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Nutri-tracker: A Personalized Nutrition Advisory System

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Abstract- Nutri Tracker is a smart mobile app created to tackle issues in personalized nutrition planning and effective food use. From the receipt text, system shall extract grocery item and be organized in the virtual pantry. By using user-defined health goals like weight management, skin health, hair growth, and PCOD-friendly nutrition, the app creates meal plans, quick recipes, and wise grocery purchase suggestions. This process utilizes the existing food sources efficiently, leads to a varied diet, and cuts down waste.. Nutri Tracker provide an intuitive, easy to use system for daily nutritional control by enabling automated, data-driven recommendations.Another important feature of the app helps users stay committed to their plan by sending personalized notifications, tracking the food they eat each day, and providing nutritional information that can assist them in addressing their health concerns and planning better meals for future days. The app also allows users to connect it with fitness applications, which helps enhance the plan by incorporating data on their physical activities

Keywords – personalized nutrition, virtual pantry, parse grocery receipt, meal suggestion, PCOD meal plan, health app, health mobile application

I INTRODUCTION

Healthy eating is vital for overall well- being, but numerous people struggle to maintain a balanced diet in their diurnal lives. Indeed when individualities buy groceries, they frequently warrant guidance on how to use these particulars effectively to achieve their health pretensions. Such factors induce unpremeditated overindulgence, nutritive imbalances and undue food spoilage.. Those with specific health issues, similar as weight oscillations, skin and hair problems, or hormonal conditions like PCOD, need further individualized salutary support, which is constantly missing from traditional diet plans.

utmost being nutrition apps concentrate on calorie shadowing or offer standard diet plans that do not consider the stoner's available food coffers. These systems generally bear homemade entry and ignore factual grocery data, making them impracticable for everyday use. Accordingly, druggies find it hard to stick to recommendations, reducing the effectiveness of these apps.

To tackle all these issues, Nutri Tracker is being developed the smart mobile app connected to the grocery data, with evidence-based nutritional plan.. The app reviews grocery bills to identify bought food particulars and arranges them into a virtual closet. Depending on chosen health pretensions like weight operation, skin health, hair growth, and PCOD-friendly nutrition, the app provides applicable mess plans, quick fashions, and suggestions for fresh food particulars that enhance nutritive value.

Nutri Tracker also supports druggies in maximizing their existing pantry contents and consequently aids healthy eating, prevents food wastage, and removes food-planning confusion during daily life.. This system offers a practical, stoner- centered result that fosters nutrition mindfulness to promote healthier choices. The lack of connection between grocery data and substantiated nutrition limits their practicality in diurnal life.

Smartphones enable healthy information and advice to be provided easily and cost-effectively.. To harness this eventuality, nutrition apps must align with real- world stoner habits and food coffers. Seen in this way Nutri Tracker is easy to use mobile app to connect shopping behavior with appropriate diet planning.The app processes textbook from grocery bills to identify bought food particulars and organizes them into a virtual closet.

Grounded on stoner- named health pretensions like weight operation, skin health, hair growth, and PCOD-friendly nutrition, Nutri Tracker creates focused mess plans, quick fashions, and smart grocery purchase suggestions. The app primarily offers practical mess ideas that use closet particulars on hand, making the recommendations simpler to follow. also, the system highlights essential nutrients for specific health pretensions and attendants druggies on food choices that support long- term heartiness.

Nutri Tracker effectively use and reduce waste by making healthy food choice.. This system offers an automated and practical way to manage diurnal nutrition, making it suitable for those looking to ameliorate their life through smart mobile technology.

II RELATED WORKS.

Several experimenters have explored intelligent systems and mobile technologies that help druggies in covering their

diet and perfecting nutritive habits. These systems substantially concentrate on food recognition, diet shadowing, recommendation systems, and nutritive analysis. The following studies punctuate important benefactions in the field of technology- supported nutrition operation.

In 2014, Yu Kawano and Keiji Yanai conducted exploration on a food image recognition system using deep convolutional neural networks. Their work concentrated on automatically relating food particulars from images captured through mobile bias. In the system designed, convolutional neural network models are applied to the classification of different orders of food and are observed to show increased subtlety over conventional image classification methods. The experimenters demonstrated that automated food recognition could simplify the process of salutary shadowing by reducing the need for homemade food entry. It contributed a significant effect in developing the computer vision tasks within the domain of food computingstill, the system substantially concentrated on relating food particulars from images and did n't address the problem of generating substantiated mess plans grounded on available constituents.

Additional notable contributions were those of Weiqing Min, Shuo Jiang and Ramesh Jain in 2019, who offered a paper on food recommendation and analysis of multimedia food data. This work studied the ways that extensive datasets of foods with images, ingredient lists and nutritional content could be applied to build smart food recommendation systems. The authors anatomized different recommendation approaches, including content- grounded and cooperative filtering ways, to ameliorate the applicability of food suggestions. Their study stressed the significance of combining nutrition data and stoner preferences in developing substantiated diet recommendation systems. Although their work contributed greatly to the field of food recommendation technologies, it substantially concentrated on assaying food data and erecting recommendation models rather than furnishing practical results that use real grocery particulars available to druggies.

2015, David Elsweiler, Morgan Harvey and Bernd Ludwig introduced a evidenced-based nutrition recommendation strategy to promote healthier eating. Their exploration explored how stoner preferences, salutary pretensions, and behavioral patterns could be incorporated into recommendation systems to induce customized mess suggestions. The authors emphasized the significance of personalization in adding stoner engagement and adherence to salutary recommendations. Their system anatomized stoner relations and nutritive conditions to suggest refections that align with individual health objects. While this approach bettered personalization in diet recommendation systems, it reckoned substantially on predefined form databases and stoner profile information, without considering the food constituents formerly available in the stoner's kitchen.

also, Morgan Harvey and David Elsweiler in 2016 delved the conception of environment- apprehensive food recommendation systems. Their study examined how contextual information similar as time of day, stoner life, and environmental factors could impact food choices. By incorporated contextual information to the recommendation algorithm, their system proposed more relevant and timely mess recommendations. The exploration demonstrated that environment- apprehensive systems could ameliorate the delicacy and utility of food recommendations. still, the approach still depended heavily on manually entered food information and did n't integrate grocery purchase data or closet operation features into the recommendation process.

Another study, which could be relevant, was also developed by Mike Lee, Albert Lee and Nick Steel in 2009. They managed the design and development of the "MyFitnessPal" web-site for nutrition tracking.This system came one of the most extensively used mobile operations for covering calorie input and nutritive information. The platform provides a large database of food particulars and allows druggies to track diurnal refections, calorie consumption, and physical exertion. It also offers progress monitoring tools that help druggies achieve fitness and health pretensions. Although MyFitnessPal is effective in furnishing nutritive perceptivity and diet monitoring features, it requires druggies to manually log their refections. This homemade process can come time-consuming and may reduce stoner engagement over long ages. also, the system does n't dissect grocery purchases to induce meal recommendations.

Despite the significant benefactions of these studies in the areas of food recognition, salutary shadowing, and recommendation systems, numerous being results still have certain limitations. utmost systems concentrate on a single functionality, similar as food recognition or calorie monitoring, and bear expansive homemade commerce from druggies. veritably many systems attempt to integrate grocery purchase information with substantiated nutrition planning.

Nutri Tracker is an envisaged system to overcome the issues described above. It integrates different functionalities into one mobile operation.. The system analyzes grocery damage textbook to identify bought food particulars and organizes them into a virtual closet. Grounded on stoner-named health pretensions similar as weight operation, skin health, hair growth, and PCOD-friendly nutrition, the operation generates substantiated mess plans, quick fashions, and smart grocery recommendations. By exercising the food particulars formerly available to the stoner, the system promotes effective food application and reduces food destruction. This integrated approach provides a practical and stoner- centered result for perfecting diurnal salutary habits and supporting healthier life choices..

III PROPOSED SYSTEM

The idea of the system is to fill the gap between buying groceries and planning daily meal with making the grocery receipts be the source of goal based nutrition guidance. A diet plan application is an effective technique that uses automated personalized recipe and meal plan Generation based on the input (grocery receipt text). The Proposed approach consists of four parts; Text preprocessing and extracting food items from grocery receipts; Building the pantry of available resources; Recommendation Generation; and Recommendation for intelligent shopping. The system

starts by providing grocery receipt text (manually, by pasting it, or scanning). The application extracts each and every food item and also its quantity from the grocery receipts and converts it into grocery receipt.

The system processes this receipt to extract each food item name; after then filters the data to take the relevant info by making them to pass from data cleaning and preparation process. In addition to data processing, the system classifies extracted items into useful entities or categories as like as fruits, vegetable, dairy, protein, grains, junk etc.

The user is given permission to verify the extracted items to create a pantry of all available food resources in a virtual way.

After the creation of pantry, user have to give preference as per health goals which include several options such as, "Weight Management" (weight gain, weight loss), "Skin health" , "Hair Growth", and "PCOD-friendly nutrition". Multiple goals could also be selectioned. After goal selection by user, system analyze available resources in pantry. System will create recipes by mapping available items of user pantry against a nutrition database comprising calories, macronutrients, vitamins, minerals values. Rule based and goal oriented recommendation Engine of the system ensures best recommendations and appropriate recipes by ensuring specific nutritional parameters such as for skin healthy food items rich in antioxidants like vitamin E, Vitamin C and the like.

By suggesting few quick and easy recipe in the morning and lunch sections, It becomes quite easy to follow in today's busy schedule and helps us in achieving desired outcome. Not only does the system help in planning the meal but also in intelligent buying of foods. The system will indicate the nutritional gaps as based on the requirements of selected health goals as well as against currently available food ingredients. So system recommend the best possible options which can cover nutritional deficiency by smartly buying ingredients. To make the users aware regarding his/her nutrition intake the summary and analysis report also provided..

IV IMPLEMENTATION

Implementation The concept behind Nutri Tracker is to translate grocery receipt data into valuable nutritional information through a structured mobile application environment. It has been developed in modular fashion as an Android-based application encompassing a receipt text processing, a pantry system, nutrition analytics and a recommendation module. NutritionDatabase This database stores the nutritional information of every ingredient identified, with respect to the calories, macronutrients, and necessary micronutrients (vitamins, minerals and fiber).vv Input The implementation begins with receipt input where the customer pastes or enters text data from their grocery receipts. The receipt data collected is unstructured so a pre-processing stage is implemented in order to clean the text by removing all the noise characters, numbers or store details from the text. We employ simple text parsing methods in order to recognize valid item name and its quantity from the available text data. Extracteditems will then be stored in a structured manner into the local database. Virtual Pantry Once the item has been extracted it will be inserted into the virtual pantry. This module will help to organize food items such as fruits,vegetables,grain and proteins. then it will be extracted into separate foods and store them into virtual pantry and it will maintain the food items seperatley This system will also allow us to review and manually update the automatically added items. This module of the application tracks real time food availability in the user. Goal Selection Module: Users can choose and specify as many goals they have, e.g., weight loss, skin care, hair growth,PCODfriendly diet, etc..

Each goal has certain preset Nutritional parameters which are stored in the nutrition database. NutritionDatabase This database stores the nutritional information of every ingredient identified, with respect to the calories, macronutrients, and necessary micronutrients (vitamins, minerals and fiber

Recommendation Engine The recommendation engine uses the inputs from the pantry module and the goal selection module to generate personalized meal recommendations and quick recipes including breakfast,lunch, salads and refreshing drinks.These recipes will also carry instructions for meal preparation along with recipe names and preparation time. SmartShopping Recommendation Module Nutri Tracker would compare nutritional requirements for chosen goals against inventory in user's virtual pantry. If specific nutrients have deficiencies, it will suggest buying more appropriate food items to meet them, aiding smart purchasing decisions.

The application will offer a nutrition summary to show the nutritional information from all the ingredients in the virtual pantry.This will provide a bird's eye view of the user's intake of calories, protein, fiber, vitamins etc.. StorageThe application would store data locally using simple storage methods to manage all ingredients in the user's pantry while ensuring data privacy.

TABLE I. FUNCTIONAL MODULES OF NUTRI TRACKER

Module Name	User Role	Description	Technology Used
User Input Module	User	Allows users to paste or enter grocery receipt text that contains purchased food items and quantities.	Flutter / React Native, Text Parsing
Virtual Pantry Module	User	Extracts food items from receipt text and organizes them into a virtual pantry that represents available ingredients.	Python / JavaScript, Local Storage
Goal Selection Module	User	Enables users to select health goals such as weight loss, weight gain, skin health, hair growth, or PCOD-friendly nutrition.	Mobile UI Framework
Meal Recommendation Module	System	Analyze pantry ingredients and selected health goals to generate personalized meal suggestions and diet plans.	Rule-based Logic, Nutrition Dataset
Recipe Suggestion Module	System	Provides quick recipes such as breakfast, lunch, salads, and energy drinks using available pantry ingredients.	Recipe Database
Smart Shopping Module	System	Recommends additional grocery items needed to achieve the selected health goals and fill nutritional gaps.	Recommendation Algorithm
Nutrition Analysis Module	System	Displays nutritional information such as calories, protein, vitamins, and minerals related to recommended meals.	Nutrition Database
Data Storage Module	System	Stores pantry data, user preferences, and generated recommendations for quick access and system performance.	Local Database / Cloud Storage

V RESULTS AND DISCUSSION

Testing of the proposed Nutri Tracker system was carried out to test its ability to utilize grocery receipt data in generating comprehensive nutritional information. The application was tested with different datasets of grocery receipt input encompassing various types of grocery items like fruits, vegetables, grains, dairy products, and protein sources.The key goal during testing was to observe the efficiency with which the system could extract items,

classify them into a virtual pantry and create apt meal/recipe recommendations corresponding to specified health goals.

During the testing process, the receipt text processing module exhibited stable functionality in identifying and extracting grocery items from unstructured receipt text. The receipt text was adequately preprocessed to remove non-relevant characters and information such as date, retailer name and transactional details from the receipt. It was possible to classify correctly these harvested items into the virtual pantry as well where they could be sectioned into foods like fruits, vegetables, protein, grains, dairy, and healthy fats. This partitioning enabled the recommendation engine to understand the ingredients, their nutritional properties and accordingly provide structured meal suggestions.

Additionally the system was tested against alternative set of health goals i.e. Weight control, skin treatment, hair growing and PCOD friendly diet.diet. When specific goal was chosen, the recommendation engine interpreted the pantry contents by considering the nutrient information derived from the integrated nutritional database. Using the rule based logic, the system successfully suggested fitting ingredient combinations and suitable meal recommendations according to the specified goal. For instance, with respect to weight management goal, the system gave importance to complete and well-balanced meals with the right balance of calories and higher content of proteins and lesser processed carbohydrates. For the aims of skin & hair growth the food consumed should consist of food which have high content of Vitamins, antioxidants, and necessary nutrients.

Another key outcome from the conducted tests were based on the efficacy of the recipe suggestion module of the system. The system presented time-efficient recipes like breakfast ideas, salads, smoothy ideas and quick lunches utilizing all ingredients available in the pantry. With every recipe meal the instruction for the preparation with estimated preparation time came, so meals were really easy to prepare. Thus the suggestions were not merely theoretical but also provided readily accessible and healthy recipes for everyday usage in this fast-paced world.

The smart shopping recommendation module of the system yielded satisfactory results. The testing also showed how easy to use the app was. The application's interface is simple and user friendly, it was quick to input all of the receipt details and also easy to navigate through all the outputs of the nutrition data. For instance, the system recommended to purchase more fiber-rich ingredients if PCOD friendly diet needed such items and the existing pantry lacked the necessary ingredients.

This testing also revealed a good user interface, easy to use and navigate for inputting details and viewing nutritional output.. The Minimal user effort required further streamlined this process as it negated the tedious data entry into the conventional diet tracking applications. This encouraged the use of the application more frequently for the user.

As the investigation showed, incorporating scanning and the dietary management tools could promote better generation of nutritional recommendations and meal planning. This approach allowed the system to customize its recommendations using already accessible ingredients. In this case food was not wasted as the system is suggesting to use the available food rather than purchasing new food. The system developed Nutri Tracker is capable of being helpful in personal diet and health management with the help of technology.

VI. CONCLUSION

Diet chart: - The first part of ensuring a good and a healthy life style is to adopt the right diet chart. A balanced diet will not only improve the body's immune system but also keep it healthy throughout life. One of the few disadvantages of humans in today's world is to plan proper nutritional diets for ourselves based on health status and the foods currently in use in the kitchen.

The reasons for this are primarily the rush in daily lives and a lack of awareness in the field of nutrition. To address these issues and to eat nutritional food and not produce any extra food (waste), several nutritional tracking tools and diet applications are available.

But most of these are for you to enter the foods that you eat, and none to suggest the food for you. More and more such tools exist, the only deficiency that the tool users face is that they either don't support their required nutritional goals or these tools require a lot of input/manually entering foods you eat. In order to overcome this problem, a Smart Nutrition Tracker app, called the 'Nutri Tracker', will be designed.

This application will be a mobile platform to analyse grocery receipt text and help users manage their grocery food with the concept of a virtual pantry; in order to create personalised meals on the basis of desired nutritional goals and objectives (e.g., weight loss, healthy skin, hair growth, PCOD diet, etc).

The main purpose of the Nutri Tracker will be to convert grocery products purchased by users into a way where it can translate those into the users desired Nutritional Food and provide him with nutritional guidance and a meal plan that is easily manageable by any individual.

The primary objective of the proposed Nutri Tracker system will be to help users turn grocery information from receipt text to nutritional knowledge and simple, doable meal plans for achieving personal health objectives. The input for the proposed system will consist of the user's grocery receipt text, and output will be based on the output for the personal health goals desired. For example, by taking into account receipt text, the system can establish a user's virtual pantry; the user can choose his desired personal health objectives from various options like weight management, healthy skin, hair growth, etc. and also the PCOD diet.

After defining a desired objective the Nutri Tracker will first obtain the detailed nutritional information of all items purchased by the user from his grocery receipt text using a Structured Nutritional Database. Then it can generate various meal recommendations on the basis of the defined user objectives by using a developed Recommendation Engine that is built upon the analysis of a wide variety of nutritional criteria such as dietary restrictions, nutrient values, availability of ingredients from the user's pantry, user's taste preferences (optional) and more importantly defined health objectives. Apart from suggesting and recommending meals, application could also generate fast and simple recipes for e.g. Fast breakfast, fast salads, fast

smoothie, fast lunch etc. Recipes have to be simple and fast to prepare so that user could prepare without requiring many time or cooking knowledge.

Another major novelty introduced by the present system will be its smart grocery shopping recommendation module that analyses potential dietary gaps based on the nutritional requirement criteria set for personal health objectives, based on the items available in the user's pantry and provide recommendations on additional items required in the next grocery shopping trip for an optimized diet plan, thereby also avoiding any sort of unnecessary spending of money on ingredients which would then later be wasted due to non-use and unsuitability.

Major benefits of NutriTracker: - It provides useful practical outputs which will help the user to understand his/her body and nutrition for improving diet choices and making healthy eating simple. - It reduces the need of continuous user input as it identifies the food products automatically from the scanned grocery receipts.

Effective usage of all the groceries purchased. Decreases the loss of grocery items, and increases the grocery bill efficiency. Personalized recommendations for diet and meal plans and the provision of easy and quick recipes with nutritional details increase user engagement and facilitate adherence. The experimental evaluation proved the suitability of the system to extract useful data from grocery receipt text and utilize this information for generating tailored meal recommendations that complement varied personal health objectives. The system offers intuitive user interface and detailed dietary guidelines and recipes.

For future development, smart technologies like Optical Character Recognition (OCR) may be incorporated for fully automated scanning of grocery receipts, and further development of machine learning algorithms can be used to obtain more efficient recommendation models and enable real-time monitoring of user diet and physical activity for more advanced health and fitness tracking. In a Nutshell: The Smart Nutrition Tracker is the latest app of this kind which addresses several limitations of previously developed dietary management systems. Its capability of identifying grocery items directly from receipt text and providing users with the option to establish personal health goals and receive appropriate food recommendations makes it a convenient tool for personalized nutrition management..

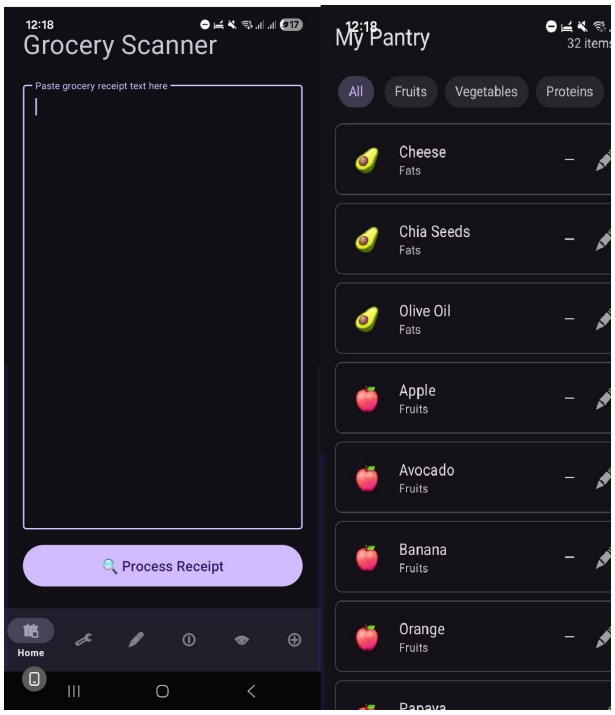

Fig 1 Home page and pantry page of Nutri tracker

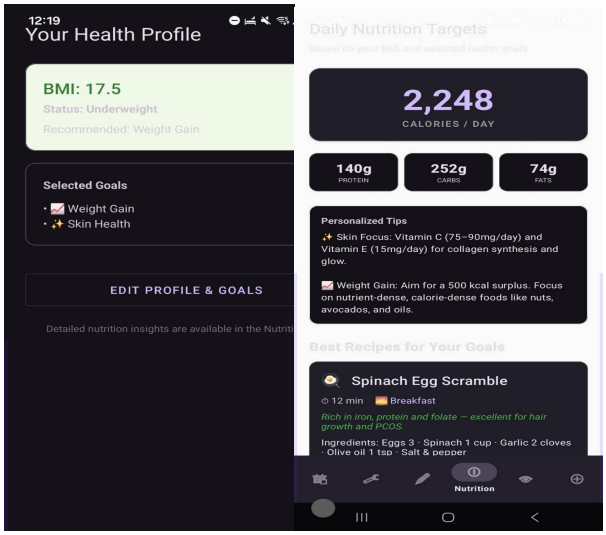

Fig 2 Personalized profile and their Recommendations

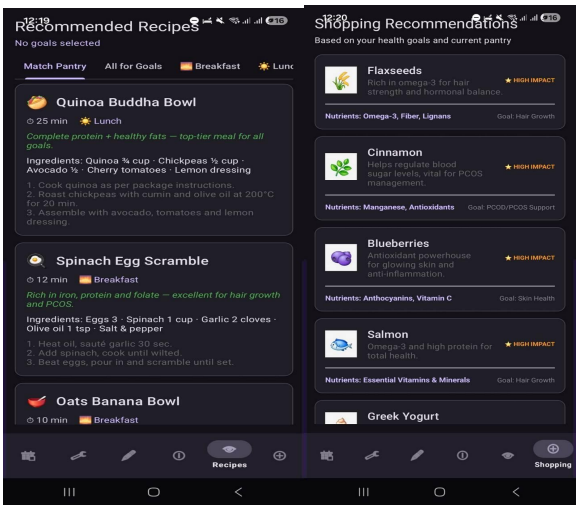

Fig 3 Shoppimg Recommendations And Recipes

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