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Ekopak Uses InfluxDB for More Sustainable Water Treatment

Ekopak

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With The Help Of Factry Historian And InfluxDB, Ekopak Transformed Its Data Management Process

Company in brief

Ekopak is a company working on making industrial water management more sustainable and cost effective. It's the first renewable water supplier in Belgium. Ekopak's business is driven by chemicals, disinfection equipment, and processing equipment. Workers there build, sell, and operate water treatment equipment to industrial clients in a variety of industries. The company focuses on recycling water to reduce water and energy use.

The Factry Historian is a platform for industrial processes data management. Factry has two different products, Historian and FactryOS (an MES system). The company has customers in many industrial sectors, including steel, chemicals, food and beverage, renewable energy, and textiles. Sometimes called the digital factory industry, its solutions bring together Information technology (IT) and Operational Technology (OT). Over a two-year, iterative process, Factry Historian dramatically improved data management at Ekopak, and InfluxDB was a key part of the system.

Case overview

Ekopak collects large volumes of data from the water treatment equipment they operate. Before using Factry Historian, their data management system was labor intensive and slow. Because their employees had to spend time downloading data and creating new Excel files to analyze it, they lost opportunities to spend time with the actual data to see where it could lead them. Their new system automatically stores data in InfluxDB and creates dashboards in Grafana so they can visualize near real-time data and use it to the greatest effect possible.

Engineers use this data to identify sources of past problems, help with time-sensitive decisions, and predict the future. Ekopak is growing, so they have to treat more water with more complex equipment setups, and they have more data coming in that they need to monitor. With so much equipment operating simultaneously, it's very valuable to be able to predict failure so they can maintain machines rather than repair them.

Technologies used: InfluxDB, Grafana, Factry Historian, OPC-UA, eWON, DataMailbox, ERP

The business challenge

Countless industrial processes use water, from brewing beer to heating and cooling manufacturing equipment. Before it can be used, water needs to be treated for each specific purpose. In its untreated form there are various minerals dissolved within it. These minerals can interfere with industrial processes, so companies like Ekopak specialize in treating water to prepare it for various industrial uses. Minerals dissolved in water used for heating or cooling can form scales, as you often find on tea kettles used in any kitchen. Water quality is also important for uses involving human health, like food and beverage manufacturing.

Ekopak works on several different kinds of filtration equipment, including some that remove bacteria and viruses from water. The team designs the water treatment installations, builds and assembles them, and puts them in containers. The client then installs these containers and Ekopak operates them, collecting data from the instruments. Ekopak uses the data to identify problems with equipment, and also to inform reports on performance.

With so much data coming in, it's important to have an efficient data management system. Prior to working with Factry Historian, tedious manual processes slowed down business at Ekopak . Now the Factry platform automatically sends that data to InfluxDB, where Ekopak can quickly create dashboards. This allows Ekopak to handle greater volumes of data and work with more clients.

The technical challenge

Before the Ekopak team started working with Factry, they were using a system that required analysts to select each equipment installation individually to view. They also didn't have very high resolution data, collecting metrics like pressure and temperature every minute or so. They used Excel to analyze and graph data that they manually downloaded. The team had to regularly redownload data and recreate Excel files to keep their analysis up to date. This approach was very slow and meant employees only had time to analyze data when it was necessary to identify a problem, rather than using data proactively to inform decisions.

The data Ekopak collects originates in programmable logic controllers (PLCs). Before implementing the new system, there was a multi-step manual download process that interfered with keeping data up to date. With the new system, there is a Factry Historian collector set up within the Ekopak machinery that collects metrics at resolutions from a hundred to a few thousand points every second and stores that data in Factry'sCloud. The switch to using real-time data that automatically updates to the cloud lets Ekopak use their data for more complex purposes.

The solution
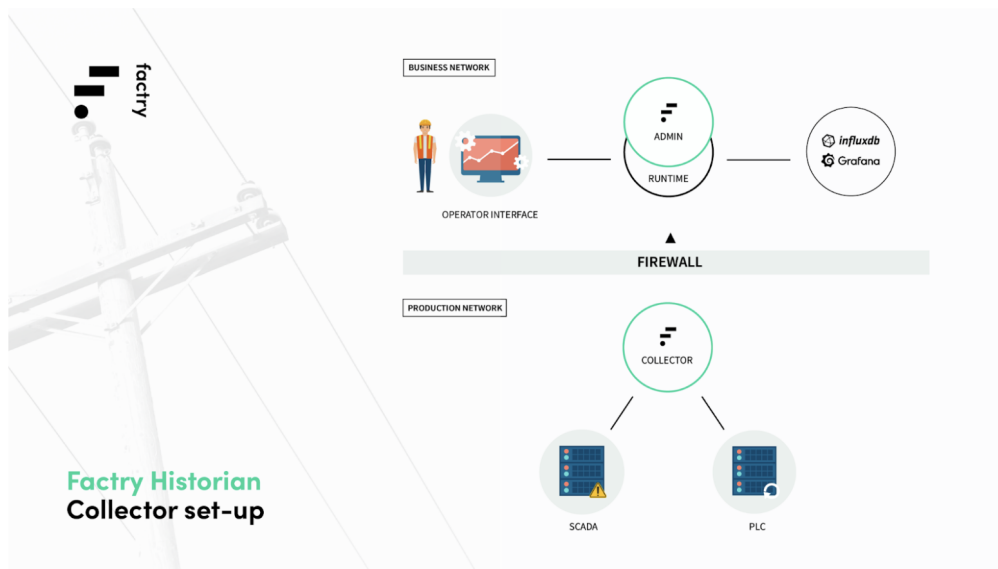
Architecture of the EkoPak solution powered by Factry and InfluxDB. Source: Factry

Factry began the transformation of Ekopak's data management by importing previous data into InfluxDB and visualizing it with Grafana. They used one InfluxDB database per Ekopak installation. Using a dashboard environment instead of Excel spreadsheets saved Ekopak a lot of time. This enabled the Ekopak team to spend more time analyzing data to better understand their installations.

Next, they added new installations and data to the system. New installations used OPC-UA (a standard for data exchange with automation equipment) to collect data directly from the PLC. This provides Ekopak with more data resolution options and enables the team to actively choose the optimal time resolution for different metrics. The higher resolution data made a huge difference for identifying events and setting alerts. Factry set up small industrial-grade Raspberry PIs with their OPC-UA collector installed, and Ekopak includes them in new installations. The devices connect to wireless networks and search for Factry backends. Then the collector requests its configuration, and in the administration interface, an employee enters the hostname of the OPC-UA server and the tags or measurements they want to collect from the device.

Now Ekopak has access to high-resolution, near real-time data that's coming into dashboards automatically so they can look at historical data and also schedule preventative maintenance. They can set alerts and alarms, for example when temperatures surpass a certain threshold. They have an automatic process so if an alert goes off for temperature, they get the name of the sensor that triggered the alert along with tags and a timestamp. The system automatically creates a URL and sends it to workers who see a dashboard with more details on the issue. Organized measurement naming conventions are vital to this process. Data on alert frequency and causes helps with end-of-the-month reports and plans to improve machinery.

The availability of open source tools like InfluxDB was vital in allowing Factry to start their business. Factry also contributes to the open-source community by sharing some of their tools, such as the OPC-UA logger which sends data to InfluxDB and commits to the Go OPC-UA package.

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We get a lot faster and better insights, pre-interpretive dashboards are excellent for new hires, and it helps with knowledge retention.

Frederik Van Leeckwyck, Business Development Director, Factry

Results

One example of the new system leading to insights is with pressure metrics across water filters. Before implementing the new system, the Ekopak team made charts in Excel that showed the pressure sensors measured before and after the water filtration process occurred. This gave them numbers without a lot of meaning. With the new system, they used Flux to easily query the data and subtract the pressure after filtration from pressure before to get the difference in pressure across the filter. They found that the difference was gradually increasing over time as the filter got dirtier. Monitoring the pressure difference lets them know when they need to clean or replace a filter. Remotely monitoring the status of filters, rather than manually inspecting them, lets Ekopak schedule maintenance more effectively. It's a lot easier to query data to get useful results like this in a dashboard environment, and that becomes even more true with more complicated queries.

Dashboards also make it easier to train new hires in interpreting and acting on data. Ekopak is now able to identify equipment issues much more quickly. They are also able to schedule maintenance proactively. Ekopak also shares the data they collect with their clients. They use separate InfluxDB databases and Grafana organizations for each client so they can share data easily.

Grafana dashboard example. Source: Factry

What's next

Ekopak is in the midst of a business model transition. At the moment, the team sells and operates water treatment installations. But they're looking to shift to continuing to own the equipment and bill their customers based on the amount of water they treat using it.

With this new business model, they need to be even more diligent about collecting and handling data properly. They need exact numbers in order to send invoices to their clients. Dashboards allow clients to see detailed data and interact with it themselves to check that everything is correct. Ekopak can also set up automatic invoices using this process. In the future, Factry also hopes to apply machine learning methods to these kinds of projects.

About Factry

Factry is a Belgian software company that was founded in 2016. Its core mission is to introduce data-driven, operational improvements and greater insight to their clients by offering a scalable platform for the easy collection, storage and visualization of sensor data from any type of industrial equipment.

Factry Historian is a child of the open source revolution. By leveraging and combining state-of-the-art open source technologies Factry is able to dramatically increase data visibility and offer frictionless access to data for everyone in a manufacturing, processing or production

About InfluxData

InfluxData is the creator of InfluxDB, the leading time series platform. We empower developers and organizations, such as Cisco, IBM, Lego, Siemens, and Tesla, to build transformative IoT, analytics and monitoring applications. Our technology is purpose-built to handle the massive volumes of time-stamped data produced by sensors, applications and computer infrastructure. Easy to start and scale, InfluxDB gives developers time to focus on the features and functionalities that give their apps a competitive edge. InfluxData is headquartered in San Francisco, with a workforce distributed throughout the U.S. and across Europe. For more information, visit influxdata.com and follow us @InfluxDB.

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