

The background of the entire image is a photograph of industrial machinery, specifically a large gear assembly. The gears are metallic and arranged in a complex, interconnected system. The lighting is bright, highlighting the metallic surfaces and the intricate details of the machinery. The overall tone is industrial and professional.

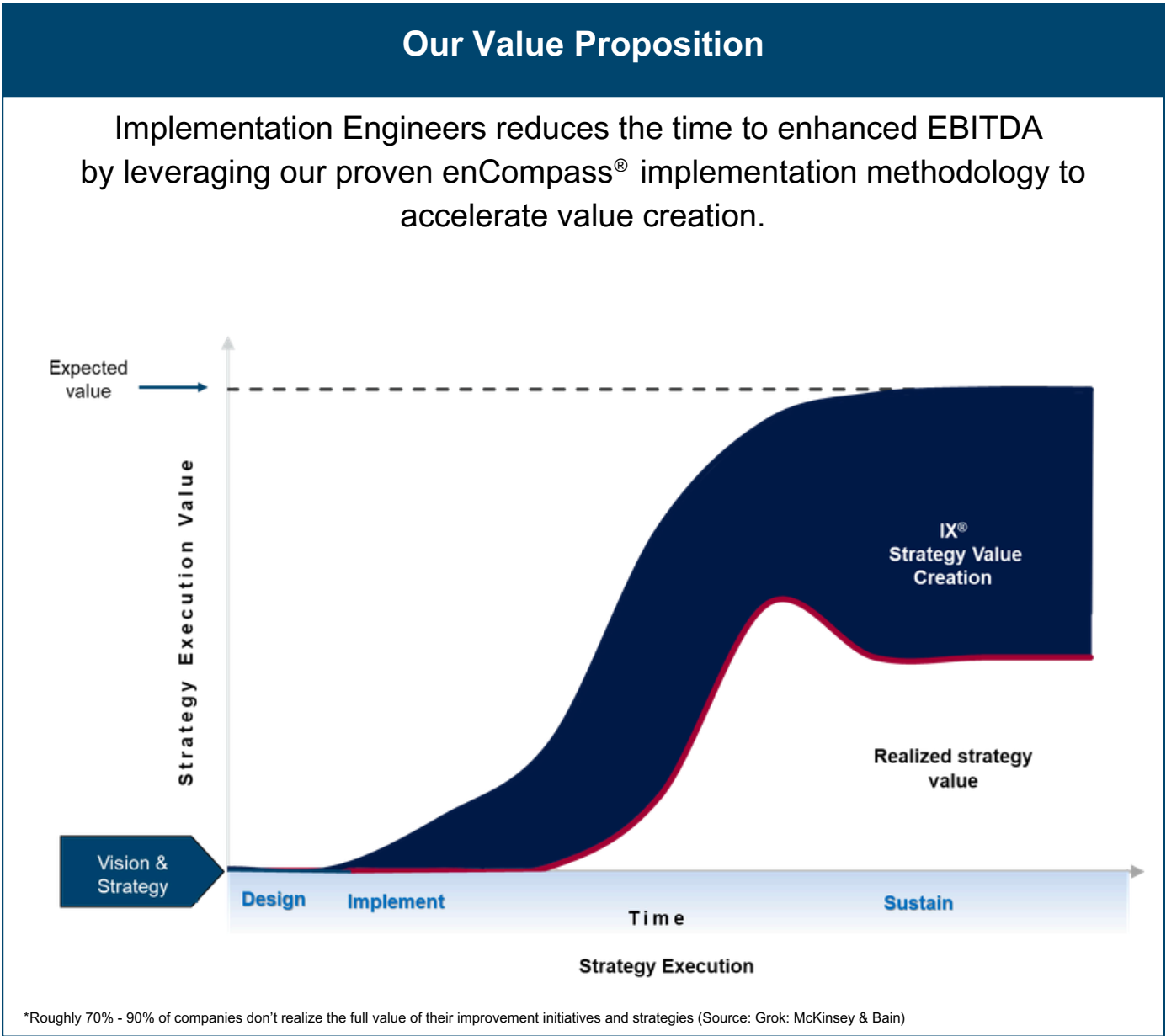
IX[®] for Maintenance & Reliability



**IMPLEMENTATION
ENGINEERS[®]**
BEYOND CONSULTING

Introduction to IE

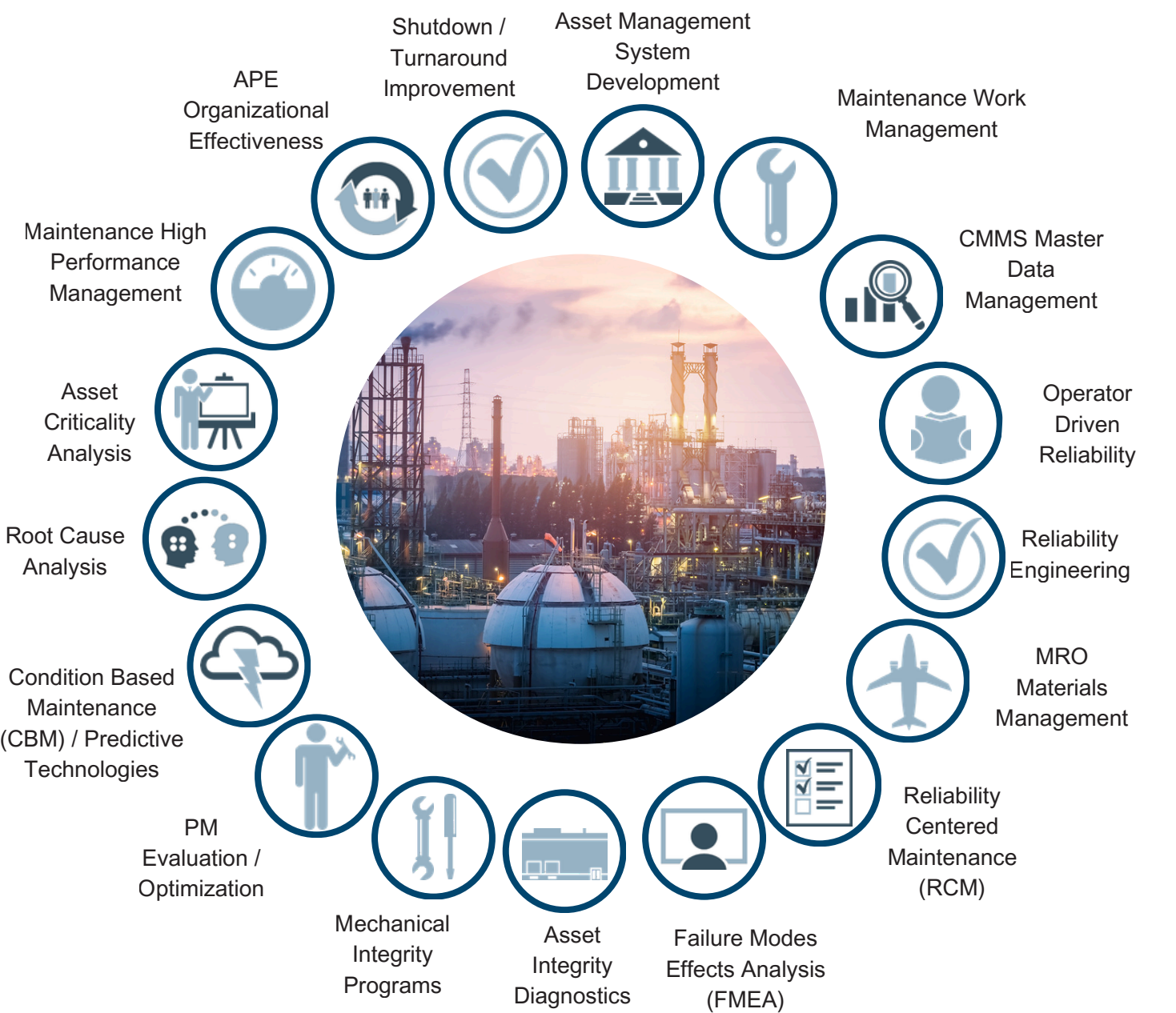
Implementation Engineers is not a consulting or advisory services firm. We are an Implementation Execution (IX®) services company dedicated to helping our clients accelerate value creation through the implementation of Vision and Strategy. Research has shown that a significant 90% of strategic initiatives fall short of achieving their intended value. At Implementation Engineers, we are here to assist leaders who recognize gaps in their implementation capabilities that are crucial for realizing the full potential of their business vision and strategy. By streamlining the strategy design process from months or years to mere weeks, we enable faster implementation. Our approach involves leveraging enCompass®, our structured, disciplined, and sustainable implementation methodology, to ensure successful implementation. Our core value proposition is centered around expediting the realization of Vision and Strategy, resulting in sustainable achievement of expected value.



Implement What?

Implementation Engineers specializes in providing an integrated approach to Maintenance and Reliability through our Asset Performance Excellence practice. We help organizations develop a cross-functional understanding and appreciation of good maintenance and reliability practices, and move from a reactive to a proactive environment that results in reduced equipment downtime and risk. Through this integrative approach, we work with our clients to achieve world class maintenance execution and reliability practices, and drive improved operational performance.

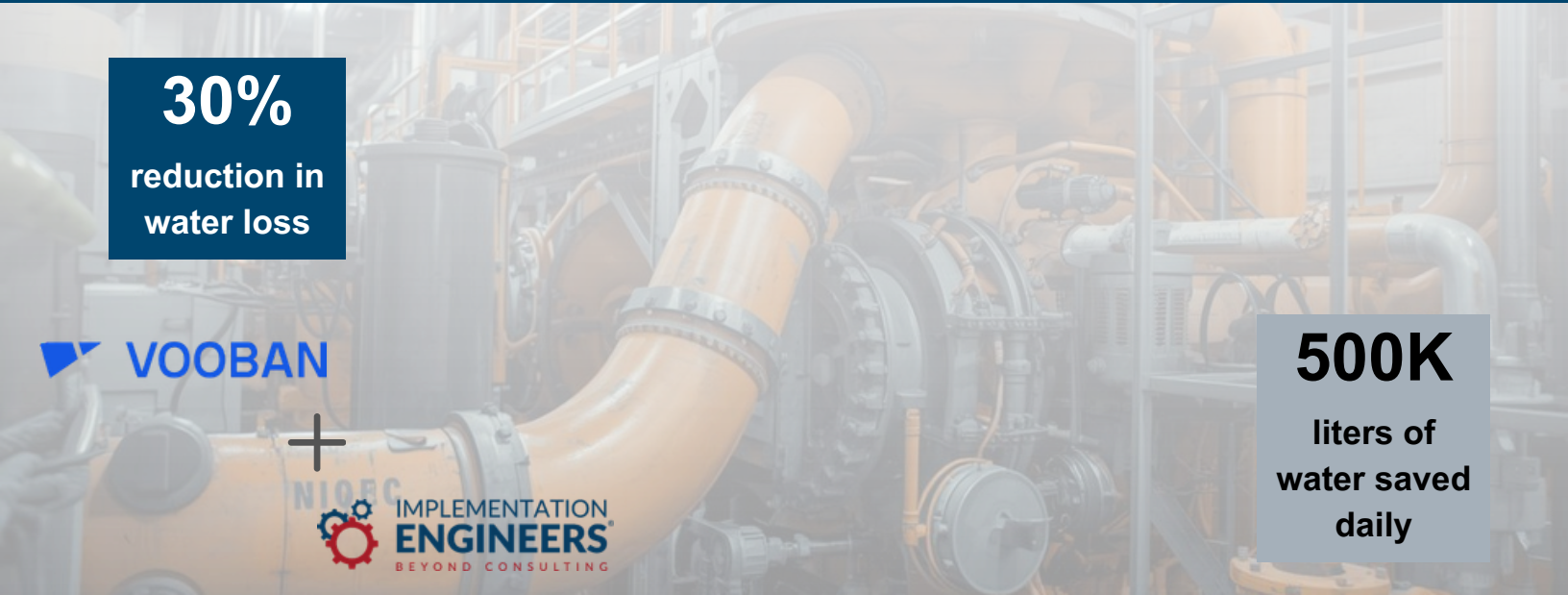
Maintenance & Reliability Implementation Support



We support the development of a maintenance-focused Implementation Design, which includes detailed implementation plans and a business case for your project or initiative. To develop an implementation plan, an on-site analysis is conducted, tailored to the specific focus areas and complexity of the desired improvements. If you already have an implementation design in place, we provide the necessary resources to support your team's implementation needs. Our team members work with you to ensure the realization and sustainability of value while minimizing Implementation risks.

AI-Driven Predictive Maintenance

IX® in Action



A long-established industrial manufacturer of sealing systems for pumps, valves, and rotating equipment faced costly failures driven by undetected gasket degradation. Maintenance decisions were largely reactive or time-based, leading to excessive water losses, premature part replacements, unplanned downtime, and equipment damage across heavy industrial environments.

Implementation Engineers, in partnership with Vooban, deployed an AI-driven predictive maintenance solution that continuously monitors operating conditions and forecasts seal failure before it occurs.

Key capabilities implemented:

- **Real-Time Condition Monitoring:** Sensors captured pressure, temperature, and operating data from rotating equipment
- **Predictive Failure Models:** AI algorithms assessed gasket health and predicted degradation based on actual operating conditions
- **Prescriptive Maintenance Guidance:** The system recommended targeted actions — such as adjusting pressure or scheduling inspections — to prevent failure
- **Edge & Cloud Integration:** Field devices delivered real-time insights to operators while enabling centralized analytics and remote visibility
- **Self-Learning System:** Models continuously improved as new operating data was collected

Impact:

The deployment transformed maintenance from reactive to predictive, delivering:

- Up to 30% reduction in water loss
- Over 500,000 liters of water saved per facility per day
- Lower maintenance costs through extended component life
- Reduced unplanned downtime and improved asset reliability

AI-Enabled Maintenance Planning & Inventory Optimization

IX® in Action

12
month
maintenance
demand
visibility

~2
hours for work
package
analysis, down
from 3 days



A major aerospace maintenance, repair, and overhaul (MRO) provider struggled with planning complexity as aircraft work packages contained thousands of tasks and frequent unexpected findings. Critical decisions on parts procurement, labor allocation, and scheduling were largely manual, leading to planning delays, parts shortages, extended ground time, and inefficient inventory levels.

Implementation Engineers, in partnership with Vooban, deployed an AI-enabled planning system that transformed maintenance data into automated, forward-looking decisions within the existing enterprise platform.

Key capabilities implemented:

- **Automated Work-Package Processing:** AI converted thousands of pages of technical documentation into structured task plans in hours rather than days
- **Predictive Maintenance Forecasting:** Generated 12-month forecasts of scheduled and likely unscheduled work to improve readiness
- **Inventory Optimization:** Pre-positioned critical parts based on predicted demand, reducing shortages without increasing stock levels
- **Resource & Schedule Optimization:** Aligned certified technicians and facility capacity to projected workloads

Impact:

The AI system transformed reactive planning into proactive orchestration:

- Work-package analysis reduced from ~3 days to ~2 hours
- Dramatically improved parts availability with minimal shortages
- Reduced aircraft ground time through advance preparation
- Higher technician utilization and reduced overtime
- Lower inventory working capital while maintaining service levels

Asset Criticality

PM Optimization

Root Cause Analysis

IX® in Action



A \$1B specialty chemical manufacturer faced chronic downtime driven by repeat equipment failures, reactive maintenance practices, and ineffective turnaround execution. Implementation Engineers implemented a comprehensive reliability system built on asset criticality, optimized maintenance strategies, and disciplined root cause elimination.

Key actions implemented:

- **Asset Criticality Assessment:** Conducted consequence-based classification across all operating units to prioritize equipment by operational risk
- **PM Optimization:** Developed risk-based preventive maintenance programs for critical assets, eliminating unnecessary work while protecting uptime
- **Root Cause Analysis (RCA):** Implemented a structured RCA program targeting recurring failures and “bad actor” equipment, with permanent corrective actions to prevent recurrence
- **Work Management System:** Standardized planning, scheduling, and failure reporting in SAP PM to enable disciplined, data-driven execution
- **Turnaround Management Transformation:** Introduced structured pre-planning, short-interval controls, and post-event reviews to reduce outage duration and improve execution precision
- **Capital Investment Prioritization:** Identified high-ROI CAPEX projects to address systemic asset weaknesses
- **Workforce Enablement:** Delivered training, audits, and coaching to shift teams from reactive firefighting to proactive reliability management

Maintenance Management Operating System

IX® in Action



During the transition from an aging rod mill to a new facility, a leading wire manufacturer faced significant operational risk. Maintenance execution was largely reactive, SAP PM was underutilized, and the organization lacked a structured system to manage performance, reliability, and material readiness for commissioning.

Implementation Engineers designed and implemented a comprehensive Maintenance Management Operating System (MOS) to provide daily control, visibility, and accountability across maintenance and reliability functions.

MOS components implemented:

- **Performance Governance:** Established a KPI tree, scorecards, visual dashboards, and tiered meeting structure to track results and drive accountability
- **Leader Standard Work:** Defined supervisory routines, action management, and RACI ownership to ensure consistent execution
- **Reliability Integration:** Embedded asset criticality analysis, maintenance strategies, and Root Cause Analysis into daily operations through a closed-loop reliability framework
- **Proactive Work Management:** Installed disciplined planning and scheduling processes integrated with SAP PM, shifting maintenance from reactive to prioritized execution
- **Material Readiness:** Optimized MRO inventory processes and stocking strategies to ensure availability of critical parts for startup and ongoing operations
- **System Enablement:** Aligned SAP PM configuration, data structures, KPIs, and reporting with the MOS to support data-driven decision-making

CMMS Optimization

IX® in Action

\$2.3M
Annualized
P&L impact

28%
increased
capacity

59%
reduction in
reactive
breakdowns

Our pet food manufacturing client was underperforming, a critical concern for its private equity owner focused on profitability and scalability. Equipment downtime was rampant due to a reactive maintenance strategy, core processes were undefined, and the existing Computerized Maintenance Management System (CMMS) couldn't support modern workflows. These inefficiencies translated into lost revenue for our client.

Implementation Engineers collaborated closely with the client's leadership to design and execute an Asset Performance Excellence (APE) initiative to improve yield, uptime, and operational efficiency.

Asset Performance Excellence (APE)

- **Current State:** High equipment downtime stemmed from reactive maintenance, inadequate core processes, and an outdated Computerized Maintenance Management System (CMMS). Mechanic labor utilization was inefficient, and asset monitoring lacked proactivity.
- **Transformation:** We designed and installed foundational maintenance processes, including asset hierarchy, criticality assessments, and master data. A new, plant-specific CMMS was researched, procured, and implemented, replacing paper-based work orders with a digital workflow accessible via tablets. Maintenance teams were trained on planning, scheduling, and execution, supported by a standardized "APE Playbook."
- **Results:** Planned maintenance work increased by 57%, while reactive breakdowns decreased by 59%. Downtime was reduced across critical areas, including a 67% decline in slow batch times and a 94.4% improvement in coating system performance.

Maintenance Work Management

Reliability Centered Maintenance (RCM)

IX® in Action



50%

Improvement in
scheduled work

40%

Improvement
in resource
utilization

35%

Reduction in
breakdown
work

A leading North American baked goods manufacturer faced significant operational challenges due to unplanned maintenance and unreliable manufacturing equipment. These issues disrupted production, increased costs, and strained resource efficiency, threatening the company's ability to meet demand and maintain profitability.

Implementation Engineers partnered with the client to design and execute a corporate-wide Asset Performance Excellence Initiative. Our approach focused on streamlining maintenance operations, enhancing equipment reliability, and driving sustainable performance improvements. Key components included:

- **Maintenance Work Management:** Implemented work identification, prioritization, and planning processes to optimize task allocation and enable effective repairs. Coordinated scheduling with production timelines ensured minimal disruption, while execution and closeout processes improved resource utilization and captured critical data for future decisions.
- **Computerized Maintenance Management System (CMMS):** Deployed a fully integrated CMMS to manage work orders, provide real-time data, and enable analytics-driven asset strategies. Preventive and condition-based maintenance plans were established, supported by detailed asset histories and KPI dashboards to monitor performance and drive behavior.
- **Reliability Centered Maintenance (RCM):** Introduced a comprehensive RCM program, including asset criticality assessments, simplified Failure Modes and Effects Analysis (sFMEA), and optimized Preventive Maintenance strategies. Root Cause Analysis and Failure Trend Analysis tools were embedded to eliminate recurring issues and enhance reliability.
- **Sustainability Framework:** Developed a management operating system with structured meeting protocols, visual control boards, and leading/lagging KPI indicators. Training and coaching ensured client teams were equipped to sustain gains, while daily and weekly operating reviews maintained accountability and focus.

Material Management (MRO)

Maintenance Work Management

Reliability Engineering

IX® in Action

\$7M

Annualized
benefits

25%

improvement
in work order
schedule
compliance

82%

reduction of
excess &
obsolete work
orders

A major pulp and paper manufacturer experienced chronic downtime, low asset availability, and rising maintenance costs driven by aging equipment, reactive work practices, unreliable spare parts availability, and limited use of structured reliability methods. Although SAP Plant Maintenance was in place, the absence of disciplined processes and governance prevented the organization from effectively controlling maintenance execution.

Implementation Engineers delivered a comprehensive maintenance and reliability transformation, rebuilding the system from planning through failure prevention.

IX® in Action (continued)**Work Management System**

- Implemented an end-to-end work order process covering Identification → Prioritization → Planning → Scheduling → Execution → Close-Out → Quality Audit
- Enabled SAP PM as the operational backbone by aligning processes, roles, and data structures
- Eliminated obsolete backlog to improve data quality and planner effectiveness
- Introduced staged deployment to accelerate adoption and deliver early benefits
- Established twice-daily operations–maintenance coordination meetings to improve visibility and response to emerging issues
- Embedded coaching at the point of use and installed performance metrics and compliance audits

Materials & MRO Management

- Identified critical spare parts for major production areas (PM12, PM10, Converting) to protect uptime of high-value assets
- Validated condition and usability of existing inventory to eliminate false availability
- Established min/max and safety stock levels based on asset criticality and lead times
- Implemented standardized MRO processes, tools, and governance with clear RACI accountability
- Installed a formal cycle counting program to improve inventory accuracy
- Deployed MRO performance metrics to monitor service levels and inventory effectiveness

Reliability Engineering

- Conducted Reliability-Centered Maintenance (RCM) analysis and FMEA on critical assets to identify dominant failure modes
- Developed optimized preventive and predictive maintenance strategies aligned to asset risk
- Implemented a structured Root Cause Analysis program supported by the EasyRCA digital platform
- Defined reliability-driven spare parts requirements to support rapid recovery
- Installed reliability processes and tools to sustain continuous improvement

The organization transitioned from reactive firefighting to a controlled, proactive maintenance system. Improved planning discipline, reliable parts availability, and failure prevention significantly reduced downtime risk, increased maintenance productivity, and extended asset life — enabling SAP PM to function as a true decision-support system rather than a passive record of work.

Asset Management System Development

IX® in Action

\$29.6M
net financial
impact across 15
sites

A leading North American food and beverage manufacturer operated 15 production facilities with inconsistent maintenance and reliability practices, resulting in variable performance, higher lifecycle costs, and limited enterprise visibility. The organization lacked a unified asset management system capable of supporting reliability, regulatory compliance, and scalable improvement. Implementation Engineers designed a comprehensive Corporate Asset Management System and implementation blueprint to standardize practices, governance, and performance management across the enterprise.

Key elements of the system developed:

- **Corporate Asset Management Framework:** Established policy, mission, governance structure, and organizational alignment to guide asset performance across all sites
- **Standardized Processes:** Designed 17 core maintenance and reliability processes—including work management, operator-driven reliability, reliability engineering, and PM optimization—supported by tools and RACI accountability
- **Best-Practice Standards:** Defined requirements for CMMS optimization, maintenance planning, inventory management, and reliability methodologies to enable consistent execution
- **Enterprise Performance Model:** Developed KPIs, reporting structures, and governance mechanisms to monitor performance and drive continuous improvement
- **Pilot Site Assessment:** Evaluated a flagship facility to validate assumptions, identify gaps, and refine implementation priorities
- **Multi-Year Deployment Roadmap:** Created a scalable rollout plan for all 15 sites, including prioritization criteria, resource planning, change management, and transition to client ownership

Outcome:

The engagement delivered an implementation-ready asset management system and enterprise rollout plan, identifying an estimated \$29.6M in potential financial impact across the network. The organization gained a clear blueprint for transforming asset performance while maintaining alignment with food safety and GMP requirements.

Organizational Effectiveness



A rapidly growing silver and gold producer operating across the Americas faced execution challenges driven by unclear roles, weak accountability, and misaligned performance measures. Organizational structures had not kept pace with growth, resulting in inconsistent decision-making, cross-functional friction, and limited visibility into performance.

Implementation Engineers implemented an Asset Performance Excellence Organizational Effectiveness program to align structure, roles, and performance management with the company’s strategic objectives.

Key elements implemented:

- **Accountability Framework:** Developed comprehensive vertical and horizontal accountability mapping, clarifying decision rights and cross-functional interfaces using RACI structures
- **Role Clarity:** Defined roles, responsibilities, and reporting relationships aligned to the future-state organization
- **Performance Alignment:** Established performance measures for all roles, ensuring objectives were directly linked to business outcomes
- **Performance Management System:** Designed, communicated, and trained standardized processes for goal setting, evaluation, and feedback
- **Job Architecture:** Created detailed job profiles for each position, including required skills and behavioral competencies
- **Talent Enablement:** Linked job profiles to recruitment, development, and succession planning to build long-term organizational capability

Impact:

The organization gained clear accountability, aligned performance expectations, and a structured framework for managing people and results. This enabled more consistent execution across sites, reduced decision ambiguity, and strengthened leadership effectiveness to support continued growth.

Shutdown / Turnaround Improvement

IX® in Action

76%
improvement in
plant overrun

\$9.8M
additional gross
margin

A leading refining, chemical, and biofuels company experienced chronic schedule overruns during major shutdowns and turnarounds at one of its large processing facilities. Weak planning discipline, inconsistent execution practices, and limited on-the-ground control led to extended downtime, escalating contractor costs, and increased operational risk.

Implementation Engineers implemented a structured shutdown and turnaround management system to restore schedule control, improve execution efficiency, and reduce risk.

Key elements implemented:

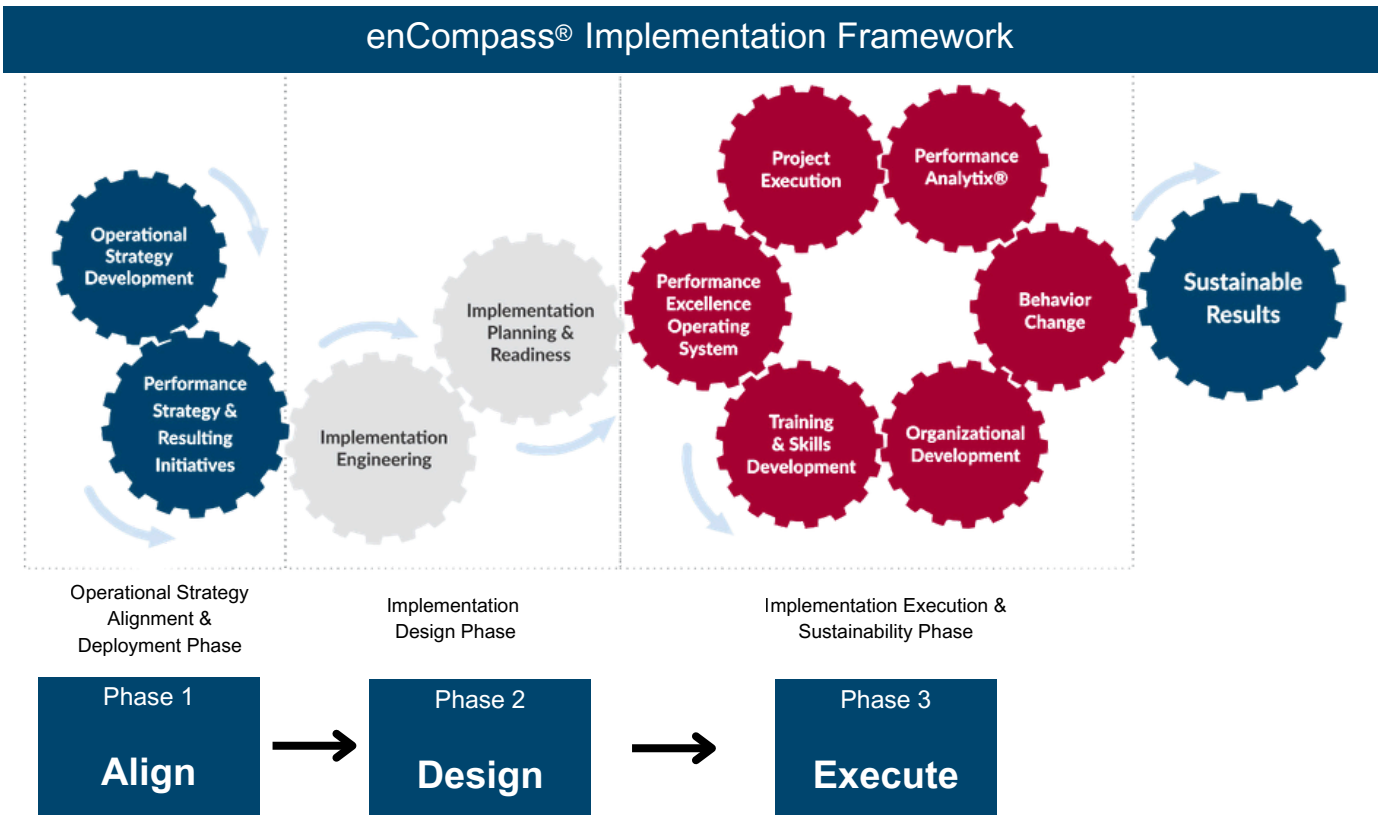
- **Planning & Scheduling Discipline:** Redesigned shutdown planning processes to ensure complete scope definition, sequencing, and resource alignment prior to execution
- **Standardized Turnaround Process:** Established a consistent methodology for preparation, execution, and close-out to eliminate variability across events
- **Execution Control System:** Implemented short-interval control using a High Performance Management System to monitor progress in real time and resolve issues quickly
- **Workforce & Organization Alignment:** Reconfigured roles, responsibilities, and supervision practices to support the new execution model
- **Productivity Improvement:** Increased wrench time through improved work packaging, coordination, and field readiness
- **Contractor Cost Reduction:** Reduced labor costs by minimizing delays, idle time, and rework through better planning and control
- **Safety Risk Reduction:** Strengthened planning and execution discipline to reduce exposure to incidents during high-risk activities

Impact:

The organization regained control of shutdown execution, significantly reducing schedule overruns and associated costs. The improved processes delivered approximately \$9.8M in benefits while enhancing safety, productivity, and reliability of future events.

Our Implementation Approach

While Implementation Engineers is not a strategy firm, we collaborate with leaders to enhance strategic thinking and assess the feasibility of implementing various strategies to achieve expected value. Our enCompass® framework offers a comprehensive Align-Design-Execute model to drive value realization. In contrast to traditional approaches, we advocate for a bottoms-up value creation process where each improvement is valued, and the collective impact of these solutions forms the expected value. Leveraging cutting-edge i4.0 principles throughout the value stream, we implement improvements and evaluate the necessary skills and behaviors essential for sustained value realization.



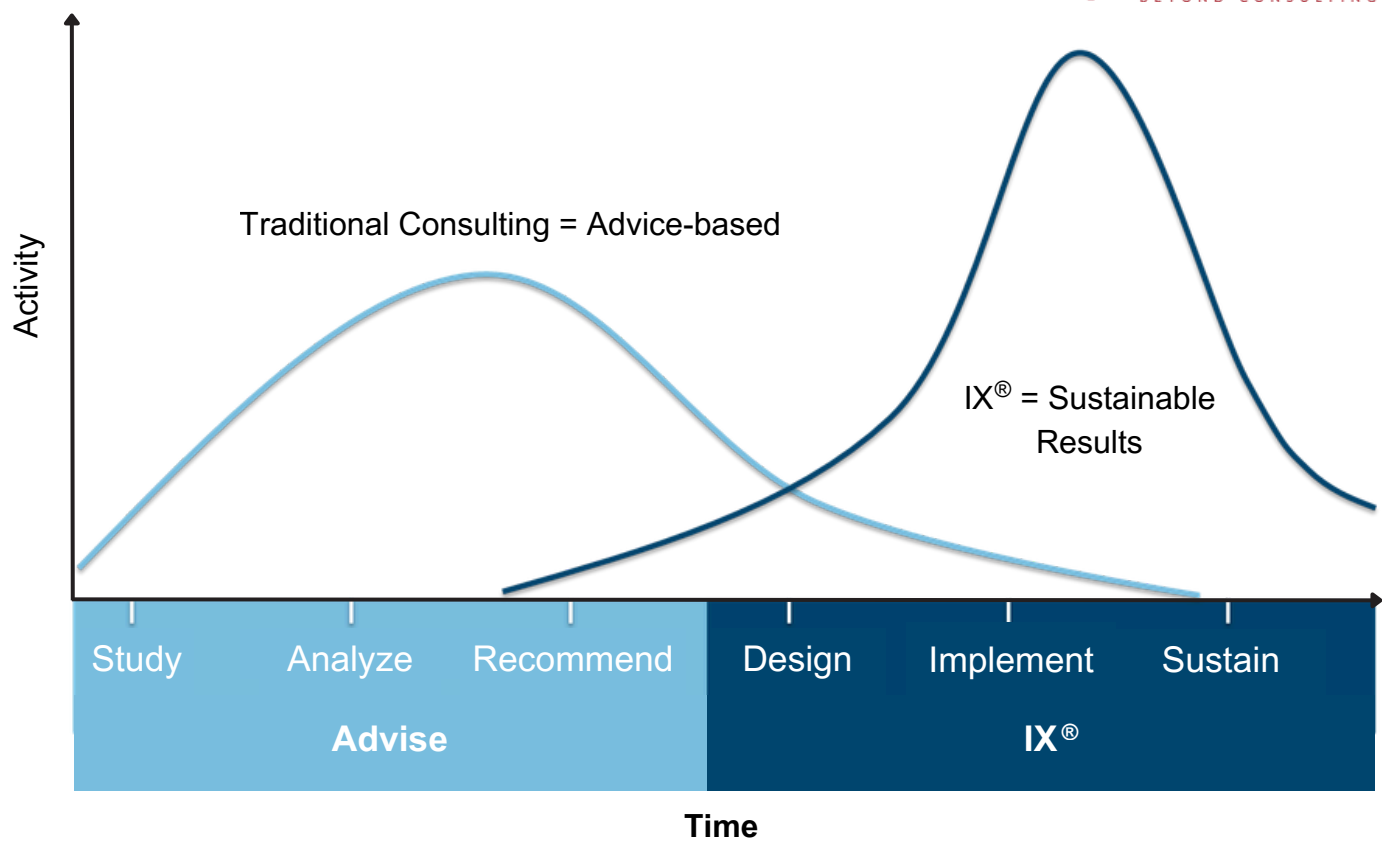
Our People

People make the difference. With record growth over the last many years, we are attracting the best talent to meet our customers' needs. Our IX® experts have been in industry most of their careers and know how to work with your teams to get things done. With over 20 years experience on average, our people bring the experience, skills and capabilities needed to complement your organization to deliver sustainable results.



IX[®] Is A New Service Paradigm For Value Creation

In summary, IE is not a consulting or advice service firm. We do not lay on the ground and look at the clouds in the sky to draw pictures of the perfect world. Instead, we are face down in the cactus working seamlessly with your people to get done what needs to be done to drive value creation. We accelerate the alignment of your people to focus on the hard work of executing the strategies that matter for your business. Some people believe that IE is a new professional service paradigm supporting organizations and leaders that don't need advice, just results. Finally, there is an Implementation Execution (IX[®]) services firm when you need one.



**Implementation Engineers works
Beyond Consulting[®] to drive value creation.**

Let's Turn Your Vision Into Results

At Implementation Engineers, we don't just execute projects - we transform your vision into operational reality. Our proven 3-phase approach - **Align, Design, Execute** - delivers lasting value, from aligning your team on strategic goals to optimizing operations and driving measurable outcomes. Whether you're aiming to lead your market, boost efficiency, or maximize shareholder value, we're here to make it happen, step-by-step, side-by-side.

Ready to Get Started?

Let's explore how we can bring your vision to life. Contact us today to schedule a conversation. Together, we'll chart the path to your success.

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