Power Systems Manufacturing Builds Data Pipeline with AWS and Apiphani

aws partner network

Executive Summary

Build strategic data pipelines and create business intelligence (BI), data science (DS), machine learning (ML), and artificial intelligence (AI) capabilities using a modern data stack of AWS tools

Apiphani had previously proven itself to PSM in migrating PSM's complete suite of systems – including large SAP and OpenText environments – to AWS, hitting an almost impossibly tight deadline. PSM business leaders recognized both the potential power of data held for PSM's business strategy and the lack of control the company had over this ever-growing resource. Because of the trust apiphani had built, PSM turned to apiphani to modernize the PSM approach to data and analytics enterprise-wide, leveraging the apiphani Data Pipeline with data from its mission-critical systems and other operational sources to create strategic data pipelines and self-service data products.

Challenges

- Overnight data downloads combining data from system silos not timely, hard to support, increasingly costly, and perpetuating last-generation technology
- Engineers and business leaders spending days accessing, organizing, and making data reliable for performance reporting, engineering analysis, and basic operations
- Digital products for advancing PSM clean energy innovation in the market requires the latest tools for digital twin modeling, real time equipment monitoring, and ML / AI integration
- Enthusiastic efforts in flight, but the efforts lack experience in data engineering, DevOps, and tools to be fast and productive in both development and support

Results

- Operationalized the PSM data pipeline, configuring and integrating the apiphani Data Pipeline into PSM's infrastructure in parallel with technology integration
- Established the PSM data domain core team and defined the strategy, business case, and data product roadmap for the next 12 months
- Launched five data products with funding for five more, all in key data domains: Product delivery, product engineering, demand management, sourcing, and finance
- Showcased the first two data products (product delivery and demand management), demonstrating the business impact of data pipelines and replacing skepticism with enthusiasm
- Defined architecture and implementation plan for DS, ML, and AI development tools and capabilities that builds upon the initial platform aimed at BI

About PSM

PSM a Hanwha company

Power Systems Mfg, LLC (PSM) provides technologically advanced aftermarket gas turbine components, parts reconditioning services, and full-scope long-term service agreements to gas turbine-equipped power plants worldwide.

PSM has developed proprietary technology that can retrofit gas turbines to improve their efficiencies and enable them to burn high hydrogen content (HHC) fuel. PSM also actively monitors its global customers' turbines in operation, optimizing the efficiency of a turbine in real time.

Situation

Power Systems Mfg, LLC (PSM) provides technologically advanced aftermarket gas turbine components, parts reconditioning services, and full-scope long-term service agreements to gas turbine-equipped power plants worldwide. The CEO and leadership team recognized the increasing necessity for fast-cycle, reliable data access and analytics to improve business performance, drive new digital engineering products, and leverage the increasing power business intelligence (BI), data science (DS), machine learning (ML), and artificial intelligence (AI) tools. The leadership team could see that all PSM's data resided in system silos in SAP, SalesForce, engine monitoring systems, and homegrown operations systems. The data from these systems was then downloaded and viewed in Excel, Access, PowerBI, and Tableau throughout the company, resulting in questions about data consistency, timing, meaning, and so on.

Quarterly Business Reviews took the leadership team days or even weeks to collect and adjust data. PSM engineers and data science experts were having difficulty accessing and organizing customer engine monitoring and other data needed for their analysis. Their aerospace and mechanical engineers and data science experts want to perform sophisticated analysis, but it took a great deal of complex, backend data wrangling to prepare the data for analysis. "Our aerospace and mechanical engineers just want to engineer," commented Eric Christian, Data Scientist at PSM.

"Ours is a data-driven industry," John Thorburn, Head of IT for PSM, "and we needed a data and analytics platform that would enable us to take advantage of our opportunities. We needed to leverage the data from our own engineering and business processes. More importantly, the data from the engines we manage for our clients represents a business opportunity, creating saleable data products that would help our clients better manage their operations."

"Our goal," said Thorburn. "Was to move to a modern data platform that will add substantially to our business strategy. Now the question was, how do we get there?"

Solution

Apiphani and PSM worked collaboratively to architect, configure, and integrate into PSM's AWS infrastructure a modern data and analytics platform built on AWS toolsets and Atlan's Data Catalog. Data from PSM's various data sources are pulled into the PSM Data Pipeline and organized according to PSM's data domains, creating persistent data pipelines that run at the speed of the business. Self-service data products orchestrate data from the data domain, making data available on-demand to users throughout the company.

"We didn't want a proprietary solution," explained Thorburn. "It was important to have the pipeline completely integrated into our AWS cloud infrastructure, retaining control of the data and the systems ourselves. That was essential."

Beyond the technical foundation, the planning and outreach that apiphani and the PSM team undertook in building support for the data pipelines within PSM was paramount. "This was a large project with impact throughout the entire company. The most influential people in the company needed to be involved in this effort in some capacity, and not all of them understood it. We had to do a lot of education, and we had to shoehorn our working sessions with

stakeholders around their busy schedules" said Thorburn. "Due to the failures of past data initiatives, there was also a lot of initial skepticism to be overcome."

Apiphani successfully gained executive commitment to assign PSM's most sought-after business leaders to the domain core team. Additionally, PSM understood roles and responsibilities would change and assigned its top data and analytics talent to a Data and Analytics Center of Excellence (CoE). The new team members made time because they could see a realistic, achievable vision and mission that would have a major impact on the company's competitive advantage and overall personnel effectiveness and satisfaction. Thorburn, the relentless champion of the effort, worked the back channels encouraging supporters and providing perspective to skeptics. A series of workshops were held by domain, the top-priority data products were defined, business cases developed, and implementation was funded. In parallel, all the technical environments were defined, the DevOps infrastructure put in place, and a managed services team put in place.

Apiphani brought valuable expertise to the effort, supplementing PSM's own resources. "We have business domain experts, and we have people who know how to extract data from SAP or other applications," explained Thorburn. "We didn't have the experts or the tools to put it altogether into an organized data pipeline. That requires data architects, data engineers, DevOps engineers, a platform, and new methods that treat data as a product. Apiphani had the people, the processes, and the platform needed to put this thing together. Apiphani knew how to get it done right."

Results

Six months into the project, PSM has seen significant progress. When we showed them the engine state analysis within the pipeline, that's when the lights went on," commented Thorburn. "They were wowed by it, especially when they learned it was repeatable and reusable. People began to see this is a real thing, that it could be done, and it initiated a lot of discussions about additional ways we could use the data pipeline. Everybody's on board now. That's a big shift.

"We didn't start with the 'next gen' of data applications, which will support our engineers and data scientists doing sophisticated analytics on high-volume data with ML and AI tools," said Thorburn. "The data pipeline project was really driven by the need for basic business metrics; getting the right data for that becomes the foundation for all future advanced data usage.

"But this is important: What we built is flexible and adaptable enough to handle the advanced data analytics needed by the engineering team. That's the beauty of it. We built a platform and a foundation, where we can plug in other components to deal with higher velocity data, greater amounts of data, and far more complex analytics and visualizations. Initially, Pipeline 1.0 was built with AWS AppFlow, S3, Lambda, Glue Toolset, Athena, QuickSight, PowerBI, and the Atlan Data Catalog. In 2.0 we are adding Kinesis Toolset, SageMaker, Redshift, EMR, Q in QuickSight, and others as we work with AWS architects."

PSM is not finished with this effort. “It'll never be done,” explained Thorburn. It’s still early in the process to determine hard number results, but Thorburn anticipates it will save hundreds of hours spent preparing reports. “Once you’ve done it once, you’re done. The next time you need updated metrics, you just go back and click the button, and up it comes.”

As a side benefit, Thorburn also expects to see performance improvement in PSM’s mission critical systems. “We're still running these big data dumps at night. With the pipeline, we're going to start to eliminate unnecessary services databases because we don't need to park the data anymore. Now we can pull it right out of SAP and marry it up inside the pipeline. This will reduce our licensing and consumption costs with SAP.”

PSM is also now pushing forward with ML and AI applications sooner than expected. “The future is now,” concluded Thorburn. “Our engineering and product development teams were looking at other solutions outside of apiphani as recently as a month ago. By delivering the 1.0 platform, we were able to convince them that PSM did not need to go outside of the partnership to delivery ML and AI capabilities.”

About apiphani

Apiphani is a global leader in automated mission-critical application management. Founded by recognized industry leaders, apiphani is dedicated to helping businesses minimize the effort and risk associated with managing tier one applications. By integrating decades of experience with Deep Automation™ and machine learning, apiphani is able to drive extreme efficiency and reliability in support of its clients' most vital workloads.
For more information visit www.apiphani.io

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