Superstore Sales & Shipping Analytics – Microsoft Power BI

Context & Audience

This project was created as a personal initiative to simulate the type of analytics solution a retail company would require. The intent was to create a practical case study that demonstrates how raw transactional data can be transformed into meaningful insights through a business intelligence platform. The project was designed for different levels of stakeholders within a typical retail organization, each requiring a unique lens of analysis.

- Executives: Required high-level KPIs such as revenue growth, profit margins, and cost drivers to monitor the overall business health.
- Regional Managers: Needed detailed insights into sales performance across states and product categories to understand regional opportunities and risks.
- Supply Chain Teams: Focused on shipping modes, delivery efficiency, and cost trade-offs to optimize logistics operations.

Objective & Added Value

The main objective of this project was to design a comprehensive end-to-end BI solution in Power BI. This involved not only creating a visually appealing dashboard but also developing a scalable data model, calculating business KPIs, and presenting insights in a way that would support informed decision-making. The added value of the project included providing stakeholders with an interactive tool that allowed them to explore business performance dynamically, without needing technical skills or SQL knowledge.

- A single platform to monitor sales, profit margins, and shipping performance.
- Ability to quickly identify underperforming regions and categories through interactive filters.
- Insights into cost versus delivery trade-offs, enabling better supply chain decisions.
- Dynamic self-service analytics capability that empowers managers and executives to investigate data on their own.

Process

The development of the dashboard followed a structured process, starting from data preparation and ending with visualization and storytelling:

- Data Preparation: Cleaned and transformed raw data using Power Query. This included handling missing values, removing duplicates, standardizing formats for dates and regions, and ensuring data consistency.
- Data Modeling: Designed a star schema consisting of fact tables (Orders, Sales, Shipping) and dimension tables (Products, Customers, Regions). Relationships were defined to allow smooth filtering across different attributes.
- DAX Development: Developed custom measures for KPIs including Profit Margin, Total Sales, Average Shipping Cost, and Customer Profitability. DAX was used to create dynamic calculations that respond to slicers and filters.
- Dashboard Design: Focused on creating a layered dashboard experience:
- - Executive view: Top-level KPI cards for sales, profit, and cost, allowing executives to get a quick overview of performance.
  - Regional view: Geographic maps and tabular reports enabling managers to drill into performance by region and state.
  - Operational view: Drill-through pages focusing on shipping modes and product categories, designed for deeper investigation by supply chain teams.

Obstacles & Solutions

Several obstacles were encountered during the development of this project, each requiring careful problem-solving to ensure the final solution was efficient and insightful.

- Large Dataset Performance: The raw dataset contained thousands of rows, and initial reports were sluggish. Solution: Optimized the model by separating fact and dimension tables, reducing column count, and implementing efficient relationships.
- Balancing Aesthetics and Clarity: Initial designs were visually appealing but overloaded with information. Solution: Adopted BI design best practices by placing KPIs at the top, using consistent colors, and separating summary insights from detailed drilldowns.
- Stakeholder Simulation: Since this was a personal project, real stakeholder input was not available. Solution: Simulated stakeholder needs based on real-world case studies of retail companies, ensuring realistic functionality.

Evidence & Insights

The final dashboard provided several key business insights and highlighted the power of interactive business intelligence tools:

- The analysis revealed that Second-Class shipping was significantly more expensive without delivering faster results, providing an opportunity to refine shipping strategies.
- Product category analysis showed that while Technology generated high revenue, its profit margins were lower, signaling a need for pricing or discount adjustments.
- Regional breakdowns helped identify states with consistently low profitability, guiding resource reallocation and targeted interventions.
- Screenshots were taken in full-screen mode with careful attention to readability, ensuring that visual evidence clearly supports the findings presented in the portfolio.

Conclusion

This project demonstrated how a structured approach to BI development can transform raw datasets into meaningful business insights. By focusing on data preparation, modeling, DAX calculations, and thoughtful dashboard design, the solution successfully simulated the type of analytics tool that could add real value in a retail organization. Beyond technical execution, the project highlighted the importance of clear storytelling and stakeholder-focused design in delivering actionable insights.