

“Electro Mart” Product Sales Report

Electro Mart is a globally recognized electronics retailer operating in various locations across the globe. I’m a business data analyst working with Electro Mart’s data team, where I was given the task of reporting business activity in the form of visualization. As mentioned, it operates in different locations and sells different types of electronics in various categories and sub-categories to customers across the world. Through this reporting, we can drill deep into the data, which includes information about customers, products, store locations, sales, and exchange rates, which helps us calculate the revenue generated through the business. This report walks you through the end-to-end process to help us explore, clean, manipulate, visualize, derive insights, and summarize them with recommendations to increase Electro Mart’s product sales.

Why Is This Project Important?

For any firm, knowing the market's behavior and sales trends is essential knowledge. Selling electronic goods without understanding the satisfaction, interest, and demography of the consumer will cause the company to move blindly in a direction that may lead the company toward a phase of decline. Hence, the following are the objectives that can be accomplished from this analysis:

1. Knowing the Customer demographics
2. Identifying sales trends and patterns
3. Customer's interest in each product
4. Brand awareness in each location

Through this analysis, it gives the business a clear understanding of how the customers are attracted to our retail products in every location. This analysis predominantly explains the happenings in the past, which makes it a DESCRIPTIVE ANALYSIS side of the data analysis

Tools Used

1. Power BI – This tool is used for data cleaning, data modeling, data manipulation and its visualization. Following are the Data Analysis Expressions (DAX) used across the analysis.
 - a. Aggregation DAX formula – SUM, PRODUCT, COUNT, DISTINCTCOUNT, MIN, MAX
 - b. Date DAX formula – YEAR, MONTH, DAY, DATEDIFF, TOTALYTD
 - c. Time Intelligence formula – CLOSINGBALANCEMONTH, CLOSINGBALANCEYEAR
 - d. Filtering DAX formula – CALCULATE, FILTER, RANKX

Exploring The Dataset

The business team has given us data in five different CSV files, such as **Sales**, **Customers**, **Products**, **Stores**, and **Exchange Rates**, which include various fields of different data types. Below is the table consisting of the table name, its fields, its datatype, and its description

Table	Field	Datatype	Description
Sales	Order Number	Number	Unique ID for each order
	Line Item	Number	Identifies individual products purchased as part of an order
	Order Date	Date	Date the order was placed
	Delivery Date	Date	Date the order was delivered
	CustomerKey	Number	Unique key identifying which customer placed the order
	StoreKey	Number	Unique key identifying which store processed the order
	ProductKey	Number	Unique key identifying which product was purchased
	Quantity	Number	Number of items purchased
	Currency Code	Text	Currency used to process the order
Customers	CustomerKey	Number	Primary key to identify customers
	Gender	Text	Customer gender
	Name	Text	Customer full name
	City	Text	Customer city
	State Code	Text	Customer state (abbreviated)
	State	Text	Customer state (full)
	Zip Code	Number	Customer zip code
	Country	Text	Customer country
	Continent	Text	Customer continent
	Birthday	Date	Customer date of birth
Products	ProductKey	Number	Primary key to identify products
	Product Name	Text	Product name
	Brand	Text	Product brand
	Color	Text	Product color
	Unit Cost USD	Currency	Cost to produce the product in USD

	Unit Price USD	Currency	Product list price in USD
	SubcategoryKey	Number	Key to identify product subcategories
	Subcategory	Text	Product subcategory name
	CategoryKey	Number	Key to identify product categories
	Category	Text	Product category name
Stores	StoreKey	Number	Primary key to identify stores
	Country	Text	Store country
	State	Text	Store state
	Square Meters	Number	Store footprint in square meters
	Open Date	Date	Store open date
Exchange Rates	Date	Date	Date
	Currency	Text	Currency code
	Exchange	Decimal	Exchange rate compared to USD

Data Munging

In the mission of analyzing the data, munging the data is the most important part of the analysis. This is basically cleaning and transforming the data before using it for further processing. Through cleaning the data, the analyst could find errors and remove inconsistencies and incorrect, duplicated values of various datatypes. By transforming or wrangling the data, we can make the data more valuable and sensible, such as splitting the column values into different columns, removing unwanted columns, calculating KPI measurements, etc. This process is taken care of in the POWER QUERY feature in Power BI.

Data cleaning

1. In the Sales table, the Delivery Date field is removed as it has more number of null values.
2. In the Stores table, the Square Meters field has one null value for the online store. Hence, the null value is replaced with zero (0).
3. In the Customers table, the State Code is removed from the table as it has inconsistent values.
4. Also, in the Customers table, the Zip Code is removed from the table as the data has an inconsistent data type and they don't represent the customer behavior.
5. In the Sales table, Line Item column is removed as it will not be used in any calculations or visualization. So, it is an unwanted column of data.

Data wrangling

1. In the Customers table, values in the City field are transformed from uppercase to Capitalize each word.
2. In the Exchange_Rates table, the Exchange field has inconsistent decimal values. Hence, it is transformed to maintain consistent values by rounding off the values to two decimal values.

Data Modeling

This is a process of conceptualizing and visualizing the transformed data. Here, We have used the STAR SCHEMA method to model the data as it will have a fact and dimension tables. This gives an advantage of data redundancy and de-normalizing the data.

Here, the Sales table becomes the fact table, and the Customers, Products, and Stores table becomes the dimension table.

Data Manipulation Using DAX functions

Power BI has its own Data Analysis Expression (DAX) functionality that helps to manipulate the data to get meaningful insights like measuring KPIs, calculating the other key measures, etc. Here, we have used certain DAX functions to get the desired measures.

1. Calculating the profit per product – in the Products table, the Profit column calculates the difference between the selling price and the cost price to calculate the profit per product.
2. Calculating the profit margin – in the Products table, the Profit Margin column calculates the profit margin per product.
3. Calculating total sales – in the Sales table, the Total Sales USD column calculates the total sale amount by multiplying the quantity and unit price USD. For converting the other currencies to USD, it is further multiplied by the exchange rate at the specific date.

Business Insights

1. Key Performance Indicators (KPIs):

- Total Revenue
- Total Products
- Total Orders
- Total Profit
- Average Order Value
- Profit Margin(%)

2. Monthly and Yearly Trends:

- Total Orders
- Total Revenue

3. Categorical Analysis:

- Top 10 States by Sales
- Top 3 Continents by Revenue
- Top 5 Selling Products
- Percentage of Orders by Gender

4. Filters: Month, Brand, Country, Continent, Category, Sub-Category

5. Slicers: Year

Project Summary

This project has helped us to learn about the following concepts

- Creation of interactive dashboards for online sales data analysis
- Data manipulation techniques: connections, table joins, calculations, and user-driven parameters for visualization
- Various visualization types used: bar chart, pie chart, clustered bar chart, line chart, filters, slicers, etc.

Conclusion

This project harnesses Power BI's capabilities to empower stakeholders with a dynamic platform for sales data analysis. The derived insights lead to informed decisions and refined sales strategies.