PROJECT: -

Business Intelligence Solution Implementation for AXON Retailer

Problem Statement: -

Axon Company, which is a retailer selling classic cars, is facing issues in managing and analyzing their sales data. The sales team is struggling to make sense of the data and they do not have a centralized system to manage and analyze the data. The management is unable to get accurate and up-to-date sales reports, which is affecting the decision-making process. To address this issue, the company has decided to implement a Business Intelligence (Bi) tool that can help them manage and analyze their sales data effectively. They have shortlisted Microsoft Power Bl and SQL as the Bl tools for this project.

The goal of the capstone project is to design and implement a Bl solution using Power BI and SQL that can help the company manage and analyze their sales data effectively. The solution should be able to:

1. Import and integrate the data from MySQL database into Power BI.

2. Clean and transform the data to make it ready for analysis.

3. Build interactive dashboards and reports using Power BI that can help the sales team and management make sense of the data.

4. Use SQL to perform advanced analytics on the data and extract insights.

5. Enable the management to access the dashboards and reports in real-time and make data-driven decisions.

The solution should be user-friendly and easy to use for the sales team and management. The project will be successful if it helps the company effectively manage and analyze their sales data and improve their decision-making process.

Data Source: -

The MySQL database serves as the primary source of data for the project. The MySQL database is chosen for its reliability, scalability, and compatibility with the selected BI tools, Power BI, and SQL. MySQL database is essential for gaining insights into sales performance, customer behavior, and market trends.

Overview of the Data Schema and Tables:

The data schema outlines the structure and relationships of the tables within the MySQL database. The tables within the database typically include:

Customers: Stores customer information such as names, contact details, addresses, and demographic data.

Products: Provides details about the products sold by Axon, including product IDs, names, prices, and quantities in stock.

Product Line: Store descriptions and product categories.

Employees: Includes employee data such as employee IDs, names, contact information, and roles within the organization.

Offices: Stores information about Axon's office locations, including office codes, addresses, contact details, and geographic regions.

Orders: Incudes sales order data such as ordered date, shipped date, required date, status of status of shipment

Order Details: Provide information such as quantity of orders, product code, price of order, order number.

Payment: Provides details about the amount, payment date, Cheque number and customer number.

Data Extraction and Cleaning:

Process: Connected Power BI Desktop to MySQL workbench to extract data.

Data Cleaning: In Power Query Editor, removed null columns, merged columns, handled missing values, and changed data types. Dropped unnecessary columns, applied transformations, and ensured data quality for analysis.

Dashboard Design:

Design: Created three pages: Home, Page One, and Page Two.

Content: Home and Page One focused on product and order analysis, while Page Two centered on customer analysis.

Interactivity: Implemented slicers for navigation: On the home page and page one, slicers for year-wise and product category-wise data navigation. On page 2, slicers for year-wise and country-wise data navigation.

Insights Overview: Analyzed sales by each office, reviewed average order value, examined quarterly trend of sales. Analyzed total sale value and net profit.
On customer order analysis page: Identified top 10 paying customers.
Examined average credit limit, customer count, and maximum payment.

Schema: Utilized a snowflake schema due to constraints for forming relationships

Analytics with SQL Queries

TOP 5 CUSTOMER WITH HIGHEST CREDIT LIMIT

```
SELECT CUSTOMERNUMBER, CUSTOMERNAME, CONCAT
(CONTACTFIRSTNAME," ", CONTACTLASTNAME) AS CONTACT_NAME,
CREDITLIMIT FROM CUSTOMERS

ORDER BY CREDITLIMIT DESC

LIMIT5
```

CUSTOMERNAME	CONTACT_NAME	CREDITLIMIT
Euro+ Shopping Channel	Diego Freyre	227600.00
Mini Gifts Distributors Ltd.	Susan Nelson	210500.00
Vida Sport, Ltd	Mihael Holz	141300.00
Muscle Machine Inc	Jeff Young	138500.00
AV Stores, Co.	Rachel Ashworth	136800.00

TOP 5 ORDER SALES AND CUSTOMER

```
SELECT OD. ORDERNUMBER, CUSTOMERNAME, SUM (QUANTITYORDERED * PRICEEACH) AS TOTAL_PRICE FROM ORDERDETAILS OD
JOIN ORDERS O ON OD. ORDERNUMBER= O. ORDERNUMBER
JOIN CUSTOMERS C ON O. CUSTOMERNUMBER= C. CUSTOMERNUMBER
GROUP BY OD. ORDERNUMBER, CUSTOMERNAME
ORDER BY TOTAL_PRICE DESC
LIMIT 5
```

ORDERNUMBER	CUSTOMERNAME	TOTAL_PRICE
10165	Dragon Souveniers, Ltd.	67392.85
10287	Vida Sport, Ltd	61402.00
10310	Toms Spezialitäten, Ltd	61234.67
10212	Euro+ Shopping Channel	59830.55
10207	Diecast Collectables	59265.14

TOP 5 CUSTOMERS WITH HIGHEST NUMBER OF ORDERS

```
SELECT O. CUSTOMERNUMBER, CUSTOMERNAME, COUNT(ORDERNUMBER) AS NUMBER_OF_ORDERS FROM ORDERS O
JOIN CUSTOMERS C ON O. CUSTOMERNUMBER=C.CUSTOMERNUMBER
GROUP BY CUSTOMERNUMBER, CUSTOMERNAME
ORDER BY NUMBER_OF_ORDERS DESC
LIMIT 5
```

CUSTOMERNUMBER	CUSTOMERNAME	NUMBER_OF_ORDERS
141	Euro+ Shopping Channel	26
124	Mini Gifts Distributors Ltd.	17
145	Danish Wholesale Imports	5
114	Australian Collectors, Co.	5
148	Dragon Souveniers, Ltd.	5

QUANTITY OF MOST ORDERDED PRODUCTS

```
SELECT PRODUCTCODE, SUM(QUANTITYORDERED) AS PRODUCT_QUANTITY
FROM ORDERDETAILS

GROUP BY PRODUCTCODE

ORDER BY PRODUCT_QUANTITY DESC

LIMIT 5
```

PRODUCTCODE	PRODUCT_QUANTITY
S18_3232	1808
S18_1342	1111
S700_4002	1085
S18_3856	1076
S50_1341	1074

TOP 10 CUSTOMER WITH HIGHEST PAID AMOUNT

```
SELECT C. CUSTOMERNUMBER, CUSTOMERNAME, CONCAT
(CONTACTFIRSTNAME," ", CONTACTLASTNAME) AS CONTACT_NAME,

CITY, SUM(AMOUNT) AS TOTAL_AMOUNT FROM PAYMENTS P

JOIN CUSTOMERS C

ON C. CUSTOMERNUMBER= P. CUSTOMERNUMBER

GROUP BY P. CUSTOMERNUMBER

ORDER BY TOTAL_AMOUNT DESC LIMIT 10
```

CUSTOMERNAME	CONTACT_NAME	CITY	TOTAL_AMOUNT
Euro+ Shopping Channel	Diego Freyre	Madrid	715738.98
Mini Gifts Distributors Ltd.	Susan Nelson	San Rafael	584188.24
Australian Collectors, Co.	Peter Ferguson	Melbourne	180585.07
Muscle Machine Inc	Jeff Young	NYC	177913.95
Dragon Souveniers, Ltd.	Eric Natividad	Singapore	156251.03
Down Under Souveniers, Inc	Mike Graham	Auckland	154622.08
AV Stores, Co.	Rachel Ashworth	Manchester	148410.09
Anna's Decorations, Ltd	Anna O'Hara	North Sydney	137034.22
Corporate Gift Ideas Co.	Julie Brown	San Francisco	132340.78
Saveley & Henriot, Co.	Mary Saveley	Lyon	130305.35

MONTH EFFECT OF SALES OF PRODUCT AND COUNT OF ORDER

```
SELECT DATE_FORMAT (ORDERDATE,'%M') AS MONTH_COLUMN,

SUM(QUANTITYORDERED*PRICEEACH) AS SALES, COUNT
(ORDERDETAILS.ORDERNUMBER) AS NUMBER_OF_ORDERS FROM
ORDERDETAILS

JOIN ORDERS ON ORDERDETAILS.ORDERNUMBER= ORDERS.ORDERNUMBER

GROUP BY MONTH_COLUMN

ORDER BY NUMBER_OF_ORDERS DESC
```

MONTH_COLUMN	SALES	NUMBER_OF_ORDERS
November	1967317.13	616
October	1014570.07	323
May	869235.79	261
March	737920.36	232
January	716815.00	229
February	735098.65	226
December	705561.42	224
April	718244.98	203
August	597584.20	191
September	520497.65	171
July	527503.85	165
June	493841.51	155

Summary & Analysis:

•Analysis reveals notable trends, such as a slow sales start during the initial quarters of 2003 and 2004, Sales consistently increase throughout the year in each quarter. Followed by a significant growth trend observed in the first quarters of each year in 2005.

•The progression of each year shows a consistent increase in order counts, indicating a positive trend in sales volume over time.

•All offices across each listed country, a balanced relationship between sales and profit is observed, with each office generating profitable sales.

•Net profit margins have shown consistent improvement over the years, indicating increasing profitability and efficiency in operations.

Recommendations for Future Improvements or Enhancements:

•Further analysis of product line performance, particularly for classic cars, can provide insights into seasonal sales trends and inform inventory management strategies.

•Focus on optimizing operations in high-performing offices, such as those in the USA and France, to sustain and maximize profitability.

•Continuation of quarterly sales analysis can help identify emerging trends and opportunities for growth, especially in the last quarter, which has shown significant increases in sales.

•Enhanced customer segmentation and targeted marketing efforts can capitalize on the high concentration of customers from the USA and Spain, further driving sales and revenue growth.