CORTEX DIGITAL LABS

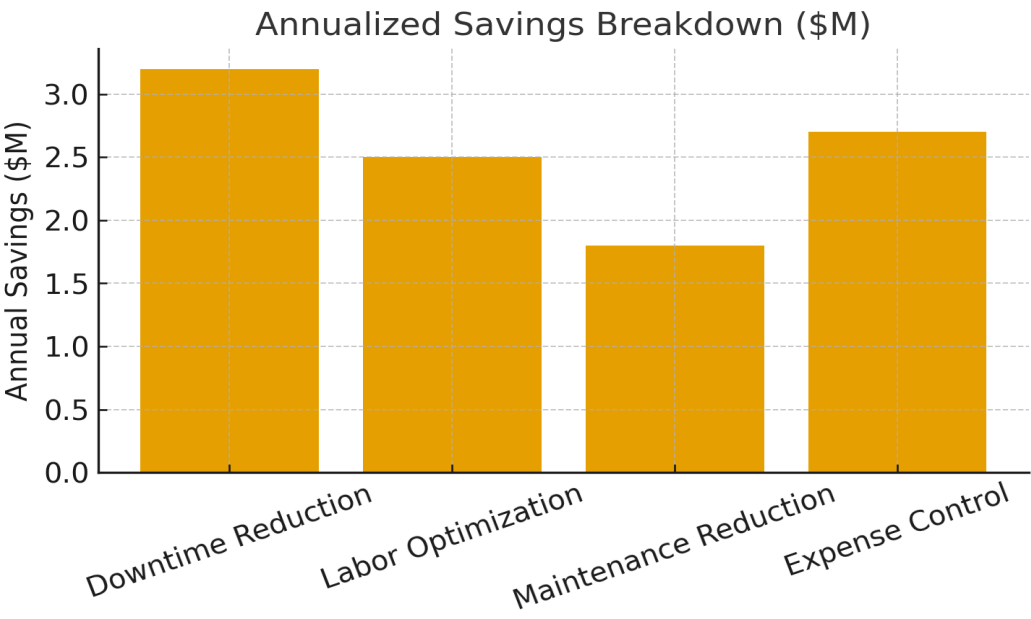## MENASCO SYSTEM ARCHITECTURE TRANSFORMATION

Technical Case Study and ROI Analysis

Key Performance Indicators

Menasco engaged Cortex Digital Labs to redesign its technical foundation and deliver measurable financial outcomes. The following indicators capture the realized impact once the new architecture, data flows, and automations were live in production.

| Metric	Result
Verified Annual Savings	$10.2M per year
Unexpected Downtime Reduction	19–28 percent depending on line
Expense Leakage Reduction	76 percent drop in untracked overhead
Manual Expense-Processing Hours Removed	3800 hours per year
Reactive Maintenance Events	18 percent fewer failures recorded

Annualized Savings Breakdown

Technical Execution and System Architecture

Cortex rebuilt Menasco's core systems around a modern, cloud-hosted architecture. The work centered on four technical pillars: network and VPC design, data unification, digital twin construction, and targeted financial automation.

• VPC and Network Layer — A segmented global virtual private cloud connected Menasco offices and plants through secure tunnels and identity-controlled access. • Data Lake and Warehouse — Operational data from PLCs, sensors, ERP, and project systems flowed into a governed lake and warehouse with a consistent schema. • Digital Twins — Each major prefabrication line was mirrored through a digital twin fed by real time or near real time operational data, enabling predictive and what-if analysis. • Automation Engine — Expense and project-cost workflows moved from manual spreadsheets into a rules-driven automation layer with validation, routing, and reconciliation.

Downtime Reduction by Production Line

Downtime Reduction by Line (%)
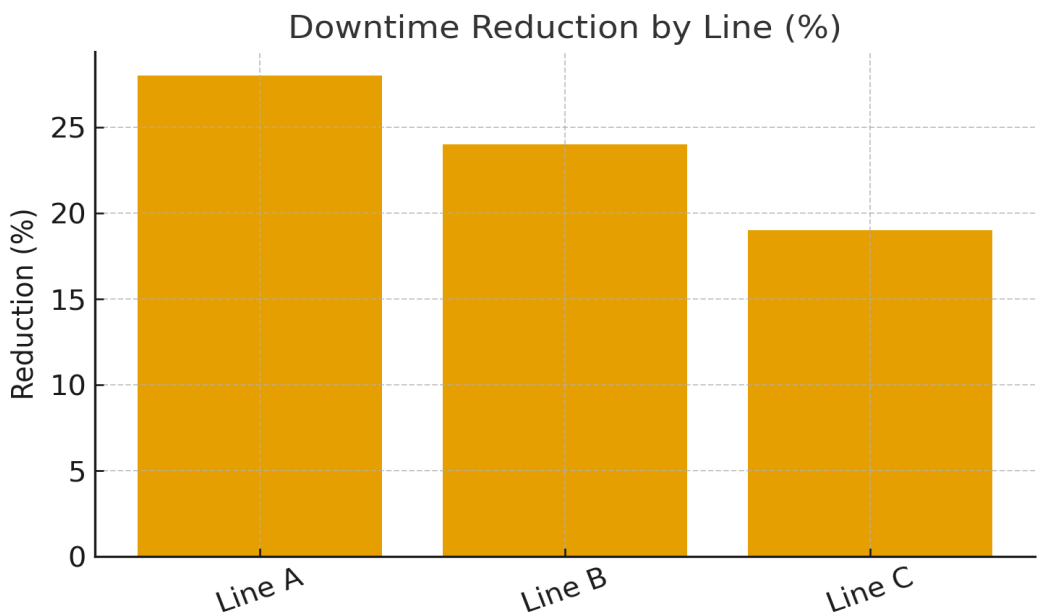
Challenge and Value Engineering Solution

During the second year of the program Menasco expanded production into two additional regions. The new facilities operated legacy PLCs, had inconsistent network connectivity, and lacked sensor coverage. If handled in a conventional way, the required hardware replacement would have delayed rollout and damaged the financial case.

Cortex responded with a value-engineered retrofit strategy designed to keep the digital twin and data architecture intact while minimizing capital expenditure.

• Edge Gateways for Legacy Equipment — Modular devices were installed at each legacy line to standardize and transmit data without replacing PLCs. • Hybrid Ingestion Model — Newer sites streamed events in real time while legacy sites published structured batches per shift. Both paths entered the same governance and analytics layers. • Secure Overlay Network — An encrypted overlay linked the new regions to the central VPC and respected local regulatory constraints on data flows.

Impact of Expense Tracking Automation

Cortex also attacked one of Menasco's persistent pain points: project expense tracking. Manual spreadsheets and late reconciliations had resulted in untracked overhead and delayed visibility into project profitability.

Expense Processing Improvements
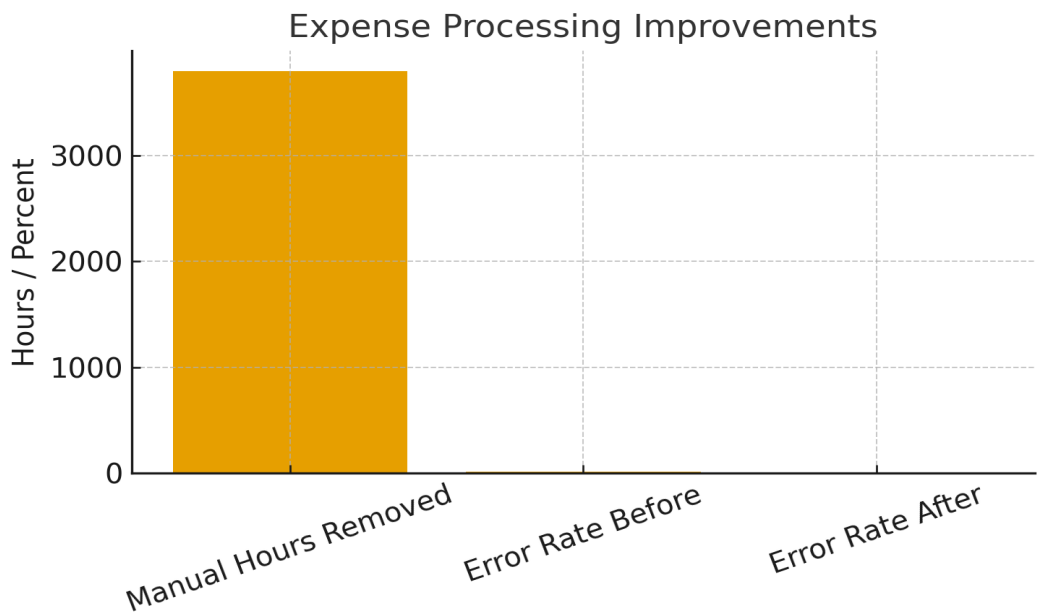
By centralizing expense data and enforcing validation rules at the point of entry, the system removed thousands of hours of manual work and dramatically reduced posting errors. Finance and project leaders gained a live view of cost consumption by project and by line.

Closing Summary

The Menasco program demonstrates how a focused, technically rigorous architecture initiative can generate multi-million-dollar recurring savings for a complex MEP organization. Cortex delivered a unified, governed data environment, resilient connectivity, operational digital twins, and automation that directly removed waste from the system.

For organizations with similar manufacturing or project-based operations, the pattern is repeatable: establish the right network and data foundation, instrument core assets, and automate the workflows that consume the most time and introduce the most financial risk. Cortex provides the technical leadership, engineering talent, and delivery discipline needed to execute these programs from first design through stable operations.