# SALES ANALYTICS: POWER BI DASHBOARD

## INTRODUCTION

### PROJECT OVERVIEW

- ***Introduction to the Project:*** This project aims to develop an interactive sales performance dashboard using Power BI to analyse and visualize sales data for a company.
- ***Description of the Dashboard:*** The dashboard will provide insights into sales and profit by product categories, KPIs and sales trends over time.
- ***Importance of Data Visualization:*** Utilizing Power BI for data visualization enables stakeholders to gain actionable insights from the sales data, aiding in strategic decision making and performance monitoring.
- ***Tools and Technologies Used:*** The project utilizes Power BI and the most important Power BI components such as *Power Query, DAX, Model view*, etc. for dashboard creation.
- ***Timeline and Scope:*** The project will cover loan sales data for the years *2014-17*, focusing on key metrics and trends.

### GOALS AND OBJECTIVES

- ***Analytical Goals:*** The primary objective is to analyse sales and profit performance across product categories, sub categories, shipping modes, etc. to identify growth opportunities and areas for improvement.
- ***Key Metrics and KPIs:*** Key metrics such as total sales and profit, sales and profit trend over the years, Units/Customers/Profit/Sales KPIs will be visualized to track performance against targets.
- ***Dashboard Features:*** The dashboard allows sales managers to drill down into specific product categories and sub categories, view quarterly, monthly and annual sales trend, and identify top performing products and weak performing products.
- ***Data Exploration Goals:*** Exploring historical sales data will help uncover seasonal trends, customer purchase behaviour, and the effectiveness of marketing campaigns.
- ***Stakeholder Engagement:*** Engaging with sales teams and executives to understand their data needs ensures that the dashboard aligns with their strategic objectives and supports decision-making processes.

## DATA SOURCING & INTEGRATION

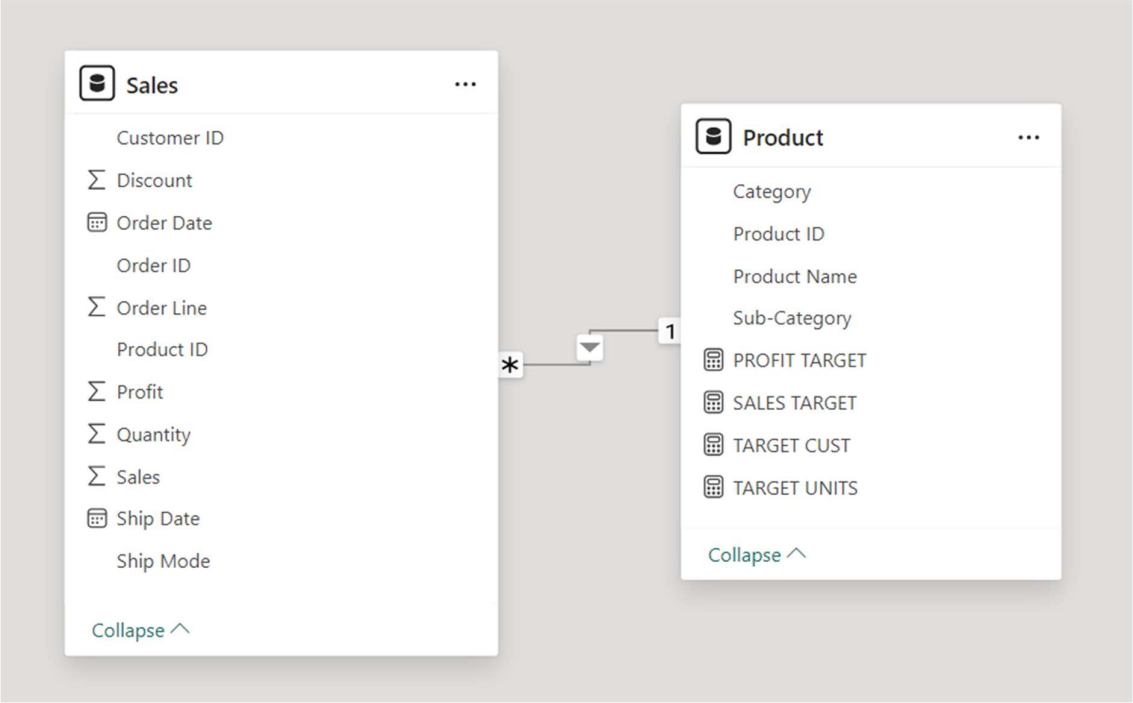
### SOURCE DATASETS UTILIZED

- ***Source Format:*** The source datasets are in the format of *Excel Worksheets* and *CSV* files.
- ***Dataset Details:*** Since this project analyses the performance of a company in terms of sales and profit, the source datasets include the following

- *Product:* Contains the category, sub category and details of the products.
- *Sales:* Contains order date, units sold, sales and profit amount, and shipment details.

## LOADING AND INTEGRATION

- ***Loading the Data from Sources:*** The datasets are now loaded into Power BI one by one and the different data sources are now integrated together using Power BI's *Model View*.
- ***Integrating the Source Datasets:*** The *cardinality* and *modality* among the datasets are also established in this step. In this case, the *Sales* table has a *many to one* relationship with *Product* table. This is due to the fact that Sales table has a *foreign key* '*Product ID'* which is a *primary key* in Product table. A screenshot of the integrated data model is shown below.



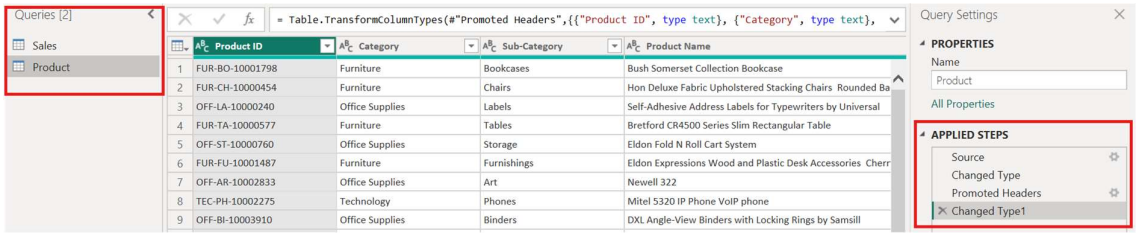

# DATA CLEANING AND PREPROCESSING

## DATA TRANSFORMATION

- ***Use First Row as Headers:*** Using *Power Query*, efficient data transformation can be performed in Power BI. The first step in data transformation involves using *First Row as Headers*. This ensures that proper column name is assigned to the columns rather than Power BI using its own column names. Here, the *Product* table had to be transformed using this technique.
- ***Assigning Relevant Data Types:*** The second step in data transformation involves type conversion. Some of the columns will not have relevant data types assigned by default. For them, we have to manually convert to the necessary datatypes. In this case, the *Order Date* column was in text format by default. We had to manually convert it to *Date* datatype.

## DATA CLEANING

- ***Removing Null Values:*** Null values in dataset can skew analysis results and affect data visualization. Power Query provides tools to filter out or replace null values. In this case, the null values were removed since the dataset is huge and doesn't affect it in a big way.
- ***Dealing with Errors:*** Errors in data, such as #N/A or #VALUE, can disrupt data processing. Power Query offers functions to handle errors gracefully, such as replacing errors with default values or custom error messages. Here, errors were observed in certain columns and they were replaced with the text 'NA'.
- ***Removing Duplicate Values:*** Duplicate values in dataset can lead to inaccuracies in analysis and visualization. Power Query offers features to identify and remove duplicate rows. Few duplicate entries were observed in a table and they were removed.




# EDA AND VISUALIZATION

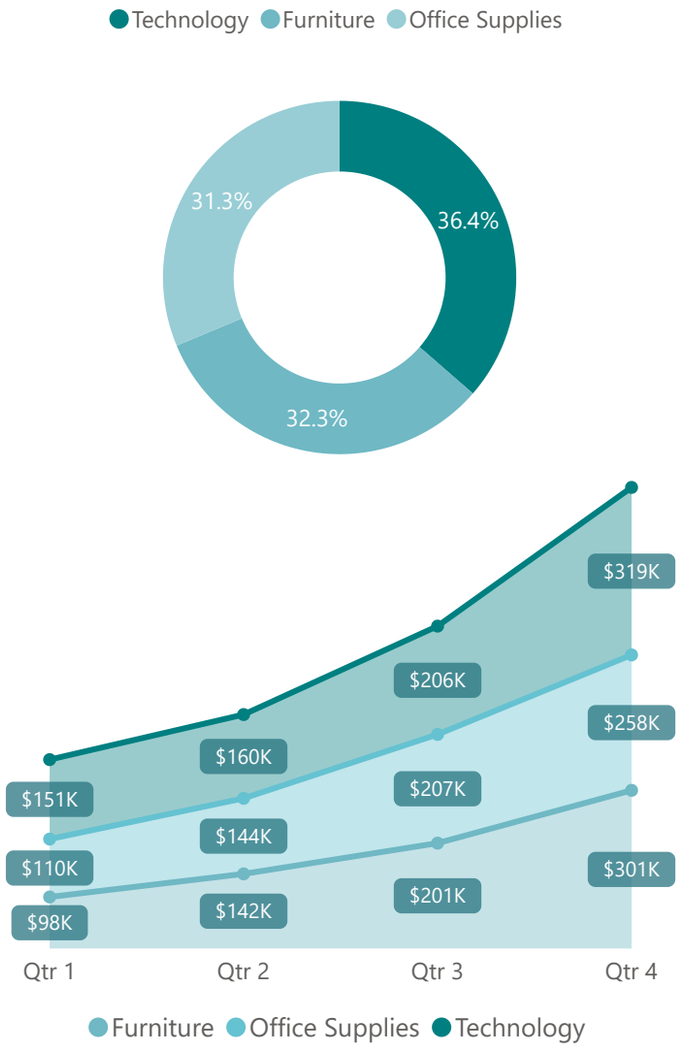
## ANALYSIS

- ***Sales Trend:*** Analysing the trend of sales made by the company over a period of time. Annual, Quarterly and Monthly trend are also identified to find the peak year, quarter and month in which sales are made.
- ***KPI Tracking:*** The dashboard helps in tracking the KPIs of the company in terms of Sales, Profit, Customers and Units Sold. Through this it can be identified whether the desired target for each have been achieved or not.
- ***Product Analysis:*** Volume of sales made for each product is tracked. Top products that have made profit and top products that have made loss are also identified.
- ***Shipment Analysis:*** Identifying which shipment mode has sold most units and achieved the highest profit and sales.
- ***Profit Analysis:*** Analysing the profit made in terms of product category and sub category.

# SALES PERFORMANCE DASHBOARD

| TOTAL CUSTOMERS | TOTAL PROFIT | UNITS SOLD | TOTAL SALES | PRODUCT TYPES |
|---|---|---|---|---|
| 793 | $286.40K | 38K | $2.30M | 17 |

## SALES BY PRODUCT CATEGORY




SELECT YEAR

All

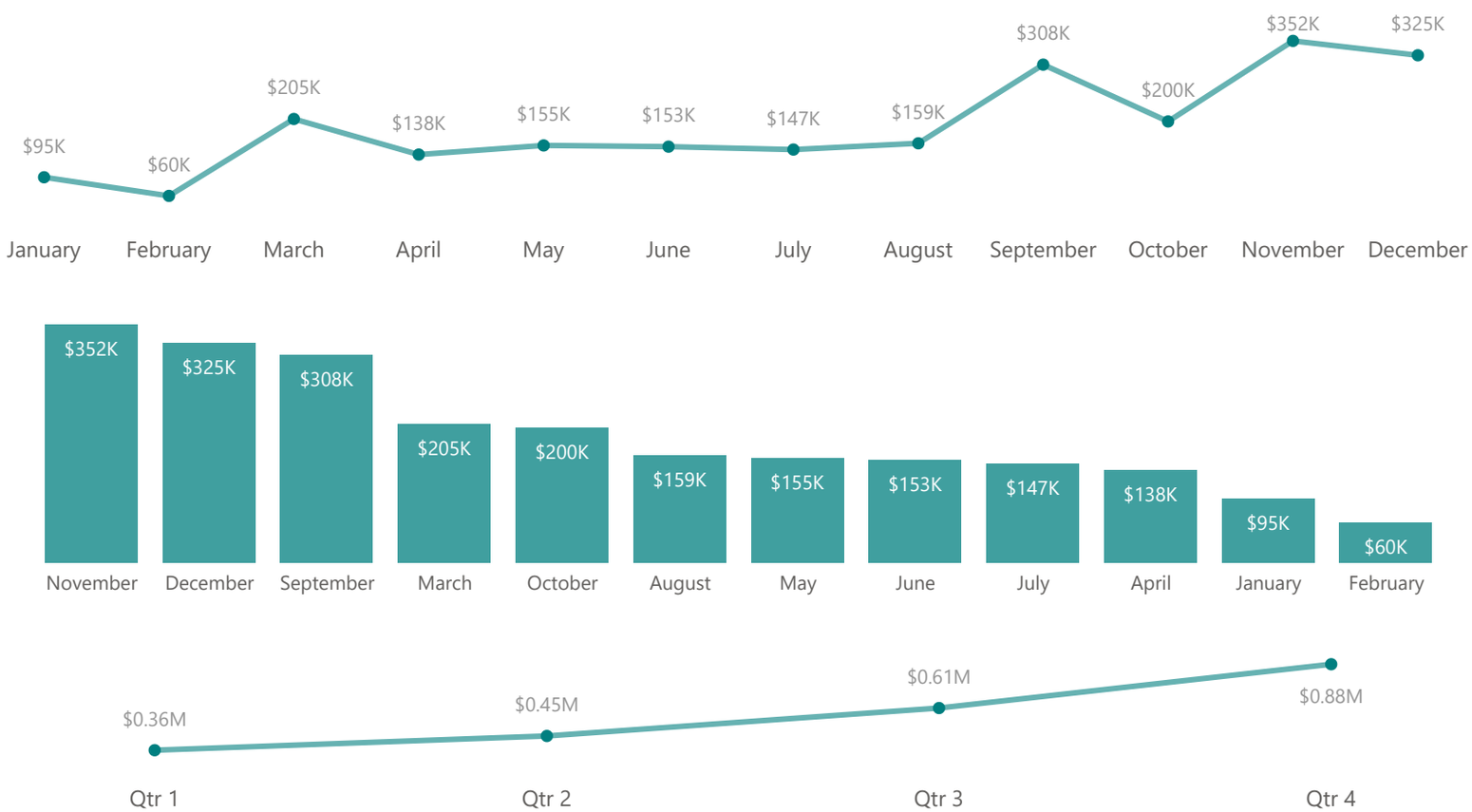
SELECT SHIPMENT MODE

All

SELECT PRODUCT

All

## SALES TREND AND VOLUME



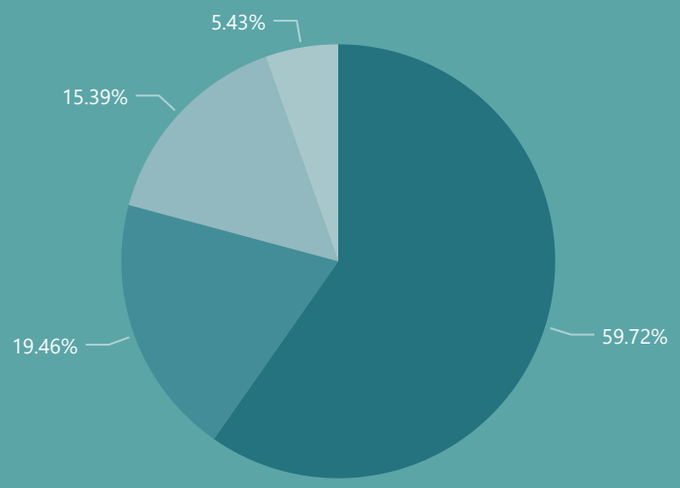
$93.44K
TARGET PROFIT: $93K (+0.47%)

$733.22K
TARGET SALES: $740K (-0.92%)

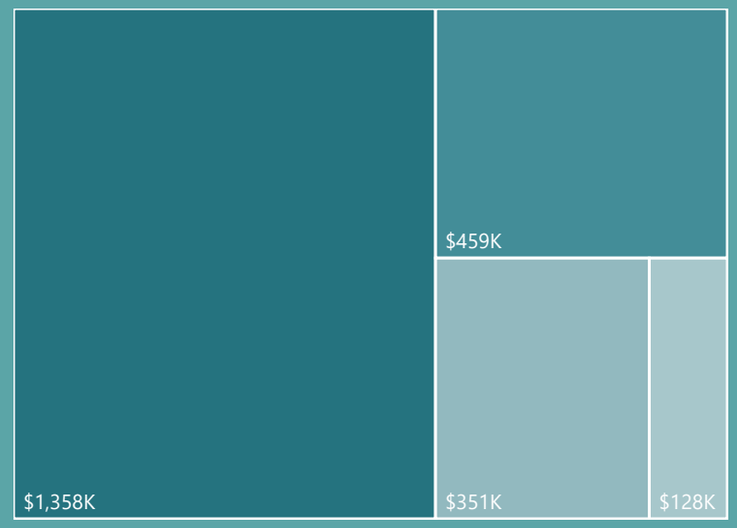
693
TARGET CUSTOMERS: 650 (+6.62%)

12476
TARGET UNITS: 13000 (-4.03%)

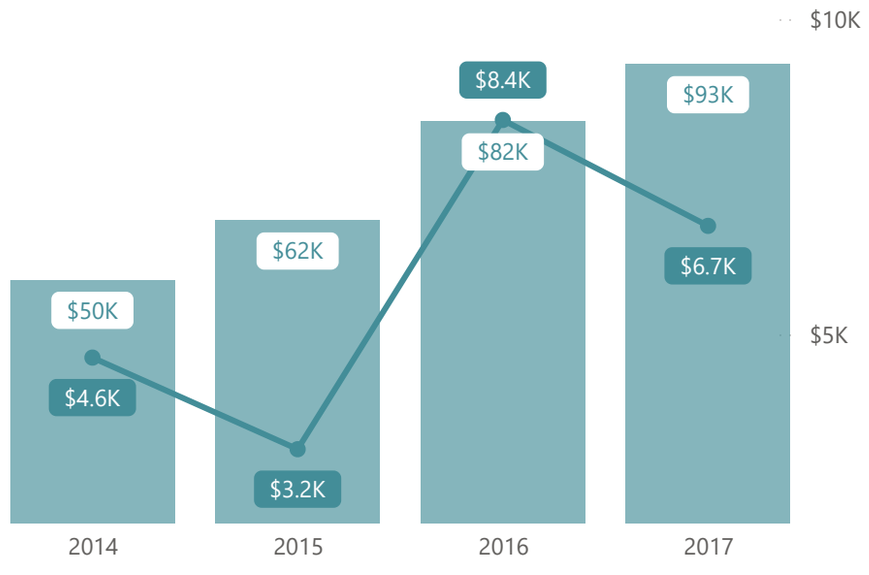
SHIPPING MODE STATS



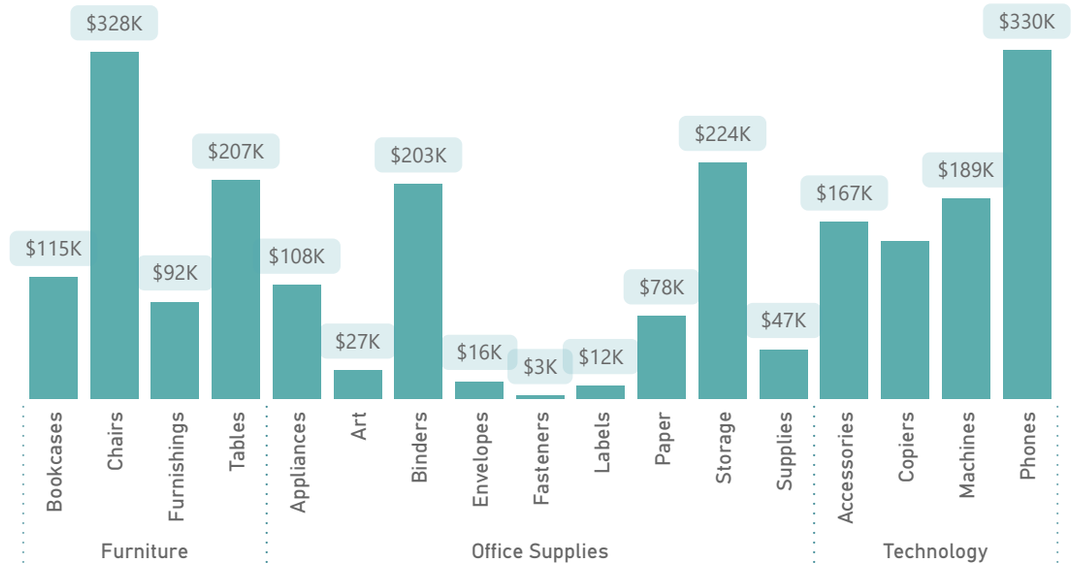

- Standard Class
- Second Class
- First Class
- Same Day




## TOTAL PROFIT AND MAX PROFIT EVERY YEAR




## TOTAL SALES OF EACH PRODUCT



# RESULTS AND CONCLUSION

## FINDINGS AND KEY INSIGHTS

- ***Sales Seasonality:*** The highest sales typically occur during the *final quarter* of the year, particularly in *September*, *November*, and *December*.
- ***Customer Preference for Shipment Mode:*** A substantial *60%* of shipments are processed via *Standard Class* mode, contributing to a total sales revenue of *$1358K* for the company.
- ***Top Products in terms of Sales:*** *Phones* emerge as the top-selling product category, generating an impressive sales revenue of *$330K*, closely followed by *Chairs* with a sales total of *$328K.* In contrast, *Fasteners* have recorded the lowest sales, amounting to just *$3K* in total.
- ***Profit Trend and Volume:*** The profit trend appears to be consistently rising over the years. Notably, the highest profit from a single order was recorded in *2016*, reaching *$8.4K*.
- ***KPIs:*** The Profit and Customer targets have been successfully achieved as desired. However, there is room for improvement in meeting the targets for units sold and sales made, indicating areas that require attention and optimization.
- ***Equal Sales in Products:*** Sales are distributed nearly evenly among various product categories, including technology, furniture, and office supplies. This balance indicates a well-rounded outreach strategy aimed at diverse customer segments.

## LIMITATIONS

- ***Historical Data Availability:*** Although the dataset includes data from 2014, a broader historical dataset could offer deeper insights and more accurate trend analysis.
- ***Performance Challenges with Large Datasets:*** When working with extensive datasets in Power BI, there's a possibility of encountering performance issues, such as prolonged loading times or reduced responsiveness.
- ***Complex Data Transformation:*** While Power Query provides a diverse set of data transformation capabilities, intricate transformations may necessitate advanced scripting.
- ***Customization Limitations in Visualizations:*** Despite the range of built-in visualizations in Power BI, achieving highly specialized or customized visualizations may pose challenges due to limited customization options.

## CONCLUSION

In conclusion, the Power BI data analysis project has provided valuable insights into the company's sales performance, shipment patterns, product profitability, and KPI tracking. Key findings indicate a seasonal sales trend with the highest sales typically occurring in the final quarter of the year. The analysis also underscores the significance of Standard Class mode in driving sales revenue, with a substantial 60% of shipments processed through this mode. Additionally, the project identifies top-performing products in terms of sales revenue, highlighting the importance of product category management. While profit trends show consistent growth over the years, there is room for improvement in meeting targets for units sold and sales made. Addressing these insights will be essential for optimizing operations and driving continued business success.