**MySQL + Power BI Project Documentation**

**Summary of Report-** In this project, we integrated MySQL for data management and Power BI for data visualization to create an interactive dashboard that provides insightful analysis of retail sales data stored in the global\_retail\_sales\_db database. We prepared the data by converting date formats and conducted various analyses, including sales performance, customer demographics, product performance, shipping metrics, and order and rating analysis. These insights were visualized in Power BI using various chart types, facilitating data-driven decision-making and delivering valuable business insights.

**1. Database Creation and Setup**

* **Create Database**

Purpose: This step initializes the database where all the sales data will be stored.

CREATE DATABASE global\_retail\_sales\_db;

* **Select Data from Table**

Purpose: This query retrieves all data from the global\_retail\_sales table for examination and analysis.

SELECT \* FROM global\_retail\_sales;

* **Describe Table Structure**

Purpose: This query provides the structure of the global\_retail\_sales table, detailing column names and data types.

DESCRIBE global\_retail\_sales;

* **Update Order Date Format**

Purpose: This query converts the Order Date column format from string to date for more accurate date-related operations.

UPDATE global\_retail\_sales

SET `Order Date` = STR\_TO\_DATE(`Order Date`, '%d-%m-%Y');

* **Modify Order Date Column Type**

Purpose: This alters the data type of the Order Date column to DATE after converting its format.

ALTER TABLE global\_retail\_sales

MODIFY COLUMN `Order Date` DATE;

**2. Sales Performance Analysis**

* **Total Sales by Year**

Purpose: This query calculates the total sales for each year to analyze yearly sales performance.

SELECT SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY YEAR(`Order Date`);

* **Total Sales by Month**

Purpose: This query calculates the total sales for each month to observe monthly sales trends.

SELECT SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY MONTH(`Order Date`);

* **Total Sales for February**

Purpose: This query filters the sales data to show total sales for the month of February.

SELECT SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

WHERE MONTH(`Order Date`) = 2; -- February

* **Average Sales Price**

Purpose: This query calculates the average sales price of all products, providing insight into pricing trends.

SELECT AVG(`Sales Price`) AS average\_sales\_price

FROM global\_retail\_sales;

* **Total Quantity Sold**

Purpose: This query calculates the total quantity of products sold to measure sales volume.

SELECT SUM(`Quantity`) AS total\_quantity\_sold

FROM global\_retail\_sales;

* **Sales per Unit**

Purpose: This query calculates the average sales per unit, which helps in understanding the revenue generated per product.

SELECT AVG(`Sales per Unit`) AS average\_sales\_per\_unit

FROM global\_retail\_sales;

* **Monthly Sales Difference**

Purpose: This query calculates the sales difference between consecutive months to identify growth or decline patterns.

SELECT

MONTH(`Order Date`) AS month,

SUM(`Total Sales`) AS total\_sales,

LAG(SUM(`Total Sales`), 1) OVER (ORDER BY MONTH(`Order Date`)) AS previous\_month\_sales,

(SUM(`Total Sales`) - LAG(SUM(`Total Sales`), 1) OVER (ORDER BY MONTH(`Order Date`))) AS sales\_difference

FROM global\_retail\_sales

GROUP BY MONTH(`Order Date`);

* **Sales Trend by Month**

Purpose: This query calculates and orders the total sales by month to analyze the sales trend.

SELECT

MONTH(`Order Date`) AS month,

SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY MONTH(`Order Date`)

ORDER BY MONTH(`Order Date`);

* **Quarterly Sales Analysis**

Purpose: This query calculates the total sales for each quarter to observe quarterly sales performance.

SELECT

QUARTER(`Order Date`) AS quarter,

SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY QUARTER(`Order Date`);

* **Monthly Sales Growth Rate**

Purpose: This query calculates the monthly growth rate to assess the percentage change in sales month-over-month.

SELECT

MONTH(`Order Date`) AS month,

SUM(`Total Sales`) AS total\_sales,

(SUM(`Total Sales`) - LAG(SUM(`Total Sales`), 1) OVER (ORDER BY MONTH(`Order Date`))) / LAG(SUM(`Total Sales`), 1) OVER (ORDER BY MONTH(`Order Date`)) \* 100 AS sales\_growth\_rate

FROM global\_retail\_sales

GROUP BY MONTH(`Order Date`);

* **Sales Comparison by Year and Month**

Purpose: This query compares total sales for each month across different years to identify yearly trends.

SELECT

YEAR(`Order Date`) AS year,

MONTH(`Order Date`) AS month,

SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY YEAR(`Order Date`), MONTH(`Order Date`)

ORDER BY YEAR(`Order Date`), MONTH(`Order Date`);

3. **Customer Demographics Analysis**

* **Sales by Gender**

Purpose: This query calculates total sales grouped by buyer gender to understand gender-based sales performance.

SELECT `Buyer Gender`, SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY `Buyer Gender`;

* **Sales by Age Group**

Purpose: This query calculates total sales grouped by buyer age to analyze age-based sales distribution.

SELECT `Buyer Age`, SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY `Buyer Age`;

* **Sales by Location**

Purpose: This query calculates total sales grouped by order location to understand geographic sales distribution.

SELECT `Order Location`, SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY `Order Location`;

**4. Product Performance Analysis**

* **Sales by Product Category**

Purpose: This query calculates total sales grouped by product category to identify top-performing categories.

SELECT `Product Category`, SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY `Product Category`;

* **Sales by Product ID**

Purpose: This query calculates total sales grouped by product ID to determine best-selling products.

SELECT `Product ID`, SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY `Product ID`;

**5. Shipping Metrics Analysis**

* **International vs. Domestic Sales**

Purpose: This query calculates total sales grouped by shipping type (international vs. domestic) to compare market performance.

SELECT `International Shipping`, SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY `International Shipping`;

* **Total Shipping Charges**

Purpose: This query calculates total shipping charges to evaluate the overall shipping cost.

SELECT SUM(`Shipping Charges`) AS total\_shipping\_charges

FROM global\_retail\_sales;

6. **Order and Rating Analysis**

* **Order Count**

Purpose: This query counts the total number of orders to measure sales volume.

SELECT COUNT(`Order ID`) AS order\_count

FROM global\_retail\_sales;

* **Average Rating**

Purpose: This query calculates the average rating of products to gauge customer satisfaction.

SELECT AVG(`Rating`) AS average\_rating

FROM global\_retail\_sales;

* **Review Analysis**

Purpose: This query analyzes the count of reviews and average rating per product to assess product performance and feedback.

SELECT

`Product ID`,

COUNT(`Review`) AS total\_reviews,

AVG(`Rating`) AS average\_rating

FROM global\_retail\_sales

GROUP BY `Product ID`;

**7. Additional Metrics Analysis**

* **Sales Over Time**

Purpose: This query calculates total sales grouped by month to analyze sales trends over time.

SELECT

MONTH(`Order Date`) AS month,

SUM(`Total Sales`) AS total\_sales

FROM global\_retail\_sales

GROUP BY MONTH(`Order Date`);

* **Order Date Analysis**

Purpose: This query counts the total number of orders grouped by order date to understand daily sales distribution.

SELECT

`Order Date`,

COUNT(`Order ID`) AS order\_count

FROM global\_retail\_sales

GROUP BY `Order Date`;

**Chart Types For KPI’s**

* Sales Performance

Total Sales by Month: Line Chart

Average Sales Price: Bar Chart

Total Quantity Sold: Bar Chart

Sales per Unit: Bar Chart

* Customer Demographics

Sales by Gender: Pie Chart

Sales by Age Group: Bar Chart

Sales by Location: Map Chart

* Product Performance

Sales by Product Category: Bar Chart

Sales by Product ID: Bar Chart

* Shipping Metrics

International vs. Domestic Sales: Stacked Bar Chart

Total Shipping Charges: Bar Chart

* Order and Rating Analysis

Order Count: KPI Card

Average Rating: Gauge Chart

Review Analysis: Bar Chart

* Additional Metrics

Sales Over Time: Line Chart

Order Date Analysis: Histogram