



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 3, March 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423



9940 572 462



6381 907 438



ijirset@gmail.com



www.ijirset.com



NUTRI SCAN

Isha Sharma, Nishant Patel, Parth Patel, Nidhi Shah, Bhagyasha Pandhi

UG Student, Department of Computer Science and Engineering, Parul Institute of Engineering and Technology,
Vadodara, India

UG Student, Department of Computer Science and Engineering, Parul Institute of Engineering and Technology,
Vadodara, India

UG Student, Department of Computer Science and Engineering, Parul Institute of Engineering and Technology,
Vadodara, India

UG Student, Department of Computer Science and Engineering, Parul Institute of Engineering and Technology,
Vadodara, India

Assistant Professor, Department of Computer Science and Engineering, Parul Institute of Engineering and Technology,
Vadodara, India

ABSTRACT: Making healthy eating choices is more important than ever in the fast-paced world of today. The ubiquity of processed foods and nutritional concerns have created a greater need for tools that enable people to make educated food choices. This urgent issue is addressed by "Nutri-Scan," a web tool that is set to alter how we view and choose our meals. A cutting-edge web program called Nutri-Scan combines technology and nutrition to help people live healthier lives. In order to give users important information on the ingredients and nutrients included in food products, it is based on a painstakingly curated database of food products. The NutriScore, a revolutionary element of Nutri-Scan, is built on this abundance of information. The NutriScore is a nutritional rating system that evaluates a food product's healthfulness by taking into consideration elements such as the nutritional balance, the presence of additives, and more. By just scanning a product's barcode or conducting a search within the application, users can access this NutriScore. This cutting-edge function enables people to quickly determine whether a food product is in line with their health objectives. Nutri-Scan provides a smooth sign-in and login process to significantly improve the customer experience. In addition to enabling customized recommendations, this paves the way for later features like food preferences and specialized dietary advice. The combination of nutrition and technology has advanced thanks to Nutri-Scan. It gives consumers a strong tool to decipher the mysteries of food labels and gives them the authority to take charge of their dietary decisions. As we move through a time when making health-conscious decisions is crucial, Nutri-Scan serves as a source of knowledge, pointing people in the direction of a healthier and more knowledgeable culinary journey. A healthier and happier world may be fostered one food decision at a time thanks to Nutri-Scan's user-friendly interface, cutting-edgedatabase, and NutriScore innovation

I. INTRODUCTION

Introducing Nutri-Scan, your key to making shrewder and healthier food choices. Understanding a food's nutritional value in a society where options abound might be difficult. This is where Nutri-Scan can help, providing a simple and educational option for both health-conscious people and curious diners. You may quickly and easily scan the barcode of any food package, from grocery store treasures to cupboard essentials, using our state-of-the-art web application. After carefully examining the product's ingredients and nutrient content, Nutri-Scan quickly provides a thorough NutriScore evaluation. This NutriScore acts as your nutritional compass, pointing you in the direction of foods that support your wellness and health objectives. However, we go beyond ratings. In order to promote openness and ensure that you are aware of exactly what you are consuming, Nutri-Scan offers a thorough explanation of the substances utilized in the meal packet. Nutri-Scan provides easy sign-in and login choices for a customized and improved experience. You can use this function to track your dietary choices over time, store your favorite goods, and get personalized recommendations based on your individual interests and goals. Nutri-Scan is your important tool, whether you're looking for healthier food options, managing dietary restrictions, or just wondering about what's on your plate. scan a barcode each time, take charge of your nutrition, and set out on a path to a healthier, more knowledgeable version of yourself. Welcome to Nutri-Scan, the future of eating, where nutrition meets knowledge

and making informed decisions becomes second nature.

II. LITERATURE REVIEW

The research paper "An Italian Case Study for Assessing Nutrient Intake through Nutrition-Related Mobile Apps" examines the utilization of nutrition-related mobile apps in Italy to evaluate nutrient intake. It underscores the growing trend of using such apps to promote healthy eating habits and combat chronic diseases. Three prominent nutrition-related mobile apps were employed to gather data from 28 participants in Italy. Through analysis, the researchers evaluated the nutrient composition of participants' diets and compared the findings with Italian Recommended Daily Intake (RDI) guidelines. Results indicated that employing nutrition-related mobile apps was a viable and effective approach for collecting nutrient intake data. However, the study revealed significant discrepancies in the accuracy and completeness of nutrient information provided by different apps.^[18]

This article delves into the significance of Optical Character Recognition (OCR) within machine vision, encompassing various disciplines such as pattern recognition, artificial intelligence, and image processing. It elucidates OCR's widespread application across industries, from real-time monitoring systems to office automation. The focus has shifted towards character recognition in natural environments, fueled by the proliferation of high-definition cameras in smartphones. Deep learning technologies, particularly in OCR, have revolutionized text detection and identification, leading to advancements in semantic segmentation and object recognition. Notably, deep learning's efficacy surpasses conventional techniques, as evidenced by improved accuracy and robustness in text recognition. Researchers are increasingly exploring complex text detection in natural settings, employing end-to-end networks and innovative structures like CTPN and CRNN for table detection and recognition.^[10]

The research paper explores various methods for mobile app account creation and login, including invitation codes, email, phone numbers, and unique usernames. It also covers biometric authentication like voice, face, iris, and fingerprint scanning, as well as third-party logins (e.g., WeChat, QQ, Weibo). Objective evaluation of each method's pros and cons illuminates the unified vs segmented system debate. It highlights that the decision to require login and registration hinges on the app's product form and the added value to user requests. The paper provides valuable insights for UI designers and stakeholders in human-computer interaction and e-commerce sectors.^[3]

This study describes an image processing technique that can automatically and accurately read QR and Bar codes with an accuracy of 87 percent. The photos are filtered, converted to grayscale, and then binaryized using the suggested approach. The experiments were created in Python and ran using internal data. The approach, which takes around 0.25 seconds to execute, is appropriate for real-world applications. The work's next goal is to put the suggested technique into practice on a microcontroller platform in order to create a proof-of-concept prototype for automated Bar/QR code detection.^[2]

The study article describes a mobile app prototype that scans the barcode or ingredients label of packaged food goods to provide consumers health recommendations. According to an early user research, the app is simple to use and may be useful in encouraging food habits that are healthful. The research makes other recommendations on how to discover possible allergies and additives in foreign language ingredient labels, such as quicker scanning and multilingual help.^[4] In order to categorize items, a series of deep learning algorithms (including data cleaning, tokenization, frequency calculation, and product classification) are used after a web crawler algorithm collects online reviews. After providing accurate login credentials, users may answer questions on their dietary intake, which is then combined with a genetic algorithm to provide recommendations that are specific to them. This method ensures the validity of the suggestions and customizes them to the user's desire while assisting users in understanding their current nutrient consumption and making product recommendations in line with it.^[6]

The study employed a mixed methodology to evaluate the effectiveness of FoodSwitch, a smartphone app promoting healthier food choices. A randomized controlled trial involving 800 participants assessed the app's impact on meal selections and salt intake. Additionally, a crowdsourcing approach gathered and analyzed nutritional information from Australian supermarkets to inform the app's development. Qualitative analysis of user feedback further explored the app's utility. This comprehensive approach suggests that FoodSwitch and its crowdsourced database have the potential

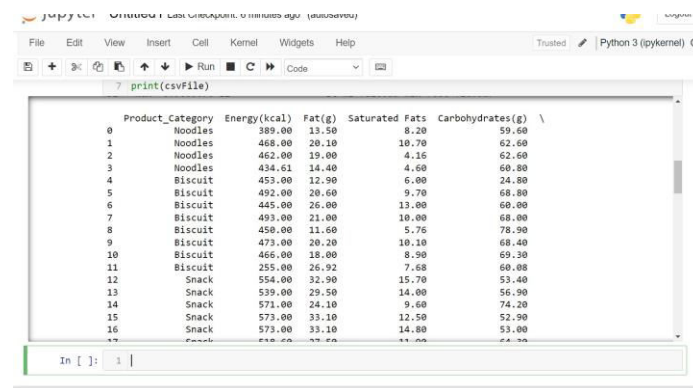
to improve consumer food decisions and contribute to better public health outcomes by offering personalized nutrition information and empowering informed choices.^[11]

The FoodSwitch initiative, developed by the George Institute for Global Health, aims to improve food choices and enhance nutrition through a smartphone app. Utilizing barcode scanning, it provides nutritional data and suggests healthier alternatives. A randomized controlled trial with 1,148 participants evaluated its effectiveness. Results indicate that the app positively impacts users' dietary habits, potentially reducing the risk of diet-related illnesses and promoting better public health outcomes by empowering informed food choices.^[20]

III. METHODOLOGY

A. Data Collection

Data gathering is of utmost importance at the beginning of the project. In order to do this, particular characteristics from food packaging, including specifics like ingredients and nutrient levels, must be manually extracted. Rigid organization and standardization techniques are used to protect data integrity and guarantee usability, fostering uniformity in the data stored for accurate nutritional assessments.



	Product_Category	Energy(kcal)	Fat(g)	Saturated Fats	Carbohydrates(g)
0	Noodles	389.00	13.50	8.20	59.60
1	Noodles	468.00	20.10	10.70	62.60
2	Noodles	462.00	19.00	4.16	62.60
3	Noodles	434.61	14.40	4.60	60.80
4	Biscuit	453.00	12.90	6.00	24.80
5	Biscuit	492.00	20.60	9.70	68.80
6	Biscuit	445.00	26.00	13.00	60.00
7	Biscuit	493.00	21.00	10.00	68.00
8	Biscuit	450.00	11.60	5.76	78.90
9	Biscuit	473.00	20.20	10.10	68.40
10	Biscuit	466.00	18.00	8.90	69.30
11	Biscuit	255.00	26.92	7.68	60.08
12	Snack	554.00	32.90	15.70	53.40
13	Snack	539.00	29.50	14.00	56.90
14	Snack	571.00	24.10	9.60	74.20
15	Snack	573.00	33.10	12.50	52.90
16	Snack	573.00	33.10	14.80	53.00

Fig. 1. Basic Model of epileptic seizure detection^[7]

B. User Authentication

A key component in improving user experiences is User Authentication and Profiles. We enable users to customize their interactions with the platform by integrating user registration and login options. The platform can now be customized to meet each user's needs and tastes thanks to the development of user profiles that allow preferences to be saved, favorite goods to be tracked, and search histories to be reviewed.

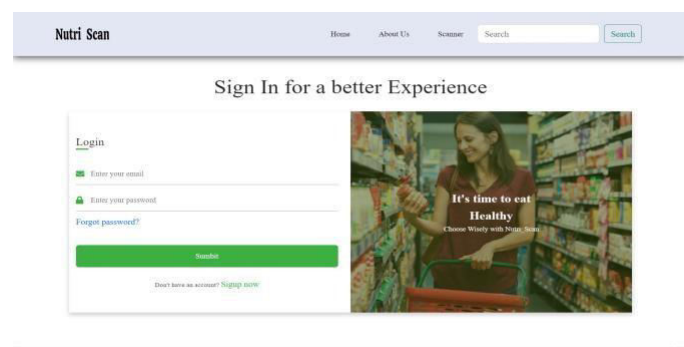


Fig. 2. Authentication

C. Barcode Scanner Integration

By incorporating a barcode scanning function and making use of the appropriate APIs or libraries, users will be able to use their device's camera to scan product barcodes. This connection simplifies the process of getting access to comprehensive product information, which is in keeping with our goal of making it easier to make informed dietary decisions.

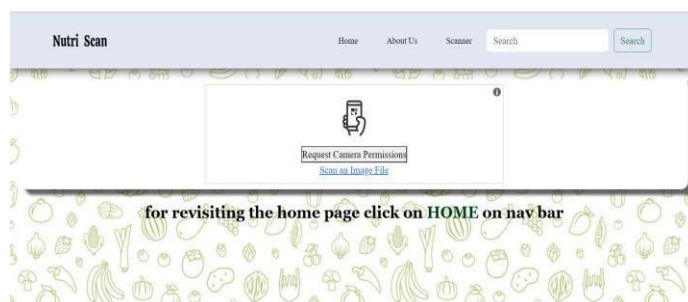


Fig. 3. Barcode Scanner

D. NutriScore Calculation

Using information about components and nutritional values and adhering to established nutritional scoring systems, we will develop algorithms for NutriScore calculation in this phase. The main emphasis will be on providing transparency and accuracy in the scoring process so that users can make informed dietary decisions based on trustworthy criteria

Nutri-Score points system											
Negative points						Positive points					
Category	A = Energy density		B = Simple sugars		C = Saturated fats		D = Salt		Category	E = Fruit and vegetables	
Unit	kcal / 100g	kcal / 100 ml	g / 100g	g / 100ml	g / 100g	%	mg / 100g	Unit	%	%	g / 100g
Points		(used for beverages)	(used for beverages)	(used for cooking fats)				Points		(used for beverages)	g / 100g
0	< 80	< 7.2	< 4.5	≤ 0	≤ 1	< 10	< 90	0	< 40	< 40	< 0.7
1	> 80	< 7.2	> 4.5	< 1.5	> 1	< 16	> 90	1	> 40		> 0.7
2	> 160	< 14.3	> 9.0	< 3.0	> 2	< 22	> 180	2	> 60	> 40	> 1.4
3	> 240	< 21.5	> 13.5	< 4.5	> 3	< 28	> 270	3			> 2.1
4	> 320	< 28.5	> 18.0	< 6.0	> 4	< 34	> 360	4		> 60	> 2.8
5	> 400	< 35.9	> 22.5	< 7.5	> 5	< 40	> 450	5	> 80		> 3.5
6	> 480	< 43.0	> 27.0	< 9.0	> 6	< 46	> 540	6			> 4.2
7	> 560	< 50.2	> 31.0	< 10.5	> 7	< 52	> 630	7			
8	> 640	< 57.4	> 36.0	< 12.0	> 8	< 58	> 720	8			
9	> 720	< 64.5	> 40.0	< 13.5	> 9	< 64	> 810	9			
10	> 800	> 64.5	> 45.0	> 13.5	> 10	> 64	> 900	10		> 80	
Total negative points: A + B + C + D						Total positive points: E + F + G					

Fig. 4. Nutri Score Calculation is based on this table

E. Testing and Deployment

We will thoroughly evaluate the web application during the testing and deployment phase, including assessments of its functionality, usability, performance, and security. Our goal is to guarantee data confidentiality and accuracy while providing a seamless user experience. We will choose a web hosting company for online deployment after testing is successfully finished, set up domain settings, and make sure the website is user-accessible. This phase is essential for offering customers a dependable platform where they may acquire precise nutritional data and make knowledgeable dietary selections.

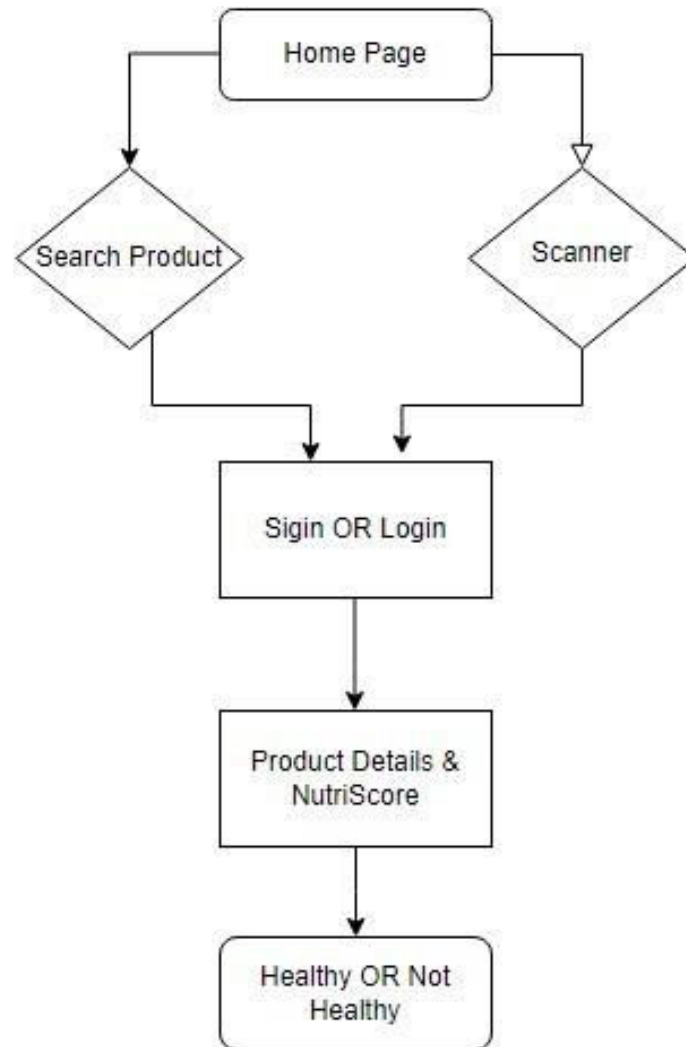


Fig. 5. Flow diagram

IV. CONCLUSION AND FUTURE WORK

In conclusion, the development of this web application marks a significant stride in promoting healthier lifestyles and informed food choices. By enabling users to access detailed nutritional information and NutriScores for various food products through barcode scanning or product search, it offers a user-friendly approach to understanding nutritional values. The incorporation of user authentication and personalized features enhances the overall user experience, allowing individuals to tailor their dietary choices to their health goals and preferences. Looking ahead, the integration of food preferences and ongoing database enhancements promise even greater user empowerment and access to accurate nutritional data. Ultimately, this application serves as a beacon of innovation in bridging the gap between diet and technology for improved health and well-being.

In future developments of this web application, enhancing user engagement and nutritional precision are key objectives. Customized food preferences will empower users to tailor their dietary decisions to their unique needs and preferences, fostering more informed choices. A recommendation system will suggest healthier alternatives within the same product category, encouraging positive dietary changes. Regular updates to the database ensure users access the latest nutritional information, reinforcing the application's reliability. These advancements promise to further promote healthier lifestyles and informed dietary choices, solidifying the application's utility in the realm of nutrition and well-being.

REFERENCES

- [1] Mohd Saad, Norhashimah Hashim, Nik Mohd Zari- fie, 2013. Barcode Recognition System. International Journal of Emerging Trends Technology in Computer Science. 2, pp. 278-283
- [2] Aman A. , Singh A. , Raj A. and Raj S. , 2020. An Efficient Bar/QR Code Recognition System for Consumer Service Applications. Zooming Innovation in Consumer Technologies Conference (ZINC), 2020 ,Novi Sad, Serbia.
- [3] Wang, Z.Y. and Sun, Y., 2018. How to Design the Registration and Login Function of APP. Journal of Software Engineering and Applications, 11, pp. 223-234.
- [4] Wong, Man Ye, Qing Kai, Yuk Kylar, Chan Pang, Wai-Man Kwan, Kin, 2016. A Mobile Adviser of Healthy Eating by Reading Ingredient Labels. 6th EAI International Conference on Wireless Mobile Communication and Healthcare, 2020, Milan, Italy.
- [5] Maninder Meenu a, Chinmay Kurade b, Bala Chakravarthy Neelapu c, Sahil Kalra b, Hosahalli S. Ramaswamy d, Yong Yu, 2021 .A concise review on food quality assessment using digital image processing [Online] [Updated on 5 th October 2021] Available at: <https://www.sciencedirect.com/science/article/pii/S0924224421005380> [Accessed 1 st March 2023]
- [6] Pratiksha Ashok. Naik Ie, 2020. Intelligent Food Recommendation System Using Machine Learning. International Journal of Innovative Science and Research Technology, Volume 5(2456-2165), pp. 616-619
- [7] Pagano, Dennis Maalej, Walid, 2013. User Feedback in the AppStore: An Empirical Study. 21st IEEE International Requirements Engineering Conference, 2013 .
- [8] Mapanga, Innocent Kadebu, Prudence, 2013. Database Management Systems: A NoSQL Analysis. International Journal of Modern Communication Technologies Research (IJM- CTR). Volume-1. pp . 12-18.
- [9] Verma, Hemant Saini, Ajay Borgamwar, Shantanu Pande, Sandeep Pandit, Aditya, 2020. Food Packet Analyzer. International Research Journal of Engineering and Technology (IRJET), Volume 7(4), pp. (4056-4063).
- [10] He Y. , 2020. Research on Text Detection and Recognition Based on OCR Recognition Technology. IEEE 3rd International Conference on Information Systems and Computer Aided Education (ICISCAE) , 2020, Dalian, China.
- [11] Rajani B. Phatak, Prajakta R. Joshi, and Pranjali S. Kulkarni. "FoodScan: Food Monitoring App by Scanning the Groceries Receipts," International Journal of Computer Applications, vol. 181, no. 42, pp. 1-5, January 2018. King Saud University, P.O.Box 2454, Riyadh 11451, Saudi Arabia
- [12] Sahil Kamboj, Neeraj Gupta, Julie D Bandral, Garima Gandotra and Nadira Anjum, (2020), Food safety and hygiene: A review, Division of Food Science and Technology, MDPI ,St. Alban-Anlage 66, 4052 Basel, Switzerland
- [13] Elizabeth Dunford, Helen Trevena, Chester Goodsell, Ka Hung Ng, Jacqui Webster, Audra Millis, Stan Goldstein, Orla Hugueniot, and Bruce Neal, FoodSwitch, The George Institute for Global Health in Australia
- [14] Ann Janeth Garcia, Danielle Jaye Agron, and Wansu Lim. "Android Application in Food Ordering System," Proceedings of the 2017 International Conference on Information and Communication Technology Convergence (ICTC), Jeju Island, South Korea, 2017, pp. 147-149, doi: 10.1109/ICTC.2017.8190810.
- [15] Sak, J., Suchodolska, M. (2021). Artificial Intelligence in Nutrients Science. Javadi, B., Trieu, Q. L., Matawie, K. M., Calheiros, R. N. (2020). Smart FoodScanner System Based on Mobile Edge Computing. 2020 IEEE International Conference on Cloud Engineering (IC2E).
- [16] Klaus L. Fuchs, Mirella Haldimann, Alexander Ilıc, Denis Vuckovac. 2018 International Conference on Information and Communication Technology Convergence (ICTC).
- [17] Carol Byrd-Bredbenner, Carl A. Bredbenner (2010). The Nutrition Company, Long Valley, New Jersey, USA. 40(3):305-313.
- [18] Lorenza Mistura , Francisco Javier Comendador, Laura D'Addezio¹, Deborah Martone and Aida Turrini 2021. An Italian Case study for assessing Nutrient intake through Nutrition- Related mobile apps.
- [19] Gabriela Almeida, Melissa Sponga, Laura Melo, Ana Margarida Pisco Almeida, Ana Margarida Pereira, Raquel Guimar, Nuno Nogueira, Henrique Barros, and Olga Amaral, Diet-Related Mobile Apps to Promote Healthy Eating and Proper Nutrition: A Content Analysis and Quality Assessment, (2018), Rua das Taipas 135, 4050-091 Porto, Portugal.
- [20] Maria F Vasilogiou, Klazine van der Horst, Thomai Stathopoulou, Micheal P Jaeggi, Giulia S Tedde, Ya Lu, and Stavroula Mougiakakou, Published online 2021 ARTORG Center for Biomedical Engineering Research, University of Bern, Bern, Switzerland.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



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