**Capstone Project Documentation**

**Project Title: Sales Data Analysis and Business Intelligence Implementation**

**Project Overview**

The objective of this capstone project is to design and implement a Business Intelligence (BI) solution using Power BI and SQL to help the company "Axon" effectively manage and analyze their sales data. This documentation provides an overview of the project, including data sources, data transformations, visualizations, and insights.

**1. Introduction**

**Project Background**

The capstone project addresses the data management and analysis challenges faced by the company "Axon," a retailer specializing in classic cars. The project aims to implement a BI solution using Power BI and SQL to enhance data-driven decision-making.

**Problem Statement**

Axon is struggling to manage and analyze their sales data effectively due to the absence of a centralized system. This impacts their decision-making process as they lack accurate and up-to-date sales reports.

**Project Goals**

The primary goals of the project are:

* Implement a BI solution using Power BI and SQL.
* Import, clean, and transform sales data.
* Build interactive dashboards and reports.
* Perform advanced analytics.
* Enable real-time access for management.

**2. Data Description**

**Data Sources**

The project uses data from a MySQL database provided as a data source. The database includes tables such as Customers, Products, Orders, OrderDetails, Payments, Employees, Offices, and ProductLines, Orders, OrderDetails, Payments, Employees, Offices

**3. Data Preparation**

**Data Import**

Data was extracted from the MySQL database and loaded into Power BI using appropriate features and methods.

**Data Cleaning and Transformation**

Data cleaning involved tasks such as removing duplicates, handling missing values, and ensuring data consistency. Transformation processes prepared the data for analysis.

**Data Integration**

Data from multiple tables was integrated using relationships to enable cross-table analysis.

**4. Data Modelling**

**Relationships**

Relationships were established between tables where necessary, including connecting Customers to Sales Representatives and linking Employees to Managers.

**Calculated Columns**

Calculated columns were created to derive additional insights, such as Sales in order details table, Processing time (days) in orders table, "Order Month" and "Month Year" for time-based analysis.

**Measures**

Measures were defined for aggregations, including "Total Sales" and "Average Order Quantity."

**5. Visualizations and Dashboards**

**Overview of Visualizations**

Visualizations include bar charts, line charts, pie charts, slicers, and tables, presenting key metrics and trends.

**Interactive Dashboards**

Dashboards were designed to provide real-time insights for the sales team and management. Users can interact with slicers and filters to explore data.

**Key Metrics and Insights**

Visualizations highlight total sales, average order quantity, and other key metrics. Insights include sales trends over time and product performance analysis.

**6. Advanced Analytics**

**SQL Queries and Analytics**

SQL queries were utilized to perform advanced analytics on the sales data. This includes extracting insights, running queries, and generating views.

**Extracted Insights**

The project extracted valuable insights from the data, including sales trends, product performance, and customer behaviour.

**7. Deployment**

**Deployment of BI Solution**

The BI solution, including dashboards, reports, and advanced analytics, was deployed for the sales team and management. It is accessible through Power BI Service.

**User Accessibility**

The solution is user-friendly, and a user guide is provided to ensure adoption and success. Stakeholders can access real-time dashboards and reports.

**8. Testing and Validation**

**Testing Procedures**

Thorough testing of the BI solution was conducted to ensure functionality, accuracy, and performance. This included data validation and functionality testing.

**Validation of Results**

The results and insights were validated to confirm that they align with business objectives and expectations.

**9. Project Performance**

**Performance Optimization**

Performance optimization measures were implemented to enhance the responsiveness and efficiency of the BI solution.

**Scalability Considerations**

Considerations for future scalability and data expansion were addressed.

**10. Insights**

Monthly Sales

Monthly Sales to get an overview of the month which has the highest sales and the lowest sales.

Sales over years

Historical data of sales over year to see how our sales have increased or dropped.

Credit limit by country

Credit limit of our customers from different countries to see which countries have the highest credit limit so that we can develop sales strategies.

Order by country

Total revenue generated by each country over time to oversee how we have sold in each country.

Count of orders by country

Total number of orders by each country to see which countries are getting less orders.

Average processing time by country

Processing time can affect the sales. Hence in this chart we can see which countries have high processing time so that we can work to speed them up.

**10. Conclusion**

**Project Summary**

The capstone project successfully addressed Axon's data management and analysis challenges by implementing a BI solution using Power BI and SQL.

**Achievements and Impacts**

The project can lead to improved decision-making, better data accessibility, and insights that can drive business growth and efficiency.