0.5, 'carbohydrates_total_g': 13.0}]

[{'sugar_g': 8.9, 'fiber_g': 5.5, 'serving_size_g': 100.0, 'sodium_mg': 1, 'name': 'guava', 'potassium_mg': 39, 'fat_saturated_g': 0.3, 'fat_total_g': 0.9, 'calories': 67.7, 'cholesterol_mg': 0, 'protein_g': 2.5, 'carbohydrates_total_g': 14.4}]

[{'sugar_g': 15.5, 'fiber_g': 0.9, 'serving_size_g': 100.0, 'sodium_mg': 2, 'name': 'grapes', 'potassium_mg': 20, 'fat_saturated_g': 0.1, 'fat_total_g': 0.2, 'calories': 69.6, 'cholesterol_mg': 0, 'protein_g': 0.7, 'carbohydrates_total_g': 18.1}]

[{'sugar_g': 0.2, 'fiber_g': 0.9, 'serving_size_g': 100.0, 'sodium_mg': 97, 'name': 'dosa', 'potassium_mg': 52, 'fat_saturated_g': 0.6, 'fat_total_g': 3.8, 'calories': 170.5, 'cholesterol_mg': 0, 'protein_g': 4.0, 'carbohydrates_total_g': 30.0}]

[{'sugar_g': 0.3, 'fiber_g': 1.4, 'serving_size_g': 100.0, 'sodium_mg': 193, 'name': 'idly',