Project Report: Data Analysis and Visualisation Using SQL and Power BI

Background: This project utilised datasets from AdventureWorks2019, an online database containing sales data for a specific organisation. The data was initially unformatted and required extensive preparation to extract meaningful insights. The project began with a Business Demand Email outlining the manager's requirements. As the Business Analyst, my role was to process the data, derive insights, and present the findings in an interactive dashboard using Power BI.

Task Overview: The primary objective was to interpret the manager's requirements, define the scope of work, and create an optimised process for analysing and visualising the data. Key deliverables included:

- As-Is and To-Be process documentation.
- User stories and acceptance criteria.
- Cleaned and formatted data ready for visualisation.
- An interactive dashboard tailored to the manager's specifications.

Solution:

1. **Data Preparation:**
    - Cleaned and formatted the raw dataset using SQL to align with the specified requirements.
    - Addressed missing or inconsistent data points and ensured data integrity.
2. **Data Bucketing:**
    - Segmented the cleaned data into logical buckets, such as sales categories and time periods, for easier analysis.
    - Exported the processed data to CSV files, which served as input for Power BI.
3. **Data Modelling in Power BI:**
    - Built a data model and established relationships between tables for seamless integration.
    - Ensured the model adhered to best practices for performance and accuracy.

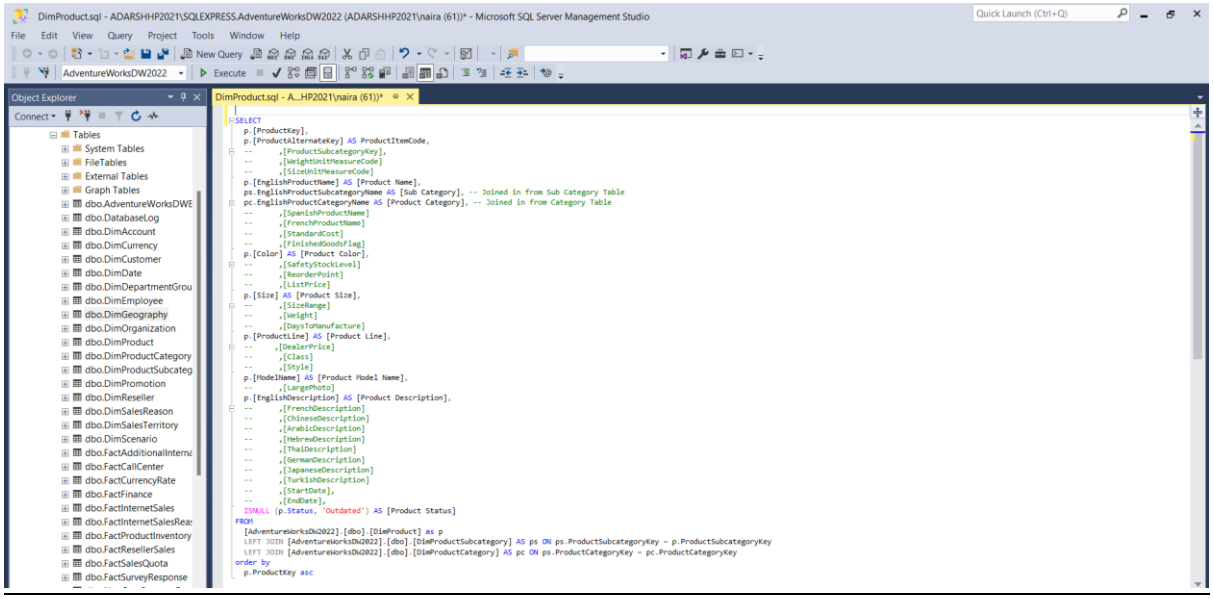
4. **Measure Creation:**
    - Developed measures based on the user requirements, including Total Sales, Budget, and Sales-to-Budget Ratio.
    - Grouped calculations into Key Measures for frequent use in reports and dashboards.
5. **Dashboard Design:**
    - Designed an interactive Sales Overview Dashboard to visualise insights effectively.
    - Incorporated filters for dynamic analysis, allowing users to drill down by year and month.
    - Presented data in an intuitive layout to facilitate decision-making.

Result: The final solution transformed an unformatted dataset into actionable insights presented through an interactive Power BI dashboard. Key outcomes included:

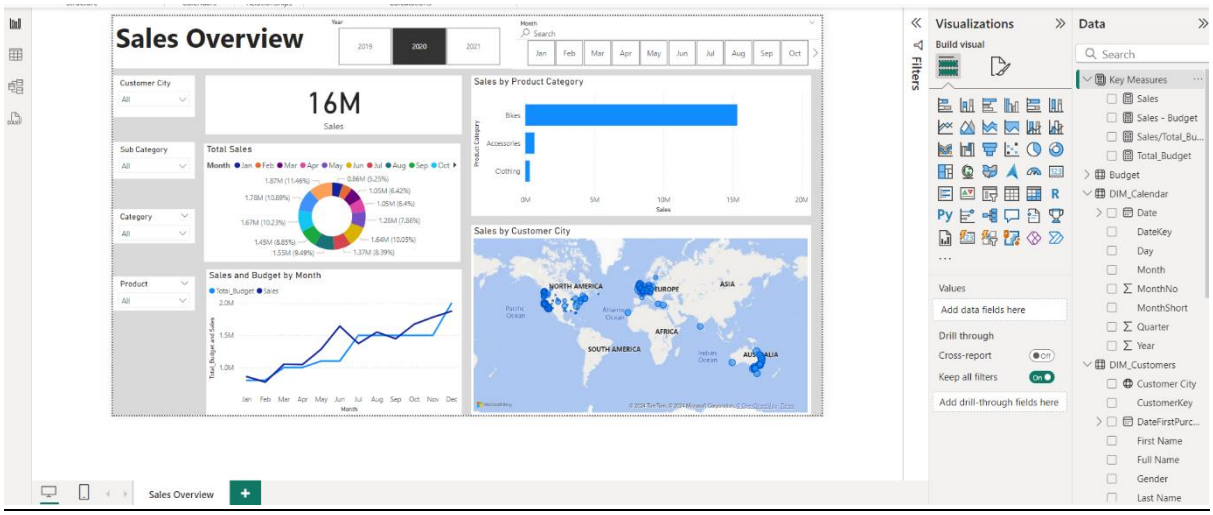
1. **Improved Data Usability:**
    - Raw data was cleaned and structured to provide accurate and meaningful insights.
2. **Enhanced Reporting:**
    - The Power BI dashboard offered a dynamic and user-friendly interface to explore sales data.
3. **Flexible Analysis:**
    - Filters and drill-down capabilities enabled detailed exploration of specific data points.
4. **Business Impact:**
    - Provided stakeholders with clear, actionable insights to inform strategic decisions.

Conclusion: This project demonstrated the power of combining SQL for data preparation with Power BI for visualisation. The process involved understanding business requirements, cleaning and modelling data, and delivering insights through an interactive dashboard. The end result was a flexible, user-friendly tool that allowed for detailed analysis and supported data-driven decision-making.

Project Snapshot



A SQL code snippet of the Products Table



Sales Overview Interactive Dashboard and Key Measures on the right that were calculated