



QUANTA
TECHNOLOGY

BUILDING AN ASSET PERFORMANCE CENTER (APC) USE CASE

INDEPENDENT, OBJECTIVE, AND PRACTICAL EXPERTISE
IN ELECTRIC POWER



USE CASE

The customer aimed to establish an Asset Performance Center (APC) as a centralized hub for monitoring and managing its field assets. The primary objectives of the APC include detecting potential failures before they occur, supporting maintenance activities, and identifying assets for replacement or investment.



KEY BENEFITS

1. **Provides** a comprehensive overview of power system asset health, enabling detailed forensic analysis and informed decision-making.
2. **Integrates** data from various sources, offering a unified view of each asset throughout its lifecycle.
3. **Reduces** unnecessary travel and enhances maintenance planning and failure prevention.
4. **Facilitates** more effective allocation of limited capital, aligning with the ISO “line of sight” principle to focus on remedial actions that mitigate the highest risks.

Customer/Industry Context

The customer owns and operates extensive generation and transmission assets. As a wholesaler of power, the customer serves large commercial and industrial customers, as well as local power companies that manage distribution systems. The customer operates one of the largest transmission networks in the U.S., with over 16,000 circuit miles of high-voltage lines, more than 500 substations and switchyards, delivering approximately 165 billion kWh of electricity annually to a service area covering multiple states, serving approximately 10 million people.

Overview:

The Asset Performance Management (APM) solution, implemented at the APC, integrates data from multiple sources to provide executive dashboards and in-depth analysis tools for engineering personnel. This system supports detailed forensic investigations into asset performance and covers substation components such as transformers, circuit breakers, and station batteries.

Detailed Use Case Description

Specific scenarios:

- Asset investment planning: Allocates resources more effectively, aiming to mitigate the highest risks.
- Failure detection: Identifies at-risk assets, enabling them to take corrective actions to prevent failures.
- Optimizes and strategically prioritizes maintenance.

Problem Statement

Similar to other U.S. electric utilities, this customer faced several key challenges:

1. Aging workforce: The impending retirement of experienced personnel led to a loss of expertise in maintaining and operating the power grid.
2. Aging assets: Deteriorating infrastructure resulted in reduced reliability, extended power outages, and a decline in public confidence.
3. Lack of situational awareness: Incomplete risk assessments and misaligned resources impeded efforts to effectively mitigate asset failure risks.
4. Data silos: Disparate data storage across multiple databases hindered the ability to create a unified view of an asset throughout its lifecycle.
5. Manual processes: Reliance on manual data collection and analysis increased the potential for errors in planning remedial actions.

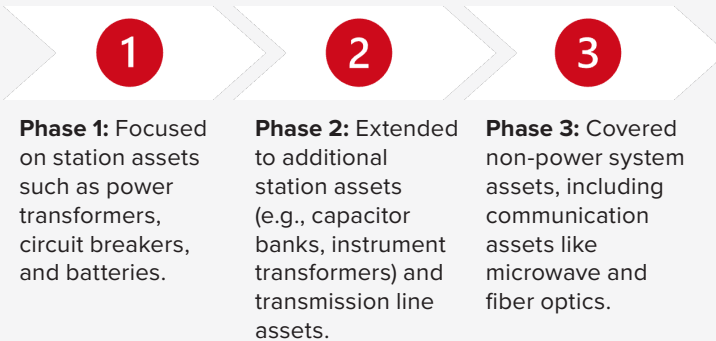
Technologies Used:

- Cloud infrastructure: Microsoft Azure
- Containerization and orchestration: Kubernetes
- Monitoring and visualization: Grafana, PowerBI
- Integration: MuleSoft (ETL) for seamless connectivity with IBM's Maximo, Doble's DTA-Web, and eDNA.

Implementation Process:

The project was implemented following structured project management principles. The process began with a kickoff meeting to identify key resources within both the vendor and customer organizations. A Project Manager and several Subject-Matter Experts (each responsible for a specific asset class) were appointed under the guidance of an Executive Sponsor committed to the project's success.

The implementation involved several information exchange workshops, which led to actionable insights for the customer's personnel. These workshops focused on identifying data sources, determining data formats, and planning the transformations needed for the APM solution. The ETL process, handled by MuleSoft, was pivotal in integrating the necessary data. The project was executed in phases:



Subsequent steps included rigorous testing (unit, integration, and user-acceptance testing), comprehensive training, and support during the go-live process.

Workflow/Process

The workflow involves data ingestion from various sources into the APM solution at the APC. The APM solution provides comprehensive risk assessments, trend analysis, and notifications of risk changes. It also helps prioritize remedial actions based on real-time conditions and user-defined criteria.

Data is ingested periodically, on-demand, or upon changes in data, including online data, into the APM system. The APM solution generates work requests, which are then sent to the local Work Management System for maintenance planning. Capital allocation actions are routed to the ILM software for asset investment planning. All work requests from the APM solution can be tracked at the APC.



Visit our website at <https://quanta-technology.com/asset-management/> to explore our Asset Management offering and see more project references.



For more information, connect with our Asset Performance Management experts via info@quanta-technology.com

Results and Benefits

Quantitative results:

- Between May 2022 and December 2023, active monitoring of assets resulted in 139 action items, including 70 “good catches” and 15 “great saves.”
- These actions supported the customer in reducing O&M costs and improving capital allocation, aligning with ISO 55000 standards.

Qualitative benefits:

- Improved data-driven insights.
- Enhanced asset monitoring.
- Reduced manual processes. Notably, the need for “windshield” miles decreased, improving operational efficiency.

Customer Testimonial:



“Having the same subject-matter experts involved in all stages of the APC project provided much-needed continuity during these challenging COVID times. The seamless transition from Sales to Production was remarkable!”

Challenges, Solutions, and Lessons Learned

Challenges:

The project was initiated during the COVID-19 pandemic, which necessitated remote work—a new and challenging concept for a project requiring significant human interaction.

Solutions:

The project team quickly adapted to the remote work paradigm. The presence of knowledgeable, skilled, and positive team members was crucial in overcoming the challenges posed by the pandemic.

Lessons learned:

- Clearly defining objectives and expectations from the outset is critical for APM implementation success.
- Aligning the APM implementation with broader business goals is essential, ensuring that technology serves strategic objectives.
- Collaboration among vendors, contractors, and internal business units is vital, with executive support being a key factor for success.
- A phased or limited scope implementation can be beneficial, allowing for testing and scaling based on initial successes and lessons learned.
- Continuous training for all APM users is crucial to ensure effective system utilization and understanding of the benefits.
- APM is an ongoing process, requiring regular updates, maintenance, and alignment with evolving business needs for sustained success.



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TRADITIONAL CONSULTANTS

INDEPENDENT — OBJECTIVE — PRACTICAL — EXPERTISE

Who:

- Trusted advisors and solution providers with global utility experience
- Industry-recognized thought leaders
- Engineers and MBAs with the ability to address business and technology strategy, as well as the most specialized issues
- Experience spanning the entire lifecycle, from planning to EPC implementation with Quanta companies, to asset management and renewal

Why:

- Independent, objective, and practical advice and solutions
- Unique business, regulatory, and technical expertise and best practice know-how
- Unique SW and HW solutions
- Staff extension requiring technical skills
- Testing, commissioning, integration, and post-installation evaluations of technologies via sustainable technology integration labs

Traditional
Management
Consultants



Traditional
Engineering
Companies

Quanta Technology, LLC
4020 Westchase Blvd.
Raleigh, North Carolina 27607

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Document number: QTECH-BR-113-X-08-24

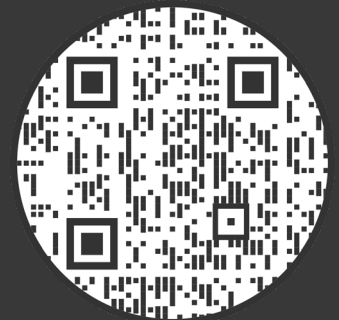
CONTACT US:

 919-334-3000

 [quanta-technology.com](https://www.quanta-technology.com)

 info@quanta-technology.com

 [LinkedIn.com/company/quanta-technology](https://www.linkedin.com/company/quanta-technology)



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