Supplier Quality
Report Summary

Monitor defects, downtime, and supplier performance in real-time

BY: Abdelrahman Yahia Gaber

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Summary of Data Cleaning Impact

Issue	Solution Applied	Impact on Data
Duplicate records in Fact Table	Removed 326 duplicates	Defect count corrected (from 56M → 55M)
Redundant Sub-Category Column	Removed & renamed IDs	Improved model efficiency
Referential Integrity Issue	Rebuilt Dim Defect & Dim Vendor with consolidated IDs	Eliminated orphaned records (32 missing Defect IDs, 2 Vendor IDs fixed)
Inconsistent Data Types	Converted all IDs to text (except old IDs)	Prevented relationship mismatches
Unclear Table Names	Renamed tables for clarity	Improved readability

Summary of Data Modeling Impact

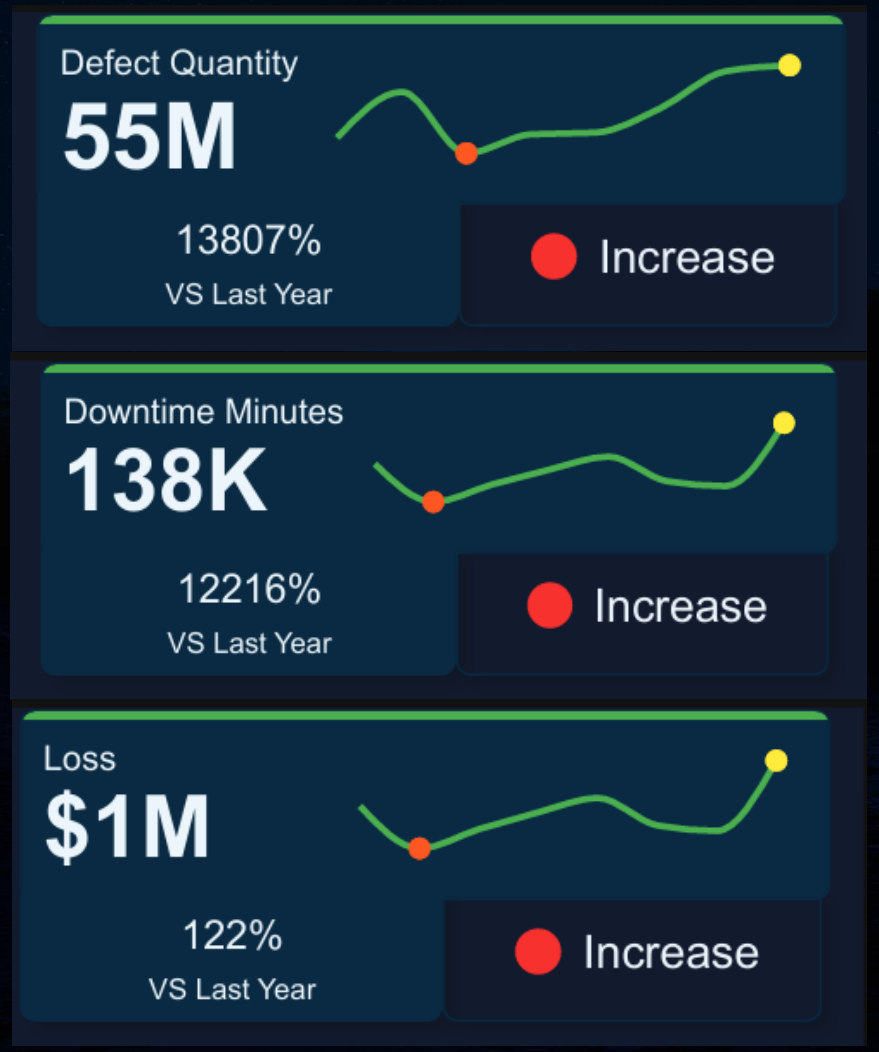
Optimization	Impact on Performance & Usability
Star Schema Design	Faster queries, simpler relationships
Created Dim Calendar Table	Better time intelligence & trend analysis
Removed Unnecessary Columns	Reduced model size & improved efficiency
Converted IDs to Text for Consistency	Prevented relationship mismatches
Used Single-Directional Filters	Optimized cross-filtering performance
Marked Date Table	Enabled advanced DAX date functions

Summary of DAX Measures & Their Impact

Measure Name	Purpose	Optimization Strategy
Total Defect Qty	Aggregates total defects	Simple SUM(), ensuring high performance
Previous Year Defect Qty	Fetches last year's defect data	Uses SAMEPERIODLASTYEAR() for efficiency
Defect YoY Change %	Calculates YoY change	Uses VAR for cleaner, optimized DAX
Defect Status Indicator	Assigns trend labels (🔴 🟢 🟡)	SWITCH() avoids redundant calculations
Total Loss	Calculates financial impact	Uses parameter selection for user control
Avg Defect Qty Per Vendor	Measures supplier defect rate	DIVIDE() prevents division errors
Avg Downtime Per Vendor	Measures supplier downtime impact	Ensures smooth aggregation
Top Vendor	Identifies worst vendor	Uses TOPN() for ranking
Top Vendor by Downtime	Identifies vendor causing most downtime	Uses TOPN() on Downtime min

High-Level Trends

Defect quantities **surged to 55 million units**, driving a **138,000-minute (2,300-hour) increase in downtime**, which in turn **led to an estimated financial impact of $1.037 million**.

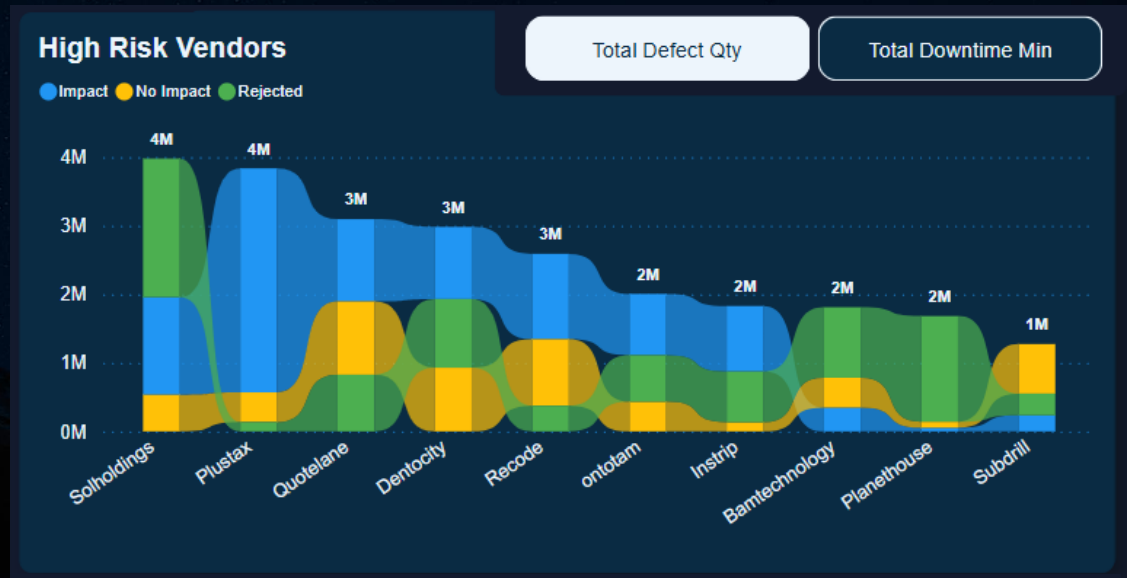


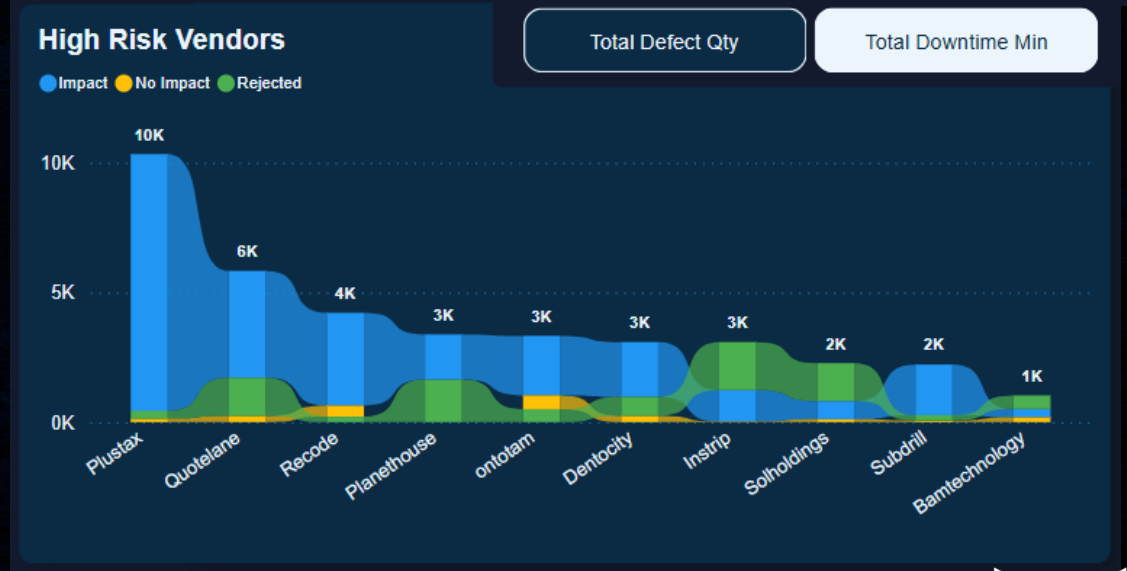
Financial Loss:

The analysis reveals a **direct correlation between downtime and financial losses**. With an estimated **downtime cost of $7.5 per minute**, the company **incurred over $1.037 million** in downtime-related expenses.

Vendor Quality Risks

- “Plustax” was responsible for 13.03% of total defects, requiring immediate supplier review.
- “Impact-type” defects caused 75.71% of all downtime, suggesting that defect severity is a major issue, not just quantity.
- “Plustax” also contributed to 25.51% of downtime, making it a high-risk supplier.

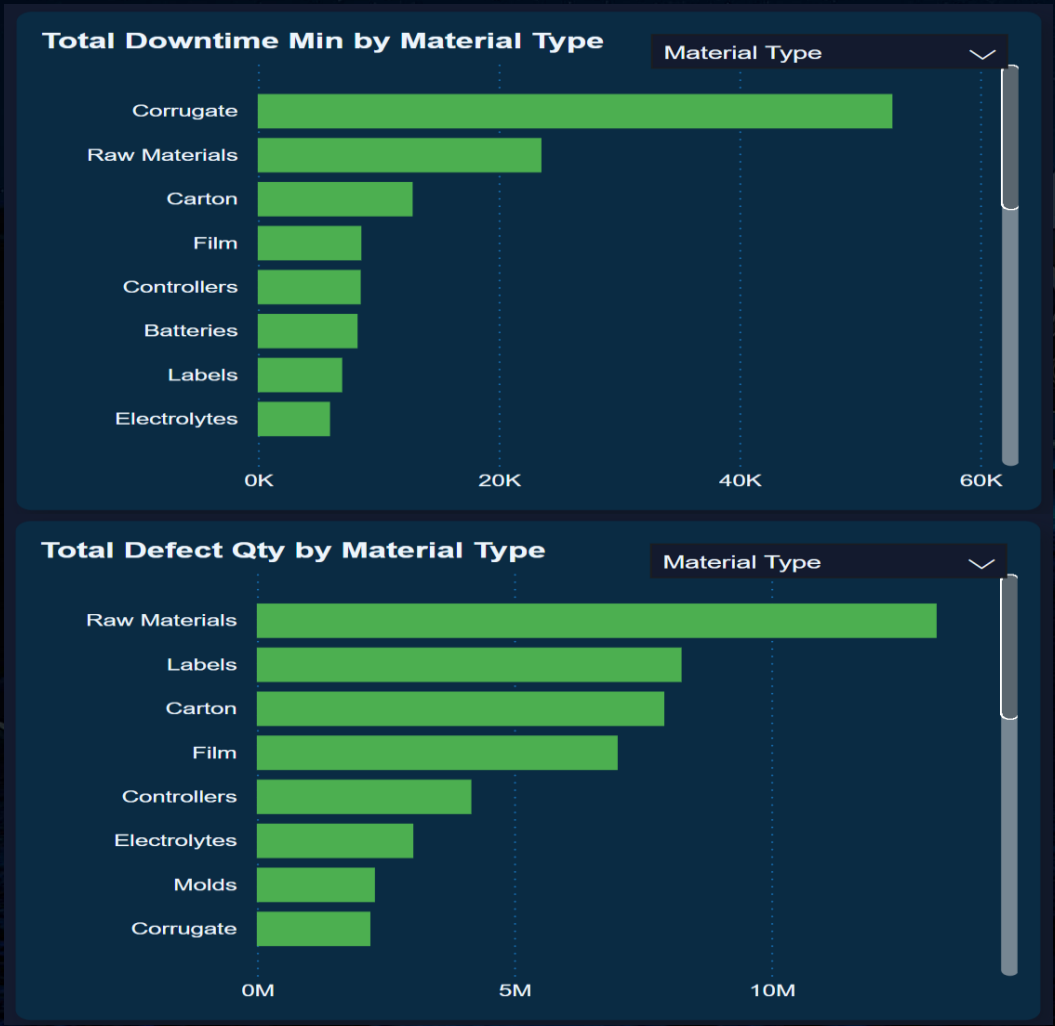




Plant Quality Risks

- "Detroit", MI had the highest defect count (6.6M), while "Springfield, IL" had the highest downtime (17,296 minutes).
- Most plants had total downtime below 5,764 minutes, but "Springfield" far exceeded this threshold.
- Packaging defects accounted for the highest defect count at plant level.
- Logistics-related defects caused 40.41% of all downtime.

Material Quality Risks



- “Corrugate” materials had the highest downtime impact (52,726 minutes), followed by “Raw Materials” and “Carton”.
- “Raw Materials” had the highest defect quantity (13.2M defects), while “Wires” had zero reported defects.
- “Corrugate” contributed to 38.11% of all downtime, making it a bottleneck material.

Insights Summary

Defect Trends	• **Q4 had the highest defect rates**, signalling potential year-end quality control challenges. • More defects reduce adherence to quality standards.
Supplier Performance	• **Reddoit contributed to the highest downtime (18.93%)**, and **Solholdings had the highest defect count (7.29%)**. • **Impact-type defects caused 75.71% of downtime.**
Plant Efficiency	• **Most plants had total downtime below 5,764 minutes**, but Springfield far exceeded this threshold. • **Packaging defects accounted for the highest defect count at plant level.**
Material Impact	• **Raw Materials had the highest defect quantity (13.2M defects), while Wires had zero reported defects.** • **Corrugate contributed to 38.11% of all downtime, making it a bottleneck material.**

Recommendations

Focus on High-Risk Suppliers & Plants:

- **Plustax, Reddoit, and Solholdings require urgent quality reviews** to mitigate defects and downtime.
- **Detroit, MI (highest defects) and Springfield, IL (highest downtime) need intervention to stabilize operations.**

Improve Supply Chain Efficiency:

- **Logistics-related downtime is a major issue (40.41%),** meaning supply chain improvements could significantly reduce production delays.
- **Corrugate materials cause the highest downtime, requiring supplier audits or alternative sourcing**

Data-Driven Quality Control:

- **High rejection rates (35.54%) suggest quality control improvements at the manufacturing stage.**
- **Impact-type defects cause 75.71% of downtime—focus on resolving these critical issues.**

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