

# Legacy Refinery Embarks on A Smooth Digital Transformation

Modernizing refinery ops with AI, real-time data, and cloud-native tools.

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## The Client

A U.S.-based refinery with over 80 years of experience in refining crude oil and petrochemical products. While their operations were time-tested and efficient, the IT systems hadn't kept pace. Faced with rising compliance pressures and disconnected data, the team needed a smarter, disruption-free path to modernization.



## The Challenge

The reliance on legacy applications was inhibiting progress and exposing risks in operations. Key concerns were:

- **Repeated System Crashes:** Production-facing workflows ran on aging applications that crashed routinely, leading to costly downtime and causing teams to use manual workarounds.
  - **Absence of Real-Time Visibility:** No real-time information on production and stock inventories was available. This prevented timely solutions to issues and forced decision-makers to react based on incomplete or outdated reports.
  - **Disconnected Reporting Processes:** Reporting was based on manual data consolidation across multiple departments. This was sluggish, unreliable, and error-prone, impacting strategic decision making.
  - **Siloed Supply Chain and Vendor Systems:** Disconnected supply chain and vendor systems created inefficiencies, missing out on SLAs, and reactive supply planning.
  - **Audit and Compliance Risks:** Without digitized procedures or audit-ready records, the refinery struggled with compliance with shifting environmental and safety demands and consequently faced an escalating administrative burden.
- **Repeated downtime due to outdated applications interrupted operations**
  - **Inability to gain real-time insight rendered it hard to resolve problems immediately**
  - **Manual reporting slowed down decisions and introduced a potential for human error**
  - **Isolated supply chain systems were responsible for missed SLAs and delays**
  - **Compliance efforts were strained because audit-ready records were lacking**

## The Solution

Damco collaborated with the client to implement a refinery-wide change that weighed innovation against operational stability. Every solution area was designed for visible results and long-term flexibility:

 <b>Legacy System Re-Engineering</b>	<ul style="list-style-type: none"><li>• Legacy monolithic applications were re-engineered as modular, cloud-native services with .NET Core and hosted on Azure.</li><li>• This facilitated scalability without interruptions, minimized system crashes, and provided long-term maintainability of production-critical systems.</li></ul>
 <b>Data Modernization with Unified Visibility</b>	<ul style="list-style-type: none"><li>• Azure Synapse was utilized to integrate and get production data ready for analytics, eliminating operational silos.</li><li>• Power BI dashboards provided real-time, plant-level visibility into principal KPIs, streamlining decisions and enhancing operational management.</li></ul>
 <b>AI/ML-Based Predictive Maintenance</b>	<ul style="list-style-type: none"><li>• A hybrid AI/ML model was used to track key equipment, identify anomalies early, and forecast failure points.</li><li>• Maintenance windows were optimized, resulting in less unplanned downtime and improved asset utilization.</li></ul>
 <b>Accelerated Delivery Using CI/CD Pipelines</b>	<ul style="list-style-type: none"><li>• CI/CD pipelines and DevOps best practices like automated testing and phased rollouts were implemented.</li><li>• This helped reduce release-related disruptions and reduced deployment timelines by a significant amount.</li></ul>

## The Benefits

The digital transformation program made measurable improvements in all key areas of refinery operation:

- **40% reduction in system downtime**, promoting greater production continuity
- **3 times faster reporting periods**, with greater executive visibility and decision-making
- **25% enhancement in supply-chain accuracy**, leading to enhanced vendor coordination and better performance of SLAs
- **More effective compliance stance**, supported by digitized audit trails
- **30% lower maintenance costs** with a Cloud-first architecture and predictive maintenance



## From Legacy Bottlenecks to Scalable Success.

Strategize Your Digital Transformation

## About Damco

Damco Solutions is a trusted technology and digital transformation partner for businesses around the globe. We engineer software products, create new digital experiences, modernize applications and automate business processes for greater agility and business growth. With 29+ years of leadership in software engineering and digital solutions, our mission has remain constant - complete client success.

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