

A Personalized System to Recommend a Healthy Diet Based on an Individual's Unique Dietary Needs and Goals

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Many people are struggling with their dietary habits, especially those who have health issues. Often, individuals with health problems consume inappropriate foods in improper amounts, which can be harmful to their well-being. Creating a mobile application that provides personalized diet plans based on an individual's health condition could be highly advantageous. The National Family Health Survey (NFHS-4) 2015-16 conducted by the health ministry indicates that more than half of all Indians, particularly women, have an imbalanced diet that lacks essential nutrients such as fresh fruits, green vegetables, pulses, meat, and dairy products, which are crucial for maintaining good health. Shockingly, the survey found that only 47% of women consume leafy, dark green vegetables on a daily basis, while 38% consume them just once a week.

Keywords: Headify, Credentials, Ecosystem, Protocol, Database

1 Introduction

Headify is a comprehensive mobile application that offers personalized diet plans based on the user's health conditions, food preferences, and cuisine. In today's fast-paced lifestyle, people have limited time and patience to determine what to consume to maintain a healthy lifestyle. This app simplifies the process by providing a detailed list of recommended foods that the user can consume. The app presents the recommended diet plan in a detailed section list that includes carbohydrates, proteins, fats, and more. Each section includes a list of dos and don'ts to help the user make informed decisions about their food choices. As people increasingly prioritize their health, this app is a valuable tool to help them achieve their dietary goals [1].

2 Literature Survey

This research project aims to create a mobile application that enables users to plan and track their food consumption on the go. The system facilitates users in managing their dietary habits by allowing them to log their food intake history, select foods that align with their health goals and discover their favorite restaurants [2]. The study utilizes various methodologies, including analysis, design, and literature review, to develop a comprehensive food planning mobile application for the Android platform. The end product is a user-friendly app that helps users to manage and track their food consumption, as well as calculate and choose balanced foods that are suitable for their bodies [3].

Maintaining a well-balanced diet that includes sufficient quantities of proteins, minerals, fats, vitamins, and carbohydrates is vital for good health. Unfortunately, poor eating habits have resulted in the development of various diseases, such as diabetes and hypertension, in many individuals. Shockingly, one in six people with diabetes globally are from India. According to global rankings in 2019, India ranks 156th and 164th for hypertension prevalence among men and women, respectively. In the same year, the prevalence of hypertension was 31.6% among men and 30.5% among women. It is alarming to note that nearly 31% of individuals between the ages of 30 and 79 in India have hypertension, as of 2019.[4].

People who are afflicted with diabetes and hypertension must take particular care to regulate their diets. However, it can be challenging to find reliable and accurate information on the internet. To address this issue, we developed Headify, a mobile application that offers personalized diet plans to help users manage these health conditions more effectively [13].

Headify is an innovative mobile application that caters to the individual dietary needs of users. It utilizes the user's weight, height, and health conditions, as well as their dietary preferences (Vegetarian or Non-Vegetarian) to create a customized diet plan [14]. The app provides detailed information on the number of carbohydrates, proteins, fat, and other essential nutrients, along with descriptions of recommended food items like rice, bread, chicken, and much more. The app also provides specific details on the amount of each recommended food item that the user should consume to meet their dietary requirements [15].

3 Existing System

The existing app which is similar to our app is MyFitnessPal Review

Inconsistent Updating: MyFitnessPal offers a convenient method for individuals to monitor their food intake and record nutritional data by scanning the barcodes of food items. However, this feature has some limitations, as the scanner may not always recognize the product, and the database must be frequently updated. Additionally, the program does not permit users to modify certain aspects of consumed food. For instance, if a user drinks less than 8 oz. of wine, they cannot adjust the record to

reflect the exact amount consumed. This lack of flexibility can be bothersome for some users who want to track their food intake accurately [8].

Mobile Dependability: Although MyFitnessPal provides a convenient way to track food intake on the go, it does have a limitation that requires a wireless signal. If a user is in an area without a wireless signal, it may not be possible to access the app and record anything in the diary. This limitation can be problematic for users who frequently travel or find themselves in areas with poor wireless signal strength. It can result in incomplete or inaccurate tracking of food intake, which can impact the effectiveness of the app in helping users achieve their health and fitness goals [9].

Health Drawback: While counting calories can be a useful tool in achieving weight loss and health goals, some argue that it is not necessarily the best or healthiest approach. While a calorie is a calorie in terms of basic science, there are other factors to consider when making food choices.

Various types of food can have different effects on the body, with some producing hormonal responses that can result in fat storage, sugar release, or muscle growth. Diets with equal caloric intake but differing amounts of fat, protein, and carbohydrates may have vastly different satiety effects.

As a result, it is crucial to consider factors beyond just calories when creating a proper eating plan. While counting calories may seem like a straightforward method, it is essential to take into account the nutritional value and other benefits that various types of food can offer[10].

Moreover, calorie counting can have a detrimental impact on a person's mental health, especially when taken to an extreme. It can lead to fixation and obsession with food choices, which can be especially harmful to individuals with eating disorders.

4 System Architecture

System architecture refers to the overall design of a complex system, outlining its components, interactions, and organization to meet stakeholder needs. [5] An architecture description provides a clear understanding of a system's structure and behavior. For instance, a flowchart and description of Beep can aid in comprehending its architecture.

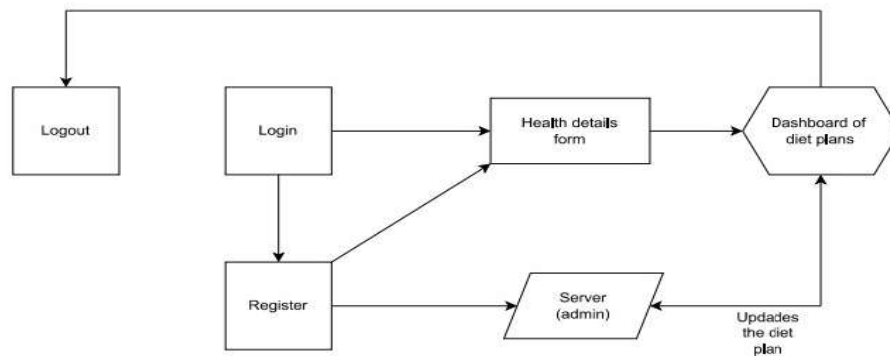


Figure 1. System Architecture

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When the user registers and logs in to the application, they are prompted to fill out a form that includes their preferred food options and health condition information. Based on this information, a personalized and detailed diet plan is generated and displayed to the user. The plan includes recommendations for what foods to consume and avoid.

5 Methodology

To access the Headify application, users must first complete the registration process.

During registration, users will need to provide their full name, email, and contact information. Once the user submits their registration form, the server will save the user's information in the database [16].

After registration, users can log in using their valid credentials to access the app. Upon successful login, users will be directed to a health details form where they can provide information such as their name, gender, age, height, weight, food habits, and allergies [11].

Once the form is completed, the user will be taken to their dashboard. The dashboard will display recommended diet plans based on the user's information, including details such as the number of carbohydrates, protein, and fat recommended, as well as descriptions of recommended foods like rice, bread, chicken, and more, along with suggested serving sizes [12].

6 Tools Description

To begin the implementation of our concept, we created a responsive prototype of the complete application using Figma, a web-based interface design software. [6] With this prototype as our guide, we began developing the application in Android Studio, an IDE for mobile application development. Our programming language of choice was Java. To manage all of our application's data, we utilized Firebase, a real-time NoSQL database hosting service that allows data to be synced and stored in real time.[7] Additionally, we used a combination of Git and GitHub for version and source control, enabling our development team to manage multiple versions of the project.

- IDE- Android Studio
- Programming language- JAVA
- Design & Prototyping- Figma
- Database- Firebase
- Version & Source control- GIT, GitHub

7 Hardware Design and Implementation

7.1 Use Case diagram

The user registers and logs into the application where he is asked to fill out the form of his preferred food listing and health conditions questions. Then according to that, a detailed diet plan is displayed to the user with what or what is not consumed.

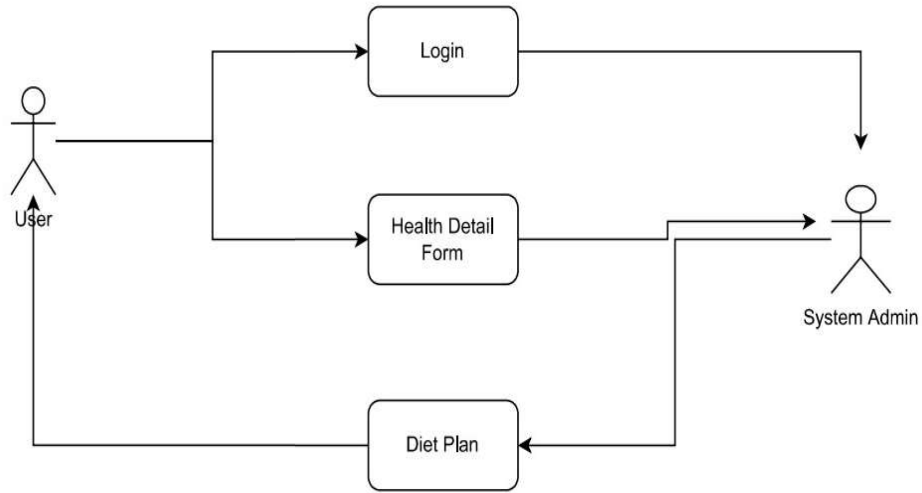


Figure 2. Use Case Diagram

7.2 Data flow diagram

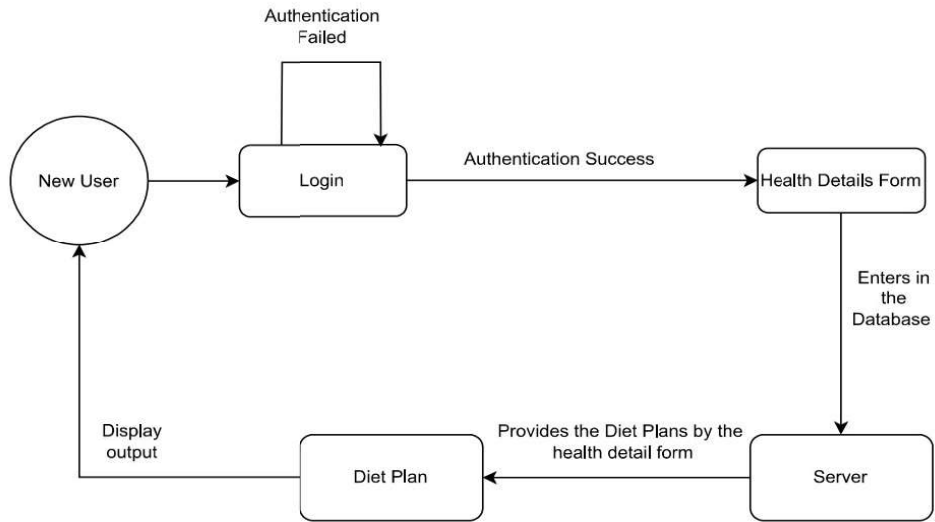


Figure 3. Data Flow Diagram

The user registers and logs in with an authentication check, after the success of authentication the health details form is displayed where the data received is entered into the data and an appropriate diet plan is designed and shown to the user.

7.3 Sequence Flow Diagram

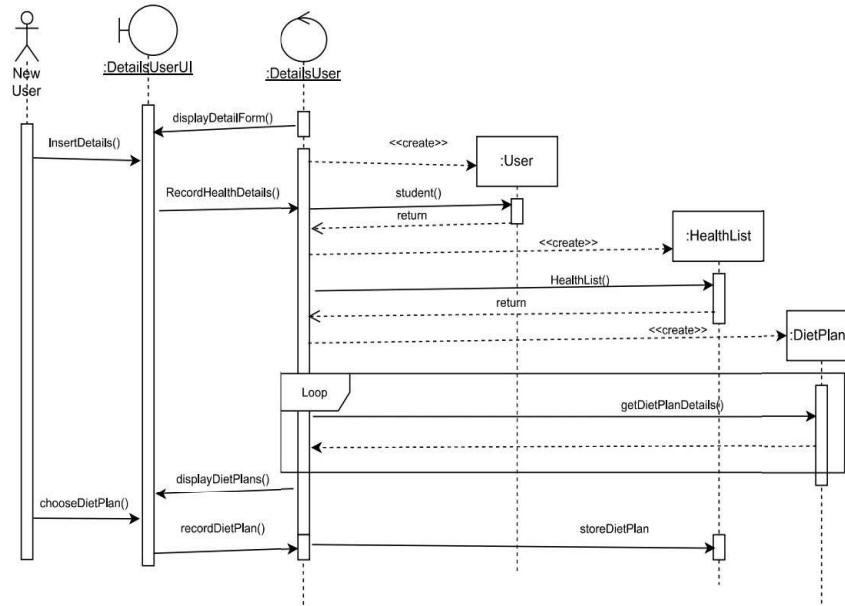


Figure 4. Sequence Flow Diagram

When the user registers and logs in with the authentication check, after the success of authentication the health details form is displayed where the data received is entered in the data and an appropriate diet plan is designed and shown to the user.

8 Conclusion

The My Food Assistant application can be a helpful tool for users to plan and track their diet history, make balanced food choices, and achieve their body's nutritional needs [17]. However, it should be noted that the nutritional information provided in the application may not be entirely accurate due to deviations from reference values. As such, the app can be used as a general orientation aid rather than a precise measurement tool [18].

The application can be a useful tool for self-monitoring, depending on the user's goals, despite its limitations. However, it is still unclear to what degree the application can help improve users' nutritional knowledge, eating habits, and body weight [19].

To ensure the effectiveness and accuracy of such applications, nutrition experts should be involved in the development process from the outset [20]. As digital nutrition communication continues to gain importance in the future, there is a critical need for the ongoing discussion and systematic research on the challenges involved in this field.

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