Challenges in Asset Management

And ways that you can deal with them

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Contents

Introduction ................................................................................................................................. 4

Asset Management: An explanation ........................................................................................ 4
  Asset Management: Why do we care? .................................................................................... 5
  Asset management and the bigger picture ............................................................................ 5

The “Great Crew Change” ....................................................................................................... 6
  Software that captures and models Expert Knowledge ....................................................... 6
  What you think is going to happen isn’t what really happens! ............................................. 9

The challenge of Organizational Alignment ........................................................................ 11

Advanced software facilitates planning and scheduling ..................................................... 13
  Integrate with Back Office, Project, and Primavera ......................................................... 13

Enhanced Decisions boost asset management performance ............................................. 14

About ........................................................................................................................................... 15
  Michael Israel ........................................................................................................................... 15
  Actenum Corporation ............................................................................................................. 15
Introduction

This document was originally published in 2009, and discussed features of Actenum Corporation's then-current maintenance and production scheduling software, Actenum MPS.

Since 2009 Actenum MPS has been renamed DSO/Maintenance, and has been upgraded with many significant features that provide additional capabilities and insight into asset performance and production operations. Accordingly, this document has been updated to reflect features and capabilities of current Actenum technology.

Asset Management: An explanation

What is asset management? There is no question that there are various points of view about it. So let’s get a generally acceptable perspective from two reliable sources:

- Wikipedia considers asset management to be: “... optimal management of the physical assets of an organization to maximize value ... By managing assets across the facility, organizations can improve utilization and performance, reduce capital costs, reduce asset-related operating costs, extend asset life and subsequently improve ROA (return on assets)”.

- The University of Toronto’s Professional Development Centre offers a Management Certificate Program in Asset Management. The official program description states “… Asset Management can significantly impact an organization’s bottom line by reducing maintenance costs, increasing the economic life of capital equipment, reducing company liability, increasing the reliability of systems and components, and reducing the number of systems and components.”

In actual practice, though, asset management has been more about keeping track of data about assets from a transactional perspective. Asset management’s traditional focus has been about gathering asset information, such as asset location, asset configuration, maintenance activities, production throughput, and so on.

In other words, asset management practices have typically provided a great deal of information about assets and their performance. But this information by itself does little, if anything, to actually improve an asset’s effectiveness and performance. The information is, in fact, irrelevant unless and until someone acts upon it. People still need to analyze and use this information intelligently to make informed decisions that positively impact overall asset performance.
Asset Management: Why do we care?

We care because managing assets effectively and maximizing asset effectiveness is the key to:

- Achieving production targets,
- Controlling costs, and
- Meeting corporate and organizational goals.

There is so much information gathered today by ERP, EAM, CMMS, and other systems that the dilemma for many organizations is how to identify the most relevant information. Almost too much data is gathered in many organizations to be reasonably interpreted.

So how do you pinpoint and take action on the most pressing challenges and issues to positively impact actual asset performance?

Asset management and the bigger picture

In addition to individual asset management issues, management in asset intensive industries faces these and other key challenges as well:

- An ongoing retiring workforce sometimes referred to as “the Great Crew Change”.
- Corporate strategy and operational reality are out of alignment; in other words, what the corporation plans to happen frequently isn’t what really happens.
- Organizational alignment issues: for example, maintenance management and production management goals and targets may not be in sync.
- Corporate or organizational backing for technology investments may be lacking or in-adequate.

Also, while many organizations have a plethora of asset information, some may still have a surprising lack. Some recent studies indicate that asset management is not always given the priority and attention that is merited.

The remainder of this paper will focus on how a technology solution can help improve both asset performance and positively impact the top three issues above—The Great Crew Change, Corporate Strategy and Operational Reality, and Organizational Alignment—at the same time.
Countless operational experts will retire over the next few years. Many of these professionals have been working in, and sometimes managing and running, production or maintenance operations in asset intensive industries for two, three, or in some cases four decades. When these wizards retire they will take a great deal of knowledge and “tricks of the trade” with them.

So the question is, how can you preserve that tribal knowledge and all of the benefits that knowledge brings to the table every day?

Furthermore, is there a way you can dispel folklore-based maintenance perceptions to promote better maintenance practices and boost asset and overall operational performance? For example, it may be a commonly-held impression that it doesn’t make sense to schedule maintenance on weekends because the overtime costs involved are too high. But what if scheduling occasional maintenance on weekends actually enabled greater production, which resulted in greater sales and larger margins, which in turn more than offset the higher overtime costs? Would it not be worth it to the organization to schedule that weekend maintenance?

The retiring maintenance or production expert may have known about this scheduling peculiarity. But that expert has gone. So how do you replace and retain that know-how?

The answer is an expert software scheduling solution.

Software that captures and models Expert Knowledge

The great news is that software is available today that is capable of capturing, modeling, and emulating an expert’s knowledge in this and countless similar scheduling situations. The software we’re referring to is the “DSO/Maintenance” product from Actenum Corporation.

DSO/Maintenance enables maintenance and operations managers to schedule production equipment for full and efficient utilization. For example:

- It empowers management to determine the best time to take equipment down for maintenance;
- In so doing it is sensitive to production requirements and schedules;
- The software is aware of production run gaps and slow-downs;
- It takes availability of certified and skilled technicians into account;
- It considers the parts and tools required for maintenance tasks.
The following screen shots (Figures 1 and 2) illustrate how Actenum’s software can be used to develop the best possible maintenance schedule to minimally impact production, while taking other critical factors into account at the same time, such as:

- Overtime costs,
- Crew availability,
- Potential idle (non-productive) time,
- Technician skills,
- Predictable production schedule slow times, and so on.

*Figure 1: DSO/Maintenance scheduling software: location view*
DSO/Maintenance facilitates the rapid development of optimal schedules for maintenance in any type of facility.
What you think is going to happen isn’t what really happens!

The long-term corporate plan is generally developed at the beginning of a fiscal cycle. This longer term planning phase is sometimes referred to as the “slow-loop” planning phase. In the “slow-loop” planning phase the:

- Required production output levels are set to meet the required corporate revenue goals,
- Individual and departmental production targets are established,
- Preventive maintenance plans are prepared,
- Some unexpected maintenance time is allocated,
- Spare parts and tools are planned for and ordered.

This long term slow-loop planning phase requires input and collaboration from both maintenance and production staff. And of course the output of the plan must be in alignment with the organization’s goals and targets.

But then comes the actual execution of the plan, or what we'll refer to here as the “fast-loop” phase of the cycle. This is the phase where the plan is actually put into motion and production and maintenance plans are actually executed against real world demands. And in the real world, things are not often the way we had envisioned.

For example, sales may be higher than expected (that’s good), which results in an increased demand on production equipment. This increased demand on production equipment causes someone to make a decision to skip a scheduled preventive maintenance on a production asset. That specific production asset later suffers a catastrophic breakdown (that’s bad). This unanticipated breakdown will not only put the organization’s ability to meet the increased production requirements in jeopardy, but it may put its ability to meet the original production requirements at risk as well.

These sudden and unexpected changes will now require modifications to both the maintenance and production schedules to get them back on track. Collaboration between the maintenance and production teams will be essential in successfully devising the revised plans. Software technology can significantly facilitate that effort.

For example, rows 3 and 4 of the screen shot in Figure 3 clearly show an asset with 100% risk of a breakdown due to an overdue maintenance task.
Figure 3: Scheduled maintenance and breakdown risk illustration

This type of tool and screen would clearly have been useful to both maintenance and production management in the scenario described above in helping them determine whether that PM should have been skipped. It will also be valuable to them going forward in devising their updated plans and schedules.

Actenum's software presents crucial information in real time for evaluation, so management can develop alternative action plans when necessary to ensure critical targets are not missed.
In order to develop, maintain, revise, and optimize plans and schedules, maintenance and production management need accurate and real-time information to determine such things as:

- How will maintenance activities impact production? For example, will today’s maintenance shutdown cause a production problem next week?
- What crucial maintenance activities cannot be skipped (like that skipped PM)?
- What’s the best response to unanticipated events (such as an increase in demand or an unanticipated breakdown)?
- Can machine failures be minimized, or even eliminated?
- What's the best way to boost overall asset availability to meet production targets?

Moreover, maintenance and production managers have to cooperate and collaborate in both the slow-loop planning phase and the fast-loop execution and scheduling phases. Such cooperation benefits the entire organization, not just their individual departments.

Traditionally however, these efforts have been largely manual in nature, aided in large measure only by spreadsheets and similar tools. Fortunately, technologies such as the DSO/Maintenance software are facilitating these efforts in both the slow-loop and fast-loop phases.

To illustrate, the screen shot in Figure 4 displays several missed production deadline risk factors and a very high breakdown risk for a proposed maintenance and production schedule before the schedule is automatically optimized.

*Figure 4: A schedule with high missed deadlines and risk of breakdown, before optimization*
When the same schedule is optimized, though, the risk factors are virtually eliminated, as illustrated in Figure 5.

*Figure 5: Automated optimization with DSO/Maintenance significantly improves both missed deadlines and breakdown risk*
Advanced software facilitates planning and scheduling

The benefits to implementing advanced software technology to assist with maintenance and production planning and scheduling are numerous. To highlight several of the primary advantages, DSO/Maintenance software:

- Speeds coordinated planning in both the slow-loop and fast-loop phases,
- Coordinates the creation of production of both maintenance and production schedules,
- Displays production output by time period, (daily, weekly, monthly, quarterly, etc., or user defined)
- Lists detailed maintenance activities and schedules
- Automatically calculates the best possible maintenance and production schedules,
- Displays revisions and impacts to the schedule in real-time,
- Measures and displays risks of missing production targets,
- Measures and displays potential breakdown risks,
- Evaluates and displays potential conflicts; e.g., a technician with a required skill is not available for a scheduled PM, or a production asset is not available for a production run due to a scheduled PM,
- Analyzes and displays a wide variety of user defined Key Performance Indicators (KPIs), such as equipment availability and utilization or production output.

Actenum recognizes, though, that seasoned and experienced professionals in asset intensive industries know a great deal about their environments. So the company designed DSO/Maintenance to allow for what the company refers to as a “two expert” approach. Maintenance and production managers and authorized users can easily and actively interact with the software using a “drag and drop” interface to manipulate and revise the schedule. DSO/Maintenance analyzes and evaluates all suggested revisions made to the schedules in this fashion and presents the updated schedule, the potential conflicts, the possible risks, the KPI impacts, and other factors back to the users in real-time for instant analysis and action.

Integrate with Back Office, Project, and Primavera

DSO/Maintenance is a stand-alone application that easily integrates with a variety of CMMS and EAM systems. It also easily integrates with and optimizes schedules generated in Microsoft Project or in Oracle Primavera.
Enhanced Decisions boost asset management performance

Organizations today gather an enormous amount of data about the assets they use and maintain. They store that data as information in the advanced ERP, CMMS, EAM, and other systems that are available. But as we said at the beginning of this paper, information about assets in and of itself is not valuable unless someone uses the information to make good decisions that positively impact an asset's performance.

Actenum's DSO/Maintenance does just that. It empowers maintenance and production management staff to use available information to make great decisions—decisions that positively impact the assets’ ability to produce goods, to extend their useful life, and to provide an improved return on assets (ROA) financial measurement.

The user normally works with the schedule in two modes: manual and automatic. In manual mode, the user may select activities and drag and drop them elsewhere in the schedule Gantt chart. As activities are moved, the optimization objectives will be updated to reflect the outcome of the change. Each such change may be easily undone, if necessary. In automatic mode, the optimization engine takes control of the schedule and assigns activities in order to satisfy constraints, and to satisfy the optimization objective targets (for example, maximizing production output, or minimizing costs). Once the optimizer has generated a new schedule, the user can examine the objectives (usually referred to as Key Performance Indicators (KPIs)), generate desired reports, and send the schedule to external execution and enterprise systems.
About

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igniteService, Inc. provides expert business consulting and marketing support for companies with customer service, field service, repair depot and asset maintenance operations, and for vendors providing technology solutions to those companies.

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Actenum Corporation

Actenum develops scheduling and optimization software for oil & gas operators.

Our products create shareholder value for our customers by increasing operational efficiency, reducing cycle times, and improving collaboration within teams.

Our customers, including some of the largest oil & gas companies in the world, use our software to schedule and manage complex programs, with demanding cycle times that sometimes involve thousands of activities, and milestones. Our solutions increase production uptime through rapid, reliable scheduling of production assets.

To speak to an Actenum representative, or to schedule a demonstration, please contact us at 604.681.1262, or info@actenum.com.

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