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CHENNAI 'A'**

Ingredient Reader with Chemical Alert System

Know What You Consume!

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Abstract

Consumers are **increasingly exposed to harmful chemicals and allergens** present in everyday products such as food, cosmetics, and household items. Ingredient labels are often printed in small fonts, **use complex chemical terminology**, and can be misleading, making it difficult for the average shopper to identify potentially dangerous substances. Existing solutions primarily rely on barcode databases, which may not cover all products, especially local or unbranded items, and often lack personalized health risk alerts.

This **lack of accessible, real-time ingredient analysis leads to uninformed purchasing decisions**, increased health risks for allergy sufferers and sensitive individuals, and reduced consumer trust in product safety.



Prioritizing Health Protection

The core purpose of our system is to safeguard user health by identifying and alerting them to potentially harmful substances. We aim to be a vital tool for everyone, especially those with specific sensitivities.



Toxic & Allergenic Alerts

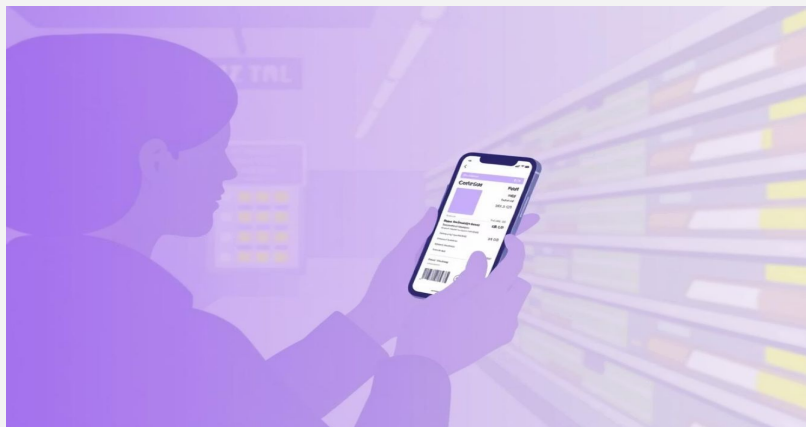
The system is designed to immediately flag the presence of toxic, allergenic, or harmful chemicals such as parabens, sulfates, MSG, and various preservatives. This proactive alert system helps users avoid adverse reactions.

Support for Sensitivities

For individuals with allergies or medical sensitivities, our tool is indispensable. It helps them navigate product choices with confidence, ensuring they can avoid substances that could trigger severe health issues.

Revolutionizing Consumer Awareness

In an increasingly complex world of product labels, our "Ingredient Reader with Chemical Alert System" empowers consumers to make informed decisions about the products they use daily. From food to cosmetics and household items, understanding what goes into these products is crucial for personal well-being and health.



Informed Decision-Making

Our system encourages consumers to understand the ingredients in their products, fostering a proactive approach to health and safety. By highlighting questionable chemicals, we enable users to choose products that align with their values and health goals.

Transparency and Trust

We bridge the information gap between manufacturers and consumers, promoting greater transparency in product composition. This builds trust and allows individuals to feel confident about what they are bringing into their homes and bodies.

Objective

- **To empower consumers to make informed purchasing decisions by providing instant, accurate detection of harmful chemicals and allergens directly from product labels using OCR technology.**
- **To create a versatile ingredient scanning system that works across food, cosmetics, and household products, without relying solely on barcode databases.**
- **To offer personalized safety alerts and safer product recommendations tailored to individual health profiles, allergies, and dietary restrictions.**
- **To track and analyze long-term exposure to harmful substances, enabling users to monitor and reduce their chemical intake over time.**
- **To enhance public awareness of ingredient safety through accessible education tools, real-time alerts, and an optional SOS feature for severe allergy emergencies.**

Workflow :

Scan Label

User presses a button to capture an image of the product label.

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Text Extraction

The image is processed using Tesseract OCR to extract the ingredient list.

Chemical Matching

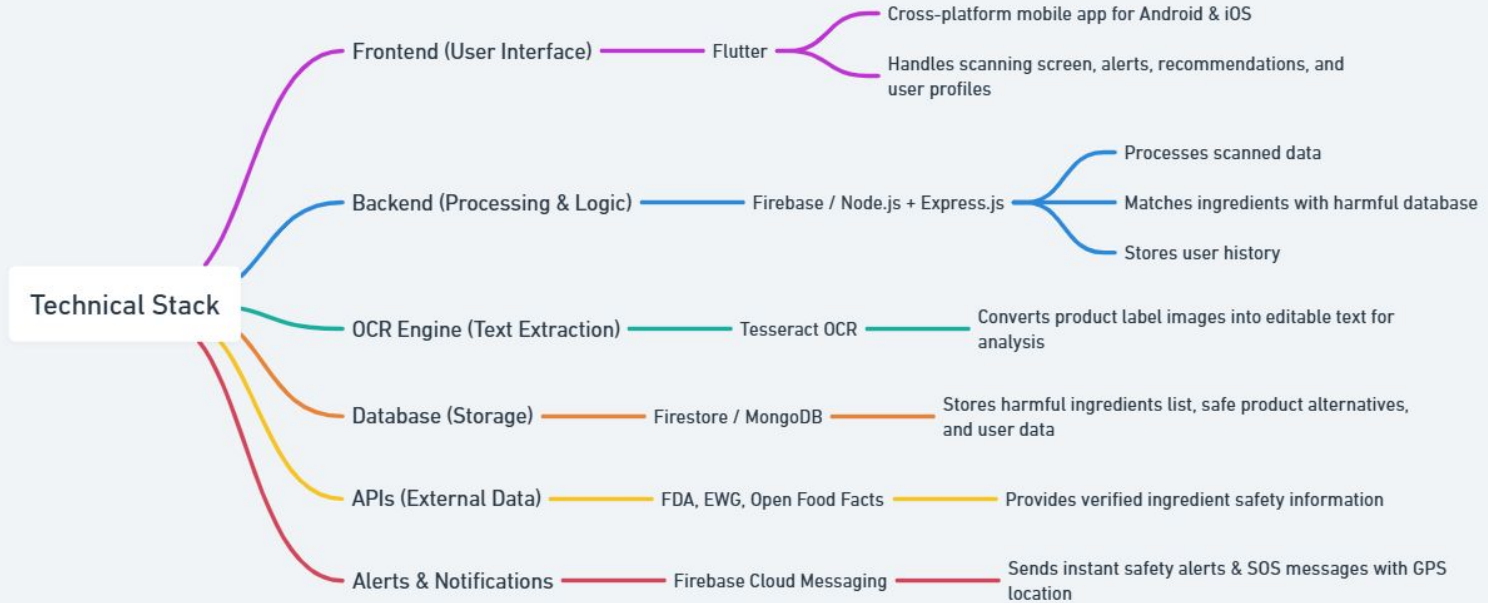
The extracted text is compared against a database of harmful ingredients.

Alert Mechanism

If a flagged chemical is detected, a red LED is triggered. If all ingredients are safe, a green LED is shown.



TECHNICAL STACK AND APPLICATION USED



HOW is it different , Why Our App Stands Out ?

OCR (Optical Character Recognition)



Unlike most existing product safety apps that depend only on barcode scanning, our system uses **OCR (Optical Character Recognition)** to read ingredient lists directly from any label. This means it can analyze **any product, branded or unbranded**, capture even the smallest printed details, and work across multiple languages. With OCR, our app breaks the limits of barcode databases and offers **true universal label scanning** for instant, reliable safety alerts.

FUTURE ENHANCEMENTS:

In the future, the Ingredient Reader with Chemical Alert System can be upgraded with AI to detect and predict risks from new or unknown chemicals, and support multiple languages to make label scanning accessible worldwide. Voice alerts can be added to assist visually impaired users, while a crowdsourced database will allow people to share and update product safety information. An offline chemical database will make the app usable in areas without internet, and integration with wearable devices can provide instant red or green alerts. Additional features such as product recall notifications and a health dashboard to track long-term chemical exposure will further improve safety and user awareness.



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THANKYOU!

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