AI-POWERED NUTRITION FITNESS ANALYZER ENTHUSIASTS

USING ARTIFICIAL INTELLIGENCE

A Project report submitted in partial fulfillment of 7th semester in degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted by

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BONAFIDE CERTIFICATE

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ACKNOWLEDGEMENT

We have successfully completed the project with blessings showered onus by god, the almighty, A project of this nature needs co-opreation and support from many for successful completion.

We express our heartfelt thanks to **Mr.A.MATHIVANAN, BE., M.sc.,(Agri),** Managing Trustee of Einstein college of Engineering, Tirunelveli, for his mortal support and device.

Our thanks to **Prof.A.AMUTHAVANAN, BE., M.S (USA).B.L,**Chairman of our college for making necessary arrangements to do this project.

Our heartly thanks to **Prof.EZHILVANAN, MBA.,** Secretary of our college for making necessary arrangements to do this project.

We wish to express our gratitude to **Dr.VELAYUTHAM,M.E,Ph.D.,FIE.** Principal for the support he provided us to carry out this project successfully.

We are very much thankful to **Dr. T.SURESH THANKRISHNAN**, Head of the Department , Electronics and communication Engineering who is always a constant of inspiring us.

We are extend our sincere thanks to all teaching and non-teaching staff members and our family members, friends for their help in completing this project.

Project Report Format

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1.INTRODUCTION

It is a vital part of analytical chemistry about the chemical composition, processing, quality control and contamination of food. The main aim of the project is to building a model which is used for classifying the fruit depends on the different characteristics like color, shape, texture etc...As the world grows more fitness conscious with passing time, the demand is diversifying. Lately, a number of startups in india and worldwide are using predictive analytics artificial intelligence and natural language processing to help scores of fitness enthusiasts to track and monitor their nutrition and calorie intake.

In India, this global trend has had a positive impact on scores of startups and websites catering to this segment.AI and its us subsets have been leveraged by these platforms to identify the calorie intake and also to make food recommendations for a healthy diet. In most cases, what we see is that these platforms act as a data respository where while providing real- time information to its users, it also makes available to numerous clients who work in this field for a determined rate.

In this project, we take a look at the top AI-based online platforms which make use of AI and other deep learning technologies to provide a real-time update about nutrition intake.

1.1PROJECT OVERVIEW

Food is essential for human life and has been the concern of many healthcare con conventions. Now days new dietary assessment and nutrition analysis tools enable more opportunities to help people understand their daily eating habits, exploring nutrition pattern and maintain a healthy diet. Nutritional analysis is the process of determining the nutritional content of food. Here the user can capture the images of different fruits and then the image will sent the trained model. The model analyses the image and detect the nutrition based on the fruits like(Sugar,Fibre,protein,calorie,etc)

1.2 PURPOSE

Artificial intelligence is a rapidly evolving area that offers unparalleled opportunities of progress and applications in many healthcare fields. In this project we provide an overview of the main and latest applications of AI in nutrition research and identity gaps to address to potentialize these emerging field.AI algorithms may help better understand and predict the and non-linear interactions between nutrition-related data and health outcomes, particularly when large amounts of data need to be structured and integrated, such as in metabolomics.

1. LITERATURE SURVEY

Review -1

Title of the paper:

High fat diet endogeneous thrombin generation inplasma during obesity

Name of the Author:

sanchez [Orateur] (1), pierre Morange (1), Matthis canault (1), Stephane Tanguy (2), Dorothee Faille (1), Anne Dutour (1), MichelGrino (1), Marie –Christine Alessi (1).

Problem Description:

Association between obesity, cardiovascular disease, and venous thromboembolism colud partially be explained by a hyper coagulable state. In addition, it is still controversial which of obesity, diet or metabolic disturbances are the main factors in the changes in the coagulation system. In this study, they investigated endogenous thrombin potential(ETP) durng high-fat-diet (HFD) inducedobesity.

2.1 EXISTING PROBLEM

- Low intake of food. Some people develop Malnutrition because there is not enough food available, or because they have difficulty eating or absorbing nutrients.
- Mental health conditions and social or mobility problems.
- These problems include problems of overeating and consistently making poor food choices resulting in obesity.
- Conversely, other adolescents develop problems with unhealthy and extremely restrictive dieting without meeting the minimum nutritional requirements necessary for healthy growth and development.

2.2 REFERENCE

1. J. Cade, R. Thompson, V. Burely, and D. Warm, "Development, validation and utilization of food frequency questionaries-a review, " public health nutrition, vol.5, pp.567-587,2002.

2. R. steele, "An overview of the state of the art of automated capture of dietaryintake information, "Critical Reviews in Food Science and Nutrition, 2013.

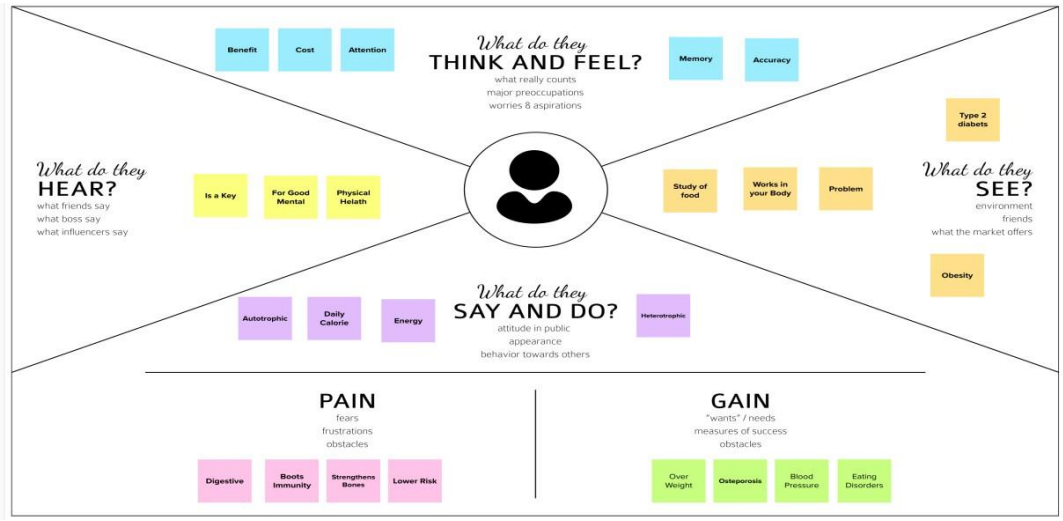
2.3 PROBLEM STATEMENT DEFINITION

A Problem Etiology Symptoms statement or nutrition diagnosis statement is a structured sentence that describes the specific nutrition problem that you the dietitian is responsible for treating and working toward resolving, the causes of the problem and the evidence that this problem exists. A PES statement needed for all nutrition assessments except those with no nutrition diagnosis. There has been a great deal of information from the Nurses' Health Study in USA, which is following some 85,000 nurses, with diet and health records. This is an observational study, so all we can say is that people who eat more of this, or less of that, are moreor less at risk of developing whatever disease we are interested in. It is all too easy to draw conclusions that may or may not be misleading. For example, people who eat relatively large amounts of processed and preserved meat products are more likely to develop gastric and colorectal cancer, but these people may also eat less fruit and vegetables, less whole grain cereal products, less oily fish, etc. They may also have other behaviour that are, or may be, conducive to ill health, such as smoking, taking little exercise, being obese, etc. At one time there was a list of some 600 factors associated with the development of atherosclerosis and coronary heart disease, one of which was religious observance! All of these confound interpretation of the data and muddy the water, making it difficult to draw clear conclusions about what constitutes a healthy diet.

3.IDEATION & PROPOSED SOLUTION

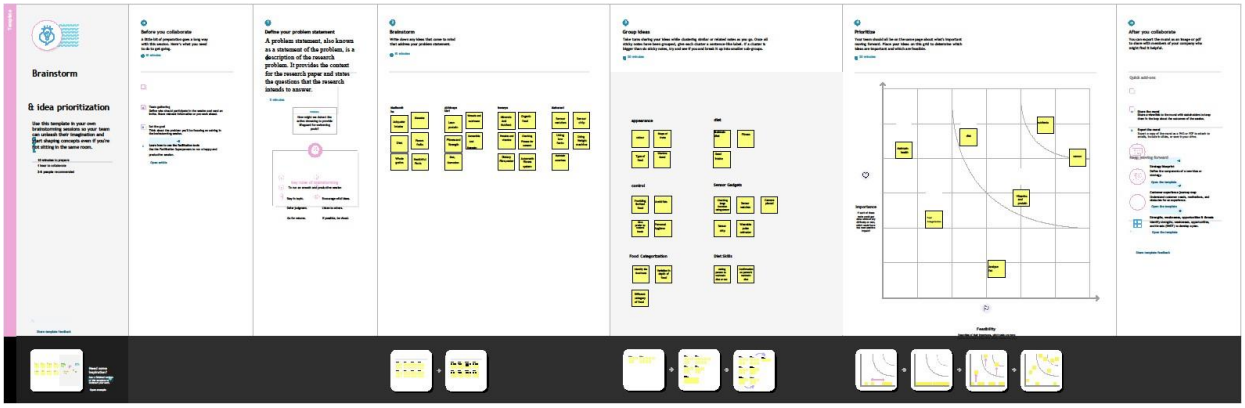
Food Technology teaches students to cultivate and process food materials using technology so that it can be products with high use value and an even higher selling value. On the other hand, food materials will have high good nutrition value and fit for consumption

3. 1 EMPATHY MAP CANVAS



Empathy map is a collaborative tool teams can used to gain deeper insight into their customer. Much like a user persons, an empathy map can represent a group of users, such a customer segment. The empathy map was originally created by dave gray and has grained much popularity within the agile community. An empathy map helps to map what a design team knows about the potential audience. This tool helps to understand the reason behind some actions the user takes deeply. This tool helps build empathy toward users and help design team shift focus from the product to the user who are going to use the product. Essentially, an empathy map is a square divided into four quadrants comprises a category that helps us delve into the mind of the user. The four empathy map quadrants look at what the user says things and does.

3.2 IDEATION & BRAINSTORMING



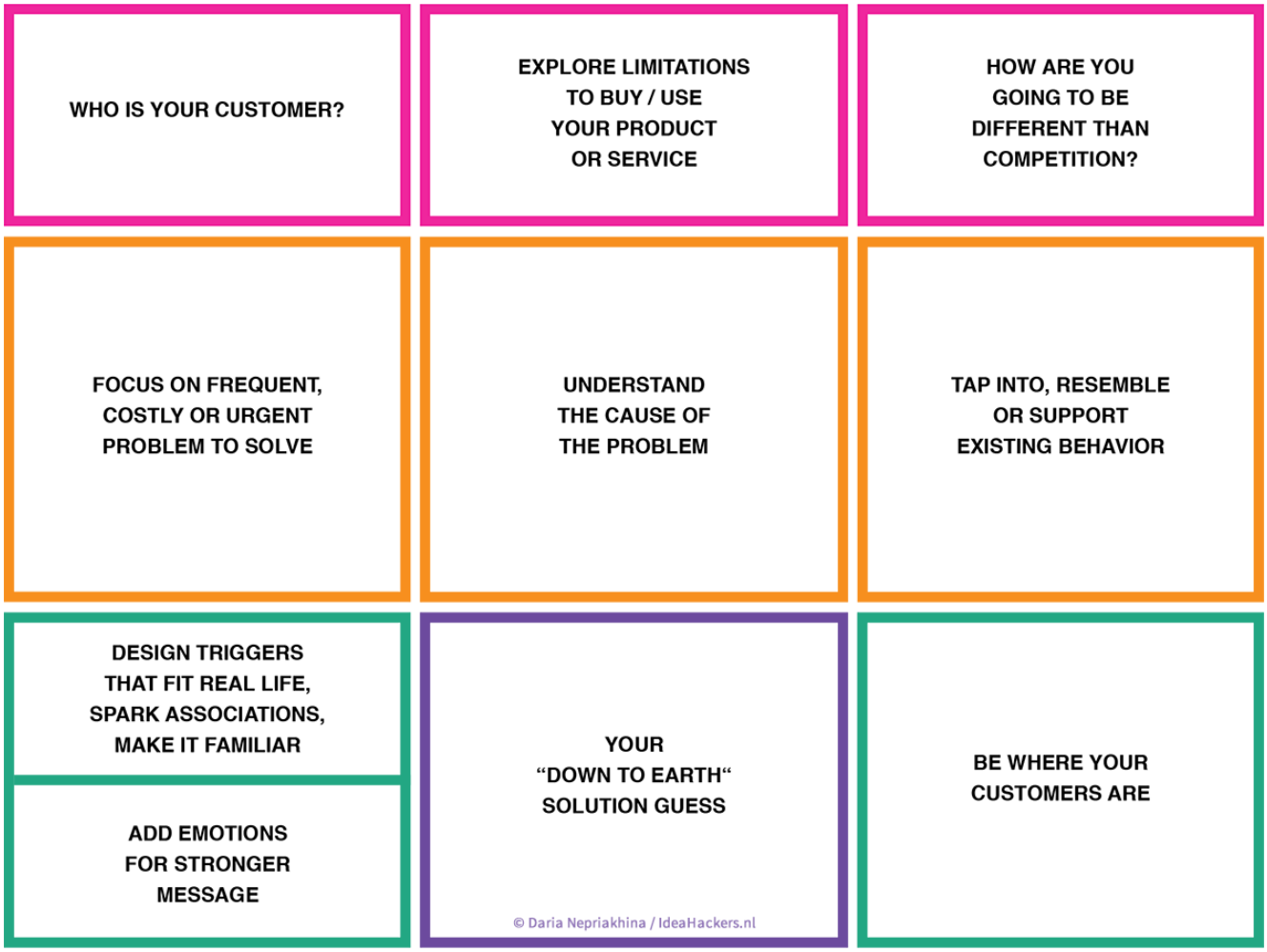
Brainstorming is one of the primary methods employed during the ideation stage of a typical design thinking process. Brainstorming is a greate way to generate many ideas byleveraging the collective thinking of the group, engaging with each other, listening, a building on other idea. Ideation is often closely related to the practice of brainstorming a specific technique that is utilize to generate new ideas. A principles different between ideation and brainstorming is that ideation is commonly more thought of as being and individual pursuit while brainstorming is almost always a group activity. Ideation these three stages generation, selection and development. Brainstorming is a strategies is used to generate a number of ideas to help solve ea particular problem. The technique has been around for over 70 years and still used today to engage student in solving a range of problems. Techniques vary but there is a general structure to follow when developing brainstorming session.

3.3PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	As the world grows more fitness-conscious with passing time, the demand for technological solutions to cater to this burgeoning demand is diversifying. Lately, a number of startups in India and worldwide are using predictive analytics artificial intelligence and natural language processing to help scores of fitness enthusiasts to track and monitor their nutrition and calorie intake.
2.	Idea / Solution description	AI-based diet planning programs would rely on machine learning and data analytics to create meal plans for your specific digestive system. AI would analyze the user's metabolism and digestive system to create an ideal meal plan for their needs.
3.	Novelty / Uniqueness	Whether these A.I. nutritionists are ready for widespread use is still unclear, and there is very little research available from sources outside the companies selling apps. Users should be wary of overly broad claims that go beyond predicting how foods affect blood sugar.
4.	Social Impact	Minimizing human effort, AI empowers community managers to nurture new users and promote engagement. The fuel that ignites community activity in combination with AI is real-time data.
5.	Business Model (Revenue Model)	This means that the popularity of on-demand health and fitness apps like Healthify Me is steadily growing and it's a good time for any entrepreneur to jointhis growing sector.

Nutrition education provides provides people with correct information on the nutritional value of foods, food quality and safety, methods of preservation, processing and handling, food preparation and eating to help them make the best choice of foods for an adequate diet. The promotion of household and community food, gardens and the use of nutrient dense crops with low levels of water use. The prevent malnutrition is to eat a healthy balance diet. Try not to miss or skip meals and aim to eat three small meals a day and two to three snacks a day if your appetite is poor take for drinks after your meal, not before are during as that can fill you up. It provide vita nutrients for survival and help the body function and stay healthy. Food is comprised of macronutrients including protein carbohydrate and fat that not only offer calories to duel the body and give it energy but play specific roles in maintaining health.

3.4PROBLEM SOLUTION FIT



Problem solution fit simply means that you have found a problem with your customer and that the solution you have realized for its actually solves the customer's problem. This occurs when you have evidences that customer care about certain jobs, pains and gains. Achieving a problem solution fit is us rare and difficult as plant alignment due have to be able to align at least three big plants, namely a valuable customer segment, their underserved needs and your value proposition. The Problem-Solution Fit canvas is based on the principles of Lean Startup, LUM (Lazy User Model) and User Experience design. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why. It is a template to help identify solutions with higher chances of solution adoption, reduce time spent on testing and get a better overview of the current situation.

4. REQUIREMENT ANALYSIS

4.1FUNCTIONAL REQUIREMENT

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR – 1	Authentication	Email Id or Username Password
FR – 2	Confirmation of authentication	Confirmation via Email Confirmation via OTP
FR – 3	Authorization levels	User Administrator
FR – 4	External Interfaces	Protein Fats Vitamin s Dietary Fiber Minerals
FR – 5	Demo	Video Pictures
FR – 6	Reservation	No. of adults No. of children Time period Functional foods are foods that offer health benefits beyond their nutritional value.
FR – 7	Payment	Credit card UPI payment QR scan
FR – 8	Feedback	Feedback through form

Functional requirements are product features or functions that developers must implement to enable users to accomplish their tasks. So, it's important to make them clear both for the development team and the stakeholders. Generally, functional requirements describe system behavior under specific conditions .Functional requirements are the desired operations of a program, or system as defined in software development and systems engineering. The systems in systems engineering can be either software electronic hardware or combination software-driven electronics. The amount of each nutrient needed in the human body is called the nutritional requirement. These are different for each nutrient and also vary between individuals and life stages .

4.2 NON-FUNCTIONAL REQUIREMENTS

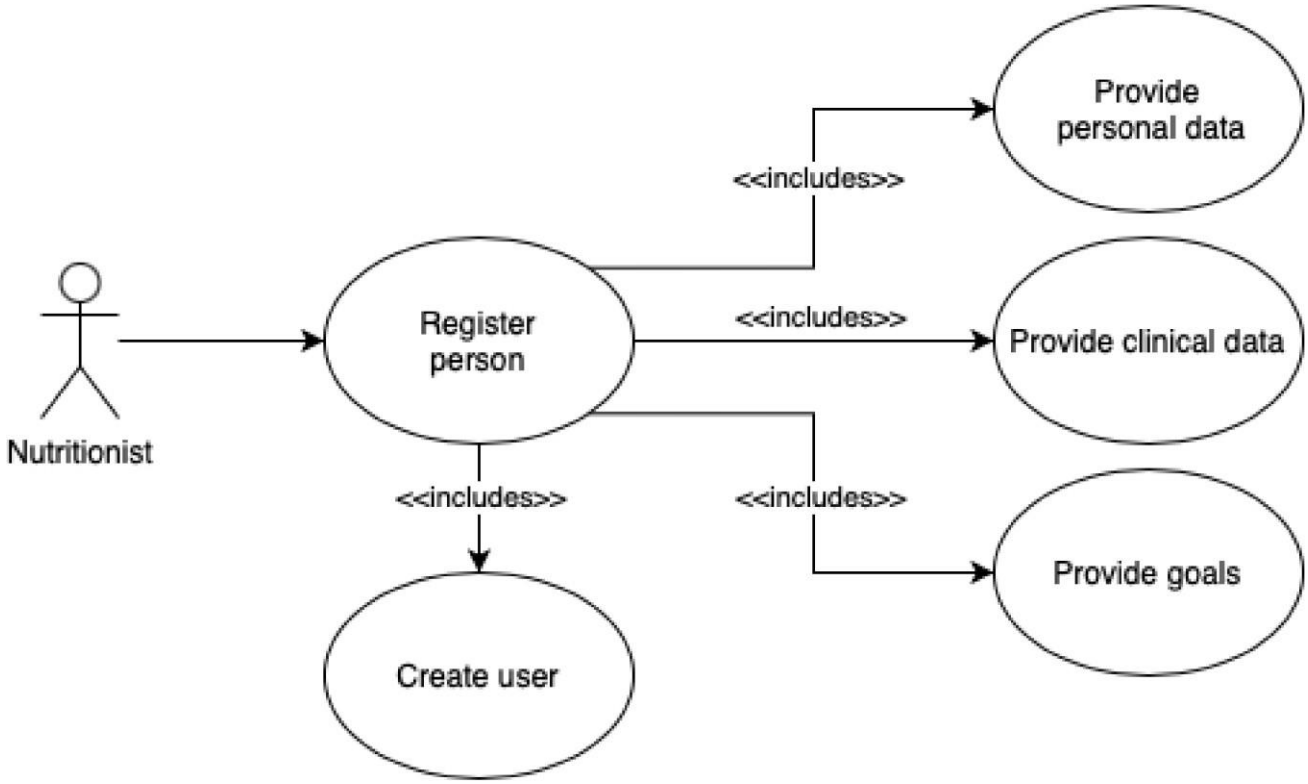
NFR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Nutrition is a critical part of health and development.
NFR-2	**Security**	Is the consistent access, availability and affordability of foods and beverages that promote well-being and prevent disease.
NFR-3	**Reliability**	Nutrition studies often use inaccurate methodology and suffer from self-recall bias.
NFR-4	**Performance**	Nutrition can help enhance athletic performance. An active lifestyle and exercise routine, along with eating well, is the best way to stay healthy.
NFR-5	**Availability**	Nutrient availability as the name suggests, is the available source of nutrients for plant growth and sufficient quantities of food, appropriate quality, supplied through the domestic production or imports, including food aid.

Non-Functional Requirement (NFR) specifies the quality attribute of a software system. They judge the software system based on Responsiveness, Usability, Security, Portability and other non-functional standards that are critical to the success of the software system. Example of non functional requirement, Failing to meet non-functional requirements can result in systems that fail to satisfy user needs. Non Functional requirements in Software Engineering allows you to impose constraints or restrictions on the design of the system across the various agile backlogs. Example, the site should load in 3 seconds when the number of simultaneous users are > 10000. Description of non-functional requirements is just as critical as a functional requirement. Hereare eight examples of non functional requirements and their significance to applicatIions:

- Security. ...
- Portability. ...
- Compatibility. ...
- Capacity. ...
- Reliability. ...
- Environment. ...
- Localization

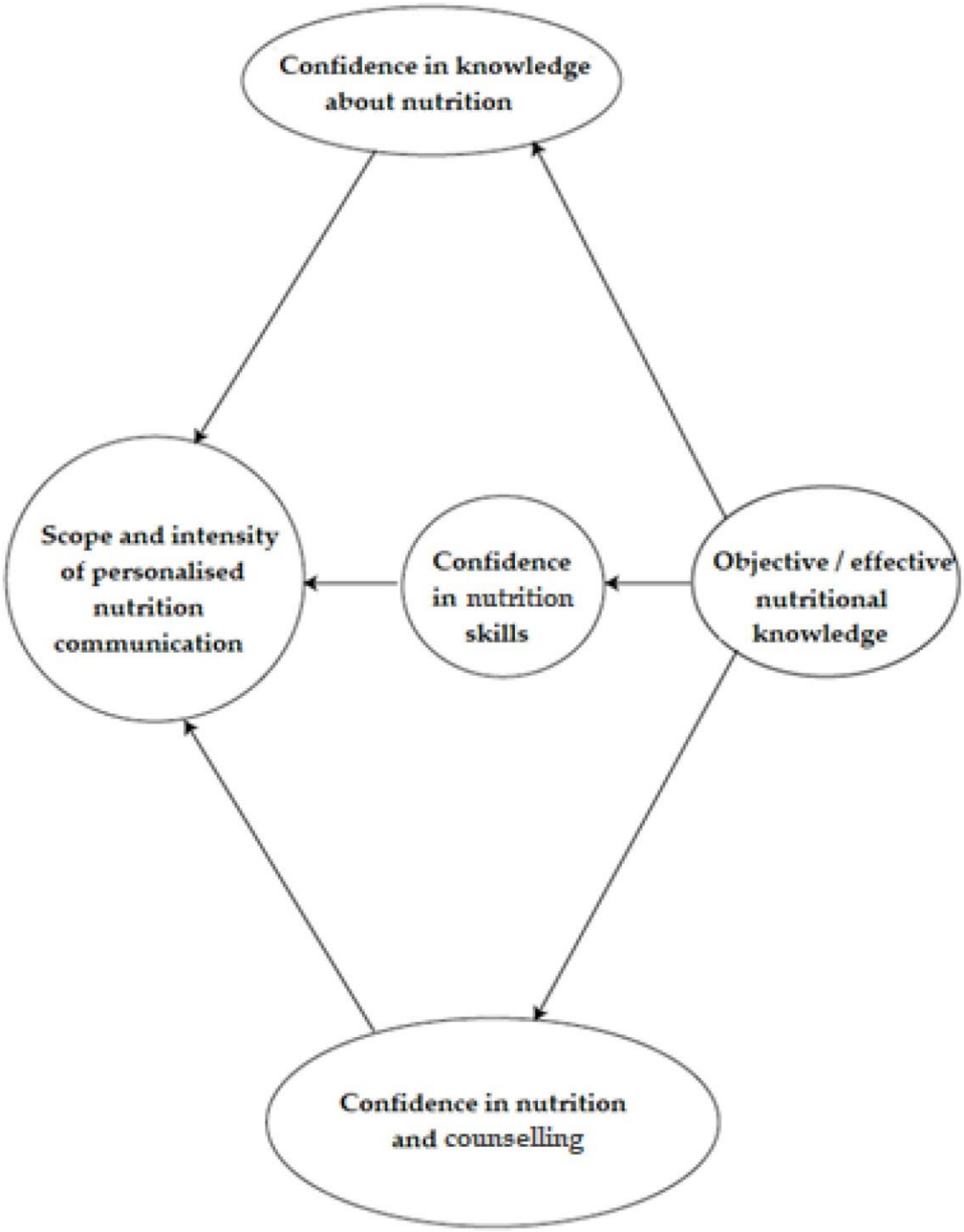
5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAM



A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination. Data flowcharts can range from simple, even hand-drawn process overviews, to in-depth, multi-level DFDs that dig progressively deeper into how the data is handled. They can be used to analyze an existing system or model a new one. Like all the best diagrams and charts, a DFD can often visually "say" things that would be hard to explain in words, and they work for both technical and nontechnical audiences, from developer to CEO. That's why DFDs remain so popular after all these years. While they work well for data flow software and systems, they are less applicable nowadays to visualizing interactive, real-time or database-oriented software

5.2 Solution & Technical Architecture



Technical Architecture (TA) is a form of IT architecture that is used to design computer systems. It involves the development of a technical blueprint with regard to the arrangement, interaction, and interdependence of all elements so that system-relevant requirements are met. The role of Technical architect are systems .

They are responsible for designing the structure of new technology systems, overseeing the implementation of programs, and liaising with the software development team. A solutions architect creates the overall technical vision for a specific solution to a business problem. A solutions architect creates the overall technical vision for a specific solution to a business problem. They design, describe, and manage the solution.

5.3 USER STORIES

For development teams new to agile, user stories sometimes seem like an added step. Why not just break the big project into a series ofsteps and get on with it? But stories give the team important context and associate tasks with the value those tasks bring. User stories serve a number of key benefits:

- **Stories keep the focus on the user.** A to-do list keeps the team focused on task that need to be checked off, but a collection of stories keeps the team focused on solving problems for real users.
- **Stories enable collaboration.** With the end goal defined, the team can work together to decide how best to serve the user and meet that goal.
- **Stories drive creative solutions.** Stories encourage the team to think critically and creatively about how to best solve for an end goal.
- **Stories create momentum.** With each passing story, the development team enjoys a small challenge and a small win, driving momentum.

6.PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING &ESTIMATION

The definition of a sprint is a dedicated period of time in which a set amount of work will be completed on a project. It's part of the agile methodology, and an Agile project will be broken down into a number of sprints, each sprint taking the project closer to completion.

In case you're unfamiliar, a sprint schedule is a document that outlines sprint planning from end to end. It's one of the first steps in the agile sprint planning process—and something that requires adequate research, planning, and communication.

In short, project estimation is a complex process that revolved around predicting the time, cost, and scope that a project requires to be deemed finished. But in terms of software development or software engineering, it also takes the experience of the software development company, the technique they have to utilize, the process they need to follow in order to finish the project (Software Development Life Cycle). Project Estimation requires the use of complex tools & good mathematical as well as knowledge about planning.

In most cases, the whole estimation process would cost the company rather considerable cost &time at the very first stage of developing a brand new website, app, or software. However, this will act as the stepping stone to make the final result more credible, realistic, and customer- satisfying.

6.3 SPRINT DELIVERY SCHEDULE

A sprint is a short, time-boxed period when a scrum team works to complete a set amount of work. Sprints are at the very heart of scrum and agile methodologies, and getting sprints right will help your agile team ship better software with fewer headaches

Sprint	Functional Requirement(Epic)	User Story Number	User Story/Task	Story point	Priority	Team Members
Sprint-1	Registration	USN-2	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Madhumitha.P
Sprint-1		USN-2	As a user, I will receive confirmation email once I have register for the Application	1	High	Abhinaya Shri.S
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	Low	Iswarya.P
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	Maharani.M
Sprint-1	Login	USN-5	As a user, I can log into the applicationby entering email & Password	1	High	Madhumitha.P

7.CODING & SOLUTIONING

7.1 FEATURE 1

```
    Import stream lit as
from PIL import Image
  from keras.preprocessing.image import load_img,img_to_array
  import numpy as np
  from keras.models import load_model
  import requests
  from bs4 import BeautifulSoup

  model = load_model('FV.h5')
  labels = {0: 'apple', 1: 'banana', 2: 'beetroot', 3: 'bell pepper', 4: 'cabbage', 5:
      'capsicum', 6: 'carrot', 7: 'cauliflower', 8: 'chilli pepper', 9: 'corn', 10:
      'cucumber', 11: 'eggplant', 12: 'garlic', 13: 'ginger', 14: 'grapes', 15: 'jalepeno',
      16: 'kiwi', 17: 'lemon', 18: 'lettuce',
          19: 'mango', 20: 'onion', 21: 'orange', 22: 'paprika', 23: 'pear', 24: 'peas', 25:
      'pineapple', 26: 'pomegranate', 27: 'potato', 28: 'raddish', 29: 'soy beans', 30:
      'spinach', 31: 'sweetcorn', 32: 'sweetpotato', 33: 'tomato', 34: 'turnip', 35:
      'watermelon'}

  fruits = ['Apple','Banana','Bello Pepper','Chilli
      Pepper','Grapes','Jalepeno','Kiwi','Lemon','Mango','Orange','Paprika','Pear','Pin
      eapple','Pomegranate','Watermelon']
  vegetables =
      ['Beetroot','Cabbage','Capsicum','Carrot','Cauliflower','Corn','Cucumber','Eggp
      lant','Ginger','Lettuce','Onion','Peas','Potato','Raddish','Soy
      Beans','Spinach','Sweetcorn','Sweetpotato','Tomato','Turnip']

  def fetch_calories(prediction):
      try:
          url = 'https://www.google.com/search?&q=calories in ' + prediction
```

```
        req = requests.get(url).text
        scrap = BeautifulSoup(req, 'html.parser')
        calories = scrap.find("div", class_="BNeawe iBp4i AP7Wnd").text
        return calories
    except Exception as e:
        st.error("Can't able to fetch the Calories")
            print(e)
```

Coding Solutions is a highly competitive job accelerator and talent refinement program that recruits and transitions college graduates with past programming experience or technical degrees into professional careers with Alabama companies and organizationsat no cost to the graduated

7.2 FEATURE 2

```
Defprocessed_img(img_path):
    img=load_img(img_path,target_size=(224,224,3))
    img=img_to_array(img)
    img=img/255
    img=np.expand_dims(img,[0])
    answer=model.predict(img)
    y_class = answer.argmax(axis=-1)
    print(y_class)
    y = " ".join(str(x) for x in y_class)
    y = int(y)
    res = labels[y]
    print(res)
    return res.capitalize()
```

A software solution is typically custom-built or configured to solve a specific customer problem. It could include: Custom software development. Customized Assembly of multiple software products. Custom implementation of existing software platforms or products.

7.3 DATABASE SCHEMA

When it comes to choosing your database, one of the things you have to think about is the shape of your data, what model it will follow, and how the relationships formed will help us as we develop a schema.

A database schema is a blueprint or architecture of how our data will look. It doesn't hold data itself, but instead describes the shape of the data and how it might relate too there tables or models. An entry in our database will be an instance of the database schema. It will contain all of the properties described in the schema.

Think of a database schema as a type of data structure. It represents the framework and arrangement of the contents of an organization's data.

A database schema will include:

- All important or relevant data
- Consistent formatting for all data entries
- Unique keys for all entries and database objects
- Each column in a table has a name and data type

The size and complexity of your database schema depends on the size of your project. The visual style of a database schema allows programmers to structure the database and its relationships properly before jumping into the code. The process of planning a database design is called data modeling.

Schemas are important for designing database management systems (DBMS) or relational database management systems (RDBMS). A DBMS isa software that stores and retrieves user data in a secure way that follows the ACID concept.

In many companies, database design and DBMS responsibilities usually fall to the role of the Database Administrator (DBA**)**. DBAs are responsible for ensuring that data analysts and database users can easily access information.

They work alongside management(DBMS) or relational database management systems (RDBMS). A DBMS is a software that storesand retrieves user data in a secure way that follows the ACID concept.

In many companies, database design and DBMS responsibilities usually fall to the role of the Database Administrator (DBA**)**. DBAs are responsible for ensuring that data analysts and database users can easily access information. They work alongside management

8.TESTING

8.1 TEST CASES

Test Case is a set of actions executed to verify a particular feature or functionality of your software application. A Test Case contains test steps, test data, precondition, post condition developed for specific test scenario to verify any requirement. The test case includes specific variables or conditions, using which a testing engineer can compare expected and actual results to determine whether a software product is functioning as per the requirements of the customer.

A test case is a set of actions performed on a system to determine if itsatisfies software requirements and functions correctly.

The components of a test case include:

- Test ID
- Test Name
- Objective
- Reference
- Test setup
- Test steps
- Excepted Result

USER ACCCEPTIG TEST

What is user acceptance testing (UAT)? User acceptance testing (UAT), also called application testing or end-user testing, is a phase of software development in which the software is tested in the real world by its intended audience. User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing is done.

BLACK BOX TESTING

Black box testing assess a system solely from the outside , without the operator or tester knowing what is happening with in the system to responses to test action. Black box testing is the software testing and the methodology analyses functionality of an application without the through knowledge of internal design.

WHITE BOX TESTING

White box testing is an approach that allow stester to inspect and Verify the inner working of software system. The developer will do the white Box testing , and they will test all the programs line by line of code to find the Bug. If they found any bug in any one of the programs, they will correct it.

9.RESULT

9.1PERFORMANCE MATRICES

Metrics are a baseline for the tests. They help to track the progress of a project. Using metrics, a QA team becomes able to define an issue and measure it for finding a solution. Tracking metrics over time allows you to compare the results of tests and estimate the impact of code changes.

10.ADVANTAGES

- Reduction in human error
- Zero risks
- 24*7 availability
- Digital Assistance
- New invention
- Unbiased Decision
- Perform Reptetitive Jobs
- Daily Applications

DISADVANTAGES

- High costs
- No Creativity
- Make human lazy
- No ethics
- Emotionless
- No improvement

11.CONCLUSION

Good nutrients promotes not only better physical health and reduce suscepitibility to disease, but has also been demonstrate to contribute to cognitive development and academic success. Left to their own devices, children will not automatically select healthy food. AI holds the key to unlocking a magnificiant future where, driven by data and computer that understand not just hope to turn on the switches but why the switches but why the switches need to be turned on.

12.FUTURE SCOPE

The goal is to create computer intelligence programme that can handle real-time problems and help organization and everyday people achieve their goals. Machine games, speech recognition, language detection, computer vision, expert systems, robotics, and other field have potential. *Food & Nutrition Research* is a peer-reviewed journal that presents the latest scientific research in various fields focusing on human nutrition. The journal publishes both quantitative and qualitative research papers. Through an Open Access publishing model, *Food & Nutrition Research* opens an important forum for researchers from academic and private arenas to exchange the latest results from research on human nutrition in a broad sense, both original papers and reviews, including:

- Associations and effects of foods and nutrients on health
- Dietary patterns and health
- Molecular nutrition
- Health claims on foods
- Nutrition and cognitive functions
- Nutritional effects of food composition and processing
- Nutrition in developing countries
- Animal and *in vitro* models with clear relevance for human nutrition
- Nutrition and the Environment
- Food and Nutrition Education
- Nutrition and Economic

13.APPENDIX

SOURCE CODE:

```
import streamlit as st
from PIL import Image
from keras.preprocessing.image import load_img,img_to_array
import numpy as np
from keras.models import load_model
import requests
from bs4 import BeautifulSoup

model = load_model('FV.h5')
labels = {0: 'apple', 1: 'banana', 2: 'beetroot', 3: 'bell pepper', 4: 'cabbage', 5: 'capsicum', 6: 'carrot', 7: 'cauliflower', 8: 'chilli
pepper', 9: 'corn', 10: 'cucumber', 11: 'eggplant', 12: 'garlic', 13: 'ginger', 14: 'grapes', 15: 'jalepeno', 16: 'kiwi', 17: 'lemon',
18: 'lettuce',
         19: 'mango', 20: 'onion', 21: 'orange', 22: 'paprika', 23: 'pear', 24: 'peas', 25: 'pineapple', 26: 'pomegranate', 27:
'potato', 28: 'raddish', 29: 'soy beans', 30: 'spinach', 31: 'sweetcorn', 32: 'sweetpotato', 33: 'tomato', 34: 'turnip', 35:
'watermelon'}

fruits = ['Apple','Banana','Bello Pepper','Chilli
Pepper','Grapes','Jalepeno','Kiwi','Lemon','Mango','Orange','Paprika','Pear','Pineapple','Pomegranate','Watermelon']
vegetables =
['Beetroot','Cabbage','Capsicum','Carrot','Cauliflower','Corn','Cucumber','Eggplant','Ginger','Lettuce','Onion','Peas','Potato'
,'Raddish','Soy Beans','Spinach','Sweetcorn','Sweetpotato','Tomato','Turnip']

def fetch_calories(prediction):
    try:
        url = 'https://www.google.com/search?&q=calories in ' + prediction
        req = requests.get(url).text
        scrap = BeautifulSoup(req, 'html.parser')
        calories = scrap.find("div", class_="BNeawe iBp4i AP7Wnd").text
        return calories
    except Exception as e:
        st.error("Can't able to fetch the Calories")
        print(e)

def processed_img(img_path):
    img=load_img(img_path,target_size=(224,224,3))
    img=img_to_array(img)
    img=img/255
    img=np.expand_dims(img,[0])
    answer=model.predict(img)
    y_class = answer.argmax(axis=-1)
    print(y_class)
    y = " ".join(str(x) for x in y_class)
    y = int(y)
    res = labels[y]
    print(res)
    return res.capitalize()

def run():
    st.title("Fruits□-Vegetable□ Classification")
    img_file = st.file_uploader("Choose an Image", type=["jpg", "png"])
    if img_file is not None:
        img = Image.open(img_file).resize((250,250))
        st.image(img,use_column_width=False)
        save_image_path = './upload_images/'+img_file.name
        with open(save_image_path, "wb") as f:
            f.write(img_file.getbuffer())
```

```
        # if st.button("Predict"):
        if img_file is not None:
            result= processed_img(save_image_path)
            print(result)
            if result in vegetables:
                st.info('**Category : Vegetables**')
            else:
                st.info('**Category : Fruit**')
            st.success("**Predicted : "+result+'**')
            cal = fetch_calories(result)
            if cal:
                st.warning('**'+cal+'(100 grams)**')
run()
```