

Power BI business intelligence dashboard for AdventureWorks

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1. Introduction

Adventure Works is a global manufacturing company that specializes in producing and selling bicycles, accessories, and related components to customers across different regions. The company caters to both retail and wholesale markets, generating a large amount of data every day from its sales, customer interactions, and product returns. To make informed business decisions and maintain a competitive edge, Adventure Works needs a clear understanding of its key performance indicators and overall business performance.

The main goal of this project is to build an interactive and insightful **Business Intelligence dashboard using Power BI** that helps track and analyze the company's performance in various aspects. The dashboard focuses on tracking important KPIs such as **sales, revenue, profit, and returns**, comparing **regional performance**, analyzing **product-level trends**, and identifying **high-value customers**. By visualizing these metrics, the management can easily identify opportunities for growth and areas that require attention.

The dataset provided for this project consists of a collection of **raw CSV files**, containing detailed information about transactions, returns, products, customers, and sales territories. To transform this raw data into meaningful insights, the project involves several key steps. It begins with an introduction to **Power BI Desktop**, followed by **connecting and shaping the data** using Power Query. Once the data is cleaned and structured, a **data model** is created to establish relationships between different tables. After modeling, **interactive visualizations** are designed to represent the business insights clearly and effectively.

Finally, using **DAX (Data Analysis Expressions)**, calculated measures such as total sales, total revenue, profit margin, and return percentage are created to make the analysis more dynamic and flexible. This Power BI dashboard ultimately serves as a complete analytical tool for Adventure Works, enabling stakeholders to monitor business performance, uncover insights, and make data-driven decisions with confidence.

2. Work Overview

2.1 Connecting and Shaping Data - Connecting to data, shaping & transforming tables, using profiling tools, editing, merging & appending queries.

2.2 Creating a Data Model - Building relational models, creating table relationships, understanding cardinality and filter flow, etc.

2.3 Calculating Measures with DAX - Understanding DAX syntax, adding calculated columns and measures, writing common formulas and functions . Measures like Total Orders , Total Revenue , Revenue Target ,Revenue Target Gap have been created using DAX.

2.4 Visualizing Data with Dashboards - Inserting charts and visuals, customizing formats, editing interactions, applying filters and bookmarks, etc.

3. Dashboard Overview and Insights

3.1 Executive Dashboard

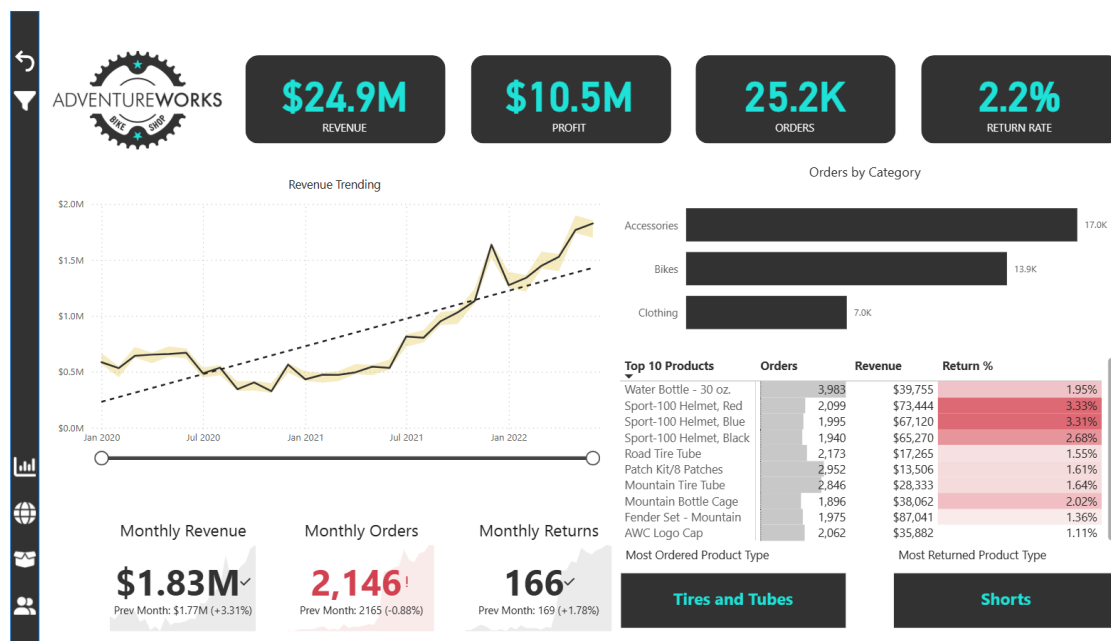


Fig 3.1.1 Executive Dashboard

3.2 Insights

In this **Executive Dashboard**, the key insights are:

1. The key KPIs highlight strong performance with a **Total Revenue of 24.9M USD**, **Total Profit of 10.5M USD**, **Total Orders of 25.2K**, and a **Total Return Rate of 2.2%**.
2. The **Accessories** category recorded the **highest total orders of 17.0K**, showing strong market demand.
3. From the **Top 10 Product Matrix**, the **top product by orders** is *Water Bottle – 30 oz*, the **top product by revenue** is *Fender Set – Mountain*, and the **product with the highest return percentage** is *Sport-100 Helmet, Red*.
4. The **most ordered product type** is *Tires and Tubes*, while the **most returned product type** is *Shorts*.

3.3 Global Orders Dashboard

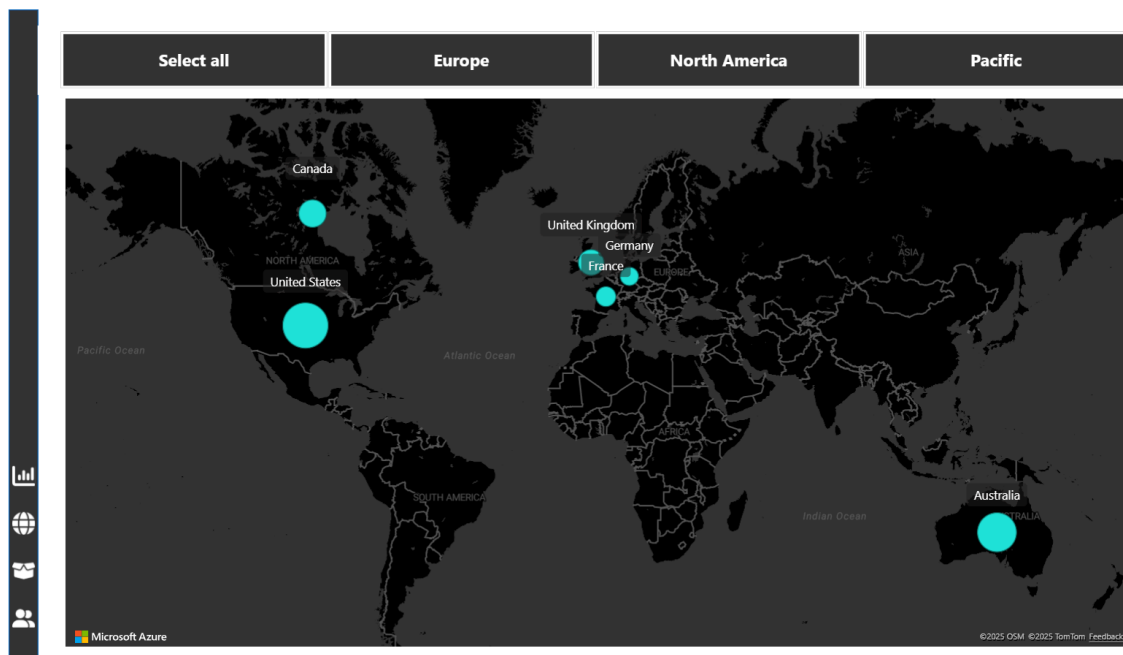


Fig 3.3.1 Map Overview of Dashboard

3.4 Insights

In this **Global Orders Dashboard**, the key insights are:

1. The **United States** recorded the **highest total orders** with **8,700 orders**, indicating its dominance in overall sales performance.
2. **Australia** ranked **second** with **6,060 orders**, showing strong regional demand.
3. **Canada** stood **third** with **3,024 orders**, contributing a moderate share to total global orders.

3.5 Product Detail Dashboard

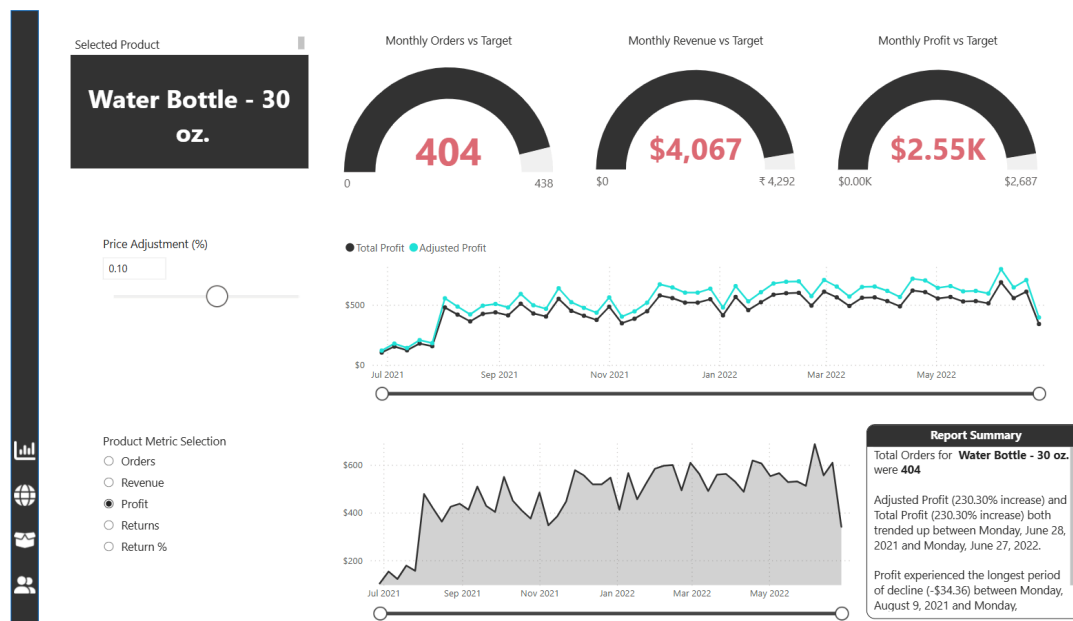


Fig 3.5.1 Product Detail Dashboard

3.6 Insights

In this **Product Detail Dashboard**, the key insights are:

1. The **Gauge Cards** show performance against targets for any selected product. For example, for *Water Bottle – 30 oz*, the **monthly orders** are **404** against a target of **438**, the **monthly revenue** is **4,067 USD** against a target of **4,292 USD**, and the **monthly profit** is **2.55K USD** compared to a target of **2,687 USD**. This provides a quick view of how the product is performing relative to its goals.
2. A **line chart** displays **Total Profit** and **Adjusted Profit**, allowing the user or viewer to adjust the price and immediately see its impact on profitability.

3. An **area chart** provides a detailed view of the selected product's performance metrics, including **Orders, Revenue, Profit, Returns, and Return %**, with the ability for the user or viewer to choose which metric to analyze, enabling flexible and interactive insights.

3.7 Customer Detail Dashboard

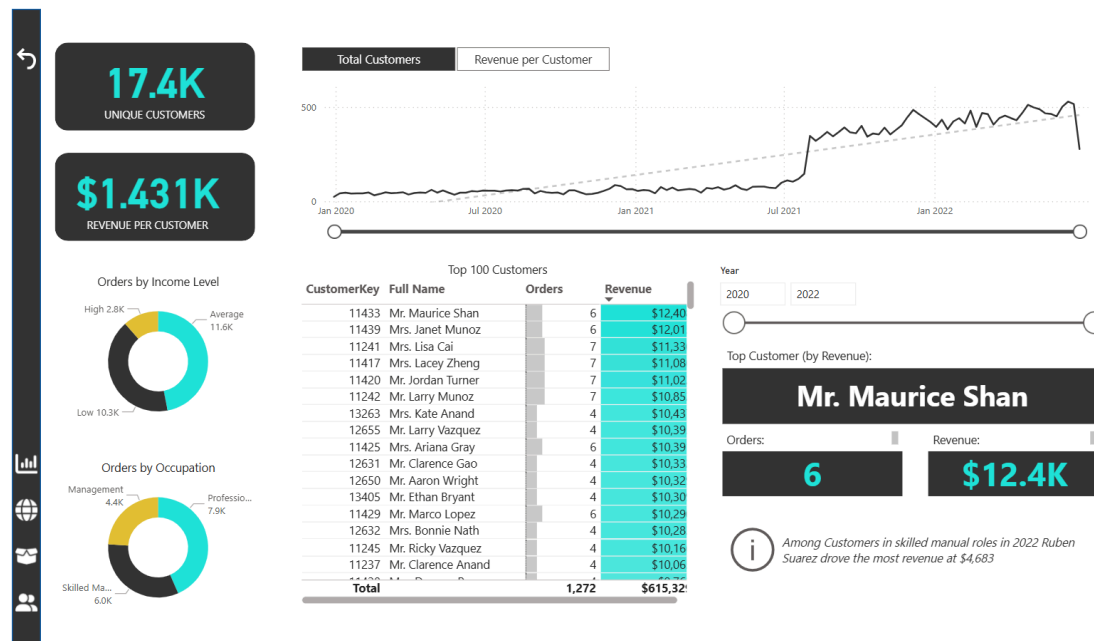


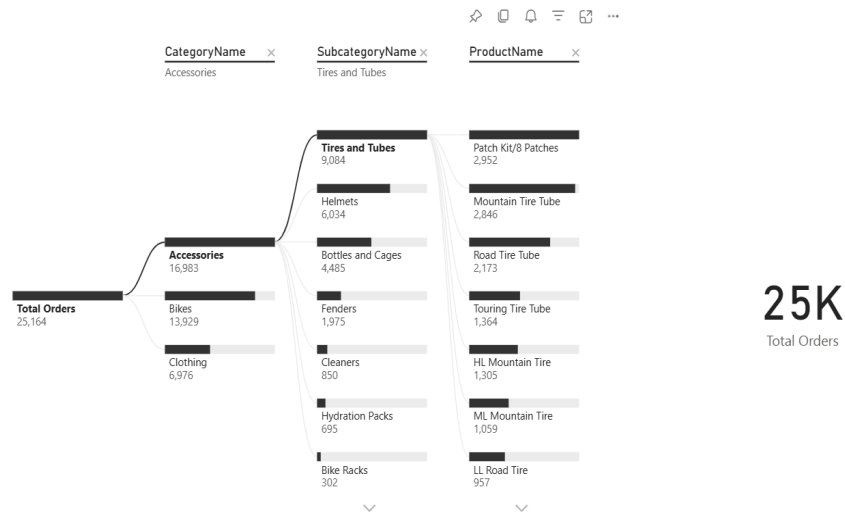
Fig 3.7.1 Customer Detail Dashboard

3.8 Insights

In this **Customer Detail Dashboard**, the key insights are:

1. The key KPIs show that there are **17.4K total unique customers** with an average **Revenue per Customer of 1,431 USD**, providing a quick overview of customer base and value.
2. **Donut charts** display the distribution of orders by **Income** and by **Occupation**, highlighting customer segments contributing most to sales.
3. The **top customer by revenue** is *Mr. Maurice Shan*, who generated **12.4K USD** across **6 orders**, indicating a high-value customer for targeted strategies.

3.9 Product Hierarchy Insights



3.9.1 Decomposition Tree - Total Orders

4. Conclusion

This Adventure Works Power BI project demonstrates how raw business data can be transformed into actionable insights through interactive dashboards and visual analytics. By connecting and shaping the provided CSV datasets, creating a robust data model, and leveraging DAX calculations, we were able to track key performance indicators, analyze regional and product-level trends, and identify high-value customers effectively.

The **Executive Dashboard** provided a high-level overview of total revenue, profit, orders, and return rates, enabling quick decision-making for management. The **Global Orders Dashboard** highlighted country-wise performance, showing which regions contribute most to overall sales. The **Product Detail Dashboard** offered deep insights into individual product performance, allowing users to compare actuals against targets and explore metrics like orders, revenue, and profit interactively. Finally, the **Customer Detail Dashboard** delivered valuable information on customer behavior, segments, and top customers, supporting targeted marketing and sales strategies.

Overall, this project illustrates the power of **Power BI** in turning complex datasets into **easy-to-understand, interactive, and visually appealing dashboards**. It enables data-driven decision-making, supports performance monitoring, and provides the tools necessary for identifying growth opportunities, improving product performance, and enhancing customer engagement.