Managing the Flow of Data Along With the Flow of Electricity

How To Manage Data for the Modern Power Grid

HITACHI
Inspire the Next

BEST PRACTICES GUIDE

The New Grid Carries Both Energy and Data

By 2050, electricity demand is expected to more than double, and renewable energy capacity will grow by a factor of 10. This revolution extends to energy storage capacity, which is projected to grow at a CAGR of 30% through 2030.

These trends are unfolding alongside the transition away from fossil-based fuel to renewables and the shift toward electricity as an energy source, particularly in sectors such as industry, transportation and building management. The combined impact of these changes will make energy transmission and management across the bidirectional grid exponentially more complicated.

As organizations move into this age of renewable energy and decarbonization, they must use distributed and microdistributed platforms to integrate new, greener energy sources into their networks. This requires the capacity to manage a more sophisticated, fully digitalized grid where the flow of data is as mission critical as the flow of electricity. Equally important is a commitment to measuring, reporting on, and improving generation and transmission efficiencies as part of an overall strategy for managing infrastructure efficiency, uptime and performance.

This guide provides essential insights into driving efficiency, performance and accelerated decarbonization efforts. In addition, it offers an overview of the foundational data integration and analytics capabilities needed to derisk and accelerate energy companies' digital transformation journeys.

DataOps is all about getting actionable insights from your data faster.

FIVE DATAOPS BEST PRACTICES

1 Clarify the business need for the data and set your parameters to establish measurable performance benchmarks.

2 Know your data. Plan for data produced internally (by your organization) and externally (such as pricing or weather data). Build a data inventory.

3 Factor sources, formats, interoperability, security and access into the equation to ensure you're choosing the optimal data storage and analysis solution for your organization.

4 Clearly define your DataOps objectives to ensure that they contribute to delivering optimal insights, maximize efficiency and scale with evolving needs.

5 Implement automation, reporting and auditing solutions that support efforts to ensure that data insights can convert to timely operational action and results.

> To extract hundreds of millions of data flows and transform them into meaningful information our customers would buy and use to enhance their energy delivery processes, you have to do a lot of work. Pentaho* makes it easier.

Dan Hopkinson
Head of Network and EMI Services
ElectraLink

* Pentaho is a Lumada portfolio product.

1 When Data Aligns With Business Needs, It Drives Optimal Decision-Making

Big data is an asset until it overwhelms. With 90% of the world's unstructured data created in the last two years, it's essential to remain focused on data that yields insights. Volume alone will not drive business outcomes or enhance the ability to achieve objectives.

Consider the experience of a Hitachi utility client that embarked on initiatives designed to deliver better customer self-service capabilities. The goal was to blend and merge customers' smart meter data with other logistical, billing and tariff data. But the company hadn't given enough thought to other departments that might also need that data. The resulting solutions were cumbersome and not capable of allowing equal and efficient access for multiple departments, groups and personnel. Hitachi's Lumada software for IIoT included data ingestion; extract, transform, and load for multiple databases and data formats (including timestamped data); schema matching; analytics; and customizable dashboards and reports, all designed and implemented in compliance with the highest security and governance protocols.

2 Conduct a **Full Inventory of Your Data,** From Internal and External Sources

For energy companies, one of the first steps is to conduct a data assessment: How easily is your data available to those who need it? What's missing or restricted in access? Can your data be visualized on a single pane of glass? This assessment can be simplified by choosing an efficient data catalog.

When developing customer self-service capabilities, for example, you must also take into consideration the need to access external data sources, such as energy pricing or weather data. Hitachi aided one such utility in deployment of a data catalog that made it possible to connect to, integrate, ingest and blend related data. This proved instrumental in building an efficient, opt-in-based marketplace that matched third-party partners and solution providers with customers.

3 Edge, Core or Cloud? Where Will Your Data Be **Analyzed and Archived?**

Consider your current and future data analysis and storage needs in advance. If data will be analyzed in-house, without the use of outside consultants of data scientists, an on-premises data hosting solution could suffice. If not, and if data needs to be exchanged with third parties or contractors, a secure cloud solution would take precedence.

It's important to get a good understanding of existing and "incoming" data formats. Existing data could reside in enterprise resource planning or customer relationship management systems or in noSQL databases. Incoming data could consist of time-stamped data, such as data from smart energy meters. These databases use completely different schemas and so require a plan for interoperability and usability.

4 It's All About DataOps, and DataOps Is All About Insights

Precision is essential not just in data collection, but also in analytics: the step in the process that achieves the required end results. DataOps is the end-to-end process of getting data operational: sourced, ingested and translated into a usable format and optimized for analytics. Data science works only after data has been readied to then bring the data to a state that represents the vast majority of the prework.

It's essential to choose an efficient and rapid solution for ensuring that data is operational and provides insights. Considering scale is equally important and can promote continuity as needs evolve with larger sets of data, when systems are replicated in more locations, or when regulations require that data be stored in triplicate.

5 Data Is Meaningful Only When Stakeholders Can Put It to Work

A wind farm owner engaged Hitachi to close the gap between modeled and actual wind energy output from 100 wind turbines. Turbine vendors had guaranteed only the maximum downtime, to be remedied through scheduled maintenance. But the real issue was how the owner could make better market bids based on energy outputs closer to the projections.

Hitachi's Lumada software for IIoT used artificial intelligence (AI) to reduce the error margin between forecasted and actual energy production values from 20% to 10%. It also sent automatic emails with the more accurately forecasted numbers every 90 minutes, 24/7, to their energy trading personnel. This helped the organization enhance its bidding ability and profitability. The solution did not require any complicated dashboards or fancy reports — a reminder that, sometimes a well-timed, four-line text message is all that's needed to meet key business objectives.

> "The Optimise Program has really helped us understand how our vehicles are used and how they are charged, and that helps us plan for the size of the vehicles we need as well as the charging infrastructure."
>
> **James Baker**
> Chief Engineer and Fleet Director, Royal Mail

Lumada IIoT Software Delivers the Data Advantage

Lumada provides the foundational data management services and tools to optimize the delivery of analytical results. From edge analysis to multicloud analytics processing, Lumada can ingest, blend, analyze, and report results in highly customizable formats meant for various end users. Lumada includes foundational edge-to-cloud data management features, including a data catalog, edge intelligence, and data integration and analytics for accelerated time-to-insights that can be deployed flexibly. Also available are ready-made applications that run on Lumada software, such as Lumada Asset Performance Management, Lumada Enterprise Asset Management and Lumada Field Service Management.

Take the Next Step

To learn more about Lumada software for IIoT, visit our IoT Software and Solutions page ↗

For a quick overview of Hitachi Vantara's energy solutions, check out this video ↗

We Are Hitachi Vantara

Hitachi Vantara solves digital challenges by guiding you from what's now to what's next. Our unmatched industrial and digital capabilities benefit both business and society.