



# Maximo<sup>®</sup> Asset Management made simple



**By Dave Bertolini**

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## IBM Perspective: Managing Assets in the Era of IoT

The Internet of Things (IoT) is changing the way businesses and consumers interact with and experience the physical world. IoT is poised to transform industries — disrupting profit pools and creating new opportunities for growth and advancement, benefiting businesses who can unlock its economic potential. According to McKinsey, the impact of IoT will be as much as \$11.1T per year by 2025. Factories could contribute up to \$3.7T, while worksites in sectors such as mining, oil, gas and construction could see an impact on the scale of \$930B.<sup>1</sup> For companies in asset-intensive industries, the future of enterprise asset management (EAM) lies in the Internet of Things. The competitive advantage to businesses who can unlock the value of IoT is undeniable. But beginning an IoT transformation can be tricky.

Businesses managing assets often fall along a maturity curve in terms of IoT. In the early stages, the organization will be concerned primarily with managing physical assets and inventory, scheduling and business processes. More mature organizations will leverage the capabilities of an EAM system to optimize their preventive maintenance practices using IoT data — realizing cost savings as they move toward a condition-based maintenance model. The most mature organizations will be able to combine IoT device data with advanced, cutting-edge cognitive analytics to embrace a truly predictive model of asset management and maintenance.

IBM Watson IoT helps businesses make smarter decisions about their most critical assets by augmenting IoT data with powerful cognitive insights. As a key part of the Watson IoT portfolio, Maximo has been the global leader in enterprise asset management for more than a decade. With Maximo, businesses get the visibility, control and automation of key information they need to achieve greater efficiency by managing all asset types — from traditional physical assets to emerging smart assets — on a single technology platform.

Maximo 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 while providing a safe and reliable operating environment.

The following Ebook will lay out the basics of EAM for those whose business rely on core asset management functions. But wherever you fall on the spectrum of IoT maturity — whether you're new to enterprise asset management or implementing an advanced analytics-driven maintenance program — you'll find Maximo has the rich capabilities and features to grow with your organization and to help you reach the next stage of your company's IoT transformation.

### Learn More

(Click on links below)

[Visit the Watson IoT for Asset Management website](#)

[Read the Maximo Brochure for future details](#)

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<sup>1</sup> McKinsey, [www.mckinsey.de/sites/mck\\_files/files/unlocking\\_the\\_potential\\_of\\_the\\_internet\\_of\\_things\\_full\\_report.pdf](http://www.mckinsey.de/sites/mck_files/files/unlocking_the_potential_of_the_internet_of_things_full_report.pdf)

## Introduction

This document provides insights from a maintenance perspective, the day-to-day user of the system and the information contained within it. Identifying all maintainable assets and their physical locations are critical to the maintenance function. From this functionality, data to identify the required maintenance strategies, develop logical maintenance routes and identify routine spare parts can be understood. All too often, this data is not fully populated and assets, systems, or locations are omitted, leaving significant informational gaps that are ultimately never populated.

Identifying maintainable assets and establishing their parent-child relationships (i.e., the asset hierarchy) are two of the most critical elements to ensure system success. The inclusion of maximum asset data not only assists maintenance, but the entire organization, while providing a robust maintenance management tool for accurate data-driven decisions.

The information in this document is not a system configuration or training guide for Maximo.® It is presented as examples of data needs from a maintenance perspective.

## Asset Management

### Identifying Assets

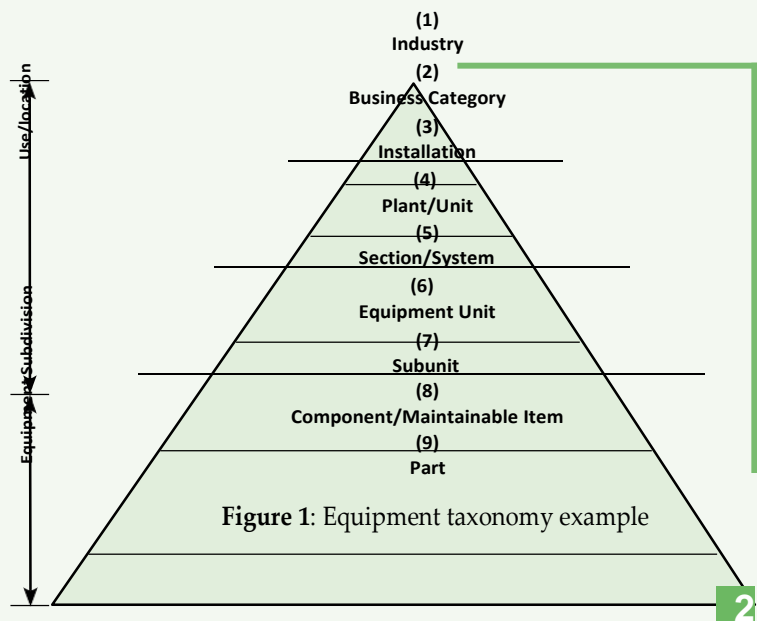
The asset management module or area should contain **all data** for each maintainable asset located within the site. This module or area is the most critical part of the system since it contains the equipment hierarchy, which is considered the backbone of the system. The hierarchy requires significant thought and must include a top-down approach starting with the site itself. It is helpful to follow the process flow of the site. Identify the site, the functional locations, the systems and then the equipment.

One of the biggest contributors to data disappointment in Maximo® is an incomplete or inaccurate asset hierarchy. The hierarchy establishes the structure for numerous aspects of system functionality. A majority of these disappointments can be corrected with a properly defined hierarchy utilizing an internationally recognized equipment taxonomy or natural grouping of equipment.

It's all about parent-child relationships that are established that enable cost roll ups, asset identification, data analysis, reporting for metrics, and failure threads (e.g., mean time between failures, failure rates, etc.). Typical hierarchies are routinely void of all assets, lack defined parent-child relationships and, many times, lack logical flow. Organizations must manage their assets and using an accurate equipment taxonomy is a requirement.

Once the functional location of the area and sub-functions or subsystems are identified, the assets can be inserted and established with their respective parents identified. All maintainable assets should be identified and/or those that have a defined maintenance strategy. For example, a functional location or a press in-feed system would have these child assets associated with it: a roller conveyor, an electric motor, a gearbox and a variable frequency drive (VFD).

Start at the highest level required for your organization and define the hierarchy down to the component or maintainable asset item level. What are the functions? The lowest level could be utilized to attach bill of material (BOM) information. The hierarchy structure as shown in Figure 1 uses equipment taxonomy or natural grouping of equipment.



Using the equipment taxonomy example in Figure 1, one can identify similar failure issues on all electric motors for the assets at the plant or within specific areas. Mean time between failures (MTBF) for all electric motors in a plant or motors on the hydraulic system now can be quickly obtained. Once the hierarchy is accurate and aligned utilizing equipment taxonomy, then MTBF, failure rate, cost, effectiveness of the maintenance strategy, etc., can be identified with a Maximo® report or data query.

Identifying what is causing the majority of any type of component or maintainable asset failure begins with knowing that you have a problem. Getting this correct enhances the capabilities and functionality of the Maximo® and eliminates data disappointment for the maintenance resources.

### Asset Hierarchy

The asset hierarchy is also a critical element of the system. Because it is commonly referred to as the backbone of the system, it must be properly identified and established. If established incorrectly, roll up (vertical) and comparison (horizontal) searching, sorting and reporting are not possible. Spend the necessary time to get this part right, or everything in the system will be dysfunctional. It is best to conduct this activity with the implementation team, a large dry-erase board and multiple walks through the site to ensure everything is identified and, ultimately, correctly established.

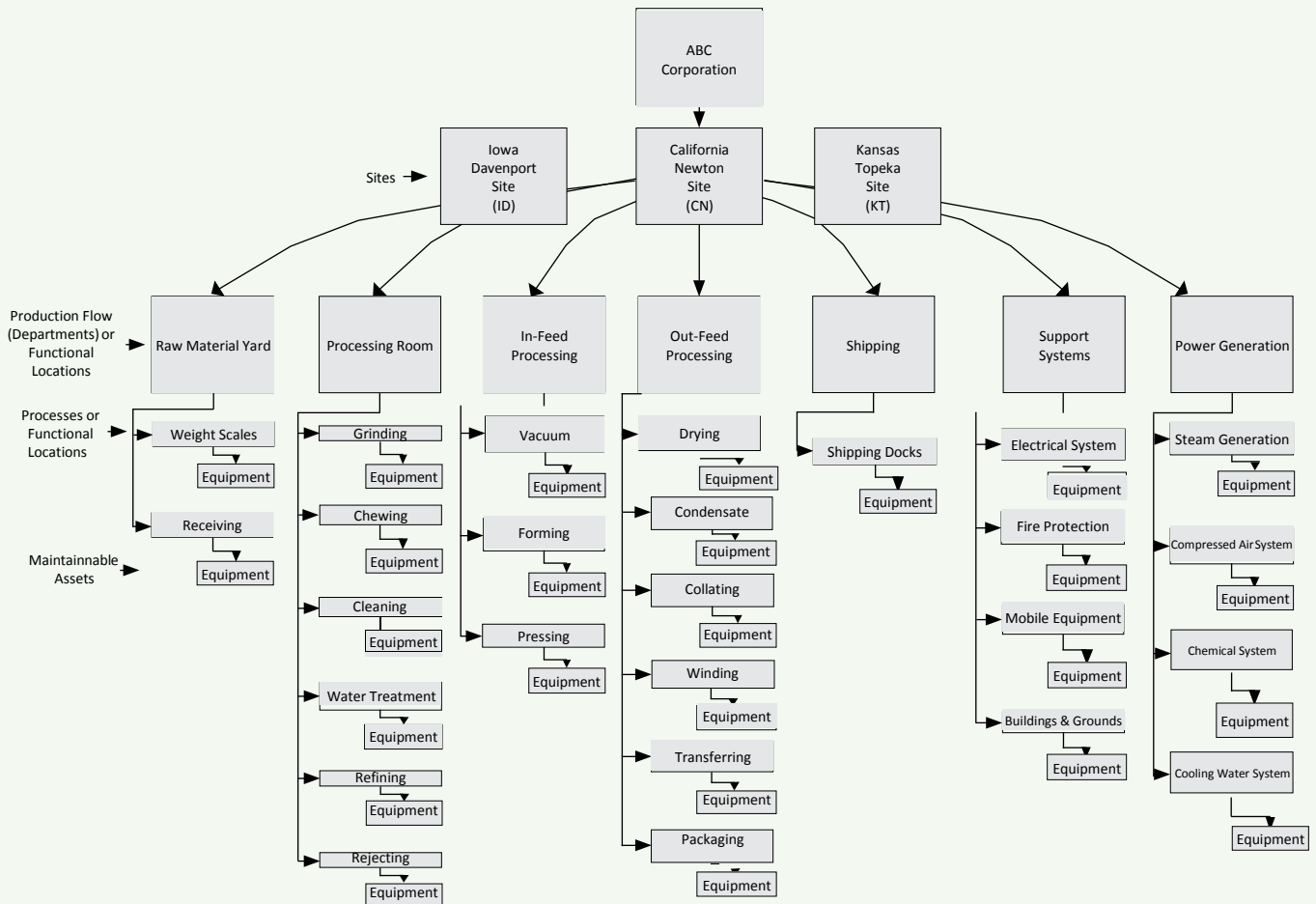


Figure 2: Multiple site hierarchy

Items that must be defined are: a unique equipment number, a well structured description, equipment classification, location, cost center, department, BOM or parts information, etc. The assets module or area is one of the most infor-

mation intensive to populate, so a well-defined informational gathering process must be established to ensure only necessary information is collected.

If the process flow in a manufacturing environment, for example, is followed, the end users can quickly relate to navigating the hierarchy. It is imperative that everyone understands how to locate a specific asset, so historical information is collected to that specific asset. It should be the exception that work orders are written to the department or process level. Keep in mind there are always exceptions to exceptions. For example, a valid work order written to the process level could be a visual inspection of an entire line, process, or system.

### Functional Locations

A functional location may mirror what you call departments and systems, which may mirror what you call lines or areas. If you think about utilities, you might consider that a system, however, if you consider utilities as a functional location, then the logical systems would be water, heat and air, compressed air, etc. Figure 3 shows this example as: ABC (site), UTILITIES (functional location), COMPRESSED AIR (system) and AIR COMPRESSOR #1 (asset).

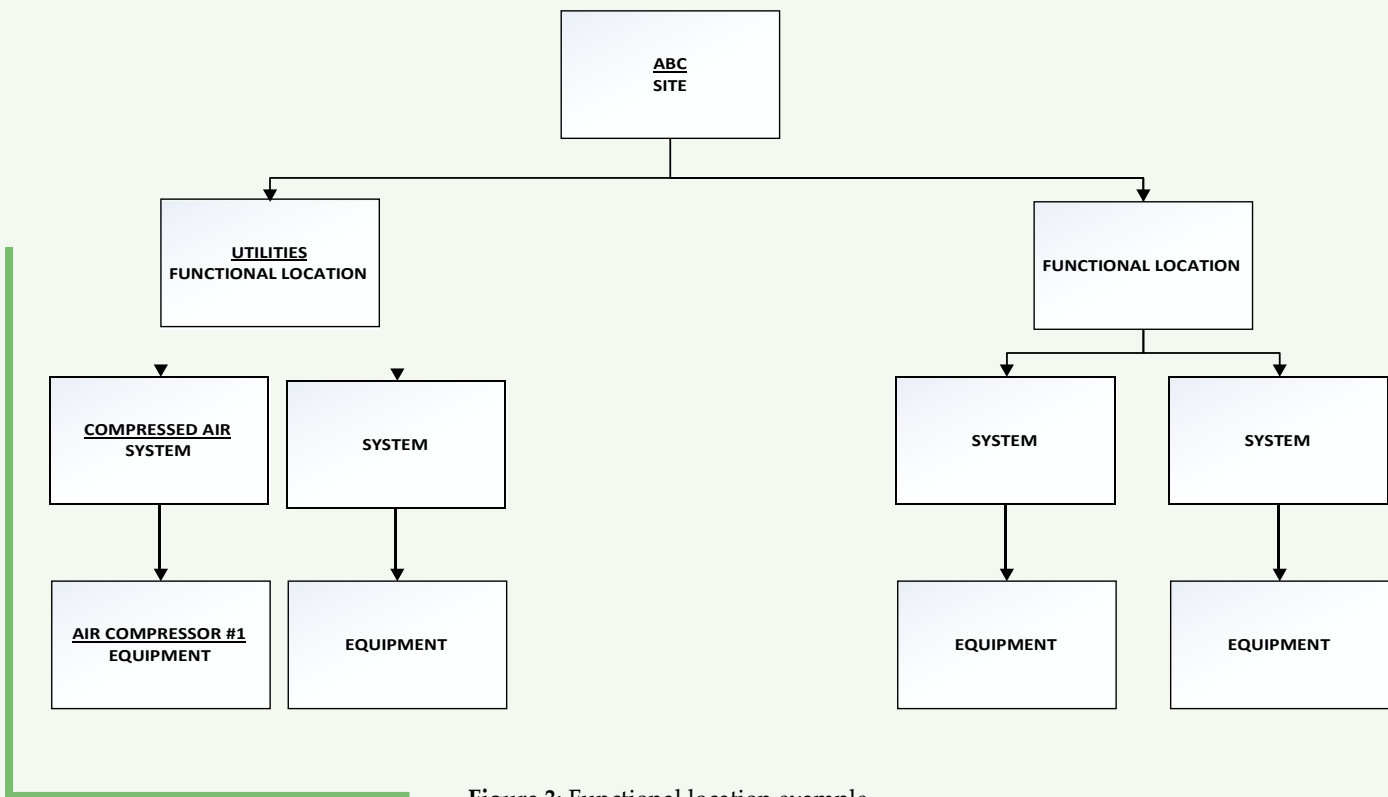


Figure 3: Functional location example

### Parent-Child Relationships

A parent is an asset to which other assets are assigned or linked and these are considered children. For area type assets, this could be considered a functional location. For equipment assets, this could be the area in which it is located or a larger piece of equipment that it is a part of. Using the hierarchy example in Figure 2, the RAW MATERIAL YARD (functional location) would be the parent of the WEIGHT SCALES (asset).

The assets assigned to a parent asset are known as child assets or children. Using the same hierarchy example, the WEIGHT SCALES is a child of the RAW MATERIAL YARD. The parent-child relationship is a way of assigning component assets (children) to larger, all-inclusive assets (parents). An unlimited number of parent-child relationships between assets can be defined. Even though a child can have only one parent, a parent can have multiple children and these children also can be parents of child assets.



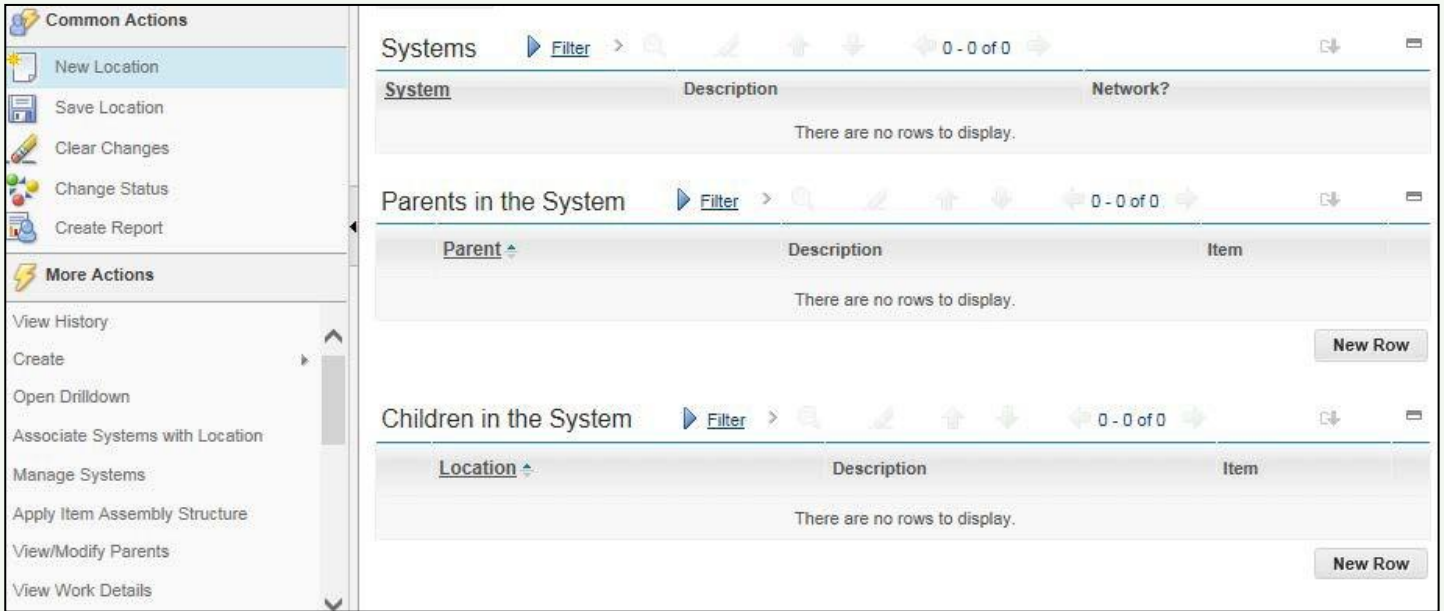


Figure 4: Establishing systems and parent-children

### Parts versus Equipment

One of the more difficult discussions for the implementation team is sorting out the difference between what should be established as an asset and what should be considered a part. While both are valuable, they both are established in different places. Assets are established in asset management and become part of the hierarchy, while parts are ultimately established within the BOM.

The quickest way to make the part versus asset decision is to identify what you want to accomplish, such as preventive maintenance (PM) or predictive maintenance (PdM) activities. Those that have a defined maintenance strategy should be considered assets. Utilizing Figure 5 as an example, the conveyor, gearbox and motor would be considered assets. What is removed and replaced upon failure? Those are typically considered parts. Again utilizing Figure 5, the conveyor belt, drive belt, rollers and the head roller would be considered parts. But use some level of caution here since, at times, there is some crossover.

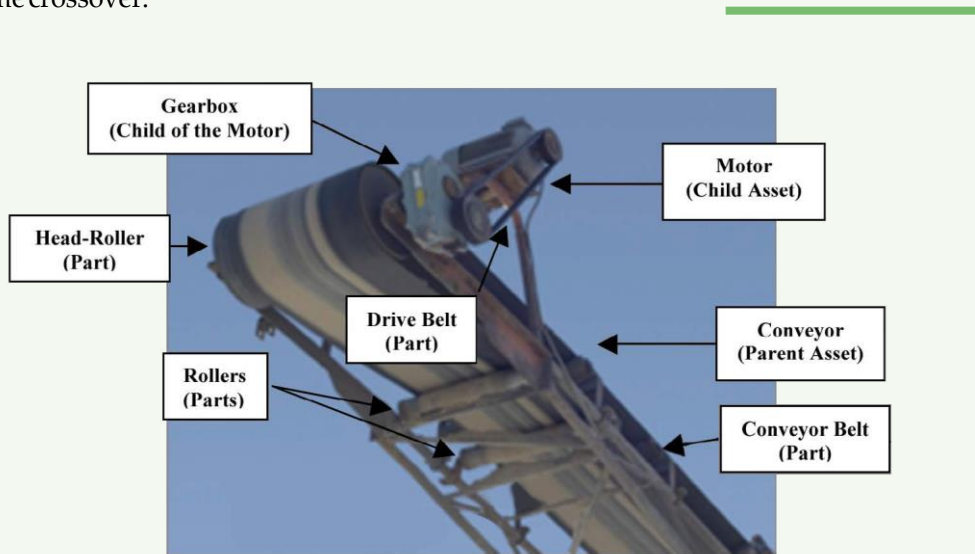


Figure 5: Parts versus equipment example



### Establishing Assets in Maximo®

Once you have defined the asset hierarchy structure on the dry-erase board and have ensured it accurately identifies the site, functional locations, systems and assets, the hierarchy must be established in Maximo® asset management. The screen captures, as illustrated in Figure 6, are where these assets will be established. Note all fields are not specifically addressed, but the fundamental fields to establish assets and define the hierarchy structure are presented.

Although screen captures are normally presented as a single screen or form, they are displayed as separate sections for discussion points in the upcoming sections.

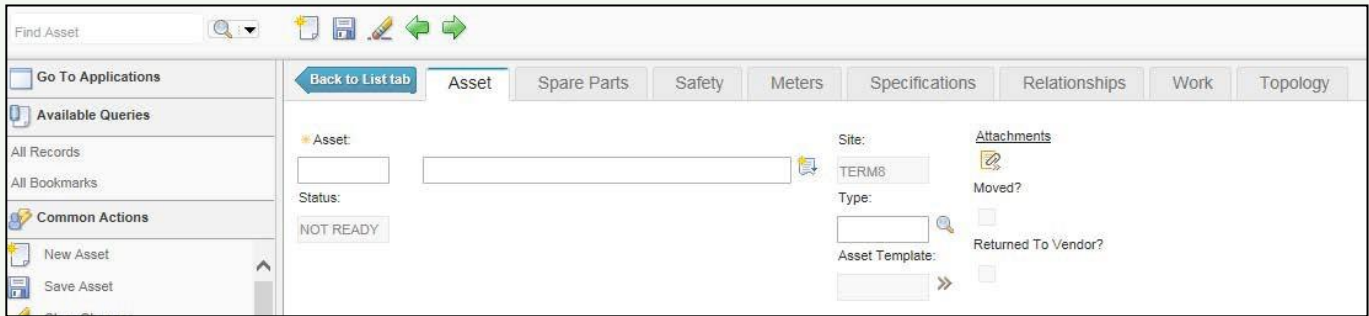


Figure 6: Establishing assets

### Equipment Numbering

More heated discussions and debates have been started over defining an asset numbering scheme for inclusion into systems. One viewpoint is to think of the asset number merely as a unique identifier, much like your taxpayer identification number that only identifies you as an individual. The key is no two numbers are the same in either a system or a taxpayer identification number. Maximo® has the capabilities to automatically assign a sequenced number.

Many like to invent a smart numbering scheme (Figure 7) where a number or series of numbers represent aspects of the asset, process, system, or even a location. This is unnecessary since these aspects are fields within Maximo® that would enhance search and sort capabilities if populated. This prevents the scenario of no one remembering the rational of the smart numbering scheme after the “smartones” are gone.

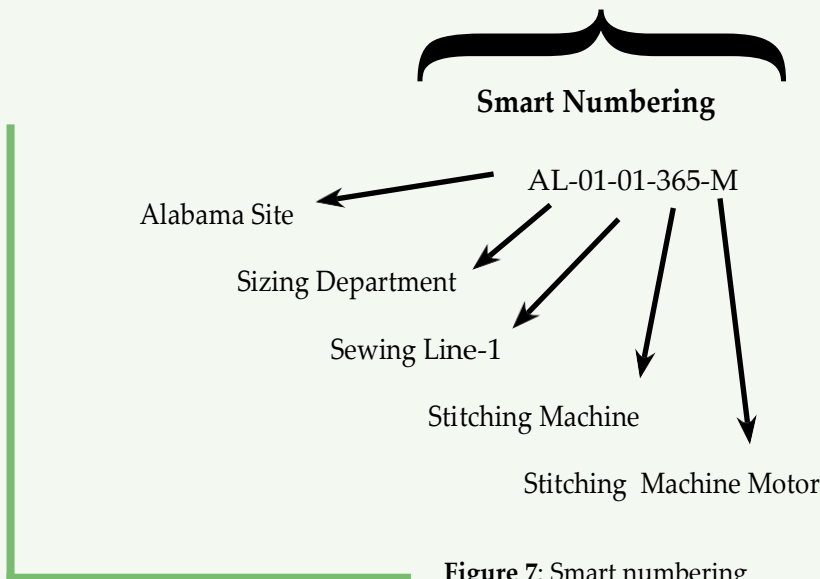


Figure 7: Smart numbering

Regardless of what you ultimately define as a numbering scheme, if you do not tag the asset with the same number established within the system, you can never be assured the correct asset was identified and, ultimately, worked on. Asset tags are available in numerous types of material for virtually any asset operating environment to ensure better accuracy in asset identification. Each tag should contain the asset number and its description as it is established within the system.

If assets are not tagged, the supporting asset data that you populated in Maximo® should enable the correct asset to be identified. That supporting data should be: the assignment of the proper parent, an accurate asset description, a detailed location and the establishment of both defined specifications with the manufacturer and detailed attributes. Anything that makes it easier for those determining that an issue exists and those who are responding to the issue quickly is key.

## Equipment Description

Working hand-in-hand with the asset number is the asset description. Typically, site or facility personnel know the assets by a number or name. To ensure accurate data collection occurs, consider tagging all assets identified within the system with both the asset number and the asset description. Standardization is important, so a well-defined method of establishing naming conventions must be put in place. Many utilize a noun, verb, adjective approach, which works well. For example, a pump that provides service to fill a caustic tank would have a description of Pump, Caustic Tank, Filling. The motor attached to the pump would have a description of Motor, Pump, Caustic Tank Filling. It may take a little getting used to, but if you define standards and utilize them throughout the system, then searching, sorting and grouping will be much easier.



Figure 8: Equipment tagging

## Asset Status

Maximo® allows the user/implementer to define and select an asset status. If an asset is removed from service, any repetitive tasks associated with that asset will not generate until it is returned to in service status. Each asset established must have a status assigned and a consistent set of statuses must be defined and utilized. By utilizing asset statuses, the status of all assets can be quickly determined in a report or query. Proper utilization of these statuses is critical to the organization to ensure unnecessary maintenance activities are not performed on out of service or seasonal assets out of season.

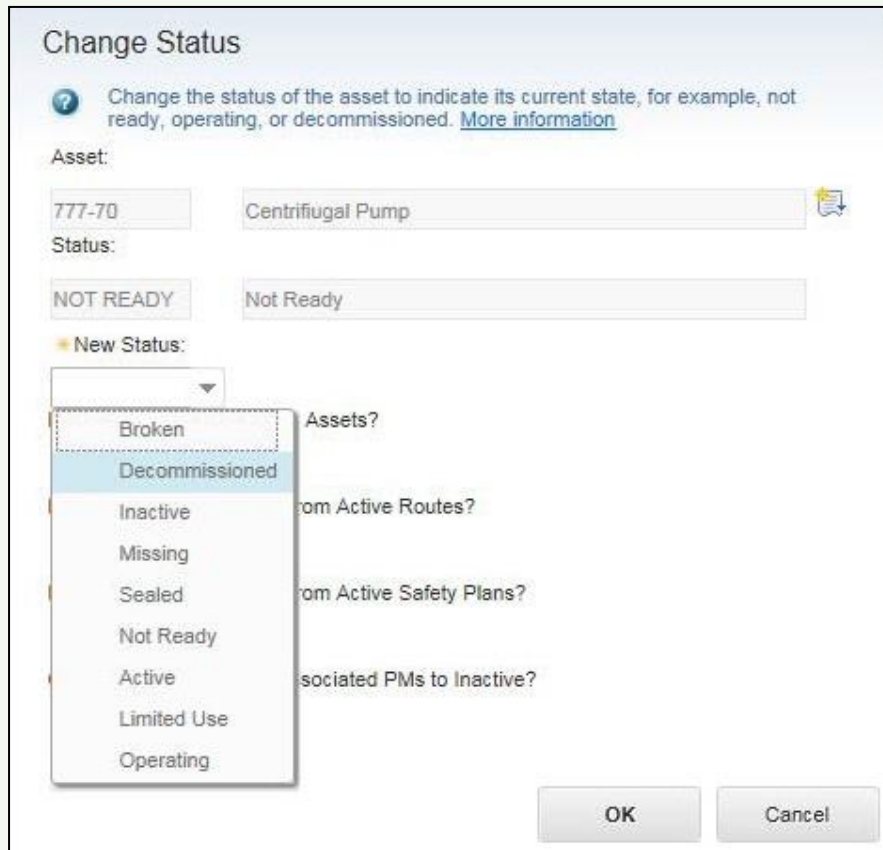


Figure 9: Asset status

### Attachments

Maximo® has the capability to link or attach documents, drawings, web pages and even videos. This feature is extremely powerful to arm the maintenance workforce with all the necessary information to safely, efficiently and effectively conduct activities without making multiple trips to review needed information. Items can be selected to print with specific PM procedures or predefined tasks when the accompanying work order is printed or linked to equipment or materials for viewing. Care should be taken when utilizing this functionality to ensure you are not printing an entire operations and maintenance manual with the work order.

This is the ideal place to attach operations and maintenance manuals, pictures, drawings, specifications, values, etc. With large numbers of maintenance talent retiring, many organizations are utilizing this functionality to video the execution of activities for future technician use in training and performing the work activity.

## Locations

The screen capture in Figure 10 displays attributes of the locations and location types.

Figure 10: Locations

The goal of the asset location is to enable individuals to physically locate the asset within the facility or site. Do not mistake this as the way to build the asset hierarchy. There is functionality to display the assets located in specific locations in a row/column view. This functionality enhances the capabilities to define routes based on assets or types of assets in specific locations.

Make use of the location as necessary to accurately identify the specific physical location of the asset. Establishing rails and roads may require mile markers or even yards as specific locations. Defining and standardizing locations is critical for future development of routes and reporting information from a location perspective. For large facilities, radio-frequency identification (RFID) tags or a global positioning system (GPS) are viable options for capturing and reading latitude/longitude and locating the asset. Locations may also contain functional locations, described as locations where specific functions occur, such as in-feed processing.

## Location Types

Specific types of locations can be defined to assist in establishing specific location information. This functionality is critical for items that may be removed from service for repair and sent to an external repair facility, etc. These types are typically defined during implementation.

Value	Description
COURIER	Courier Location
HOLDING	Holding Location
LABOR	Labor Location
OPERATING	Operating Location
REPAIR	Repair Location
SALVAGE	Salvage Location
VENDOR	Vendor Location

Figure 11: Location types

## Asset Details

The screen capture in Figure 12 displays the details for each specific asset. Parent assignment, priority or asset criticality assignment/identification, serial number and condition and failure information are established here.

Figure 12: Asset details

## Asset Priority

The goal of assigning asset priority or asset criticality is to prioritize the importance of the assets to the facility and the process. This, in conjunction with the work order priority, will assist maintenance planners in determining planning and scheduling priorities. Think of priorities/criticalities as the ultimate behavior driver; you respond immediately to the highest priority rankings first. It has also been found that identification and assignment of priorities takes the “passion” out of the maintenance decision process so it becomes a data-driven process.

Each asset should have a priority assigned. These priorities are based on the needs and mission of the facility or process where the asset resides.

## Meter Group

Meter groups allow for the establishment of meters to maintain the asset based on usage. Meters are typically expressed in hours, rotations, miles, etc. Basically, the configuration and initial setup of meters are the identification of hours, rotations or miles and the meter range (e.g., 1-XXXX-hours, rotations, or miles). There are two important aspects for making meter functionality work properly: establishing the range to determine the rollover point of the meter (e.g., 9,999.99 or 99,999.99) and collecting and entering the readings.

Meters are normally attached or read from the asset that provides the reading. It is common to establish a repetitive task (issued weekly) from the system to collect specific meter readings. Meter readings can be entered manually to each specific meter or, in some interfaced circumstances, directly uploaded from field data recorders. Maximum utilization of meters, where possible, should be considered to perform PM based on actual usage versus a repetitive calendar frequency that may cause unnecessary or over performance of a PM activity.

### Failure Class

Failure class allows for the building of failure hierarchies. These failure hierarchies ultimately allow for establishing problems, causes and remedies to assist in troubleshooting issues, identifying remedies and reporting on asset problems and causes. This failure class must be well defined so only specific problems, causes and remedies associated with specific asset classifications will be displayed. For example, if a pump failure class is established, only problems, causes and remedies specific to pumps would be displayed.

### Equipment Analysis Using Problem, Cause and Remedies

Through the utilization of the defined failure class and associated problems, causes and remedies, asset analysis functionality is available. However, most organizations do little or nothing with it.

A note of caution about these defined problem, cause and remedy codes: maintenance or reliability engineers feel the failure code is actually the failure mode, so grouping them by asset classification eliminates the utilization of some generic codes. They also feel to be successful, they must rely on the maintenance technician to identify the specific failure or mode (e.g., cause: the bearing seized; remedy: replaced the bearing). But, the determination of the cause is best left to a maintenance or reliability engineering function. Numerous factors must be investigated to determine what caused the bearing to fail (e.g., improper installation, improper lubrication, misalignment, overloading, brinelling, etc.). Without failure analysis, time and education, an average maintenance technician will not know the true root cause of the failure.

Once established within the system, these codes collect what failed, what caused the failure and what action was required to fix the failure. Keep this in mind when establishing your asset classifications to ensure you can take advantage of this functionality. This information is only available if all activities are captured on work order entries, completions and the utilization of the appropriate codes by the organization.

#### Centrifugal Pump Failure Class

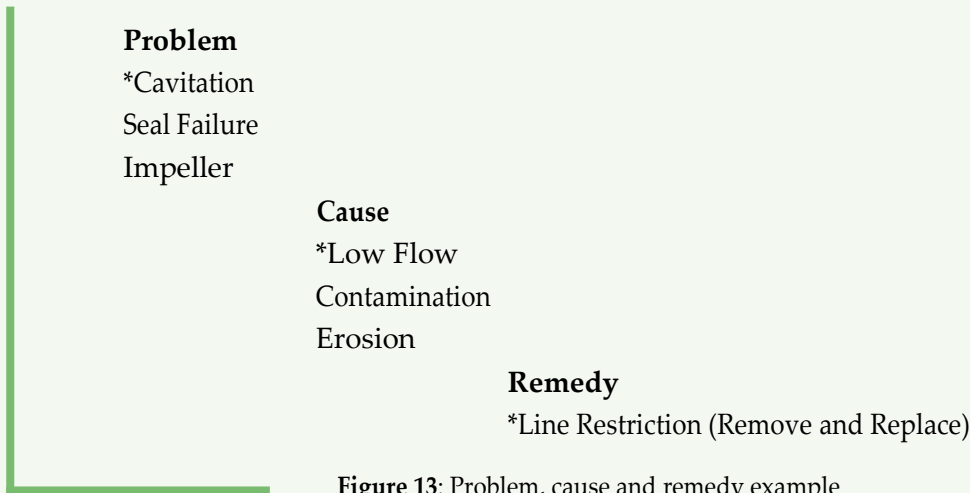


Figure 13: Problem, cause and remedy example

As you complete the current transition of retiring maintenance resources and establishing their replacements, this information can be invaluable to an organization since it is based on historical events of the equipment at your site. When developing these tables, think of the end user and do not overdevelop and make it difficult to provide the correct information. The easier it is to get this data in the system, the more likely it will get entered. The intent of this information is to understand problems and their causes, not finger-pointing, otherwise you'll collect misinformation.



## Problems

These are typical problems that exist throughout a site or facility. Figure 14 is an example only; you must define your problems based on the assets at your site.

Problem	Problem Description
Bad Connection	Unable to make connection
Breaker Trips	Circuit breaker trips when utilizing asset
Can't Start	Equipment will not start
Jammed	Product jammed, unable to operate
Product Leak	Product leaks while operating
Out of Adjustment	Unable to adjust to operate at rated flow, speed, etc.
Instrument Failure	Instrument (speed, pressure, temperature, etc.) not functioning
Failure to Stop	Equipment does not stop when shut down
Erratic Operation	Equipment operates erratically when in use

Figure 14: Problem example

## Causes

These are typical causes of failures throughout a site or facility. Figure 15 is an example only; you must define your causes.

Cause	Cause Description
Improper Operation	Induced by improper asset operation
Improper Maintenance	Induced by improper maintenance activity
Design Defect	Induced by an engineering design defect
Parts Defect (typically occurs shortly after a new part is installed)	Induced by a parts defect or failure; ensure it is a parts defect and not an improper maintenance defect
Lubrication	Induced by lack of, improper, or over lubrication
Unbalance	Induced by excessive vibration due to equipment not being properly balanced
Alignment	Induced by severe misalignment
Worn (beyond life)	Induced by equipment, component, or part being worn beyond its useful life
Improper Usage	Induced by improper equipment or component usage that exceeds operational parameters (i.e., ratings exceeded) or equipment utilized for unintended purposes

Figure 15: Cause example

## Remedies

These are typical remedies throughout a site or facility to address work accomplished on a work order. Figure 16 is an example only; you must define the remedies applicable to the equipment at your site.

Remedy	Remedy Description
Replaced	Item, material, or part was replaced with like item from the materials management function; these items could be certified rebuilt items issued from the storeroom
Repaired	Item, material, or part was repaired but not replaced with a new or rebuilt item
Temporary Repair	A temporary repair was performed due to parts, materials, or labor availability; the action taken informs the maintenance planner that a new work order must be established, planned and scheduled for future permanent repair
Cleaned	The removal of debris and foreign matter (e.g., product, dust, dirt, grease, etc.) that has or may have an impact on the reliable operation of equipment or may be environmental related
Adjusted	An adjustment was made to ensure the equipment was/is operating at normal operating conditions; adjustments could be speed, pressure, flow, temperature, etc.
Inspected	The visual inspection in the performance of a PM activity; the action taken is only utilized and associated with the PM work order type
Deferred	The deferment or non-performance of a PM activity that has been scheduled but not performed due to equipment or labor availability
Lubricated	The application of lubrication, typically performed by lubrication technicians

Figure 16: Remedy example

### Asset Purchase Information

This is where information specific to the initial purchase of the asset is established. This information assists the organization with the repair versus replace decision. As activities to maintain the asset are accomplished through the work order system, labor and material costs are captured.

The screenshot displays the 'Purchase Information' and 'Costs' sections of the Maximo Asset Management interface. The 'Purchase Information' section includes fields for Vendor, Manufacturer, Installation Date, Purchase Price, Replacement Cost, and PO. The 'Costs' section includes Total Cost, YTD Cost, Budgeted, and Inventory, all showing 0.00.

Figure 17: Purchase information

### Manufacturers

This often overlooked table is of extreme value if you want to have the capabilities to determine by manufacturer which assets costs more, require more maintenance, or fail quicker (MTBF). Unfortunately, most organizations do not populate this field or when they do, standards are not defined and they are riddled with duplicate manufacturers. Take full advantage of this capability, but structure it by establishing standards and controlling who can add or modify the values. And remember, spaces should be avoided.

Here’s an example of why standardization is important using Allen-Bradley as the manufacturer. Imagine all the creative ways to establish it as a manufacturer:

Allen Bradley   Allen-Bradley   Al-Brad   A/B   AB   A-B

### Asset Specifications

This is where specific asset classifications and specifications (i.e., nameplate data) are established.

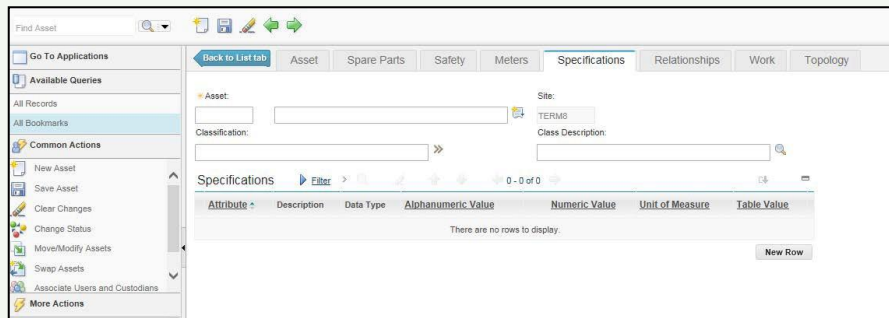


Figure 18: Asset specifications

### Asset Classifications

Asset classifications can be the most powerful sort and search capabilities of a system. It allows for groupings of like items for assignment of master tasks or procedures and searching and sorting items both vertically and horizontally within the database for detailed analysis. These fields must be defined during implementation. This is also commonly called asset type or equipment type. Additionally associated specifications are established for each classification. For example, specifications identified for centrifugal pumps would display for each centrifugal pump.

If you think of a typical asset type, such as a pump, it describes what type of asset it is. However, there could be various types of pumps within a facility. However, one of the capabilities of this field is the assignment of master tasks. An asset type of “pump” does not clearly identify the type of pump (e.g., centrifugal, positive displacement, etc.) and a search of “pump” would show all pumps. Instead, consider utilizing classification and class description, as shown in Figure 19.

Classification	Class Description
PUMP-C	Centrifugal Pump
PUMP-D	Diaphragm Pump
PUMP-P	Positive Displacement Pump
PUMP-V	Vacuum Pump
PUMP-S	Sump Pump

Figure 19: Classification example

These classifications and specifications are typically defined and established at implementation. The specifications (e.g., nameplates or attributes data) are linked to the classification, so when you utilize a specific classification, the accompanying data template becomes available. Some typical items that have associated classes are motors, conveyors, instruments, etc. It’s important to develop classifications and specifications, but do not overdevelop with unnecessary data requirements.

### Specifications/Attributes

One of the largest data collection efforts of an implementation is the collection of nameplate information, equipment specifications, or attributes. A majority of this information is located on the equipment and must be collected in the field. Most times, the information is never established or is over identified and contains unnecessary information. Prior to conducting this data collection effort, a few things must be established.

Identification of what will be collected is the logical starting point, yet there must be some rationale applied to ensure only the necessary data is collected. When trying to establish what must be collected, ask yourself these two questions:

1. What must be known to identify the appropriate maintenance strategy?
2. What must be known to order a replacement?

For example, if you ask the above questions about a motor to identify a maintenance strategy, the response to Question 1 would establish that horsepower, drive type (e.g., chain, direct drive, or belt) and lubrication requirements are necessary. From this, it could be determined that the horsepower falls below the required level for resistance testing. It was belt driven, so belt and motor inspections are required. Also, it is a lubricated motor that requires lubrication at some frequency.

In addressing Question 2, horsepower, RPM, frame size, enclosure, volts and amps would be required information to order a replacement. From this information, materials management or buyers could quickly identify suitable vendors for future purchasing requirements.

Templates or tables must be developed for each specification that will be established within the system. These templates are linked to the asset by the associated classification. In the case of the motor example, it would appear in a template as shown in Figure 20.

AC Motor Specification Attributes	
Horsepower	25
RPM	1800
Drive Type	BELT (B-52 X 3)
Lubrication	SHC 100 LITHIUM GREASE
Frame Size	256T
Enclosure	TEFC
Volts	230/460
AMPS	25.6/12.8

Figure 20: AC motor specification attributes example

Once all specifications are defined, a data collection sheet can be developed and utilized to conduct the activity in the field. This is also the best way to validate that the asset is in service and the location is correct, as well as collect the manufacturer, model and serial number information.

### Data Collection Sheet

EQUIPMENT NUMBER \_\_\_\_\_ EQUIPMENT LOCATION \_\_\_\_\_

DESCRIPTION \_\_\_\_\_

PARENT EQUIPMENT \_\_\_\_\_

MFR \_\_\_\_\_ MODEL \_\_\_\_\_ SERIAL \_\_\_\_\_

**MOTOR (AC)**

HORSEPOWER \_\_\_\_\_ FRAME SIZE \_\_\_\_\_ VOLTS \_\_\_\_\_ AMPS \_\_\_\_\_ RPM \_\_\_\_\_

ENCLOSURE \_\_\_\_\_ LUBRICATION REQUIRED YES NO LUBE TYPE \_\_\_\_\_

DRIVE TYPE \_\_\_\_\_ ADDITIONAL COMMENTS \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 21: Data collection sheet example

### Hazards/Precautions

Maximo® has the capabilities to establish safety notes, hazards, or precautions linked to the assets you have identified. Most times, this information is selected during implementation as view only, or each time a work order is issued it prints with the work order. Keep in mind that once established with information, the data must be routinely audited for accuracy. To ensure you have a better chance of remembering to audit if utilizing these informational fields, establish a repetitive task at some assigned frequency to conduct auditing and modify the notes, hazards and precautions as necessary.

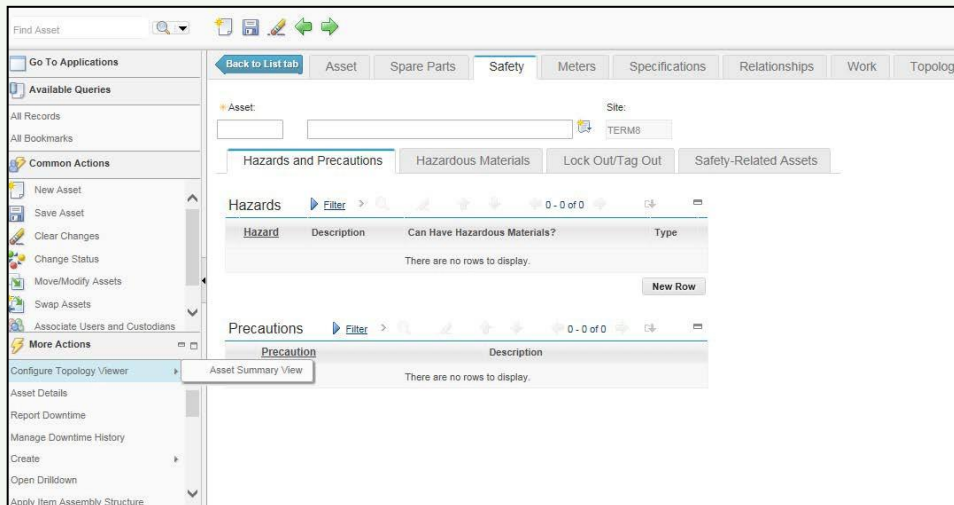


Figure 22: Hazards and precautions

### Equipment History

A final thought... The rationale for having Maximo® is to have a historical reference associated with each asset established within the hierarchy. That historical reference is from all **completed** work orders that were assigned to that asset. For this reason alone, it is imperative that assets are "tagged" to ensure accurate and appropriate history is collected

and **all work** is captured to a work order. Routine reviews of the historical work orders should be conducted to identify repetitive failures, MTBF and refinement of the PM program.

The collection of this history should be monitored to ensure an accumulation of work orders does not impact system performance. It is recommended to keep the previous two years and the current year active and archive the remainder. Archived history can quickly be retrieved when needed.

Obviously, there are other data fields or system features associated with the assets. This document addresses the minimum fields and areas that must be defined, populated and trained to the end users to ensure usable historical information is collected and meaningful asset and maintenance decisions can be made. From these foundational elements, valid asset data can be collected, reported and analyzed.



## Meet the Author



Dave Bertolini is a Managing Principal for People and Processes, Inc., a firm that specializes in changing cultures from reactive to proactive through the optimization of people and processes. He has more than thirty-five years of experience in improvement initiatives.

As the author of “CMMS Explained Made Simple” (1st and 2nd edition), he is routinely sought out by organizations for system advice and guidance.

His certification as a Reliability Leader (CRL), Master Instructor and Seminar Leader has led to his involvement in over three hundred and seventy-five improvement initiatives and computerized maintenance management system (CMMS) implementations, utilizing thirty-nine different software packages. He has conducted numerous CMMS needs analysis and CMMS selections for facilities, municipalities and manufacturing environments. In addition, he routinely conducts educational seminars on CMMS selection, request for proposal (RFP) development and avoiding CMMS implementation failures. He routinely is a speaker at the CMMS/EAM Conference and the International Maintenance Conference and has numerous articles published in trade publications for facilities, municipalities and manufacturing plants.

His satisfied clients include Alcatel-Lucent, Procter & Gamble, Motorola, Uniroyal, DirecTV, Ainsworth Engineered, Lockheed Martin, City of Akron, City of South Bend, Old World Industries, Ohio State University, J.M. Huber Corporation, Rayonier, Cornell University, Georgia-Pacific, Northrop Grumman Corporation, PCS Phosphate White Springs, C.H. Guenther & Son Inc., Trinity Industries and Latrobe Specialty Metals.

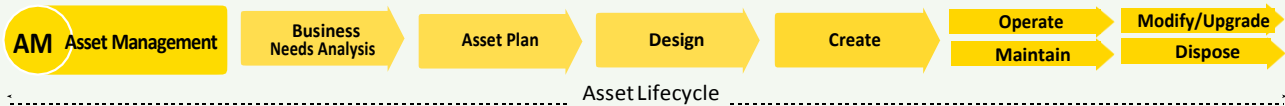
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# uptime® Elements™

A Reliability System For Asset Performance Management



Reliabilityweb.com's Asset Management Timeline



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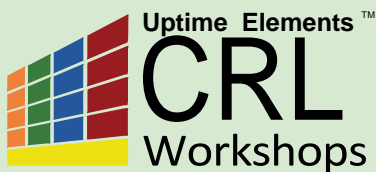
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MaximoWorld is the conference for those using or considering Maximo for their CMMS. This focused event is designed to share and discover best practices in asset management using Maximo, create a connection between Maximo owners and functional users, support existing Maximo communities of practice and user groups, and provide the opportunity to connect with world-class Maximo Solution Providers.



Delivered at the Reliability Leadership Institute™ learning center in Fort Myers, Florida or brought to your location, this course amplifies the lessons from the Certified Reliability Leader™ (CRL) Body of Knowledge with practical exercises, group work, peer discussions and expert instructor facilitation. The promise of this live course is that you will leave this course Being a Reliability Leader and Exercising Reliability Leadership as natural self-expression.



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