UMHackathon 2025: Grab Problem Statement

Theme: Economic empowerment through AI (from Grab's vision + AI)

Task 2: MEX Assistant – Insights

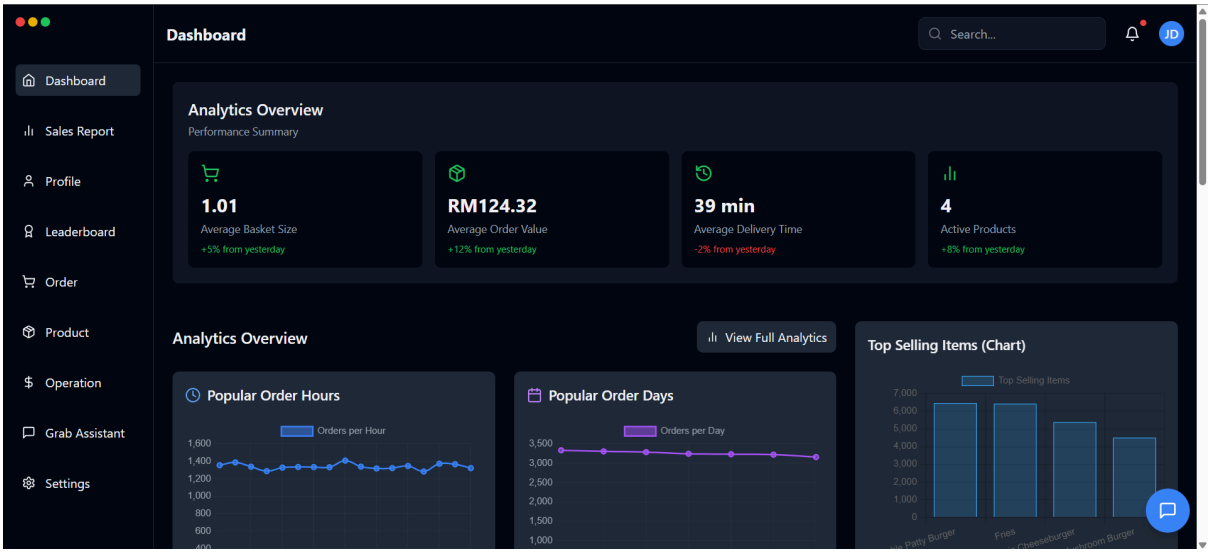
Group: LLF

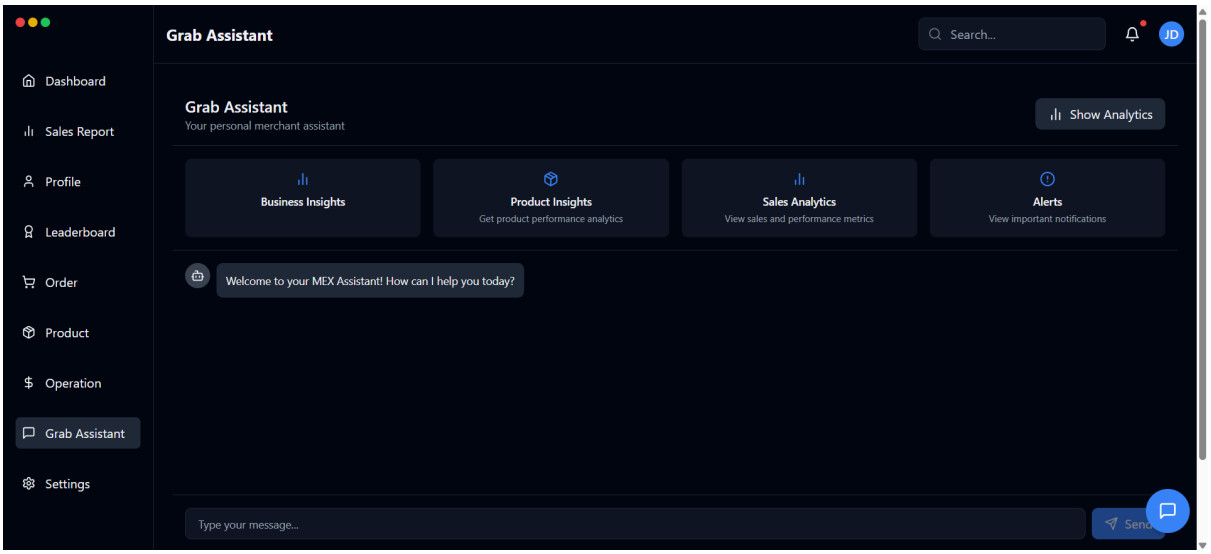
1.0 Solution Architecture: MEX Assistant

1.1 Overview

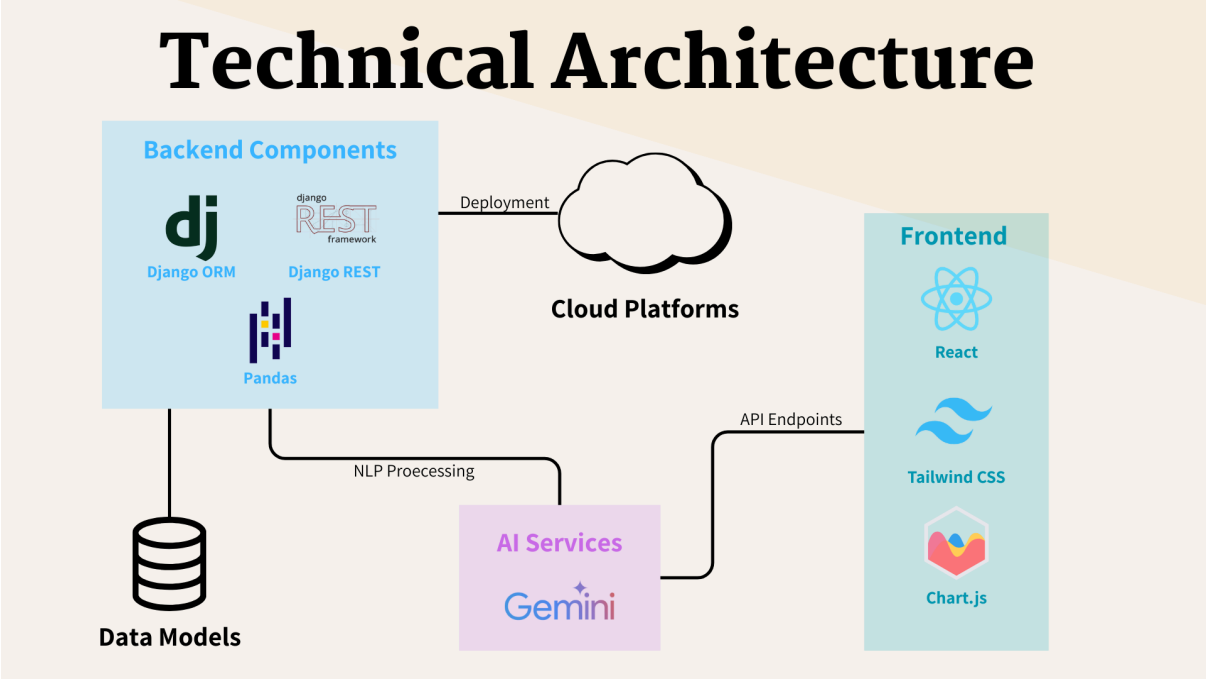
MEX Assistant is a web-based platform designed to empower Grab merchants with:

- A real-time business insights dashboard for data-driven decision-making.
- A chat-based AI assistant for instant merchant support with personalized guidance and business insights (e.g., sales queries, operational guidance).





1.2 Technical Architecture



Short Breakdown:

- Backend: Django (ORM + REST APIs) for server logic.
- Data: Pandas for processing/aggregation of synthetic datasets.
- AI: Gemini API (Google's GenAI) for text/LLM tasks (e.g., recommendations, insights).
- Frontend: React + Tailwind CSS for UI, Chart.js for graphs.

2.0 Data Utilization

2.1 Synthetic Datasets

File	Description
merchant.csv	Merchant profiles (location, category, tier, etc.)
transaction_data.csv	Transaction logs (order ID, date, revenue, delivery time)
transaction_items.csv	Item-level data per transaction (operation)
items.csv	Menu item metadata
keywords.csv	Keyword-item mapping for discovery/SEO

To enable behavior-based insights and personalization, the following datasets are merged together:

- merchant.csv
- transaction_data.csv
- transaction_items.csv
- items.csv

The merged structure allows for merchant-centric analysis with full visibility into order flow, item-level performance, and revenue dynamics.

The keywords.csv file is not merged with the core analytics dataset. Instead, it is used exclusively for SEO optimization by:

- Mapping each keyword to its associated order, checkout, view.
- Evaluating keyword performance based on its engagement.
- Recommending high-performing or trending keywords for better discoverability

3.0 Personalization Strategies

3.1 Behavior-Based Insights

Analyzes each merchant's past and current data to identify patterns, behaviors, and opportunities:

- Sales Performance – Tracks revenue trends and flags anomalies.
- Sales Profit – Calculates item-level and time-based profit margins.
- Popular & Underperforming Items – Identifies best-sellers, stagnating products, and seasonal trends.
- Customer Behavior – Detects high-traffic time windows and order frequency to recommend operational adjustments.

3.2 Dynamic Recommendations

Delivers merchant-specific suggestions to optimize growth and streamline operations:

- Plan some meal sets to improve the customer loyalty and sales performance.
- Suggest a promotion event based on least-selling items that's dropped in performance
- Restock fast-moving items based on their inventory turnover

3.3 Proactive & Context-Aware Alerts

Anticipates merchant needs by detecting key metrics in real time and sending alerts accordingly:

- “Your inventory for Item A is low.”
- “Revenue dropped 15% this week compared to last.”

3.4 SEO Keyword Optimization

The assistant also provides keyword analytics and SEO enhancement suggestions to improve discoverability on the Grab platform:

- Reviews the current keywords used in item titles or descriptions.
- Measures keyword effectiveness based on search frequency and conversion.
- Recommends high-impact keywords to improve visibility and engagement.

3.5 Data-Driven Personalization Chatbot

The personalization system leverages key performance indicators (KPIs) computed per merchant, including:

- Top & Bottom Performing Items
- Average Basket Size & Order Value
- Popular Ordering Times & Days
- Delivery Performance & Total Revenue

These metrics form the foundation for dynamic Gemini-powered insights and proactive operational guidance.