Mobile Enterprise Asset Management Solutions for Today's Real-Time Manufacturers

Mobile EAM Solution Increases Technician Maintenance Time, Preventive Efforts to Improve Physical Asset Uptime

Executive Summary
For manufacturers, physical assets provide continuity of operations and ensure movement of products throughout the supply chain. From the shop floor to the top floor, this means that electricity isflowing, building mechanical systems are working, computers are online and transportation is moving. If even one of these assets breaks down unexpectedly, it interrupts operations and affects amanufacturer's ability to provide products or services.

Many manufacturers already have a computerized maintenance management system (CMMS) or enterprise asset management (EAM) in place. However, many still rely primarily on paper -based communicationsand tracking. As a result, technicians spend up to 50 percent of their time with paperwork or data entry and less time performing corrective or preventive/predictive maintenance activities.Enterprise mobility systems improve technician productivity. With this, they spend more time on preventive tasks, which translates into more uptime for your strategic physical assets.

Introduction: Revitalizing the EAM Process
Most maintenance technicians depend on an EAM system to receive their daily work orders and manage their workflow. Most use paper for input and outputs of the system. However, this reliance onpaperwork and data entry stands in the way of the maintenance technician's primary function. During an average workday, maintenance technicians are charged with three functional areas:

- » Corrective maintenance
- » Preventive maintenance
- » Rounds and conditions

Each of these activities keeps the company's assets and operations at optimum efficiency. For technicians, the more time spent on a core task translates into increased productivity and physicalasset uptime. This has a direct affect on the operational costs and profitability of the manufacturer.

Process Challenges - *Barriers to Operational Efficiency*
Entering and extracting information on paper to and from an EAM system consumes the time a technician could spend maintaining assets. The following troubles occur whenever paper - based work ordersand reporting are used, creating a bottleneck for the EAM system.

- » Routing work orders are often delayed in getting to the proper technician
- » Distributed work orders are frequently lost in routing
- » Completed paperwork orders are lost
- » Completed work orders remain open in the EAM system
- » Time delay for getting information into the EAM system
- » Time delay lag in response to open or regenerated issues
- » Technicians, supervisors and clerks become encumbered with data entry Entering data requires a double effort - it's written down first on paper and then keyed data entry
- » Data entry errors are numerous

In addition, maintenance technicians lack current information at the point of activity. Regardless of the job function, the technician constantly has to locate and retrieve work orders,documentation, parts, tools and assistance. This "travel time" to locate and retrieve information and equipment takes the technician away from the actual time for maintenance. Once work isperformed, details are recorded at a later time. This technique creates a "best recollection" type of reporting, which causes multiple problems and devalues the purpose of the EAM systems. Otherconcerns in this area include:

- » Accurate failure information is not tracked
- » Accurate and complete parts usage are not tracked
- » Inventory is inaccurate and results in "out of stock" situations
- » Accurate labor figures are not tracked
- » Accurate inspections and rounds are not tracked
- » Accurate make, model and make is not recorded

The technician may also perform other equipment "break / fix" maintenance activity while at an asset location. This kind of "technician -initiated work" is never tracked or recorded in the EAMsystem. That's because it's easier to perform the adjustment or repair while at the original work order location than going back to the desk and waiting for the work order creation process toinitiate again.

The result of all of these issues is lost productivity among the work force, limited use of the EAM system, and ultimately higher costs of asset ownership and reduced asset reliability. This maytranslate into lower product quality and increased liability.

> Technicians spend less than 50 percent of their time working on real maintenance work.

Making the Move toward Enterprise Mobility
Applying enterprise mobility to the EAM process empowers companies to maximize their maintenance operations by addressing these process pain points. These physical assets - manufacturing equipment,building mechanical systems, computers and fleet operations - operate at the highest capacity with more uptime. This is achieved with the right formula for enterprise mobility. Manufacturers needthe ability to capture, move and manage maintenance information to and from the point of business activity.

- » **Capture:** eliminate manual, paper -based and data entry errors using *advanced data capture technology*
- » **Move:** provide an automatic electronic transfer of EAM information in real -time to eliminate keyed data entry errors and speed real -time access to information *using ruggedmobile computers with multiple methods of secure communications*
- » **Manage:** efficiently manage the devices that capture and movement of customer delivery information from the technicians at another location to the host, back -end databases using *powerful enabling software*

Mobile EAM Increases Productivity, Asset Uptime for Enhanced Operational EfficiencieS
Providing the technician with a mobile computer to access the EAM system eliminates the amount of time -consuming paperwork that must be processed each day. They access job plans, safety plans andequipment histories right from the equipment location for the highest level of accuracy and productivity. Because information is electronically synchronized, the instant response generates evenmore productivity gains for other supporting staff also using the EAM or other systems.

Paper-Based EAM System Process Details
The general functional blocks of a full EAM system range from workflow management to inventory issues and transfers to asset auditing and compliance reporting.

Mobile EAM Process Improvements

Mobile EAM solutions provide technicians with critical information at the point of activity. The technician drastically reduces the "travel time" spent retrieving spare parts, tools or supportingdocumentation. It also improves the tracking and tracing of parts used in a specific asset. Any saved time is spent performing more maintenance work. The mobile computer informs the technicianwhether or not equipment readings are acceptable   - on the spot. Technician -initiated work is recorded in an efficient manner, and information is provided to the EAM system that is usually notrecorded. When more accurate and faster completed work order information is transmitted into the EAM system, the more valuable it becomes to the organization.

Management is able to use the EAM system to create better job planning, work scheduling, maintenance billing and customer service. The improved quality and quantity of data collected about theassets enables management to develop stronger corrective and preventive maintenance programs to extend the life of the assets and lower operation expenses. It also reduces liability when necessarymaintenance data and parts tracking for compliance are quickly and accurately reported.

Productivity Gains and Cost Savings

Every time maintenance is performed on a piece of equipment, enterprise mobility enables technicians to provide the most accurate information to the EAM system. As a result, the EAM system deliversimproved information on each asset. First   -time fix rates increase. Technicians spend more time on preventive maintenance or even corrective maintenance on other assets. Identification of arecurring asset problem is now available. So, the more informed technician takes immediate action to identify the root cause of the problem.

A snapshot of the maintenance technician's workflow easily demonstrate the value of mobility.
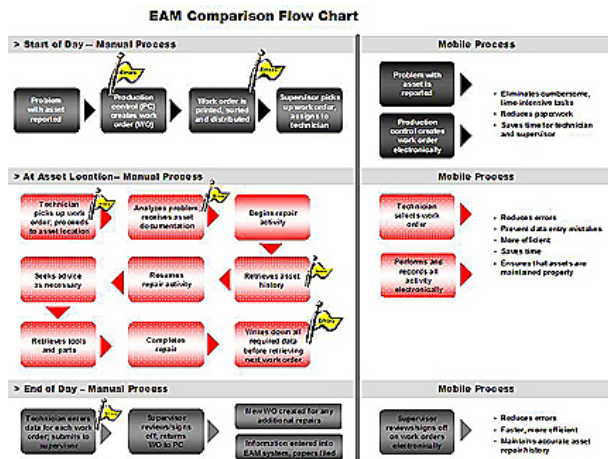
Transforming a task and paperwork-intensive process delivers significant productivity improvements during the course of the work day. Technicians save time picking up orders at thestart of the day and in updating work order information and supervisory review at days' end.

More accurate equipment histories provide technicians with the necessary tools to pre   -analyze a problem prior to the actual visit to the equipment location. Proper parts and tools are locatedbefore going on site, so the overall travel time associated with each maintenance task is drastically reduced. For many companies, especially manufacturing, maintenance activities are automaticallyrecorded for OSHA, ISO 9000 and other compliance reporting. Again, technicians spend more time performing actual maintenance.

A Solution Architecture Designed for People in Motion

A mobile EAM system uses rugged mobile computers with integrated advanced data capture technology, wireless infrastructure and powerful applications to coordinate the various functions of thetechnician. It also provides the information for the technician to perform their job.

Data Synchronization Function

Rugged mobile computers used by maintenance technicians synchronize with the mobile EAM server in a variety of ways:

» Batch data synchronized via communication cradle (Ethernet or serial)

» Batch data synchronized via wireless local area network (WLAN)

» Batch/real-time data synchronized via wireless wide area network (WWAN)

Mobile computers that operate in the batch mode of communications typically require that the device be returned to a communication cradle. Mobile computers equipped with wireless LAN or wirelessWAN radios synchronize the mobile data with the mobile EAM server   —at the point of maintenance.


EAM Function

The mobile EAM server has an interface module to the EAM system. This mobile EAM server also provides the mobile application that runs on the handheld computer. The configuration of the mobileapplication is either a function of or an external configuration tool feeding into the mobile EAM server. This provides all of the provisioning of the mobile application and EAM information. If themobile application contains a communication module, the mobile EAM server also handles the routing.

Information such as work orders, equipment history and maintenance / safety procedures are available on the mobile computer used by the technician. All of this information is stored within the EAMsystem and the mobile EAM server processes the updates to the mobile computer.

Maintenance technicians carry lightweight, rugged mobile computers from location to location. Wireless WAN communications enables current information to be synchronized - quickly andaccurately - into the EAM system server via a mobile EAM server.

Proven Enterprise Mobility Solutions Deliver Powerful Results

Manufacturers utilizing mobile EAM solutions enable more maintenance work to be performed in less time with reduced costs. Mobile computers empower maintenance technicians to be more efficientwhile delivering faster, more accurate performance and asset information back to management. The more efficiently the maintenance technician can perform their goals, the better the organizationruns. Every activity shows improvement, from capturing failure codes and asset conditions to managing technician details, inventory and scheduling.
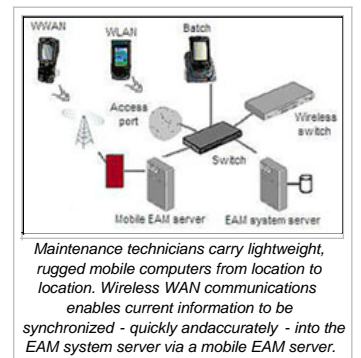
Mobile EAM solutions enable companies to realize the following benefits:

- » Eliminate paperwork and data entry to save costs and time
- » Provide information at the point of activity to eliminate travel time
- » Increase technician maintenance time
- » Utilize EAM system more effectively
- » Provide management with an accurate view of field activities
- » Respond faster (management)
- » Improve preventive maintenance

Mobile EAM Increases the Lifecycle of Valuable Physical Assets

Mobile EAM systems eliminate paperwork and improve productivity to increase the time spent maintaining physical assets. A technician utilizing a rugged mobile computer has critical information atthe point of activity or maintenance, which reduces the daily travel time. The buy back period, based on the time a technician saves each day, is less than 4 months.

Automatic data synchronization from the technician's mobile computer to the mobile EAM server removes the key data entry process and any associated data transposition errors for improved accuracy.It also reduces the amount of time between when work is performed and when that information is available to other interests. This improves management efficiencies that increase the productivity ofthe entire maintenance organization.

Additional benefits occur because mobile computers enable technicians to perform more maintenance in less time. The saved time is utilized to perform more preventive maintenance, which in turndecreases the corrective maintenance. Increases in preventive maintenance help to increase the life of an asset, reducing the total cost of ownership.

directly for more details on end -to-end mobile EAM solutions from Symbol, its business partners and Symbol Enterprise Mobility Services. More information on enterprise asset management solutions isavailable at .