Business Analytics Dashboard Report Using Power BI - A Data-Driven Approach to Retail

Performance Analysis

Submitted By:

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Course: ISM 6404 – Introduction to Business Analytics and Big Data

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Introduction:

This project applies Power BI-driven business analytics to generate actionable insights from a real-world retail dataset using interactive dashboards to analyze sales performance, profitability, and regional trends for data-driven decision-making. The dataset used is *"Superstore Dataset Final"* from Kaggle (https://www.kaggle.com/datasets/vivek468/superstore-dataset-final), containing 9,994 rows and 21 columns of U.S. transaction data. Key fields include Order Date, Category, Segment, Region, Sales, Profit, Quantity, and Discount. The CSV was imported into Power BI and validated for correct data types prior to analysis.

Methodology

Tool Selection and Justification:

Power BI was chosen for its ability to build interactive dashboards with real-time filtering, cross-highlighting, and drill-down features. Its drag-and-drop interface simplifies analysis without coding and supports industry-standard business decision-making, making it ideal for this project.

Analytical Approach (Three-Lens Method):

Univariate Analysis

Conducted to assess variables independently. The Sales by Year chart showed consistent growth from 2015–2017, reaching ~$0.78M in 2017. KPI cards indicated total sales of $2.30M and profit of $286.40K, establishing baseline business performance.

Bivariate Analysis

Examined relationships between variables. Technology emerged as the most profitable category, and the West region performed best. Cross-highlighting confirmed that profitability shifts with category and region selection.

Multivariate Analysis

Focused on combined variable effects. The Discount vs Profit scatter plot (with Sales as bubble size) revealed that high discount levels reduce profit, while the West manages discount strategies more efficiently. This provided deeper insight into pricing and regional alignment.

Visualization Execution Process

Visuals were created using Power BI's drag-and-drop approach with suitable chart selection. Slicers (e.g., Region, Category) and cross-highlighting were implemented to enable interactive exploration. Insights were refined and consolidated into the final dashboard to support a cohesive narrative and decision-focused analysis.
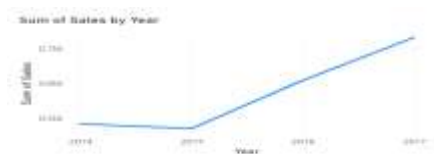

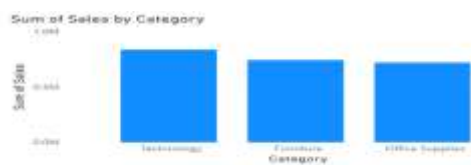*Fig1: Initial Sales by Year chart used for univariate analysis*

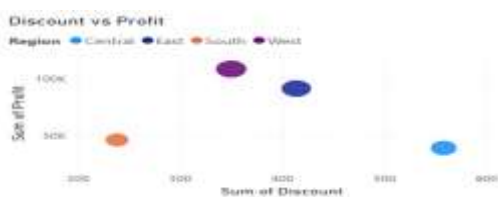*Fig2: Category vs Sales visual during bivariate exploration*

Fig3: Multivariate scatter chart setup (Discount, Profit, Region)

Dashboard Design

The Power BI dashboard was built as an interactive analysis tool with five connected visuals: KPI cards (overall performance), a line chart (sales trends), a bar chart (category comparison), a scatter plot (discount–profit relationship), and a geographic map (regional performance). These visuals are arranged in a logical sequence, moving from summary metrics to detailed insights. Interactive slicers (Region and Category) and cross-highlighting enable real-time

exploration—for example, selecting *Technology* instantly updates all visuals. Consistent colors, clear titles, and readable formatting improve usability for finance, marketing, and strategicdecision-makers.
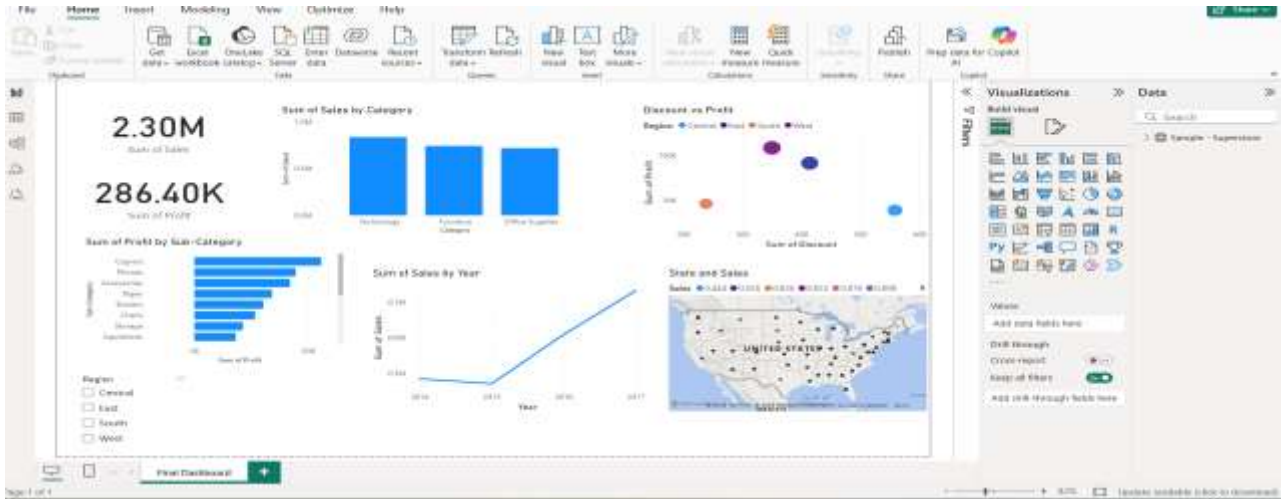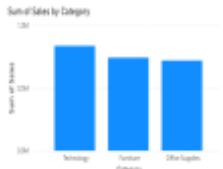

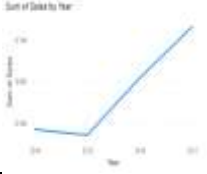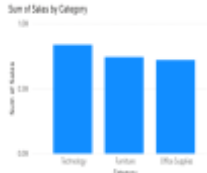*Fig4: Final Interactive Dashboard with Five Visualizations*
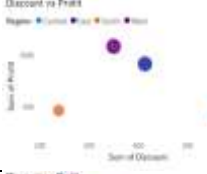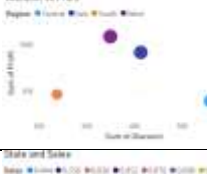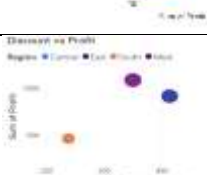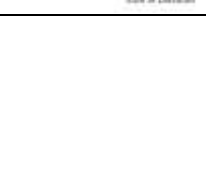
Insight Synthesis and Data Storytelling

The analysis shows $2.3M in sales driven mainly by Technology and strong West/East region performance, while excessive discounting—especially in Furniture—reduces profit. Focusing on Technology, adapting successful regional strategies, and refining discount policies can improve long-term profitability.

Business Model Canvas Mapping

Insights were mapped to key Business Model Canvas components to translate analysis into strategies focused on product prioritization, regional expansion, pricing optimization, and operational improvement.
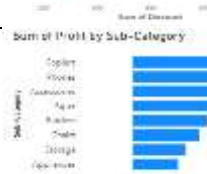
Type	Insight(2 meaningful sentences)	Visual Ref.	BMC Component	Impact
Uni	Technology leads revenue & profit; indicates strong customer demand.		Value Prop.	Invest more in high-profit tech products.

Uni	Sales steadily increased 2015–17, showing market growth.		Revenue Streams	Scale proven strategies.
Uni	Office Supplies sell well but profit low due to discount dependence.		Cost Structure	Adjust pricing or bundle products.
Uni	West region highest sales; indicates strong demand.		Customer Segments	Prioritize resource allocation there.
Bi	Furniture generates high sales but weak profit.		Cost Structure	Review pricing/supplier costs.
Bi	Technology profitable despite discounts.		Revenue Streams	Use targeted discount strategy.
Bi	Sales concentration seen in logistics-optimized states.		Channels	Improve supply chain in weaker regions.
Bi	West manages discounts better than others.		Customer Relationships	Apply pricing model to other regions.
Multi	Excess discounting reduces profit across segments.		Cost Structure (Risk)	Limit discount thresholds.
Multi	Tech + West yields highest profit combination.		Value Prop.	Expand tech distribution here.
Multi	Growth stagnates in Central region.		Customer Segments	Introduce targeted campaigns.
Multi	Growth stagnates in Central region.		Revenue Streams	Implement data-driven pricing control.

SMART Recommendations

Recommendation 1: Optimize Discount Strategy

Implement a tiered discount strategy to reduce discounts on low-profit categories like Furniture while retaining competitive pricing for Technology. This is expected to improve profit margins by 8–12% annually, monitored via Power BI, with implementation in Q1–Q2 2025. *(BMC: Cost Structure, Revenue Streams)*

Recommendation 2: Replicate West Region Strategy in Lower-Performing Areas

Replicate the high-performing strategy from the West region in the Central and South regions to enhance sales performance. This approach could drive a 10–15% sales increase within six months, requiring ~$5K for training and tracked via regional performance dashboards. *(BMC: Customer Segments, Channels)*

Recommendation 3: Expand Technology Product Line

Expand the Technology product line through increased inventory and marketing efforts to leverage strong demand. This could generate $200K–$300K in additional annual revenue, launching in Q2 2025, with impact measured by category sales and profit contribution. *(BMC: Value Proposition, Key Activities)*

Conclusion

Profitability is mainly driven by Technology products and strong performance in the West, while excessive discounting especially in Furniture reduces margins. Refining pricing strategies and replicating high-performing regional approaches can enhance growth, though the absence of customer-level and seasonal data limits forecasting accuracy. Implementing these insights through Power BI enables scalable, data-driven decision-making.

AI Assistance Disclosure: AI tools (ChatGPT) were used solely for linguistic refinement and structural clarity. All dataset analysis, insight interpretations, synthesis, and final recommendations are entirely original and based on independent analytical thinking.