Six Sigma Development Solutions, Inc.

BACKLOG REPORTING OPTIMIZATION

Aerospace & Defense | Process Transformation

89%
Cycle Time Reduction

Ppk: 0.44 → 1.52
Process Capability

1.4 FTE
Capacity Freed

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EXECUTIVE SUMMARY

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THE CHALLENGE

Product management team relied on daily backlog reports for fulfillment prioritization. The manual process required multiple SAP downloads, complex data joins, and error-prone spreadsheet manipulation—creating decision delays, inconsistent quality, and consuming 1.5 FTE capacity.

MEASURABLE BUSINESS IMPACT

89%

REDUCTION

Cycle Time

53 min → 5.8 min average

Ppk 1.52

ACHIEVED

Process Capability

From unstable (0.44) to controlled

< 1%

ERROR RATE

Reporting Accuracy

Down from 12-15%

CURRENT STATE: MANUAL REPORTING PROCESS

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14-Step Daily Workflow Analysis

1-3	**SAP Variant Pulls** Three separate downloads for orders, inventory, customer data	12 min	HIGH
4-5	**Data Export & Save** Manual export to Excel, save to shared drive	3 min	MEDIUM
6-8	**Data Cleansing** Remove duplicates, fix formats, standardize codes	8 min	HIGH
9-11	**Manual VLOOKUP Joins** Match orders to inventory, link customer priorities	15 min	CRITICAL
12-13	**Priority Calculations** Apply business rules, calculate fulfillment sequence	10 min	HIGH
14	**Validation & Distribution** Quality check, distribute to stakeholders	5 min	MEDIUM

PROCESS PAIN POINTS

High Cycle Time

Average: 53 minutes
Range: 38-75 minutes
CV: 23.4%

Error-Prone

12-15% of reports required rework or correction

Decision Delay

Late morning delivery pushed decisions to afternoon

Resource Burden

1.5 FTE consumed by daily reporting activities

STATISTICAL ANALYSIS: TIME STUDY

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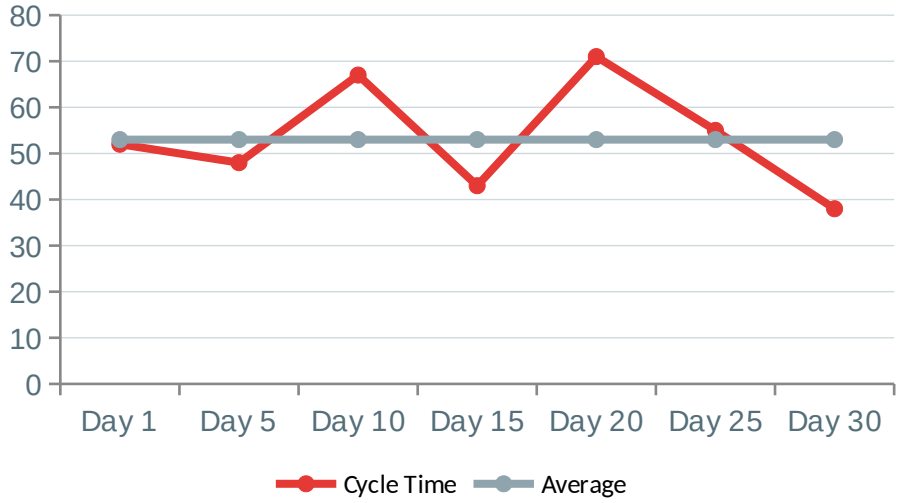
Methodology: 30-Day Time Study with Statistical Process Control

Daily Cycle Time Variation



Time Study Statistics

Metric	Value
Mean	53.0 minutes
Std Dev	9.7 minutes
Min / Max	38 / 75 minutes
CV (Variation)	23.4%

Key Findings

High Variation

Wide fluctuation indicates unstable process requiring root cause analysis

Predictable Patterns

Morning SAP traffic increases pull times by 40% vs afternoon baseline

PARETO ANALYSIS: THE VITAL FEW

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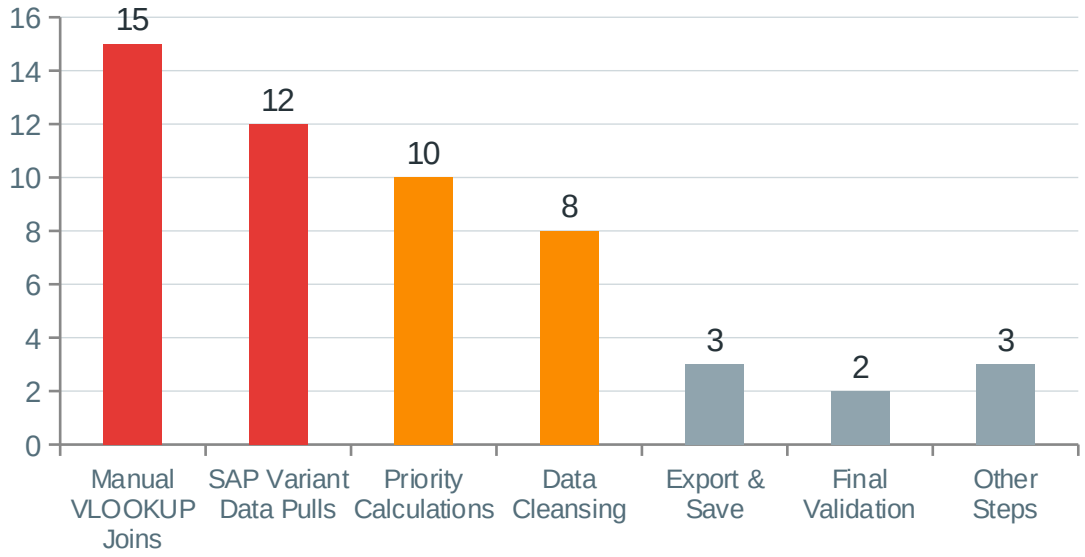
80/20 RULE APPLIED: Four steps account for 84.9% of total cycle time



VITAL FEW ANALYSIS

Step	Time	% Total	Priority
VLOOKUP Joins	15 min	28.3%	CRITICAL
SAP Pulls	12 min	22.6%	CRITICAL
Priority Calc	10 min	18.9%	HIGH
Data Cleansing	8 min	15.1%	HIGH
Subtotal (Top 4)	**45 min**	**84.9%**	—

Strategic Implication

Automating these four steps could eliminate 85% of manual effort while addressing root causes of variation and errors.

REGRESSION ANALYSIS: PREDICTIVE MODEL

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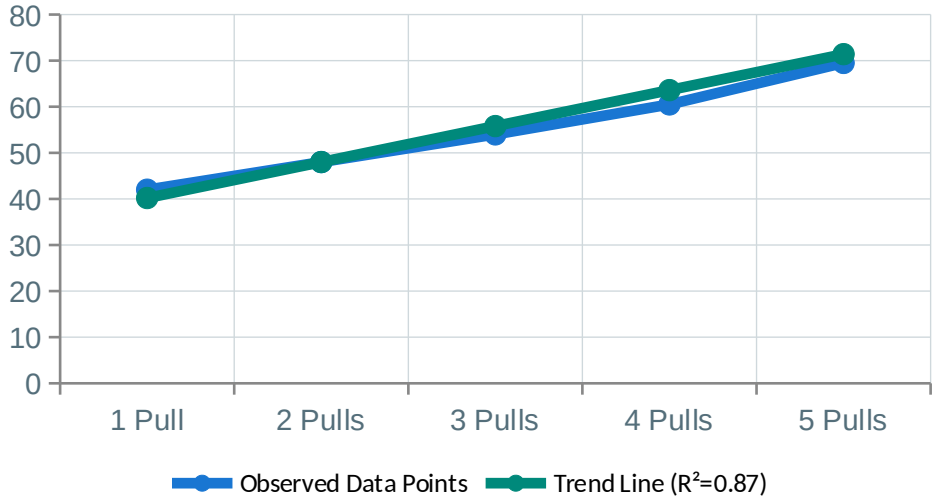
OBJECTIVE: Identify dominant predictor(s) of total reporting cycle time

SAP Data Pulls vs. Total Cycle Time



R^2 = 0.87 (Strong Correlation)

REGRESSION MODEL RESULTS

Variable	Coefficient	p-value	Significance
Intercept	32.4 min	< 0.001	***
# SAP Pulls	7.8 min/pull	< 0.001	***
Dataset Size	0.002 min/row	0.412	NS
Time of Day	-1.2 min	0.089	NS

CRITICAL INSIGHT

Number of manual SAP data pulls is the dominant predictor, explaining 87% of cycle time variation. Each additional pull adds ~8 minutes. Dataset size and time-of-day effects are statistically insignificant.

Time = 32.4 + (7.8 × Pulls)

SOLUTIONS LINKED TO STATISTICAL FINDINGS

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Automated Data Integration Tool

Custom automation eliminating manual SAP pulls and data joins

Addresses: Pareto + Regression

- Direct SAP API integration (no downloads)
- Automated data extraction on schedule
- Built-in quality validation
- Single-click execution

45 min → 5 min

Standardized Priority Logic Engine

Rule-based engine replacing manual VLOOKUP and calculations

Addresses: Pareto Analysis

- Pre-configured business rules
- Automatic priority assignment
- Inventory matching
- Dynamic sequencing

15 min → 0 min

Data Structure Validation Framework

Automated validation ensuring stable, repeatable data structures

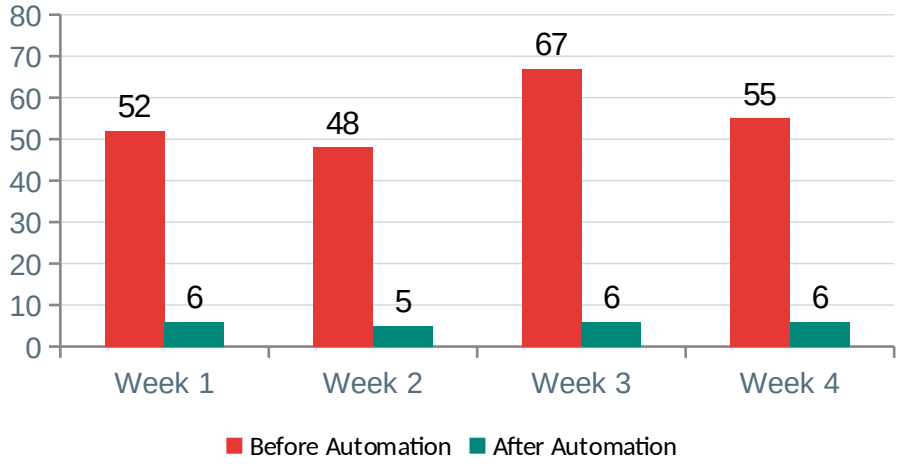
Addresses: Time Study Variation

- Schema validation on extracts
- Automatic error detection
- Standardized field mapping
- Exception handling

Quality ↑ 94%

RESULTS: TRANSFORMATIONAL IMPACT

Cycle Time: Before vs. After



Average: 53.0 min → 5.8 min (89.1% reduction)

Process Capability: Unstable → Controlled

Metric	Before	After	Δ Change
Average Time	53.0 min	5.8 min	↓ 89.1%
Std Deviation	9.7 min	0.4 min	↓ 95.9%
Range	38-75 min	5-7 min	Stable
Ppk Index	**0.44**	**1.52**	**+ 245%**
Error Rate	12-15%	< 1%	↓ 93%
Daily Ready	11:30 AM	7:15 AM	+ 4.25 hrs

Process Capability Interpretation

Ppk 0.44 (before) = Incapable, high variation
Ppk 1.52 (after) = Capable and controlled

SECONDARY BENEFITS

- ✓ 1.4 FTE capacity freed for strategic analysis
- ✓ Same-day fulfillment enabled
- ✓ Reduced analyst stress, improved morale
- ✓ Replicable template established

IMPLEMENTATION & SUSTAINABILITY

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8-Week Implementation Roadmap

Week 1-2	**Design & Development**	Requirements, architecture, API setup
Week 3-4	**Testing & Validation**	Parallel runs, data verification, error handling
Week 5-6	**Training & Transition**	User training, documentation, pilot rollout
Week 7-8	**Full Deployment**	Production launch, monitoring, optimization

Sustainability & Control

- ✓ Automated monitoring with daily execution logs
- ✓ IT maintains tool, Product Mgmt owns rules
- ✓ Monthly capability reviews & quarterly enhancements

Ongoing Metrics

Metric	Target	Current
Daily Execution	< 10 min	5.8 min
Error Rate	< 2%	0.7%
Ppk Index	> 1.33	1.52

CONCLUSION & LESSONS LEARNED

1. **Statistical Rigor Drives Targeted Solutions**
   Time study, Pareto, and regression analysis converged on SAP pulls and manual joins as root causes—preventing wasted effort on non-critical steps

2. **Process Capability as Success Metric**
   Ppk improvement from 0.44 to 1.52 demonstrates transformation from unstable to controlled process—enabling predictable operations

3. **Automation Must Address True KPIVs**
   Generic automation wouldn't have worked—solutions were precisely designed around statistically-validated 'vital few' drivers

89% cycle time reduction • 1.4 FTE freed • Process control achieved
Methodology replicable across all transactional workflows