2025 INTERNSHIP REPORT

Submitted to : Smart Internz ,Smart Bridge company

Track : Data Analytics with Tableau

Project Title : Strategic Product Placement Analysis: Unveiling Sales Impact with Tableau Visualization

Submitted by:

Team ID : LTVIP2025TMID20803

Team Leader : Pidatala Harshita

Team member : Nallamothu Ayyappa Venkata Surya

Team member : Muthireddy Narendra

Team member : Nalla Hemanth Kumar

From:SeshadriRao Gudlavalleru Engineering College, Gudlavalleru

1. INTRODUCTION

1.1 Project Overview

Project Title:
Strategic Product Placement Analysis: Unveiling Sales Impact with Tableau Visualization

Project Summary:
This project focuses on analyzing the effectiveness of strategic product placements within retail or e-commerce environments and visualizing their impact on sales using Tableau. By leveraging historical sales data and visual analytics, the project aims to uncover patterns, trends, and actionable insights that inform optimal product positioning strategies to maximize revenue.

Objectives:

- Analyze sales performance based on different product placement strategies.
- Identify high-performing placement zones (e.g., end-caps, eye-level shelves, homepages).
- Create interactive Tableau dashboards to visualize placement vs. sales correlations.
- Provide actionable recommendations for inventory and layout optimization.

Scope:
In-Scope:

- Data cleaning and preparation of sales and product placement data.
- Exploratory data analysis using Tableau.
- Creation of dashboards illustrating sales trends, heatmaps, and product performance by location.
- Insights and reporting for stakeholders on placement effectiveness.

Out-of-Scope:

- Real-time placement optimization system development.
- Hardware implementation for in-store product tracking.

Timeline:

- **Week 1–2:** Data collection and preprocessing
- **Week 3–4:** Exploratory data analysis and initial dashboard development
- **Week 5:** Insights generation and final dashboard enhancements
- **Week 6:** Report preparation and presentation

Key Stakeholders:

- **Project Sponsor:** Smart Bridge Company
- **Project Manager:** Indra Prakash sir
- **Data Analyst / Visualization Developer:**

- Team Leader : Pidatala Harshita
- Team member : Nallamothu Ayyappa Venkata Surya
- Team member : Muthireddy Narendra
- Team member : Nalla Hemanth Kumar

End Users: Marketing and Sales Teams, Inventory Managers

Tools & Technologies:

- Tableau for data visualization
- Excel/SQL/Python for data preprocessing (optional)
- Retail sales and placement datasets

Risks and Dependencies:

- **Risk:** Incomplete or inconsistent placement data
- **Mitigation:** Work with stakeholders to define placement tags clearly
- **Dependency:** Timely access to historical sales and product layout data

1.2 purpose:

The purpose of the **"Strategic Product Placement Analysis: Unveiling Sales Impact with Tableau Visualization"** project is to **evaluate how product placement strategies influence sales performance** and to **present these insights through interactive Tableau dashboards**.

By understanding the relationship between **where products are placed** (e.g., shelf level, store zone, website layout) and **how well they sell**, the project aims to:

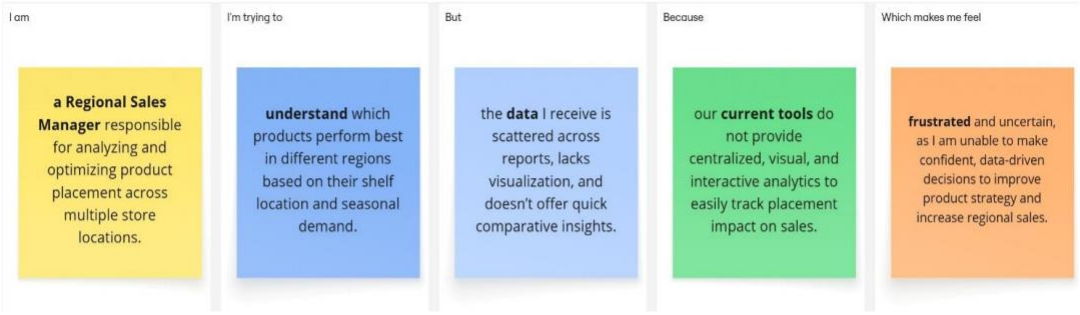
- Help businesses **optimize product positioning** to increase visibility and drive higher sales.
- Provide **data-driven insights** that support strategic marketing, merchandising, and inventory decisions.
- Enable stakeholders to **interactively explore sales trends** and identify opportunities for improving product placement effectiveness.

In essence, the project bridges the gap between **visual analytics** and **retail strategy**, empowering decision-makers with clear, actionable data to enhance product performance through smarter placement.

2. IDEATION PHASE:

2.1ProblemStatement:

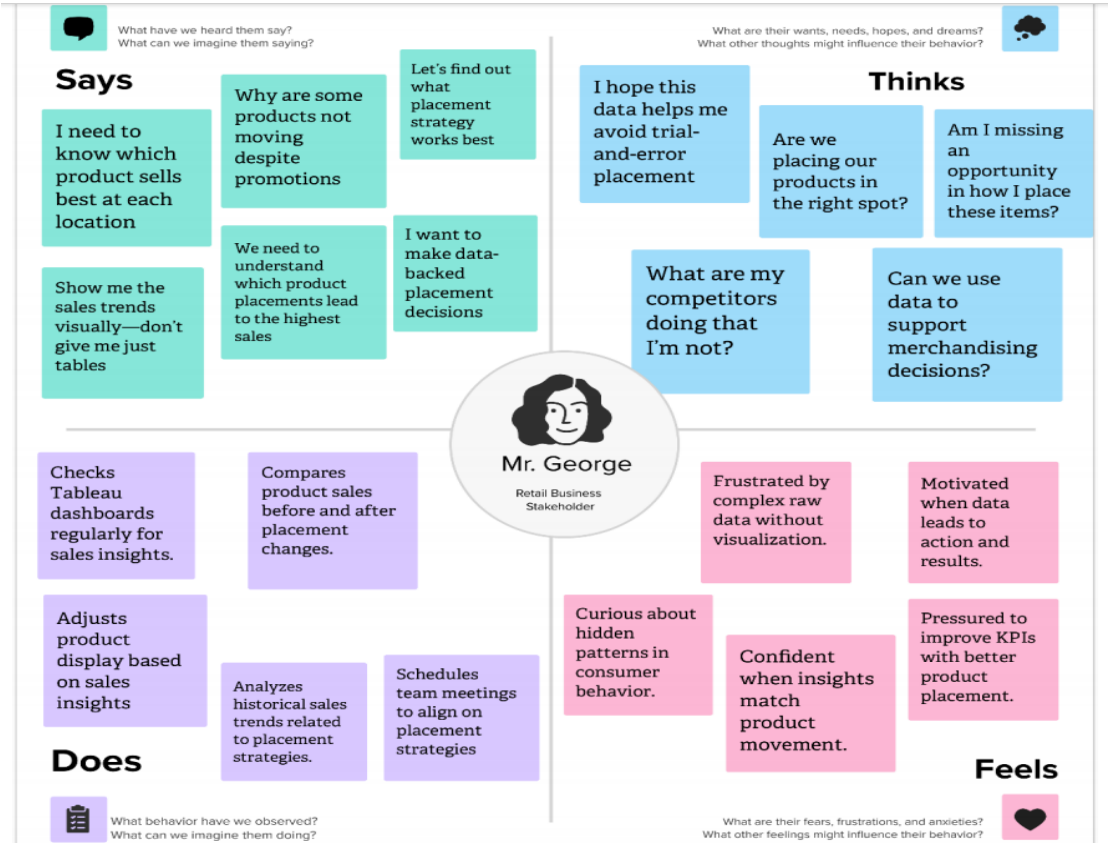
Problem Statement 1: **Regional Sales Manager in a Retail Chain**



Problem Statement 2: **Marketing Analyst at a Fast-Moving Consumer Goods (FMCG) Company**

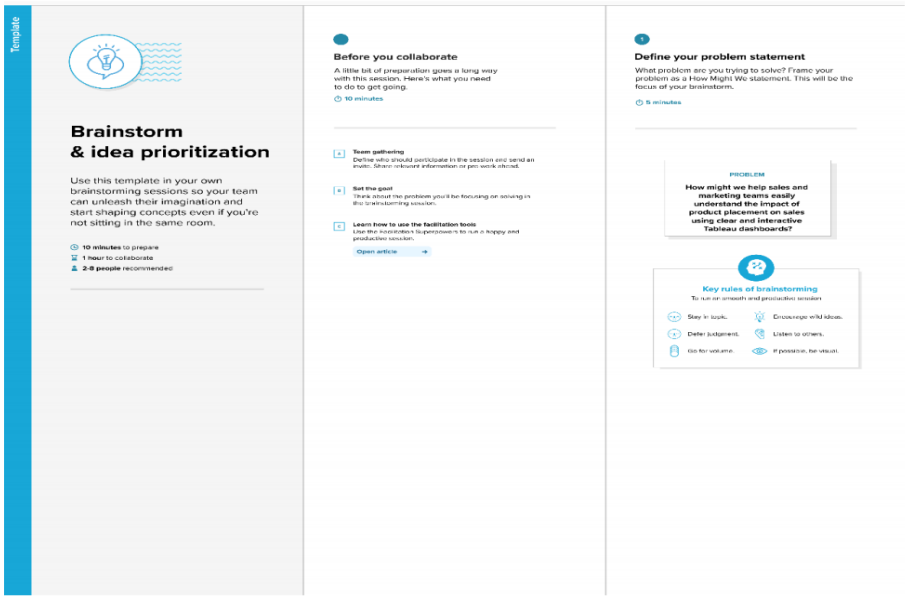
Problem Statement (PS)	I am	I'm trying to	But	Because	Which makes me feel
PS-1: Regional Sales Manager in a Retail Chain	a Regional Sales Manager responsible for analyzing and optimizing product placement across multiple store locations.	understand which products perform best in different regions based on their shelf location and seasonal demand.	the data I receive is scattered across reports, lacks visualization, and doesn't offer quick comparative insights.	our current tools do not provide centralized, visual, and interactive analytics to easily track placement impact on sales.	frustrated and uncertain, as I am unable to make confident, data-driven decisions to improve product strategy and increase regional sales.
PS-2: Marketing Analyst at a Fast-Moving Consumer Goods (FMCG) Company	a Marketing Analyst who supports sales and merchandising teams with performance insights for promotions and product displays.	identify how in-store product positioning affects promotional sales and which visual layouts influence customer buying behavior.	I can't get a clear picture of product performance linked to placement due to static reports and disconnected data sources.	we lack a unified, real-time dashboard that connects sales trends with visual placement metrics using interactive tools like Tableau.	overwhelmed and limited, as I'm unable to proactively recommend strategies that boost product visibility and effectiveness.

2.2 Empathy Map Canvas:

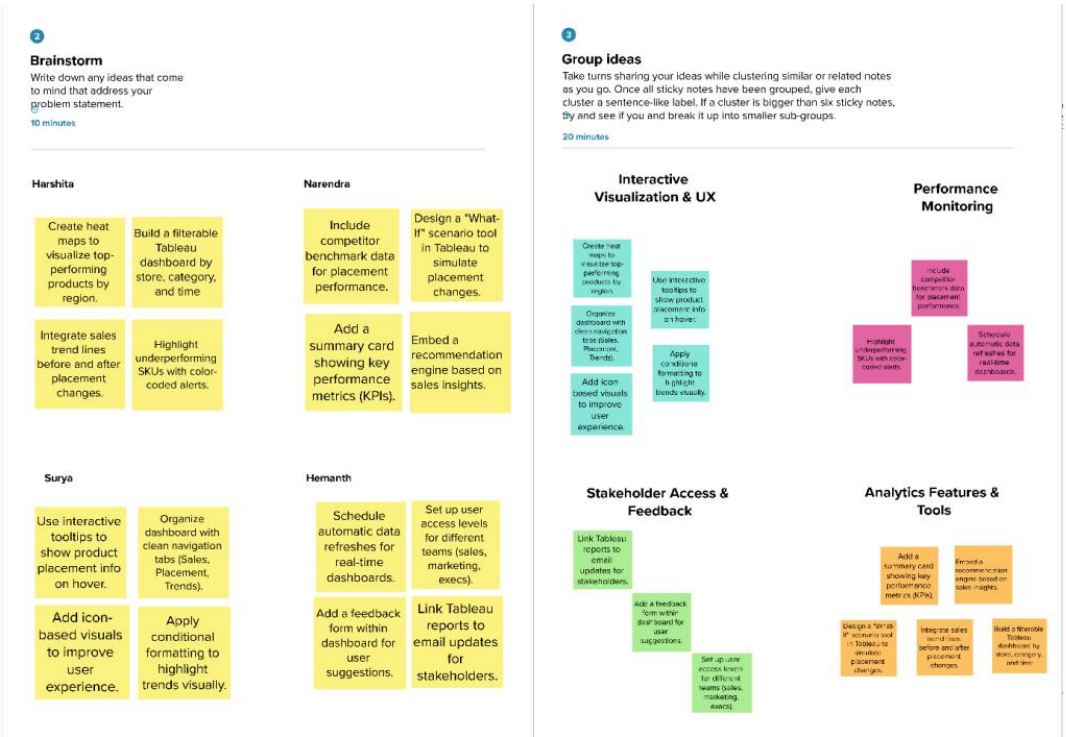


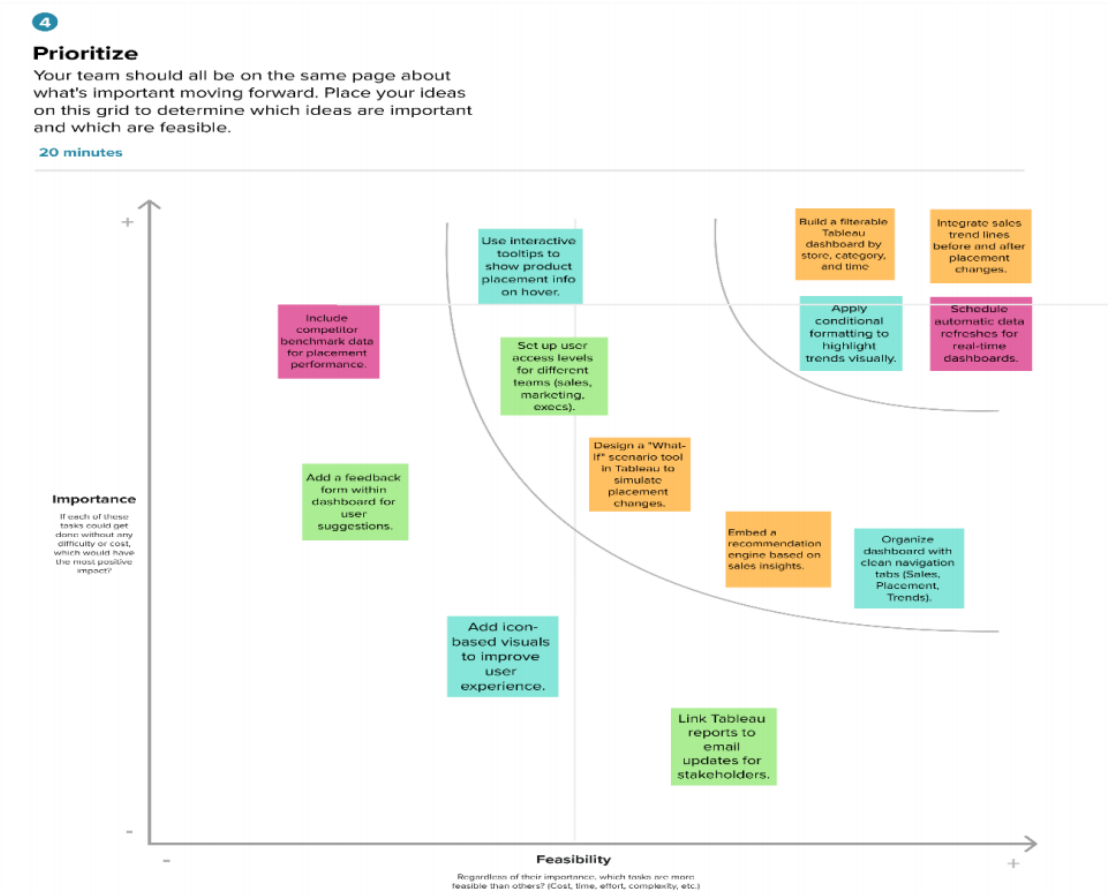
2.3 Brainstorming:

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



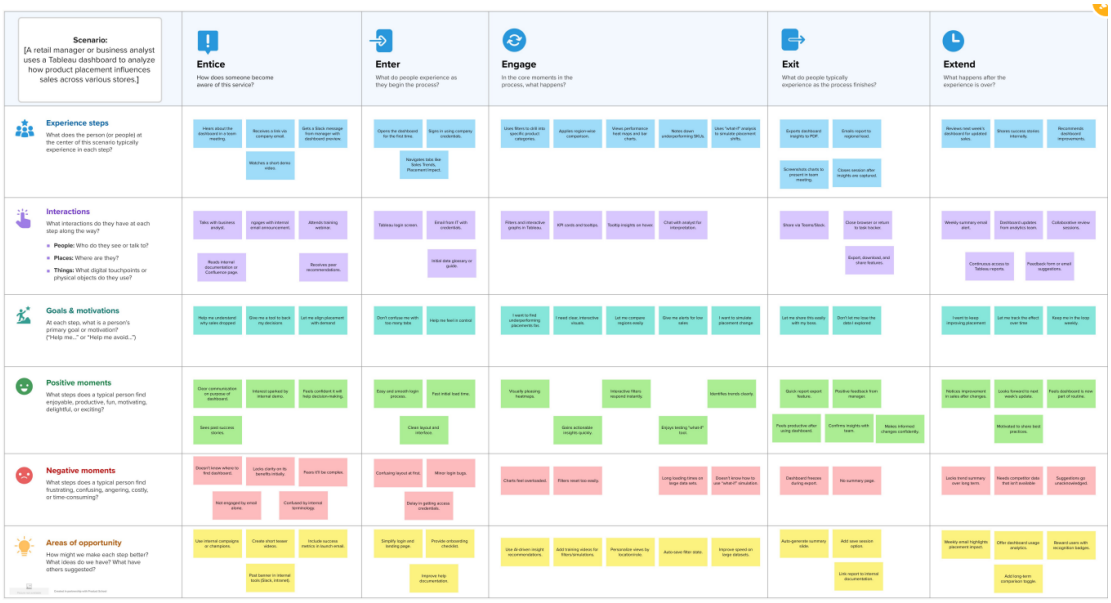
Step-2: Brainstorm, Idea Listing and Grouping





3. REQUIREMENT ANALYSIS :

3.1 Customer Journey Map :



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	Data Gathering	Collect sales, price, promotion, and product placement data from retail databases.
FR-2	Data Cleaning & Preparation	Remove duplicates, handle missing values, and normalize data for consistency.
FR-3	Visualizations	Create Unique Visualizations , for example: • Avg Sales Volume vs Product Category • Create Competitor Price vs Price comparison • Avg Sales Volume by Product Category by Posit • Consumer Demographics vs Sales Volume • Develop Product Category vs Price
FR-4	Dashboard Development	Create interactive dashboards in Tableau.

Non-functional Requirements:

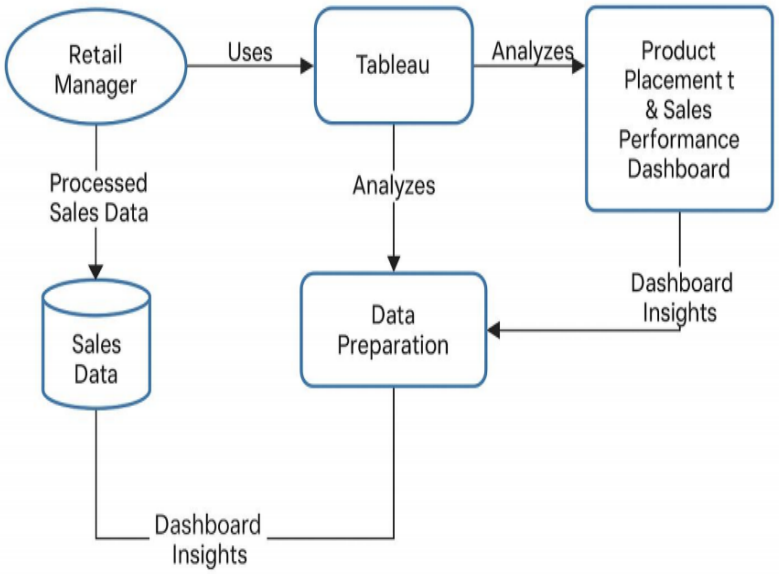
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The dashboard must be user-friendly with intuitive navigation, filters, and clear visualizations.
NFR-2	**Security**	Ensure role-based access, data encryption, and secure connections (SSL/HTTPS).
NFR-3	**Reliability**	The solution should consistently deliver accurate and updated insights without failure.
NFR-4	**Performance**	Dashboards must load within 5 seconds and support quick interactions with filters.
NFR-5	**Availability**	The dashboard should be available 24/7 with minimal downtime (<1% monthly).
NFR-6	**Scalability**	The system must handle growing data volumes and users without degrading performance.

3.3 Data Flow Diagram:

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Retail Manager	Interactive Dashboard	USN-1	As a Retail Manager, I want to view product sales by store and category so that I can understand placement effectiveness.	Able to filter sales by store, product, and region with charts updating dynamically.	High	Sprint-1
Business Analyst	Sales Performance Metrics	USN-2	As a Business Analyst, I want to track KPIs like revenue, units sold, and trends over time to support decision-making.	Dashboard displays KPIs in clear cards with trend lines for the past 3 months	High	Sprint-1
Marketing Analyst	Product Comparison	USN-3	As a Marketing Analyst, I want to compare product performance across placements to optimize store layouts.	Able to view side-by-side comparisons by shelf location and placement strategy.	Medium	Sprint-1
Sales Executive	Access Control	USN-4	As a Sales Executive, I want role-based access so that sensitive data is protected based on user roles.	Each user sees only data allowed for their role (Sales, Analyst, Manager)	High	Sprint-1
Data Engineer	Data Preparation and ETL	USN-5	As a Data Engineer, I want to clean and load sales data into Tableau in a structured format.	Data sources are connected, cleaned using Tableau Prep, and correctly populate the dashboard.	High	Sprint-1
Stakeholder	Summary Insights View	USN-6	As a Stakeholder, I want a quick summary view with top insights so that I don't have to explore every detail.	Summary section with 3-5 key takeaways auto-generated at top of dashboard.	Medium	Sprint-1
Analyst	What-If Scenario Tool	USN-7	As a Analyst, I want to simulate placement changes and see potential impact on sales.	Can input hypothetical placement, run simulation, and view projected KPI changes.	Low	Sprint-2

3.4 Technology Stack:

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Data Source	Raw sales data collected from POS,ERP, or CRM systems	Microsoft SQL Server / Excel / CSV
2.	Data Preparation	Cleans, transforms, and loads data into Tableau	Tableau Prep / Python / SQL
3.	Data Storage	Centralized storage for processed data	Azure SQL Database / Amazon RDS/Local System
4.	Data Visualization Tool	Creates dashboards and interactive visual reports	Tableau Desktop / Tableau Online
5.	User Interface	Web or embedded view where users interact with dashboards	Tableau Public / Embedded Tableau
6.	Access Control	Manages user roles and access levels	Tableau Server / Active Directory
7.	Report Sharing	Mechanism to export and distribute dashboard insights	Tableau Share / PDF Export / Email
8.	Feedback Collection	Collects feedback from users about the dashboard experience	Google Forms / Microsoft Forms

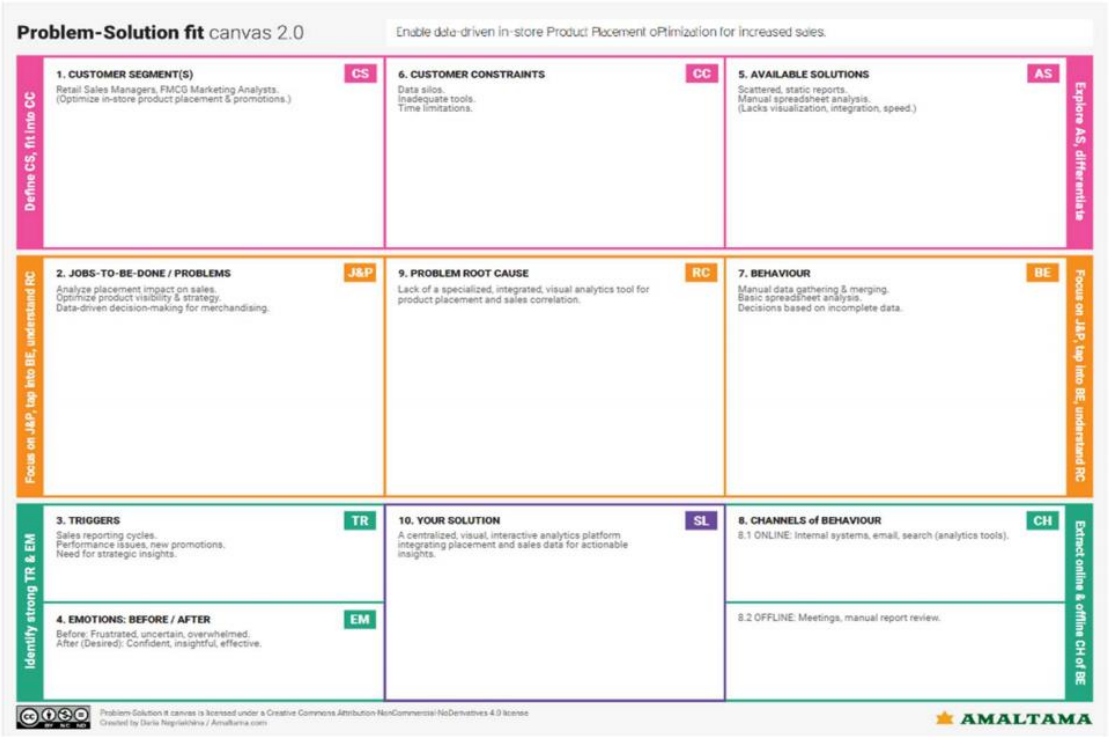
Table-2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Usability	Easy-to-use dashboard with filters, tooltips, and clean layout	Tableau UX / UI design best practices
2.	Performance	Fast data loading and interaction with filters	Tableau Extracts (TDE/Hyper), Optimized SQL
3.	Security	Role-based access and secure data handling	Tableau Server Permissions / HTTPS
4.	Scalability	Ability to handle large datasets and user growth	Tableau Server / Cloud Storage
5.	Availability	Ensures the dashboard is accessible 24/7 with minimal downtime	Cloud Hosting (Azure/AWS), Tableau Server
6.	Integration	Seamless connection to different data sources	Tableau Connectors / APIs
7.	Real-time Data Refresh	Automatically updates dashboards with latest data	Tableau Scheduler / Live Data Connection

4. PROJECT DESIGN:

4.1Problem solution Fit:

Template:



4.2 Proposed Solution:

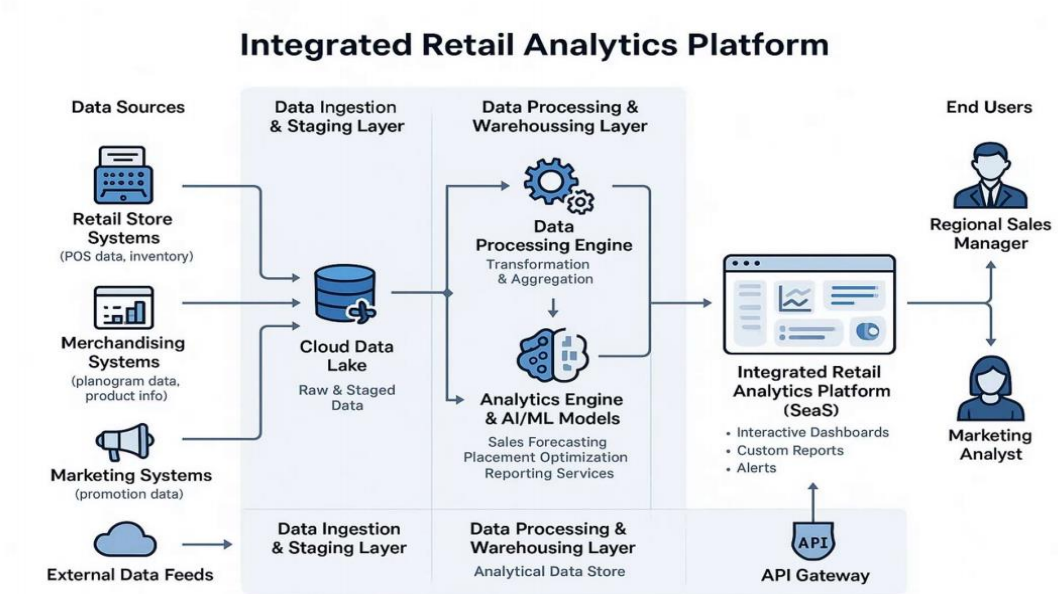
Proposed Solution Template:

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

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Inefficient product placement decisions due to fragmented data and lack of visual, actionable analytics, hindering sales optimization and strategic planning.
2.	Idea / Solution description	An **Integrated Retail Analytics Platform** providing centralized data, interactive visualizations, and comparative insights for optimizing product placement and sales.
3.	Novelty / Uniqueness	Unifies siloed data (sales, placement, promotions) into a single, user-friendly analytical view offering actionable, near real-time insights.
4.	Social Impact / Customer Satisfaction	Empowers users with data-driven confidence for better decisions, leading to increased sales, improved ROI, and enhanced operational efficiency.
5.	Business Model (Revenue Model)	**SaaS subscription model** with tiered pricing based on usage, data volume, and features.
6.	Scalability of the Solution	**Cloud-native architecture** ensuring scalability for data, users, and geographic expansion, with a modular design for future feature enhancements.

4.3 Solution Architecture:

Solution Architecture Diagram:



5. PROJECT PLANNING & SCHEDULING:

5.1 Project planning:

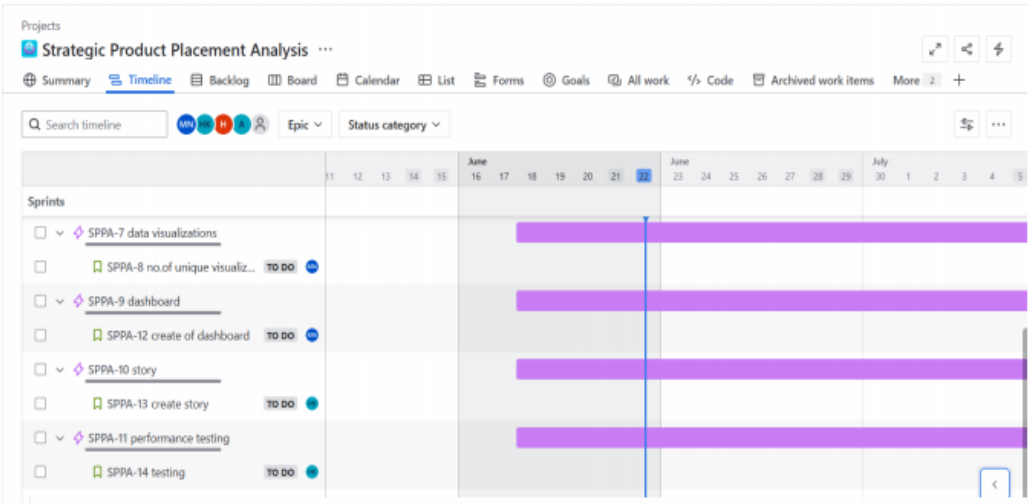
Product Backlog, Sprint Schedule, and Estimation (4 Marks)

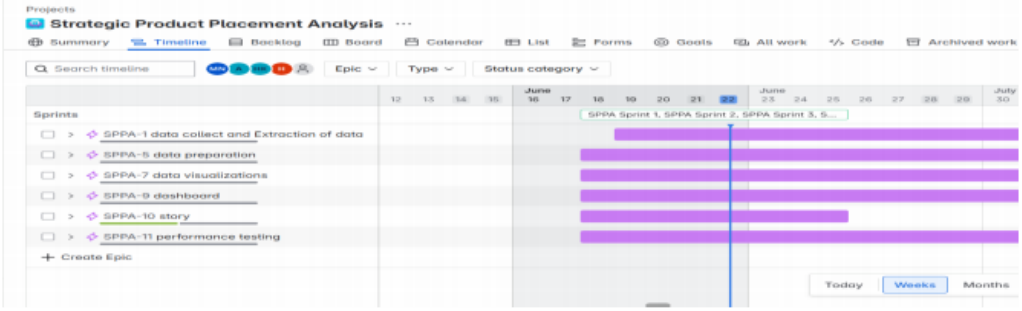
Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data collect and Extraction of data	USN-1	Collection of data	3	High	Surya
Sprint-1		USN-2	Understanding data	2	medium	Surya
Sprint-1		USN-3	Connecting the data set with tableau	2	medium	Surya
Sprint-2	Data preparation	USN-1	Prepare the data for visulization	3	High	Harshita
Sprint-3	Data visulization	USN-1	No.of unique vizulation	3	High	Narendra
Sprint-3	Dashboard	USN-1	Create of dashboard	3	High	Narendra
Sprint-4	stroy	USN-1	Create story	2	medium	Hemanth
Sprint	Performance testing	USN-1	testing	2	medium	Hemanth

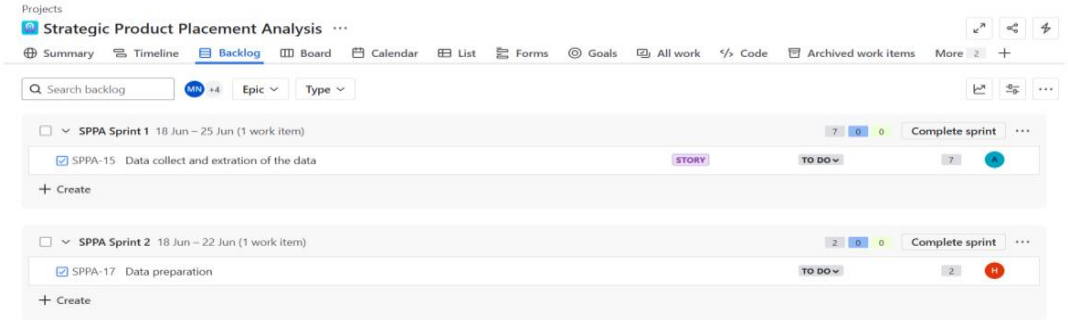
Project Tracker, Velocity & Burndown Chart: (4 Marks)

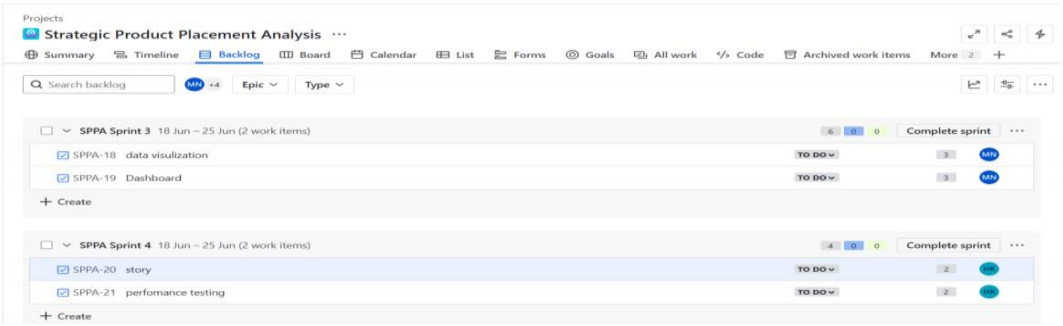
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	7	6 Days	16 june 2025	22 june 2025	7	22 june 2025
Sprint-2	2	6 Days	18 june 2025	24 june 2025	3	24 june 2025
Sprint-3	6	6 Days	20 june 2025	26 june 2025	6	26 june 2025
Sprint-4	4	6 Days	21 june 2025	27 june 2025	4	27 june 2025



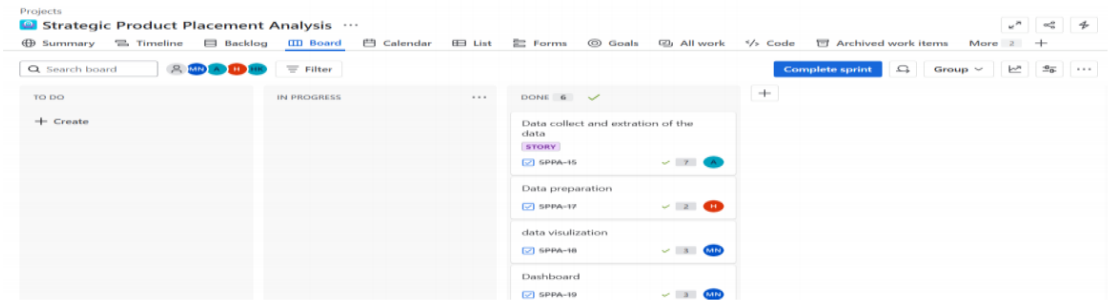


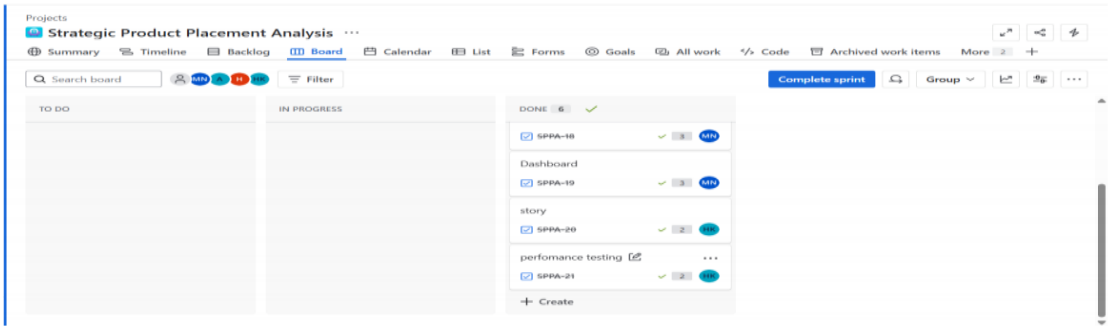
Backlog:





Board:





6. FUNCTIONAL AND PERFORMANCE TESTING:

6.1 Performance Testing:

Model Performance Testing:

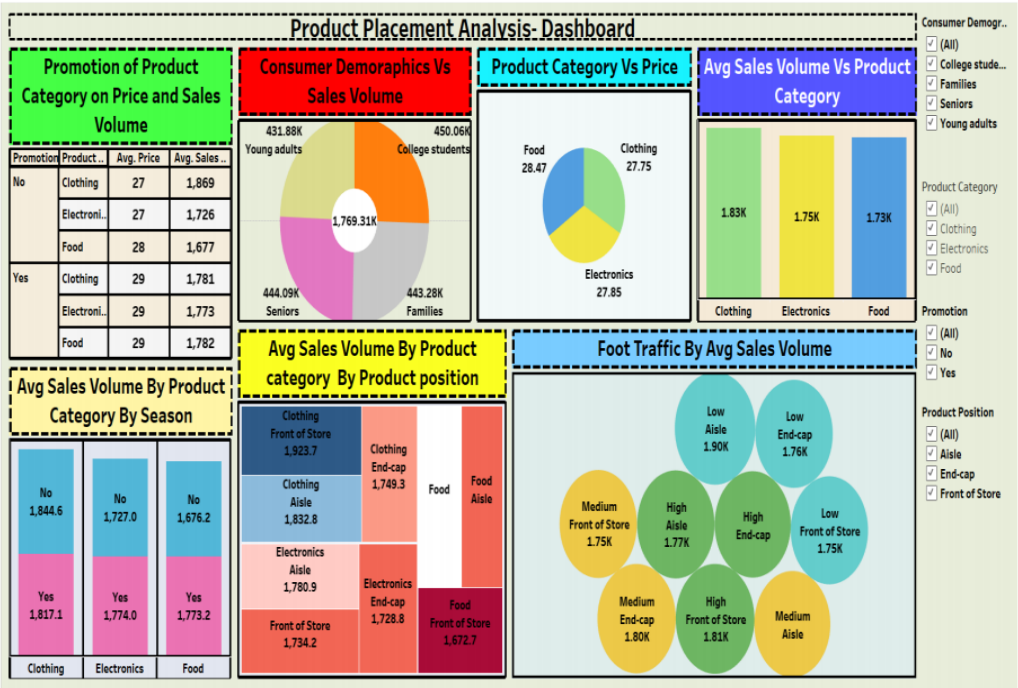
Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	10 Rows and 1000 Coloums
2.	Data Preprocessing	Handle missing values and removed Duplicate values
3.	Utilization of Filters	Measure Names , product position , consumer demorphics , product category
4.	Calculation fields Used	No
5.	Dashboard design	No of Visualizations / Graphs - 7 Visualizations 1. avg sales volume vs product category- Bar chart 2. competitor price vs price- side by side bar chart 3. avg sales volume by product category- Tree map 4. consumer demorphics- Donut chart 5. product category vs price-Pie chart 6. avg sales by season by product category- Stack bar chart 7. foot traffic by avg sales-PackedBubbles chart 8. promotion of product category bu avg sales-Texttable
6	Story Design	No of Visualizations / Graphs - 3 Visualizations 1. avg sales volume by product category 2. competitor price vs price 3. consumer demorphics

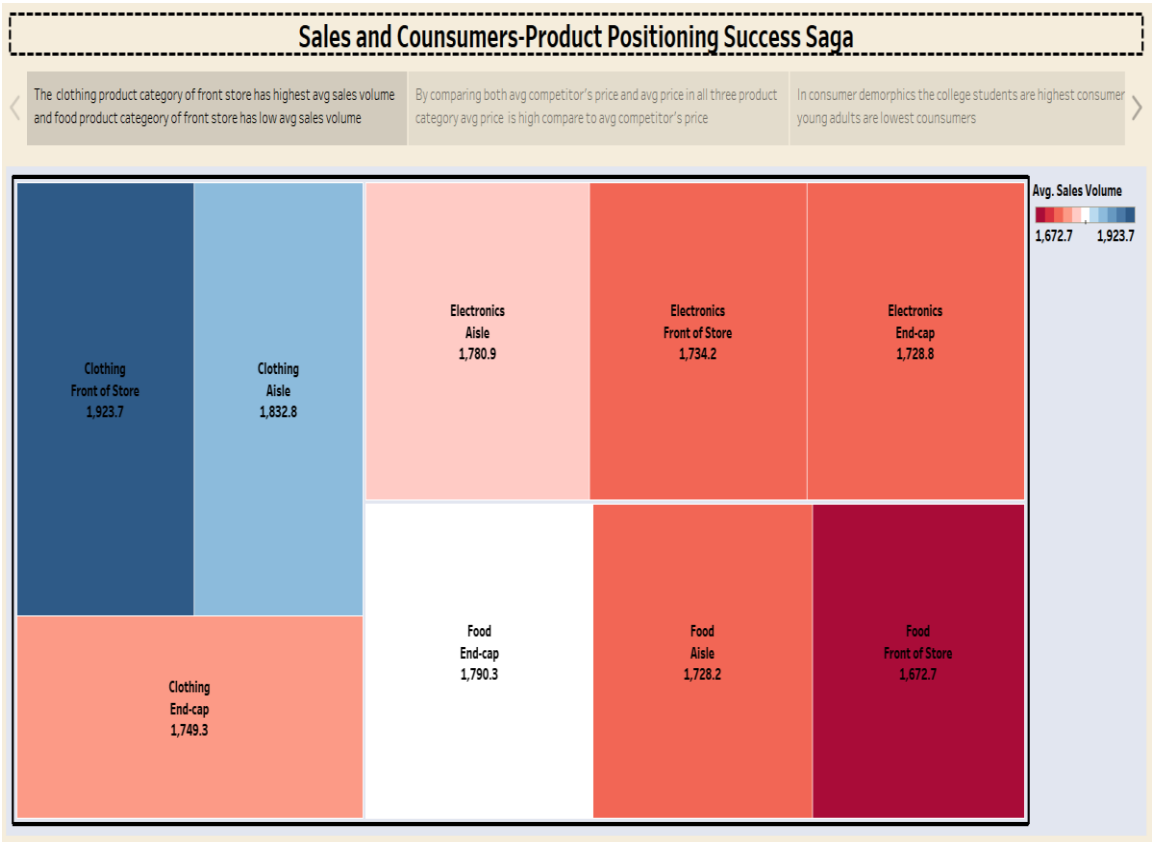
7. RESULTS:

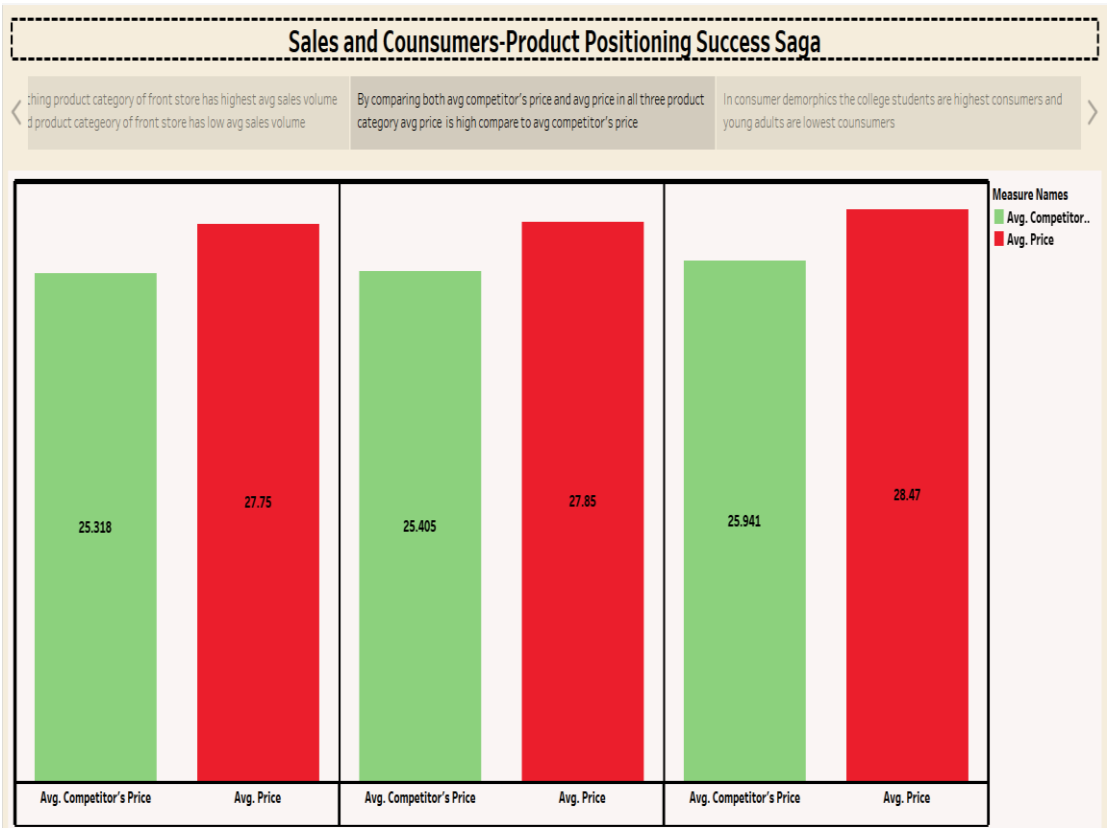
7.1 Output Screenshot:

Dashboard:



Story:


Sales and Counsumers-Product Positioning Success Saga
The clothing product category of front store has highest avg sales volume and food product categeory of front store has low avg sales volume
By comparing both avg competitor's price and avg price in all three product category avg price is high compare to avg competitor's price
In consumer demorphics the college students are highest consumer young adults are lowest counsumers
Clothing Front of Store 1,923.7
Clothing Aisle 1,832.8
Clothing End-cap 1,749.3
Electronics Aisle 1,780.9
Electronics Front of Store 1,734.2
Electronics End-cap 1,728.8
Food End-cap 1,790.3
Food Aisle 1,728.2
Food Front of Store 1,672.7
Avg. Sales Volume
1,672.7
1,923.7


Sales and Counsumers-Product Positioning Success Saga
By comparing both avg competitor's price and avg price in all three product category avg price is high compare to avg competitor's price
In consumer demorphics the college students are highest consumers and young adults are lowest counsumers
Measure Names
Avg. Competitor..
Avg. Price
25.318
27.75
25.405
27.85
25.941
28.47
Avg. Competitor's Price
Avg. Price
Avg. Competitor's Price
Avg. Price
Avg. Competitor's Price
Avg. Price

8. ADVANTAGES & DISADVANTAGES :

Advantages:

Data-Driven Decision Making:

Helps retailers and marketers make informed decisions about where to place products to maximize sales.

Improved Sales Performance:

- Identifies optimal product placement strategies, leading to increased product visibility and potentially higher revenue.

Customer Behavior Insights:

- Reveals buying patterns and foot traffic trends, improving understanding of customer preferences.

Effective Use of Tableau:

- Provides interactive, visual insights that are easy for stakeholders to interpret, even without technical backgrounds.

Cost Optimization:

- Helps reduce wasted shelf space and inefficient layouts by showing which placements yield poor returns.

Competitive Advantage:

- Businesses using advanced analytics gain an edge over competitors relying on intuition alone.

Disadvantages:

Data Dependency:

- Requires large volumes of accurate and up-to-date sales and placement data; poor data quality can mislead conclusions.

Complexity in Setup:

- Initial setup for data collection, integration, and visualization in Tableau can be time-consuming and require technical expertise.

Dynamic Market Conditions:

- Consumer preferences and market trends change frequently, making it hard to maintain consistently optimal placements.

Tool Limitations:

- Tableau is a powerful tool, but it may have limitations in advanced predictive modeling or real-time analytics compared to specialized tools.

Cost of Implementation:

- Investment in tools, training, and data infrastructure may be significant for small businesses.

Over-reliance on Visualization:

- Users might focus more on visuals than on underlying business logic, possibly ignoring key qualitative insights.

9. CONCLUSION:

The **"Strategic Product Placement Analysis"** project, enhanced with **Tableau visualization**, serves as a powerful approach for businesses aiming to optimize product positioning and drive sales growth. By leveraging data analytics, companies can gain actionable insights into customer behavior, shelf performance, and layout efficiency. While there are challenges such as data requirements and implementation complexity, the benefits—like improved sales, informed decision-making, and competitive advantage—far outweigh the drawbacks when executed properly. Overall, this project empowers businesses to make smarter merchandising decisions and adapt quickly in a competitive retail environment.

This analysis proves that intuitive product placement alone is no longer sufficient in today's data-centric retail world. Incorporating visual analytics provides a scalable and repeatable method to evaluate and refine placement strategies across different store formats and product categories.

While the project presents strong advantages, it also highlights the importance of maintaining high-quality data and regularly updating insights to keep up with changing consumer trends. Strategic product placement should be seen as an ongoing, dynamic process rather than a one-time task.

10. FUTURE SCOPE :

Integration with Real-Time Data:

- Incorporate real-time sales and inventory data to enable dynamic product placement adjustments based on current trends and demand.

AI & Machine Learning Enhancements:

- Use predictive analytics and machine learning models to forecast sales performance based on proposed placements and customer behavior patterns.

Customer Heatmap & Footfall Analysis:

- Integrate in-store sensor data or camera-based heatmaps to track customer movement and identify high-traffic zones for optimal product placement.

Cross-Channel Analysis:

- Extend the analysis to include online sales and digital shelf performance, providing a unified view across physical and digital storefronts.

Personalized In-Store Experiences:

- Combine placement data with customer profiles and loyalty data to tailor shelf arrangements and promotions for targeted customer segments.

Automation of Reporting:

- Set up automated dashboards in Tableau that update periodically, reducing manual effort and improving decision-making speed.

Scalability to Multiple Locations:

- Apply the framework across multiple stores or regions to compare and optimize placement strategies in different demographics and layouts.

Integration with Augmented Reality (AR):

- Use AR to visualize proposed placement changes before implementing them in physical spaces, aiding in layout planning and testing.

Sustainability and Waste Reduction:

- Use insights to minimize overstocking and underperforming placements, contributing to more sustainable inventory practices.

Collaboration with Marketing Campaigns:

- Link product placement strategies with promotional campaigns to evaluate their combined impact on sales and customer engagement.

11.Acknowledgement / Thank You Note:

I would like to express my heartfelt gratitude to **Indraprakash Sir**, my internship mentor, for his continuous guidance, support, and encouragement throughout this project. His expertise and insights have been invaluable in shaping my understanding of data analytics and visualization.

I also extend my sincere thanks to **SmartInternz** for providing this valuable opportunity to work on a real-world project and gain practical experience in tools like Tableau. This internship has been an enriching and rewarding learning journey.

Thank you once again for your constant support and mentorship.

11. **APPENDIX:**

Tools & Technologies Used

Tableau Public / Desktop – For data visualization and dashboard creation

Microsoft Excel – For data cleaning, preparation, and preprocessing

Google Sheets – For online collaboration and dataset sharing

SmartInternz Platform – For internship guidance and submissions

Data set link:

https://docs.google.com/spreadsheets/d/1rdNSpWYKrZdNANNhTkIV1ilQprXuy3OF/edit?usp=drivesdk&ouid=111671031581478693801&rtpof=true&sd=true

Tableau Public Link:

https://www.google.com/search?q=tableau+public&oq=table&gs_lcrp=EgZjaHJvbWUqBggBEEUYOzIGCAAQRRg8MgYIARBFGDsyBggCEEUYOTIGCAMQRRg7MgYIBBBFGDwyBggFEEUYPDIGCAYQRRg8MgYIBxBFGD3SAQg0MzI5ajBqN6gCCLACAQ&sourceid=chrome&ie=UTF-8

Tableau public Dashboard and story links :

Dashboard link :

https://public.tableau.com/views/MyDashboard_17503433444870/producttplacementanalysis-dashboard?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Story link:

https://public.tableau.com/views/MyStory_17503434942610/productpositioningstory?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Web Integration link :

https://smartbridge-nu.vercel.app/

Github link:

https://github.com/

Video Demo link:

https://drive.google.com/file/d/1k1GxElt0cbLyTackaevJFXz4vi1UgwTB/view?usp=drivesdk