

IBM Maximo®

IBM Maximo powers the Oil and Gas industry

Asset management solutions
for the oil and gas industries



IBM Asset Management and IoT help oil and gas companies achieve operational excellence and improve quality

Highlights

- Offers standardization, convergence, collaboration and industry-standard practices to help achieve operational excellence and boost industry intelligence
- Provides role-based capabilities and user experiences that match the focus and maturity of the organization
- Helps improve safety and reliability while controlling costs
- Enables an easy to use repository of organizational knowledge
- Provides a consolidated and trusted platform for managing tools, parts and highly complex systems for the largest production and maintenance facilities
- Provides extensibility for adding on next-generation technology for monitoring and managing assets, people and processes

The challenge of change in oil and gas

Lower oil and gas prices have ushered in a challenging era for oil and gas companies. They're responding quickly by enhancing their core work processes with new technologies that help them reduce costs, improve operations, and become safer and more secure. The innovations they're adding include analytics, mobile, and Internet of Things (IoT) capabilities that connect processes, people and their assets (things) in new ways. These changes create new value within the industry.

Today's business climate demands a different approach. Oil and gas companies are discovering that in order to thrive under these changing economic and regulatory conditions, they need to understand and utilize cutting-edge technologies. They need to enable highly skilled engineers to work in new ways to optimize the assets that drive their day to day operations. They also need to maintain the highest safety standards possible.

Additional industry challenges that oil and gas companies must address include:

- Improving asset analysis
- Facilitating compliance efforts
- Planning shutdowns
- Reducing manual intervention
- Responding to complex supply chain demands
- Aligning roles and responsibilities
- Facilitating continuous improvement

Leaders in the industry are rising to the challenge of economic change. They're on top of it. They're taking action. They're making changes. They'll achieve their goals by adopting sophisticated new technologies and by improving their employees' behavior, safety and teamwork leadership skills. Those who lag behind will undoubtedly suffer the consequences of competitive weakness.

Embracing the opportunities in oil and gas

As technology reaches every corner of the globe—and organizations and systems are more interconnected than ever—the world becomes a smaller and smarter place. This digital transformation has brought the oil and gas industries the potential to optimize operations and achieve new levels of business value.

From exploration and production to refining and marketing, IBM® is using its technological and deep industry and process expertise to help oil and gas companies succeed. IBM Maximo® for Oil and Gas builds on the strength and reliability of IBM Maximo Asset Management, employing IoT, AI and analytics to deliver the critical capabilities. Gas and oil industry-driven techniques help enhance operational sectors, which can improve efficiency and optimize global resources, enabling

IBM Maximo for Oil and Gas

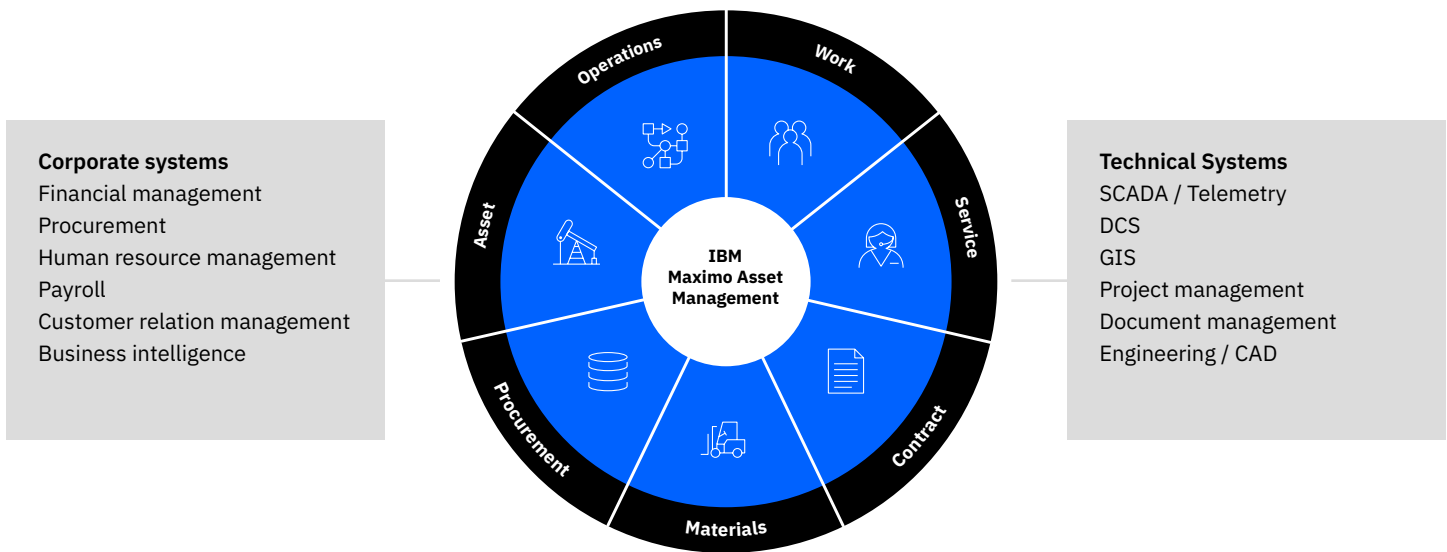


Figure 1: Maximo for Oil and Gas brings together traditionally separate business functions onto a single, integrated platform, and then adds a layer of industry-specific functionality to support the unique requirements of the oil and gas industries.

organizations to focus on operational efficiency and resource utilization. Capabilities range from enabling processes that record and store organizational knowledge to providing a consolidated and trusted platform for managing assets—from the smallest tools and parts to the largest production and maintenance facilities. New asset performance management (APM) features within Maximo for Oil and Gas help organizations achieve a more connected business model by leveraging the IoT, AI and analytics. These enhancements enable remote monitoring and inspections and predictive maintenance and augment worker decision making.

An integrated foundation for improved asset optimization

Today's oil and gas companies are on a quest for operational excellence. They want to improve safety, reliability and compliance while controlling costs and making better operational decisions. Success depends on a number of factors, which include how well they manage physical assets and human capital, how well they use operational intelligence, and how they make use of available data and information. IBM Maximo for Oil and Gas can help organizations boost operational intelligence—and realize operational excellence—with standardization, convergence, collaboration and embedded industry-standard operational practices.

Built to integrate with your existing business processes and technologies, Maximo for Oil and Gas solution consists of seven key functional areas—work, service, contract, materials, procurement, asset, and operations management—merging traditionally separate business functions onto one single, integrated platform.

This integrated platform enables the addition of a layer of industry-specific functionality. It can reduce the number of applications and redundant data stores, which helps reduce costs while creating a single source of information for use and reference. Collaborative, cross-functional business processes help improve efficiency. And with increased collaboration that spans functional roles, and increased confidence in the underlying data, Maximo for Oil and Gas can provide a foundation for improved operational intelligence.

Driving operational excellence in the oil and gas industries, Maximo for Oil and Gas delivers industry-specific processes and capabilities that are designed to drive operational excellence, including:

Action tracking

Provides mechanisms for ensuring that findings and recommendations of internal, external and regulatory audits are managed and tracked to closure.



Cheniere Energy, Inc. needed to upgrade its enterprise asset management (EAM) system to keep thousands of high-tech components operational 24/7 at their Sabine Pass facility. Cheniere chose IBM Maximo for Oil and Gas to support its new platform with consistent, optimized business processes across the entire asset lifecycle—from inventory control and work management to monitoring and maintenance.

Asset management

Detailed asset information includes location management, hierarchy modeling from enterprise to sub-assemblies, condition monitoring, metering, hazards and precaution management, costing, and rich work order history.

Audit and survey

Combined with enhanced failure reporting, audit and survey helps customers include processes that help manage compliance and assess cumulative risk.

Benefits and losses

Maximo for Oil and Gas records and stores benefits resulting from improvements, and losses associated with downtime, shutdowns or near-misses. Detailed data provides insight into areas for improving availability and safety.

Calibration

Calibration processes are automated, which enables traceability and can improve compliance management and work planning. With the proliferation of instrumented devices, the ability to view calibration work with other work helps drive efficiency and increase equipment reliability.

Certifications

This is the management of multiple different types of certifications: materials, people and equipment. It can be used to support processes requiring formal certification, such as mechanical completion and commissioning.

Change management

Full management of change processes is integrated with work management and other applications, providing transparency and visibility that spans operations, maintenance and engineering.

Competency management

Tracking workforce competencies helps assure effectiveness. Maximo for Oil and Gas can link competency requirements to permit and certificate requirements, and enable the identification and validation of competency requirements on job plans and work orders.

Condition for work

Maximo for Oil and Gas aggregates similar jobs that span assets, groups of assets, areas and individual locations. This helps support opportunity maintenance. Identifying work that can be merged into planned or unplanned work can improve efficiency as well as equipment reliability.

Contract management

Maximo manages many types of contracts for maintenance, repair, and overhaul materials and services. Functional areas supported include purchase, master, warranty, lease and rental contracts, labor rate contracts, payment schedules, and terms and conditions.

Continuous improvements

Maximo for Oil and Gas includes capabilities that help manage continuous improvement programs such as Six Sigma or similar methods. Maximo provides an industry-standard practice for



Kuwait Oil Company wanted to connect *everything* for maximum operational efficiency. KOC chose IBM Maximo for Oil and Gas to improve its production targets from upstream operations through improved efficiency from their assets. The productivity improvements from automating processes and workflows freed up multiple resources to focus on exploration and production.



capturing improvements at all levels and facilitating continuous improvement programs.

Control of work

Manage permits for work orders and job plans, including permit and certificate requirements in work orders, and job plans that can improve safety, efficiency, communication and collaboration between operations and maintenance.

Defect elimination

With this standardized approach, operations and maintenance can record equipment defects in near real time, which can improve communication between different domains and can help service levels remain high.

Failure reporting

Maximo for Oil and Gas supports the ISO 14224-based standard for failure mode effects analysis, and failure reporting and corrective action system processes. Implementing a standardized practice for failure reporting and root cause analysis enables a good reliability program.

GIS spatial integration

GIS solutions record and store location information that is valuable for an asset management system. Maximo enables spatial visualization and analysis of work and asset objects, along with a bidirectional data exchange of valuable work and asset information with GIS systems.

IBM Maximo Integration Framework

Maximo integrates open industry standards with real-time systems and engineering data sources such as MIMOSA, ISA88/95, ISO 15926, Open O and M, and others. Other system integrations, including engineering systems, can enable cross-domain workflows and process orchestration.

Incident management

Work and safety incident management are integrated to address incidents that occur in organizations that work on assets and equipment in challenging and hazardous locations. This feature allows users to view incidents and trends in their areas of responsibility as well as status of correction or prevention .

Investigations

Maximo Oil and Gas supports required incident and defect investigations such as root cause failure analysis or after action review. It also provides complete traceability into historical incidents, defects, work orders, and other relevant data, which helps to support the investigation.

Learning repository

This feature collects lessons learned and proven solutions in an operational, maintenance or engineering context . It offers a mechanism to share institutional knowledge in an environmental context, along with history, scenario and experience.

“The process improvements we’ve attained through the use of IBM Maximo for Oil and Gas have been critical to keeping us on track with our production targets.”

Asim Hussain, Senior IT Specialist,
Corporate Information Technology
Group and Corporate Solutions Team,
Kuwait Oil Co. Ltd.

Linear asset modeling

Linear modeling capabilities for assets, such as wells and pipelines, enables levels of data capture, exchange and analysis that cannot be achieved by hierarchical models. Maximo for Oil and Gas enables modeling of linear assets based on features and attributes.

Location and work details

Maximo for Oil and Gas captures characteristics such as physical location, engineering reference numbers, drawing IDs, safety zones, safety criticality and permitting requirements, and provides the ability to report production losses against a work order or location.

Materials management

Capabilities for managing maintenance, repair and overhaul inventory support functional areas, such as the item master, storeroom management, inventory management, lot management, kitting, issues and transfers, condition codes, stocked tools, service items, cycle counting, ABC analysis, inventory costing and more.

Operator Logs

Operator logs capture data associated with shift staffing, plant operating parameters, log entries, associated qualifying data, and web or document links. It integrates this data with work and incident management and other asset management applications, and creates a rich history to understand cross-functional impacts of events during operations.

Permit to work

Maximo’s permit to work capability eliminates the need for third party systems and supports improved communications between maintenance, operations, and engineering to enhance safety and reliability.

Permit and certificate types

Permit and certificates types identify hazardous locations, and drive the appropriate procedures for isolation and safety, including permits and certificates. Having this capability integrated with work management planning and scheduling can increase the effectiveness of work management, and improve overall safety compliance.

Plant, facility and equipment modeling

Modeling establishes a common, standard approach for reliability and maintenance data collection, exchange and analysis based on ISO 14224 engineering and asset specifications. This feature supports standardization of location, asset and equipment referencing and asset classifications.

Procurement

Capabilities to acquire maintenance, repair and overhaul materials and services are provided to support requests for quotes, purchase requisitions, purchase orders, receiving orders, material inspections, invoicing, desktop requisitions and more.

Regulatory compliance

Maximo for Oil and Gas helps manage efforts to comply with health, safety, and environmental statutes. It helps manage compliance with licensing and asset requirements, which can significantly reduce the costs associated with compliance.

“In Maximo, we found the platform we needed to support the transformation of our LNG operations.”

Ahmad Mousselli, Director, Operations Applications, Cheniere Energy

Risk analysis

Maximo for Oil and Gas helps to standardize risk management for challenging operating locations, assets and equipment, across job plans, work orders and change records. It's a powerful solution for managing risk and improving safety and reliability.

Risk matrixes

Modeling probability and the consequences of events helps support risk management processes across different operating locations, assets, equipment and types of work. It's used to improve how risk management, promote a safety culture, improve reliability and manage compliance.

Work management

Maximo for Oil and Gas helps manage multiple types of work, such as planned downtime, unplanned outages and emergencies. It includes job planning and routes, service requests and service items, safety, labor reporting, qualifications, lock-out or tag-out, labor, materials, tools, planning versus actual costing, preventive maintenance and more.

Work prioritization

Matrix-based prioritization helps optimize the planning and scheduling of maintenance by using operational standard criteria to prioritize critical assets. This practice enables dynamic scheduling and schedule optimization, which can help to improving overall operational efficiency.

Enabling the *technician of the future*

With pressure to do more with less, connectivity and intelligence play an increasingly essential role in maintaining a competitive edge. Nowhere is this more important than in the field, miles away from well-provisioned facilities and workshops.

The next-generation of tech-savvy technicians will require digitized assets to help them work smarter. Therefore, investments in mobility and analytics are critical. With the adoption of new capabilities that mobility makes possible—including the use of AI advisors and augmented reality—virtual teams can tackle any asset, anytime and anywhere.

Field management solutions: Maximo supports the full mobile maintenance, repair and operations (MRO) lifecycle for remote operations, including online and offline support, linear asset management, dynamic scheduling, inspections (rounds) work centers. Augmented reality facilitates real-time peer guidance. By leveraging voice interactions, AI and peer guidance, technicians are able to finish inspections faster, eliminating the extra step of logging them to system afterwards. First-time fix rate and efficiency can be greatly improved.

Safety never takes a vacation

With new technologies monitoring and inspecting dangerous locations, organizations are now seeking to augment their ability to execute comprehensive compliance tracking and remediation using their asset management system. Today, the ability to keep workers safe through

the use of sensors and wearables is providing an edge for oil and gas companies to reduce the cost of health, safety and environmental (HSE) operations.

Optimizing asset performance

IBM Maximo Asset Performance Management (APM) helps oil and gas companies move beyond traditional approaches for measuring and managing asset performance. Through the integration of disparate data sources, including EAM systems of record and IoT data, Maximo APM provides:

Criticality of assets: A comprehensive view of your operational assets that helps assess which assets require priority status.

Asset health monitoring: Maximo APM can design a program for measuring asset health.

Predictive maintenance and optimized inspections: An AI powered maintenance assistant captures the wisdom of internal and external asset management experts to guide repairs and maintenance activities.

Conclusion: Essential support for a critical industry

IBM Maximo solutions for Oil and Gas provides vital technological tools for an industry that faces complex and evolving issues. Maximo helps organizations collect valuable knowledge, improve operational efficiency, and manage and operate mission-critical assets safely and productively. So you can continue to evolve your operations and operating model.

As oil and gas companies strive for operational excellence in a world that's growing smaller and smarter every day, Maximo helps provide a brilliant competitive advantage.

For more information

To learn more about how IBM Maximo solutions for Oil and Gas can facilitate your organization's operational excellence, contact your IBM sales representative or IBM Business Partner, or visit ibm.com/products/maximo.



© Copyright IBM Corporation 2019

IBM Corporation
New Orchard Road
Armonk, NY 10504
Produced in the
United States of America
2019

IBM, the IBM logo, ibm.com, and Watson are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at “Copyright and trademark information” at www.ibm.com/legal/copytrade.shtml.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

All client examples cited or described are presented as illustration of the manner in which some clients have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual client configurations and conditions. Contact IBM to see what we can do for you.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED “AS IS” WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OR CONDITION OF NON-INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements under which they are provided. The client is responsible for ensuring compliance with laws and regulations applicable to it. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the client is in compliance with any law or regulation.