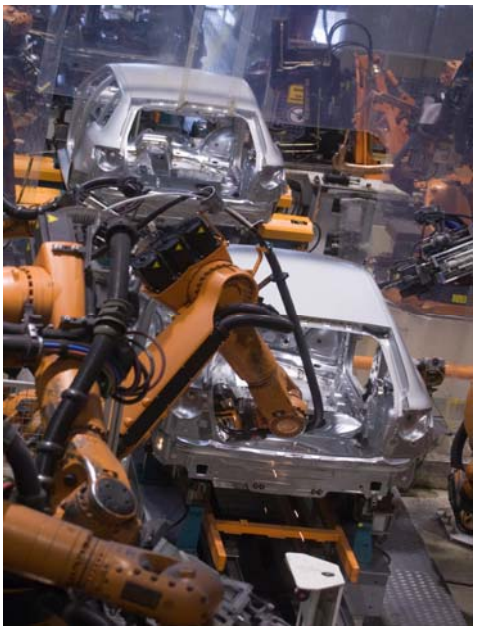
Integrated Enterprise Asset Management and Product Lifecycle Management from IBM



Every manufacturer faces maintenance, repair and operations (MRO) costs. These are recurring costs that impact the company's bottom line and directly affect profits. Most companies have seen large increases in the cost of energy, raw materials and health/safety/environment regulatory compliance. And there are other financial impacts too, such as unscheduled production outages caused by asset failure or under performance.

Many companies today see that improved MRO can lead to greater plant efficiency and longer plant operational life. Enterprise asset management offers you the opportunity to take control of some of these costs. However, leading manufacturers are going one step further and improving production efficiencies and managing MRO expenditures by integrating their product lifecycle management systems with enterprise asset management systems.

You might even already be using Product Lifecycle Management (PLM) technology to design products, test them and automate their production. This same technology can be integrated with solutions such as IBM Maximo® Asset Management to manage manufacturing assets involved in production, including the plant itself or its equipment, like conveyors, robotic cells, CNC machines or materials handlers.

What is enterprise asset management and why integrate it with Product Lifecycle Management?

Your assets—goods, equipment, systems and the networks connecting them—are distributed over departments, locations, business units, fleets or customer sets. Enterprise asset management takes care of their costs, service contracts, spares, workforce, performance levels, procurement, deployed location and consumables.

Good enterprise asset management starts with good systems engineering such as design for maintainability/sustainability and reliability, which touches both the physical design of the system and the design of your asset management support processes. The goal is to minimize overhead and support costs and maximize business value for plant equipment and manufacturing processes. When you combine enterprise asset management with product life cycle management, you complete the life cycle for your manufacturing plant.

Product lifecycle and enterprise asset management integration provides manufacturers with:

- Improved communication between engineering and service teams
- Improved capability to provide maintenance services to customers
- Greater efficiency in deploying yard equipment and maintaining continuous operations

The synergy between enterprise asset management and Product Lifecycle Management

Traditionally, product lifecycle management and enterprise asset management technologies have been used separately. But now companies have begun using the two together. This is because enterprise asset management technology complements product lifecycle management at the manufacturing plant and in service after sales.

Companies using Product Lifecycle Management already know the benefits of having a complete 3D digital product definition and a direct way to connect product design with engineering, analysis and manufacturing. Enterprise asset software can support the plant itself and the assets associated with manufacturing by directly linking to the product data resources.

Combining Product Lifecycle Management with enterprise solutions improves asset utilization, performance and reliability, and it increases efficiency in planning and execution.

Introducing integrated enterprise asset management and Product Lifecycle Solutions from IBM
With IBM integrated enterprise asset management and product lifecycle products, you can not only improve production efficiencies and manage MRO expenditures but also offer direct customer service after sales:

•**IBM Maximo Asset Management** helps you develop comprehensive programs for preventive, predictive, routine and unplanned maintenance.

•**Collaborative innovation with ENOVIA V6** is the primary link between Product Lifecycle Management and enterprise asset management.

•**Digital manufacturing and production with DELMIA** uses advanced 3D systems to define, plan, create, monitor and control all production processes virtually, from early process planning and assembly simulation to final testing, quality assurance, packaging and shipping.

•**Lifelike Experience with 3DVIA** associates technical documentation directly with the digital manufacturing process.

•**IBM service-oriented architecture (SOA)** is the application framework for integrating IBM Product Lifecycle Management and enterprise asset management.

IBM Maximo Asset Manager
Overall, the Maximo Asset Management solution portfolio provides the most complete support for visibility, control and automation of as-installed and as-maintained asset management information used in manufacturing companies. Rated the highest performing enterprise asset management (MRO) solution suite in the industry, Maximo Asset Management offers Product Lifecycle Management users full asset and work management support.

Maximo Asset Management also provides service management solutions for asset owners, operators and service providers and to all users in the supply chain. Included in the solution are:

• Best practices that help improve the productivity of your critical assets and insight into the delivery of service after sales of the product
•Advanced features that support people, maintenance and service processes
•Technology insight into all critical aspects of each asset's life cycle

Maximo Asset Management also takes into consideration the stringent requirements of regulatory bodies, while adhering to governmental or industry-standard regulations.

IBM enterprise product data management
IBM's advanced product data management technology integrates business processes with all information surrounding your product's design and production. This includes all product, process and resource information captured by Product Lifecycle Management, along with your enterprise resource planning, procurement, supply chain management and customer requirements.

IBM enterprise product data management manages all manufacturing and engineering bills-of-material (BOMs). These BOMs create very important parts relationships and show how products are broken down into components and assemblies. Both are critical for MRO. In addition, our enterprise product data management solution provides collaborative portals where suppliers can interact with the product design and parts catalogs they reference.

IBM digital manufacturing
The IBM digital manufacturing solution is a major resource because it can completely simulate and validate complex MRO tasks before they are passed to enterprise asset management systems for ongoing maintenance and operations.

The solution can even perform analysis on different MRO scenarios and propose an optimal solution for the plant's general layout, equipment or processes affecting production, or for MRO tasks related to the manufactured product. Most enterprise asset management systems lack these analysis and optimization capabilities.

IBM technical documentation authoring
Maintaining current technical documentation is a significant challenge because it is dynamic, changing frequently. The IBM technical documentation authoring solution addresses this problem by automating process and product technical documentation.

When used with the IBM digital manufacturing solution, the IBM technical documentation authoring solution links technical documentation to the product, process and resource definitions so that when process or product configurations change, technical documentation changes, too. The IBM technical documentation can create exploded parts diagrams and technical drawings and animations of assembly and disassembly sequences.

IBM SOA

IBM SOA is a significant concept and IT framework for any manufacturer using Product Lifecycle Management and IBM Maximo for enterprise-wide advantage. A Web-based application framework, SOA takes business solutions and breaks them down into individual functions and processes called services. SOA Web services are independent of the applications and the computing environments they require, hiding the complexity of the application environments it integrates.

IBM SOA integrates Product Lifecycle Management and enterprise asset management services with a central Enterprise Services Bus (ESB), a share point where their data exchange conventions are defined. The ESB makes application data available to any other application tied into the same SOA framework and other point-to-point exchanges are not necessary.

How Product Lifecycle Management and enterprise management integration from IBM works

Product Lifecycle Management solutions develop a complete digital representation of product design through manufacturing. Conceptual designs are taken from the earliest stages of customer specifications through design development, analysis, simulation and manufacturing prototyping. Each phase is an enrichment of the previous phase, as designs are refined and details added. When you think about these phases, it becomes easier to understand how and where PLM and EAM intersect.

Basically, enterprise asset management manages the assets directly associated with production (arrow 1 in figure). These might include machinery, like conveyors and robots or materials, spare parts or tool cribs. They can be fixed or mobile assets too, like fleets of vehicles, cranes or railroad cars. An asset also might be the physical facility itself or even IT assets such as networks or process control computers.

Enterprise asset management also offers support for Product Lifecycle Management service after sales (arrow 2 in figure). Here, the asset is the manufactured good that the manufacturer's customer has either purchased or leased. In some cases, the manufacturer may be remotely operating the product.

Another intersection is where enterprise asset management provides feedback to the concept phase of Product Lifecycle Management (arrow 3 in figure). At this point, the MRO experience from service after sales influences the early conceptual design of new products. If a previous manufactured good performed below expectations or there were other customer support issues with installation or maintenance, this can be taken into account.

For an example of how all this fits together, consider a service call affecting the production line in a manufacturing plant. A fault from an electrical control unit (ECU) for the motors powering a central conveyor line is detected by process monitoring software. IBM Maximo instantly receives an event notice. The motor's calibration and instrument reading, also monitored by Maximo, confirms that the fault is real. Plant operators issue a high priority work order using Maximo, alerting the on-duty field technician to the problem. The technician uses his personal digital assistant (PDA) to review the work order, identify the ECU's unit number, physical location, safety notifications and a brief description of the fault type.

PLM and EAM intersections

Maximo automatically prepares an audit report of the ECU's previous maintenance and performance, determining from its ERP system interface that there is no replacement ECU from the manufacturer in the warehouse; however, a direct query of the enterprise product data management system indicates that an equivalent part is available there. The system also indicates that the supplier has a field performance upgrade that improves the current ECU's operation.

Meanwhile, the technician locates the ECU and uses a standard safety procedure for shutting it down that appears in his PDA checklist. He retrieves installation, configuration and testing procedures from the enterprise product management system and learns about the upgrade. After consulting with operations, he applies the upgrade to bring the conveyor motor back into a no-fault operating condition. He refers to the standard restart procedures and brings the conveyor back on line. The ECU is monitored locally to ensure that the startup sequence has not stressed the ECU or motor beyond performance standards.

The technician uploads the ECU's operational history from Maximo and diagnostic outputs at the time of the fault to the enterprise product data management system. The ECU's manufacturer will investigate the circumstances to determine if there is a fundamental design flaw. The service request is closed out and standard operations resume.

Why enterprise asset management and Product Lifecycle integration from IBM?

IBM, our Business Partners and our independent software vendors (ISVs) can deliver the tools and the specialized global development, sales, services and support necessary for a successful integration of Product Lifecycle Management and enterprise asset management solutions. We are a leading provider of solutions for automating and supporting best practices—from the powerful modeling of business processes and enterprise architectures to the requirements-driven development of advanced systems and software. Using our integrated platform for systems and software delivery and our process and best practices support, we can help you integrate and align product lifecycles with asset management and MRO. This helps you improve production efficiencies, manage MRO expenditures and offer direct customer service after sales.

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