MONITORING PLATFORM FOR LARGE-SCALE SOLAR PLANTS

Mastery in Software Engineering

FORTECH.
a GlobalLogic company

Key Facts

Industry: Industrial Manufacturing

Team Size: 5 People

Duration: 14+ Years (ongoing)

Technologies:

- ASP.Net, Bootstrap, Typescript, .NET, MS SQL Server

Services:

- Software Development
- Software Architecture
- Manual Testing
- Automatic Testing
- Maintenance
- Deployment

Trends:

- Industrial IoT

Highlights

- The charts, periodical reports and error notifications allow users to remotely monitor solar plants that rely on PV inverters.
- Reducing operational and maintenance costs by offering a self-diagnosis functionality for the solar inverters.
- The software analyses the performance of every connected inverter, and factoring in the performance of other, close-by devices can make the difference between false alarms and actual errors.
- The platform allows the users to remote control the solar inverters.

Solution

The task of the manufacturing software team at Fortech was to develop a monitoring portal – web application, mobile iOS & Android apps - that provides, with rich graphics, real-time data on the performance of large-scale solar plants and allows users to remote control the PV inverters.

Data insights on the performance of solar inverters are available in clear and understandable charts, periodical reports, and errors are displayed as notifications.

Solar inverters convert DC power provided by solar panels to AC power that can be fed into the power grid. Through a network of sensors, the PV inverters can log their performance parameters and send them through the internet to a central database.

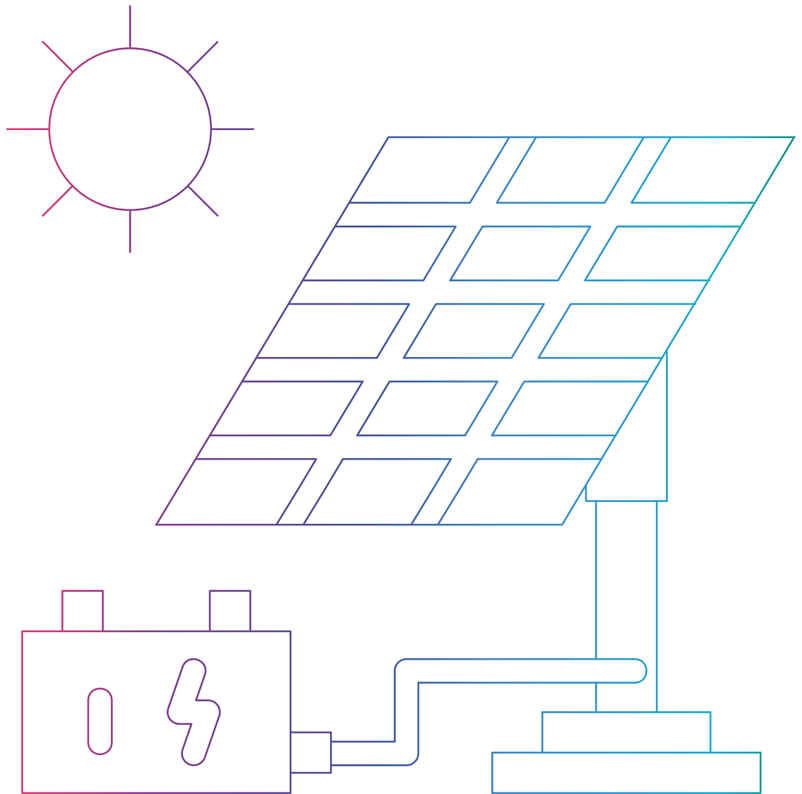
With data being transmitted continuously (the progress of the connected devices can be sent every 1, 5, or 10 minutes), the maintenance crew can swiftly react to any changes or errors, reducing operational and maintenance costs and downtime of solar panels to a minimum.The platform allows them to remote control the solar inverters. They have the possibility to restart, upgrade the firmware or to configure multiple internal parameters.

One innovative part of the software is the algorithm that analyses the performance of every device (solar panel), and by factoring in the performance of other, close by devices can automatically make the difference between false alarms (output dropping because of passing clouds) and real errors (output drops because of faulty modules or inverters).

Critical features for real-time maintenance of the solar system:

- Charts: They show minute-resolution data of tens of parameters in line graph format as day, month, year, and total. Users can visualize data in a table format, too.
- Periodical reports: Users can choose to receive daily, monthly and yearly reports about the performance of their connected solar plants.
- Error notifications: Warnings and errors can be viewed in grids that can be sorted and filtered. When severe errors occur, users receive an e-mail.

Industrial IoT systems facilitate predictive maintenance by monitoring asset conditions, such as solar panels. In this case, long downtimes in energy production can be prevented by allowing the user to visualize real-time data insights even on mobile devices. Even more so, the API will enable users to download the data of their devices.



Collaboration

Our client, a multinational company provides power solutions for industrial manufacturing. The ongoing collaboration between our companies started in 2008. The team at Fortech works on a suite of projects that facilitate the maintenance of solar plants that rely on PV inverters:

- Load balanced services that collect the data
- Local services that maintain the database, send e-mails, and generally operate on data
- Web application that allows users to visualize real-time data insights
- API that allows users to download the data on third-party devices
- APIs serving other components of the solution, like the Android and iOS apps

During the long-term collaboration, the project transitioned from Waterfall to Agile allowing for a dynamic change request management. More so, a tailored process that ensures fast reaction from both sides was implemented.

One of the biggest challenges of the implementation lies in the application's capacity to receive and manage large packages from the connected inverters and other devices and the ability to make it available for the user because the number of connected devices is significant.

In the last months, the project was expanded with services that allow the users to request support (repairing, servicing etc.) for their inverters online, directly from the user interface.

We offer full-cycle manufacturing software development services such as specification analysis, UI/UX, documentation of implemented features, source code maintenance and deployment, and data center communication for maintenance operations for the overall project.

Client Benefits

- Intuitive user interface design for web and mobile apps that simplifies maintenance and error analysis
- Accrescent admin interface that allows the staff to execute administrative tasks directly from the user interface
- Long-term collaboration with a constant self-sustainable core-team that ensures the continuity of the project

ABOUT FORTECH

Fortech is a top Romanian software development company headquartered in Cluj-Napoca. With a workforce of 1150+ people, Fortech has been repeatedly recognized by Deloitte, IAOP®, EY, and Forbes for its fast-growing, entrepreneurial journey.

With expertise and a strategic focus across healthcare, financial services, automotive sectors, and more, we cover the end-to-end software life-cycle development to deliver the innovation, scalability, quality and speed our clients need.

Our approach to software engineering combines strong technology and process know-how, Agile delivery methods, and a blend of code quality practices and metrics refined in almost two decades. Since 2003, over two hundred fifty clients chose Fortech as their tech partner.

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