

## Problem Definition

### 1. Identify the Problem Area:

**A/B Testing** – Optimizing the online display of promotional content to improve customer engagement and sales.

### 2. Conduct Preliminary Research:

In the competitive e-commerce landscape, especially in the grocery and retail sector, the way products are displayed on a website can significantly impact user behavior. Consumers often make decisions based on visual hierarchy and placement of promotions. Supermarkets frequently promote “Hot Sales” items on their homepage or product listing pages, but there is little standardization in the order of presentation. This opens the door for data-driven experimentation to determine what layout maximizes user engagement and conversion.

### 3. Define a Specific Problem:

Supermarkets do not currently have data-driven guidelines on the most effective sequence to display “Hot Sales” items on their website homepage. The lack of optimized ordering may lead to lower click-through rates and lost sales opportunities.

### 4. Propose a Solution with Methodology

- **Data Collection:**

Collect data from website traffic during a controlled A/B test into the database. Two or more versions of the homepage will be created, each with a different order of the same “Hot Sales” products. Data will include user clicks.

- **Analytical Techniques:**

Use A/B Testing to compare performance between different layouts. Metrics like Click-Through Rate (CTR), Conversion Rate, and Average Order Value will be analyzed using hypothesis testing (e.g., two-proportion z-test or t-tests) to determine statistically significant differences.

- **Implementation plan**

The version that results in the highest CTR or sales uplift will be deployed as the default layout. Further tests may be run periodically to adapt to seasonal or behavioral changes.

### 5. Expected Outcomes:

Improved user engagement, higher click-through rates on promoted products, and increased sales from hot deals. Supermarkets will benefit from an evidence-based strategy for content placement.

**6. Evaluation Metrics:**

- Click-Through Rate (CTR) on hot sales items
- Uplift in revenue and engagement compared to baseline