SUCCESS CASE

edp

ANALYTICS4ASSETS:
ADVANCED ASSET MANAGEMENT

INTRODUCTION

Physical assets are the heart of the network that distributes the electricity to the end-users. The process of managing these assets in a company of EDP's size is a combination of complex tasks and people with skills to tackle them. Having these in place leads to correct planning and efficient performance analysis.
However, an effective asset management requires a predictive model that can increase the assets' business value and provide great benefits for those responsible for the assets, and the end-users.
This was the context that led EDP Distribuição to apply a data-driven approach to the management of technical assets, bringing the Analytics4Assets project to life.

MAIN CHALLENGES

- **Asset health.** Evaluating the state of each and every asset's health is a complex task. Different classes of assets require a different set of analysis criteria. As the data used for health assessment come from different sources, it's difficult to integrate it in one system.
- **Asset lifetime**. Understanding the effective lifetime of an asset is vital for efficient maintenance and investment planning. Different assets deteriorate at different paces, depending on internal and external factors that are difficult to evaluate manually.
- **Asset reliability**. How reliable an asset is equals how reliable the network is. The ability to measure, evaluate and early detect potential asset failures, allows faster response and greater stability of the entire system.
- **Data**. Data comes from multiple sources with different levels of accessibility, in diverse formats and with distinct classification models, consuming more resources and making the extraction of valid information highly effortful.

SOLUTION

Analytics4Assets emerged to address the identified challenges related to Technical Asset Management. Its main objective is to gain advanced knowledge of assets' behavior over time, maximizing their value and life. It also supports the decision making process and optimizes the company's maintenance and investment plans.
From extracting and organizing the data, analyzing it, creating advanced algorithms of the analytical models and designing intuitive dashboards, Analytics4Assets hopes to improve the daily tasks of EDP Distribuição people and makes the service more stable, and reliable for everyone who is connected to the network.

8 MVP
Developed to accelerate business value

9.089 KM
Of high-voltage overhead lines

2.625
High-voltage circuit breakers

796
HV/MV Power Transformers

About Digital Global Unit (DGU)

Digital Global Unit (DGU) was born to help EDP Group drive transformation to digital by developing outstanding ideas to improve and optimize processes and thus simplifying both clients and employees' journey. Comprised of a multifaceted team of developers, engineers, designers, data scientists, business specialists, and other experts, DGU works every day to turn impossible ideas into successful business projects at EDP Digital Factory.

digital global unit>_

SUCCESS CASE

edp

HOW IT WORKS

TEAM

The multidisciplinary team working on the project rapidly found common ground, creating a great atmosphere conducive to knowledge sharing and devoting themselves to the project, including the top management.
The agile methodology guaranteed speed and effectiveness, while the offboarding approach has added a layer of continuous knowledge transition across the teams.

DATA

From the beginning, data was considered to be the fundamental basis of the project. The presence of experts on data science, business team members, as well as the data infrastructure teams was essential to the project's success. Their involvement guaranteed contribution of those who know the data, those responsible for the technological infrastructure to make them available, and those who work with them. Inspired by the knowledge shared by the business teams, the data scientists selected, mined, organized and manipulated the essential data sources to feed the MVP, assessing the data relevance, availability and quality. The system allows for future scalability and the addition of new and enriched data sources.
Understanding and using the data was the next step. The brain of the project are the algorithms, some of them revised, others developed, to cover the scope.

MVP

To support the project, 8 MVP have been developed to cover separate workstreams. A number of existing international models and rules were used as the base of the MVP, but with needed customization to adapt the solution to the local challenges. The final algorithms deliver an end-to-end solution that will evolve through time.

DASHBOARDS

The key role in asset management and decision making is played by the dashboards that allow monitoring each asset and managing the risk, and provide relevant actionable insights to support the decision making process.
The dashboards include detailed historical data to give an overview of the asset's health, complied in one spot for easier analysis.

BENEFITS

- Bigger margin expansion due to lower repair and maintenance costs.
- Optimized capital allocation due to highlighting critical asset substitution and prioritizing necessary investment.
- Maximizing the asset life by constant control and forecasting asset health.
- Improved asset reliability due to fewer downtimes and critical breakdowns.
- Reduced business risk by having access to detailed asset information and insights.

BUMPS IN THE ROAD

Dealing with a high amount of data from various sources is a challenging process that involves not only organizing and integrating the data formats, but also understanding the information available and extracting viable insights from it. Fortunately, the team's previous experience proved invaluable to ease and tackle this complex process.
It was also essential to review the current models and find areas of improvement that led to revamping some essential parts of the old framework and bringing new, more efficient algorithms to life.
The most challenging part of the solution proved to be the asset failure probability assessment. A vast number of conditions that influence the extracted data required an innovative approach and showed the weaknesses of the initial assumptions that needed to be reevaluated.
Last, but not least, launching a partial solution was an unusual situation in the organization. However, Analytics4Assets is seen as a living organism that will evolve in time as the database grows and the algorithms learn from all the processed information.

RESULTS

Analytics4Assets has proven that a data-driven approach applied to Technical Asset Management has a high potential of being successful. With the perfect mix of highly qualified human and technical resources, agile work methodology and team's devotion, the future of the project is surely secured.
The project's success factors also included the automation of the reporting models that allows for data-driven decision-making process that can be easily applied to operation and shortens the response time.
Training the stakeholders and users involved in the asset management process is another key success factor to be mentioned. The team's knowledge and experience ensures faster adoption and correct use of the new tools across the organization.
The project is currently in the initial rollout phase, covering three main asset types: high-voltage overhead lines, HV-MV and MV-MV transformers and high-voltage circuit breakers.
The success of the project will open the doors to innovative transformation of asset design and control, data mining and failure probability analysis.

digital global unit>_