



Tapping into Real-Time Sensor Data with InfluxCloud to Provide Clean Energy to Rural Africa

AN INFLUXDATA CASE STUDY

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April 2017

Overview

BBOXX had an interesting problem to solve—how to become a data-driven company by continuously monitoring their geographically dispersed 85,000 solar rooftop units providing insights into customer-usage patterns and anomaly detection. They turned to InfluxData’s core Time Series Database InfluxDB because “it was a “fire up and forget” database—it just worked!”

The result: BBOXX provides over 350,000 people across 35 countries with electricity—children are now able to study under good light without inhaling soot and fumes from burning kerosene. InfluxData is a core part of their solution meeting their current needs of remote monitoring, billing, and alerting of their 85,000 units, growing to nearly 1 million by 2020.

About BBOXX

BBOXX (pronounced “Bee Box”) develops and manufactures products to provide affordable, clean solar energy to off-grid communities in the developing world. The name is short for “Battery Box.” BBOXX systems comprise of a solar panel connected to a battery and a set of USB and DC connectors to power lights, radios, and low-powered televisions. The unit also includes a set of electronics to allow BBOXX to control it remotely.

“On scalability, we wanted to grow from monitoring about 1,000 units at first to 20 million units by 2020. So we also needed the system to be reliable and stable while growing between those two points. And we needed it to be fast, both for data collection and querying.”

David McLean, Senior Developer

The Business Problem

The company grew on a fast trajectory; in just seven years it has 350 employees across five offices in China, UK, and East Africa, and has sold over 85,000 BBOXX units running in over 35 countries, providing 350,000 people with electricity. But their outsourced system of monitoring was unreliable and was not able to meet their business goals of being a data-driven business.

The Technical Problem

Becoming a data-driven business meant that their solution needed to have real-time data at its core which had another set of challenges:

- Securely monitor a distributed set of devices across low bandwidth 2G networks
- Provide real-time 24-7 monitoring to a distributed team who expects the data to always be right and available
- Provide the ability to monitor and react to high-speed time series data
- Ability to remotely monitor and manage the distributed devices
- Ability to track usage statistics and bill based on these statistics
- Proactively monitor units so they could be repaired before the customer lost power
- Provide insight into customer usage patterns to develop compelling pricing plans
- Gather, harmonize, and use 3 different sets of data from the various components
 - Raw telemetry data (voltage, current, temperature)
 - Logs from the box firmware
 - Derived data (power, daily energy usages, state of charge)
- Lack of staff to manage another solution
- Keep latency systems at a minimum—their systems were already hosted in AWS and the performance was meeting the need of the company

“InfluxDB is helping BBOXX become a data-driven business. Instead of just selling boxes, we’ll soon be selling customers a pay-by-the-month plan. It’s the speed, reliability, and scalability of InfluxDB that is enabling us to move ahead with this more flexible and responsive plan.”

Providing Business Value

In addition to these technical challenges, they were looking for a system that could create real business value.

- **Drive Business Value:** Proactively monitor and analyze battery health, creating alerts based on historical trends that can predict battery failure before it happens. Their customers buy a service, not a battery!
- **Increase customer satisfaction and retention:** Gain insight into the day and the life of a customer and uncover interesting usage scenarios that drive product development. For example, knowing that customers leave their lights on all night for security purposes helps BBOXX deliver additional security offerings.
- **Upsell Opportunities:** Correlate and aggregate usage data and upsell additional power capacity based on upcoming events; for example, the Kenya and Zambia football match increased demand for more energy to support extended viewing times.

Why InfluxData?

InfluxData's Time Series Platform was key to BBOXX's final solution. Here are the main reasons they chose InfluxCloud:

- **Fully managed and hosted:** BBOXX didn't want to run the solution themselves on their own hardware so InfluxCloud fit this requirement. Furthermore, having it in the same AWS data center with the other components of their solution also helped to maintain their low latency requirement.
- **Scalability:** InfluxData's InfluxDB was able to handle their current load and their projected load of 20 million units by 2020, all producing hundreds of events.
- **Purpose-Built:** InfluxData was built to reliably handle time series data. This was critical to BBOXX. They loved the fact that "InfluxDB was the 'fire and forget' database for us."
- **Query Language:** The InfluxData Query Language with its SQL-like structure was very easy to understand and work with.

"We have become a highly data-driven company to constantly monitor and improve our products based on real-time data from field installations. It is the InfluxData Time Series Database that allows us to do that."

Results

BBOXX provides over 350,000 people across 35 countries with electricity—children are now able to study under good light without inhaling soot and fumes from burning kerosene. InfluxData is a core part of their solution meeting their current needs of remote monitoring, billing, and alerting of their 85,000 units, growing to nearly 1 million by 2020.

The initial goal of becoming a data-driven business is a reality. They are now able to get insight into their data and are applying lessons learned from analyzing past data to develop new and exciting products that exceed customer expectations. Although gathering data was not a core part of their business plan, the insight it has created is a core asset to the business.

The whole company now uses data stored in InfluxDB in a whole new way:

- Developers analyze the data for ways to create new data streams.
- Analysts look for irregularities in usage and write algorithms to detect alerts.
- Business Managers look for customer usage patterns.
- Technicians analyze time series voltage and current patterns for remote diagnostics
- Centralized Call Center Operators reconcile more technical issues for customers by seeing the reason for the outage (hardware failure, over-usage, non-payment).

In addition, their investors are highly interested in their data collection and analysis as a marker for data-based competitive advantages, reduced delinquencies, growth potential, and decreased risk.