# SUPPLIER QUALITY ANALYSIS

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Round Code: DEPI_GIZ2_DAT2_S2

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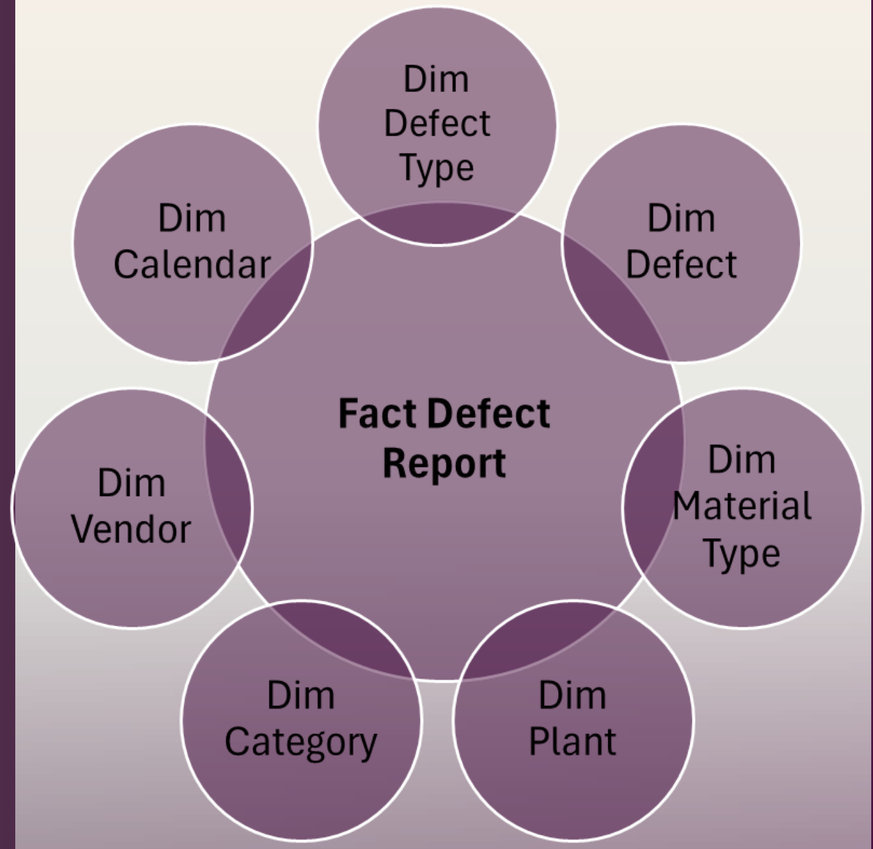
# Data Overview

The Supplier Quality Analysis dataset provides insights into the quality performance of suppliers by tracking defects, defect rates, and overall supplier efficiency. The dataset includes various attributes related to supplier evaluation, product quality, and defect trends over time. The primary objective is to analyze supplier reliability, identify recurring defects, and suggest improvements for better quality control.



# Main Business Questions

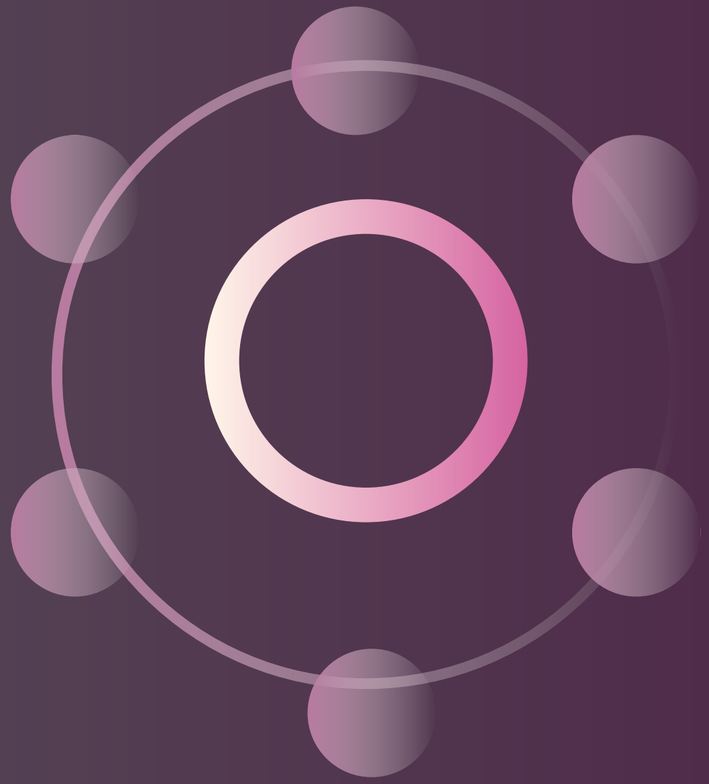
- Which vendor has contributed the most to downtime in the production process?
- How does defect quantity vary across different vendors?
- Which material type has the highest number of defects?
- Is there a seasonal trend in defect occurrences over time?
- What is the projected defect rate and downtime trend for the upcoming months?
- What is the relationship between defect quantity and production downtime?

# Key Metrics & Top Contributors to Defects

Most Common Defect: Misc

Total Defects Reported: 42.99 M

Most Frequent Defect Type: Rejected



Total Downtime: 103,259 minutes

Most Defective Material Types: Hardware, labels, and cartons

Top Defective Vendors:  SolHoldings, Dentocity

# Key Steps Of Data Cleaning

### Trimmed & Cleaned Text

Removed extra spaces and inconsistencies in defect descriptions.

### Standardized Names

Unified defect names (e.g., "Print defects" → "Printing Defect").

### Handled Duplicates

Removed duplicate records based on ID to ensure uniqueness.

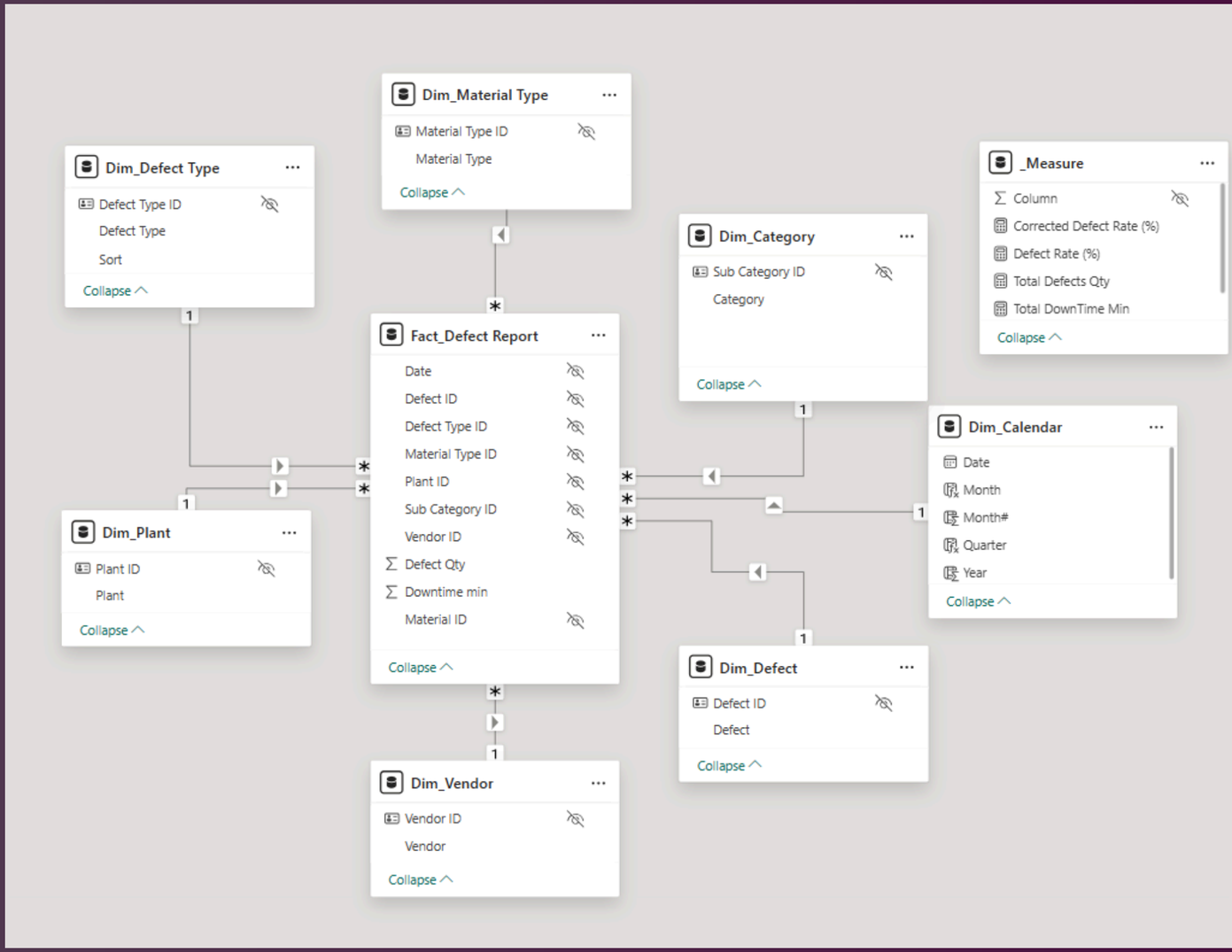
### Formatted Data

Converted ID to Text format for consistency. Reordered columns for better structure.

# Data Modeling

The data model is designed to optimize supplier quality analysis by ensuring efficient data storage, reducing redundancy, and enabling seamless reporting. It follows the Star Schema approach to enhance query performance and maintain data integrity.

- Normalization: Applied to eliminate redundant data and ensure consistency
- Star Schema: Implemented to improve reporting efficiency, with a central fact table linked to multiple dimension tables for easy filtering and aggregation.
- Primary Key Highlighting: Ensured each dimension table has a clearly defined Primary Key for establishing relationships.
  Hiding Unused Columns: Unused columns in each table were hidden to enhance usability and prevent unnecessary data exposure.



# Dax Measures

### Creating the Dim_Calendar Table

Dim_Calendar = CALENDARAUTO()

Year = Dim_Calendar[Date].[Year]
Month = Dim_Calendar[Date].[Month]
Month# = Dim_Calendar[Date].[MonthNo]
Quarter = Dim_Calendar[Date].[Quarter]

### Total Defects Quantity

Total Defects Qty = SUM(Fact_Defect Report[Defect Qty])

### Total Number of Vendors

Vendors = COUNT(Dim_Vendor[Vendor ID])

### Defect Rate (Last 3 Months)

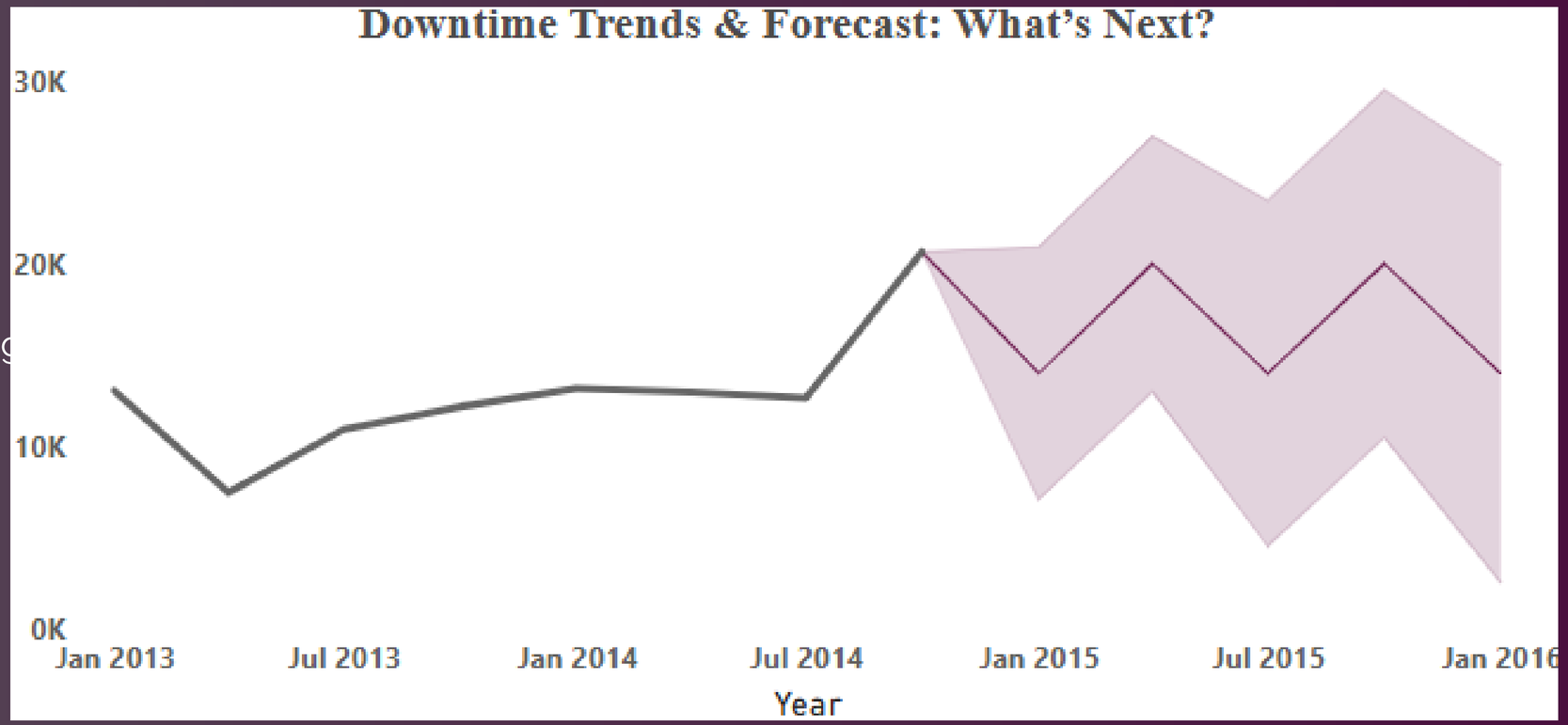
Defect Rate (Last 3 Months) = AVERAGEX( DATESINPERIOD(Dim_Calendar[Date], MAX(Dim_Calendar[Date]), -3, MONTH), [Total Defects Qty])

### Total Downtime (Minutes)

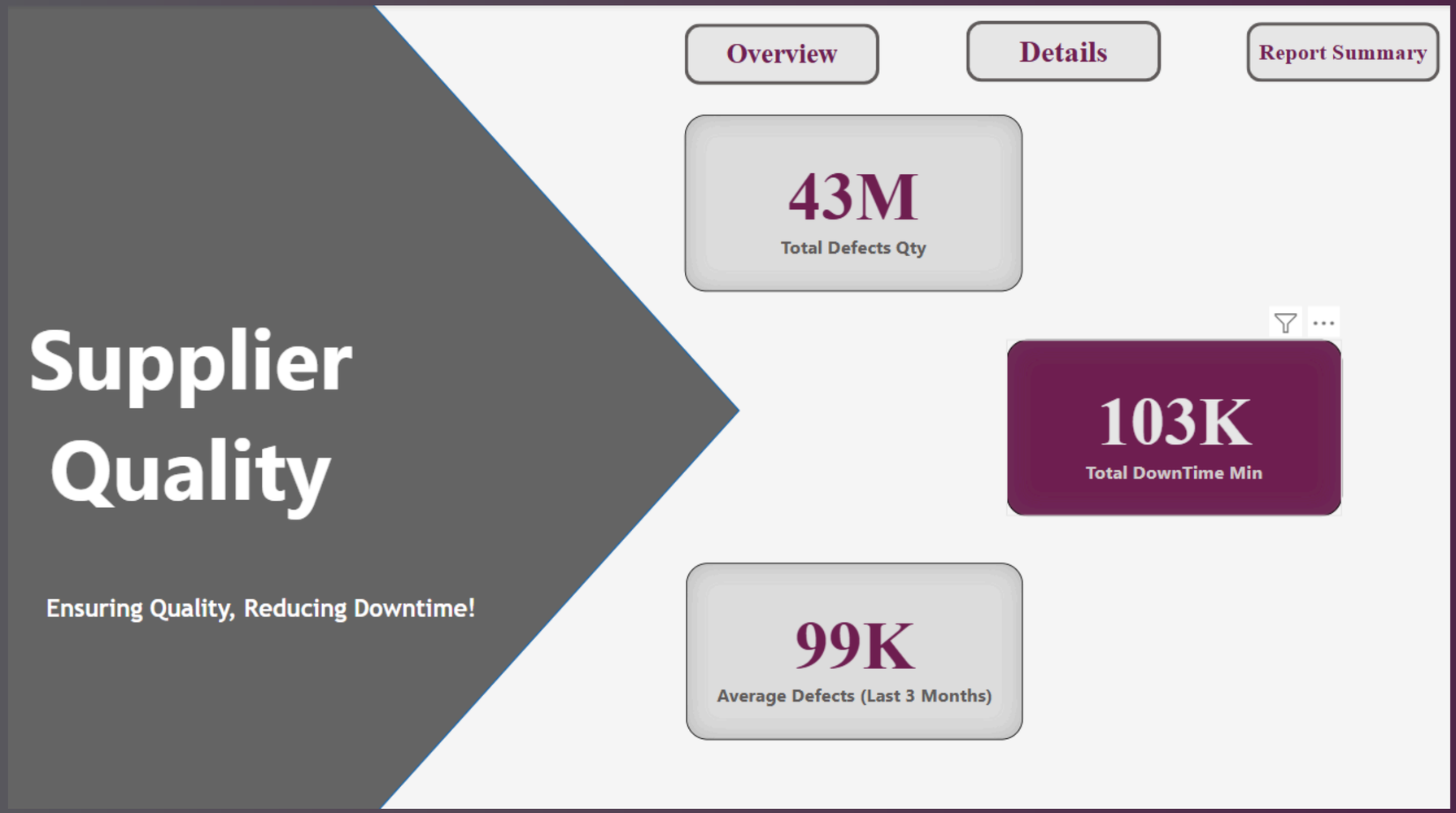
Total DownTime Min = SUM(Fact_Defect Report[Downtime min])

# Can We Predict Future Downtime Trends?

- Historical Trend: Downtime showed a steady increase from 2013 to mid-2014, followed by noticeable fluctuations.
- Forecasted Downtime: The shaded area represents the projected trend, indicating potential volatility in upcoming months.
- Peak Downtime Periods: The forecast suggests sustained high downtime, highlighting the need for proactive strategies.

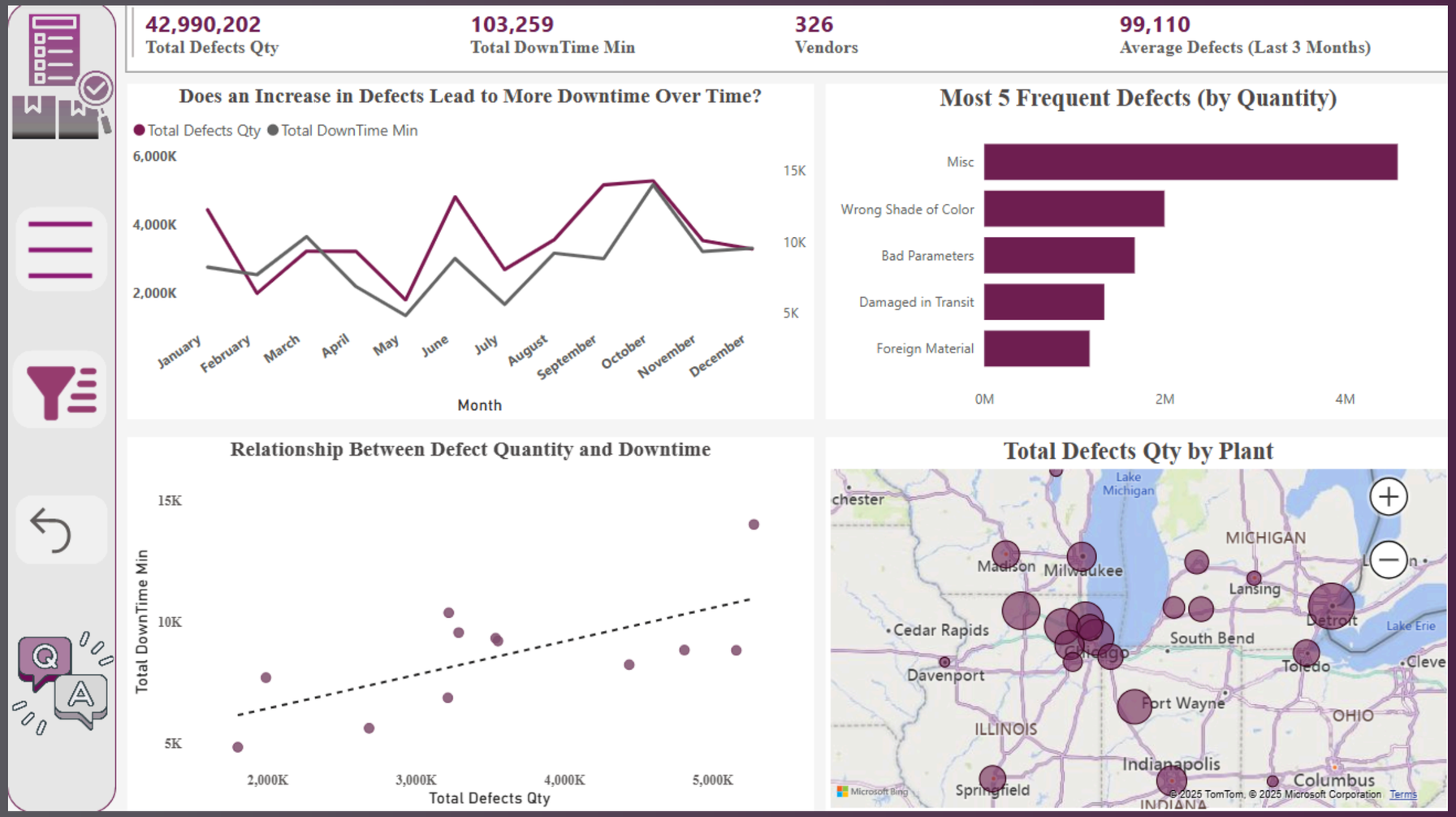


# Home page



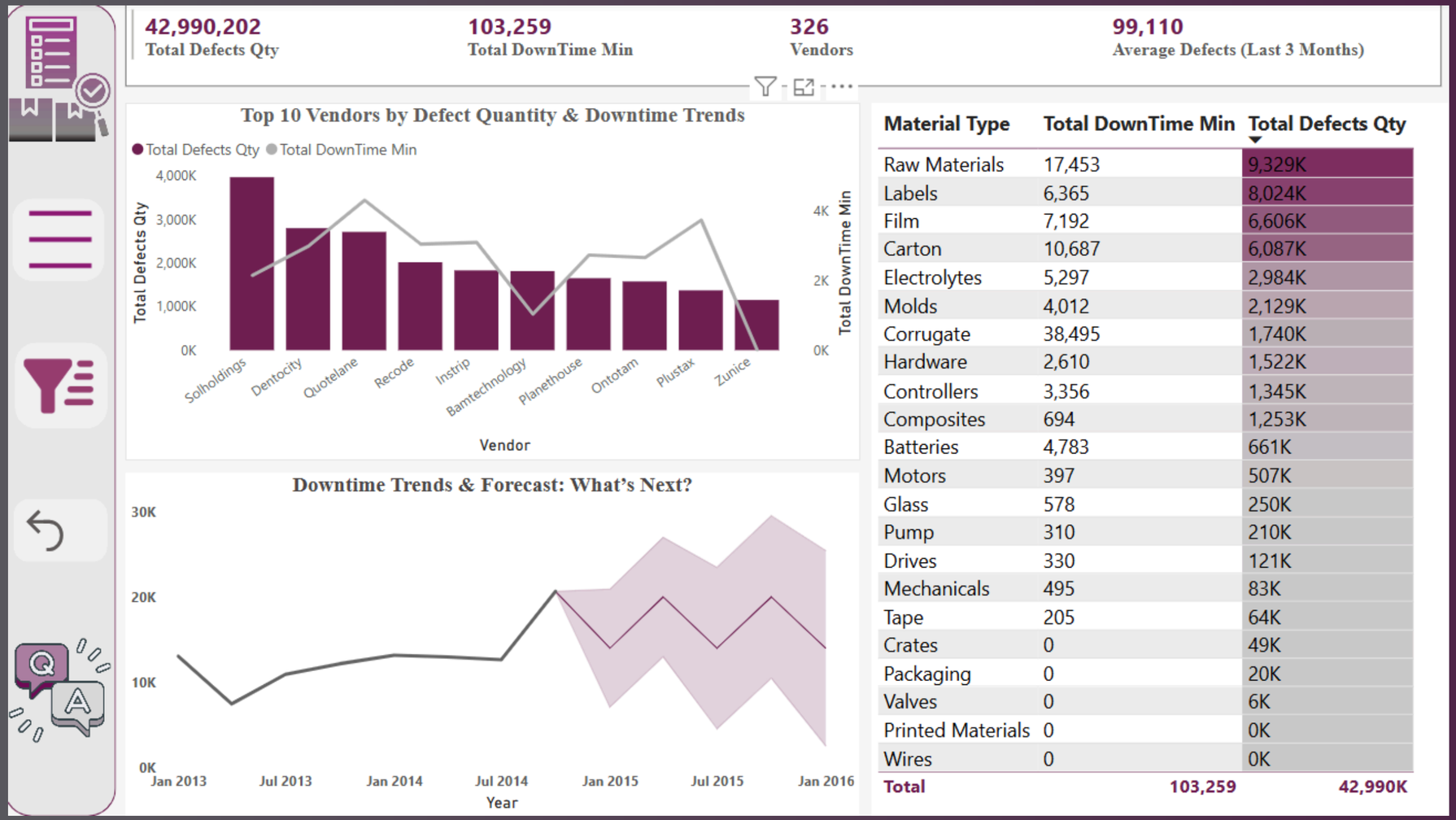

The Home Page serves as the entry point to the Supplier Quality dashboard, providing a high-level summary of key defect metrics and quick navigation to detailed insights. It ensures users can quickly understand the current state of supplier quality performance and explore further details as needed.

# Overview Page




The Overview Page provides a comprehensive view of supplier quality metrics, focusing on defect trends, downtime impact, and defect distribution across different plants. It helps users quickly assess key performance indicators and identify patterns in supplier defects.

# Details Page




| Material Type | Total DownTime Min | Total Defects Qty |
|---|---|---|
| Raw Materials | 17,453 | 9,329K |
| Labels | 6,365 | 8,024K |
| Film | 7,192 | 6,606K |
| Carton | 10,687 | 6,087K |
| Electrolytes | 5,297 | 2,984K |
| Molds | 4,012 | 2,129K |
| Corrugate | 38,495 | 1,740K |
| Hardware | 2,610 | 1,522K |
| Controllers | 3,356 | 1,345K |
| Composites | 694 | 1,253K |
| Batteries | 4,783 | 661K |
| Motors | 397 | 507K |
| Glass | 578 | 250K |
| Pump | 310 | 210K |
| Drives | 330 | 121K |
| Mechanicals | 495 | 83K |
| Tape | 205 | 64K |
| Crates | 0 | 49K |
| Packaging | 0 | 20K |
| Valves | 0 | 6K |
| Printed Materials | 0 | 0K |
| Wires | 0 | 0K |
| **Total** | **103,259** | **42,990K** |

The Vendor & Material Defects Analysis Page provides insights into top defect contributors by vendor and material type. It helps stakeholders identify high-risk vendors and materials causing significant defects and downtime.

# Report Summary

## Supplier Quality

**This report provides a comprehensive analysis of supplier defects, highlighting key trends and their impact on downtime. The data reveals that a total of 42.99 million defects** were reported, resulting in approximately **103,259 minutes of downtime** across **326 vendors**.

### Key Insights:

- **Defect Trends by Vendor:** The **top 10 vendors** with the highest defect counts contribute significantly to total downtime, with some vendors showing a strong correlation between defect volume and downtime impact.
- **Defect Rate Analysis:** Certain material types, such as **hardware, labels, and cartons**, exhibit exceptionally high defect rates, indicating areas for quality improvement.
- **Downtime Impact:** Categories like **packaging, mechanical components, and logistics** contribute significantly to both defect volume and total downtime, making them critical focus areas for supplier quality enhancement.

**.Defect Seasonality & Forecasting**

- There are **seasonal trends** in defect occurrences, indicating potential **recurring patterns**.
- Forecasting models suggest an **increasing trend** in defects and downtime, emphasizing the need for **proactive quality management**.

### Recommendations:

**Supplier Quality Audits:** Conduct regular supplier performance evaluations to ensure quality standards are met.
**Targeted Quality Improvement:** Focus on high-defect material types (e.g., raw materials, labels, cartons) to minimize quality issues.
**Defect Prevention Strategies:** Implement stricter quality checks at the supplier level to prevent defects before materials reach production.
**Downtime Reduction Initiatives:** Develop action plans for vendors with high defect-related downtime to optimize operational efficiency.
**Forecasting & Trend Analysis:** Leverage historical defect and downtime data to predict future trends and proactively address potential issues.
**Supplier Collaboration & Training:** Work closely with vendors to improve their quality control processes and implement best practices.

By leveraging these insights, businesses can enhance supplier quality management, reduce downtime, and improve operational efficiency.

This page serves as a comprehensive summary of all previous dashboards, highlighting key insights, trends, and recommendations related to supplier defects and their impact on downtime.

# THANK YOU!