Sri Lanka AI Challenge 2025 (SLAIC 2025): Case Study

Smart Shopping Assistant: Intelligent Multi-Vendor Grocery Planner

Background

In the post-pandemic economy, Sri Lankan households face increasing difficulty in balancing price, quality, and convenience when purchasing groceries.

The grocery retail landscape is highly fragmented, with price volatility, inconsistent product availability, and minimal interoperability between vendors. The Smart Shopping Assistant is designed to address these challenges by leveraging autonomous AI agents capable of planning, optimizing, and executing shopping tasks in real time.

Problem Context

Sri Lankan shoppers face multiple barriers to efficient and cost-effective grocery shopping:

1. **Lack of Price Transparency**: No central source to compare prices across supermarkets, general trade outlets, and neighborhood shops.

2. **Inconsistent Product Availability**: Stock levels vary widely and are often not reflected in online listings.

3. **Manual Comparison Process**: Shoppers must browse multiple platforms or visit stores physically to compare prices and availability.

4. **No Household Inventory Integration**: Leads to duplicate purchases or missed essentials.

5. **Fragmented Delivery Ecosystem**: Vendors have different schedules, service coverage, and delivery fees.

6. **Lack of Personalization**: Most systems fail to adapt to dietary needs, brand preferences, and buying patterns.

7. **Loyalty & Rewards in Silos**: Points, discounts, and offers are not unified during decision-making.

8. **Budget Management Challenges**: No dynamic tool exists to optimize purchases within a fixed budget.

Agentic AI Opportunity

The Smart Shopping Assistant will be powered by a multi-agent AI architecture, with each agent serving a distinct role:

● **Data Acquisition Agent**: Gathers real-time price, availability, and promotion data via APIs, web scraping, or crowdsourcing.

● **Budget Optimization Agent**: Dynamically allocates spending across vendors to maximize value.

● **Personalization Agent**: Learns user preferences, dietary restrictions, and brand affinities.

● **Logistics Agent**: Consolidates orders for optimal delivery timing and cost.

● **Loyalty Aggregator Agent**: Integrates loyalty points, bank offers, and member discounts into purchase decisions.

● **Execution Agent**: Places and tracks multi-vendor orders automatically.

This agentic approach enables autonomous decision-making, ensuring that every purchase is optimized for price, availability, convenience, and personalization.

Expected User Outcomes

● **10–20% Savings** on total grocery expenditure through intelligent vendor selection and deal aggregation.

● **80% Reduction** in time spent on shopping list creation, price comparison, and order placement.

● **Reduced food wastage** through integration with household inventory tracking.

● **Greater access** to neighborhood vendors lacking a digital presence.

Data & API Resources

Participants may use real, mock, or hybrid datasets. Suggested sources include (but are not limited to):

- **[Sri Lanka Open Data Portal](#)** – Economic and retail datasets.

- **[WFP Food Price API](#)** – Commodity price tracking.

- **[Central Bank of Sri Lanka – Economic Data](#)** – Inflation and economic indicators.

- **[World Bank Microdata on Food Prices](#)** – Market-level food pricing trends.

- **Vendor website scraping** ([Keells](#), [Cargills](#), [Glomark](#), [Kapruka](#), [Lassana](#), [Onlinekade](#), [Celeste](#), [Daraz](#)) – Real-time retail prices and offers.

Structured Outcome

The Smart Shopping Assistant combines agentic AI capabilities, market data integration, and personalization to transform grocery shopping into a cost-efficient, time-saving, and intelligent experience. By solving real consumer pain points while supporting both modern and neighborhood vendors, this solution has the potential to redefine the grocery retail ecosystem in Sri Lanka.

Approach

The Smart Shopping Assistant will leverage a structured, multi-step process to seamlessly convert a user's shopping intent, whether captured from a handwritten list, past bill, or digital input, into an optimized purchase plan.

First, the system will extract and standardize product details, quantities, and preferences, aligning them with a curated product knowledge base. It will then integrate the user's context (e.g., budget, preferred brands, dietary needs, loyalty memberships) and location-based constraints (e.g., delivery radius, vendor coverage, available slots).

Using autonomous data-gathering capabilities, the system will aggregate real-time prices, promotions, stock availability, and delivery options from both modern trade and neighborhood vendors. This information will feed into a decision-making process that generates tailored purchase recommendations, either for direct home delivery or as a curated list of store options, based on cost efficiency, delivery speed, and user priorities.

Throughout, the system will ensure privacy, respect user-defined constraints, and maintain transparency in recommendations while continuously learning from past interactions to improve future results.