AdventureWorks Sales Analysis

Power BI Project Report

1. Introduction

The AdventureWorks Sales Analysis project delivers actionable insights into the company's sales performance, product profitability, and order behavior. Using Power BI, data was transformed into interactive dashboards that allow business users to explore and interpret patterns effectively. The project demonstrates end-to-end business intelligence practices including data cleaning, modeling, DAX-based analysis, and storytelling through visuals.

2. Dataset Description

The dataset was sourced from the AdventureWorks dataset on Kaggle. It consists of transactional and master data tables including Product, Sales, Customer, and Order details. Each table provides a unique view into different aspects of the company's operations, such as sales revenue, regional performance, product mix, and customer engagement metrics.

3. Data Cleaning and Transformation

Data cleaning and transformation were performed in Power BI using Power Query Editor. Major steps included:

• Removing duplicate and null values.• Standardizing column names and ensuring data type consistency.• Merging and appending tables where required.• Creating calculated columns such as Total Sales = Quantity × Unit Price.• Extracting and formatting date columns to support time intelligence calculations.

4. Data Modeling

A star schema model was implemented, with the Sales table serving as the fact table connected to dimension tables including Product, Customer, and Territory. Relationships were created using primary and foreign keys. This model enabled dynamic slicing and filtering across multiple analytical dimensions.

5. DAX Measures

DAX (Data Analysis Expressions) was used to derive business metrics and KPIs. Key measures include:

• Total Sales = SUM(Sales[SalesAmount])• Total Quantity = SUM(Sales[OrderQuantity])• Average Sales per Customer = DIVIDE([Total Sales], DISTINCTCOUNT(Customer[CustomerID]))• Year-to-Date Sales (YTD) = TOTALYTD([Total Sales], 'Date'[Date])• Profit Margin = DIVIDE([Total Sales] - [Total Cost], [Total Sales])

6. Dashboard Overview

Three interactive dashboards were developed to present insights from different business perspectives. Each dashboard is designed with a specific analytical focus, combining KPIs, charts, and tables for both macro and micro-level exploration.

6.1 Summary Dashboard

The Summary Dashboard provides an at-a-glance view of overall company performance. It includes key KPIs such as Total Sales, Total Orders, Profit Margin, and Average Sales per Customer. These KPIs are presented in Power BI cards for quick visibility. The dashboard also contains time-series visuals such as Sales by Month, allowing users to identify seasonal trends or monthly growth patterns. Category-wise bar charts compare performance across product categories, highlighting top-performing segments. A pie or donut chart visualizes revenue distribution, while supporting slicers enable filtering by year, region, or product category.

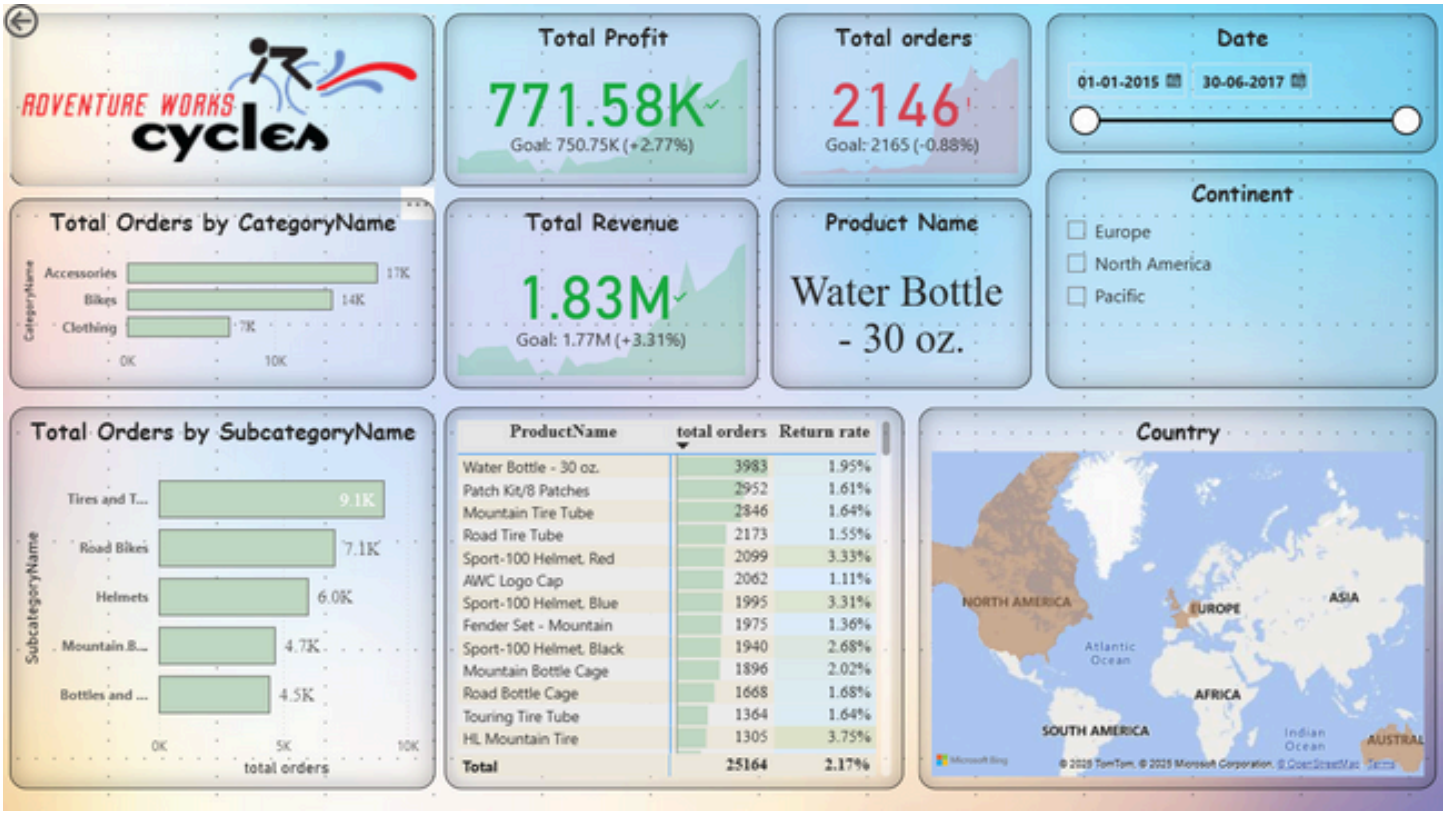

Figure 1: Summary Dashboard — High-level view of sales and profitability performance.

6.2 Product Detail Dashboard

The Product Detail Dashboard dives deeper into product-level insights. It visualizes product sales performance, profit contribution, and quantity sold across various categories. A stacked column chart highlights sales contribution by product subcategory, while a table or matrix visual displays detailed metrics such as total revenue, cost, and margin for each product. KPIs like Top 5 and Bottom 5 Products are derived using DAX ranking measures. The dashboard may also include scatter plots to compare sales versus profit, providing visual cues for identifying high-margin products. Users can apply filters to focus on specific categories, brands, or time periods for comparative analysis.

Figure 2: Product Detail Dashboard — Analysis of individual product performance and profitability.

6.3 Order Detail Dashboard

The Order Detail Dashboard provides a granular view of sales orders and customer behavior. It includes visuals showing Order Quantity by Territory and Customer Segment, revealing which regions generate the most revenue and which customer types are most active. Trend lines display daily or weekly order activity, highlighting fluctuations in order volumes. A geographical map visual depicts regional performance, making it easier to identify high-demand areas. Additionally, KPIs such as Total Orders and Average Order Value offer quick numerical summaries. Tables provide detailed order records, enabling users to drill down into transaction-level data for validation or deeper insights.

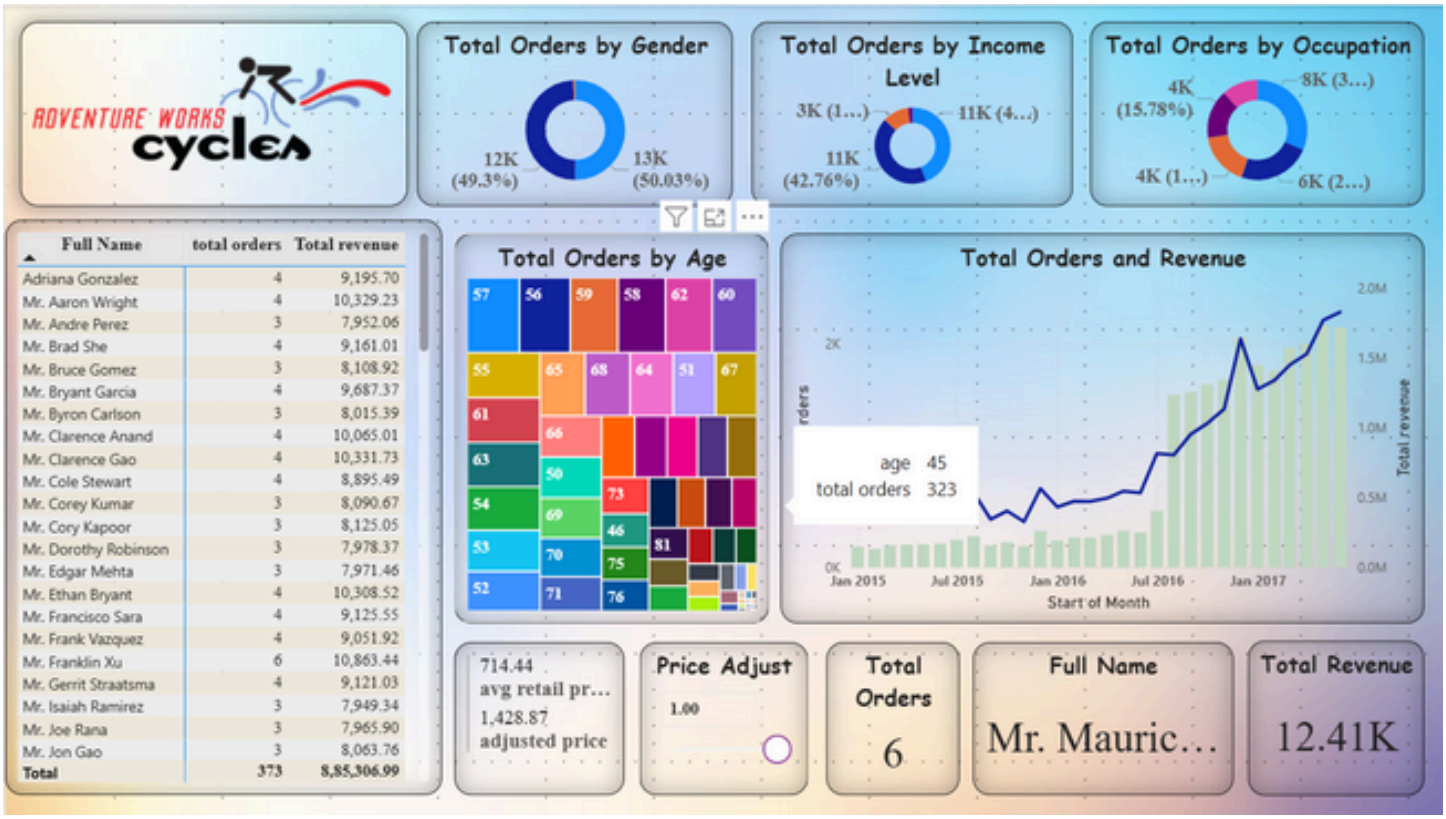

Figure 3: Order Detail Dashboard — Comprehensive breakdown of order trends and regional activity.

7. Insights and Findings

• Sales show strong seasonality, with specific months consistently outperforming others.• Certain product categories contribute the majority of total revenue, identifying key growth drivers.• Profit margins vary significantly across products, highlighting opportunities for pricing optimization.• Regional performance analysis reveals areas with untapped potential and customer growth opportunities.• Customer segmentation shows that repeat buyers drive a large portion of sales, emphasizing retention strategies.

8. Tools and Technologies Used

• Power BI – for data visualization, cleaning, and modeling.• DAX – for custom KPIs and advanced measures.• Power Query – for transformation and ETL operations.• Kaggle – for dataset sourcing.• Microsoft Excel/CSV – for raw data storage and manipulation.

9. Conclusion

The AdventureWorks Sales Analysis project successfully demonstrates the complete analytical workflow in Power BI. From data ingestion and modeling to dynamic dashboard creation, it illustrates how data-driven insights can guide business decisions. The dashboards empower stakeholders to monitor performance, assess product success, and explore customer trends interactively. This project highlights both technical Power BI proficiency and business acumen.