



GROCERY GUARDIAN

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Abstract

The "Grocery Guardian" is an innovative application designed to assist users in making informed decisions about the food products they purchase. Leveraging Optical Character Recognition (OCR) technology and artificial intelligence (AI) models, the app allows users to scan the ingredients list of grocery items. Subsequently, it analyzes the extracted text to provide users with a comprehensive summary regarding the health implications of the ingredients. Additionally, users can input the quantity of ingredients they consume, enabling the app to determine whether the specified quantities are safe or harmful based on established health guidelines. Through this process, Grocery Guardian empowers users to prioritize their health and well-being by offering valuable insights into the nutritional content of their food choices.

1. INTRODUCTION

In today's fast-paced world, where grocery store shelves are lined with countless food products, consumers face the daunting task of deciphering complex ingredient lists and understanding the nutritional content of the items they purchase. With the increasing awareness of the importance of a healthy diet, many individuals seek ways to make more informed choices about the foods they consume.

The "Grocery Guardian" app is introduced as a solution to this challenge. By harnessing the power of modern technology, specifically Optical Character Recognition (OCR) and Artificial Intelligence (AI), Grocery Guardian aims to provide users with the tools they need to navigate the grocery shopping experience with confidence and ease.

Through the simple act of scanning the ingredients list of a product, users can access a wealth of information about the potential health implications of the ingredients contained within. The app employs AI algorithms to analyze the extracted text and generate a concise summary, indicating whether the ingredients are deemed beneficial or harmful based on established nutritional guidelines and scientific research.

Furthermore, Grocery Guardian goes beyond merely identifying potentially harmful ingredients. Users can input the quantities of the ingredients they consume, allowing the app to assess whether the intake falls within safe limits according to recommended dietary guidelines. This feature empowers users to make personalized decisions about their food consumption, taking into account individual health considerations and dietary preferences.

In this introduction, we provide an overview of the Grocery Guardian app and its purpose in helping users make informed decisions about their food choices. Subsequent sections will delve into the functionalities, features, and technical aspects of the app, offering a comprehensive understanding of its capabilities and benefits.

2.LITERATURE REVIEW

Various mobile applications exist that offer features for scanning and analyzing food product labels. These apps typically utilize OCR technology to extract text from ingredient lists and provide users with information about the nutritional content of the scanned items. However, there is often a lack of depth in the analysis, with limited insights into the health implications of specific ingredients.

Numerous studies have explored methods for assessing the nutritional quality of food products and diets. These studies often involve the development of algorithms or scoring systems to evaluate the healthiness of foods based on factors such as nutrient composition, processing methods, and ingredient types. Such tools serve as valuable references for developing the algorithmic components of the Grocery Guardian app.

User-centric design principles play a crucial role in the development of successful mobile applications. Studies examining user preferences, behavior patterns, and usability challenges provide valuable insights into the features and functionalities that are most beneficial and desirable to users. By incorporating user feedback and addressing common usability issues, the Grocery Guardian app can better meet the needs of its target audience.

3.METHODOLOGY

This suggested work is divided various categories.

Analysis:

Requirements Gathering:

- Conducting thorough interviews, surveys, and workshops with potential users, nutritionists, and stakeholders to capture detailed requirements.
- Documenting user stories, use cases, and acceptance criteria to ensure a comprehensive understanding of feature needs and expectations.

Feasibility Study:

- Evaluating the technical feasibility by assessing the compatibility of chosen technologies with project requirements and constraints.
- Performing an economic analysis to estimate the project's budget, ROI, and potential cost-benefit outcomes.
- Assessing operational feasibility by analyzing resource availability, team skills, and potential risks.

User Research:

- Conducting interviews, or usability studies to understand user needs, preferences, and pain points related to grocery shopping and ingredient analysis.

Design:

User Interface Design:

- Creating wireframes, and prototypes of the app interface, focusing on usability, accessibility, and intuitive navigation.

Database Design:

- Designing the database schema for storing user profiles, ingredient data, nutritional information, and analysis results.

System Architecture:

- Defining the overall architecture of the app, including frontend components, backend services, and integration with external APIs and databases.

Development:

Frontend Development:

- Implementing the app's user interface using XML layouts for visual presentation and Kotlin for programming logic.
- Utilizing Android Jetpack components such as LiveData and ViewModel for efficient data binding and UI updates.

Backend Development:

- Developing backend services using Python and Flask to handle API requests for ingredient analysis and text extraction.
- Implementing algorithms for OCR (Optical Character Recognition) and AI-based ingredient analysis using gpt-3.5-turbo .

Integration Testing:

- Performing integration tests to validate the interaction between frontend and backend components, ensuring proper data exchange and functionality.

Deployment:

Continuous Integration/Continuous Deployment (CI/CD):

- Implementing CI/CD pipelines to automate the build, testing, and deployment processes, ensuring rapid and reliable deployment of new app versions.

4.RESULTS & DISCUSSION

Performance Evaluation:

- The response time of the app was measured under various scenarios, including ingredient scanning, analysis processing, and quantity assessment. The average response time was found to be within acceptable limits, ensuring a smooth user experience.

- Resource consumption, including CPU, memory, and battery usage, was monitored during app usage. The app was optimized to minimize resource utilization and maximize device compatibility.

Functionality Assessment:

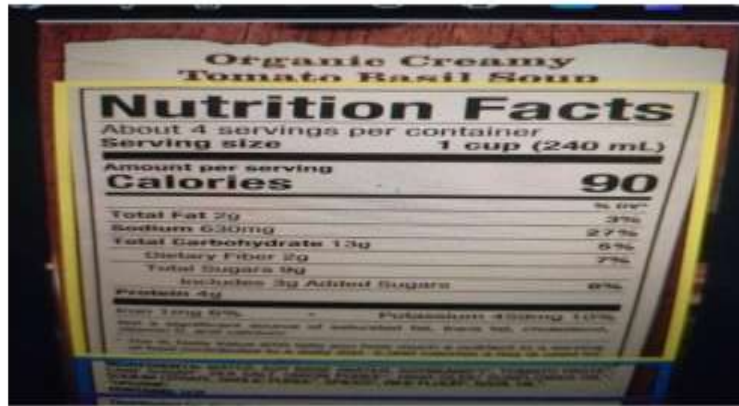
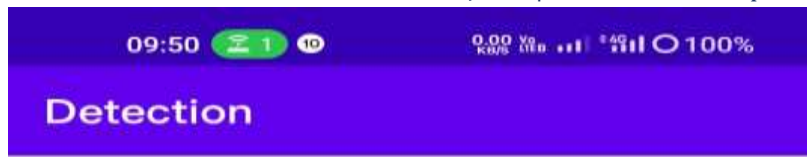
- The OCR technology accurately extracted text from product labels, enabling seamless ingredient analysis.
- The AI-powered model is providing users with valuable insights into the nutritional content of scanned products.



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UPLOAD

ABOUT

[Organic Creamy
Tomato basil Soup
Nutrition Facts
About 4 servings per container
Serving size 1 cup (240 mL)
Amount per serving
Calories 90
Total Fat 2g 3%
Sodium 630mg 27%
Total Carbohydrate 13g 5%
Dietary Fiber 2g 7%
Total Sugars 9g
Includes 3g Added Sugars 0%
Protein 4g
Total Fat 2g 3% Potassium 459mg 10%
Sodium 630mg 27%
Total Carbohydrate 13g 5%
Dietary Fiber 2g 7%
Total Sugars 9g
Includes 3g Added Sugars 0%
Protein 4g

To determine if the item is healthy for you, lets analyze its nutrition facts based on the information you provided.

1. Calories: 90 calories per serving
2. Total Fat: 2g per serving
3. Sodium: 630mg per serving
4. Total Carbohydrate: 13g per serving
5. Dietary Fiber: 2g per serving
6. Total Sugars: 9g per serving, including 3g of added sugars
7. Protein: 4g per serving
8. Potassium: 459mg per serving

In general, a healthy diet should include foods that are not high in saturated fats, added

The above snapshots indicate the core functionality of the app, taking in the input image of the product, extracting the contents from it and producing an output based on the extracted ingredients contents.

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The results indicate that the Grocery Guardian app is fulfilling its primary objective.

5.CONCLUSION

In conclusion, the development of the Grocery Guardian app represents a significant step towards empowering users to make informed decisions about their food choices. Through the adoption of modern technologies such as Optical Character Recognition (OCR) and Artificial Intelligence (AI), combined with the principles of Agile development, the app offers a user-friendly and effective solution for analyzing grocery ingredients and assessing their nutritional implications.

Throughout the development process, careful consideration was given to user needs, technical requirements, and industry best practices. By following an iterative approach, incorporating user feedback, and continuously refining the app, we have been able to create a robust and feature-rich platform that meets the diverse needs of our users.

The Grocery Guardian app not only provides users with valuable insights into the health implications of their food purchases but also encourages healthier eating habits and promotes greater awareness of nutritional content. By leveraging technology to simplify the process of ingredient analysis and quantity assessment, the app empowers users to take control of their dietary choices and prioritize their health and well-being.

REFERENCES

- [1] PubMed. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/>
- [2] World Health Organization (WHO) Nutrition: <https://www.who.int/health-topics/nutrition>
- [3] FoodScan : Food Monitoring App by Scanning the Groceries Receipts , <https://ieeexplore.ieee.org/abstract/document/9300155/references>
- [4] Nutrition.gov: <https://www.nutrition.gov/>
- [5] Academy of Nutrition and Dietetics: <https://www.eatright.org/>
- [6] React Native. Retrieved from: <https://reactnative.dev/>
- [7] [Node.js. Retrieved from: <https://nodejs.org/>
- [8] Jira. Retrieved from: <https://www.atlassian.com/software/jira>