



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 4, April 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.512



9940 572 462



6381 907 438



ijirset@gmail.com



www.ijirset.com

Immunity Booster Meal Planner Application

Mr. Mayur Narkhede¹, Mr. Muheeb Shaik², Ms. Kalyani Kalambe³, Mr. Ayush Pande⁴,

Prof. Sayali Shivarkar⁵

UG Students, Department of Computer Engineering, Dhole Patil College of Engineering, Pune, India ^{1,2,3,4}

Professor, Department of Computer Engineering, Dhole Patil College of Engineering, Pune, India⁵

ABSTRACT: One essential factor of a balanced diet to prevent morbidity and mortality, and promote a good immunity status is the consumption of immunity-dense foods with an appropriate macronutrients dispersal (carbohydrates, protein, fat) and the right amount of calories based on personal energy expenditure. While the field of dietetics and nutrition has been bombarded with food recommender systems over the years, little research has been performed on immunity increasing meal planner applications grounded on macronutrients compliance. Drawing from a parallel-iterative design methodology, this paper proposes the development of a web-based immunity enhancer meal planner app called ‘Immunity-Booster-Meal-Eat-Planner’ that can generate tailored diet plans according to individual’s needs. Six Registered Nutritionists–Dietitians served as a panel of human expert validators and 24 regular users served as app testers for evaluation using mixed-methods approach. Study participants confirmed and concluded the potential of ‘Immunity-Booster-Meal-Eat-Planner’ web app as a personal meal planner to ensure the consumption of immunity-rich needed macronutrients. Suggestions and interpretations were made regarding the technical improvements that could be done to enhance the app as a complete virtual nutrition assistant.

KEYWORDS: Immunity Planner, Meal Planner, Health ,Filtration methods, Naïve Bayes.

I. INTRODUCTION

The integration of information technology and computer science concepts in the field of medical care has been capturing the attention of many people. Because of this, many software and application are being developed to enhance the quality of life within the society. ‘Immunity-Booster-Meal-Eat-Planner’ is an example of instalment of how these areas of computing could aid people to be health-aware and achieve a good nutritional status. Experts and app testers offered exceptional ratings and feedback to the web app that results to its acceptability. Based from the scores, additional enhancements were highlighted based on the mixed-methods approach. These enhancements are towards the development of “Virtual Dietitian – A Knowledge-Based System”. Future works of this study will cover the inclusion of grounding the web application into an international standardized framework called Nutrition Care Process, and the practice of evidenced based dietetics to personalized nutrition care for formulating tailored dietary interventions based on personal preferences (e.g., dietary type like Vegan or cooking style like Indian cuisine), health-related restrictions (e.g., allergy and disease related barrier), and fitness objectives.

II. LITERATURE SURVEY

A. Towards Automatic Meal Plan Recommendations for Balanced Nutrition.

To collect food preferences data Authors created a food portal website, <http://www.quizine.me>, where users could upload, browse, share and search recipes, calculate the nutritional properties of a recipe and receive recipe recommendations based on users profile. Users can rate recipes from 1 (strongly dislike) to 5 stars (strongly like). Over 3 years 148 users gave 4,549 ratings (median 8 per user) of 957 recipes, consisting of diverse styles of food. To investigate meal planning authors needed a number of varied user personas describing quantities like height, weight, gender, age, nutritional goal (lose/gain/maintain weight) and activity level (from sedentary to highly active). Activity levels and goals were assigned to each subject at random assuming unconditional uniform distributions. Authors are looking for nutritional experts to collaborate with to evaluate and refine the approach from this perspective. Such an expert would also be able to evaluate how truly healthy the meal plans are, as just because they fit the various nutritional constraints does not necessarily mean they are balanced. The number of recommendations used has an impact on both the number of plans that can be generated as well as the quality of those plans. [elesiever2015]



B. Automated Recommendation of Healthy, Personalized Meal Plans.

Authors calculate nutritional requirements using a version of the Harris-Benedict equation revised by Roza and Shizgal which estimates an individual's basal metabolic rate (BMR) and daily calorie requirements. The estimated BMR value is multiplied by a number between 1.2 and 1.9 corresponding to the individual's activity level giving a recommended daily energy intake to maintain current body weight. They add or remove 500 kcal for individuals who wish to gain or lose weight which would result in the safe gain or loss of 0.45 kgs per week. They assume that 20% of the required energy will come from drinks and between-meal snacks and use standard measures for the proportion of calories that should come from proteins, fats, carbohydrates and fibres.[Harvey 2015]

C. Food Recommender Systems

This paper makes two primary contributions. Firstly, we provide a summary of the state-of-the-art in food recommender systems, highlighting both seminal and most recent approaches to the problem, as well as important specializations, such as food recommendation systems for groups of users or systems which promote healthy eating. Authors examine which algorithms have been used in the food domain, how systems are typically evaluated, and the resources available to those interested in building or studying recommender systems in practice. In a second contribution they discuss the diverse challenges involved, as well as a summary of the lessons learned from past research and an outline of important future directions and open questions. [trattner 2017]

D. Online Recommender System for Personalized Nutrition Advice

This project will investigate an effective way of providing automated personalized online dietary recommendations in order to increase the diet quality of the population and ways considering user's preferences during the online recommendation. This proposed system aims to increase effectiveness and acceptability using the following dimensions: dietary intake, user's preferences, other users' responses, population data and nutrition experts' knowledge. [franco2017].

E. An overview of recommender systems in the healthy food domain.

In this paper, authors provide an overview of recommender systems in the healthy food domain on the basis of discussing four different types of food recommender systems. The first three types present some existing studies in the healthy food domain, which mainly focus on tailoring recommendations to individuals, by considering the preferences and/or nutritional needs of users. Meanwhile, recent studies presented in the fourth type target at consulting healthy food items in group scenarios. Popular recommendation approaches (e.g., Collaborative Filtering recommendation, Content-based recommendation, Constraint-based recommendation) are used in many food recommender systems. Besides, hybrid approaches are also employed in order to improve the recommender's performance. Although being considered in different contexts, in general all food recommender systems play a vital role in providing food items meeting preferences and adequate nutritional needs of users as well as persuading them to comply positive eating behaviors.[Trang tran 2018]

III. PROPOSED METHODOLOGY

The proposed methodology for development of 'Immunity-Booster-Meal-Eat-Planner' web app works for immunity meal planning with consideration of two things. First is the calories consumed by the individual on daily basis and second on the disease inhibited by the individual. For example if the individual is a office worker with regular sitting job of 9 to 5 with no calories consumption and facing the disease such as diabetics and stress then the food is recommended considering these both factors.

IV. SYSTEM ARCHITECTURE

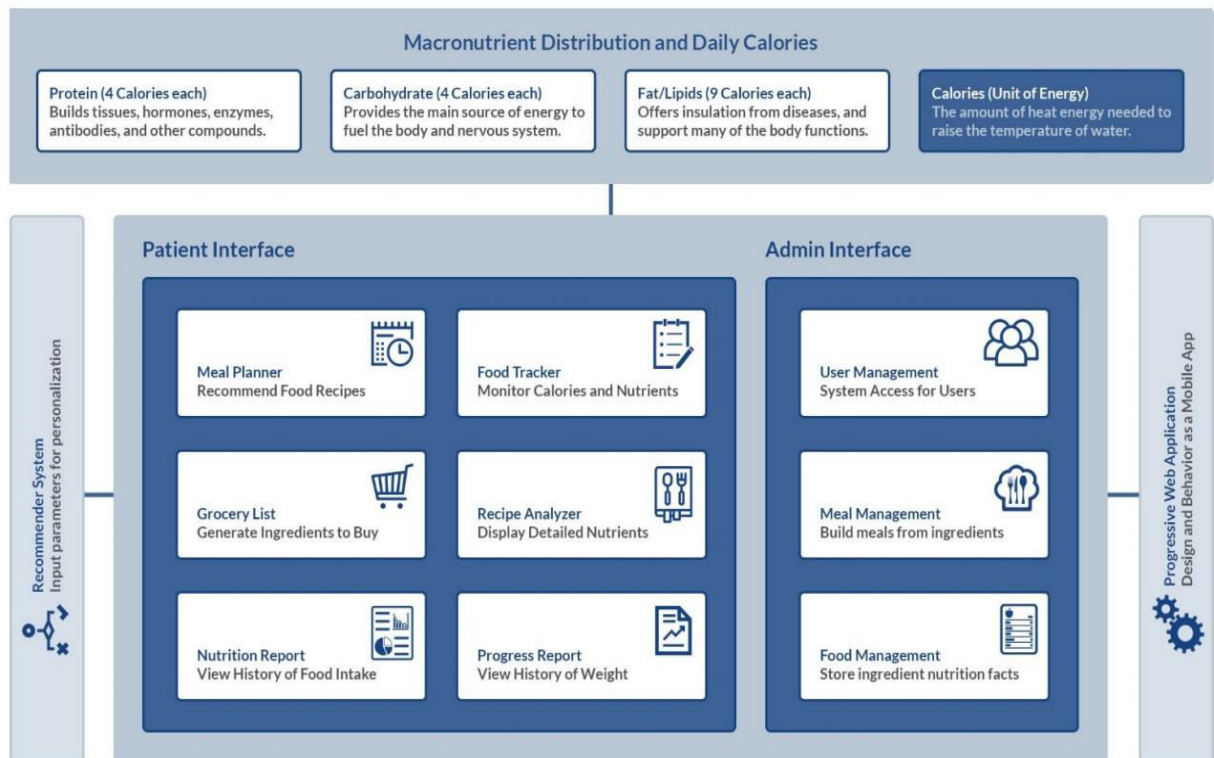


Fig: System Architecture

V. ALGORITHMS

As stated in proposed system two factors are considered for meal recommendation first is calorie consumption and second is disease enlisted. Filtering Methods are applied for recommendation of food on calorie consumption while naïve bayes algorithm is applied for recommendation of food for disease enlisted.

1) Filtering Methods:

The filtering method is founded based on the calories consumed and the user's preference for recipes. It finds the features of an item that the user likes or items that are similar to those that the user liked in the past and then recommend another item that has similar features to the item that the user had liked. So, in order to collect and identify the user's preference(s), information regarding the user's input into the application will be tracked. Every search made by a user is recorded and stored in the user's log repository.

2) Naïve Bayes Algorithm:

The user gives input for the disease and the naïve bayes classifier categorize the users according to the disease and provides the result. The diseases that are classified are Diabetes, Lung cancer, Heart disease. Naïve bayes classifiers are a collection of classification algorithm based on bayes theorem. Every pair of features being classified is independent of each other. Bayes theorem finds the probability of an event occurring given the probability of another event that has already occurred.

$$P(A/B) = P(B/A) P(A) / P(B)$$

VI. CONCLUSION AND FUTURE WORK

In summary, 'Immunity-Booster-Meal-Eat-Planner' will redound to the benefit of humanity, that is, anyone who consider Immunity as a key aspect of leading a long and healthy life. The digitalization of meal planner with respect to optimal macro distribution will provide a better patient care and improve public health as the advancement of nutrition knowledge and the development of personalized nutrition intervention are available to all. As a society that experiences public health challenges, it is pivotal to promote solution be it in a form of information system like 'Immunity-Booster-Meal-Eat-Planner' or the consistent dissemination of food-based dietary guidelines like Food Pyramid. The rise of modern computing concepts and techniques now pave a way for a more exciting avenue of research in the nutrition



science field. Advancements such as expert system, machine learning, big data, and Blockchain are starting to conquer the medical field. It is only a matter of time when technology is deeply and prevalently embedded in the society and in our life, and 'Immunity-Booster-Meal-Eat-Planner' is a small step towards the creation and development of a smarter nutrition application.

REFERENCES

- 1) Elswailer, David, and Morgan Harvey. "Towards automatic meal plan recommendations for balanced nutrition." In *Proceedings of the 9th ACM Conference on Recommender Systems*, pp. 313-316. 2015.
- 2) Harvey, Morgan, and David Elswailer. "Automated recommendation of healthy, personalised meal plans." In *Proceedings of the 9th acm conference on recommender systems*, pp. 327-328. 2015.
- 3) Trattner, Christoph, and David Elswailer. "Food recommender systems: important contributions, challenges and future research directions." *arXiv preprint arXiv:1711.02760* (2017).
- 4) Zenun Franco, Rodrigo. "Online recommender system for personalized nutrition advice." In *Proceedings of the Eleventh ACM Conference on Recommender Systems*, pp. 411-415. 2017.
- 5) Trang Tran, T.N., Atas, M., Felfernig, A. *et al.* An overview of recommender systems in the healthy food domain. *J Intell Inf Syst* **50**, 501–526 (2018).



**Impact Factor:
7.512**



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 **9940 572 462**  **6381 907 438**  **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details