



Smart Predictive Warehouse System

– Revolutionizing Retail Efficiency with AI & Automation



We are

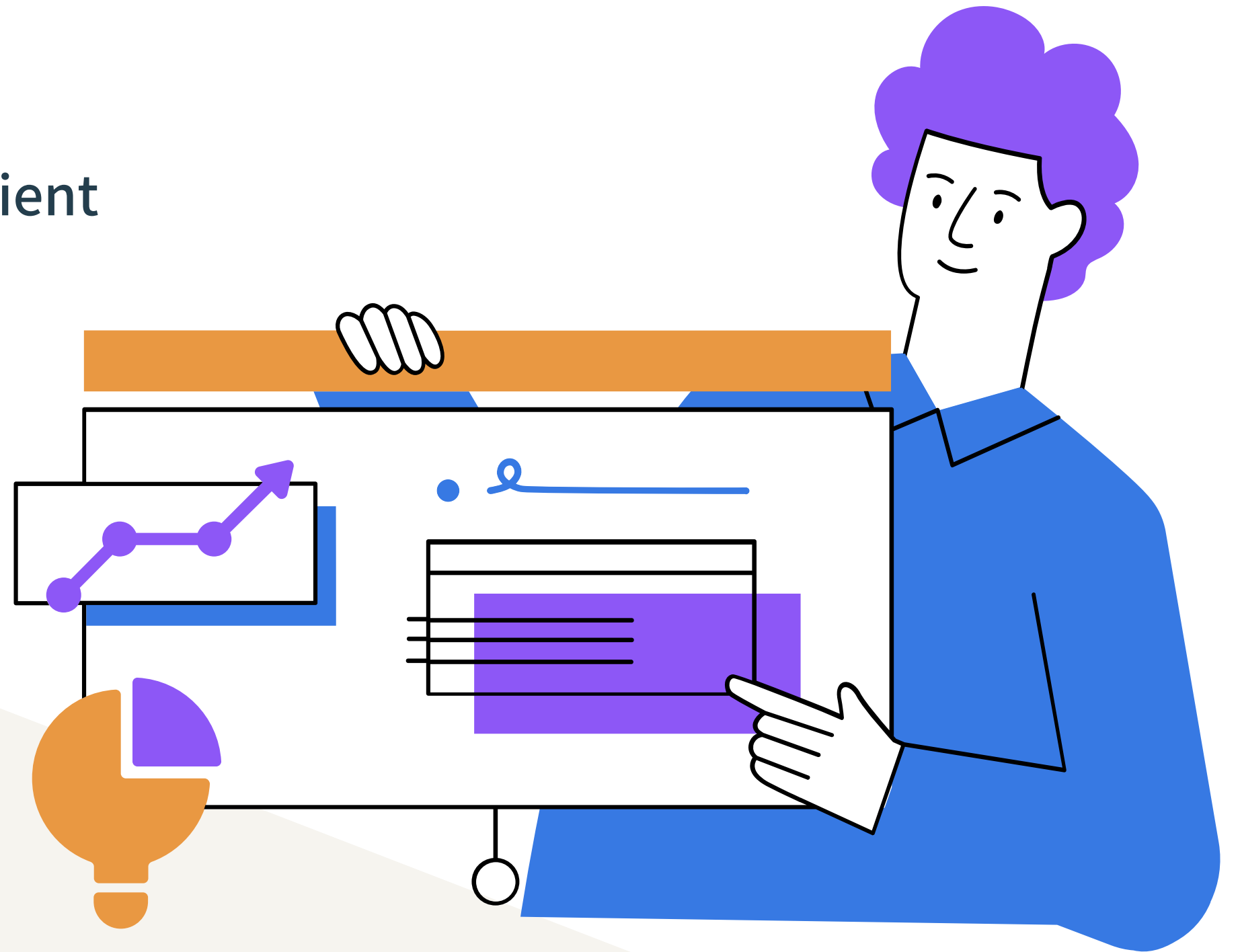
- Title: Smart Predictive Warehouse System
- Subtitle: Hackathon Submission
- Team Name: 3 Idiots
- Members: Hemang Joshi,
Sanidhya,
Vijay Kumar Saini



Problem Statement

“Inventory mismanagement, expired goods, and poor demand forecasting lead to revenue loss in retail.”

- Manual inventory management = inefficient
- Expired items = loss of trust & money
- Lack of real-time product tracking
- No regional demand insights



Our Solution

A **QR based, AI enhanced & IOT powered** model which has :

- QR based entry of goods, with stocks, & sales tracking
- ML powered dynamic offers & shelf placements
- Aisle display powered by the ML model



Key features :

1. Inventory Management

- QR based entry of good (with expiry)
- Smart way to manage stocks and log sales, with alerts on restocking and overstocking

2. Goods Sales Analysis

- Reports regarding the trends of sales
- Ranking of goods based on predictive modelling of demand of goods
- Basketing of goods (for eg. Beer & Diapers sell great together)

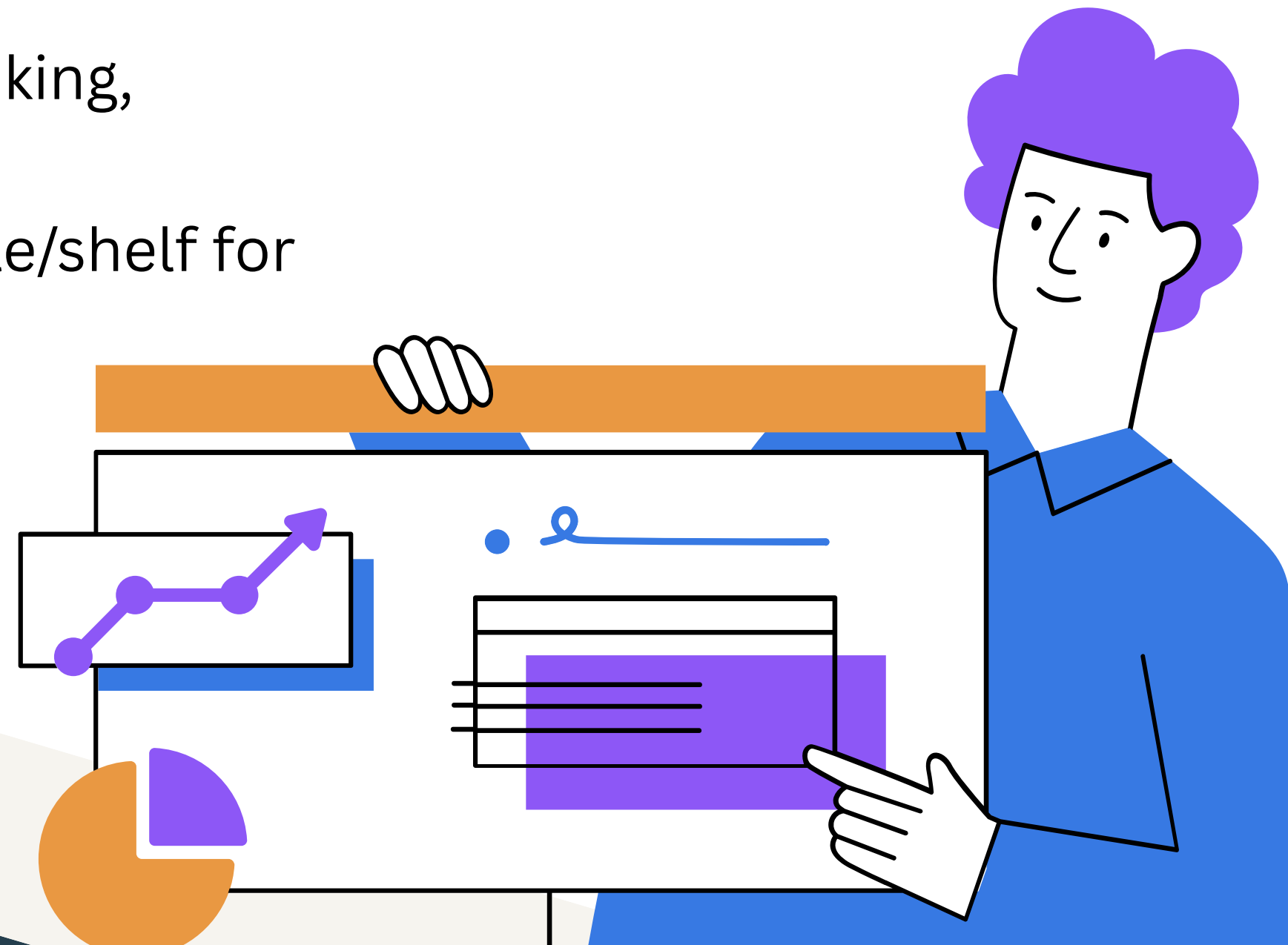


3. Dynamic Offers

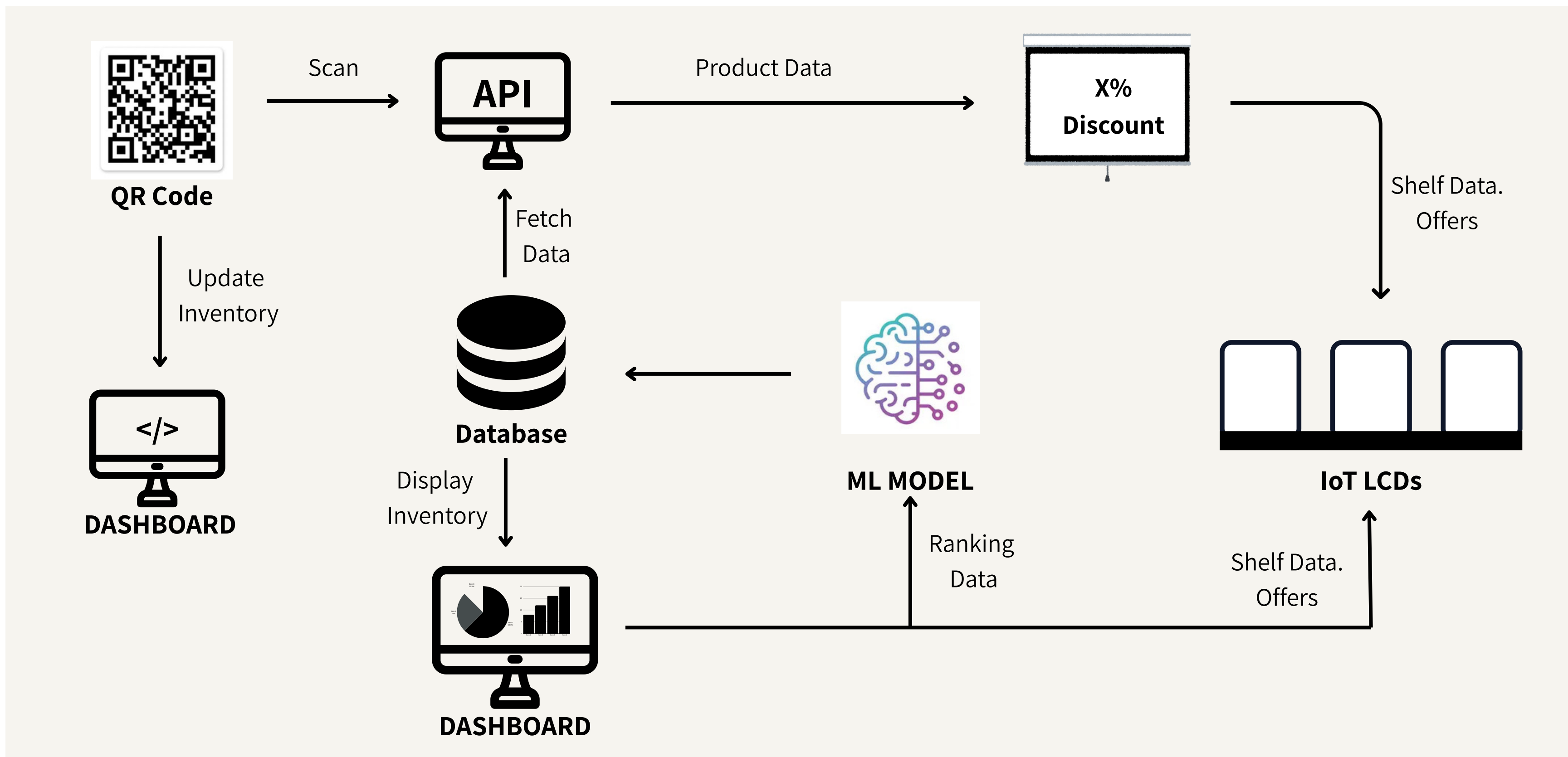
- Offers based on the expiry and stock size

4. Automated Aisle Placement

- Aisle placement suggestions based on the ranking, basketing and expiry of goods
- IoT based LCD system to display over the aisle/shelf for ease in change of placement of goods



Architecture Diagram



Dataset & Dashboard

FRONTEND

React.js + HTML + CSS +
React Native (Expo Go)

BACKEND

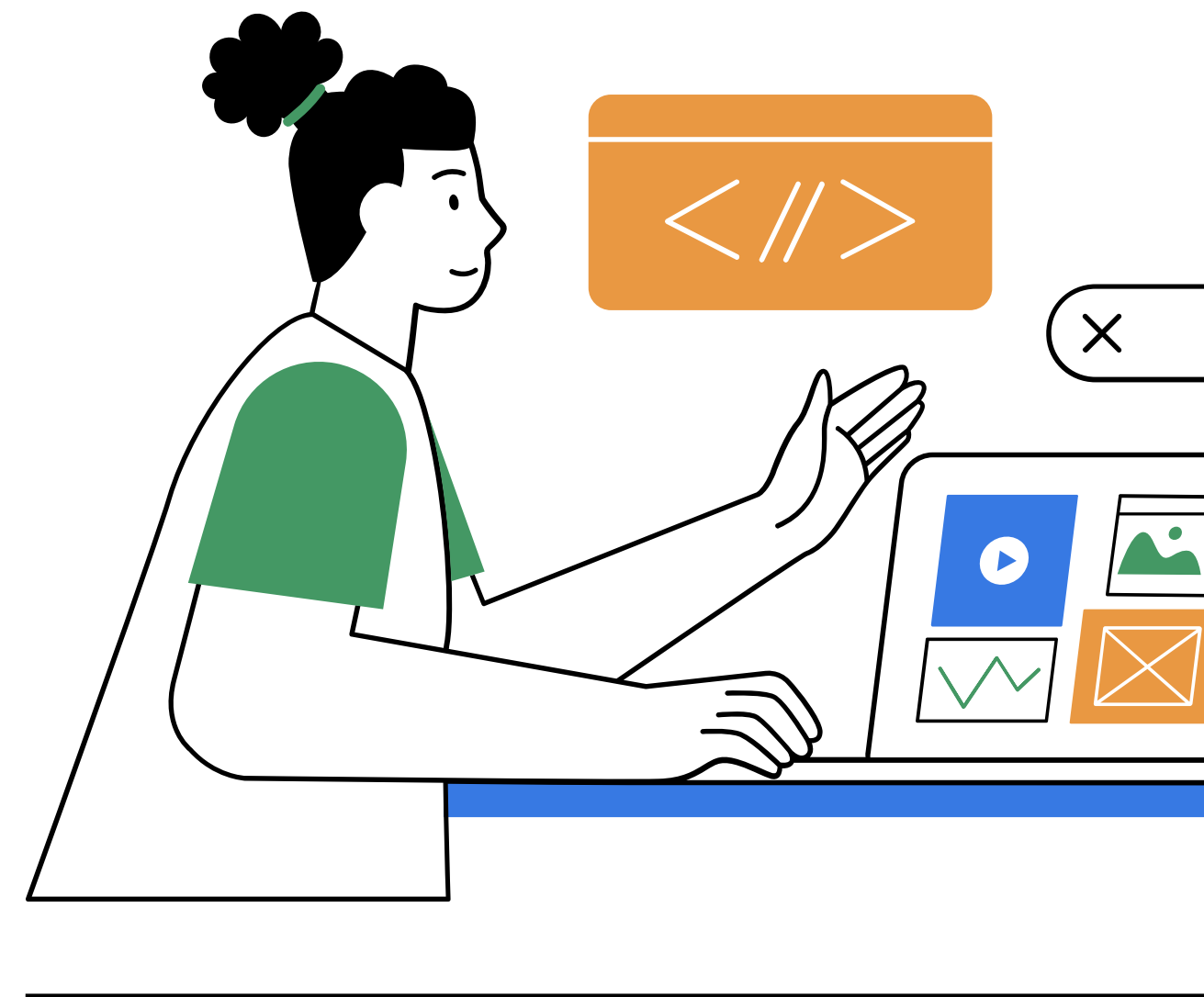
Flask (Python) + FastAPI

DATABASE AND MODEL

MySQL, scikit-learn, pandas,
joblib, mlxtend, matplotlib

HARDWARE

ESP32 + I2C LCD + LEDs +
Buzzer



Future Scope:

- **Advanced ML Integration** : Incorporating seasonality and price elasticity models to adapt to market trends dynamically.
- **Centralized Store Management**: Unified dashboard to manage multiple retail locations from a single control point.
- **Computer Vision + Smart Sensors** : Deploy smart shelves for live inventory insights and theft detection.
- **Toward Automated Stores** : Minimizing human intervention to only restocking and critical decisions, enabling near-autonomous retail operations.



Thank You