

# Improving Profitability Through Asset Optimization

In the 1970s, a group of chemical engineers led by MIT Professor of Chemical Engineering Larry Evans, tried to figure out that if Computer automation was being applied to other engineering disciplines - civil, mechanical, electrical - why not chemical? Evans saw an opportunity to apply the burgeoning computer-aided chemical engineering technology to market requirements that were being driven by the energy crisis. Supported by funding from the newly formed Department of Energy (DOE), the ASPEN (Advanced System for Process Engineering) Project was started in 1977.

Today as one of the world's leading suppliers of asset optimization software solutions, AspenTech's software tackles the most complex process manufacturing challenges, creating value and improving profitability for customers. The industries that drive our economies and touch our lives are optimized by aspenONE software every day. The world's leading oil & gas, chemical, engineering & construction, pharmaceutical, food, beverage, and



Antonio Pietri  
President and CEO, AspenTech

consumer packaged goods companies all rely on AspenTech to run their business.

Antonio Pietri, President and CEO, AspenTech was in Bahrain last month to deliver the keynote - "Driving Sustainable Growth" at MEPEC 2017. Held at the Bahrain International Exhibition and Conference Centre, MEPEC 2017's focus was "Sustainable Growth through Process Innovation

and Downstream Integration." Pietri's keynote, addressed how asset optimization improves asset reliability, achieves operational excellence and helps leading firms manage through complexity to optimize the asset lifecycle across design, operations and maintenance. On the sidelines of the conference he gave bizbahrain an exclusive interview.

## What is the story behind AspenTech and your success?

AspenTech was founded on August 12, 1981 to commercialize the technology that was developed by Larry Evans and a group of MIT chemical engineers. Over time, that original goal of a general-purpose process simulation system evolved to a focus on process optimization, and eventually a broader vision - Asset Optimization. Today, an integrated set of industry-leading AspenTech products optimize assets across the design, operations and maintenance lifecycle.

Our success is down to our constant innovation and the fact that no other technology provider in process manufacturing spends more on Research and Development (R&D) as a percentage of revenue than AspenTech. We staff three R&D Centers of Excellence for Engineering, Manufacturing and Supply Chain and Quality and have brought to market a long line of industry firsts.

## Can you describe your own career journey and what brought you to AspenTech and now Bahrain?

I began my career at ABB Simcon as an applications engineer focused on advanced control and multi-variable controllers for refining. I always was interested in sales and all aspects that eventually prepared me for my job today as CEO. I am originally from Venezuela but I have lived and worked in a number of countries around the world. I joined AspenTech through the company's 1996 acquisition of Setpoint, Inc. where I previously held a range of sales, services implementation, and consulting roles, overseeing the integration of AspenTech solutions at European refinery and process manufacturing sites. In 2002, I relocated to Singapore as Vice President, Business Consulting, and was then promoted to Managing Director of the Asia Pacific region. My first trip to Bahrain was as CEO of AspenTech in 2009. At the time I had no staff here, but we grew quickly and today we have 25 to 30 staff in Bahrain and more than 50 in the region. Bahrain is our HQ for the Middle East.

Our main client here in BAPCO, but Bahrain has been a very good

springboard for us to the region and even North Africa.

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## Let's get into your software details. Can you explain AspenTech's value addition and role in process manufacturing?

We have developed deep process manufacturing industry knowledge from exclusively focusing on optimizing process manufacturing solutions for more than 35 years. Our expertise includes more than 400 R&D professionals, including more than 80 process-modelling developers, many of who are PhDs, as well as around 400 service engineers and technical sales professionals working every day with the world's leading process industry companies. We also have a large customer service organization supporting these companies. AspenTech offers the broadest footprint of asset and process optimization solutions and aspenONE is the only integrated software suite focused on design,

operations and maintenance across the entire asset lifecycle. aspenONE applications are customized for complex manufacturing environments, such as oil and gas, chemicals and other capital-intensive industries. The company was founded for the sole purpose of helping capital and process intensive industries break free from traditional constraints. In recent years, we've lived through the worst downturn in oil prices in history, and are seeing continued competitive pressures. Now, more than ever, our focus is on efficiency, optimization, and running assets more reliably than ever - ultimately operational excellence in the asset means asset optimization.

## Can you explain briefly your premise about how actionable insights have allowed failures to be predicted and eliminated for the operation lifecycle to be fully optimized?

It is an entirely new approach to getting at the critical insights necessary to avoid process-induced disruptions and failures. These insights include the all too common occurrences of running equipment longer than expected to meet increased market demand, or degradation due to varying raw materials or usage. There is a significant need to carry out failure prevention using data-driven truths rather than guesstimates. The combination of mechanical and process induced



breakdowns costs up to 10 per cent of a worldwide \$1.4 trillion manufacturing market per a 2012 report from The McKinsey Global Institute. While companies have spent millions trying to address this issue and ultimately avoid unplanned downtime, until now, they have only been able to address wear and age-based failures. Current techniques cannot detect problems early enough and lack insight into the reasons behind the seemingly random failures that cause over 80% of unplanned downtime. This is where using machine learning software to cast a "wider net" around machines can capture process-induced failures.

To avoid unplanned downtime, companies must identify and respond effectively to early indicators of impending failures. Traditional maintenance practices do not predict failures caused by process excursions. That would require a unique technology approach combining machines and processes; particularly for asset-intensive industries such as manufacturing and transportation. With the right technology in place, organizations can sense the patterns of looming degradation, with sufficient warning to prevent failures and change outcomes.

Advanced machine learning software has already demonstrated incredible successes in the early identification of equipment failure. Such software is near autonomous and learns behavioral patterns from the streams of digital data that are produced by sensors on and around machines and processes. Automatically, and requiring minimal resources, this advanced technology constantly learns and adapts to new signal patterns when operating conditions change. Failure signatures learned on one machine "inoculate" that machine so that the same condition will not recur. Additionally, the learned signatures are transferred to similar machines to prevent them being affected by the same degrading conditions.

**How have the changing demographics in the region affected the industry?**

It is great to see a new cohort of young process engineers come out of university and into industry. The change

in guard is a major focus for the industry now as a wave of experienced engineers retires, a younger generation is being put into roles that require more experience to do challenging work. It is important to develop all employees' skills to ensure that the staff has the right knowledge and tools to perform the job most effectively. Ultimately the goal is to help ease the demographic transition that is currently happening.

**Given the challenges our customers are facing in optimizing their enterprise-every plant, every system, every asset-maintaining a safe operation has never been tougher. Only AspenTech has the software and models to give companies the confidence to advance from process to asset optimization.**

**What are the trends and developments in asset performance management?**

At the plant level, we are seeing the development of risk analysis. This involved reliability modelling and simulation that predict and optimize future plant availability and capacity throughout the entire lifecycle. At the process level, there is a trend towards process analytics, through which operators can discover the root cause of process disruptions, predict future occurrences and prescribe actions to avoid them. At the equipment level, we are seeing machine learning analytics that predict when failures will occur, understand why they will occur and prescribe what to do to avoid the failure.

**Why has optimization become essential for the Middle East?**

We are leveraging our 35-plus years of software, technology and industry expertise and combining it with the latest machine learning and analytics capabilities to create the next generation

of optimization, asset optimization. Optimization was initially a "nice to have," something to help generate the last percent of profit. However, with the increasing scope and complexity of the oil and gas industry in the Middle East, for example, it is no longer an option, but a business necessity. The competitive environment that has emerged in just a few short years requires a more holistic approach, which is where asset optimization comes in.

**Any experiences and insights to share about the Middle East market and Bahrain?**

My first visit to Bahrain was in 2009 when we came to see if it would be a good base for our regional operations. It has been a great decision for us. The Middle East is an important region for us. The economies are changing and looking increasingly at becoming value aggregators, which fits well with our own vision.

Every region of the world has its own requirements. One thing I learned about the Middle East when I set up operations here was that customers like to deal with people based right here rather than conduct business over the phone. For customer support and implementation of systems they need a face-to-face interaction.

**What's next? Where is AspenTech heading? What is the vision?**

Our focus is on the shift from process optimization to asset optimization. Given the challenges our customers are facing in optimizing their enterprise-every plant, every system, every asset-maintaining a safe operation has never been tougher. Only AspenTech has the software and models to give companies the confidence to advance from process to asset optimization. We're combining our unrivaled modeling expertise with big data machine-learning to maximize the performance and life of all assets. Our technology delivers the most accurate and actionable insights, enabling customers to run assets faster safer long and greener. AspenTech is optimizing the asset design, operation and maintenance lifecycle for a growing number of customers in complex, industrial environments. ©



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