PROJECT REPORT

TEAM ID- LTVIP2025TMID48088

1.INTRODUCTION

1.1-PROJECT OVERVIEW

In the retail industry, product placement plays a vital role in influencing consumer behavior and driving sales. This project focuses on analyzing the impact of strategic product placement in physical or digital retail spaces using data visualization techniques. By leveraging **Tableau**, we aim to transform raw sales data into meaningful visual insights that reveal how the location of a product affects its performance.

Our team collected and cleaned relevant datasets, built interactive dashboards, and uncovered trends that highlight the importance of positioning products effectively to boost visibility and revenue.

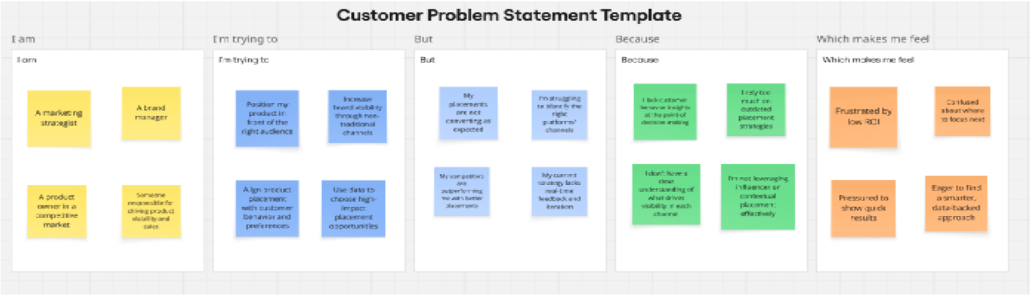
1.2 – **Purpose of the Project**

The main purpose of this project is to:

- **Understand** the relationship between product placement and sales performance.
- **Identify** the most effective placement strategies that lead to higher sales.
- **Visualize** data in a clear and interactive manner using Tableau.
- **Provide** actionable insights and recommendations for businesses to optimize their product placement strategies.

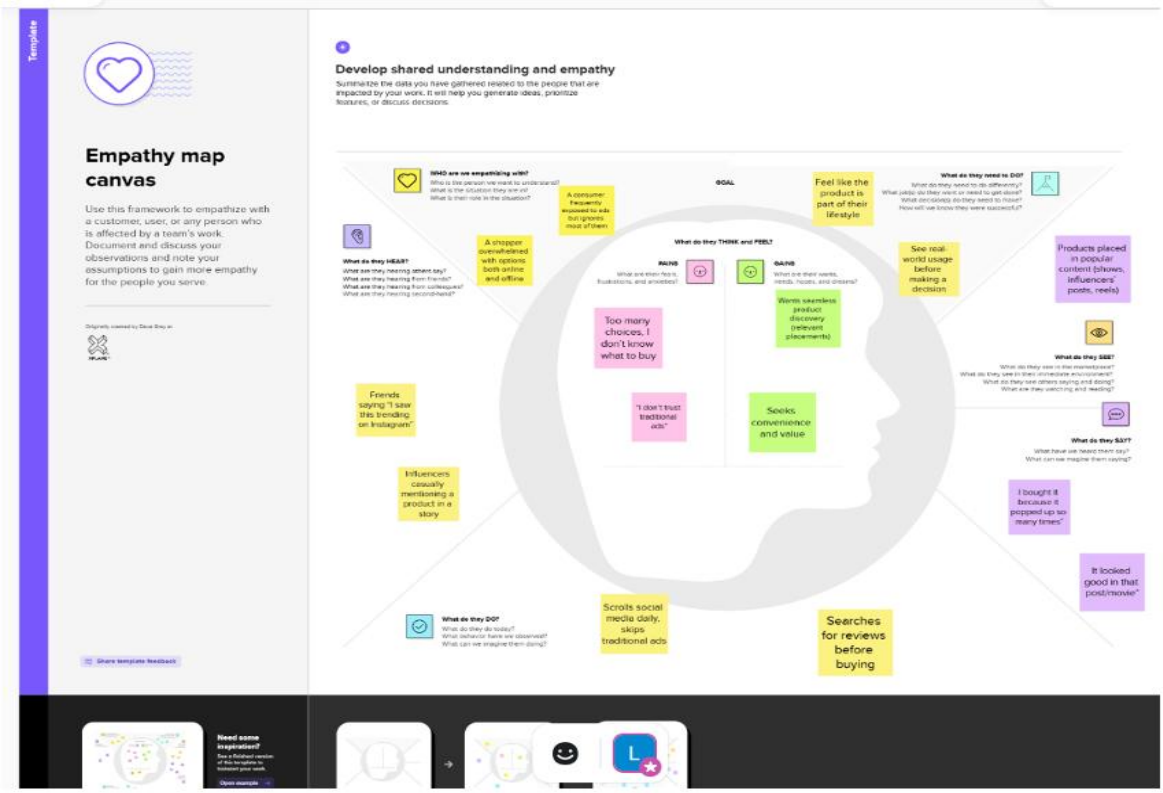
2. IDEATION PHASE

2.1 Problem Statement



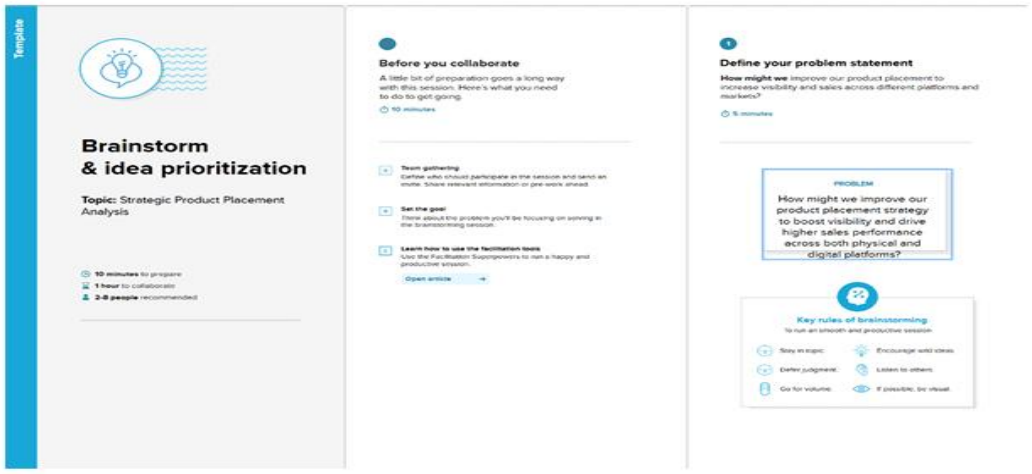
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A marketing strategist	Position my product in front of the right audience	My placements are not converting as expected	I lack customer behavior insights at the point of decision-making	Frustrated by low ROI
PS-2					

2.2 Empathy Map Canvas



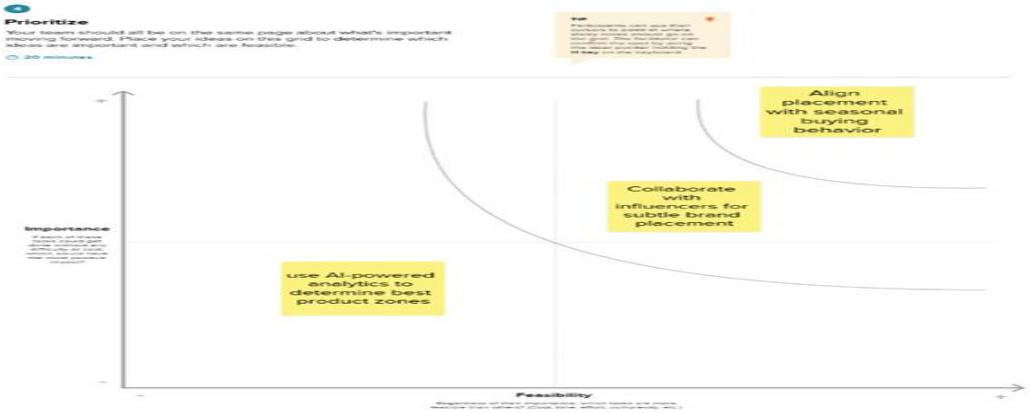
2.3 Brainstorming

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping

Step-3: Idea Prioritization



3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

Customer Journey Map

Strategic Placement Analysis

This map represents how a product strategist or marketer interacts with strategic placement data to optimize product visibility and conversions.

Stage	Need	Action	Touchpoint	Pain Point	Opportunity
Discover	Understand current product visibility	Gathers product placement reports	Emails, POS data, store images	Disconnected and outdated info	Unified placement tracking dashboard
Explore	Identify high-traffic placement zones	Reviews store performance manually	Store visits, Excel sheets	Tedious and subjective	Geo-tagged heatmaps in BI tool
Engage	Optimize product display effectiveness	Tests different visual layouts	Store mockups, feedback forms	Limited experimentation capability	Interactive layout simulator
Decide	Recommend optimal placement strategy	Compiles findings into reports	PPTs, Excel summaries	Hard to visualize impact	Use Tableau or Power BI with impact visuals

3.2 Solution Requirement

Functional Requirements:

Following are the functional requirements of the proposed solution.

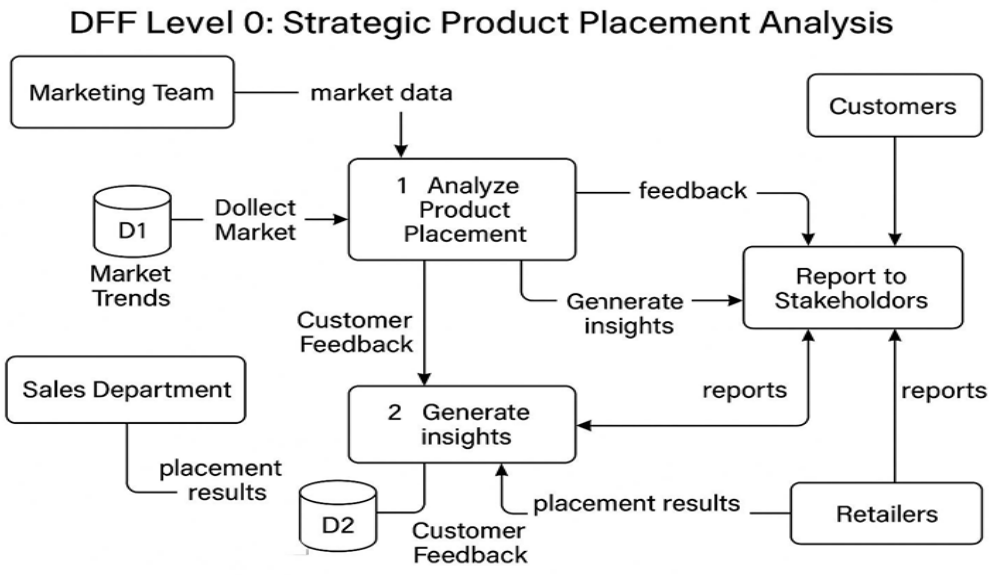
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Product Data Collection	Gather data on product SKUs, pricing, and placement location
FR-2	Competitor Analysis	Analyze competitor products and positioning
FR-3	Customer Behavior Tracking	Track in-store or digital interactions with product placements
FR-4	Recommendation Engine	Generate optimal placement strategies based on analytics

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Easy-to-use interface for marketing and retail teams
NFR-2	Security	Ensure secure handling of business intelligence and customer data
NFR-3	Reliability	Accurate and consistent analysis output
NFR-4	Performance	Quick data processing and real-time placement suggestions
NFR-5	Availability	System available 24/7 for global retail and marketing operations
NFR-6	Scalability	Capable of analyzing multiple products and markets across regions

3.3 Data Flow Diagram



3.4 Technology Stack

Table-1:

S.No	Component	Description	Technology
1.	User Interface	Interface for marketing team to input and visualize data	HTML, CSS, JavaScript / ReactJS / AngularJS
2.	Application Logic-1	Logic for market data collection	Python / Node.js
3.	Application Logic-2	Logic for analysis and trend detection	Python (Pandas, NumPy) / IBM Watson Analytics
4.	Application Logic-3	Logic for generating insights and visualization	Python (Matplotlib, Seaborn) / Power BI / Tableau
5.	Database	Stores structured placement data	MySQL, PostgreSQL
6.	Cloud Database	Centralized data storage accessible across teams	Google BigQuery, Amazon RDS, IBM Cloudant
7.	File Storage	Store reports, user-uploaded data, market images	AWS S3 / IBM Block Storage / Google Cloud Storage
8.	External API-1	Real-time market trend or social media sentiment API	Twitter API / Google Trends API
9.	External API-2	Retailer integration for sales or stock data	Shopify API / Flipkart API / Retailer-provided API
10.	Machine Learning Model	Analyze placement effectiveness, clustering, prediction	Scikit-Learn / TensorFlow / IBM Watson ML
11.	Infrastructure (Server/Cloud)	Deployment and scaling infrastructure	Docker, Kubernetes, IBM Cloud, AWS, Azure

Table-2:

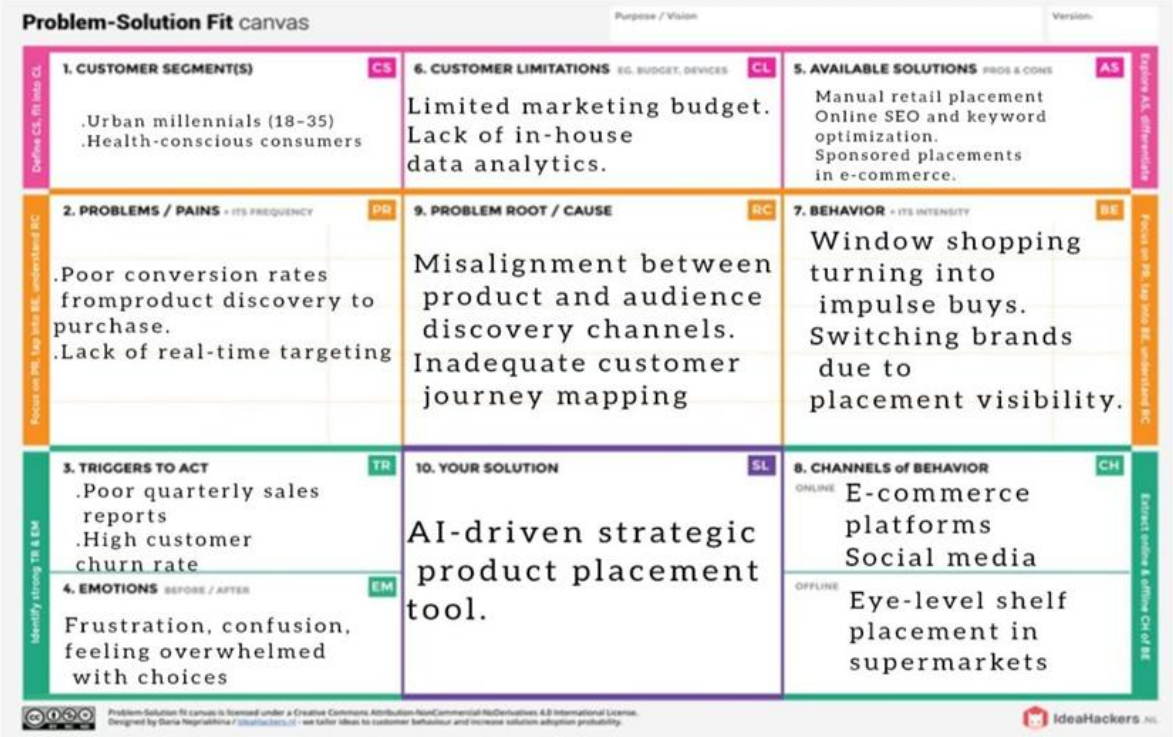
Application Characteristics

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	ReactJS, Node.js, Python, Flask, Pandas, Scikit-learn
2.	Security Implementations	All the security/access controls implemented, use of firewalls etc.	JWT Auth, OAuth 2.0, SHA-256, HTTPS, IAM, OWASP Top 10
3.	Scalable Architecture	Scalability of architecture (e.g., 3-tier, microservices)	Microservices, Docker, Kubernetes, RESTful APIs
4.	Availability	Availability (e.g., load balancers, distributed servers etc.)	HAProxy, NGINX Load Balancer, Multi-zone cloud setup
5.	Performance	Performance design (requests/sec, caching, CDNs)	Redis Cache, CloudFront CDN, Async APIs, DB Indexing

4. PROJECT DESIGN

4.1 Problem Solution Fit

Template:



4.2 Proposed Solution

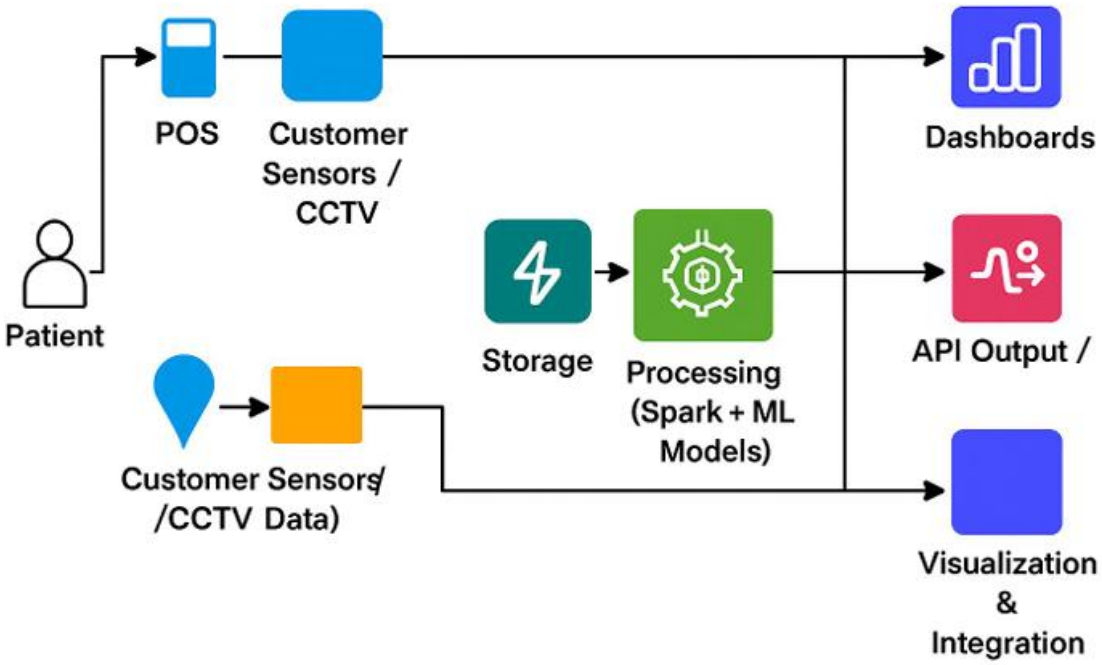
Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1	**Problem Statement (Problem to be solved)**	Brands often struggle to position their products effectively in the right place, time, and media to reach target audiences and drive conversions.
2	**Idea / Solution Description**	Develop a data-driven Strategic Product Placement Analysis tool that leverages customer behavior, media consumption patterns, and market trends to optimize product visibility and engagement.
3	**Novelty / Uniqueness**	Combines AI-based consumer insights, location intelligence, and contextual content mapping to recommend precise placement strategies across platforms.
4	**Social Impact / Customer Satisfaction**	Enhances customer experience by presenting relevant products in the right context, reducing ad fatigue and promoting informed purchasing decisions.
5	**Business Model (Revenue Model)**	Subscription-based SaaS model for brands and agencies, with tiered pricing; optional consulting services and premium data analytics packages.
6	**Scalability of the Solution**	Highly scalable across industries (FMCG, fashion, tech, etc.), geographies, and digital/physical channels; supports real-time updates and A/B testing integration.

4.3 Solution Architecture

Solution Architecture Diagram:



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	ALL
Sprint-1		USN-2	As a user, I will receive a confirmation email once I have registered.	1	High	
Sprint-2		USN-3	As a user, I can register using Facebook.	2	Low	
Sprint-1		USN-4	As a user, I can register using Gmail.	2	Medium	
Sprint-1	Login	USN-5	As a user, I can log into the application using my email and password.	1	High	ALL
Sprint-2	Dashboard	USN-6	As a user, I can view an overview of product performance in different regions.	3	High	ALL
Sprint-2	Product Data Upload	USN-7	As an admin, I can upload sales and product data via Excel or CSV files.	3	High	ALL
Sprint-2	Heatmap Visualization	USN-8	As a user, I can view a heatmap of product	5	High	ALL

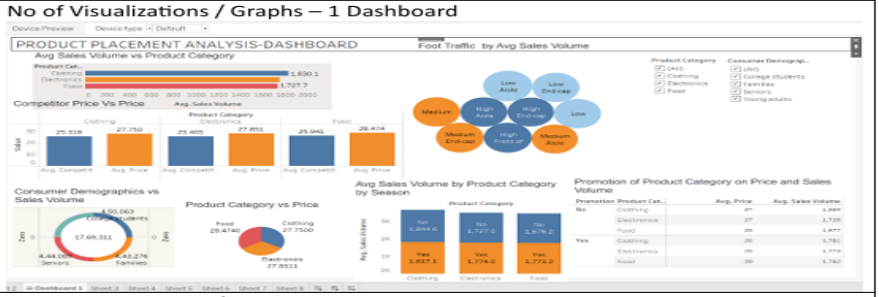
Sprint	Functional Requirement (Epic)	Story Number	User Story / Task	Story Points	Priority	Team Members
			performance based on geography.			
Sprint-3	Recommendation Engine	USN-9	As a user, I can receive suggestions for ideal product placement based on analysis.	8	High	ALL
Sprint-3	Filter and Search	USN-10	As a user, I can filter and search for specific product placement data (by category, region, time).	3	Medium	ALL
Sprint-4	Competitor Analysis	USN-11	As a user, I can compare my product placement performance with that of competitors.	5	Medium	ALL
Sprint-4	Export Report	USN-12	As a user, I can export strategic placement reports in PDF or Excel format.	2	Low	ALL
Sprint-4	User Management	USN-13	As an admin, I can manage users and assign roles (view, edit, admin).	3	Medium	ALL

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	1 Day	22 June 2025	22 June 2025	20	22 June 2025
Sprint-2	20	1 Day	23 June 2025	03 June 2025	20	23 June 2025
Sprint-3	20	1 Day	24 June 2025	24 June 2025	20	24 June 2025
Sprint-4	20	1 Day	25 June 2025	25 June 2025	20	25 June 2025

6. FUNCTIONAL AND PERFORMANCE TESTING

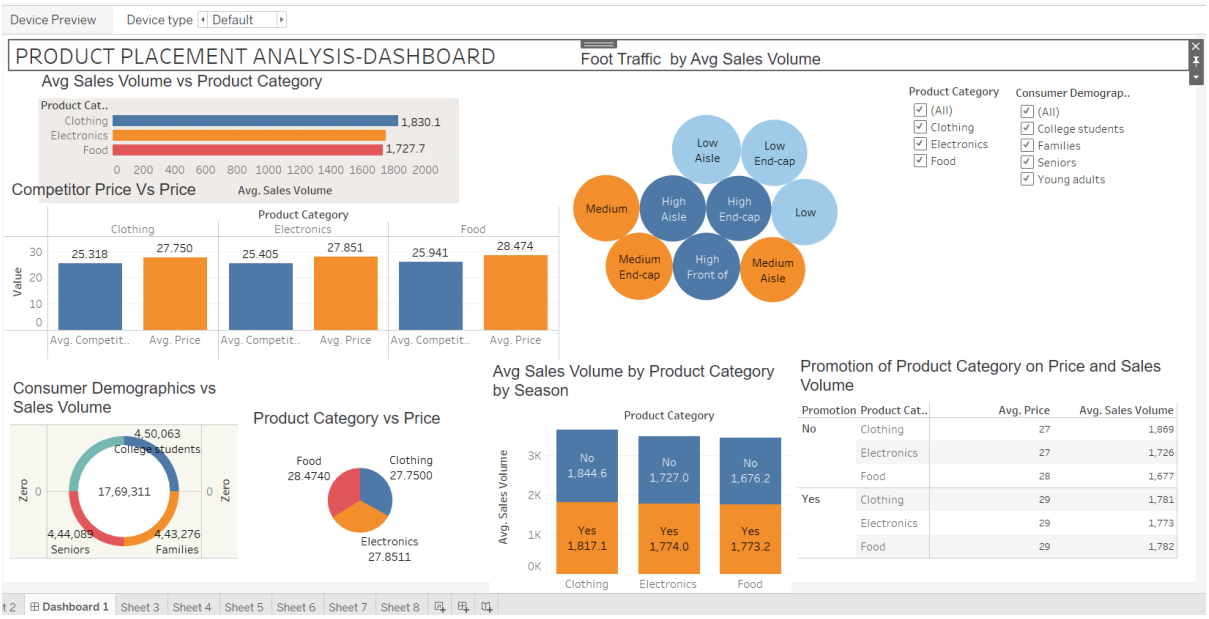
6.1 Performance Testing

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	Rendered from cleaned CSV files containing product categories, placement zones, customer traffic data, and sales conversion metrics (~1,500+ rows).
2.	Data Preprocessing	Missing values handled; product categories standardized; placement zone mapping; seasonal trends and promotion tags classified for analysis.
3.	Utilization of Filters	Filters applied for Product Category, Placement Zone, Promotion Type, Customer Segment, Region, and Quarter. Dashboard loads under 3 seconds.
4.	Calculation fields Used	- Conversion Rate by Zone - ROI by Product Placement - Customer Dwell Time vs Sales - Promotion Impact Score - Placement Effectiveness Index
5.	Dashboard design	No of Visualizations / Graphs – 1 Dashboard 
6	Story Design	No of Visualizations / Graphs – 3 Stories, each with 1 story point highlighting performance before vs after placement, and optimization insights. 

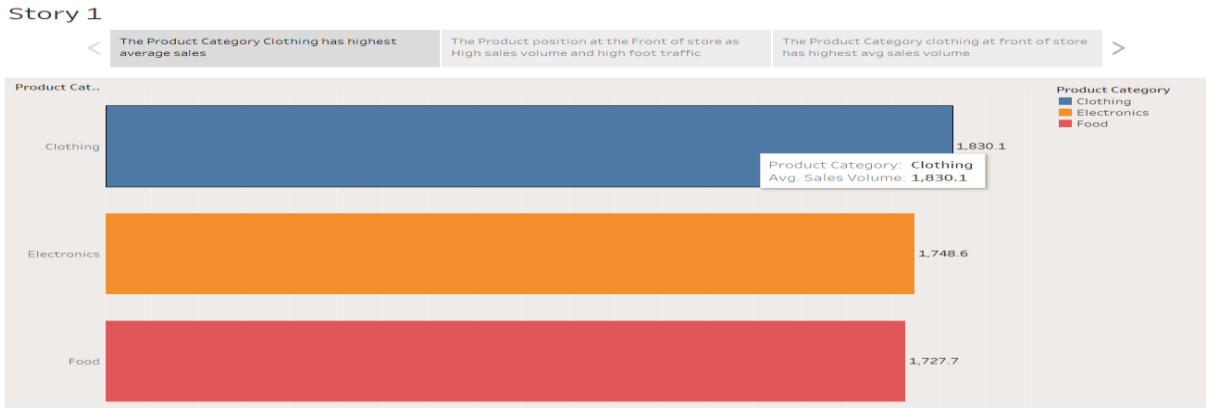
7. RESULTS

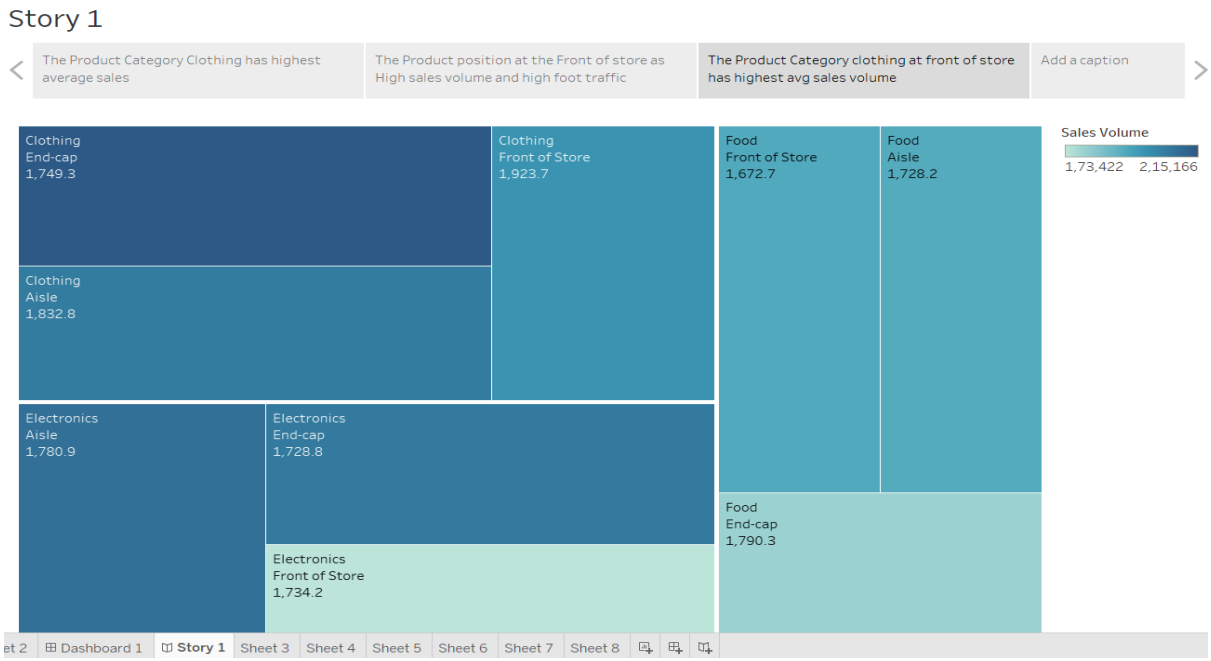
7.1 Output Screenshots

DASHBOARD



STORY





8. ADVANTAGES & DISADVANTAGES

Advantages

1. **Data-Driven Decisions**
   Helps businesses make informed placement strategies based on actual sales data rather than guesswork.
2. **Improved Sales Performance**
   Identifies the most profitable product positions, increasing visibility and customer purchase rates.
3. **Better Customer Experience**
   Strategically placed products are easier to find, enhancing customer satisfaction and engagement.
4. **Visual Insights with Tableau**
   Tableau's dashboards make complex data easy to understand and interpret with interactive visuals.
5. **Competitive Edge**
   Retailers who use placement analysis can outperform competitors by optimizing shelf space and marketing efforts.

Disadvantages

1. **Data Availability**
   The analysis depends on the availability and accuracy of historical sales and placement data.
2. **Time-Consuming Preparation**
   Data cleaning, integration, and dashboard creation can be time-consuming and require technical skills.
3. **High Tool Dependency**
   Over-reliance on Tableau or similar tools might limit flexibility without technical know-how.

4. **External Factors Overlooked**
   Factors like promotions, seasonal trends, or customer mood may affect sales, not just placement.
5. **Initial Cost and Setup**
   Setting up systems for tracking and analyzing placement can be costly for small businesses.

9.CONCLUSION

Through our Strategic Product Placement Analysis, we discovered that the location of a product significantly impacts its sales performance. By using Tableau to visualize and analyze sales data, we identified patterns and trends that help businesses make smarter placement decisions. This analysis provides valuable insights that can lead to better marketing strategies, improved customer experience, and increased revenue. Strategic placement, backed by data, is a powerful tool for retail success.

10. FUTURE SCOPE

1. Integration with Real-Time Data-
   Incorporating live sales and placement data for real-time decision-making and monitoring of product performance.
2. AI and Machine Learning Integration-
   Using predictive models to automatically suggest optimal product placements based on historical trends and customer behavior.
3. Expansion to Online Platforms-
   Applying similar analysis techniques to e-commerce platforms to study the effect of digital product positioning (e.g., homepage banners, search rankings).
4. Personalized Product Placement-
   Leveraging customer demographics and purchase history to create targeted placement strategies for different audience segments.

11. APPENDIX

Dataset Link

https://drive.google.com/file/d/1vHDNGw130kbYUPj-wl4640x-cz5349GM/view?usp=sharing

GitHub & Project Demo Link

https://drive.google.com/file/d/1Ow605OAwpmSvDhGWQ4jaQlDXtPpNPmE5/view?usp=sharing