

Achieving New Levels of Efficiency and Reliability Through Performance Management Systems

Featuring Peter Thuring, Advisory Business Consultant, Aspen Technology, Inc.





Peter Thuring has almost 30 years of experience in automation and control, industrial IT and manufacturing execution systems (MES) in the process industries, including exploration and production, refining, chemicals, pharmaceuticals and consumer packaged goods.

After eight years working on the engineering and implementation of distributed controls systems at a major supplier of automation systems in Germany, he joined AspenTech in 1996 as part of the Business Consulting Group focusing on process information systems and MES for customers in Europe. He holds a degree in electrical engineering from the Technical University Darmstadt in Germany.

Competitive advantages are realized by specialty chemical producers who can sort through the complexity of their operations and react to deviations from optimal performance in a timely fashion. This is contingent on capturing process measurements, performing analysis of probable causes in real-time and providing notifications.

Peter Thuring shares his insight into how specialty chemicals companies are utilizing performance management systems to increase productivity and efficiency, including some of his recent experiences with customers in the industry.

What kind of goals and objectives should an organization have in place to develop an optimal performance management program?

Many companies have corporate initiatives ongoing — whether it's around Industry 4.0, digitalization, logistics or planning and scheduling — and when you look into them, they have certain aspects that trickle down to operations. In those cases, the performance management solutions using the data from the plant and creating useful key performance indicators (KPIs) and monitoring performance become part of the higher-level initiatives in the plant.

So it's one aspect of a bigger initiative. The overall goal of the company is to become more effective in all different areas, and the performance management related to the process is one part of that.



What are the characteristics or drivers of a productive performance management system?

The business drivers are always to improve the operation of a plant, to increase the efficiency, to reduce energy consumption and increase the availability of the process equipment. Ultimately the KPIs are the focal point — the bridge between the business and the process. We have automated processes that are continuously monitoring the physical process and performing computations that drive the KPIs.

Also, there must be a system to report and track the results, and to alarm on deviations. This is the environment that people are using to check how well they are performing, how they are operating and to determine corrective actions as soon as they see deviations. The characteristics of a productive performance management system are really the calculations, the visualization and the information management part of the systems.

What are the metrics or KPIs that matter the most?

From what I have seen in recent engagements, it's all KPIs related to quality, batch yields, batch cycle times and overall equipment effectiveness (OEE) — the type of KPIs that measure the performance and availability of process equipment. I think these categories are currently of the greatest interest to operating companies.

It's important to note these are industry-specific. For example, energy is an aspect that is important to everybody, but it's even more important in the continuous processes. OEE is also used in continuous processes, but we see it more in semi-continuous and batch operations, specifically in polymers and extruder lines. This is where OEE is typically requested by customers, and we're working on a number of implementation projects in these industries. So the answer to which KPIs are most important is really dependent on the process.

What are some best practices that you can share around using a performance management solution?

Before you can start using or implementing a performance management solution, you must be very clear on what your KPIs are. Once this is done, you must define what you need to measure, where those measurements will come from, how frequently they need to be made and who needs to have visibility into those KPIs. I think the definition phase is even more important than the implementation because it requires much more information to define the KPIs. The focus should be on defining what you want, and then making a clear architecture to implement it.

In specialty chemicals, there is a focus on getting the utilization of the equipment as high as possible. Having a performance management system in place is a great start and a building block for the next level of maturity and sophistication. OEE is an additional approach companies can take to improve the performance of an asset and reveal the source of production losses.

What is a typical performance management implementation?

If we look at companies who are using our manufacturing execution systems (MES) solutions, there are thousands of servers installed to collect data from automation systems. But in many cases the data is just used for analyzing the process or viewing trends.

A performance management solution requires going one step further. It's about defining KPIs, which are typically derived from plant data by using calculations, and defining targets that should be met, and then comparing the actual performance of the plant or process to those targets.

Besides the pure data collection and basic trending, a performance management implementation also includes calculations of KPIs, visualization in the form of real-time dashboards, reports and notification of the operators or supervisors if something is beyond limits and affecting performance.



What does a performance management pilot entail? What does it look like?

A pilot would include a limited set of KPIs that are defined with input from the customer, the implementation of the calculation that is required to calculate the actual performance, the establishment of targets and the visualization component to see the results in a dashboard or report. A pilot is typically a small engagement with just a small set of KPIs to prove how the system performs, how well the visualization efficiently conveys information and how the notifications work. High-level KPIs that align with business initiatives such as production, yield, energy intensity and quality are key metrics that would serve as a good starting point for a real-time view into how assets are performing relative to the desired metrics.

Why should a prospective customer choose AspenTech's performance management solution? What makes our solution unique?

Our unique offering is that we provide one common environment for multiple tools and applications. The user has a single interface to access all the systems, and all the applications can be inter-linked. There is no other provider that has a system that can cover such a broad range of functionality in a single environment.

AspenTech also provides an application platform that gives companies the capability to collect data from the automation system. The same platform is used for KPI monitoring, OEE, root cause analysis and column analytics, as well as the basis for pattern search. It's one application platform that supports multiple technologies.

As our customers become more mature in MES, our performance management solution provides a strong foundation for one environment that can be used for normal process monitoring, analytics, real-time visualization and all the big data and analytics capabilities that are currently available within our Asset Performance Management (APM) suite.





What are some of the benefits customers have seen since implementing AspenTech's performance management solution? How long does it take to see the value?

What we've seen from customers, after implementing our performance management solution that tracks KPIs and OEE, is improved availability and performance of their production lines by between 5 and 20 percent. Benefits include higher production volumes (by 5 to 15 percent), increased yields and reduced off-spec products. The benefits start to be realized almost immediately, and the return on investment is typically within a few months to a year.

Most recently, one of the world's leading specialty chemicals companies, began monitoring quality in real time and decreased variation in the process after implementing AspenTech's performance management solution. Another major chemical company indicated a 2 to 3 percent reduction in energy loss.

It is important to understand that the benefits gained from implementing a performance management solution are depended upon the users of the system. It's really about the people, the operators and shift supervisors who are acting on the information they are getting out of the system. The system itself is not closed loop; the person who takes action is the one who closes the loop and generates the benefits by acting in a timely manner to the information. This is where companies who are very proactive tend to see better results than those who are not really reacting to the information that the system is providing.

The system provides information about what, where and possibly how something can be improved, but the action needs to be taken by the operators and the users.

AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with big data machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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