# Developing a Recommendation System for Personalized Nutrition Plan

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## ABSTRACT

There is a demand for customized nutrition plans as a result of the the realization that diet has a substantial impact on human health and well-being. To provide personalized dietary recommendations, these plans take into account a person's particular features, such as age, gender, body composition, lifestyle, and food preferences. The development of a recommendation system for customized nutrition plans is crucial to properly meet this demand and assist people in achieving their health goals.

The goal of this project is to create and implement a recommendation system that makes use of cutting-edge technologies to produce personalized nutrition plans. The suggested system takes a comprehensive approach, focusing largely on physical characteristics like weight, height, and body mass index while taking into account other factors that affect dietary requirements and preferences. To create individualized suggestions, it considers both personal health goals and general nutritional recommendations.

A comprehensive database that includes a wide range of food items, their nutritional values, and related health features is built in order to apply the recommendation system. The most recent scientific discoveries and dietary recommendations are reflected in this database, which is often updated.

Access to the system and instructions on how to follow the suggested nutrition plans are given to participants. The success of the system is evaluated through studying changes in the participants' blood markers, body composition, and subjective well-being.

An effective recommendation system that can create customized nutrition plans in line with a person's preferences and health goals will be the result of this research. A system like this could offer customized nutritional advice to a wide spectrum of people, transforming the area of nutrition. The ultimate goal of creating this recommendation system is to enable people to make intelligent food choices and enhance their overall well-being and health.

*Keyword:- Customized nutrition, personalized dietary recommendation, cutting-edge technologies, body-mass index, copyright.* 

## **1. INTRODUCTION**

At the time the study was done, neither the online nor the Play Store diet guidance applications offered information about BMI, ideal body weight, or the required calorie and macro-nutrient intake. The requirement for an application with all of this data gathered in a single area results from this. The objectives of this research are to design and create an Android application that recommends a diet and calculates BMI, ideal body weight, required calories, and macro-nutrient amounts. Additionally, this application can offer suitable food items with macro-nutrient amounts. The

project's scope includes calculating the BMI, ideal body weight, necessary calories, and macro-nutrient quantity within

the application itself. Appropriate food options with the relevant macro-nutrient amount will subsequently be displayed.

This paper is divided into various sections. The first section of the paper focuses on the associated calculations. The second half of the process covers the design and technique, as well as the formulas to be employed and the necessary user data. The application's user interface is shown in the third section. The last section of the paper provides a summary of what it discovered.

#### 2.LITERATURE SURVEY

In order to build the diet recommendation application, few related works have been reviewed and there were certain problems that could be encountered:

Lack of Personalization: Numerous applications provide broad advice based on parameters like age, gender, weight, and height, but they frequently overlook personal dietary preferences, food intolerance, medical issues, and lifestyle considerations.

Inaccuracy: Many apps' nutrition information may not be accurate, which could cause users to make poor decisions. Additionally, not all food varieties or variations from throughout the world may be included in the database.

Cost: Some nutrition applications may cost money or demand an in-app purchase to unlock additional features or receive tailored advice. For some individuals who cannot afford the added fee, this might not be an option.

#### **3.METHODOLOGY AND DESIGN**

The waterfall model, which progresses linearly from one phase to the next, is used in this research.



Figure-1: Waterfall Model

As there are different requirements depending on the user, the waterfall model is applied here. The values that will be used as input have been used to design the application in this case. The application was constructed in sections because it produces a variety of outputs. Finally, the components are combined to create an all-encompassing plan. The following table shows the relationship between the user's data and the requirements of the application: **Table-2:** User's Data and Application Requirement

No.	User's Data	Application Requirement
1	Height	Height in meters is one of the key values
2	Weight	Weight in kg is another key value
3	Type of Lifestyle	Type of Lifestyle
4	Ideal Body Weight(IBW)	IBW is required to find required calories
5	Gender	Gender differentiates in calorie count
6	Age	Age is needed to count calories required

(Height will be provided in feet and inches as it is easy for users to measure in those units)

Next stage includes the calculations for all the values provided to the user:

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(a) BMI=Weight(kg)/(Height(m))<sup>2</sup> [1]
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(b) Ideal Body Weight= $22*(\text{Height}(m))^2$  [2]

(c) BMR:

For women,  $BMR = (10 \times \text{weight in } \text{kg}) + (6.25 \times \text{height in } \text{cm}) - (5 \times \text{age in years}) - 161$ For men,  $BMR = (10 \times \text{weight in } \text{kg}) + (6.25 \times \text{height in } \text{cm}) - (5 \times \text{age in years}) + 5$ 

[3]

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(d) Required Calories:

Sedentary : AMR = BMR x 1.2 Moderate : AMR = BMR x 1.55 Heavy : AMR = BMR x 1.9

(e) Macros Value:

Carbohydrate: 45% x Required calories / 4 calories = Carbohydrates grams per day Protein: 25% x Required calories / 4 calories = Protein grams per day Fat: 30% x Required calories / 9 calories = Fat grams per day [4]

### **4.RESULT**

The result of the research paper is to provide with the application with various details based on body with respect to basic body details. The following screenshot include the various activities being done on this application:



Screenshots of the Application

## **5.CONCLUSION**

For users who are concerned about their health, an Android app that delivers information based on their height, weight, and lifestyle is essential. However, very few apps on the market offer the full range of information that this project does. The end result will include the amount of macro-nutrients and recommended meal items. This makes the application an essential component of a user's healthy lifestyle.

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