



AVEVAWORLD

POWERRUNNER

On AVEVA™ PI System™

Project Delivery Lessons Learned



Introduction



Scott Smith

PowerRunner, Senior Industry Consultant & Project Management

Experience

25 Years – In the Energy Industry, mostly focused on system operations and architecture and large data solutions.

- PG&E National Energy Group
- Energy East (Avangrid)
- eMeter (Siemens)
- OSIsoft (AVEVA)
- PowerRunner

UK Power Networks empowers more resilient and efficient grid through innovation and collaboration

Challenge

- Integrating new software into existing grid infrastructure
- Managing legacy system constraints
- Ensuring real-time data accuracy for operational decision-making

Solution

- Deploy a software solution that can be built around CIM (IEC 61970, IEC 61968) and support integration to legacy automation, 3rd party metering solutions, and support the market transition to a DSO
 - **AVEVA™ PI Data Infrastructure**
 - **PowerRunner on AVEVA PI System**
 - **SISCO CIM Adapter for the AVEVA PI System**

Results

- **Strengthened foundation for future scalability**
- **Improved interoperability between legacy and new systems**
- **Increased operational efficiency and data reliability**



EMACSA ensures seamless revenue flow and operational excellence with advanced data integration

Challenge

- Legacy metering data infrastructure with a risk of revenue impact due
- Complete system
- Need to integrate SCADA data with metering for system balance insights

Solution

- Replacing legacy metering system with **PowerRunner on AVEVA PI System** for enhanced data management
- Implementing robust data validation processes to improve accuracy and reliability
- Integrating SCADA data with metering to enable system balance and operational insights leveraging **AVEVA System Platform, AVEVA PI Data Infrastructure, and CONNECT**

Results

- Ensured continuity of cash flow through reliable metering data
- Improved data quality with automated validation mechanisms
- Laid the foundation for system balance analysis, enhancing the operational value of meter data



Unlocking Potential: Addressing Key Industry Hurdles

External Drivers



Utility Industry Transformation

- Global/Societal Trends
 - Net-Zero targets
 - Sustainability goals
- Regulatory Compliance
 - Regulatory mandates
 - Renewable mandates
 - Transition from DNO to DSO
 - FERC 2222
- System Integration & Interoperability
 - Numerous data silos
 - Multiple suppliers with differing protocols

Technology Drivers



Digitalization – OT/IT Convergence

- Next-gen “AMI 2.0” which includes advanced capabilities to better understand how electricity is generated and used in real-time
- A scalable time-series data solution to manage edge data
- Ability to combine measure data w/ contextual data to create an enterprise OT/IT platform
 - Network Model Management
 - Data Management
 - Temporal alignment
 - Normalization
 - Data Governance
 - Versioning
 - Role-based security
 - Traceability, etc.

Business Drivers



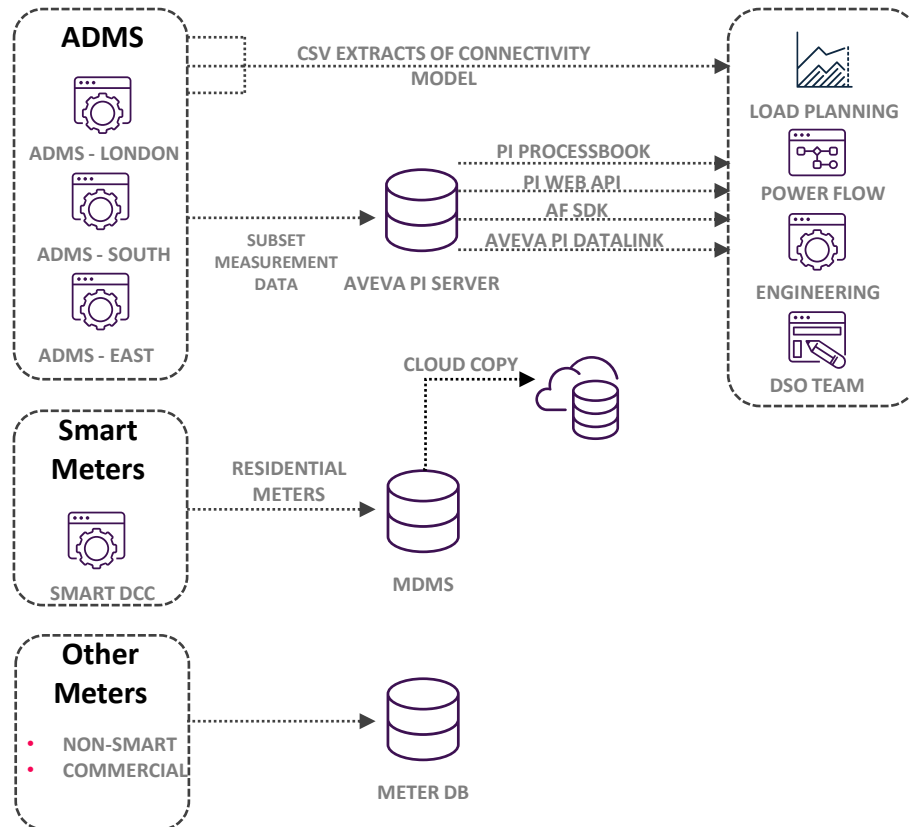
Enterprise OT/IT Platform

- A single source of truth for the enterprise
- All business units working from the same data set & network model
- Always operate on the best available data
- Configurable analytics created by business users, not dependent on IT resources – no more data wrangling
- Extensible and extendable OT/IT platform that can be reconfigured to meet future business requirements
- Real-time situational awareness from the edge to the source

Original System Architecture – Challenges & Limitations

Data Governance Gaps, Disparate Systems, and Contextual Alignment

Initial Scope

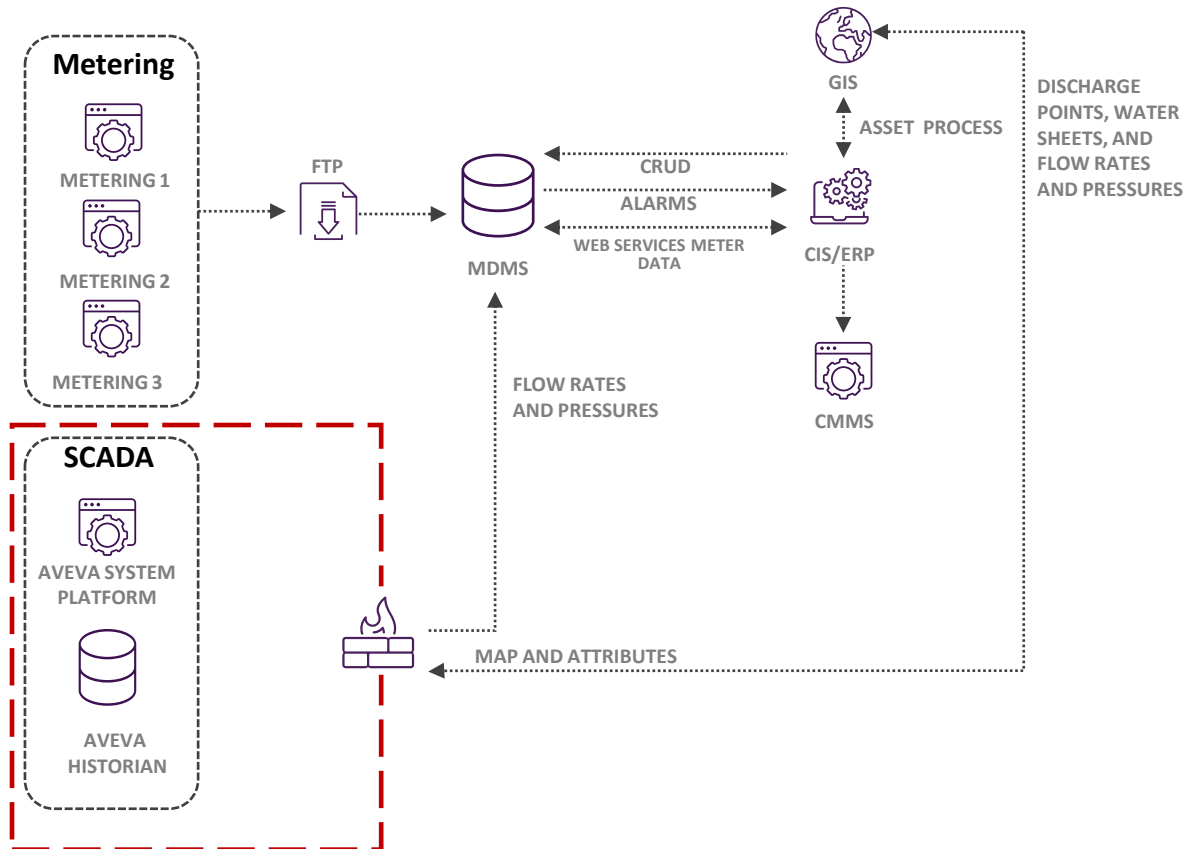


- **System of record for all integration of time-series data**
 - Current SCADA PI Server Data
 - Uncollected SCADA Data
 - Smart Meter Data
- **Common Information Model (CIM)**
 - Leverage the CIM standard and use of profiles to allow a common Impedance or Connectivity model for all three networks
 - Use CIM as the basis of the network model and update the as-operated with daily changes
 - (FUTURE) Could evolve to adding as-switched changes to the network model relationships
 - Historize/Version of daily CIM files
- **Asset Health Analytics**
 - Initial scope is to help monitor and analyze the RTU Health for field devices
- **Network Model Validation and Phase Identification**
- **Network Health Monitoring (Scope TBD)**
 - Transformer Load Management
 - Volt/Var Analytics

Original System Architecture – Digitalization

Adding AVEVA PI System, CONNECT, and PowerRunner as part of their digital strategies

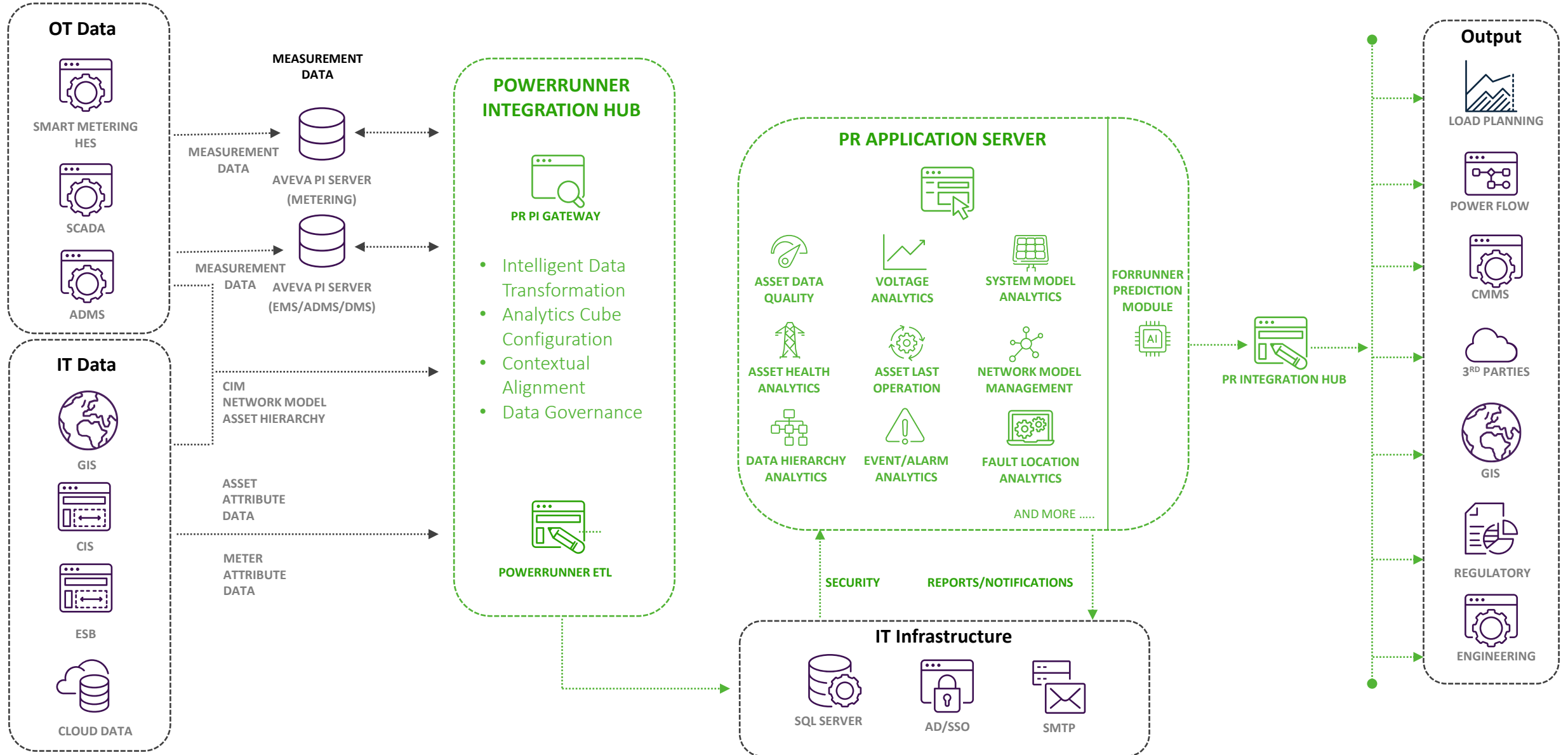
Initial Scope



- **Digitization and System Modernization**—This is part of a larger digitalization of the entire IT/OT system, which includes upgrades to the SCADA and Billing Systems, plus the addition of analytics, data sharing, new tools for access and visualization
- **Replacement of the legacy MDMS platform**
 - Replace the legacy metering data system
 - Replace multiple web services
 - Create an OT layer of time-series data in AVEVA PI System for Metering and SCADA data
 - AVEVA PI Vision
 - Replace FTP Process
 - Provide support for the billing process to eliminate the MDM
 - Add data validations
 - Metering systems growing from 3 to 5 Head End Systems
 - Next Phase will be CONNECT
- **Water/System Balance**
 - The scope is to extend the system balance with the data from smart meters for a complete water balance.

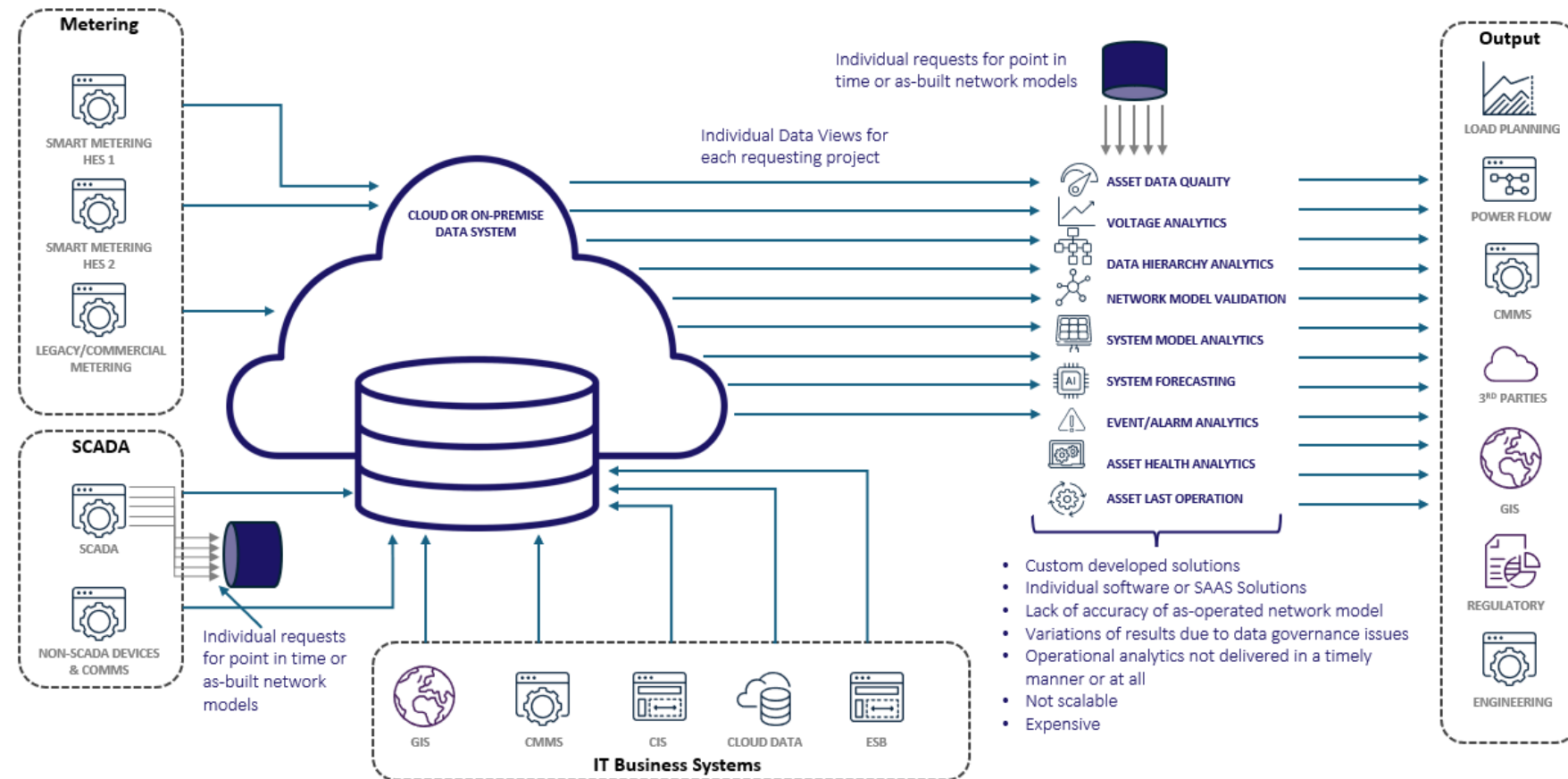
Enterprise Architecture

Connecting the Pieces with Context & Governance



Bridging the Gap: IT's Big Data Approach vs. Operational Realities

Aligning IT & OT for a Holistic, Adaptive Data Strategy



KEY CONCERNS

Requirements design solutions, and the operation analytic requirements typically differ from other business user requirements.

Contextualization and the data model are key components to a successful project.

Scalability and support ability are factors in designing these solutions.

When it comes to meter data, there is an expense consideration on cloud solutions.

Lessons Learned

Adaptability is Key

The complexity of the environment and requirements often exceed what can be conveyed or fully understood during the sales process. Projects must remain flexible and adaptable as new insights emerge.

The Importance of CIM & Network Models

The Common Information Model (CIM) and network model are fundamental to structuring data and aligning it with the dynamic nature of grid operations. A major challenge for the existing operations was the CSV extracts of the model and data and the lack of governance and version control, which created deviations from the “Truth.”

Operational Context is Crucial

Meter data and SCADA data must be aligned at the operational level within the context of the operations team. The operational technology (OT) staff holds critical contextual knowledge that is essential for effective data interpretation.

Managing Data Complexity & Quality

The increasing complexity and interconnectivity of data sources, evolving data quality, and shifting systems of record—combined with undefined use cases—necessitate strong operational management for successful implementation.

Speaker Details



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Stop by the PowerRunner booth if you want to discuss this in greater detail