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Push Maintenance: The New Frontier in Asset Management

Today's economy has companies pursuing revolutionary change in the way they do business. They recognize that their greatest investments—mission-critical capital assets—cannot be effectively managed when information is isolated in disparate systems. Fortunately, the demand for realtime information and business transformation has stimulated the emergence of powerful new diagnostic and analytic capabilities. The convergence of innovative technologies using open industry standards simplifies communication between software and technology. Now you can centralize key performance diagnostics, push critical information to the workforce, and problems can be solved from anywhere.

With the availability of machine-to-machine (M2M) solutions, radio-frequency identification (RFID) technology, common communications standards, and other enabling technologies, the time is ripe for solutions that proactively deliver critical asset data to decision makers throughout the enterprise in real time. "Push Maintenance" is the term being applied to this new environment, and it is the new frontier in asset management.

Push Maintenance benefits delivered via M2M
Leading industry experts believe the demand for M2M communications—and the resulting Push Maintenance strategies it enables—is expected to skyrocket within this decade due to the potential benefits inherent in the technology. Connecting machines, devices, appliances, information systems, and users, M2M is expected to generate substantial savings by reducing operational costs and automating business processes. Improved efficiencies, productivity rates, and customer responsiveness are key business imperatives supported by the steady "push" of information from machine to machine. These long-awaited benefits are available to users now in large part because the following technology components have at last reached marketable maturity.

Wireless connectivity
Like many industries before it, the manufacturing industry is beginning to experience the ubiquity of wireless applications. Through the ability to wireless enable assets, they can be remotely monitored. Bar code scanning and RFID have replaced manual inventory processes. Field technicians update and close work orders from the field. Sensors detect when inventory levels are getting low. Global positioning devices track moveable assets.

Wireless connectivity is the key enabler to M2M communications because it allows machine data to be transmitted to and from any location. Rather than carrying data between machines, or returning to a workstation to belatedly record transactions, wireless capabilities make information sharing instantaneous—"pushing" the information where it needs to go in real-time. The use of open, standards-based technologies ensures that wireless architectures will adapt to future mobility initiatives, and that information can be pushed to the workforce on any device.

RFID as a bar coding alternative
RFID has emerged as a significant step up from bar coding. Barcode readers need to be precisely positioned within a clear line of sight to read a barcode tag. In contrast, RFID readers can read RFID tags regardless of the item's alignment or position, because radio waves can pass through materials such as cardboard and plastic. As a result, RFID technology can more easily "push" information to enterprise systems, making the technology a fantastic enabler for Push Maintenance strategies.

RFID readers at a receiving dock door or strategically positioned within a storeroom can track items passing in and out of inventory. Physical counts can be taken just by walking down a row of inventory. Fleet and mobile assets can be tracked as they arrive, depart, or move throughout a site. And, once captured, all of this information can be pushed to the appropriate users by EAM, ERP, CRM, and/or other enterprise systems. RFID alleviates the need to physically scan or count each item or asset being tracked, resulting in greatly increased speed and accuracy in enterprise operations and streamlined maintenance delivery.

Online asset health monitoring matures
Condition-based maintenance (CBM) is unquestionably a high-impact, high-value asset management strategy. Performing maintenance when an asset's condition deteriorates to a defined threshold level prevents excessive, time-based preventive maintenance, as well as reactive, failure-driven maintenance. Using diagnostics and prognostics, CBM extends the planning horizon for the maintenance organization. Now the asset can speak for itself, a work request can be automatically generated, and a service technician can be dispatched with parts in hand at the most opportune time, and with ample information to correct the problem.

However, CBM solutions today are largely manufacturer-specific. The lack of M2M interoperability between assets from different vendors is preventing wide-scale benefits from being achieved. To solve this challenge, ISA, OPC Foundation, and MIMOSA are collaborating to develop open enterprise integration standards for operations and maintenance (O&M). The OpenO&M initiative is intended to simplify the development and integration of O&M systems, equipment, and software with each other and with other enterprise systems. Interoperable, open solutions spanning from the plant floor through the enterprise will allow critical information to be pushed at just the right time to the appropriate decision makers. OpenO&M standards will bring CBM to an entirely new dimension.

Automated decision support
In the previous sections, we've listed the key components for deploying Push Maintenance, the sharing of information from machine to machine through enabling technologies and standards. What must follow is the ability to rapidly analyze the data in order to make critical, timely decisions. Real-time performance management (RPM) "pushes" key analytics to the right person at the right time so that informed decisions can be made.

RPM technology enables users to proactively view and analyze key performance indicators, so that corrective actions can rapidly be implemented against inefficiencies in the process. Effective RPM captures a series of performance metrics around customer loyalty, asset optimization, workforce efficiency, supply chain optimization, and financial management. Proactive, continuous improvement of these business objectives reduces operational costs, increases efficiencies throughout the enterprise, and pushes an organization toward true operational excellence.

Intrinsic benefits
Asset maintenance has evolved over time from reactive to preventive, followed by predictive and condition-based models. Reactive maintenance lacked "push" properties altogether. Pre-planned work orders with time- or frequency-based schedules prompt preventive maintenance, but a whole-scale "push" comes from gauging the condition of an asset and predicting impending failure in time to avert an unplanned outage. Furthermore, the ability to push inventory, labor, vendor, and customer information to the right time and place permits timelier, more accurate maintenance activities.

Process manufacturers are prime candidates for the efficiencies generated by Push Maintenance diagnostics and decision support analytics. Additionally, as it becomes more commonplace to outsource maintenance functions, third party and OEM service providers will find Push Maintenance particularly effective in supporting their ability to deliver superior service at lower costs. With a sound Push Maintenance strategy, service providers are better armed to optimize asset, customer, and field-force business processes.