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EAM and CMMS Implementations: Are you getting what you paid for?

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Enterprise Asset Management (EAM) and Computerized Maintenance Management System (CMMS) implementations have become significantly more complex over the last decade. The days of installing an application and using it only in maintenance departments are gone. Today, with larger and more complex enterprises, management needs to have near real-time access to data that could affect the company's ability to produce its product. That, coupled with the need to reduce the cost of production, makes it easy to understand why the systems have become more integrated.

The applications are designed to house data. That data ranges from assets to inventory to craft types and crew makeup, and more. Collectively it's a lot of data. Historically such systems were designed in-house or purchased from an industry-specific vendor. At the core, these systems can all store, categorize, and report on events, but they are only as good as the information they are fed. At some point after the system is in place, there will be a need to evaluate it for viability or to re-determine requirements. Questions will arise, including "Are we getting what we paid for, and if not, why?"

This question is most often driven by the perception that maintenance costs are either too high or are not being reduced as rapidly as expected. Some other drivers for this question might be too much downtime or not meeting quality expectations. This paper only addresses the implementation or re-implementation aspects of an EAM adoption.

Software vendors typically follow the SDLC (Software Development Life Cycle) methodology or some variant thereof. Regardless of the naming convention, the implementation will typically contain these phases: planning, analysis, design, implementation, and maintenance. Successful, game changing implementations focus on multiple intermingled threads. These threads are: software, data, integration, and processes, and each one should follow the same development phases listed above whether during an implementation or as a standalone project. These same phases can be used to implement any maintenance-related initiative available.

This article focuses primarily on processes and data.

Processes: Enough cannot be said about establishing robust processes. Asset management is more than an application; it is a series of activities designed to keep equipment doing what it does within its operational context. Reliability-centered maintenance, condition-based maintenance, and other philosophies all strive to increase an asset's availability to perform its function.

The inspection of an asset—whether manual or automatic—will produce a backlog of necessary work, which when complete, will allow the asset to produce its output. This is a simplified description of what a process does, but at the end of the day, a process leads to the creation of something. Top quartile companies have adopted processes to guide and integrate asset-management and work-management functions, as well as purchasing, financial reporting, human resources, etc. Through defined processes and applied discipline, companies are able to better control the events that affect the asset's availability through the adherence to documented processes.

If this were a game of good cop/bad cop, the above describes the good cop. The bad cop in this story is the opposite but, all too often, rewarded behavior. The lack of processes and/or lack of discipline in enforcing processes leads to a reactive environment. The ability of the maintenance staff to put out the fire makes them heroes in the eyes of the operations team. Maintenance workers are quick to respond, with toolbox and band-aids in hand, to get the asset back into production. Unfortunately, maintenance all too often only addresses a symptom of the problem, not the root cause. By defining and implementing sound processes, maintenance becomes more proactive, which can help reduce the amount of reactive work. Adopting processes also leads to reduced inventory cost, less overtime, better uptime, and lower cost of goods sold.

Data: The fuel for the analytical engine is data. Without it, analysis is at best a hypothesis if not a blind guess. That is not to say that every asset needs exhaustive history, but the level of detail required to generate meaningful data must be considered. The output of the captured data has multiple uses, including financial reporting, budget development, failure analysis, document tracking, etc.

It's crucial that data be consistent in its use and that consistency be dictated by the processes in place. Before the first maintenance transaction is documented in the new application, there is a considerable amount of work to be performed in cleansing, normalizing, and converting existing data. The data must be scanned for duplicates and obsolete records, naming conventions must be standardized, and a field by field map must be built to move data from one place to the next. Sometimes it is easier to begin anew and start from scratch, unless there is a corporate or regulatory requirement to maintain current history. A fresh start provides a chance for the organization to agree on things like what constitutes an emergency and what to call parts. For example, a pump is called a pump and not an injector.

Like the foundation of a building, it is important that the management of assets begins with good foundational data; otherwise, it will become increasingly difficult to obtain useful information from the collected data. Think of foundational data as data that doesn't often change. Some examples include work order types, catalog items, locations, failure codes, class/subclass combinations, and nameplate templates. The purpose of foundational data is to assist in the consistent execution of processes. The goal of a reliability-centered maintenance program is to maintain an asset in its optimal operating condition given the context in which it operates. The task of performing analysis across similar assets in a plant or multiple locations around the world becomes much easier and more meaningful when the foundational data is thoughtfully developed.

Strong foundational data provides the framework for consistent and meaningful reporting to drive the analytical engine. Assume that a vane pump at Plant A is the same make and model as a pump at Plant B, except Plant B calls it a drain pump even though it's the same as the pump at Plant A. Both pumps will experience similar failures and have similar inspections applied. An issue can arise when trying to get an accurate failure analysis for all vane pumps. The drain pump is likely to be left out of the first pass of data collection because its name is not consistent with other similar pumps. When dealing with a single facility, it might be possible to piece together data that was inconsistently named, but when that same effort is applied across plants around the world the task becomes daunting.

The same concept holds true for classification of work. What one plant calls an emergency, another plant may assume it is an event that can be planned. It all depends on the operating philosophy of the plant. Process standardization is supported by consistent data, and data consistency is heavily dependent on how well established processes are followed. The data collected from work events performed on a specific asset can be analyzed to create information. It is, after all, the information needed to continually improve plant operations.

Failure information fuels many decisions that enable continuous improvement, such as whether more precision needs to be incorporated into repairs or if training information should be updated. It can also feed engineering design changes that would have been overlooked if not for accurate information. Work stoppages can also be reduced by analyzing work order data. The full range of possibilities for information creation is beyond the scope of this paper; these few are listed only to illustrate the importance of asset and work data consistencies to the overall operation of the plant.

How effective are your processes? Is there room for improvement? Does your data allow for meaningful reports across your assets and your plants? Is your implementation taking the factors discussed here into account? Are there things about your implementation that could be improved? Are you getting everything you want out of your application? Finally, are you getting what you paid for? If you're not getting the best return on your investment, turning to an expert can help your organization get the most out of your implementation.

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