

Understanding the impact and value of enterprise asset management

*Implementing IBM Maximo Asset Management to enable success across your
smarter infrastructure*



Highlights

- Collect, consolidate and analyze essential information on all types of assets
- Improve operations through better asset availability, reliability and asset utilization
- Significantly extend the value of assets and increase flexibility
- Extend the useful life of all assets or equipment, improve return on investment and defer new purchases
- Unify processes for wide-ranging asset management functions across multiple sites

Introduction

Across almost every asset-intensive industry—from oil and gas, to manufacturing, to transportation—organizations are challenged with how to get the most value from assets across their entire lifecycle. In fact, in a recent survey of asset managers worldwide, more than 75 percent of respondents named system reliability as the fundamental reason to invest in enterprise asset management.¹

The reality is that today's asset-intensive organizations must constantly track, assess and manage the reliability of an extraordinarily wide range of physical, technology and human assets. They must manage both inventory and production; repair machinery; hire and schedule employees; deploy and manage IT infrastructure; maintain physical plants; and manage linear infrastructure or rolling assets. To further complicate matters, technology infrastructures are tremendously complex, typically running applications and data in silos that can limit the effectiveness of cross-organizational operations and efficiencies.

These organizations must deal with continually aging physical assets—from power plants to railroad bridges to sewer systems, or from generators to electronic devices such as smart meters—that require ongoing maintenance and repair, since

asset performance and the resulting quality of the company's products are impacted by the reliability of the asset or equipment. The increased need for asset maintenance and its management can therefore have a direct impact on customer satisfaction. This applies to processes, as well—as production, maintenance or service processes age and erode, end goods or service output may not be produced or delivered to the quality standards that were originally specified.

Managing human resources—the most valuable asset of all—comes with its own special set of challenges. Long-term employees, for example, are continually edging toward retirement, which can mean a loss of knowledge and skills—and the expense of training new employees.

Despite these challenges, an organization's products or services must constantly evolve to meet customer demands. Issues such as increased globalization; commoditization and competition; compliance with industry and government regulations; green and sustainable operations; health and safety in the workplace; eroding margins; and the resulting higher costs of doing business all contribute to this phenomenon.

So how can an organization hope to both control assets and remain profitable? Successful organizations adapt to change by improving their operations and enabling flexibility and agility. And asset management can be a significant factor in their success. One critical step in rising to the challenge of change, and in controlling the complex asset environments necessary for bottom-line results, is to unify processes that manage wide-ranging functions across an organization's multiple sites—while optimizing production and service systems within each site.

It is clear that enterprise asset management is critical to the health of an organization. If handled correctly, it can be the key to continued operations in times of reduced budgets. It can help extend the useful life of equipment, improve return on investment and defer new purchases.

This brochure introduces IBM® Maximo® Asset Management, which provides the essential capabilities for better managing your physical infrastructure assets. You can leverage this IBM solution to make better decisions around all aspects of asset management, and get the insights you need to deliver ongoing value for your organization.

Defining asset management

In January 2014, the International Organization for Standardization (ISO) released the ISO 55000 series of standards to help unite organizations worldwide behind a common framework for asset management. As the successor to the PAS 55 industry standard, ISO 55000 is the result of a three-year collaboration of hundreds of people from 28 countries. And in a recent survey, 90 percent of asset managers were already aware of the ISO 55000 release.¹

According to ISO 55000, an *asset* is a “thing, item or entity that has actual or potential value.” Therefore, the primary objective of an effective asset management program is to ensure that assets maximize value to all stakeholders in the value chain, throughout the asset’s lifecycle.

There are different levels at which critical or strategic assets can be identified and managed—ranging from discrete assets to more complex functional asset systems, networks, sites or portfolios.

Asset management focuses on all types of assets, varying from critical or strategic physical assets to human assets.



Figure 1. Enterprise assets encompass many different types.

Physical assets, which are part of an organization’s infrastructure, are positioned in the following four classes:

- Plant and production (occurring, for example, in industries such as oil, gas, chemicals, mining, manufacturing, pharmaceuticals, food, electronics and power generation)
- Infrastructure (including railways, highways, telecommunications, water and wastewater, and electric and gas distribution networks)
- Transportation (for military, airlines, trucking, shipping, rail and other use)
- Real estate and facilities (for example, in offices, schools and hospitals)

The human asset perspective provides a broad view of personnel motivation, expertise or skills, roles and responsibilities, as well as insight into leadership teams within the organization.

Maximo Asset Management provides an integrated approach to managing these discrete or complex assets, to help organizations overcome challenges rooted in their aging infrastructures or human assets and in their siloed or disconnected systems. By breaking down multiple silos of non-standard, non-integrated systems, an *integrated approach* can help align operations with overall business objectives.

Such an integrated approach can also support long- and short-term planning—controlling inventory, for example, to better meet demands. It can enable preventive and condition-based asset maintenance. It can help manage vendors with comprehensive support for a full range of contracts and full support for managing service agreements.

Managing assets in the modern era

There are many reasons for the increasing demand for better asset management. When organizations raise the importance, risk, quantity and/or cost of their corporate critical or capital assets, they often see a corresponding rise in interest by management to better maintain control and visibility of all these assets. What’s more, in this new era of mobile, cloud and analytics technologies, there are more opportunities than ever to collect, consolidate and analyze information about assets to help fine-tune performance.

In addition, governments, regulatory bodies, shareholders and other key stakeholder groups have increased the pressure on organizations in both the public and private sectors to be able to locate and track asset whereabouts. The higher the risk or opportunity cost in not knowing where an asset is located, the greater the incentive for management to implement an asset tracking system. Enterprise asset management can provide

real-time insight or visibility into all physical assets, as well as across the maintenance, repair and overhaul (MRO) supply chain.

Foundational capabilities of asset management—such as tracking, monitoring and managing information around asset reliability, asset utilization and performance, as well as information around the services to execute this type of information—should be integral in managing a company’s smarter infrastructure.

With Maximo Asset Management, asset-intensive organizations can find these core capabilities within a range of industry-specific solutions. The following diagram depicts how mobility and analytics extend the functionality of each category. Plus, it shows the integration points with enterprise resource planning (ERP), geographic information system (GIS) and supervisory control and data acquisition (SCADA) systems that help maximize value across assets.

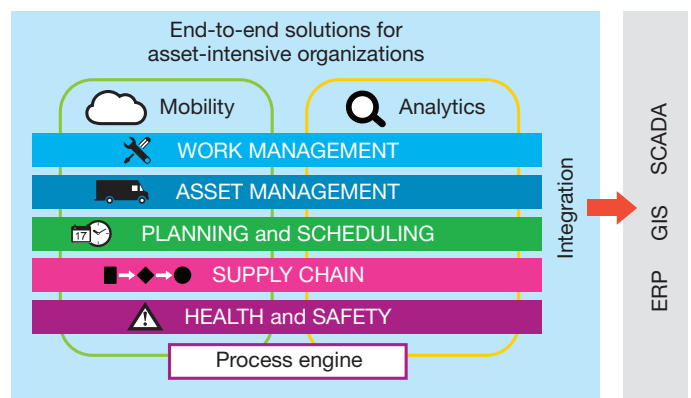


Figure 2. Today’s asset-intensive organizations need a robust set of enterprise capabilities backed by the latest mobile technologies and big-data analytics.

Core capabilities of enterprise asset management include:

- **Work management**—Asset-intensive organizations need to be able to centrally manage both planned and unplanned work activities, from initial request through completion and recording of actuals. Plus, mobile workers need to be able to get more done in the field, from performing meter readings, to capturing electronic signatures, to using bar-code and RFID capabilities for asset tracking and management. The right combination of features can streamline work processes for increased productivity.
- **Asset management**—An effective enterprise asset management solution must manage and optimize the use of all assets to achieve greater asset availability, reliability and performance. The result is the ability to extend the asset's life because assets are better maintained. The ability to gather and analyze data about asset operations allows an organization to move from corrective (repairs made after a problem occurs) to preventive (maintenance dictated by a schedule based on past experience) to predictive maintenance (performed because data for a particular asset indicates that a failure is imminent).
- **Planning and scheduling**—Planners and schedulers are at the heart of optimized work processes. To lower maintenance costs and improve resource utilization, these personnel need to be able to view all work orders and preventive maintenance schedules graphically on a Gantt chart. Intuitive navigation through work orders can help dispatchers manage task and work dependencies. In addition, the ability to locate and track field resources on a public map can help improve workforce management—and help increase the efficiencies of emergency work.
- **Supply chain management**—As traditional business assets become more technology-enabled, operations and IT functions are increasingly converging in today's changing business and technology environments. As a result, one way to manage operational applications more effectively and efficiently is to consolidate them. Companies seeking to better manage their supply chains must:
 - Find support that is able to manage all types of assets and asset maintenance information
 - Establish a single technology system to manage all types of assets and asset information—production, linear, facilities, transportation and infrastructure—including calibration support and use of mobile capabilities
 - Have an integrated asset management solution that enables optimal return on assets, complies with regulations and helps minimize risk
 - Be able to develop smarter processes and to provide users with an innovative, fully integrated supply chain management system designed for asset-intensive industries
- **Health and safety**—The primary objective of health, safety and environment initiatives is to reduce overall risk, to comply with appropriate regulations and to create a safe, yet efficient, operating environment in which assets are used. Achieving this objective is as much about standardizing health, safety and environmental practices as integrating these practices with day-to-day operations management.

An intuitive user experience is critical for supporting all of these capabilities for enterprise asset management. With easy navigation and user-friendly features, organizations can streamline work processes for increased productivity and reduce the need for user training. The ability to visualize geographically the location of both work and assets on a map can also help organizations increase workforce efficiency and quality of customer service.

Mobility

The widespread adoption of mobile technologies—and the rise of bring-your-own-device (BYOD) programs—are driving rapid change in enterprise IT. That’s why it’s more important than ever for enterprise asset management solutions to support the latest mobile capabilities.

Today’s engineers, field technicians and other business staff are now using smart mobile devices to get their work done—and they need to be able to do it within an optimized, IT-approved environment. By taking advantage of device-specific capabilities, such as photos and voice-to-text features, mobile solutions allow technicians to capture the right information at the right time.

Analytics

The amount of data within an organization—and also, around asset management processes—has exploded within the past 10 years. As organizations grow more mature in their asset management processes, this data is invaluable in helping them uncover opportunities to improve business process efficiencies and increase their return on assets. Management teams need to be able to run extended and enhanced analytics, so they can gain the right insights to make smarter decisions and operational improvements.

In particular, analytics should be supported by true optimization models to automate the key planning, scheduling and work management processes for capacity planning, resource management and work scheduling. And the right solution should make these capabilities available through easy-to-use “executive” dashboards.

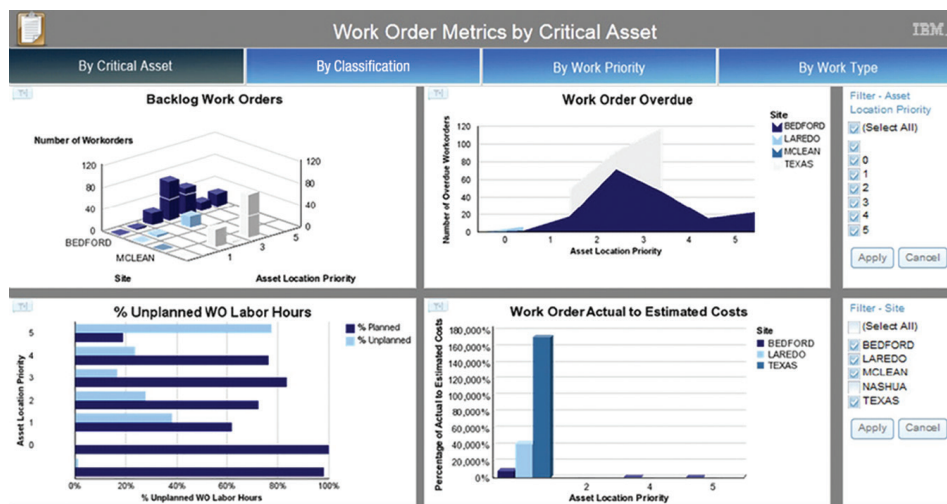


Figure 3. Integrated analytics within IBM Maximo Asset Management enables organizations to proactively improve business processes, such as work-order management, based on key performance indicators.

“Our ability to gather and manage asset, fault and condition data to minimize network problems has become the cornerstone of our ability to deliver a consistently high-quality passenger experience.”

—Neil Roberts, director of ICT, Yarra Trams, Australia

Gaining asset management benefits with visibility, control and automation

In order to manage the full asset lifecycle and better address business imperatives, asset-intensive organizations require integrated *visibility, control and automation* across their business and technology assets. This can help them better achieve their business objectives and maximize the value from all assets supporting the operation.

This increased visibility of all assets across the enterprise allows organizations to respond faster and make better decisions. Visibility provides an enterprise-wide view of asset details and processes from across the organization—including visibility into asset service processes across the enterprise supply chain.

With better control of their assets and asset-related data, organizations can:

- Better manage and secure their investments
- Increase governance and reduce operational risk
- Extend asset life, reduce inventory costs and control spending
- Mitigate compliance issues and risk
- Improve health, safety and environment, and security

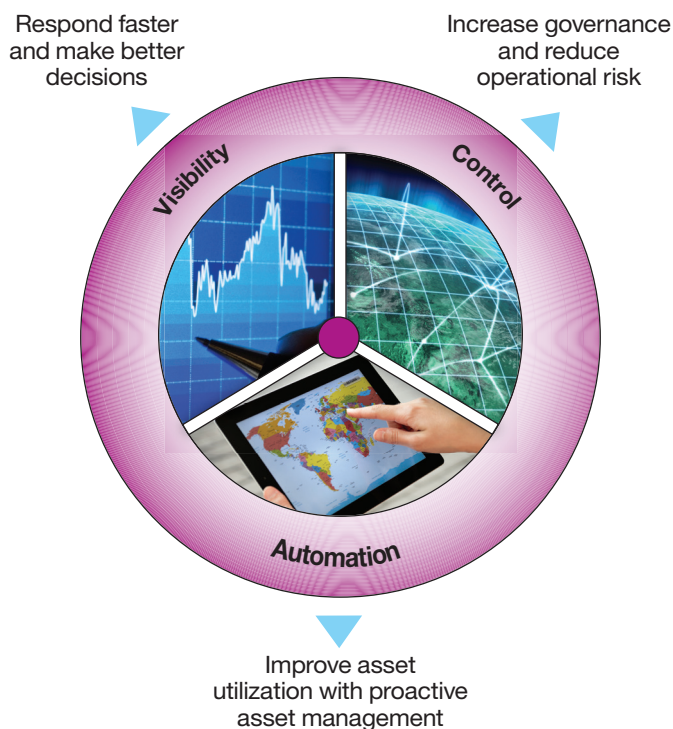


Figure 4. A comprehensive enterprise asset management solution provides increased visibility, control and automation.

In addition, increased automation enables organizations to:

- Build agility and flexibility into their operations
- Improve asset utilization with proactive asset management and consolidation of their systems
- Enhance operational capabilities by automating workflow, reporting through key performance indicators and dashboards, and improving inventory data reliability

In order to manage the full asset lifecycle and address these business imperatives, asset-intensive organizations can derive great value by implementing and using the Maximo Asset Management solution.

“With IBM Maximo Asset Management, we can determine the optimal approaches to maintenance—enabling us to deliver the highest levels of asset availability without driving up operational costs.”

—Richard Barber, maintenance systems section head, Drax Power Station, UK

Adding value through improved enterprise asset management

Increased asset availability and greater asset reliability provide a basis for *improving service delivery* and *growing more revenue* from the same asset base. As organizations tune their supply chains to meet specific supply levels, their asset or equipment uptime and availability must align to these demand schedules.

Asset management has a direct impact on profitability, since it affects the quality of the product or service produced or delivered. It can be a significant component toward justifying the price, and ultimately, determining profitability. The quantity of goods produced or services delivered directly contributes to the top-line revenue for any organization, whether in energy, utility, manufacturing, transportation, logistics or public sector—whether that good produced is a hard asset, such as an engine component, or a service delivered to a customer.

Asset management also has a logical impact on operational costs. Efficiencies realized by effectively managing labor, inventory and other support services directly impact the bottom line by helping to control costs. More timely and precise user intervention can improve productivity and reduce materials use and, in turn, overhead.

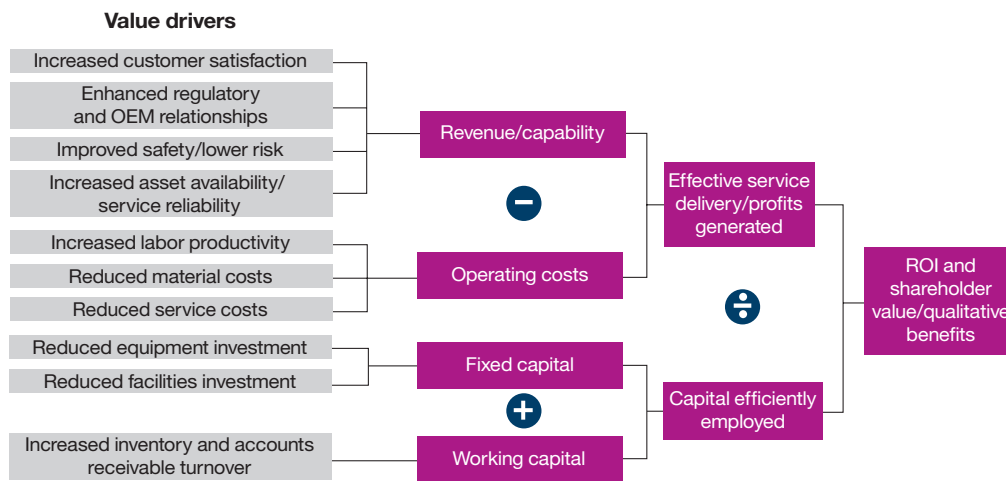


Figure 5. Certain value drivers contribute directly to ROI and shareholder value.

A significant challenge for organizations today is to effectively balance the utilization loads of their asset portfolios to meet customer expectations with the lowest operational cost. It's common practice, as a result, for organizations to overstock equipment and fleets to make sure they always have the assets they need. Other companies stockpile spares and inventory to shorten repair times by eliminating delays caused by an inefficient supply chain. Each of these "insurance policies" comes with high premiums associated with constant upkeep, refurbishment and financial carrying costs that will never go away.

These strategies can increase, rather than decrease, costs. Using Maximo Asset Management, however, helps control or eliminate overstocking and stockpiling, and can also help reduce the organization's fixed capital investment and contribute to positive, bottom-line results.

“Having broader, deeper and more analytical insights into our pipeline and refinery infrastructure will provide the basis for optimization across all phases of our asset management processes.”

— Jorge Regalado, organizational development manager,
EP Petroecuador, Ecuador

Choosing a solution that can increase revenues and decrease costs

With Maximo Asset Management, organizations are better able to meet today's business, operational and technology challenges, as well as more efficiently address the complete lifecycle of resources.

This solution enables companies to:

- Manage an aging infrastructure by:
 - Implementing and enforcing standard processes for asset management
 - Supporting real-time data collection, diagnostic and analysis tools that closely monitor aging assets to extend the useful life while improving overall maintenance best-practices, as well as meeting increasingly complex health, safety and environmental requirements
 - Controlling operational risk by embedding risk management into everyday business processes
- Control the “brain drain” among employees facing retirement by:
 - Responding to global price pressure by enabling a reduced workforce to work more efficiently and cost-effectively
 - Putting into place proven workflows and enforced best practices that capture the knowledge and critical skills of long-time employees
- Consolidate operational applications by:
 - Standardizing asset management best practices across all asset types across the entire enterprise
 - Supporting global operations by leveraging a wide range of languages
- Provide a lower cost of ownership by using one global enterprise application instance, consistent metrics and best-in-class practices that are enforced with the same standard asset management solution at all of the organization's sites
- Enable asset-intensive organizations to optimize their maintenance and repair supply chain with management of materials and spare parts inventory that is fully integrated into the asset management solution
- Leverage easy-to-use, integrated capabilities for integration with other systems for enterprise resource planning, operational systems, financial management, reporting and analysis to support better quality decision making overall

Implementing a solid enterprise asset management solution can directly contribute to the way organizations in asset-intensive industries increase revenues and decrease costs.

IBM Maximo Asset Management

The IBM Maximo Asset Management solution offers the required visibility, control and automation of key information an organization needs to achieve greater efficiency in asset management by managing all asset types—from traditional physical assets to emerging smart assets—on a single technology platform.

Maximo Asset Management can support the maintenance of an organization's physical infrastructure and improve customer service, increase return on assets, enable greater compliance, improve asset performance and reduce risk. And it can do it in a shorter time period, while providing better visibility and control of all required information to better align with an organization's overall business goals and objectives.

The IBM solution for an integrated enterprise asset management approach is designed to naturally align with asset management best practices across an organization or in an industry. Maximo Asset Management software provides industry-leading capabilities and functionalities that allow capital, asset-intensive industries to leverage the benefits of an integrated enterprise asset management system to manage all critical assets and facilities within the organization.

Maximo Asset Management software unifies comprehensive asset lifecycle and maintenance management activities, providing insight into all enterprise assets, their conditions and work processes to achieve better planning and control, leveraging the business function within an organization.

Industry solutions

Maximo Asset Management is available for and can be tailored to the following industries:

- **Oil and gas, mining and metals**—Focuses on operational excellence by improving safety, reliability, compliance and performance while reducing costs through standardization, collaboration and the adoption of better operational practices
 - **Manufacturing**—Helps industries such as automotive, aerospace and defense, electronics or industrial products, food and beverage, or consumer products manage all their assets and maintenance activities; leverages concepts such as Lean/Six Sigma; and complements product lifecycle management requirements
 - **Life sciences**—Helps monitor, track and manage equipment, facilities, mobile and IT-enabled assets; integrates with IBM Maximo Calibration to help meet complex compliance requirements from the FDA and to provide support in validation projects
 - **Healthcare**—Tracks and locates all critical assets, monitors facility conditions, complies with reporting requirements and integrates with operational health information systems
 - **Nuclear power**—Helps nuclear organizations manage all work and asset management activities and address stringent regulatory requirements on compliance, health, safety and security
 - **Transportation**—Provides best practices to help improve the availability and utilization of critical transportation assets in companies operating rail, road and air traffic or logistics
 - **Service providers**—Helps manage SLAs and all related service management activities for multiple customers in a single deployed instance
- To help improve efficiencies across every industry, Maximo Asset Management now supports effective asset management in the cloud. Clients get optional installation of a multi-tenant database that allows secure data separation for each customer or business unit, as well as the ability to expedite onboarding through templates. Internal departments can continue to run their own business processes, configurations and customizations alongside other business units within a single database without impacting each other.

- **Utilities**—Provides smarter work and asset management activities for transmission and distribution in water and wastewater, as well as gas and electric power distribution

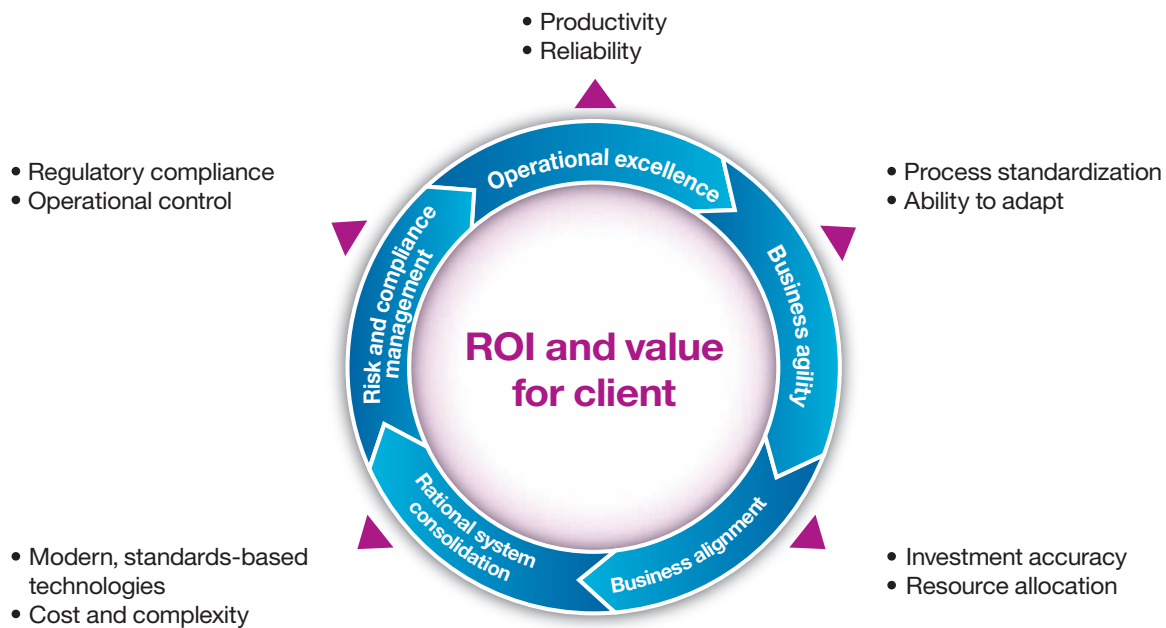


Figure 6. IBM Maximo Asset Management provides a core business solution.

Advanced capabilities

Maximo Asset Management delivers next-generation capabilities to enhance investments in enterprise asset management, including:

- **Built-in mobile access**—Using IBM Maximo Everyplace®, included in the core Maximo Asset Management solution, users can access work and asset management capabilities through any device’s browser. Maximo capabilities are provided within the form factor of a phone or tablet, allowing direct access from virtually anywhere—the field, home or a remote office.
- **Out-of-the-box mapping and crew management**—Organizations can geographically manage crews and assign work with greater flexibility—for example, by visualizing “service addresses” for both work and assets on a public map. The application designer provides support for Google, Bing and Esri maps.
- **Analytical insights**—Through IBM Cognos® integration, reporting, analytics and numerous dashboards, Maximo Asset Management makes it easier to monitor the health of your organization and make smarter decisions. Specific “business intelligence packs” for enterprise asset management provide insights for improving asset failure management, work order management and inventory management.

In addition, Maximo Asset Management solutions can leverage the following key aspects of enterprise asset management to their advantage:

- **Asset maintenance management**—Optimized at the process level. Examples include reactive, preventive and planned maintenance combining materials and service management. Maximo asset and work management modules in general address this requirement.
- **Asset risk management**—Optimized at the asset performance level. For example, asset reliability, service and performance management, IBM Maximo Calibration and key performance indicators and metrics, such as mean time to repair and mean time between failures, address such requirements.
- **Infrastructure management**—Optimized at the service performance level. Examples include utilities and facilities management. Spatial and linear asset management, facilities and integration with intelligent building management systems address these requirements.

Available as an on-premises or software-as-a-service (SaaS) offering, Maximo Asset Management provides the right capabilities to meet organization's needs. Each model provides the collection, consolidation and analysis of all types of assets, unifying processes for wide-ranging asset management functions across multiple sites.

For more information

To learn more about how IBM Maximo Asset Management solutions can help you manage your enterprise assets more effectively—and help to bolster your bottom line—contact your IBM representative or IBM Business Partner, or visit:

ibm.com/software/products/en/category/enterprise-asset-management-eam



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¹ “Research Report on Asset Management Practices, Instruments and Challenges: 2014-2019,” *Reliabilityweb.com*, Accessed December 9, 2014. http://www.reliabilityweb.com/index.php/articles/asset_management_practices_investments_and_challenges_2014-2019/



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