NutriBABA

NUTRIENT ASSISTANT APPLICATION

1. INTRODUCTION

1.1 OVERVIEW

Maintaining a healthy diet is a key for normal growth and proper functioning of the human body. But sometimes it becomes very tiresome to check all nutrients present in the food and then eat. To ease things, VMware came up with an idea to develop a web application which can do this job with a few clicks. NutriBABA is a nutrition assistant which provides nutritional information about the food in seconds.

It identifies all the nutrients present in the food with just a photograph of the food item and all that the user needs to do is logging in and uploading a picture of the food to get the food nutrient list. NutriBABA can also evaluate the BMI value of a person.

1.2 PURPOSE

The purpose of developing this web application is to assist people to know the nutrient contents of their food servings with ease. This could help them know what they are eating and make necessary alterations in their diet, which will only boost their immunity and overall health.

Having a good immune system has become very important in this pandemic. Everyone must take some serious steps in building up their immunity, healthy diet plays a major role in it.

2. SYSTEM ANALYSIS

2.1 PRODUCT PERSPECTIVE

NutriBABA is a nutrition assistant web application which

- Takes a picture of the food as input and provides all the nutrient contents of that food item.(requires user login, to give them a better experience)
- Gives a graphical representation of the food nutrient contents which a human brain can easily percept rather than just textual representation which must be read throughout.
- Can also calculate the Body Mass Index (BMI) of a person instantly by taking the height (in Feets and Inches) and weight (in Kilograms) of a person.
- Spreads awareness about Nutrition and why it is important and also gives an overview on BMI i.e, What is BMI ? and why maintaining normal BMI value is crucial.

2.2 PRODUCT FUNCTIONS

The major function of this Nutrient assistant web application is to provide the list of all nutrients present in the food item and present it in a way that a human brain can easily understand what nutrients are present in what amounts easily.

2.3 USER CHARACTERISTICS

- Users must be able to navigate through the web application and register for an account.
- Users must be able to login before using any feature.
- Users must be able to upload a picture of the food to get the nutrient list.

2.4 OPERATING ENVIRONMENT

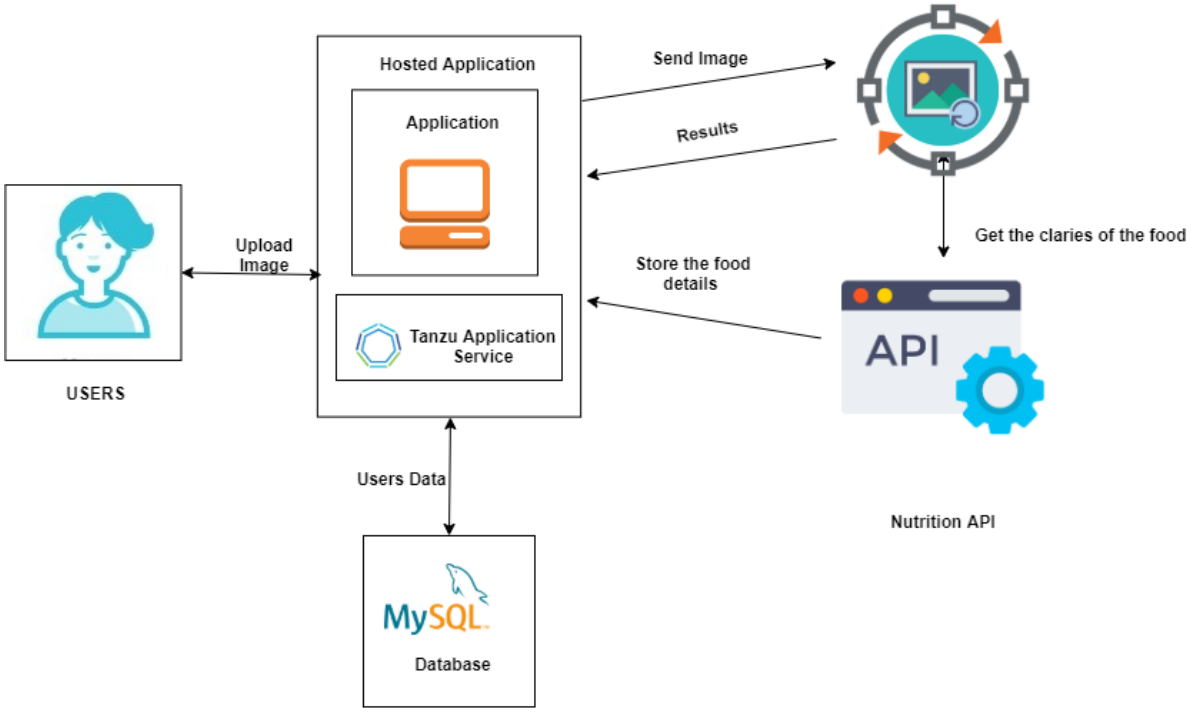
Operating environment for this web application is as listed below.

- This web application is containerized with docker, all the requirements are packed in this container. Docker is needed to run the image of this container.
- Remotemysql is used as the database for this web application which is hosted remotely.
- Platform : Python and jinja2.

2.5 DESIGN AND IMPLEMENTATION CONSTRAINTS

- User registers for an account and login.
- NutriBABA saves the user's data into the Database.
- User uploads the image to this web application which is hosted on VMware Tanzu Application Service
- This web application uses an api provided by IBM Watson IBM Watson™ Visual Recognition to recognize food items .
- It uses another api by the U.S. DEPARTMENT OF AGRICULTURE named FoodData Central to fetch the nutritional contents of the recognized food item.
- The fetched details are displayed on the screen in both graphical and textual representations.

2.6 PROPOSED ARCHITECTURE



3. SOFTWARE AND HARDWARE REQUIREMENTS

3.1 SOFTWARE REQUIREMENTS :

- Operating system : Windows / linux with Docker installed.
- Database : RemoteMySQL database
- Hosting: Tanzu Application Service
- A browser through which the web application could be accessed.
- Interactive Support : Python Flask , jinja2 and JavaScript are used for interactive support.
- Cloud Foundry

3.2 HARDWARE REQUIREMENT :

- Operating system : Windows/linux
- Processor : 1.4 GHz x64 processor

- 4 GB RAM
- 250 GB SSD

4. FUNCTIONAL REQUIREMENTS

4.1 FOOD ITEM RECOGNITION

- Users are able to upload pictures of food items without any difficulties and get results faster.
- The web application should efficiently recognize the food item using the Visual recognition api.

4.2 PROVIDE THE NUTRIENT LIST

NutriBABA provides the nutrient list of a food item in just a few seconds using the FoodData Central api which takes the name of the food item and returns a list of all nutrients present in it.
The data is both represented in graphical and textual representations for a better perception by us humans.

5. NON-FUNCTIONAL REQUIREMENTS

5.1 PERFORMANCE REQUIREMENTS

- RESPONSE TIME:
    - This web application loads within 1-2 seconds, when first loaded and loads within a second when refreshed.
    - Displaying the nutrient list takes 3-4 seconds when a photo is successfully uploaded as the web app uses two APIs and then sorts the list to display along with a pie chart.
    - Calculation of BMI value is done within a fraction of seconds.

- OPTIMIZATION :
    - To decrease the loading time of the web application all the images were compressed.
    - Optimization of JavaScripts was done very keenly.

5.2 SECURITY REQUIREMENTS

- Authentication :

  The user can only access the features of this web application after successful authentication through logging in.

- Encryption :

The passwords are hashed before being saved into the database with MD5 hashing methods.

5.3 SOFTWARE QUALITY ATTRIBUTES

- **EASE OF USE :**
  - Users only have to upload a photo to get all the nutritional content about the food item instantly.
  - A step by step process of doing that is also shown for users ease.

- **FLEXIBILITY :**
  - Containerizing a web application makes it very flexible as one has to no longer worry about the prerequisites to run this application on their machine. All that is required is having Docker installed to run the containerized applications.

- **CORRECTNESS :**
  - The nutrient list and their values are being fetched from a very official site U.S Department of Agriculture, the amount present in the food item specified by their api are totally correct and accurate.
  - While calculating the BMI value of users , measures have been taken to provide accurate results.

6. CONCLUSION

‘HEALTH IS WEALTH’, it is the one thing without which you can’t enjoy your life to the fullest. Healthy eating habits play a key role in maintaining good health alongside exercising. Everyone must adapt to a healthy diet. NutriBABA provides users with the nutrient list of food within seconds, using which he/she can make better decisions for a healthy living.

Always be very conscious about what you eat and keep your BMI value in check with the help of NutriBABA, your Nutrition Assistant.

7. FUTURE SCOPE

Keeping track of all the food items consumed in a day can give overall information about the daily calorie intake. This could give valuable insights about the current dietary plan of the user and enable him/her to make necessary changes in it.

Likewise if measuring can be done on a daily basis, we could gather more data on eating habits of users. Using which, data analytics can be applied to know whether the user needs to change his/her dietary plan or not. This could detect and avoid many health related problems and enable the users to experience healthy life.

8. APPENDIX

Source code :
https://github.com/smartinternz02/SPS-9937-Nutrition-Assistant-Application

Walkthrough video link:
https://drive.google.com/file/d/1cfhaeK2PiFyWQVdQFCe3XuWNGZYIw_wV/view?usp=sharing