Do You Know Where Your Assets Are?

Locating & Tracking Assets in Real Time

by David Berger, Director
Western Management Consultants

Western Management Consultants ®

INTRODUCTION

One of the many outcomes associated with our obsession with new and improved technology, is that assets are becoming smarter, more complex, and ultimately more costly. In almost every sector around the globe, this trend has increased our dependence on more sophisticated assets in order to stay relevant and compete effectively. Even industries with a long history of labour-intensive operations have experienced a dramatic transformation resulting in people replaced or heavily supported by automation. North American mining companies, for example, have replaced miners wielding pickaxes and shovels in hostile work environments, with advanced mobile equipment operated by a single operator perched in an air-conditioned cab, or even controlled remotely due to safety concerns.

Not surprisingly, the growing importance, risk, quantity, and/or cost of corporate assets have sparked a corresponding rise in interest by management to better maintain control of their assets. Governments, regulatory bodies, shareholders, and other key stakeholder groups have increased pressure on companies in both the public and private sectors to be able to locate and track the whereabouts of assets. 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. Furthermore, as technology improves and costs decrease for sensors, readers, and software, the business case for implementing a real-time asset tracking system becomes substantially more attractive.

So, do you know where your assets are? This white paper provides management with some insight into how to

1. identify the need for asset locating and tracking,
2. manage the complexity arising from the myriad of options available to satisfy your needs, and
3. build a business case cost-justifying the most appropriate solution.

As well, a number of examples are provided from a wide-cross-section of industries, where companies have successfully implemented real-time asset locating and tracking systems for considerable gain.

TABLE OF CONTENTS

LIST OF TABLES

WHAT IS REAL-TIME ASSET LOCATING AND TRACKING?

A real-time asset locating and tracking system allows users to find an asset at any given point in time, and monitor its movements. The "locating" of an asset refers to how the system determines the current position of an asset, depicted approximately or exactly in a number of possible ways depending on need, including

- a point on a drawing or map,
- within an area on a drawing or map,
- a point described by spatial coordinates such as latitude/longitude, GIS, x y z, aisle / shelf / bin number, etc.,
- within an area bounded by spatial coordinates, and
- relative to a fixed and recognizable reference point, such as "on the 4th floor", "in Room A113", or "12 feet north and 6 feet west of Mile Post #27".

For example, in the Health Care industry, there are a number of pieces of equipment that are expensive but quite portable, such as defibrillators, electrocardiograms, infusion pumps, and fetal monitors. A real-time asset locating system can be instrumental in quickly pinpointing a specific serialized asset or class of equipment, in order to ensure its availability when and where it is needed.

The "tracking" of an asset refers to how the system monitors and stores all changes to an asset's position over time. The level of granularity required for specific time intervals and position accuracy will vary depending on user needs and system capability, such as

- a line on a map showing the path taken by the asset over a user-specified time period,
- a table showing when and where the asset was detected over a user-specified time period (eg, in Room A113 from 9:32 am to 10:40 am; then in Room B224 from 11:15 am to 2:00 pm, etc.), and
- a table or graph showing the asset position at regular time intervals, where the user can specify start time, finish time and time interval (eg, every hour from noon on June 3rd to midnight on June 5th).

An example of where tracking an asset might be useful is on a construction site. There are many expensive assets such as a compressor or power drill that might go missing onsite or disappear off the site. By tracking the movements of the asset over time, it may be possible to piece together what happened to the asset and who is responsible, especially when coordinated with a time and attendance system, security sign-in, and/or security camera archives.

In some cases, it is useful for users to have both an asset locating and tracking system. For example, companies with assets containing radioactive materials may want to know where the asset is located at any given time for security reasons, but also track where it has been for possible health and safety ramifications.

SOME DEFINITIONS

Given that commercially-available versions of real-time locating and tracking systems are relatively new (ie, just over a decade), it is not surprising that there is a lot of confusion and lack of standardization in the marketplace. There are numerous vendors in this space selling sensors, readers, control software, end-user applications and add-ons, hardware, and complete solutions. Facing growing competition and in the absence of well-entrenched industry standards, vendors are scrambling to build market share and establish themselves as industry leaders. This has led to a proliferation of terms that may mean slightly different things to different vendors and users, such as

- Real-time location tracking
- Real-time asset location
- Real-time asset location and tracking
- Real-time asset management
- Real asset management
- Remote asset management
- Returnable asset management
- Asset tracking system
- Real-time asset location systems
- Real-time location services
- Local positioning systems

There are many more variations on these terms, complete with corresponding three and four-letter acronyms. Some vendors have even adopted some of these terms as the name of their company. The good news is that some standards have been established through cooperation of some of the larger vendors, industry associations, and standards organizations such as the International Standards Organization (ISO), but much work remains. One of the most respected industry standards is provided through referencing ISO's JTC1 SC31 and the related ISO 24730, which defines the term "Real-Time Locating System" as paraphrased and summarized below.

Real-Time Locating System (RTLS) – wireless-based hardware & real-time software combined to provide on a continuous basis, the position of an asset or resource equipped with sensors.

Note that RTLS is relevant to locating not only assets meaning physical equipment and components, but any resource that can carry a sensor for locating, such as parts, human resources, livestock, finished goods, containers, and so on. The focus of this white paper is on tracking longer-life, maintainable assets that would appear on the Asset Master Listing of a Computerized Maintenance Management System (CMMS) or Enterprise Asset Management (EAM) system. In fact, a few of the more advanced CMMS/EAM packages have developed a fully-integrated module providing real-time asset locating and tracking capability. Others work with partners to deliver the functionality. Regardless, users should look to integrate their CMMS/EAM with real-time asset locating and tracking in a manner that is seamless, consistent and intuitive, in order to maximize return on investment.

IS IT RIGHT FOR YOU?

Several companies have quickly identified a need for real-time asset locating and tracking systems and have already benefited substantially. But some companies are unaware of the nature or even existence of these systems, or they are struggling to determine applicability and cost/benefit. The following provides a logical approach to determining whether a real-time asset locating and tracking system may be right for you:

1. Do you have moveable physical assets that you maintain over the longer term?

If you use your CMMS/EAM to issue demand or preventive maintenance work orders in order to maintain a given asset or component, and that asset or component moves (eg, mobile or portable equipment) or can be moved (eg, misplaced or stolen equipment), then a locating / tracking system for those assets or components might be right for you.

2. What are the consequences if these assets cannot be located?

If the consequences of not knowing the whereabouts of your moveable assets are negligible, then an asset locating system is probably not right for you. However, the greater the consequences in terms of legal, regulatory compliance, safety, health, environmental, security, privacy, customer service, product quality, competitiveness, financial, and other impacts, the more likely a real-time asset locating and tracking system is right for you. Think about what has happened in the past when these assets were difficult to find, moved to a restricted location, or were lost altogether. If this has never happened, think of the consequences if it were to occur. For example, in a hospital, although a single defibrillator is not terribly expensive, being unable to locate one fast enough may result in catastrophic consequences such as the death of a patient.

3. What is the quantity of these assets?

The greater the quantity of assets whose temporary or permanent disappearance would have material consequences, the easier it will be to cost-justify an asset locating system. Even if the consequence of one missing asset is relatively small, such as a maintainable container used for material handling, if you have several hundred or thousand of these assets, the total payback may justify the expense of a locating system.

4. What is the probability that these assets cannot be located?

The higher the probability that these assets cannot be located, the greater is the potential payback of an asset locating system. For example, mining companies doing business in the third world, know only too well how much greater the probability of “losing” equipment and components to the black market is compared to similar operations in remote locations of North America. However, probability is inversely proportional to the consequences. In other words, if the consequences are very high, even if the probability is somewhat low, a locating system may be cost-justifiable. For example, as the impact of losing an asset approaches catastrophic consequences, such as not

knowing the whereabouts of top secret military equipment, the lower the probability needed to cost-justify a real-time asset locating and tracking system.

5. What is the potential savings or cost avoidance in locating/tracking these assets?

For many companies, this is the hard part. Potential savings can be calculated in a number of ways, including the following:

- *direct savings based on real data*, such as an average loss of $200,000 over the past three years, in labour productivity and actual production due to inability to locate a critical component, calibration instrument, test equipment, fixture or jig, etc.
- *estimated through anecdotal evidence*, such as a reported theft from a competitor company of nuclear test equipment worth $10,000, where the equipment was never recovered
- *approximated using sensitivity analysis*, such as estimating that every 1% improvement in utilization of baggage handling containers or carts in an airport, translates into $30,000 in savings from a reduced need for extra carts in so many locations just in case someone comes searching for one

For each eligible asset, it is important to determine the most appropriate impact(s) and not just focus on the financial business case. If necessary and feasible, some of these impacts can be translated into financial consequences, such as the cost of workers compensation and/or lost productivity if a worker is injured because of a missing safety-related asset. Another example is the hefty fine that may be imposed by regulatory bodies conducting an audit and finding critical safety equipment missing or in an improper location.

Sometimes, non-financial impacts easily trump weak financial business cases, depending on the needs and concerns of senior management. Examples include the threat of competitive piracy if a critical asset should fall into the wrong hands, or unfavourable media exposure if key assets go astray such as computer equipment carrying valuable or confidential data. The key is to define success for the project both quantitatively and qualitatively, for a number of impacts like financial, customer, employee, and risk management.

6. Do the benefits justify the cost of locating and tracking these assets?

Once the impacts are clear, the next step is to determine the feasibility and cost of alternative solutions. Look for technology options and vendor partnerships that maximize such things as follows:

Technology Options

- Flexibility and scalability to handle changing business needs
- Ease of implementation
- Intuitive user interface

- Reliability and performance of the system
- Standards-based tools and open systems

Vendor Partnerships

- High-quality, easily-accessible vendor services such as support, maintenance, upgrades, and training
- Standard but flexible implementation methodology
- Knowledge of industry best practices
- Proven track record
- Complete solution development / integration

Once a list of key criteria has been finalized, stakeholders in the proposed asset locating and tracking system should score alternative solutions by multiplying the importance weighting of each criteria by the rating for each technical option. Be careful not to focus on simply finding the lowest cost or best-fit technical solution. As well, return to your definition of success for this project in terms of desired impacts, and determine which alternative solution is most likely to provide favourable results.

For example, suppose an aerospace manufacturer is looking at technology options for ensuring the right assets and tools are in the right location at the right time, in order to have a smooth, planned shutdown with minimal disruption to production, maximum utilization and efficiency of maintenance personnel, and a safe working environment. In scouring the marketplace for alternative solutions, suppose four technology options from three possible vendors are determined to be viable. Table 1 provides a high-level summary of a sample cost/benefit analysis and decision matrix.

TABLE 1: SAMPLE COST/BENEFIT ANALYSIS & DECISION MATRIX

Criteria	Weight (1-10)	Tech Option A Vendor 1		Tech Option B Vendor 1		Tech Option C Vendor 2		Tech Option D Vendor 3	
		Rating (1-10)	*Wt x Rtg*	*Rating (1-10)*	*Wt x Rtg*	*Rating (1-10)*	*Wt x Rtg*	*Rating (1-10)*	*Wt x Rtg*
Technical Requirements									
Seamless CMMS/EAM integration	9	9	81	10	90	5	45	1	9
Flexible & scalable	7	3	21	7	49	2	14	8	56
Real-time location graphics & analytics	8	7	56	9	72	3	24	6	48
Intuitive user interface	10	9	90	8	80	8	80	4	40
Reliable & accurate system performance	10	8	80	9	90	7	70	6	60
Standards-based tools and open systems	6	4	24	6	36	8	48	7	42
Vendor Requirements									
Proven track record	8	9	72	9	72	6	48	7	56
Standard but flexible implementation methodology	7	7	49	5	35	8	56	4	28
Knowledge of industry best practices	5	6	30	6	30	9	45	5	25
Complete solution development / integration	7	8	56	9	63	5	35	9	63
High-quality, easily-accessible vendor services	9	8	72	8	72	4	36	9	81
Financial health / market success	8	9	72	9	72	3	24	6	48
References	9	6	54	8	72	7	63	8	72
One-time Costs									
Hardware/Software/Tags	5	5	25	10	50	4	20	2	10
Implementation	5	10	50	8	40	9	45	7	35
On-going Costs									
Maintenance and support	6	7	42	9	54	6	36	9	54
Telecommunications	6	7	42	8	48	5	30	6	36
Benefits									
Impact on production	9	8	72	7	63	5	45	5	45
Impact on maintenance	8	7	56	8	64	6	48	9	72
Impact on safety	10	8	80	9	90	8	80	7	70
Financial Payback									
(Annual savings - Annual costs)/ One-time costs	10	7	70	10	100	6	60	8	80
TOTALS:			1194		**1342**		952		1030

TECHNOLOGY OPTIONS

There are three key components to a real-time asset locating and tracking system, including

1. Sensors
2. Readers
3. Real-time asset locating and tracking software

Options for each of these components are described below.

1. Sensors

In order to determine its position, an asset must carry a unique, readable identifier such as a barcode label, Radio-Frequency Identification (RFID) tag, or Global Positioning Systems (GPS) device. There are numerous variations on these themes depending on the size, shape and composition of the asset, as well as environmental conditions and the intended application. For example, tracking the utilization and location of a calibration instrument as it moves from one room to the next in a manufacturing facility, requires a very different sensor than that used for tracking the usage and exact location of a bus for a transportation company.

Tags can be made from a variety of materials such as paper, plastic or metal, and are typically riveted or glued onto the asset. A simple rule of thumb is that the tag should be at least as rugged and last as long as the asset it is on. Barcode labels have been around for more than 30 years, are significantly cheaper than other tags, and can be easily printed from many software applications. RFID technology has been around for at least as long, however, the price point has remained high until recently. As the price of tags and readers falls, RFID technology is growing in popularity due to some distinct advantages. RFID tags can carry more information within its embedded chip than a simple barcode label, and the information can be easily updated.

One of the most important differentiators of the RFID technology is that it does not require a direct line of sight with the reader. A barcode label must pass in front of a scanner in order to be read, but an RFID tag can be read regardless of location, orientation, and movement, assuming readers are placed within range. In addition, RFID tags can be read even when covered with dirt, paper, or paint that interrupt the line of sight. Thus, at any point in time, readers can determine the exact location of all RFID-tagged assets within a given room regardless of positioning.

There are two types of RFID tags, namely, passive and active. Passive tags can be read from a distance of up to about 15 feet. Active tags carry a small battery in order to emit a signal thereby boosting read range to more than 300 feet. For multi-tag reading, active readers recognize up to 10 times as many tags, even if the assets are moving at speeds approaching 100 mph. Passive readers can recognize up to several hundred tags at the same time. As well, active tags can enable continuous tracking of position, while passive tags allow the capture of a “last seen” position. Finally, active tags can store up to about 128 Kb of data, compared to passive tags which store upwards of 16 Kb of data. Some active tags will allow advanced search and other database functions.

Ruggedized passive tags are typically priced in the range of $3 – $5, while simple paper RFID tags can be less than $0.10 each when purchased in huge quantities. Paper tags are the favoured tags in the retail and manufacturing sectors for supply chain applications, such as identifying inventory on shelves or moving through production, ensuring order accuracy for receiving and shipping, quickly identifying items on pallets or trucks, scanning purchases at a retail checkout, and so on.

Active tags use different technologies for emitting signals. Ultrasonic tags are ideal for a closed room such as in a hospital, because greater accuracy can be achieved from lower-wavelength waves that bounce off the wall rather than going through them. These devices cost about $30 each. Similarly, infra-red technology works well in a closed room because waves do not penetrate walls. Ultra-wide band technology is designed for plants, ships, and vehicles that contain a lot of metal, which can interfere with radio frequency (RF) signals. Tags are priced in the range of $80 – $90.

At $200+ per device, the most expensive sensory technology for asset locating and tracking is GPS. This is because tags require an uplink to tell satellites where they are located. These devices are useful and more cost-effective when relatively expensive assets are travelling greater distances or outside of a confined work site.

For example, specialized, returnable containers costing up to $1,000 each or more are used throughout the auto industry. Potentially millions of these containers move in a closed loop system, and roughly 10% are “lost” each year. An asset locating and tracking system can provide insight into what happens with these containers, how long they stay at a given location, when to expect them to return, and whether there is enough inventory to meet production needs. This not only reduces potential loss through better tracking, but improves utilization by extending the time containers are carrying product rather than sitting empty. Furthermore, the cost of buying additional containers can be avoided because existing containers can be better managed, and suppliers can be held accountable for loss, damage, and excess inventory.

2. Readers

Barcode labels and passive RFID tags require a choke point, ie, a location where a label or tag is read or “last seen”, such as at an access door or at a key point in a conveyor system. Passive RFID tag readers send a signal to the tag, thereby stimulating the tag long enough to emit its ID and any other data. Infrastructure costs for passive readers are about $1,000 – $2,000 for a specialized base unit, plus antennas that are priced at about $250 each. For example, if one of your checkpoints for asset tracking is at a dock door, you might place two antennas on each side of the door, and connect all four to one reader. The range on a passive antenna is about 10-15 feet, but in practice, the read rate accuracy is far superior at about 3-5 feet. The system can be fine-tuned by adjusting the attenuation or power of each antenna, as well as antenna orientation and configuration.

Active readers are more often referred to as “active receivers” as they simply receive the signal from the active tags, unlike passive readers which both emit and receive. Active tags do not require a choke point. Instead, they employ alternative coverage models with increasingly more accurate location information as follows:

- 1 active receiver can tell that the tag is present
- 2 receivers can tell on what line
- 3 receivers can triangulate
- 4 receivers can determine coordinates in 3 dimensions

Some vendors offer specialized receivers that effectively contain multiple small receivers. This allows for greater accuracy from a single, physical receiver.

The range of active receivers is up to approximately 3,200 feet for locating tags, assuming no interference or obstructions to line of site. WiFi technology can be used, but at least double or triple the coverage of a typical WiFi data network is required for triangulation. Multiple receivers are connected into a centralized hub, either wired or wireless. Systems are priced at about $500 - $1,000 per receiver, plus about $5,000 - $15,000 in additional hardware for the hub which acts as the location engine and concentrator for raw location data. Some hardware vendors charge more for their receivers and less for concentrators, and some vice versa.

Many asset locating and tracking applications use active systems because the location information is real time and more accurate. This is important for expensive assets and personnel safety requirements. While active or passive systems can both be used for asset locating and tracking, passive systems are often used for higher-volume, less-expensive items, such as office furniture, simple carts or small tools. Mixed active / passive systems are also possible, for example, when a company requires tracking within and between plants or buildings.

3. Real-time asset locating and tracking software

Data flows from the reader in a passive ID system, or concentrator in an active ID system, to middleware software that interprets and does first-line analysis of the data including

- Monitoring of the asset location,
- Zone management,
- Event processing (eg, alerts),
- Integration with lower and higher level systems (eg, sensors, CMMS/EAM),
- Logic / quality control (eg, business rules for what information to read when, data editing & consistency checking, removal of duplicate events or tag reads, smoothing), and
- User interface.

The same middleware application can be configured to provide multiple solutions to multiple problems for multiple industries. Examples are described briefly in Table 2. There are two key attributes that may cause a solution to be quite different, even though the basic logic is very

similar. These attributes illustrate the complexities in finding the right asset locating and tracking solution.

The first attribute is sensor choice. Different sensors may be required for different implementations of the same logical solution. In general, sensor choice is dictated by the solution requirements for environmental conditions (eg, harsh outdoor environment versus indoor clean room), location precision (eg, within a room versus within a foot), and the rate of location update (eg, daily versus sub-second readings). The second key attribute is that detailed or low-level use cases will almost certainly vary by customer and installation.

Look for middleware that provides maximum flexibility and scalability as your business needs change. For example, look for a software solution that can accept a wide range of sensors with different configurations that can accommodate exponential growth if necessary. Explore software solutions that use open interfaces and incorporate cost-effective technology, such as web-based software, web services and cloud computing. Another key criterion is that the middleware solution should be non-proprietary; otherwise, you are locked into one vendor which may not satisfy all of your future needs.

TABLE 2: SAMPLE MIDDLEWARE SOLUTIONS & BENEFITS

Problem	Sample Solution	Typical Benefits
Asset Locating (ie, determining the position of an asset)	**- Health Care:** find whereabouts of expensive assets (eg, wheelchairs, beds, diagnostic equipment, defibrillator) in a hospital **- IT:** determine location of key computer equipment such as laptops, monitors, UPS, portable drives, etc. **- Mining:** determine whereabouts of equipment due for repair	- 5-10% less time spent searching for assets - 5-10% greater asset usage - 5-10% fewer emergencies as proper equipment available (eg, safety) - improved internal/external customer experience
Asset Loss Prevention (ie, ensuring assets always accounted for)	**- Automotive:** account for inventory of returnable containers **- Health Care:** minimize number of times high-value mobile assets leave the building **- Construction:** ensure expensive tools do not leave the worksite	- 10-20% fewer assets needed or decreased asset rental costs for replacement - 25-40% fewer returnable containers lost/replaced
Asset in Wrong Location (ie, preventing assets from moving to restricted or suboptimal location)	**- Process Manufacturing:** ensure assets remain within designated areas **- Oil Refinery:** ensure approved assets (ie, "intrinsically safe") are allowed into certain zones	- prevents catastrophic failure such as explosion - prevents breach of security - ensures the right asset is available for a job
Asset Underutilized (ie, asset sitting idle excessively)	**- Manufacturing:** Track utilization of special tools, AGV's, calibration equipment, etc. to determine when and where a given type/quantity of assets needed **- Health Care:** Track utilization of high-value assets (eg, defibrillators)	- tracking maintainer vehicles can improve utilization and ultimately productivity by 20-30% - better utilized assets = less need for new assets
Asset Configuration (ie, ensure correct matching of components / assets)	**- Fleet Services:** ensure the right components are placed in the right vehicles **- Oil & Gas:** ensure components reassembled and accounted for during an outage	- avoids asset failure due to mismatch - increases labour productivity through reduced rework
Asset Status (ie, determine if asset is in / out of service)	**- Oil & Gas:** determine which equipment is operational, in for repair, out of service or disposed **- Facilities:** determine if emergency safety equipment was ever moved / used (eg, fire extinguisher) **- Fleet Services:** track status of non-operational vehicles	- increases PM compliance - ensures safety compliance and reduces lost-time accidents - improves accuracy of equipment status, spares ratio and asset availability
Asset Par Level Management (ie, determine if required no. / type of assets available)	**- Health Care:** ensure Operating Room has all required equipment prior to procedure **- Airport:** ensure adequate type / quantities of baggage carts available by location	- 5-10% less time spent searching for assets - 5-10% greater asset usage - 5-10% fewer emergencies as proper equipment available (eg, safety) - improved internal/external customer experience
Asset Tracking & Reporting (ie, determining the history of where an asset has been and for how long)	**- Casino:** track movement of money carts for audit purposes **- Manufacturing:** track cycle time for material handling containers **- Fleet Services:** ensure assets or components are used according to aged inventory, in order to optimize warranty recovery	- increased traceability and auditability - reduced deficiencies on regulatory audits

CMMS/EAM SYSTEM INTEGRATION

In order to extract the greatest value from a real-time asset locating and tracking system, the key is seamless integration with a CMMS/EAM system. Some of the more sophisticated CMMS/EAM systems today can easily handle assets from all classes, throughout the entire asset lifecycle (see Exhibits 1 & 2 below), and across the enterprise. This brings tremendous power to users trying to track their assets.

Exhibit 1: Asset Classes

Facilities (eg, University, Real Estate, Airport)

Equipment (eg, Health Care, Manufacturing, Defense)

Infrastructure (eg, Telecom, Pipeline, Municipality)

Mobile/Fleet (eg, Trucking, Transit, Mining)

Information Technology (eg, Bank, Data Centre, Lab)

Exhibit 2: Asset Lifecycle

The more advanced CMMS/EAM vendors are able to enhance your real-time asset locating and tracking capability with the following additional features:

- Coupling asset locating with condition monitoring on the CMMS/EAM system allows maintainers to quickly find and fix assets when a condition triggers an alert, and notifies operators that the asset is available once the work is completed (eg, oil pressure low on mobile equipment)

- Asset locating/tracking middleware can trigger an alert based on business rules, but with CMMS/EAM system integration, alerts can further trigger work orders for preventive maintenance, repair, and inventory-related transactions (eg, trigger a request to re-stock when assets are depleted from a designated area, such as baggage carts in an airport)

- The most sophisticated CMMS/EAM systems have built-in workflow engines which can further enhance users' ability to respond appropriately to very specific location-related business events and exceptions (eg, alerting management if a maintainer enters a confined space without proper safety equipment, or if an asset enters a restricted zone)

- CMMS/EAM systems offer impressive reporting, graphics, GIS mapping, drawing, business intelligence, and dashboard tools for enhancing the visualization of real-time locations (eg, showing real-time asset locations on a map or drawing, with distinguishing colours or features that symbolize say, current asset condition, asset utilization, or an alarm for passing into a restricted zone)

- Analytical tools within the better CMMS/EAM systems are critical to evaluate asset locating data relevant to KPI targets, in terms of equipment inventory, status, utilization, exception handling, and asset optimization (eg, correlating excessive mobile equipment failures with say, recent increased activity in more humid or hostile environments)

Thus, an asset locating and tracking application is a natural extension of a modern CMMS/EAM system. However, look for CMMS/EAM software that does not require proprietary asset locating systems in order to function. Vendors that support a more open system architecture will increase your flexibility and scalability as the business changes.

CONCLUSION

Operations and Maintenance organizations from every industry are under increased pressure to deliver more with less. As technology improves, and assets become smarter and more expensive, an opportunity has emerged for getting better at locating and tracking assets across the enterprise, from cradle to grave. Many industries such as Health Care, Oil and Gas, Aerospace, and Automotive have already enjoyed significant savings from finding critical assets faster and preventing their loss.

But the opportunity to build an even stronger business case exists through tight integration of a real-time asset locating and tracking application with your CMMS/EAM system. The wealth of features and functions available from today's sophisticated CMMS/EAM, such as alerts, notification, condition-based monitoring, preventive maintenance, work order management, equipment history, analytics and reporting tools, makes these two applications a powerful combination.

ABOUT THE AUTHOR

David Berger, P.Eng. (Alta), Director, Western Management Consultants, Toronto, is a Certified Management Consultant (C.M.C.) registered in Ontario, Canada and an adjunct professor at York University in Toronto, where he has taught operations management for the MBA program for 24 years. He has conducted numerous asset management audits; helped senior management develop asset management strategies involving maintenance, operations, and engineering; assisted companies in implementing process improvement initiatives with significant results; and led a variety of IT projects, from developing a detailed specification to package selection and implementation, for CMMS/EAM, PdM, RCM, and supply chain software. Mr. Berger has had significant industry experience, including senior positions in manufacturing, and as an executive responsible for operations and technology within a large, multi-national financial institution.

David Berger may be contacted at david@wmc.on.ca.

ABOUT WESTERN MANAGEMENT CONSULTANTS

Western Management Consultants (WMC), founded in 1975, has offices across Canada providing management consulting services around the world. Its senior, experienced consultants assist clients across the public and private sector spectrum, from multinational corporations to small family-owned businesses, in resolving problems and capitalizing on opportunities in seven main areas of expertise: strategic management, information technology, business process improvement, project management services, change management (including organizational development, executive coaching and human resource management), executive search, and marketing and sales.

Information on WMC can be found on our website at www.wmc.ca

Western Management Consultants
Suite 400, 4 King Street West
Toronto, ON, Canada M5H 1B6
Phone: 416 362 6863
Website: www.wmc.ca