

# Final Report

This final report provides a comprehensive analysis of the supplier quality and business impact data gathered across the company's plants. The report aims to address the key questions posed by the management team and offer actionable insights and recommendations to improve supplier performance and operational efficiency.

 **by Mona Momen**

# Executive Summary

## 1 Project Goals

Understand the best and worst suppliers with respect to quality, the business effects, and how well the company is handling the defects obtained.

## 2 Key Findings

The total number of defects obtained do not automatically translate to downtime experienced. The focus should be on where downtime is experienced (plant and supplier) to direct the improvement efforts.

Total Defect Qty: 56,010,955

Total defect: 300

Total Plant: 26

Total Vendors: 318

Total Materials: 2,071

Total Sub Category: 6

Total Downtime min: 76,607

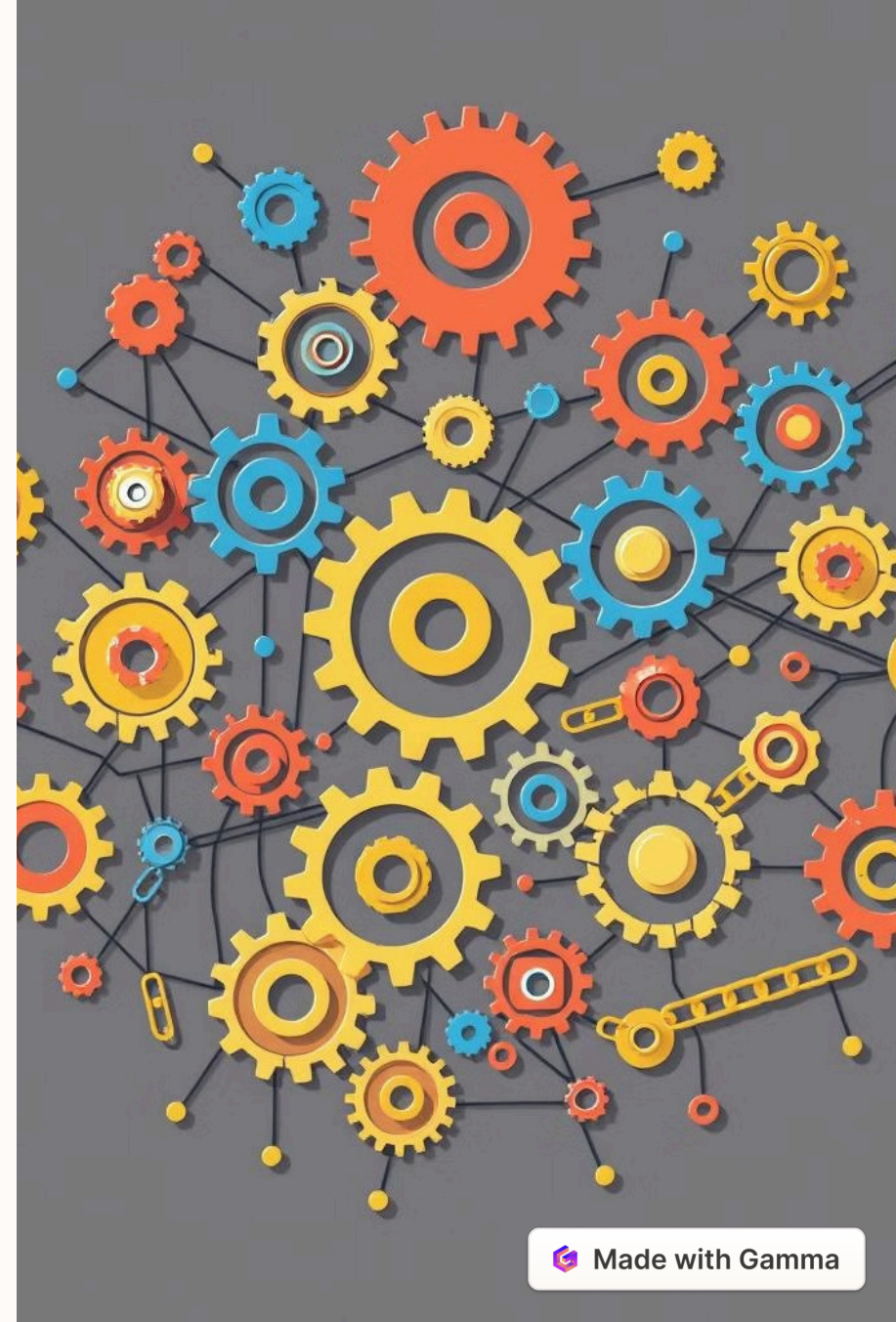
Avg Downtime/day: 192

## 3 Recommendations

Identify the vendor-material combinations and vendor-plant combinations that are performing poorly in terms of defect quantity and downtime. Implement targeted quality improvement measures for these underperforming areas.

# Introduction

This project aims to centralize and understand supplier quality as a priority for the organization. The management team has consolidated data from across the plants, including information on materials, defects, and vendors. The key objectives are to identify the suppliers and plants causing the greatest defects and downtime, and provide actionable recommendations to improve supplier performance and operational efficiency.



# Key Business Questions

## Supplier Performance

Which vendors/plants are causing the greatest defect quantity and downtime? Is there a particular combination of material and vendor or vendor and plant that performs poorly?

## Comparative Analysis

How does the same vendor and material perform across different plants? Who are our best and worst suppliers with respect to quality and business impact?

## Defect Management

How well are we managing the defects experienced? What is our worst managed material type, and why? What is the overall effect of our worst suppliers on the business?

# Data Exploration

## Data Sources

The data was initially uploaded into Power Pivot through Microsoft Excel to a data model to ensure the integrity of the data and handle complexities that may arise from the data scaling as more transactions are made.

## Data Preprocessing

Data cleaning and preprocessing steps were taken, such as handling missing values, converting data types, and creating calculated fields to aid in the analysis and reporting.

## Descriptive Statistics

Descriptive statistics and visualizations were used to summarize the data, including metrics such as total defects, total downtime, and the relationship between defects and downtime.

## Analytical Approach

The analysis focused on identifying the materials, vendors, and vendor-plant combinations responsible for the highest defect quantities and downtime, as well as determining the overall performance and ranking of suppliers.





# Data Analysis

1

## Material and Vendor Analysis

Identified the material types and categories leading to the most defected quantities, as well as the specific material-vendor combinations responsible for the highest defect quantities.

2

## Downtime Analysis

Analyzed the relationship between defect quantities and downtime events, and determined the material-vendor and vendor-plant combinations causing the most downtime.

3

## Supplier Performance Scoring

Developed an overall scoring system to rank the worst performing vendor-plant combinations based on a combination of defect quantities and downtime, providing a comprehensive view of supplier quality and business impact.



# Insights and Recommendations

1

## Defects vs. Downtime

The analysis revealed that more defects do not necessarily translate to more downtime, as the company has mechanisms in place to mitigate the impact of some defects. However, it is still important to keep the number of defects low to maintain operational efficiency.

2

## Targeted Improvement

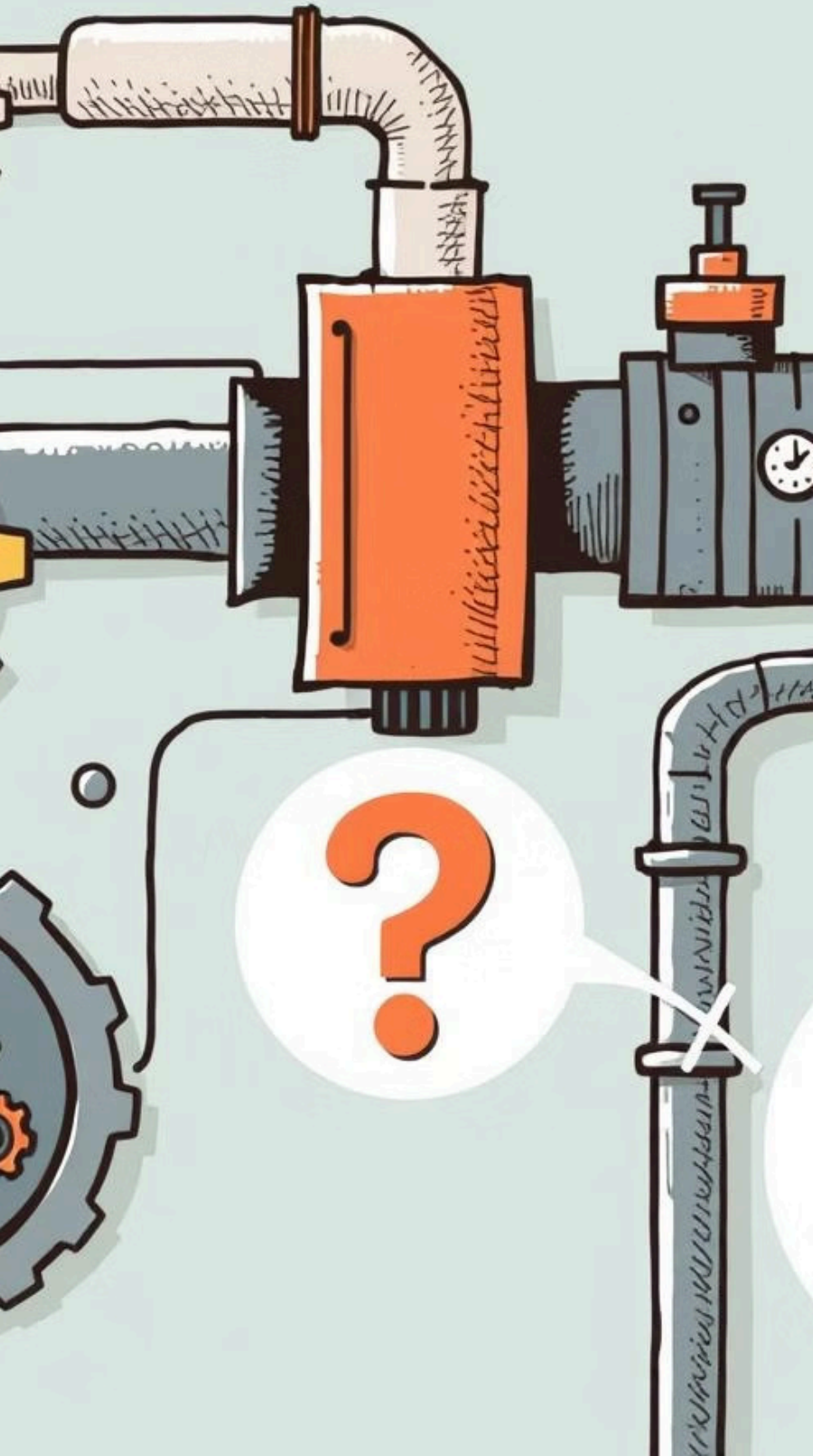
The company should focus on the specific material-vendor and vendor-plant combinations that are performing poorly in terms of defect quantities and downtime, and implement targeted quality improvement measures to address these underperforming areas.

3

## Supplier Evaluation

The overall supplier performance scoring system should be used to identify the best and worst suppliers, and the company should work closely with the underperforming suppliers to improve their quality and reliability.

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# Limitations and Future Work



## Data Limitations

The analysis was limited by the absence of total orders or supplies data, which would have allowed for a more comprehensive and absolute performance analysis of the suppliers.



## Future Improvements

Future studies could explore incorporating the total orders or supplies data to provide a more accurate and complete picture of supplier performance and its impact on the business.



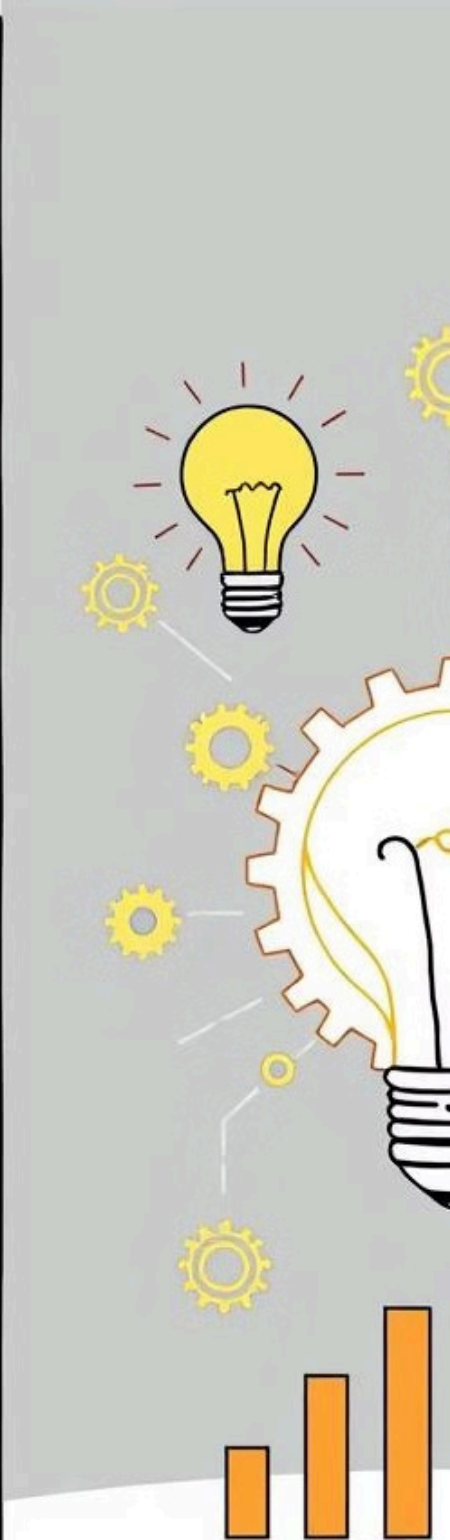
## Analytical Depth

The analysis could be further enhanced by exploring more advanced statistical techniques and machine learning models to uncover deeper insights and patterns in the data.





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# Conclusion

## Key Findings

The analysis revealed that more defects do not necessarily translate to more downtime, and the focus should be on identifying the specific material-vendor and vendor-plant combinations responsible for the highest defect quantities and downtime.

## Recommendations

Implement targeted quality improvement measures for the underperforming material-vendor and vendor-plant combinations, and use the overall supplier performance scoring system to identify and work closely with the best and worst suppliers.

## Impact

By addressing the identified quality and performance issues, the company can improve operational efficiency, reduce costs, and enhance its overall competitiveness in the market.

# Next Steps



## Stakeholder Engagement

Engage with key stakeholders to present the findings and recommendations, and gather feedback to refine the analysis and implementation plan.



## Continuous Improvement

Establish a regular review and monitoring process to track the implementation of the recommendations and continuously evaluate supplier performance and the effectiveness of the quality improvement measures.



## Future Enhancements

Explore opportunities to incorporate additional data sources and advanced analytical techniques to further enhance the insights and decision-making capabilities related to supplier quality and business impact.