Bringing Digital Transformation to the Utilities Industry

Making the Most of Meter Data Through IT and Operational Technology Integration
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Executive Summary

In the utilities industry, meter data is the lifeblood of the business – but utilities often struggle to make the most of that data. Itron is using the SAP HANA® business data platform to apply Big Data, Internet of Things technology, and advanced analytics to create a unified approach to managing meter data. As a result, Itron is opening the door to digital transformation in the industry – and creating a platform for extending its solution’s capabilities.
PROJECT HIGHLIGHTS

Itron
Liberty Lake, Washington
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Why SAP
Strength in the utilities industry, architecture and migration expertise, and the SAP HANA® business data platform – which provides powerful performance, combines OLTP and OLAP, enables real-time analytics, and integrates with a core SAP® software landscape

Products and Services
Comprehensive solutions for utilities to safely, securely, and reliably deliver critical infrastructure services through smart networks, software, services, meters, and sensors to help our customers better manage energy and water for the people they serve

Transformation
Extension of Itron’s market-leading meter data management solution to SAP HANA, enabling real-time, in-memory analytics on an operational system

Business driver
Need for digital transformation in the utilities industry to reduce costs, leverage meter data, and eliminate data silos

Outcome
Product enhancement, enabling an extended software-based business and positioning Itron as an industry partner and enabler of digital innovation

Digital innovations
Big Data, the Internet of Things, and advanced analytics

SAP Solutions
SAP HANA

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Today, utilities are looking to digital technology to help them control costs, improve customer service, and optimize workloads. The key is to integrate information technology (IT) and operational technology (OT) and make better use of the vast amount of meter data they collect.

Leveraging that data, however, has proven to be difficult. Utilities have traditionally used separate systems to support the various processes associated with meter data. For example, one system might handle the ingestion of data from the network, while another is used for data analysis. And as new capabilities are needed, utilities have typically added new stand-alone systems to support them.

This proliferation of fragmented systems has created a number of challenges. For example, utilities often struggle to handle the flood of data generated by meters—a utility might have thousands of transactions per second coming into its meter data management (MDM) systems. Data capacity is also a challenge—a large utility’s database could have many terabytes of meter data, a volume that is difficult to manage efficiently with traditional transactional systems. And to use analytics across those fragmented systems, utilities need to replicate and move data. Altogether, this approach creates delays, drives up infrastructure and management costs, and leaves utilities working with siloed operational and analytical components and multiple versions of data.

Itron solutions help customers utilize their data. The company provides utilities with a variety of solutions, including a leading MDM solution. More than 80 utility customers across six continents use Itron’s MDM solution to support nearly 40 million meters. With Itron’s MDM solution on the SAP HANA® business data platform, utilities have a unified approach to managing meter data and using analytics to reshape that data into business insights. Itron is refocusing its business model and software portfolio to provide value beyond its traditional hardware meter offerings. Together, Itron and SAP can help customers streamline the process of collecting meter data so they can make use of it immediately to improve operational efficiency and customer service.

"We were seeing a growing desire on the part of our customers for a solution that would let them take an end-to-end approach to managing meter data, using a single, real-time platform."

Mike Zimmer, Vice President of Customer and Commercial Enablement, North America, Itron

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Using SAP HANA to Eliminate Data Silos

Itron partnered with SAP to run its Itron Enterprise Edition Meter Data Management (IEE MDM) solution, used to collect and process meter data, on SAP HANA. The SAP® technology provides scalability and performance that supports IEE MDM for utilities with millions of meters.

To handle those large amounts of data, IEE MDM on SAP HANA takes advantage of the business data platform’s scalability, in-memory data management, and real-time transactional and analytical processing capabilities. SAP HANA makes it possible to meet utilities’ data ingestion, data capacity, and data analytics needs on a single platform – with high levels of performance. “SAP HANA provides Itron with a digital core that is capable of processing data quickly and empowers our customers to run their businesses with speed and agility,” says Mike Zimmer, Vice President of Customer and Commercial Enablement at Itron in North America.

With these capabilities, IEE MDM on SAP HANA lets utilities integrate IT, OT, and a variety of data. In addition, many utilities today are using SAP HANA with their SAP applications to manage customer information and assets. With IEE MDM available on SAP HANA, customers can enjoy higher integration and shared SAP HANA management skills. The solution provides tight integration with SAP applications and brings the Internet of Things and customer and business data together. The IT and OT integration provides utilities with one version of the truth as well as a foundation for streamlining and optimizing the entire meter-to-cash process.
Itron and SAP collaborated to enhance IEE MDM to support SAP HANA. In this effort, SAP supported Itron’s development efforts and provided technology and architecture expertise as well as a team of SAP migration experts. To help accelerate implementation, Itron contracted Wise Men Consultants, a consulting firm specializing in SAP HANA, to perform the necessary updates and deliver the migration. The migration project allowed the team to test IEE MDM running on SAP HANA alongside the existing supported databases.

The migration involved porting the large-scale enterprise application from legacy database technology to SAP HANA, an effort that included the migration of stored procedures, tables, views, and functions to SAP HANA. The team used the SAP Advanced SQL Migration tool – with enhancements by SAP to meet the solution’s specific needs – to analyze the Transact-SQL code and perform a feasibility assessment before starting development. The SAP tool was also used to perform an automated conversion of over 90% of the existing data definition language and SQL code in order to accelerate development and reduce time to market. In spite of the size and complexity of the effort, development was completed in only eight months.

“Working together, Itron and SAP have developed a platform that takes advantage of both our technologies to break down the operational and analytical silos traditionally found in metering systems.”

Paul Hesby, Senior Product Manager, Itron
Unlocking the Power of Data Through a Single, Unified Platform

For utilities, the IEE MDM solution on SAP HANA provides a single, unified platform for collecting, managing, and analyzing large volumes of data, helping them take advantage of the growing amount of data coming across their meter networks while leveraging the full capabilities of IEE MDM, including validation, estimation and editing, auditability, versioning, and more.

From a technology perspective, the solution eliminates the need for redundant copies of data for analytics and data management and also minimizes data reconciliation efforts – both helping reduce total cost of ownership.

From a business perspective, the solution provides better visibility into meter operations and customers, and also provides real-time insights for decision-makers – giving them the information they need when they need it. This helps utilities improve operations, increase business agility, and streamline customer interactions. For example, with those capabilities, utilities can quickly identify and resolve billing issues, which can lead to improved customer satisfaction, while also ensuring accurate and timely collection of revenue.

More broadly, advanced metering infrastructure and IoT data on SAP HANA provides a platform that enables ongoing innovation to drive digital transformation – which is rapidly becoming critical to success in the industry.

“With integrated, centralized tools and data, utilities can add value by continuing to build new digitally driven capabilities on top of the solution, which means they can take further advantage of their data without creating new technology silos.”
Jay Millar, Director of Sales Enablement and Marketing, Itron
Introducing Integration, Performance, and Insight

The architecture of the IEE MDM solution on SAP HANA breaks down traditional utility data silos and provides comprehensive tools for managing and leveraging meter data.

The solution takes in massive amounts of data from the field, including various types of meters, mobile devices, and supervisory control and data acquisition systems used to control industrial processes. At the same time, the solution fully integrates with ERP data on billing, geolocation, and so on, which can be used to streamline field service and improve theft detection, among other things. It also integrates with utilities’ systems for asset management, distribution, marketing, and other activities.

SAP HANA provides an integrated virtual data model that lets utilities easily bring in data from custom applications, third-party applications, and business intelligence systems. What’s more, that data can be analyzed in the transactional system without being moved around, which means that a range of data can be accessed in real time.

Figure: Itron Enterprise Edition Meter Data Management on SAP HANA
Altogether, IEE MDM on SAP HANA handles data ingestion, processing, and analytics on one platform, rather than relying on multiple systems, and it supports utilities’ efforts to integrate IT and OT.

With this architecture, the IEE MDM solution on SAP HANA provides:

- **Scale and performance**: The in-memory capabilities of SAP HANA have been proven to provide superior performance compared to traditional databases, and can scale to virtually unlimited size – which is critical, because utilities are planning to ingest meter-reading intervals at near-real-time data rates, creating vastly more data.
- **IT landscape simplification**: Because data can be analyzed in place, the traditional need for batch processing is reduced – as is the need to maintain separate legacy systems, siloed data, and numerous integration points.
- **Real-time insight**: The in-memory processing of SAP HANA makes it possible for information from across applications to be processed in real time, which means that data can be analyzed the moment it lands in the solution.

Testing from Itron has shown that running the IEE MDM solution on SAP HANA has delivered performance improvements of up to 60%.
A Platform for the Future

For Itron, IEE MDM on SAP HANA is a vehicle for increasing efficiency for its customers and strengthening the company’s position as a leading partner to utilities, thereby advancing the strategy of providing value-added services and outcome-based solutions.

The initiative to run IEE MDM on SAP HANA was, in a very real sense, a vital step in an ongoing journey for Itron. The solution provides a platform that addresses a range of today’s meter data management challenges. At the same time, it is a powerful enabler of ongoing digital innovation. Itron and SAP can build on the broad range of features of SAP HANA, such as predictive analysis and spatial and text analysis tools, and continue to improve the end-to-end meter data management process. It is a foundation for a new generation of solutions in areas such as load forecasting, grid analytics, and theft detection – and for working with customers to create tailored solutions.

Overall, with IEE MDM on SAP HANA, Itron has positioned itself to be a key player in the ongoing digital transformation of utilities – and in helping its customers win in an evolving industry.

"IEE MDM on SAP HANA provides a platform that will enable utilities to simplify their architectures, drive down costs, and exploit their data more fully. It removes a key barrier on the road to digital transformation."

Gary Kessler, Senior Product Line Manager, Itron