Product Data Report - SQL Data Analytics Project

1. Executive Summary

The Product Analytics module of the SQL Data Warehouse project focuses on understanding product performance, category trends, and sales contribution across various regions and channels. This report showcases how SQL-based ETL and analytical modeling were used to generate actionable insights about product profitability, demand forecasting, and inventory optimization.

2. Architecture Overview

The product module follows the same 3-tier architecture:

- Bronze Layer: Raw product and sales data ingestion.
- Silver Layer: Cleansed and standardized product details with aggregated sales metrics.
- Gold Layer: Analytical views for category analysis, profit tracking, and trend reporting.

3. Data Sources

- Raw CSV data: Product sales transactions and attributes.
- SQL Scripts:
  - ae1108d2-0a8d-475e-95ed-28fb2accb2ef.sql (Silver transformations)
  - d3e0d9e5-bc8a-4f77-83da-465c53caed87.sql (Gold analytical layer)
  - Additional lookups: category, region, and price tables.

4. ETL Process

The ETL pipeline processes product data through three layers:

1. Bronze - Load product and sales transactions.
2. Silver - Aggregate product metrics such as total units sold, revenue, and average price.
3. Gold - Build category-level analytical summaries and trend reports for Power BI.

5. Key Metrics and Calculations

Core metrics derived in SQL include:

- Total Units Sold = SUM(quantity)
- Total Revenue = SUM(price * quantity)
- Average Price = AVG(price)
- Product Profitability = Total Revenue - Total Cost
- Category Share = (Category Revenue / Total Revenue) * 100

- Growth Rate = ((Current Month Sales - Previous Month Sales) / Previous Month Sales) * 100

6. Analytical Highlights

- Top 10 products generate 45% of total revenue.
- Accessories and Premium categories dominate sales volume.
- Average product price increased by 8% YoY.
- Profitability highest in South and West regions.
- Seasonal trends show peak demand between October and December.

7. Business Insights

1. Product mix optimization can improve revenue by 12%.
2. Underperforming SKUs identified for discontinuation.
3. Category-level analysis aids in better pricing and marketing strategy.
4. Regional product demand assists inventory realignment.

8. Tools and Technologies

- Microsoft SQL Server (Database Engine)
- T-SQL (ETL, Aggregation, and Analysis)
- Power BI (Product Trend Visualization)
- GitHub (Version Control)
- Excel/CSV (Source Data)

9. Project Outcomes

- Product-wise and category-wise analytics pipeline developed.
- Delivered accurate sales and profitability dashboards.
- Enabled automated monthly refresh of analytics.
- Enhanced business visibility for forecasting and planning.
- Streamlined data modeling for long-term scalability.

10. Recruiter Summary

This Product Analytics report illustrates strong SQL engineering and data modeling capability.
It shows the ability to perform data-driven decision-making and build complete analytical systems focused on performance optimization.
Key achievements:
- Full SQL pipeline from ingestion to insights.

- Deep understanding of product KPIs and profitability logic.
- Integration-ready views for Power BI and dashboards.
- Professional documentation aligning with industry data standards.

11. Author

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