

Intelligent management of windparks – IWB uses IoT-potential with QlikView

"With the use of QlikView, a whole new world has opened up for us. For the first time we are fully informed about what is happening or not happening in each of our wind farm's turbines. We can respond immediately and initiate countermeasures. This means higher efficiency and productivity, reduced downtime and lower costs!"

– Dirk Oehlmann, *Asset Manager, IWB Industrielle Werke Basel*

Customer

IWB (Industrielle Werke Basel) supplies and networks over 250,000 customers with energy, water and telecommunications in the region of Basel and beyond. IWB is a leader in the fields of renewable energy and energy efficiency. In addition, the company owns 22 wind farms, three extensive photovoltaic plants and several medium to small photovoltaic roof plants in France, in Germany and in Switzerland, or participates in them. The company has a large amount of data available, and the optimal potential use of this also plays an important role - in line with the concept of Utility 4.0, which propagates the necessary change of classical utilities to digital energy service providers.

Starting situation

Thus data from the SCADA (Supervisory Control And Data Acquisition) plants of the 18 wind turbines, where IWB has a majority holding, are to be made available for the purposes of monitoring and analysis. The objective is to achieve the highest possible efficiency of these plants. For this, the comprehensive data, derived from heterogeneous source systems were initially combined on an internet-of-things (IoT) platform. Microsoft's Cloud computing platform Azure is used for this.

It was then necessary represent this data visually and evaluate it, via a dedicated business intelligence solution.

The selection of the appropriate software was made in close collaboration between the IT and specialist departments, above all the Asset Management division. Functionality and usability were thereby to be ensured in terms of meeting both the technical requirements of the IT experts and those of the users.

Solution

The choice fell on BI solution QlikView, renowned throughout the industry as a best practice product. Informtec Ltd.liab.Co. took over the implementation of the BI project. As Qlik Elite solution provider, the BI specialist from the Basel area is among leading Qlik partners in the DACH region and has project experience in the energy and industrial 4.0 environment.

The QlikView-based solution is operated on Informatec's Swiss BI Cloud. This is a secure, reliable and cost-effective business intelligence platform in the Cloud. The data volume of initially around 50 million records to be analysed is growing each month by three or four million. The data is updated every 15 minutes.

Application areas and uses

Solution overview

Customer: IWB Industrielle Werke Basel

Sector: Energy

Division: Asset management, finance & controlling

Region: Basel, Switzerland

Challenges: Provision and analysis of data from the supervisory control and data acquisition systems of wind turbines for the wind farm management.

Solution QlikView as cloud solution, NPrinting

Advantages:

- Direct access to SCADA data in close to real time
- Rapid analysis of large amounts of data and presentation in an intelligible form
- Full transparency on performance and condition of individual turbines and wind farms
- Monitoring and forecasting of electricity production in real time
- Automated alerts of deviations from normal values
- Investment protection for system upgrades through ROI calculations
- Cost savings and efficiency boosting through real-time monitoring and predictive maintenance

Data sources: Microsoft Azure

Qlik partner: Informatec Ltd.liab.Co.

Time to value:

Three days

Three days for the development of the data model to the availability of a first productively usable application

Return on investment

- Reducing the downtime of individual turbines from 135 hours to 5 hours
- Investment evaluation for special sensors with acquisition costs of 40,000 euros, by counter-balancing the achievable monthly increase in productivity. EUR 7,000 with an average turbine lifespan of 15 to 20 years



The QlikView applications are responsible for monitoring both the overall plants and also the condition monitoring of individual components, as well as being used for analyses. "A total of 50 signals are evaluated," explains Oehlmann. "We can thus monitor current production across national borders and in real time, which allows us to operate power trading and maintenance more efficiently."

By integrating weather data, for example, scheduled maintenance dates can be optimised. In addition, the tool reports unusual values of SCADA data so IWB can promptly inform the technical plant manager, who can then get to the bottom of the cause on location. Moreover, with the QlikView tool IWB is very quickly able to represent the monetary performance of equipment upgrades. One of the strengths of QlikView is that it is also possible to evaluate large amounts of data from the past and derive predictions for the future. IWB also uses such predictive analytics. "We initially focused on the significant key data measurements on the temperatures of the rotating parts in wind turbines," explains Oehlmann. "To this end we recorded the temperature values in the gearbox bearings of all seven turbines in a wind farm for several weeks, depicted them graphically and calculated the average value. As soon as this average is exceeded by a certain amount - for example 15 percent -, we get a warning. Then we observe if the temperature remains at excessive levels or increases further. If this is the case, we immediately inform the technical operational manager so that he can send a technician to the plant. Because the probability is then very high that it will lead to a failure - one that we can prevent. "

The managers and producers are sent automated daily, weekly and monthly reports. The Qlik all-in-one solution NPrinting is used for this, which allows control of the entire reporting processes in QlikView.

"We were looking for a solution that allowed us to both monitor the systems in operation in different levels of detail and to analyse flexibly, including the use of historical data. QlikView is just such a solution, and also a highly user-friendly one, so employees can use it in the departments without IT support."

The future

In future the scope of predictive maintenance in particular will be further expanded. We also plan to image both technical and financial data in QlikView. A requisite SAP® interface has already been realised for this.

"QlikView gives us the decision-making basis for trading electricity more efficiently, and with automated alerts and predictive analyses enables us to immediately intervene if problems arise in the wind turbines. This provides us with the best conditions for maintaining and enhancing our long-term competitiveness."

– Dirk Oehlmann, Asset Manager, IWB Industrielle Werke Basel