Capgemini

AI revolutionizes inspection processes at EDP Redes España

EDP Redes España is working with Capgemini's artificial intelligence algorithms to analyze images in just 48 hours, identifying defects with high precision and improving geolocation

EDP is a leading global energy group focused on value creation, innovation, and sustainability. It is a constituent of the Dow Jones Sustainability Indexes (World and STOXX) and a world leader in renewable energy. EDP's main business is in Iberia, with the Spanish and Portuguese markets forming the core of its operations and a presence across all energy platforms. In the region, EDP is a benchmark with over 14 GW of installed capacity, a leader in distributed generation, and 288,000 kilometers of electricity networks, 60 TWh of distributed energy, 30 TWh of energy sold, and a leading position in electric mobility.

The growth in electricity demand and the need to ensure a safer and more efficient grid prompted EDP Redes España to modernize its traditional infrastructure inspection processes through the use of advanced technologies.

Client: EDP Redes España

Region: Global

Industry: Energy & Utilities

Client challenge:
To accelerate and improve the efficiency, accuracy and flexibility of its electricity network inspection process.

Solution:
EDP Networks collaborated with Capgemini to implement a comprehensive inspection platform, leveraging deep learning, MLOps and computer vision technologies to optimize network inspections.

Benefits:
- Reduction of inspection time from one year to one month
- Greater accuracy in defect detection
- Lower CO_2 emissions, contributing to a reduced environmental impact
- Reduction in operating costs

With the goal of improving the reliability, accuracy, and efficiency of its inspections, the company decided to incorporate AI and digital tools into its processes. This transformation reduced reliance on manual reviews, minimized potential human error, and increased the overall effectiveness of network assessments. To realize this vision, EDP Redes España partnered with Capgemini, leveraging its expertise in AI and digital transformation.

Iterative process driving innovative solutions

EDP Redes España and Capgemini conducted a comprehensive review of the existing inspection processes to identify key challenges and define the project's objectives. This effort encouraged the company to implement a machine learning operations (MLOps) platform capable of training AI models with small datasets, as well as an image processing solution to support these models.

The team opted for LandingAI and AWS technologies for the solution and began development with a proof of concept (PoC) that evaluated the AI models in three different use cases. Throughout this process, the project team customized the image processing and inspection platform by incorporating geolocation features for various assets. Following successful initial tests, the solution was expanded to include nine additional use cases across three countries.

Throughout the implementation, EDP Redes España and Capgemini managed a comprehensive change management strategy to ensure adoption of the new system by the inspection teams proceeded smoothly. This approach facilitated a seamless transition to the AI-driven inspection process, minimizing disruption and maximizing efficiency.

AI transforms network inspections

With the new system in place, EDP Redes España achieved significant improvements in its inspection processes. The time required was drastically reduced from one year to just one month, while the frequency of inspections increased, enabling continuous network monitoring and maintenance. This capability ensures that the network is well prepared to meet future electricity demand efficiently.

The AI models, supported by images captured from helicopters, achieved highly precise defect detection, further enhancing inspection reliability. This success has paved the way for future developments, including the potential use of autonomous drones to carry out inspections with even greater flexibility and speed.

As a result of this transformation, EDP Redes España is now better positioned to manage the growing demand for electricity while maintaining high network quality and reliability.

The innovative solution implemented by EDP Redes España and Capgemini has set a new benchmark for network inspections, combining cutting-edge AI technologies with practical applications to deliver remarkable results. Looking ahead, EDP Redes España plans to explore further developments, such as autonomous drone inspections, to optimize and enhance its network management processes even further.

Through this collaboration, EDP Redes España has not only improved its current operations but also established a solid foundation for future innovations in network inspection and maintenance.

About Capgemini

Capgemini is an AI-powered global business and technology transformation partner, delivering tangible business value. We imagine the future of organizations and make it real with AI, technology and people. With our strong heritage of nearly 60 years, we are a responsible and diverse group of 420,000 team members in more than 50 countries. We deliver end-to-end services and solutions with our deep industry expertise and strong partner ecosystem, leveraging our capabilities across strategy, technology, design, engineering and business operations. The Group reported 2024 global revenues of €22.1 billion.

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