

# Power BI Dashboard Report Steps & Insights

## Section 1: Steps to Create the Dashboard

### 1. Load Data

- **Data Source:** Imported the `Sales.xlsx` file into Power BI.
- **Objective:** Ensure all relevant data is available for transformation and visualization.

### 2. Data Transformation in Power Query

#### Inspection and Cleaning:

- Inspected the dataset to identify potential issues or areas for optimization.
- Checked for empty or null values across all columns. Found no nulls.
- Removed duplicate rows. Although no duplicates existed due to the unique `OrderDetailID`, the check ensured data integrity.

#### Column Review and Optimization:

- **OnlineOrderFlag:** Contained only `0s`. Determined it was unnecessary and removed it.
- **ShipMethodID and ShipMethod:**
  - Both columns had only one value (`5` and `CARGO TRANSPORT 5`, respectively).
  - Removed these columns as they were redundant.
- **TerritoryGroup:**
  - Contained three distinct values. Replaced text values with numerical representations to improve efficiency.
  - Created a one-to-many relationship by mapping these numerical values to a new table (`Dim TerritoryGroup`) with their meanings.

### 3. New Calculated Columns

- Created a new column, **Revenue**, calculated as `OrderQty * UnitPrice` to simplify revenue analysis.

## 4. Dimensional Modeling

To reduce redundancy and optimize memory usage, split the dataset into dimensional tables:

### Dim Product:

- Extracted columns related to products: **ProductID**, **ProductName**, **ProductCategory**, and **ProductSubcategory**.
- Removed duplicates based on **ProductID** to ensure each row uniquely represented a product.
- Further split **ProductCategory** and **ProductSubcategory** into separate tables for efficiency.

### Dim Territory:

- Created a new table to store **TerritoryID**, **TerritoryGroup**, and **TerritoryName**.
- Removed duplicates to ensure the table contained unique and meaningful entries.

### Dim Status:

- Created a table for **StatusID** and its meanings (e.g., Shipped, In Process).
- Ensured no duplicates for streamlined status categorization.

### Dim Order:

- Extracted columns related to orders: **CustomerID**, **OrderDate**, **ShipDate**, **DueDate**, **SalesPersonID**, **StatusID**, and **TerritoryID**.
- Ensured each row uniquely represented an order by removing duplicates.

## 5. Date Table Creation

To enable time-based analysis:

- Duplicated the fact table and retained only **ShipDate**, **OrderDate**, and **DueDate** columns.
- **Unpivoted Columns:** Merged these three columns into one column, renamed it **Date**.
- Removed duplicates from the **Date** column to ensure a unique list of dates.
- Generated additional date attributes:
  - **DayOfWeek**, **DayOfWeekNumber**
  - **Quarter** (prefixed with "Q")

- MonthName, Month
- Adjusted data types where necessary, e.g., setting DayOfWeekNumber to Whole Number.
- Created a date hierarchy for easy drilling in visualizations.

## 6. Hierarchy Creation

To enable drill-up and drill-down functionality:

- Created a hierarchy for ProductCategory and ProductSubcategory.
- Created a hierarchy for TerritoryGroup and Territory.
- Created a hierarchy for the Date table.

## 7. Visualization Development

- Color Theme:** Applied a consistent color theme to ensure a professional and cohesive look.
- Key Metrics Displayed:**
  - Total OrderQty (sum)
  - Total Revenue (sum of the calculated column)
- Visualized the following:
  - Revenue trends by **Day of the Week, Month, and Quarter**.
  - Sales performance by **Product Category Hierarchy** and **Territory Hierarchy**.
  - Status distribution (e.g., Shipped, In Process, Approved).
  - Days to ship (ShipDate – OrderDate) and Days to keep (DueDate – ShipDate) visualized by product category with drill-down capabilities.
- Enabled drill-up and drill-down options in all hierarchies to enhance interactivity.

## 8. Adding Measures

- I added a new measure called TotalSalesPerOrder that calculates the sum of the total due for every OrderID, and one that calculates the total OrderQty. Then I added Slicers for each product category hierarchy and for the territory hierarchy. I also added a lot of time intelligent measures like TotalSalesPerOrder QTD, YTD, MTD, MoM, YoY, QoQ. TotalDue weighted by OrderQty. I visualised all of these.
- Key Metrics Displayed:**
  - Total OrderQty (sum)
  - Total Revenue (sum)

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## Section 2: Insights from the Dashboard

### 1. General Sales Insights

- **Total Orders:** Summarized the total quantity of orders placed. 7 million sales in total. 18,000 products ordered.
- **Revenue:** Displayed the total revenue generated, calculated using `OrderQty * UnitPrice`.

### 2. Time-Based Insights

- **Day of the Week:**
  - Identified which days generated the most revenue.
  - Revenue peaked on Saturdays.
- **Monthly Trends:**
  - Determined months with the highest sales volume.
  - July accounted for the highest portion of overall sales.
- **Quarterly Trends:**
  - Quarter 3 outperformed other quarters due to seasonal demand.

### 3. Product and Category Insights

- **Product Categories:**
  - Visualized sales distribution across categories and subcategories.
  - Bikes dominated revenue, highlighting areas of strength.
- **Drill-Down Insights:**
  - Used the product hierarchy to identify top-performing subcategories within each category.

### 4. Territory Insights

- **Regional Sales Performance:**
  - Sales were strongest in North America and then Europe.
  - Grouped performance by `TerritoryGroup` and further analyzed by territory.

### 5. Order Status Insights

- **Status Distribution:**
  - Majority of orders were in the "Approved" status, followed by "In Process".

## 6. Shipping and Handling Insights

- **Days to Ship:**
  - Average shipping time was 7 days. They all had the same shipping time max and min and avg.
  - Days to ship and days to keep were the same for every category. 5 days to keep and 7 days to ship.
- **By Territory:**
  - Days to keep and days to ship were highest in North America and lowest in Europe.

## 7. Custom Metrics and Relationships

- **Hierarchies:** Enabled users to drill down into details, such as product subcategories or territories, providing granular insights.
- **Date Analysis:**
  - Leveraged the date table to slice data by **MonthName**, **Quarter**, **DayOfWeek**, and **DayOfWeekNumber** for enhanced analysis.