

The purpose of this document is to outline the stages involved in developing the solution proposed to meet the requirements of the case study sent via email. The presentation of these stages follows a structured, step-by-step approach used to complete the analysis, which was conducted using Power BI.

### **Step 1: ETL and Data Transformation (Power Query)**

**In this initial stage, the focus was on the standardization and cleansing of the four provided datasets (Sales and Manufacturing from 2013 to 2016):**

- **Standardization:** I corrected the structure of the 2013–2014 files by splitting the merged "Country,Product" column into two distinct columns to align them with subsequent years.
- **Consolidation (Append):** I unified the annual files into two master tables: **Sales\_Fact** and **Manufacturing\_Fact**.
- **Technical Cleansing:** I applied the **Trim** function to remove whitespaces in the *Segment*, *Country*, and *Product* columns—which were causing filtering errors—and configured the appropriate data types.

### **Stage 2: Data Modeling (Star Schema)**

**To ensure performance and filtering accuracy, the data was organized into a Star Schema:**

- **Dimensions:** I created the **dProduct** table (a unique list of items) and the **dCalendar** table (via DAX) to enable robust time-series analysis.
- **Relationships:** I established **One-to-Many (1:N)** connections between the dimension and fact tables, ensuring that filters for country or year propagate correctly across all visuals simultaneously.

### **Stage 3: Data Intelligence (DAX)**

**I developed calculated measures to derive the primary Key Performance Indicators (KPIs):**

- **Volume and Value:** Calculation of **Total Revenue (SUM)**, **Units Sold**, and **Net Profit**.
- **Efficiency:** Developed the **Gross Margin %** measure to identify the actual profitability of each operation, in addition to gross revenue.

### **Stage 4: Visualization and Insights**

**I designed the dashboard to address the key business questions:**

- **Segment Analysis:** I identified that the **Government sector** is the largest customer in terms of volume.
- **Seasonality:** The line chart revealed critical sales peaks in the fourth quarter (Q4) of each year.
- **Geography and Profitability:** I cross-referenced sales by country with product profit to highlight which markets yield the best margins, moving beyond mere revenue figures.
- **Interactivity:** Implementation of Slicers by Year, Country, and Product to enable managers to perform drill-downs into the data.