

Implementing Distributed Energy Resources Management Systems

Luxoft helped implement DERMS components across distribution grids, from R&D to implementation

Client: A global energy expert in high reliability electricity transmission and distribution

Project Type: Full-cycle application development, including R&D, design, architecture, implementation and integration

Overview

1 Challenge:

In response to the changing energy industry, our client, a leading energy and utilities business, needed to develop a **Distributed Energy Resources Management System (DERMS)** that would provide them with a real-time update on equipment status for a variety of assets.

This solution needed to be able to monitor, control, forecast, schedule, and optimize distributed energy resources (DER) and the power grid.

2 Approach:

Luxoft's distributed team of industry and technological experts worked in an Agile manner to formulate and elaborate requirements and deliver R&D solutions, determining the best solution architecture and delivering the components.

Effective DER management is the key to succeeding in the changing energy market. However, integrating DER into the grid is difficult due to involving multiple entities and cutting across generation, transmission and distribution functions.

3 Solution:

Luxoft was involved in the full project lifecycle: R&D, architecture design, development, testing, and delivery. Developing the source code for seven different DERMS system components, Luxoft delivered the following DERMS features:

- Integration with electricity market systems, third-party aggregators and regional markets
- Grid network visualization, showing equipment status and situational awareness based on equipment states, making asset management effective
- DER forecasting smart grid based on current state and historical data, including weather providers
- A common user interface, making a framework for future UI development

4 Result:

Our client is able to get ahead of its competitors, drive industry transformation (making power more accessible, affordable and sustainable) and offer a streamlined DERMS solution to the market.

This solution also cut UI development costs by 25–30% across the whole DERMS solution, providing a seamless experience throughout.

Currently, a few regions have already implemented this DERMS module, and this solution is leading the way and setting the standards for all industry experts to implement.

Challenge

Monitor, control, forecast, schedule, and optimize DERs and the power grid

The energy industry is rapidly evolving. There has been pressure to develop systems capable of managing distributed energy resources (DERs), yet immense uncertainty due to a fast-moving digital market and regulations struggling to keep up.

Historically, Load Management Systems (LMS) were used for lowering system loads using one-way communication. While satisfactory for several decades, the emergence of the "smart grid" in the early 2000s brought Demand Response Management Systems (DRMS) to the market, with the capability for two-way communication. A DRMS receives information from load control devices and then determines the availability of resources, helping precisely control customers' energy loads at selected locations on the grid. This capability led utility companies to gradually replace LMS with DRMS.

Going forward, Distributed Energy Resources Management Systems (DERMS) have gained momentum in the 2010s due to the increase of renewables and the ability to store energy at the consumer level, making the following true:

- Distributed energy generation is more widely implemented (solar panels, wind farms)
- Energy storage is now available on premise, and the amount is growing
- Electric car batteries are also being used for storage
- The emergence of an energy efficiency trend, where consumers use more energy efficient electrical devices
- Demand response matching is now even more challenging, due to adding solar panels and consumer-based energy storage in addition to more traditional energy sources

Our client, a leading energy and utilities business and Fortune 100 company, needed to develop a Distributed Energy Resources Management System (DERMS) that they could bring to the market to meet their customers' demand.

Approach

Driving R&D projects via Agile teams with deep industry knowledge

Luxoft gathered a team of ten energy and software development experts to implement DERMS components. The client wanted to start with several R&D projects to develop prototypes that could adapt to more complex energy systems (solar, wind and consumer-based energy storage).

Effective distributed energy resources (DER) management is key to succeeding in the changing energy market. Utilities need to balance customer demands (such as rooftop solar and storage) with the economic impact on non-DER customers, and adapt tariff schemes accordingly.

Strong leadership, industry knowledge, and over 12 years' experience of delivering projects in the energy industry (combined with deep technology expertise), made Luxoft a great fit for the project. The distributed team adopted an Agile approach to formulate requirements, determine the best solution architecture, and deliver the right components to get to market faster.


Solution

Optimized grid operations using distributed energy resource management software

Luxoft was involved in the full project lifecycle, i.e. requirements exploration, the R&D phase, architecture design, development, testing, and delivery. By developing the source code for seven different DERMS system components, Luxoft delivered the following DERMS features:

- Integration with electricity market systems, third-party aggregators and regional markets
- Grid network visualization, showing equipment status and situational awareness based on equipment states, making asset management effective
- DER forecasting smart grid based on current state and historical data, including weather providers
- A common user interface, making a framework for future UI development

Luxoft also customized different parts of the solution for particular end-client needs and integrated with the Integrated Distribution Management System (IDMS). As the evolution of the DERMS product progresses, Luxoft continues to deliver new features periodically, making sure our client stays ahead of the market.



"We can help energy companies to improve, to change and 'level up' their operations efficiency, for all assets."

Dmitry Vilchinsky, Director of Energy and Utilities at Luxoft

Result

A fast time-to-market DERMS solution

Our software solution addresses the economic and technical challenges posed by customer-owned DERs.

The solution enabled our client to:

- Stay ahead of their competitors by offering a modern and effective DERMS solution to the market
- Drive industry transformation, making power more accessible, affordable and sustainable
- Cut UI development costs across the whole DERMS solution and provide a seamless experience throughout

The software is customizable and can be easily integrated for end clients (i.e. cities, states, regions).

Currently, a few regions have already implemented this DERMS module, and the solution is annually presented to industry experts at popular industry exhibitions.

Searching for a trusted innovation partner?

Contact Us