The case for a data-smart energy utility

Reimagine operations for your SAP environment with Dell Technologies powered by Intel® technology

ABSTRACT

This paper explores an approach that allows energy utilities to gain greater insight over their operations using smart technologies in an SAP environment. This discussion shares the Dell Technologies point of view on IT modernization with SAP HANA, SAP S/4HANA and SAP Intelligent Technologies, with the goal of turning data-driven insights into operational optimizations across the utility business.

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REIMAGINE

operations to move forward with Intel and SAP Intelligent Technologies

A CHANGING WORLD

Today's energy utilities are in the midst of a period of transformation driven by a convergence of forces. These include a shift from centralized to decentralized power generation, a global push toward sustainability and changing market expectations for the role of an energy provider.

In this new era, the business model for energy retailers is shifting from simply selling energy to providing comprehensive services for energy "prosumers" — people who both produce and consume energy. Along the way, vertically integrated utilities are increasingly focusing on automated operations. For example, smart utilities can now use sensors and smart meters to enable automatic operations management and alert grid operators to customer power outages.

The rise of this new era for the industry presents an opportunity for utilities to reimagine their operations to enable the convergence of information technology (IT) and operational technology (OT), drawing on the capabilities of SAP HANA, SAP S/4HANA and SAP Intelligent Technologies. By forging ahead with SAP, utilities are better positioned to adapt and change, so they can be ready for what comes next — including data-driven innovation, expanded process automation and new business models.

For operations teams and administrators, the key is to make optimal use of the capabilities of SAP HANA and SAP S/4HANA and to view old problems with new perspectives on turning data-driven insights into actionable intelligence for improved asset management, work management and more operational improvements. These are all characteristics of the data-smart energy utility.

THE CASE FOR A DATA-SMART ENERGY UTILITY

Rapid technological change — such as distributed energy resources, micro-generation, batteries, microgrids and electrical mobility — is forcing providers of electricity to rethink how they work, the services they provide and the business models they adhere to. Going forward, the most successful companies will flexibly manage demand, enabled by insights garnered from smart technologies. Successful companies will think like data companies, processing vast amounts of data to reengineer their own processes and adopt increasingly more efficient service delivery.

In the new data-smart energy utility, the convergence of IT and OT, enabled by edge computing solutions and capabilities on the SAP platform, will help operations teams deliver better reliability, affordability and sustainability.

For example:

- Operators can improve reliability by using more resilient standardized platforms, edge computing technologies and automated tools that enable a move from reactive to proactive management.
- The same tools help operators automate processes and drive work efficiency improvements that are among the keys to better affordability for energy and related services.
- Along the way, operators can meet new sustainability goals and mandates by maximizing renewable generation. The key is to use intelligence technologies to automatically balance supply and demand in a world of distributed energy resources.

AN EXAMPLE USE CASE: PREDICTIVE MAINTENANCE

To make this story more tangible, let's consider the example of a data-smart energy utility that leverages Dell Technologies edge solutions, empowered by Intel® Xeon® processors, and SAP Edge Services software to enable predictive maintenance (PdM).

This application uses Dell Technologies Edge solutions to collect, analyze, relay and act on real-time data from machine sensors and generate accurate, dynamic predictions. The edge solutions work in tandem with SAP Edge Services software, which uses edge computing and real-time data streaming capabilities to enable live insights and actions. SAP Edge Services deploys powerful microservices at the edge, along with robust offline capabilities, to deliver domain-specific insights, monitor real-time events and actions, and execute enterprise business processes locally, even with intermittent connectivity.

With the combination of capabilities from Dell Technologies Edge solutions, optimized to take advantage of Intel® innovations, and SAP Edge Services, the PdM application:

- Helps ensure that critical and perishable data is acted on immediately by generating alerts
- Uses edge computing and real-time data streaming to enable live insights and actions
- Runs data analytics on both structured and unstructured data to identify patterns and predict the probability of machine failures
- Integrates with enterprise asset management systems for reporting, generating alerts and automating the dispatch of maintenance crews
- Sends select data to an enterprise or cloud data center for further analysis, beyond the immediate analysis that takes place at the edge

MOVE

from reactive to predictive maintenance

MATURING MAINTENANCE PROGRAMS

The move to predictive maintenance is an evolutionary progression. As shown in Figure 1, this path progresses from reactive maintenance triggered by failures to preventative maintenance based on time or operation cycles. It then moves to condition monitoring based on standard asset operations and on to predictive maintenance based on analysis of data related to an asset's usage and wear conditions.

Predictive Maintenance

Maintenance Model Spectrum – Motor Vibration analysis example

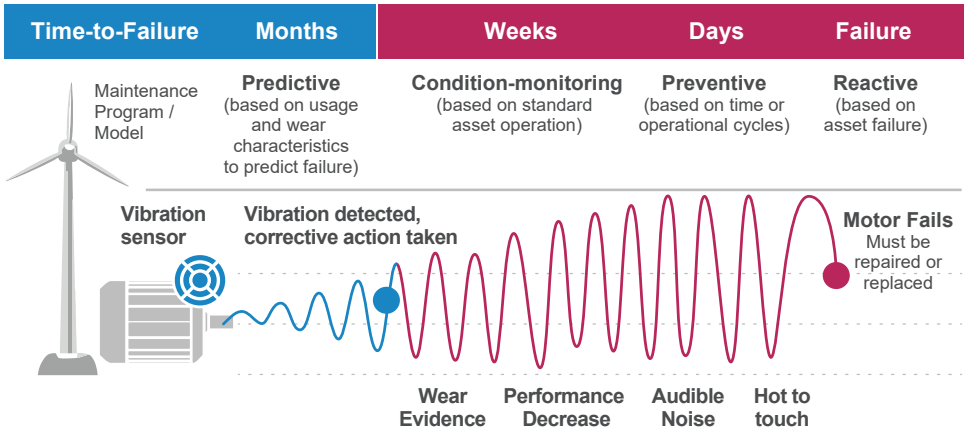

Figure 1 This example illustrates the amount of time it takes to detect a potential failure interval for each of the four maintenance models commonly used today.

Achieving predictive or prescriptive maintenance is the ultimate goal. Moving up to this higher level, from simple preventive maintenance, has been shown to save 50 percent in maintenance labor and maintenance, repair and operation (MRO) materials costs. It also sets the stage for a successful, long-term enterprise asset management (EAM) strategy that helps manufacturers find new, innovative ways to compete in a very competitive, budget-conscious, and demanding marketplace.

THE SOLUTION

The move to SAP HANA, SAP S/4HANA and SAP Intelligent Technologies is a journey. While every journey is different, the path to IT modernization in the data era invariably includes a dynamic infrastructure with flexible consumption models and data management strategies that enable an organization to achieve faster insights with SAP Intelligent Technologies.

Here's a look at some of the SAP solution areas that enable this new data-smart energy utility.

The Data-Smart Energy Utility	
SAP Intelligent Technologies	SAP Edge Services
	SAP Predictive Asset Insights (SAP Predictive Maintenance and Service)
	SAP Data Intelligence
Dell Technologies Infrastructure with Intel® Xeon® Processors	Dell EMC PowerEdge servers
	Dell EMC PowerMax data storage
	Dell EMC PowerScale data storage
	Boomi Data Integration

Figure 2 SAP, Intel ® and Dell Technologies cover the IT and operational landscape of the data-smart energy utility.

Better Together: Dell Technologies, Intel and SAP

Create dynamic infrastructure

Capture cloud momentum

Gain next-gen intelligence

SAP EDGE SERVICES WITH DELL EDGE SOLUTIONS

The SAP HANA in-memory database is foundational for data-driven applications, but there are other non-HANA data sources — including IoT data at the edge. IoT edge computing is designed to support business decisions that need to be made locally with data processed at the edge and subsets of aggregated data transferred to the core.

To enable management of IoT data on-premises, SAP Edge Services works with SAP-certified Dell Edge solutions that are tested and validated to run SAP IoT applications at the edge. This edge-to-core approach is advantageous because it uses your existing investments in SAP ERP analytics and in-house teams while securing intellectual property on-premises.

SAP PREDICTIVE ASSET INSIGHTS

SAP offers solutions to help your organization take full advantage of the IoT, including SAP Predictive Asset Insights, formerly known as SAP Predictive Maintenance and Service (PdMS). Part of the suite of SAP Intelligent Asset Management solutions, SAP Predictive Asset Insights can help your organization maintain full visibility into current asset health and predict future needs. That's because it monitors and analyzes assets using machine learning and digital twin technologies.

With SAP Predictive Asset Insights, your organization can monitor asset conditions, predict machine health, proactively deliver spare parts, improve spare parts planning, and help ensure proper technician staffing. If you use SAP Business Suite software, you can pass requests to core applications for creating maintenance orders, scheduling service delivery, executing orders on mobile devices, and providing visual support for technicians.

The benefits of SAP Predictive Asset Insights span a wide range of enterprise operations. With this software solution, your organization can plan and package your maintenance schedules dynamically to improve resource utilization, reduce asset downtime and lower your maintenance costs. Maintenance schedules can now be dynamically planned and packaged to better utilize resources and scheduled asset downtime.

SAP DATA INTELLIGENCE

With SAP Data Intelligence it's easy to manage the data for AI and ML with data orchestration and ML services. IT can discover and connect to any data source, then refine and transform data connections into usable data across landscapes. That means accessing structured, unstructured, streaming, cloud, on-premises, IoT, SAP and non-SAP data sources.

When it comes to deploying SAP Data Intelligence on-premises, your IT team can run Red Hat® and SUSE® containers on Dell EMC infrastructure. SAP Data Intelligence is a containerized application and uses Kubernetes®, which means IT can orchestrate and execute data pipelines using containers to access and share data smoothly.

DELL TECHNOLOGIES INFRASTRUCTURE WITH INTEL TECHNOLOGY

Dell Technologies infrastructure with the latest Intel® Xeon® processors and technologies provides consistently high performance for SAP workloads, with a rich mix of compute, storage and data protection solutions that enable density, power efficiency and scalability for transactional processing, analytics, AI and IoT. As a result, your IT team can better bridge the data gaps, bringing structured operational data from SAP HANA together with unstructured IoT and big data sources so you gain actionable insight without limits.

Specific hardware components include:

- Dell EMC PowerEdge servers
- Dell EMC PowerMax all-flash storage
- Dell EMC PowerScale scale-out network-attached storage

DELL TECHNOLOGIES BOOMI

Boomi, a Dell Technologies business, provides an integration platform as a service (iPaaS) that facilitates SAP to non-SAP data integration. This continually updated cloud-based service can help your organization move faster and more efficiently with a unified platform that accelerates the flow of data across applications, systems and people. Its end-to-end capabilities include application integration, data quality governance, B2B/EDI network management, API management and workflow automation.

A Global SAP Center of Excellence

To help your organization jumpstart your journey to the data-smart energy utility, the Dell Technologies Global SAP Center of Excellence provides a wide range of resources to accelerate deployment and time to value.

Using the Center of Excellence, your IT leaders can:

- Consult with technology experts
- Explore demonstrations of SAP HANA, SAP S/4HANA and SAP Intelligent Technologies
- Access test systems to size your projects

These activities can help your organization reduce project risks and enable analytic success. Located near SAP's worldwide headquarters in Walldorf, Germany, the Dell EMC Global SAP Center of Excellence can be accessed through scheduled engagements, virtually or onsite.

GETTING STARTED

For today's energy utilities, modern SAP platforms are becoming critical to automating operational processes, improving the customer experience and driving market differentiation. These platforms require infrastructure that delivers resources with superior performance, protection and agility, wherever and whenever needed.

To that end, Dell Technologies stands ready to work with your IT and OT organizations on your journey to innovate with SAP Intelligent Technologies. We can help you deploy a flexible, scalable technology foundation and gain better control of data from all sources — including IoT and operational data from SAP HANA — to achieve faster insights and better business outcomes.

KEY TAKEAWAYS

In a time of rapid change, forward-looking energy utilities will reimagine their operations to enable the convergence of IT and OT, drawing on the capabilities of SAP HANA, SAP S/4HANA and SAP Intelligent Technologies. The key is to take full advantage of the capabilities the SAP platform and view old problems with new perspectives on turning data-driven insights into actionable intelligence for asset management, work management and other operational processes.

As your organization moves down this path, Dell Technologies is an ideal IT infrastructure partner. You can look to Dell for SAP-certified edge, core and cloud solutions that reduce risk and accelerate the operational benefits made possible by data insights gleaned from your SAP environment.

To learn more, contact your Dell Technologies account representative or visit DellTechnologies.com/sap.