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Electrogrid

A software complex used to engineer and monitor power grids

Summary

A software complex for power grid engineering and monitoring, developed at the request of an engineering and manufacturing company.

Duration
6 months

Industry
Energy

Team
Project manager — 1
Analyst — 1
Back-end developer — 4
Front-end developer — 3
QA engineer — 1

Technologies
Python
JavaScript
React

Challenge

It is important in the electrical power industry to calculate the maximum allowed load on the equipment in order to prevent it from breakdown. A miscalculation may result in losses costing millions. An ideal solution was the virtual modelling of various scenarios in order to adjust the parameters correctly. Besides, it is essential to continuously monitor electric lines, collect statistics and track any accidents. Customer was developing a software complex to meet these two challenges. It was important to release the product as soon as possible, but the company could not afford to allocate the required number of professionals with the desired level of qualification. The customer came to us with a request to develop the software solutions they needed.

Solution

We came up with the idea of developing a software in two separate modules . The project required deep understanding of the specifics of electric power equipment operation. Thus, a number of complex mathematical algorithms was to be composed for scenario modelling. The first module included an extensive set of tools required to engineer complex energy systems and calculate allowed loads. The second one was a multi-screen control console for power grid operators. It used over 20 ways of displaying information on 25 screens combined into a large panel, so implementing a complex interface became a serious challenge for our front end developers. Both solutions are based on a server platform written in the Python programming language. A team of 10 engineers had been working at the software complex.

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Result

The customer added both our modules into their software complex. The calculation and analysis part lent a good helping hand to power grid engineers: they could use it to automatically adjust load parameters, model in steps the grid's operation in various modes, and build interactive graphs. The automatic monitoring system simplified life for power station operators. If an accident happens, the display on the screen changes, tables expand, fonts are increased, and additional information is outputted to capture the attention of employees. The software complex was successfully deployed in several large facilities. The number of accidents with expensive equipment decreased, and the response time to power grid outages improved, which resulted in a reduction of costs and energy losses.