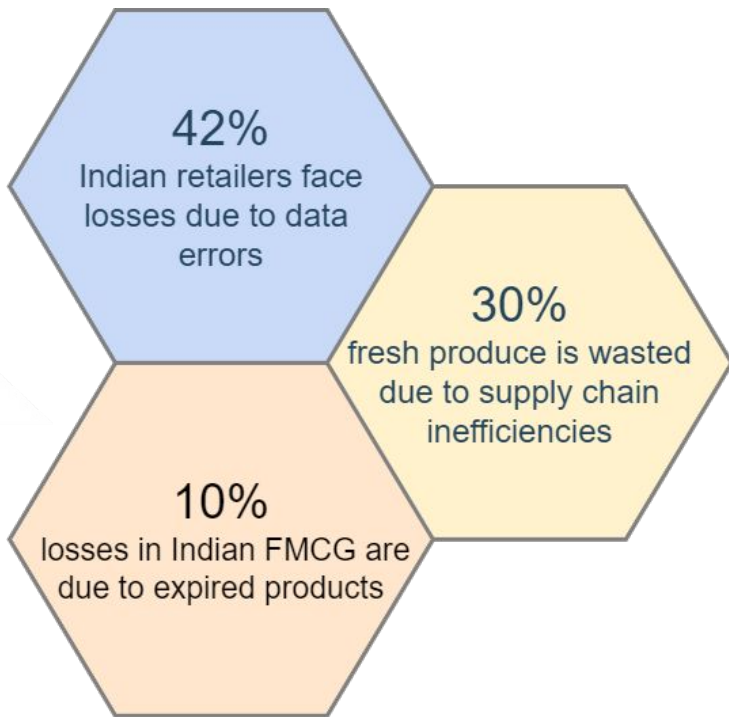




**AI-POWERED PRODUCT DETAILS EXTRACTION,
AND FRESHNESS DETECTION OF FRESH PRODUCE**

(Robotics Track)

Problem Overview



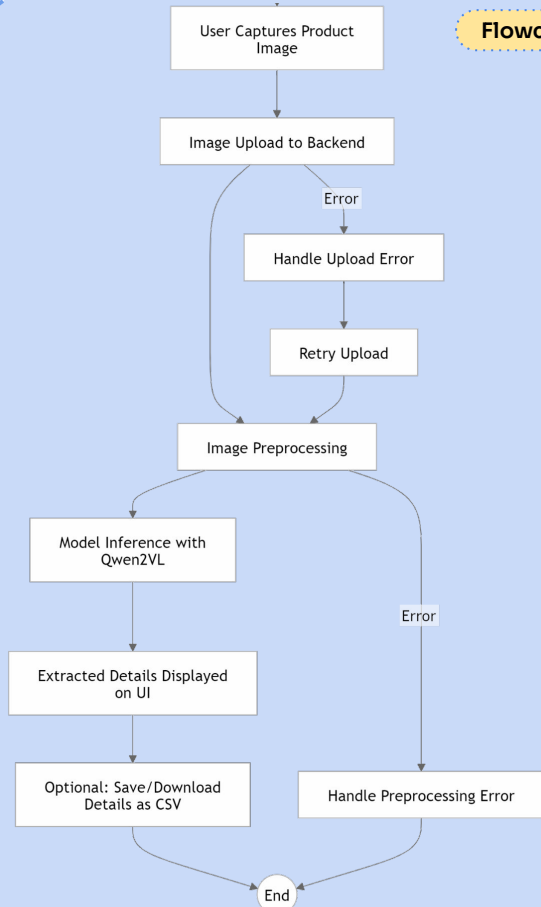
Problem Statements:

To automate the extraction of product details like **Brand, MRP, Expiry Date**, and **Net Content** from packaging, eliminating the errors and inefficiencies of manual data entry.

To detect the **freshness** of perishable items like fruits and vegetables enabling retailers to optimize food quality and minimize wastage.

Solution: Extraction of product details

Flowchart:



Application Overview:

The screenshot displays the Flipkart application interface. The top navigation bar includes the Flipkart logo and links for 'Details Extraction' and 'Freshness Detection'. The main content area shows a photograph of three products: Amul Butter, Bournvita, and Neem-Tulsi Face Wash. To the right of the image, a 'DETAILS:' section contains a table with the following data:

Product	MRP	Expiry Date	NL Content	Qty.	Timestamp	Expired?	Lifespan
Amul Butter	60	25/SEP/25	NA	1	2024-12-29T16:02:59.616065+05:30	No	9 month(s)
Bournvita	NA	03/06/25	NA	1	2024-12-29T16:02:59.616065+05:30	No	6 month(s)
Neem, Tulsi Face Wash	NA	NA	NA	1	2024-12-29T16:02:59.616065+05:30	NA	NA

Below the table, there are four buttons: 'Capture', 'Extract Details', 'Download Details', and 'View Database'. The bottom of the screen shows a Windows taskbar with the date and time as 29-12-2024, 16:03.

Solution: Freshness detection of fresh produce

User captures image of a fruit, vegetable, bread etc.

Clicks on the "Freshness Index" button to process the image.

The system automatically detects the name of the fruit or vegetable.

It calculates and displays the Freshness Index.

User can save the details for future reference or integration.






Application Overview:

DETAILS:

Timestamp	Produce	Freshness	Expected Life Span (days)
2024-12-29T00:23:44.146976+05:30	Pomegranate	6.5	3-4 days
2024-12-29T00:23:44.146976+05:30	Pomegranate	8.5	6-7 days
2024-12-29T00:23:44.146976+05:30	Banana	2.8	1 day

Freshness Index Scale for Fresh Produce

Freshness Level	Score Range	Description
Excellent	8.0-10.0	Peak freshness, optimal quality
Good	6.0-7.9	Fresh with minor quality reductions
Fair	4.0-5.9	Noticeable quality decline, nearing spoilage
Poor	2.0-3.9	Significant spoilage, not ideal for consumption
Unusable	0-1.9	Completely spoiled, unsuitable for sale or consumption

INPUT	OUTPUT
	Name: tomato Freshness Index: 8.0
	Name: coriander Freshness Index: 6.7
	Name: apple Freshness Index: 7.0
	Name: beet Freshness Index: 7.9
	Name: spinach Freshness Index: 8.5

Technology used

Environment Setup: Python v3.7 or higher

Base Model: Qwen2VL-7B-Instruct

Why Qwen2VL model?

- Vision-Language Alignment
- Dynamic Resolution
- Open Source

Fine-tuning Setup: self curated dataset (600+)

WebApp Setup:

- **Backend:**
FastAPI: A modern web framework for building APIs with Python.
- **Frontend:**
HTML, CSS, and JavaScript

Database Setup:

- SQLite3
- Includes: Product details, and freshness details database

Deployment Setup:

- Google Colab (cloud deployment)
- Docker and ngrok



Image	Entity Name	Entity Value
	Item Name	Frooti
	MRP	150.00
	Expiry Date	25/02/25
	Net Content	500 g

Sample Outputs

Future Scope

Enhanced Model Training with Larger Datasets: Continue fine-tuning the model with diverse datasets to enhance extraction accuracy and speed.

Scalability through GPU Upgrades: Leverage more powerful GPUs to reduce training time and enable fine-tuning with larger models for better accuracy.

Multi-Language Support through Fine-Tuning: Enable text extraction in regional languages for broader accessibility.

Appendices

GitHub Repository:

<https://github.com/AnamtaRehman/flipkartGrid>

References:

<https://viso.ai/deep-learning/vision-language-models/>

[https://en.wikipedia.org/wiki/Optical character recognition](https://en.wikipedia.org/wiki/Optical_character_recognition)

THANK YOU