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AspenTech Introduces a New Dimension to Asset Optimization at OPTIMIZE 2017

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Summary

Two years ago, at the company's 2015 OPTIMIZE Conference, AspenTech announced its intention to pursue new approaches for optimizing asset performance management in industrial process plants. The goal, of course, was to help its process industry users further improve profitability in an increasingly challenging business environment. At the recent sold out 2017

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AspenTech OPTIMIZE conference in Houston, Texas, more than 1,000 attendees from 26 countries learned about the company's significant progress to date.

AspenTech's deep process expertise and knowledge of the fundamental chemistry, equipment properties, and science – combined with new asset management

and plant safety capabilities has given way to a unique dimension in Asset Performance Management. AspenTech is addressing reliability at a time that is so critical to ensuring profitability and safety of the chemical, oil and gas and other process industries during volatile economic times. AspenTech estimates that the combined industry value added by its software is more than \$50 billion and cited the relevance of its solutions to the mission-critical aspects of operations.

Key takeaways from the 2017 conference include:

- It is the systematic convergence between process optimization and static asset or equipment reliability that makes AspenTech uniquely positioned to help process industry end users optimize their industrial processes and assets. This includes delivering in an untapped segment



of the Asset Optimization market and solving industrial problems that have not been addressed previously.

- By organically growing its own process analytics capabilities and making well-targeted acquisitions (ProMV multivariate process analytics, Fidelis and Mtell reliability prediction software, etc.), AspenTech has demonstrated both commitment and real progress.

Uniquely Addressing Overall Asset Performance

In his keynote address, Antonio Pietri, AspenTech's President and CEO, acknowledged that there is much hype in the market today about cognitive computing, robotics, and artificial intelligence and that this might lead users to believe that people in the process industries will be replaced. To the contrary, he believes that artificial intelligence (AI) will be used more pragmatically to insert the "expert" into the product.

The emerging Internet of Things (IoT) is often characterized by deploying sensors to connect people with the things in their daily lives. While this approach makes sense for many industrial applications as well, the process industries are already among the most "sensorized" and connected industrial sectors.

The process industries have been capturing reams of data (much of it from online sensors and systems) since the late '70s. However, while solutions have been developed for data storage, management, and basic visualization; other than the basic analytics required to support process optimization, we've only recently started to see more sophisticated analytics solutions emerging for the process industries. AspenTech believes there is great untapped wealth to be captured with the data you already own.

To beef-up its capabilities in process and plant safety, AspenTech acquired BLOWDOWN depressurization modeling software and PSVPlus software to model pressure relief scenarios and size pressure relief valves in process plants. The company is now exploring and developing high-value opportunities in asset optimization. Technology trends such as machine learning artificial intelligence and analytics can now bring safety and asset performance together. AspenTech has data scientists working on industry solutions and created an organization to tap into artificial intelligence and other advanced technologies that are typically outside of the process manufacturing realm and the purview of its usual software suppliers.

Mr. Pietri also explained that innovation, the customer, and market leadership drive the company to be uniquely positioned to go after the full asset lifecycle. The challenge now is to continue to optimize asset performance “to make the best companies even better.”

Transformation through Innovation and Acquisition

While innovation is a new idea that adds value, it’s important to recognize that many great ideas cannot be commercialized. Nevertheless, the company sees a tremendous untapped potential to transform the process industries through innovation. To help accelerate innovation in industrial

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asset performance, AspenTech invested \$70 million to acquire Mtell, Fidelis, and ProMV; plus, another \$130 million in R&D.

Mtell solutions are designed to “create a world that doesn’t break down” using a unique approach to prescriptive maintenance. Mtell applies machine learning to identify fingerprints or patterns, and provide

prescriptive alerts. ProMV’s analysis tools, in turn, have been created to supplement current inferential modeling with specific statistical multivariate technology and provide context for analytics tools. The innovation from Fidelis software helps industrial manufacturers with the reliability of the entire process lifecycle systems and the systematic interaction to the static assets that are so integral to the process.

AspenTech sees many possibilities for this with the company’s current aspenONE suite of manufacturing and supply chain solutions. For example, AspenTech developed Aspen Asset Analytics, now in limited release with selected customers. This solution leverages all the available data and pattern recognition to understand how well fractionation and distillation columns perform against flooding and weeping, both common problems in downstream refining and chemicals.

These acquisitions and newly developed tools have established the beginning of AspenTech’s new Asset Performance Management (APM) suite, which is designed to provide users with actionable insights to improve uptime and yield. According to the company, APM for AspenTech will “leverage the science” behind maintaining assets, rather than rely on preventive maintenance or simpler APM solutions that narrowly focus on basic conditions such as vibration and other single-variate solutions. These

new AspenTech innovations will allow the company to expand processes modeling expertise into the field of Big Data machine learning, with unique context to the engineering and process data.

Creating Customer Value

The company estimated that its current installed base is generating more than \$50 billion of value by using AspenTech software.

In 2004, CSX, a US-based rail transportation company, tweaked its predictive maintenance-based business strategy to focus on profit drivers and the competitive advantage that new technology could enable. Since the value of the company's operating assets (mainly locomotives, cars, and track) exceeded \$60 billion, corporate eyes quickly turned to asset utilization, particularly locomotive utilization, which represented the largest cost pool.

With each locomotive only available 45 percent of the time on average, and that each locomotive failure costing \$1 million in delays, schedules, customer impacts, and other costs, CSX implemented Mtell software to enable it to predict locomotive failures, saving millions of dollars in downtime. CSX was experiencing locomotive failures and the company rolled out Mtell to 3,000 locomotives.

In another example, an integrated oil and chemicals major used Fidelis software successfully to analyze risk and reliability to optimize a mega petrochemical complex, including storage and maintain necessary operations and capacity. As we learned, the customer estimated that it saved \$250 million in net present value by eliminating an entire process train from the design.

AspenTech proactively aligns with customer business initiatives to deliver value to the customer. By focusing on existing engagements, opportunities and problem areas can be more easily identified to help resolve any issues the customer might have with products and solutions.

Success hinges on engagement at a strategic level, solving complex optimization problems while making continued strategic investments in DCS-agnostic solutions.

The key message, "Technology that loves complexity," echoed through the halls at OPTIMIZE 2017. AspenTech software can certainly solve complex process problems, but also provides users with a solid understanding of

how to apply the tools. The company is digitizing all software training materials into short videos to help “insert the expert into the product” and appeal to a new generation of users who have a different view of software and technology. These and similar efforts reflect AspenTech’s stated goal to be the most customer-centric company in the automation industry.

Striving for Market Leadership

AspenTech’s goal is to earn the mantle of market leader by assuming a responsibility to advance the industries its solutions serve. This takes a strong passion, desire, and commitment by all employees. The next wave of market leadership and financial return will come by optimizing assets over the entire asset lifecycle, from engineering simulation and design through to how assets are operated, maintained, and ultimately retired. The company plans to evolve its depth of expertise to extend beyond the process itself, to the stranded assets and systems.

The company plans to extend its deep process expertise into the process maintenance space, an evolution that has already begun. For engineering design, this will push the boundaries of what is possible. Asset owners have a strong incentive to run at the limits of operational performance while maximizing asset availability and uptime. To achieve this, asset owners need to better understand the root costs and causes of equipment degradation and mechanical reliability.

AspenTech believes this can be achieved through a holistic approach to reliability involving the science of maintenance, deep know how, knowledge, and analytics. The goal, of course, is to achieve zero unplanned downtime.

At the plant level, engineers need to understand where the big risks are, the modes of operation, and the upstream and downstream dependencies to be able to predict problems before they happen. From a technology standpoint, AspenTech puts together reliability modeling and simulation with the overall system availability. This is why it’s more appropriate to employ AI at the process level to detect complex patterns.

Conclusion

The addition of the APM suite to AspenTech’s already industry-leading advanced control and optimization solutions is a proactive step for the industry. The new version of aspenONE provides the much-needed

unification of planning and scheduling processes and planning horizons. Engineering software included in this version can now also unify steady-state and dynamic simulation within a single application. In addition, AspenTech's APC platform has had a major re-fit that has drastically changed the maintenance and deployment methodology for Advanced Process Control applications. ExxonMobil, for example, uses Aspen DMC3 Calibrate Technology to rapidly implement controllers with minimal process impact and reduced engineering efforts. They continue to see the use of DMC3 growing by both central and site engineers.

Although a variety of its technologies have already come together, AspenTech has much work ahead to bring together reliability and process optimization. ARC anticipates that many customers will be eager to explore how this new dimension of asset performance will interact with the company's process optimization software.

After 34 years of acquisitions in the simulation market, in the last three years, the company started moving in a new direction. Rather than just focusing on material simulation or copying competing asset performance solutions, AspenTech is pushing the boundaries of the industry. They are addressing the performance of rotating and static assets and equipment such as pumps, heat exchangers, distillation columns, and furnaces and how each of these are intertwined to the systemic reliability and performance of process units or hydroprocessing facilities.

ARC believes successful industrial transformation will require effective application of machine learning and predictive analytics to improve plant uptime and asset availability. The next wave of process improvements and asset performance will be led by innovations to operational and process engineering, and process optimization, and provided by domain experts with deep knowledge of the process, the assets, and the systemic interaction between the two areas. This will raise decision support to a new level. Process experts will be empowered with information about what happened, what is happening, and what will happen in the future.

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