

# Supplier Quality Analysis Report

## 1-Solution Approach Report

**Introduction:** This report provides a comprehensive overview of the methodology used to analyze defect data using Power BI. The approach focuses on identifying key patterns, deriving insights, and improving vendor performance based on defect rates.

**Objective:** The primary objective of this analysis is to understand the distribution of defects, identify high-risk vendors, and enhance supply chain efficiency by mitigating defect occurrences.

**Methodology:**

- Data was collected from multiple sources including supplier records, defect logs, and operational reports.
- Data preprocessing was performed to clean and structure the dataset for analysis.
- Power BI was utilized to create an interactive dashboard that visualizes key insights, such as total defects, vendor performance, and defect trends over time.
- DAX calculations were implemented to derive KPIs such as defect rate percentage, average defects per order, and vendor-specific defect impact.

**Findings & Insights:**

- Total defects recorded: 55M
- The highest defect rate was attributed to the vendor "Solholdings."
- Mechanical and packaging materials accounted for the majority of defects.
- Downtime due to defects varied significantly across plants, with Detroit, MI reporting the highest.
- Key vendors contributing to high defect rates include Bolholdings and Plutax.

**Recommendations:**

- Implement stricter quality control measures for high-risk vendors.
- Introduce supplier performance monitoring through monthly audits.
- Optimize procurement strategies to reduce dependency on high-defect vendors.

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## 2. Data Cleaning Report

**Objective:** To ensure that the dataset used for analysis is accurate, consistent, and structured properly for Power BI visualization.

**Data Cleaning Steps:**

**1. Standardization:**

- Unified date formats (YYYY-MM-DD).
- Normalized vendor names to maintain consistency.

**2. Duplicate Removal:**

- Identified and eliminated duplicate defect entries to prevent overestimation.

### 3. Data Type Correction:

- Converted numerical columns from string to integer/float.
- Ensured defect rates were correctly formatted as percentages.

### 4. Outlier Detection & Treatment:

- Identified extreme defect counts per order using statistical thresholds.
- Capped excessive values to maintain data integrity.

#### Outcome:

- The cleaned dataset was validated and uploaded to Power BI for further analysis.
- Ensured accuracy in KPI calculations and visualizations.

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## 3. Power BI Data Model

#### Data Sources:

- Fact\_Defect\_Report (Contains defect-related transactions)
- Vendor\_Master (Details about suppliers)
- Plant\_Locations (Geographical data of production sites)

#### Key Measures Created in DAX:

- **Total Defects:** `SUM(Fact_Defect_Report[Defect Qty])`
- **Average Defects per Order:** `AVERAGE(Fact_Defect_Report[Defect Qty])`
- **Defect Rate per Vendor (%):** `VAR TotalDefects = CALCULATE(SUM('Fact_Defect_Report'[Defect Qty]), ALL('Fact_Defect_Report'))`  
`RETURN`  
`DIVIDE(SUM('Fact_Defect_Report'[Defect Qty]), TotalDefects, 0) * 100`

#### Data Relationships:

- Fact\_Defect\_Report linked to Vendor\_Master via Vendor ID.
- Fact\_Defect\_Report linked to Plant\_Locations via Plant ID.

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**Conclusion:** The Power BI data model is structured to support dynamic reporting and allows for an in-depth analysis of defect trends, vendor performance, and plant-specific defect impact.

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