sensus
a xylem brand

Consumer Demand Drives Need for Better Data

How two utilities are enhancing engagement through analytics

DIVE BRAND STUDIO

A **UTILITY DIVE** PLAYBOOK

More than ever before, customers are demanding insight that will give them more control over their utility bills. The key to meeting this urgent need is through the implementation of effective analytics that deliver data and alerts that are both understandable and actionable for utility personnel and customers.

Here's how two utilities are using analytics to better monitor their systems, proactively address customer problems and complaints, and more.

At the municipal electric utility serving Troy, Alabama, consumer demand for better energy data led to pressure from the very top of local government.

"Getting more information to utility customers was a top priority for our mayor when he came into office five years ago, after serving as a city council member for 16 years," said Brian Chandler, general manager of utilities for the City of Troy. "He made it a top priority for us to implement an AMI system with analytics."

In 2017, the City of Troy deployed advanced metering infrastructure (AMI) and analytics for its 8,000 electric customers. The utility is also rolling out AMI and extending analytics to its nearly 6,000

SENSUS
a xylem brand

"Having personnel with a dedicated focus on analytics has **helped us identify issues system-wide,** on our distribution network as well as on the customer side."

Brian Chandler, *general manager of utilities for the City of Troy*

water customers. Sensus – a provider of smart metering and related communication systems – supplied the AMI equipment, communications network, cloud-based analytics solution and a customer portal interface.

Support from the top can also help align internal resources (such as staffing) with new priorities. "It can be mind boggling and overwhelming to see how much information and how many reports come out of our system on a daily basis," said Chandler. "So, we hired someone to keep an eye on that. Having personnel with a dedicated focus on analytics has helped us identify issues system-wide, on our distribution network as well as on the customer side."

Proactively Addressing High Bill Complaints

Meanwhile, in Cedar Park, Texas, growing concerns and confusion about water bills spurred the municipal utility to deploy a cloud-based analytics package by Sensus in 2017.

Back in 2015, Cedar Park was using automated drive-by meter reading (AMR), but not yet AMI, so data on water consumption was limited to two monthly data points. That year, the weather was highly abnormal: an unusually wet summer followed by a dry fall with higher temperatures. This led to higher water consumption than was typical so late in the year. Without understanding the nuances of their own water usage and how billing tiers affected total charges, many customers complained of being overbilled.

"We saw very clearly that we needed to be able to communicate better with our customers; this was the big impetus for our AMI and analytics," said Nanette McCartan, utility programs manager for the

"We saw very clearly that we needed to be able to communicate better with our customers; **this was the big impetus for our AMI and analytics."**

Nanette McCartan, *utility programs manager for the City of Cedar Park*

SENSUS
a xylem brand

City of Cedar Park. "We needed to prove more clearly to our customers that they did use as much water as we were billing them for, as well as give them more insight so they could better manage their water consumption and bills."

In 2017, Cedar Park deployed Sensus smart meters with radio communications for all 23,000 municipal water customers. The utility implemented Sensus Analytics system-wide and opted for the Sensus Customer Portal to address customer engagement.

"We did our due diligence, getting outside insight," said McCartan. "We contacted 50 other cities with water districts to understand their AMI challenges. It would be a significant investment to convert, so we had to do our homework."

Most utilities have processes in place to filter out and examine abnormally high bills before they are sent to customers. But, without analytics, this process can involve considerable clerical gymnastics.

> ...Without analytics, this process can involve **considerable clerical gymnastics.**

SENSUS
a xylem brand

More Information = Happier Customers

In both cities, customer response to the information supplied via analytics has been immediate, strong and positive – especially since these utilities now can proactively alert customers to problems such as possible water leaks.

For instance, since April, the City of Cedar Park has contacted more than 250 water customers whose data indicated a "continuous flow" condition – not necessarily a leak, but a highly suspicious indicator.

"We detected continuous flow very quickly, sometimes within a few hours, and suggested that those customers check it out," said McCartan. "This helped many of them catch leaks early, before damage had occurred or bills increased significantly. A few times, customers didn't believe they had a problem – but later they called us back to thank us."

By incorporating billing system parameters such as usage tiers, Sensus Analytics also identify when a customer's usage might be trending toward bumping them up to a more expensive price tier.

sensus
a xylem brand

Customers can configure their own parameters for optional automated alerts related to water usage or billing – a new feature that has proven popular with customers.

"Many of our residents are very conservation-minded, so they appreciate the alerts," said McCartan. She noted that Cedar Park is in the watershed of the Highland Lakes chain of reservoirs in Texas. "At times, we've had low lake levels that required rather drastic mandatory conservation measures. That prominent visual of a lake drying up was a big motivator for local water conservation on an everyday basis."

> "When we talked to other utilities, we were told that 10% adoption was excellent, so we feel really good about getting **6% adoption basically right off the bat."**
>
> ***Nanette McCartan,*** *utility programs manager for the City of Cedar Park*

Cedar Park and other water utilities that draw from these reservoirs are required to meet increasingly stringent conservation targets of the Lower Colorado River Authority, which manages these reservoirs. Analytics data helps the city monitor and prove progress toward these external requirements, as well as strategize for future conservation efforts.

sensus
a xylem brand

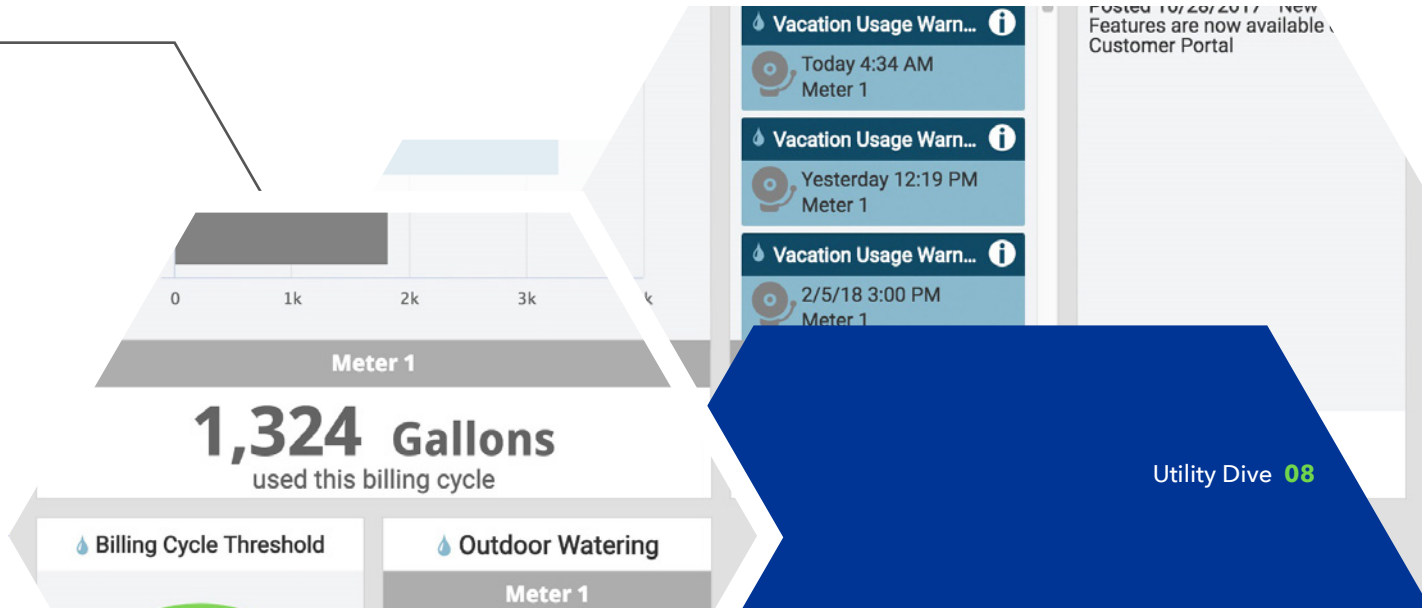
An attractive, useful customer portal can be a valuable tool for utilities to enhance customer service, empower customers to manage their usage and bills and control costs.

Through this portal, Cedar Park water customers can view a graph of their water usage in increments as small as hourly or as much as annually. Optional overlays for local temperature and rainfall data provide valuable context about the factors that might drive changes in their water usage. Customizable alerts can reflect changing circumstances. For instance, if it's winter and a customer is not running their irrigation system, they might set their water consumption alert threshold much lower than in summertime. Customers can also designate multiple alert recipients, such as family members, tenants or employees who might be available to quickly check on unusual water usage.

Cedar Park deployed its Sensus Analytics customer portal in August 2017, and just three months later they saw over 6% of customers had registered and were using the portal. "When we talked to other utilities, we were told that 10% adoption was excellent, so we feel really good about getting 6% adoption basically right off the bat," said McCartan. "All of our marketing and education on this is paying off."

Troy's portal deployment is still in the testing phase, but so far, the utility has learned that customers are valuing the portal as a way of predicting energy usage and bills. "If you're getting a new air conditioner or heat pump, or if you're considering changing your thermostat settings, the portal makes it easier to anticipate how this might affect your bill. You don't have to wait until a month later to see the impact," said Chandler.

While Troy doesn't have specific goals for portal adoption, Chandler expects a good response from customers. "We're a university town, with a lot of younger folks and highly educated consumers. They'll probably be pretty interested in the portal."



sensus
a xylem brand

Smart Alerts

Analytics can also help utilities diagnose and address emerging problems on their distribution grid, before individual customers are affected or might complain about a problem.

For instance, on a recent day in Troy, utility managers noticed the analytics system issued several brownout alarms – meters that were receiving low voltage, although not low enough to cause damage or for customers to notice.

"We investigated first by taking a deeper look into the analytics," said Chandler. "The voltage problem appeared only on one phase of our three-phase system. From that, we tracked it – all by remote – to a blown fuse on a capacitor bank. We were then able to dispatch a crew to exactly the right location to make that repair. Because of the alarms we'd configured, we found and fixed that problem within a day. Previously it might have taken weeks or months, and the costs and consequences would have been greater."

Ryan Roberts, product manager at Sensus, explained that in Sensus Analytics, it's easy to configure "soft alarms" that notify utility staff when certain conditions arise that warrant attention.

SENSUS
a xylem brand

> **"A soft alarm certainly can't replace gut-level knowledge, but it can be a way to preserve it** – which can help utilities wrestling with issues of turnover in an aging workforce."
>
> ***Ryan Roberts,*** *product manager at Sensus*

SENSUS
a xylem brand

Typically, a soft alarm combines multiple data elements: such as time and usage data. Or it might watch for a sequence of events, such as an outage followed by a reverse flow, which might indicate tampering. When certain combinations of data occur, all at once or within a defined time window, Analytics will alert utility staff to investigate.

Soft alarms are unique to each utility, based on its accessible data and organizational priorities. They can also serve as a complement to valuable staff expertise. Operations personnel typically possess a deep, nuanced understanding of the patterns and idiosyncrasies of how a utility network functions. When some of their accumulated insight is encoded as soft alarms, then automated systems and processes can provide more of the benefit of skilled eyes and minds, 24/7.

"A soft alarm certainly can't replace gut-level knowledge, but it can be a way to preserve it – which can help utilities wrestling with issues of turnover in an aging workforce," said Roberts. "As we help customers configure their analytics, every time we hear of a good soft alarm, we find ways to include it as a module, so that it becomes available for other utilities to adapt and use. Since our Analytics platform is cloud-based, this is an important way that utilities can help each other."

Of course, utilities cannot take action on alerts that aren't received. That's why the quality of the communication network is crucial to any analytical solution.

Most smart meters and other field devices transmit data and alerts to the utility via radio frequency (RF) communications. However, when communication networks utilize parts of the radio spectrum that are available for public use, interference from other radio traffic can interfere with the utility's ability to receive and act upon data and alerts. With the current proliferation of devices that connect to the Internet of Things via RF communications, signal interference is likely to become an increasing problem for AMI.

To help utilities future-proof their AMI networks against interference, Sensus obtained a Federal Communications Commission (FCC) license for a portion of the radio spectrum. This licensed spectrum is the foundation of FlexNet, a secure communication network developed by Sensus that is reserved for AMI data traffic and alerts.

Most AMI communications networks utilize mesh technology on unlicensed RF spectrum. This forces AMI data and alerts to compete on a single communications channel. But within its licensed spectrum, FlexNet allows a utility to establish multiple dedicated channels. This not only enhances the speed, flexibility and reliability of data transmission, but also helps prioritize alerts from field devices. In turn, this helps Analytics deliver alerts promptly to appropriate utility personnel.

Chandler noted that the City of Troy values this communication advantage. "We like that it's just us on that frequency," he said. "We don't have to worry about RF interference, having to find workarounds or dealing with other users of an open frequency. If we do encounter any interference, we can complain to the FCC that someone's on our frequency, and we'd have legal leverage."

SENSUS
a xylem brand

Long-Term Benefits

We can't imagine going back to having very limited information to provide to our customers," said McCartan. "Analytics is an invaluable customer service tool. Every day we're learning something new, and that's going to impact every aspect of our business."

Roberts agrees. "When a utility has a problem, it's rarely confined to just one department. It needs to be resolved across the business. It's a way to engage customer service reps, operations staff, field technicians and financial staff. Analytics can show how every department has a role in solving problems."

Both Cedar Park and Troy are planning to leverage Analytics to enhance long-term system planning and upgrades.

"We can get data on transformer loading and assets, and we'll roll that into our detailed distribution system maps and system studies," said Chandler. "This will shape our operations and maintenance planning. Which transformers are getting overloaded? We can change them before they're overloaded too long and get a heads up on distribution problems."

Right now, Cedar Park is focusing mainly on using Analytics to connect better with customers. "But in the near future we will be obtaining meter reads citywide for a particular point in time and comparing that to production of our water treatment plant," said McCartan. "That will help us estimate daily losses. We're excited about that," said McCartan.

> **"Analytics is an invaluable customer service tool.** Every day we're learning something new, and that's going to impact every aspect of our business."
>
> ***Nanette McCartan,*** *utility programs manager for the City of Cedar Park*

SENSUS
a xylem brand

Finding the Right Place to Start with Utility Analytics

From preventing high bill complaints and helping customers find ways to save power, gas or water to positioning a utility for continued business success, analytics can pave the way to greater understanding and action.

Also, regulators and local governments are increasingly focused on constructive customer engagement, and analytics can foster better relationships from above and below.

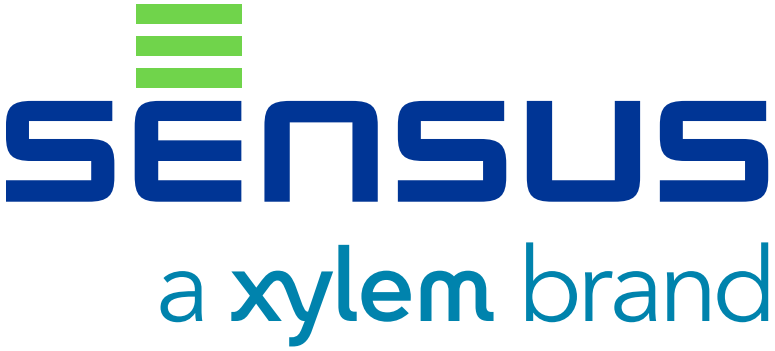
Utilities that currently have little or no automated analytics should consider these questions:

1. What kinds of customer complaints or concerns are most common, and what kinds of individualized data might help customers take proactive measures to save energy, water or money?

2. If your utility has deployed AMI, what kinds of data are your smart meters and other grid sensors supplying? How might each utility department use some of this data in order to enhance operations, support planning, or foster new opportunities?

3. What opportunities exist to bundle analytics with AMI deployment or a customer portal, to create efficiencies and compatibilities among these tools?

SENSUS
a xylem brand



Sensus helps a wide range of public service providers–from utilities to cities to industrial complexes and campuses–do more with their infrastructure to improve quality of life in their communities. We enable our customers to reach farther through the application of technology and data-driven insights that deliver efficiency and responsiveness. We partner with them to anticipate and respond to evolving business needs with innovation in sensing and communications technologies, data analytics and services.

LEARN MORE

https://sensus.com/solutions/analytics/