sparkcognition™

ML Studio

PROBLEM

T&D operators need asset management solutions to guarantee the reliability and resiliency of smart assets in the grid.

SOLUTION

Machine learning-based asset management approaches analyze physical operations in real time and identify areas for optimization.

RESULTS

Machine learning brings down operating expenses, improves customer satisfaction, and increases the reliability of networks.
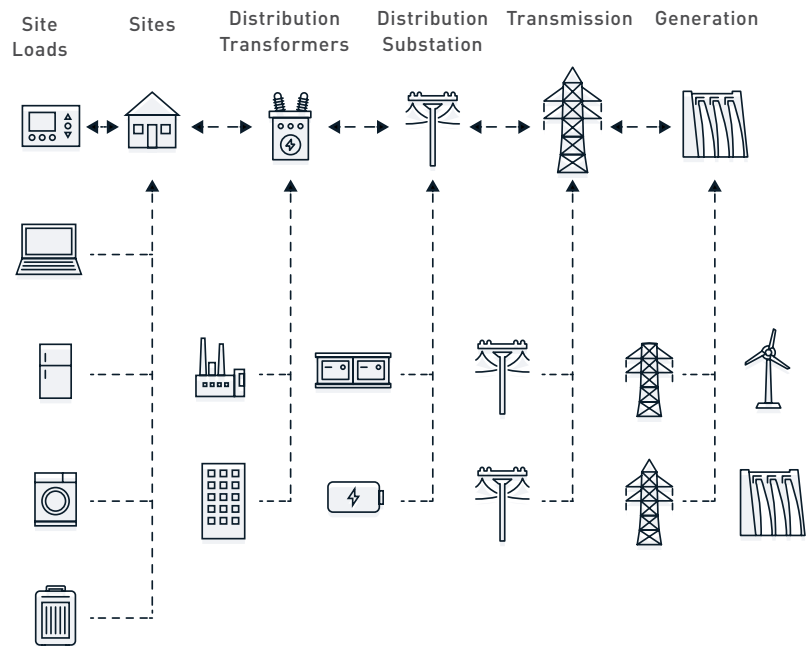
The utilities sector has benefited from the use of machine learning by implementing predictive maintenance approaches that classify and ultimately predict failures on critical equipment well in advance. This has delivered results in the generation area, reducing capital expenses by 4.5% and operational costs by 2%.[1] While these approaches are becoming ever more ubiquitous, there is still a considerable potential for machine learning in the industry that remains untapped. One of the next areas where machine learning can deliver significant value is in improving the reliability and resiliency of the smart systems that compose the grid.

THE PROBLEM

Transmission and distribution (T&D) operations are ever more complex, increasingly including new asset types with shorter life spans, differing depreciation rates and operating scenarios, and complex requirements. Utilities face the challenge of managing a growing grid of multi-aged assets, as well as the constant introduction of new equipment such as advanced metering systems, smart distribution switches, automated capacitor banks, transmission synchrophasers, and other intelligent endpoint devices.

With this kind of dynamically growing grid, utilities need enterprise-wide, integrated work and asset management solutions that enable them to analyze physical operations in real time and identify areas of optimization. Such systems can not only provide insights regarding the health of smart equipment, but also uncover utilization and capacity issues that directly impact the efficiency of the grid. For instance, a five million customer utility analyzed their distribution transformer network using smart meter data to reveal that more than 80% of their assets were being used at less than 10% of rated capacity.[2]

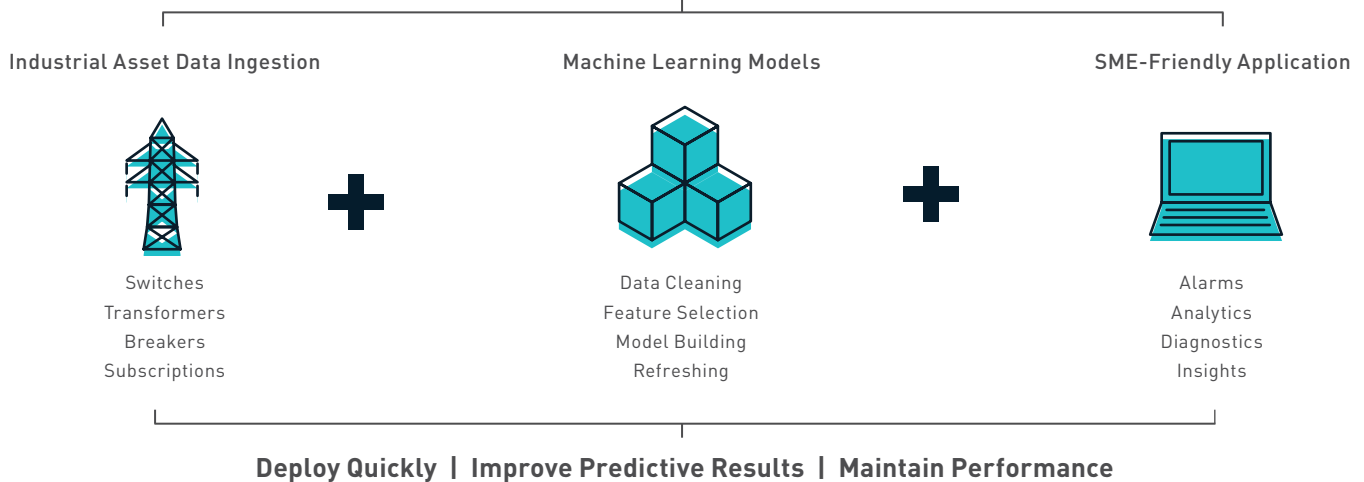*Transmission and Distribution Operations*

THE SOLUTION

Machine learning helps make sense of the vast oceans of data emanating from T&D operations, delivering actionable insights that drive operational efficiency on the grid. Machine learning ingests data from assets in the field to uncover operational patterns and provide recommendations on next best actions to improve overall reliability. This is achieved through models that characterize asset and grid behavior and identify anomalies, exposing the main contributors leading to changes. This information is then used to identify overloaded or underperforming assets and inform asset management, workflow, and portfolio strategies.

Normally, the creation of these machine learning models designed to analyze smart systems and circuits are a daunting task. Building these models requires a solid understanding of data science, subject matter expertise on grid changing behaviours and dynamics, and constant dedication to scaling and maintaining the models across the entire organization. This adds up to thousands of models that need to be created, optimized, and constantly maintained in order to reap the benefits of machine learning for grid management. To benefit from machine learning models in an efficient manner, automation is a must.

SparkCognition developed the ML Studio automated machine learning platform to tackle the creation and scaling of machine learning models throughout operations. SparkCognition ML Studio provides a productive environment that empowers users with a broad spectrum of data science experience to quickly prototype use cases and develop, tune, and implement machine learning applications faster than traditional science methods. With the ML Studio platform, T&D companies can activate the use of their data at scale to build asset management applications that provide:

• **Full grid coverage:** ML Studio's models are created using the entirety of an asset's historical data, and adapt quickly to other assets to scale implementations across the entire grid.

• **Always up to date:** Every single asset on the grid behaves differently, and that behavior changes over time. The ML Studio platform facilitates the massive retraining of models to keep them updated and accurate.

• **Total transparency:** ML Studio highlights main contributors behind every prediction, allowing users to make data-driven, informed decisions around asset management strategies.

AI-Based Enterprise Solutions

Industrial Asset Data Ingestion

Machine Learning Models

SME-Friendly Application

Switches
Transformers
Breakers
Subscriptions

Data Cleaning
Feature Selection
Model Building
Refreshing

Alarms
Analytics
Diagnostics
Insights

Deploy Quickly | Improve Predictive Results | Maintain Performance

THE RESULTS

Asset management can account for 20-30% of a transmission or distribution company's operating expenses and 15-20% of its capital expenditures.[3] Machine learning approaches to managing assets can bring down costs, improve customer satisfaction, and increase the reliability of T&D networks. With SparkCognition ML Studio, the realization of these strategies is accelerated through automated model building approaches that empower users to easily create, optimize, and maintain models at scale.

ABOUT SPARKCOGNITION

SparkCognition's award-winning AI solutions allow organizations to predict future outcomes, optimize processes, and prevent cyberattacks. We partner with the world's industry leaders to analyze, optimize, and learn from data, augment human intelligence, drive profitable growth, and achieve operational excellence. Our patented AI, machine learning, and natural language technologies lead the industry in innovation and accelerate digital transformation. Our solutions allow organizations to solve critical challenges—prevent unexpected downtime, maximize asset performance, optimize prices, and ensure worker safety while avoiding zero-day cyberattacks on essential IT and OT infrastructure. To learn more about how SparkCognition's AI solutions can unlock the power in your data, visit www.sparkcognition.com.

[1] https://learn.sparkcognition.com/utilities/artificial-intelligence-and-the-internet-of-energy-ioe
[2] https://www.elp.com/articles/powergrid_international/print/volume-20/issue-1/features/improving-grid-reliability-through-machine-learning.html
[3] https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/how-analytics-can-improve-asset-management-in-electric-power-networks

Contact SparkCognition today at info@sparkcognition.com