Algorzen Vigil

AI Drift Detection & Anomaly Monitoring Report

Report ID:	VIGIL-2025-Q4-1110
Generated:	2025-11-10 03:46:10
Analysis Period:	2024-01-01 00:00:00 to 2024-06-15 12:00:00
Total KPIs Monitored:	7
AI-Powered Analysis:	No (Heuristic)

Executive Summary

Our algorithmic drift detection system has identified 4339 anomalies across 7 key performance indicators, classified as High severity. The analysis reveals critical deviations demanding immediate investigation in core business metrics. These findings warrant executive review to maintain operational excellence and strategic alignment.

Anomaly Overview

Metric	Value
Total Anomalies Detected	4339
Severity Level	High
Affected KPIs	unit_price, subtotal, profit_margin...
Detection Methods Used	Zscore, Rolling Deviation

Key Findings

• Detected 4339 anomalies with High severity classification, indicating significant deviations from expected patterns.

• Primary impact observed in: unit_price, subtotal, profit_margin..., suggesting potential systemic issues.

• Z-score analysis identified 28 extreme outliers exceeding 3 standard deviations from the mean.

• Rolling deviation analysis flagged 4311 instances of >25% deviation from recent trends.

• Anomalies span from 2024-01-01 to 2024-06-15, requiring temporal correlation analysis.

Recommendations
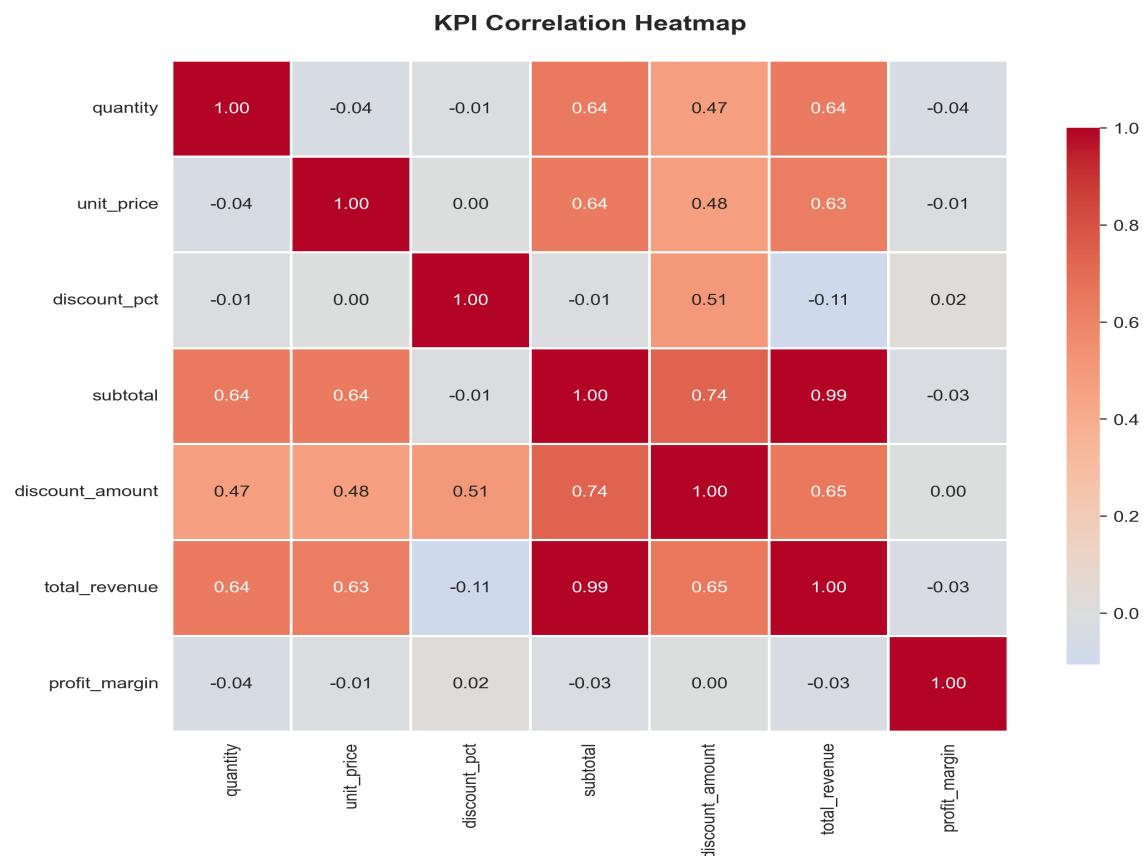
• Immediate Investigation: Convene cross-functional team to assess root causes of critical anomalies and implement corrective measures within 48 hours.

• Enhanced Monitoring: Deploy real-time alerting systems for affected KPIs to prevent recurrence and enable proactive intervention.

• Data Validation: Verify data collection processes and instrumentation accuracy for affected metrics to rule out measurement errors.

• Trend Analysis: Establish baseline performance thresholds and implement automated drift detection to maintain operational visibility.

• Stakeholder Communication: Brief department heads responsible for unit_price, subtotal on findings and remediation plans.

KPI Statistics Summary

KPI	Mean	Std Dev	Min	Max	Count
quantity	24.98	14.06	1.0	49.0	1000
unit_price	1010.56	567.03	12.68	1995.27	1000
discount_pct	12.41	7.19	0.0	24.92	980
subtotal	24920.52	20940.5	12.68	92544.48	1000
discount_amount	3072.1	3527.19	0.0	21081.31	1000
total_revenue	21848.42	18484.48	12.11	91600.53	1000
profit_margin	24.93	8.78	10.02	40.0	1000

Advanced Analytics

## Correlation Analysis

KPI Correlation Heatmap
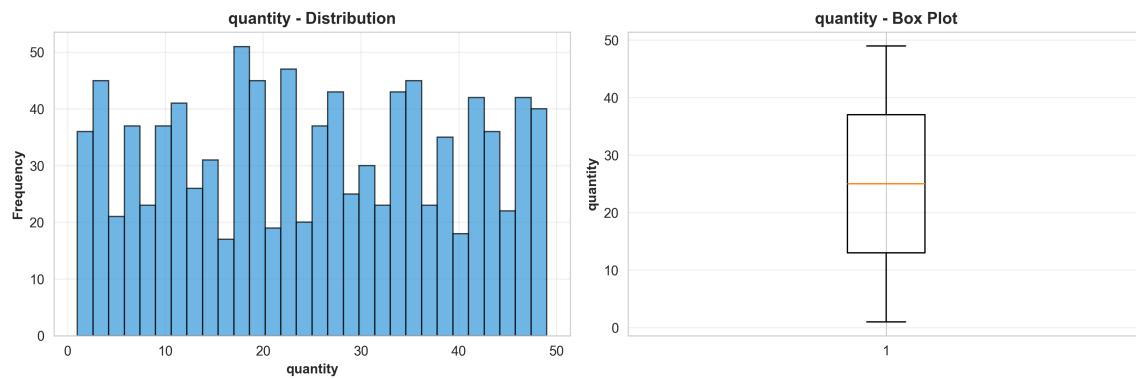
Strong Correlations Found (|r| > 0.7):
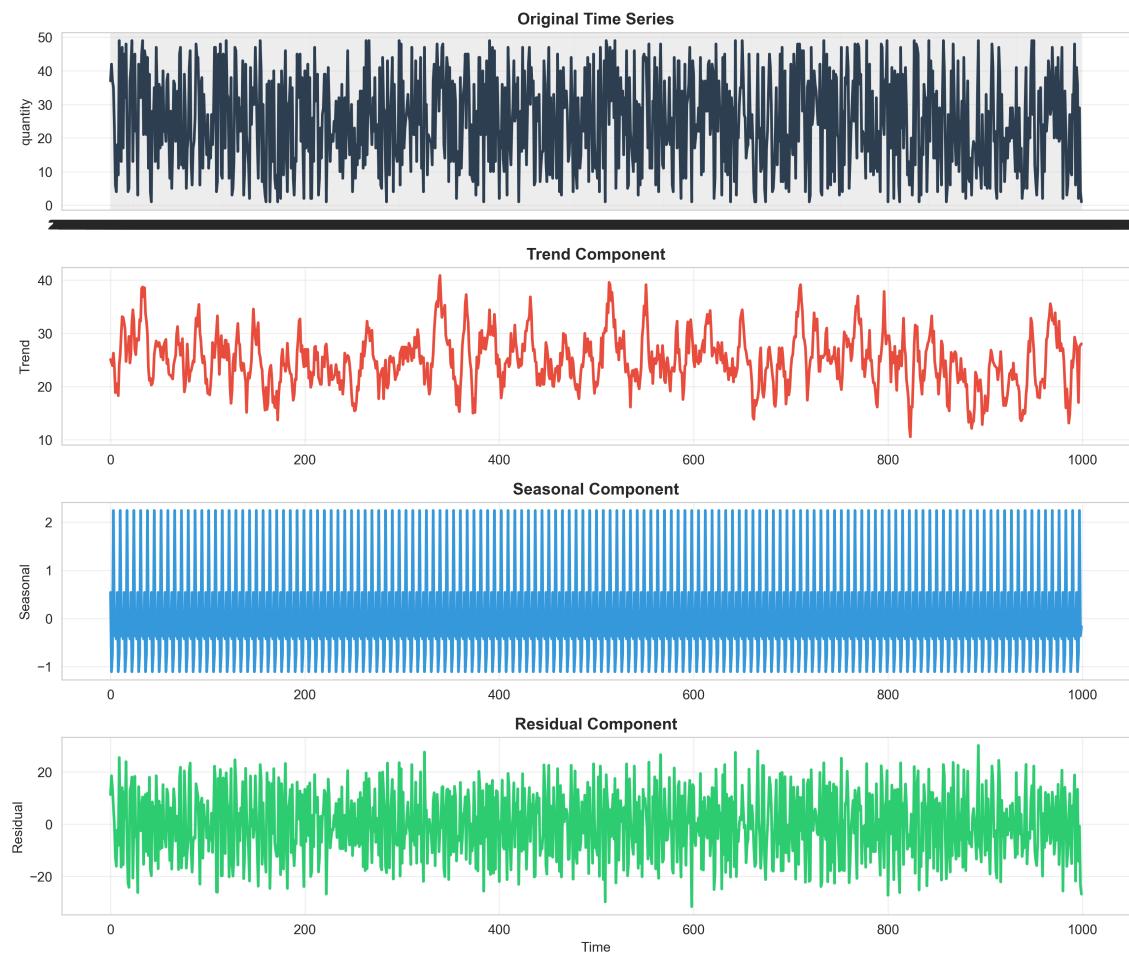
• subtotal ↔ discount_amount: 0.74

• subtotal ↔ total_revenue: 0.99

Distribution Analysis

quantity - Distribution / **quantity - Box Plot**

quantity Statistics: Mean=24.98, Median=25.00, Std=14.06, Skewness=0.01

Trend Decomposition

Original Time Series

Trend Component

Seasonal Component

Residual Component

Seasonal decomposition analysis for quantity showing trend, seasonal patterns, and residual components.

Visual Analysis

Anomalies by KPI

Anomalies by Detection Method