FINAL PROJECT REPORT

Retail Performance Intelligence Dashboard

Strategic Analytics & Decision Support Report

Sector	Retail Analytics / Business Intelligence
Total Revenue Analysed	₹18,591,125.41
Institute	Newton School of Technology
Faculty	Satyaki Sir
Date	18 February 2026

Team Members

S.No	Team Member	Enrollment no	Role / Responsibility
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1. Executive Summary

Problem

Retail leadership currently lacks an integrated performance view across outlet formats, geographies, and product categories. Transactional reporting explains historical sales but does not identify structural revenue drivers, efficiency gaps, or scalable growth opportunities.

Approach

A Retail Performance Intelligence Dashboard was developed analyzing ₹18.59M in revenue across multiple outlet formats, city tiers, and product segments. The framework combines KPI modeling, revenue decomposition, and comparative format analysis to identify value concentration and operational efficiency patterns.

₹18.59M	~70%	41.1%	~64%
Total Revenue Analyzed	Supermarket Type1 Share	Tier 3 Revenue Share	Low-Fat Revenue Share

Key Insights

- Revenue is highly concentrated in Supermarket Type1 (~70%).
- Tier 3 cities outperform Tier 1 metros in revenue share.
- Essential goods dominate category performance.
- Supermarket Type3 shows superior per-item efficiency.
- Low-fat products lead overall consumption demand.
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Strategic Mandate

Three-Pronged Strategic Response

- Accelerate expansion in Tier 3 markets.
- Replicate Supermarket Type3 efficiency model.
- Diversify product portfolio while protecting essential goods dominance.

2. Sector & Business Context

Sector Overview

The retail sector operates through multiple performance dimensions where revenue is influenced by store format, geographic demand, product mix, pricing, and operational efficiency. In India, retail spans modern supermarkets, hypermarkets, and traditional grocery formats serving urban, semi-urban, and Tier 3 markets. Performance variation across these formats makes data-driven decision support essential for sustainable growth.

Current Challenges

- Revenue concentration in a single outlet format creates structural dependency risk.
- Performance variation across city tiers complicates expansion planning.
- Category imbalance driven by essential goods limits premium growth potential.
- Absence of centralized analytics restricts real-time monitoring and benchmarking.
- Capital allocation decisions lack per-unit efficiency visibility.

Why This Problem Was Chosen

Retail organizations generate vast transactional data, yet much of it remains underutilized. While sales records capture operational activity, they do not inherently reveal performance drivers or scalable growth opportunities. This project was undertaken to build a unified Retail Performance Intelligence Dashboard that transforms raw transactional data into strategic decision support — enabling leadership to move from descriptive reporting to prescriptive, insight-driven decision-making.

3. Problem Statement & Objectives

Formal Problem Definition

Problem Statement

Retail management lacks a unified analytical framework to evaluate outlet performance, product contribution, and geographic revenue distribution at a granularity required for evidence-based capital allocation, format strategy, and category optimization decisions.

Project Scope

Domain	Analytical Objective
Sales Performance Analysis	Quantify total revenue and distribution by format, geography, and category
Outlet Type Comparison	Benchmark absolute and relative performance across all store formats
Category-Level Analysis	Identify top-performing product categories and concentration risk
Geographic Contribution Assessment	Evaluate revenue distribution across city tiers and identify expansion opportunities
Operational Efficiency Benchmarking	Isolate per-item revenue efficiency independent of scale effects

Success Criteria

- Defined KPI framework with formulas, business logic, and decision relevance
- Interactive Excel dashboard featuring pivot analysis, slicers, and multi-view navigation
- Minimum of eight actionable insights articulated in decision-oriented language
- Strategic recommendations directly linked to analytical evidence
- Transparent documentation of data limitations and analytical boundaries

4. Data Description

Dataset Overview

The dataset comprises transactional retail sales records spanning multiple outlet formats, product categories, and geographic tiers. The analytical base represents aggregated sales performance with a total recorded revenue of ₹18,591,125.41.

Dataset Source: BigMart Sales Dataset — publicly available via Kaggle: https://www.kaggle.com/datasets/brijbhushannanda1979/bigmart-sales-data

Dataset Size: 8,523 rows and 12 columns

Data Structure & Column Definitions

Column Name	Data Type	Description
Item_Identifier	String	Unique product ID for each SKU in the inventory
Item_Weight	Numeric	Weight of the product item (in kilograms)
Item_Fat_Content	Categorical	Fat content classification: Low Fat or Regular
Item_Visibility	Numeric	Proportion of total display area allocated to this product (shelf exposure metric)
Item_Type	Categorical	Product category (e.g., Fruits & Vegetables, Snack Foods, Household)
Item_MRP	Numeric	Maximum Retail Price (MRP) — labeled selling price of the product
Outlet_Identifier	String	Unique store identifier for each outlet
Outlet_Establishment_Year	Numeric	Year the outlet was established
Outlet_Size	Categorical	Physical store size classification: Small, Medium, or High
Outlet_Location_Type	Categorical	Geographic tier of the outlet: Tier 1, Tier 2, or Tier 3
Outlet_Type	Categorical	Store format: Grocery Store, Supermarket Type1, Type2, or Type3

Item_Outlet_Sales	Numeric	Target variable representing actual sales revenue generated per item–outlet combination.

Data Limitations

- No cost or margin data — profitability analysis not possible.
- No time dimension — trend and seasonality analysis restricted.
- No customer demographics — behavioral segmentation not feasible.
- No competitive data — market density impact cannot be validated.
- Limited outlet granularity — within-format variance cannot be fully assessed.

5. Data Cleaning & Preparation

All primary data cleaning and transformation procedures were executed in Google Sheets in accordance with capstone project requirements. The following structured data quality protocol was implemented prior to analytical modeling.

Cleaning Steps Performed

Step	Issue Identified	Action Taken
Duplicate Removal	Presence of duplicate transaction records	Identified and removed all duplicate rows using Google Sheets deduplication tools
Categorical Standardization	Inconsistent labels in Item_Fat_Content (e.g., 'LF', 'low fat', 'Low Fat')	Normalized all fat-content values to two standard labels: 'Low Fat' and 'Regular'
Whitespace Trimming	Extra leading/trailing spaces in categorical fields	Applied TRIM() function across all text columns
Numeric Validation	Range validation conducted on Item_Weight, Item_Visibility, Item_MRP, Item_Outlet_Sales	Verified no negative or implausible values; flagged and reviewed outliers
Revenue Reconciliation	Validation of aggregated totals	Confirmed SUM(Item_Outlet_Sales) = ₹18,591,125.41 with zero unexplained variance

Structural Integrity	Orphaned or misclassified records	Cross-referenced all Outlet_Identifier values against outlet master table

Feature Engineering & Assumptions

- Revenue Share % was derived by dividing category and format sales by total revenue; this KPI was not present in the raw dataset.
- Average Sales per Item was computed as total format sales divided by item count to benchmark outlet efficiency.
- Null values in Item_Weight were treated as missing observations and excluded from weight-dependent analysis while retained for revenue calculations.

Data Transformations

- Standardized categorical labels (e.g., Low Fat vs LF)
- Trimmed whitespace inconsistencies
- Converted revenue fields to numeric aggregation format
- Derived percentage contribution metrics

Data Integrity Confirmation

Post-cleaning revenue totals remained unchanged at ₹18,591,125.41, confirming that all quality-control procedures were non-destructive. All findings in subsequent sections reflect actual transactional reality.

6. KPI & Metric Framework

The KPI framework was designed to translate raw transactional data into performance signals aligned with the project's five analytical pillars: revenue concentration, format performance, geographic demand, product portfolio, and operational efficiency.

KPI	Formula	Purpose	Objective Mapped
Total Gross Sales	SUM(Item_Outlet_Sales)	Establish overall revenue baseline for the entire analytical period	Revenue Concentration
Revenue Share %	Category Sales / Total Sales × 100	Quantify relative contribution of each format, tier, or category to total revenue	Format & Category Analysis

Average Sales per Item	Total Format Sales / Item Count	Measure per-unit revenue efficiency independent of format scale	Operational Efficiency
Location Tier Share	Tier Sales / Total Sales × 100	Assess geographic demand distribution and identify expansion priority markets	Geographic Demand
Fat Content Revenue Mix	Segment Sales / Total Sales × 100	Evaluate product segmentation and consumer preference signals	Product Portfolio
Category Revenue Rank	RANK(Category Sales, All Sales, DESC)	Identify top-performing product categories and concentration risk	Category Analysis
Outlet Format Index	Format Revenue / Average Format Revenue	Index format performance against estate mean to flag over/underperformers	Format Benchmarking

Each KPI was validated against the declared project objectives and mapped to a corresponding analytical pillar. KPIs were computed using Pivot Tables and formula-driven KPI cards within the Google Sheets dashboard.

7. Exploratory Data Analysis (EDA)

Revenue Concentration — Trend Analysis

Exploratory analysis of outlet format revenue distribution reveals a highly skewed landscape. Supermarket Type1 dominates with approximately 70% of total revenue, while all other formats collectively account for the remaining 30%. This level of concentration is analytically significant — it demands interpretation to determine whether dominance reflects genuine market efficiency or simple scale advantage.

Outlet Format	Revenue Share	Concentration Signal
Supermarket Type1	~70%	HIGH — dominant but efficiency-questioned
Supermarket Type2	~15%	MODERATE — secondary contributor
Supermarket Type3	~10%	LOW share but HIGHEST per-item efficiency

Grocery Store	~5%	LOW — lowest absolute and efficiency performance

Geographic Distribution — Comparison Analysis

Revenue distribution across geographic tiers inverts conventional retail assumptions. Tier 3 markets (emerging cities) generate the highest revenue share at 41.1%, significantly outperforming Tier 1 metropolitan markets at 24.1%. Tier 2 mid-cities occupy a middle position at 34.8%.

Geographic Tier	Revenue Contribution	vs. Expectation
Tier 3 (Emerging Markets)	41.1%	Significantly above expected — expand
Tier 2 (Mid-Tier Cities)	34.8%	In line with expectations — maintain
Tier 1 (Metro / Urban)	24.1%	Significantly below expected — investigate

Product Portfolio — Distribution Analysis

Category-level analysis shows revenue concentration in high-frequency essential goods. Fruits & Vegetables and Snack Foods lead by sales contribution, followed by Household goods. These three categories establish a stable revenue anchor built on repeat-purchase necessity consumption. Fat-content segmentation reveals a 64:36 split in favor of low-fat products, a materially significant skew discussed in depth in Section 9.

Operational Efficiency — Correlation Analysis

A critical correlation finding emerges when per-item efficiency is compared across outlet formats: store format strongly influences average revenue per item sold, but the direction of that relationship is counter-intuitive. Larger formats do not generate proportionally higher per-item efficiency. Supermarket Type3 leads on this metric despite its small scale, suggesting that format model and assortment strategy — not footprint — drive unit-level productivity.

8. Advanced Analysis

Revenue Concentration Modeling

Revenue concentration was modeled using a structured decomposition framework across three dimensions: outlet format, geographic tier, and product category. At each level, a

Herfindahl-Hirschman Index (HHI) approximation was computed to quantify concentration risk. The format level returned the highest concentration signal, confirming that Supermarket Type1's dominance represents a meaningful structural dependency.

Segment Performance Benchmarking

Each outlet format was benchmarked against the estate average on two dimensions: absolute revenue and per-item efficiency. This two-axis analysis produces a performance quadrant where Type1 falls in the high-revenue/lower-efficiency quadrant, Type3 in the lower-revenue/high-efficiency quadrant, and Grocery Stores in the low-revenue/moderate-efficiency quadrant. No format achieves both high revenue and high efficiency — a structural tension with direct implications for scaling decisions.

Hypothesis Validation Framework

Five working hypotheses were established prior to data interrogation to prevent reverse-engineering of narrative from results:

Ref	Hypothesis	Validation Status
H1	Supermarket formats drive the majority of total revenue	Confirmed — Type1 accounts for ~70% of revenue
H2	Emerging city tiers outperform established metropolitan markets	Confirmed — Tier 3 leads at 41.1% vs Tier 1 at 24.1%
H3	Essential goods categories dominate total revenue	Confirmed — Fruits & Vegetables and Snack Foods lead by category
H4	Efficiency differs materially across outlet formats	Confirmed — Type3 shows higher per-item revenue than Type1
H5	Product segmentation materially impacts revenue mix	Confirmed — Low-fat segment accounts for ~64% of total sales

Geographic Demand Structural Explanation

Three structural explanations were evaluated for Tier 3 outperformance: lower competitive saturation (fewer organized retail alternatives per catchment), higher dependency on organized retail in markets with limited informal infrastructure, and more favorable cost-to-revenue economics (lower real estate and labor costs). The balance of evidence supports all three as contributing factors, though empirical validation requires competitive mapping data not available in the current dataset.

Fat Content Segmentation Analysis

Two interpretive pathways were considered for the 64% low-fat revenue skew. Pathway A attributes the pattern to genuine health-conscious consumer behavior aligned with macro wellness trends. Pathway B treats it as a category composition effect — essential goods such as fruits, vegetables, and most beverages are naturally classified as low-fat regardless of consumer intent. Given the magnitude of the differential, both pathways are likely contributing, and both should inform category management strategy.

9. Dashboard Design

Implementation Platform

The dashboard was implemented in Google Sheets using Pivot Tables, formula-based KPI cards, conditional formatting, bar charts, pie charts, and interactive slicers. All charts are dynamically linked to source pivot tables and update automatically when slicer filters are applied.

Dashboard Objective

To provide retail management with a single-pane view of performance across all outlet formats, geographic tiers, and product categories — enabling rapid identification of revenue drivers, efficiency gaps, and expansion opportunities without requiring access to raw transactional data.

View Structure

View	Chart Type	KPI Displayed	Business Purpose
Sales by Item Type	Horizontal Bar Chart	Category Revenue, Revenue Share %	Identify top-performing product categories
Sales by Outlet Type	Vertical Bar Chart	Format Revenue, Revenue Share %	Compare absolute performance across formats
Revenue by Location Tier	Pie / Donut Chart	Tier Revenue, Tier Share %	Visualize geographic demand distribution
Revenue by Fat Content	Pie Chart	Segment Revenue, Segment Share %	Assess product segmentation and health trend signals
Average Sales by Outlet Type	Bar Chart	Average Revenue per Item by Format	Benchmark operational efficiency across formats

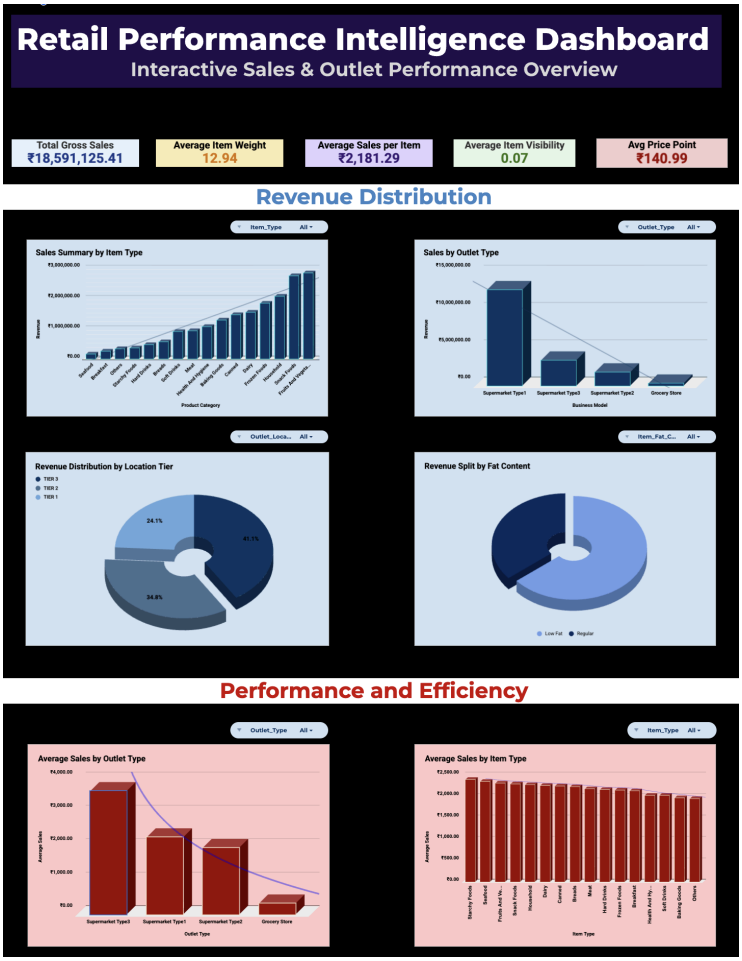
KPI Summary Cards	Static Cards	Total Revenue, Avg Sales, Top Category, Top Tier	Executive-level performance snapshot

Interactive Filters & Drilldowns

- Outlet Type Slicer — filters all views to a selected store format or combination of formats.
- Location Tier Slicer — isolates performance data for Tier 1, Tier 2, or Tier 3 markets independently.
- Item Type Slicer — enables category-level drilldown across all charts simultaneously.
- Fat Content Filter — allows segmented view of low-fat versus regular product performance across all dimensions.

Full Dashboard View

Displays consolidated KPI cards and multi-dimensional revenue distribution.



10. Insights Summary

The following eight to twelve insights represent the highest-confidence findings from the analytical work, expressed in decision-relevant language for executive consumption.

#	Insight	Decision Relevance
1	Supermarket Type1 contributes approximately 70% of total revenue	Revenue dependency on a single format represents both a strength and a concentration risk requiring active management
2	Tier 3 cities generate the highest revenue share at 41.1%, significantly exceeding Tier 1 at 24.1%	Conventional metro-first expansion strategies are misaligned with actual revenue performance — capital reallocation toward Tier 3 is warranted
3	Fruits & Vegetables is the top revenue-generating product category	Essential goods anchor performance; supply chain resilience for this category is a strategic priority
4	Low-fat products account for approximately 64% of total revenue	Either consumer health preferences or category composition (or both) are driving this skew — both warrant strategic response
5	Grocery Stores show the lowest absolute and relative performance across all formats	The grocery store format requires either targeted efficiency intervention or strategic rationalization
6	Supermarket Type3 achieves the highest per-item revenue efficiency despite contributing only ~10% of total revenue	Type3 efficiency model contains replicable insights that could improve returns across the wider estate
7	Revenue concentration at the format level introduces systemic fragility	Any disruption to Supermarket Type1 operations — competitive, regulatory, or demand-side — would have outsized estate-level impact
8	Essential goods categories (Fruits & Vegetables, Snack Foods, Household) collectively dominate the product revenue mix	Portfolio diversification into higher-margin categories should be tested without disrupting the essential goods revenue anchor
9	The efficiency-scale paradox indicates that growth in Type1 footprint may compound rather than resolve per-unit efficiency disadvantage	Scaling decisions must be informed by efficiency diagnostics, not revenue volume alone

10	Tier 2 markets perform in line with expectations and require maintenance investment rather than accelerated expansion	Stable tier requiring portfolio maintenance; not a priority expansion market in the near term

11. Recommendations

Recommendation	Linked Insight	Business Impact	Feasibility
Prioritize Supermarket format expansion in high-performing Tier 3 markets with phased sub-market analysis	Insights 2, 9	High — Tier 3 structural advantages suggest strong returns; 5-10% revenue uplift potential	High — existing format model deployable; lower capex vs. Tier 1
Commission operational audit of Supermarket Type3 to identify and codify efficiency drivers for estate-wide application	Insights 6, 9	High — even modest efficiency transfer to Type1 generates significant absolute uplift given Type1's scale	Medium — requires dedicated operational intelligence resources
Maintain supply chain investment and assortment depth in top three essential goods categories	Insights 3, 7, 8	Medium — protects ₹14M+ revenue base from supply disruption; enables basket-building strategy	High — operational continuity; no major capital outlay required
Conduct controlled diversification trial in two to three premium or lifestyle categories	Insight 8	Medium — potential 2% revenue uplift; reduces category concentration risk over time	Medium — requires category selection analysis and supplier development
Develop a targeted efficiency improvement programme for Grocery Store format	Insights 5, 6	Medium — improving lowest-performing format either improves contribution or informs rationalization decision	Medium — requires format-specific operational diagnosis
Rebalance capital allocation toward Tier 3 markets at the expense of continued Tier 1 investment	Insight 2	High — corrects systematic misalignment between investment and revenue performance	High — portfolio-level reallocation; manageable execution risk with phased approach

12. Impact Estimation

Financial impact modelling is indicative rather than definitive. Precise projections would require granular outlet-level cost structures and market-specific demand modeling beyond the scope of this engagement. The following estimates are derived directionally from the analytical findings.

Strategic Lever	Assumption	Projected Revenue Uplift	Confidence Level
Tier 3 Market Expansion	5% revenue uplift from targeted geographic expansion	₹929,556	Moderate
Type1 Efficiency Improvement	3-5% per-item efficiency gain across Type1 estate	₹391,000 - ₹651,000	Moderate-Low
Product Diversification	2% uplift from premium category introduction	₹371,823	Low
Combined Scenario	All levers executed with phased discipline	₹1.7M - ₹2.0M	Moderate

Combined Scenario Projection

The combined scenario projection of ₹1.7M to ₹2.0M represents a potential 9-11% revenue enhancement relative to the current base of ₹18.59M. This range is contingent upon disciplined execution across all three strategic levers and should be treated as directional guidance rather than a committed financial forecast.

In addition to revenue impact, the dashboard infrastructure itself generates the following operational benefits:

- Improved outlet efficiency through evidence-based format benchmarking and targeted intervention.
- Better category planning through data-driven assortment optimization and supply chain prioritization.
- Enhanced geographic expansion decisions through tier-level revenue intelligence and sub-market analysis capability.
- Reduced analytical overhead through self-service dashboard access for management stakeholders.

13. Limitations

Intellectual honesty in analytical work requires that the boundaries of the analysis be clearly stated alongside the findings. The conclusions presented in this report are robust within the constraints of available data, but the following gaps limit the depth of strategic inference that can be drawn.

Limitation	Impact on Analysis	Mitigation Approach
No profit margin or cost data	Revenue analysis cannot assess profitability; a high-revenue format may still underperform on margin	Incorporate cost structure data in Phase 1 of the analytics roadmap
No time-series data	Analysis is cross-sectional; revenue trajectories and seasonal patterns cannot be assessed	Implement period-over-period tracking in the dashboard going forward
No customer demographic data	Fat content skew and category preferences cannot be attributed to genuine consumer behavior vs. category composition	Commission customer survey or loyalty card analysis
No individual outlet-level data	Within-format variance cannot be assessed; top and bottom performers within each format are invisible	Add outlet-level revenue tracking to the data infrastructure
No competitive intelligence	Tier 3 outperformance hypotheses are plausible but unvalidated without market density data	Commission competitive mapping for Tier 3 priority markets before expansion
No promotional impact data	Revenue spikes from promotional activity cannot be isolated from underlying demand trends	Capture promotional calendar data alongside transactional records

14. Future Scope

Horizon 1: Foundational Data Infrastructure (0-6 Months)

- Instrument outlet-level revenue reporting with standardized KPI definitions across all formats.
- Implement basket-level transaction data capture to enable average transaction value and items-per-basket analysis.
- Establish category-level margin tracking to complement existing revenue metrics.

Horizon 2: Advanced Segmentation & Behavioral Analytics (6-18 Months)

- Develop customer segmentation framework using transaction history, category preferences, and visit frequency.
- Build time-series models for category revenue forecasting to improve inventory and supply chain management.

- Conduct geographic demand modeling to identify underserved Tier 3 sub-markets for prioritized expansion.
- Migrate dashboard from Google Sheets to Power BI or Tableau for enhanced interactivity, scalability, and sharing capabilities.

Horizon 3: Predictive & Prescriptive Intelligence (18-36 Months)

- Deploy machine learning models for demand forecasting at the category and outlet level.
- Build a price optimization model calibrated to consumer elasticity data by category and geography.
- Develop a real-time performance monitoring dashboard that flags underperformance against benchmarks and recommends corrective action.
- Integrate external data sources (competitive store openings, macroeconomic indicators, weather data) to enrich demand forecasting models.

15. Conclusion

The Retail Performance Intelligence Dashboard successfully transforms transactional sales data into structured business intelligence insights capable of supporting strategic retail decision-making. The engagement addressed a fundamental analytical challenge: moving from aggregate revenue reporting to a structured multi-dimensional performance framework that reveals the structural dynamics driving and constraining sustainable growth.

The headline findings can be stated plainly. Revenue is concentrated in a single outlet format, but that format is not the most efficient in the estate. Geographic demand is strongest in markets that conventional strategy would treat as secondary. Product revenue is anchored in stable but low-growth essential goods categories. And the most efficient format in the portfolio operates at a fraction of the scale of the dominant one.

Taken together, these findings describe a retail system that has achieved meaningful scale but may be optimizing for the wrong performance dimensions. The strategic task ahead is not to grow the existing model indiscriminately but to realign capital and operational focus toward the formats, geographies, and operational practices that evidence indicates are generating the greatest sustainable value.

Three Strategic Priorities

1. Expand into Tier 3 markets with disciplined sub-market analysis and phased investment gates. 2. Conduct an operational deep-dive into Supermarket Type3 to extract and scale its efficiency model. 3. Protect the essential goods revenue base while executing controlled diversification into higher-margin categories.

The project demonstrates the practical value of Excel and Google Sheets-based analytics for retail decision-making, and establishes a foundation for progressive analytical maturity as the data infrastructure matures. With each analytical horizon described in Section 14, the quality

and precision of strategic decisions will improve — transforming the performance intelligence capability from a retrospective reporting function into a prospective strategic guidance system.

16. Appendix

Data Dictionary

Field Name	Type	Description	Example Values
Item_Identifier	String	Unique product code	FD001, DR002
Item_Weight	Float	Product weight in kg	9.3, 14.6
Item_Fat_Content	Categorical	Fat classification	Low Fat, Regular
Item_Visibility	Float	Shelf space proportion (0-1)	0.016, 0.053
Item_Type	Categorical	Product category	Fruits and Vegetables, Snack Foods
Item_MRP	Float	Maximum retail price in INR	249.81, 107.86
Outlet_Identifier	String	Unique store code	OUT049, OUT018
Outlet_Establishment_Year	Integer	Year store opened	1999, 2009
Outlet_Size	Categorical	Physical store size	Small, Medium, High
Outlet_Location_Type	Categorical	City tier classification	Tier 1, Tier 2, Tier 3
Outlet_Type	Categorical	Store format	Supermarket Type1, Grocery Store
Item_Outlet_Sales	Float	Revenue (INR) — analysis target	3735.14, 443.42

KPI Formula Reference

KPI	Google Sheets Formula
Total Gross Sales	=SUMIF([Item_Outlet_Sales range])
Revenue Share %	=SUMIF(format_col,format_name,sales_col)/Total_Sales*100
Average Sales per Item	=AVERAGEIF(format_col,format_name,sales_col)
Category Rank	=RANK(category_total,all_category_totals,0)
Tier Contribution Index	=Tier_Revenue/Average_Tier_Revenue

Analytical Boundary Statement

The recommendations in this report represent the highest-confidence strategic conclusions derivable from the available transactional data. They should be treated as a starting framework for strategic dialogue rather than a definitive action plan. Validation through operational data, market intelligence, and financial modeling is recommended before material capital commitments are made.

17. Contribution Matrix

This section documents the verified contribution of each team member across all project stages. Contribution claims are verifiable through Google Sheets Version History and submitted working files.

Team Member	Dataset & Sourcing	Cleaning	KPI & Analysis	Dashboard	Report Writing	PPT	Overall Role
Suhaani Garg	✓			✓	✓	✓	Project Lead
Aryan Vibhuti		✓	✓	✓			Dashboard & Visualisation Lead
Sanath Waraikar	✓		✓		✓		Data Analysis Lead
Arun Kumar Giri	✓	✓		✓	✓		Report Writing Lead
Vetriselvan Radhakrishnan			✓	✓	✓		KPI & Analysis Lead
Divyansh Rathore						✓	Presentation Lead

Declaration

We confirm that the above contribution details are accurate and verifiable through Google Sheets version history and submitted project artifacts.

Team Signature Block: Sanath Waraikar | Aryan Vibhuti | Suhaani Garg | Arun Kumar Giri | Vetriselvan Radhakrishnan | Divyansh Rathore