Successful APMS Implementation Strategies

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Introduction and Background

Organizations face many of the same challenges when implementing a new Asset Performance Management System (APMS), regardless of the solution. Why? Because the key to success of any APMS software is the proper management of the business processes it supports and using it as a tool to help improve maintenance organization.

Based on over three decades of experience working with and implementing APMS, one thing has become apparent: the expectation that implementation of APMS software will miraculously transform maintenance operations leads to frustration, additional costs, and the belief that the software doesn't work.

This belief usually stems from the following key issues that the organization has struggled to effectively address:

- Non-existing or poorly defined maintenance practices and procedures
- Lack of documentation to support maintenance practices and procedures
- Poor quality of data
- Lack of adoption strategy
- The desire for a quick-fix
- Maximizing consultant investments
- Training is completed on the software rather than the system
- Poor communication about long term goals and/or lack of a plan to achieve them
- Lacking a champion of the system
- The belief that APMS is not part of corporate systems

But we can help.

Maintenance is generally the largest controllable operating cost in a capital intensive industry up to 40 to 50% (Mather, 2003) and finding a way to reduce these costs can significantly improve the profitability of any business. Maintaining the health and integrity of plant assets by repairing, modifying or replacing them as necessary so as to support and control their availability and reliability for production is crucial, and where the right maintenance software comes in.

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By comparing any company's current reactive processes and performance metrics to industry best practices, we can get an estimate of the effect on quality, time and costs of unscheduled maintenance . Benchmarking can help determine areas for improvement.

Regular maintenance is key to an organization's competitiveness. Even with modern Asset Performance Management Systems, organizations need to ensure they have the policies, procedures and practices in place for continuous improvement and improved reliability of assets.

Improving Maintenance Practices With Maintenance/Asset Strategy

All APMS are software tools designed to support business processes related to maintaining plant assets and modeled on current "Best Practices" for maintenance operations. In order to achieve the best possible outcome from using APMS software, an organization must first adopt a culture of change and constant improvement.

Business Process Improvement (BPI) includes the organizational structure, roles/responsibility, rules and regulations, policies, mission/vision statements, process workflows, measurements and Key Performance Indicators (KPI's). Existing processes and practices can become outdated and need to be reviewed on a regular basis. This periodic reassessment allows you to review business objectives, adjust KPI's and verify customer satisfaction.

It's easy to become reactive, and even easier to remain that way. Being comfortable with the status quo is typically the first sign of a process issue. It takes time and know-how to become proactive. Many organizations lay blame on the APMS system itself for not being able to achieve their goals and objectives. However, basic steps towards improvement are simple and can be conducted as workshops, through interviews, and by brainstorming.

Step One: Gather Intel

The first step is to gather information while ensuring the boundaries of process are well defined.

- Where does the process begin and end?
- What are the inputs and outputs of the process?
- What other processes will have a direct effect on the current process?

We also want to be careful not to define too large a process, which can become too complex to define and analyze. Once it is defined, you need to establish the direct connection and contribution the process has on your maintenance, and ultimately the organization's overall goals. This includes determining the value of the process. If there is no benefit, why is it being done? This allows us to define the measures or KPI's necessary to evaluate the process.

Step Two: Map the Process

Next, it's time to map out the process in a simple-to-follow flowchart that communicates the sequence of activities. These flowcharts can be created through post-it notes, flip charts, and sketches, to more technically detailed flowcharts.

You can also divide the flowchart into specific areas of responsibility using Swim Lanes which show the hand-off points that can provide an understanding of the time it takes to complete a process.

Most Organizations have Preventive Maintenance programs based on operating time (or calendar time), but rarely have any process or procedures in place for evaluating the effectiveness of their PM programs. When we look at the research on the causes of failure, statistics tell us that only 11% relate to age and usage, yet we persistently use time and age as key triggers to perform routine maintenance activities. (Moubray, 1997)

Step Three: Prioritizing

In order to provide a successful PM program within the maintenance strategy, we are happy to assist our clients to identify, prioritize and justify what needs to be done and consider the consequences.

- What are critical assets?
- What are the consequences of a failure?
- What are the safety, environmental or regulatory concerns?
- What are the costs?

You can begin prioritizing by ranking the risks associated with asset performance and analysing the safety, environmental and production costs of each. We have to consider not only the intangible elements such as customer service and quality, but the tangible costs like repair costs, downtime, penalties, etc.

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Justification really comes down to what it is going to cost and what are the returns. Some PM programs require many resources and result in significant downtime. Developing mechanisms and measurements to prove the results may be necessary. There are many methods available to assist in developing your maintenance tactics:

- CBM – Conditioned Based Monitoring
- FMEA – Failure Mode Effects Analysis
- MTA – Maintenance Task Analysis
- PdM – Predictive Maintenance
- PMO – Preventive Maintenance Optimization
- RCM – Reliability Centered Maintenance
- TPM – Total Productive Maintenance

In many organizations the extent of planning and scheduling is based largely on the level of Preventative Maintenance being managed, which is usually based on OEM recommendations, prior work experiences, and largely on age or time related triggers.

Strategies often include PMO – PM Optimization and RCM, both of which require a well-documented strategy, a commitment to the process, training, and ongoing evaluation and support. An APMS can support these strategies, but cannot ensure success on its own.

Step Four: Documentation

Maintenance tactics have to be both technically feasible and worth doing to be effective. Once an appropriate tactic has been determined, it will need to be documented and detailed appropriately to form part of the work management system to ensure consistent and measurable results. Documenting these tactics as part of a maintenance strategy ensures that everyone is communicating the same strategy.

Too often, we see that an organization undergoes constant struggles to define the proper maintenance strategy because of maintenance personnel turnover. The lack of a documented strategy often leads to constantly shifting priorities and tactics as duties are handed off. This documentation doesn't have to be excessive (see Step Two for tips). Enough information needs to be provided so that all users can apply the same strategies across the maintenance organization.

It's important to note that perfection might not be attained on the first try. But by constantly developing a simple strategy to review, evaluate, update and communicate these written procedures, we will be assisting our customer to set the foundation for an effective maintenance strategy.

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Strategies for a Successful APM Implementation

Once the basics of a solid maintenance strategy are well understood and documented, we can use it to create advanced strategies such as Lean Thinking, TPM, RCM, and PMO.

How Lean Thinking Works (The DMAIC Steps):

- Step 1. Define existing processes using tools such as Value Stream Mapping.
- Step 2. Measure and collect data to determine a benchmark (processes performance baseline).
- Step 3. Analyze these processes from the customer's point of view and create a process flow.
- Step 4. Implement the changes to eliminate waste.
- Step 5. Control by continuous checks, result measurement, and applying improvement.

Planning and scheduling is essential in moving from reactive to proactive operation maintenance. It is also crucial to provide planners with the work management definition that will allow the right decisions to be made about what work needs to be planned and scheduled.

The Right Person For the Right Job

There are often ineffective or no work management systems in place as planners are moved up from the shop floor with little to no training or support. Strategies and techniques are developed on the spot, and change when a new planner transitions into the role. An organization must recognize that having the right person in the planning role is essential to its success.

Necessary skills include project management, computer skills, basic equipment understanding, knowing how to assemble complete work packages, and how to support the maintenance activities of the overall organization. An effective work management strategy should include clearly defined job descriptions, roles and responsibilities.

Managing Inventory

Maintenance Repair and Overhaul (MRO) inventory is all about ensuring that the right parts are available for the right job and the right time. Thus, a secure storeroom and integrated materials management system with the work management process is integral to overall maintenance operations.

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A good APM system integrates the workflows, Bill of Materials, and work management functions with maintenance procurement functions to increase up-time of plant assets for improved reliability and output.

The Importance of Documentation

The processes and procedures documentation is the rulebook; the set of internal controls and framework that guide the organization to profitability and reliability, and ensures that the company's objectives are met. Without this instruction set, it's hard to ensure that everyone in the organization is performing the right task at the right time.

The first step in APMS implementation is reviewing the maintenance processes already in place. If they exist, chances are, they're out-of-date.

This documentation should detail how the process flows and clearly defines the roles and responsibilities within the organization for a clear understanding of its mission, allowing the organization to evolve to a high level of maturity.

This "rulebook" also specifies how the organization will measure where it is against where it wants to be and supports improving maintenance practices. It should be a direct result of the efforts put into improving business practices and developing a business strategy for the maintenance department.

In order for the documentation to be effective, it has to become a living document. Each process and procedural improvement needs to be documented, along with an annual review.

Best Practices for Process and Procedures Documentation process and procedures:

- Follow a KISS (Keep It Short and Simple) principle
- Write the procedures at the reader's level using images, flow charts, pictures, and diagrams to illustrate key points
- Ensure documentation accessible to all individuals
- Promote documentation existence and why it's crucial

Benefits of Documentation

Accessible and updated documentation prevents individuals from finding work-arounds or falling back into old habits. This documentation also allows managers and supervisors to enforce the maintenance strategy and be held accountable for the required performance in their areas of responsibilities.

Documentation plays a key role in ensuring consistent measurement of the overall maintenance management strategy, including benchmarking and KPI results. It becomes essential to the ongoing success of an organization, and is also critical in the case of safety, environmental and disaster management where specific procedures are documented and updated with current information.

Availability and Quality of Current Data

A large part of the implementation requirements for any APM system is ensuring that all the data required is available, current and the right quality to initiate an upload.

Often, managers and users may not be aware of the different silos of information in the organization, or asset lists are incomplete and outdated. Accurate location hierarchy and master equipment lists clearly define the APM system and report success is directly related to the accuracy, consistency and quality of data you enter. It is the very foundation of any APM system. Inaccurate data will lead to system failure.

The challenge of successfully generating meaningful information and reports starts with the quality of the data.

The Cost of Quality from Juran's model in Total Quality Management claims that there are three major categories:

1. Cost of prevention
2. Cost of detection and appraisal, and
3. Cost of failure – this category can be classified as internal and external failure costs.

The sum of all these costs is the total cost of quality, which is often referred to as the 1-10-100 Rule (Friedman & Smith, 2011) in data processing to illustrate the cost of poor quality data. Simply stated, it claims that it is more cost effective to prevent data issues than to resolve them. For every $1 spent in data entry, it will cost $10 to resolve an issue and $100 to correct the issue.

Attempting to build the data as the organization matures can also lead to incomplete and inconsistent data sets. The resources required to ensure success with accurate and complete data again falls to well-defined business processes and procedures. Processes must be efficient and effective to generate the proper and complete

transaction that you will depend on in order to make informed decisions and track the results of your maintenance activities. Processes in place must provide the structure and establish the guidelines the APMS can be effective.

The human factor has a significant impact on the quality of data. Your team must be committed to generating complete and accurate data.

Establishing Change Management Strategy

Another key to the successful implementation of APMS software is establishing a Decision Support Team, which should include high-level decision makers. The team's job is to define the requirements and assess the new system's ability to meet them, and then decide on the best solution for the organization.

A new APM system affects all levels of the organization and therefore requires participation from all areas to ensure success. Those affected include production, sales, marketing, and even shareholders, vendors and customers. Training and participation should begin immediately to ensure a seamless transition and mitigate resistance to change from lower levels.

Open communication as well as the appointment of an effective Change Manager can help promote buy-in at all levels for a successful implementation. The person in this role should have good management, communication, problem solving and support skills, along with the authority, to implement the change and perform necessary tasks associated with the APMS implementation.

Tracking Success For Long-Term Goals

An APMS implementation generally begins with a kick-off meeting, workflow analysis, and ends with either the system Go Live, or a post-implementation review. But that is just the beginning of efforts required to leverage your investment of time, money and resources. The dynamic nature of the maintenance operations and a commitment to continuous improvements makes it essential to develop a long-term plan and establish a baseline for comparing subsequent reviews to measure improvements.

Long-term planning is not always considered or documented because there is a perception that the goals and expectations of the original project will be realized soon after the implementation is complete and the system is operational. But there is often no consideration about how to track that success. A few things to consider are:

- How are we going to measure success?
- What measurements, metrics and KPI's are expected?
- How will these KPI's be managed? Who is responsible?
- How will you ensure that you are complying with your business processes?
- How are you going to manage APMS or other support systems?
- How will you manage upgrades?

A Company APMS Champion

The role requires both a similar vision to the APMS vendor, as well as a solid understanding of the organization's maintenance work processes. It may be a new position within an organization that is implementing an APM system for the first time. Oftentimes, the responsibility of managing the various functions is handed off to the technology, financial or other departments to manage their individual interests.

Ideally, the Company Champion would be always looking for ways to increase the system value for the organization. They must be continuously driving process improvement around the APMS, evaluating compliance with business processes, and educating key users how to leverage the most from the system.

Training For the System Rather Than the Software

Training has to be about more than keystrokes. To optimize the workflow, it has to integrate the use of the software with the business process. The training program has to ensure that everyone understands the "why" and the training supports his or her role in the organization. Users have to be educated on the importance of their actions for inputting and processing specific information on all related functions in the system. An effective training program has to include the development of employees. (Hermann, Das, & Wager, 2010)

Training should be developed and delivered in three stages:

1. Pre-implementation
2. Implementation
3. Post-implementation.

All three of these stages have distinct requirements for providing the required level of detail and the right individuals need to be included.

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The Consequences of not including APM as part of Corporate Systems

The APM project is often driven from a maintenance-defined requirement and fails to consider other departments such as finance, procurement, operations or human resources, thereby causing a disconnect between the APMS and other corporate reporting systems.

These other systems are all expected to accurately report the status of the operation to management, yet most APM systems aren't integrated into the overall strategy. Independent systems report independent results, which can be a significant source of frustration at all levels of corporate reporting. These different "versions" of the truth can be difficult to reconcile. Coordinating procurement of materials, human resources, production and even safety and environmental management is essential for an organization and prove that expectations are being met.

In Conclusion

As an APM customer, you will have different measures of success from your perspective. Improving availability and reduced costs for maintenance will be key metrics. Improved business processes and procedures, improved asset reliability, and the ability to make use of more advanced maintenance techniques and functions will no doubt improve your overall APM satisfaction level.

The key to all of this is planning and understanding the effort and commitment that you will have to make to succeed before you begin a successful APM implementation.

Get in touch, we can help.

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