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COVER PAGE

Innovation Study Title Integrating Technology into Water Use Management

Category Sustainability

Jurisdiction Name Town of Los Gatos

City/County Manager Greg Larson

Population 29,400

Submit Innovation Study for an Alliance Innovation Award Yes [] No [X]

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SYNOPSIS

Background

Los Gatos is committed to the sustainable development of the community. Over the last several years, the Town has implemented many sustainability initiatives in its internal operations. The town has established a “Los Gatos: Growing Greener Together” program to engage the community, uses alternative fuel in its vehicle fleet, has introduced solar powered trash compactors and is constructing its new library using Green Building standards with the hopes of achieving LEED Gold certification. The Town also recently signed a solar Power Purchase agreement to purchase renewable power for the Police Operations Building and Town Service Center, and has included solar panels on the new library facility.

In 2011, the Town of Los Gatos planned to broaden its sustainability efforts to include water conservation. As public awareness of the water scarcity problems in California increased, town officials concluded that they must be proactive in developing the Town’s water conservation efforts to further its efforts in establishing itself as a sustainability-conscious community. The rapidly rising cost of water also underscored the importance of curbing water consumption. According to some estimates, the cost of water is projected to rise at an annualized rate of around 7% between 2011 and 2020, which could significantly impact the town’s budget. The town was eager to manage increases in water-related budget expenses and to decrease these expenses whenever possible. Moreover, Los Gatos also faced regulatory pressures in the area of water conservation as new legislation, most importantly the California Model Landscape Ordinance and the Water Conservation Act, prompted it to reduce its water consumption. The town’s budget pays for water used by public facilities as well as for the irrigation water used in the town’s parks and medians. In 2010, the Town of Los Gatos incurred the annual water cost of \$140,000, while consuming around 27,800 CCF of water.

To further its water conservation efforts, Los Gatos needed a new water data management system that would provide better insight into the town’s current water usage. At that time that this project began, the only sources of information on the water use were the bills sent bimonthly by San Jose Water Company. The bimonthly bills were sent separately for each of the 83 water meters, which made it difficult to integrate the data and get a complete picture of the town’s water consumption. Facilities staff and town managers did not have information on water usage and leaks until 1-2 months after the use or event. Furthermore, maintenance staff often lacked the basic information on where a particular meter was located, and, when a problem, such as a leak arose, up to 80% of the repair time was spent on locating the meter. With extremely limited maintenance staffing, these delays presented a significant impact on productivity. The new system had to address these issues in clear and measurable ways and allow the town’s civil servants to focus their efforts on other important civic issues.

Project Goals

The major goals that the Town of Los Gatos planned to achieve with the new water data management system include the following:

- Understand water consumption (through dynamic observation) and billing information to determine cost implications and manage usage. Detailed water consumption information is necessary for developing and carrying out strategic and operational plans aimed at reducing water use and curbing budget expenses.
- Optimize irrigation water use. The town’s irrigation system represents a patchwork of different

vendors' solutions. Los Gatos wishes to implement the most advanced irrigation technologies. Assessing the efficiency of the different parts of the irrigation system and calibrating the system to increase overall efficiency can result in significant water savings.

- Detect leaks at the town's properties. Timely leak notifications are crucial for preventing the excessive water use and the property damage caused by leaks.
- Locate meters. The ability to quickly and easily locate the meter can radically decrease the amount of time needed to repair a leak and increase the efficiency of water system maintenance.

Constraints

The Town of Los Gatos faced several constraints in implementing the new water data management solution. Firstly, the meters are owned by San Jose Water Company, which use mobile AMR to gather metering data. The new solution had to work alongside mobile AMR without interfering with its operation. The solution also needed the blessing of the San Jose Water Company to allow its deployment on the company's meters. The vast majority of AMI solutions in the market today cannot co-exist with a mobile AMR from a different vendor, which eliminates them from vendors' consideration set.

Secondly, the water data management system had to allow staged deployment to work within the Town's budget constraints for each period while enabling the Town to start the implementation by solving the most important problems. The Town needed to identify the areas where the most significant savings could be achieved, and implement the system in those areas before expanding the program.

Finally, the town wanted a fully hosted solution to avoid additional investment in IT infrastructure or adding incremental workload for its IT staff.

Solution

Aquacue provided the Town of Los Gatos with the full range of its products and services, including Wave, its web-based analytics and leak alerts package, the meter-reading Barnacle devices. With the information supplied by the town officials, Aquacue conducted a brief analysis of the city's water metering infrastructure and recommended a list of meters where installed Barnacles could produce the most significant results. Based on the results of this analysis, the town procured 15 meter reading devices to be deployed on the identified meters.

The Aquacue Barnacle installation process conducted by Aquacue specialists, including a brief site survey, normally takes less than 15 minutes. Within 48 hours, the town had full access to metering data and meter-related analytics. Barnacles transmit water meter data at 15-minute intervals through the wireless cellular network. Aquacue gathers the data, stores it in the cloud, provides the web-based analysis tools and makes the information available to the town civil servants in real-time through an online and mobile (smart phone) dashboard presentation.

The leak alerts featured in Aquacue's software are instrumental to identifying leaks before to avoid incurring significant expenses in terms of water loss or property damage. Aquacue's system keeps track of the town's meters by employing a number of identifying keys, such as a meter's serial number,

physical address, billing identifier, or town's own identifier, and provides the mapping tools that facilitate the task of locating the meters.

Aquacue's water data management system satisfies all the constraints faced by the Town of Los Gatos. Using of the cellular network ensures that the Barnacles don't interfere with San Jose Water's mobile AMR system. Moreover, San Jose Water Company, true to its long-standing commitment to promoting water conservation, actively supported the Town of Los Gatos in implementing the new solution. As Aquacue's Barnacles do not need any supporting infrastructure, they are perfectly suitable for staged deployment "one meter at a time" to satisfy the budget constraints while addressing the most important issues, and at the same time provide unlimited flexibility for the subsequent increase in the number of monitored devices. All the information is stored and processed in the cloud, and presented to the users in easily understandable form through the web or mobile interface, completely avoiding the new IT investment and reducing the stress on the overworked IT staff.

Results

Aquacue's water data management solution is allowing the Town of Los Gatos to finally get a view of its water footprint. The new system identified several significant water leaks in the first two weeks after implementation. In fact, almost 50% of the sites included in the program had leaks of varying severity, which amounted to around 700,000 gallons in annual water loss. Town management found the weekly leak report especially useful as it assessed the magnitude of each leak and allowed them to prioritize their planning efforts. Moreover, the system maintains accessible information on all BarnacleTM-equipped meters and allows users to quickly locate every meter. Lag time has also been significantly reduced between identification of leaks and their complete repair.

Aquacue web-based analytics software, WaveTM is reducing the time and effort spent on planning the future water needs and the related budget expenses due to its ability to aggregate system-wide consumption and billing information and to present it in an easily understandable format. Town workers are now able to fine-tune irrigation systems based on detailed (15-minute intervals) near-real-time consumption information to minimize the amount of water used while maintaining landscaping and grounds.

As of August 2011, 15 meters currently equipped with Aquacue Barnacles account for around 10 M gallons (31 acre-feet) of average annual water consumption. Based on the results of the projects already completed by Aquacue, Los Gatos expects at least 10% water usage reduction in the first year after implementation, which translates into annual savings of around one million gallons of water. The expected annual reduction in water cost is approximately \$6,800.

The potential savings from prevented property damage are even greater. Given the scale of the deployment, the Town expects to identify at least three serious leaks annually that, if undetected, can result in significant property damage. Assuming the expected property damage from one such leak to be \$2,250 (50% of average water damage-related insurance claims, according to Insurance Information Network of California), the resulting annual savings amount to \$6,750. Together with the savings from decreased water use, total annual water use related savings for the Town of Los Gatos are estimated at \$13,500, which will allow the Town to fully recoup its investment in around 13 months

INNOVATION STUDY COMPONENTS

In addition to the synopsis and cover sheet, provide the following information:

1. Innovation/Creativity

- a. How did the idea/program/project/service improve the organization?

The implementation of this water management technology helped the organization in two main ways. First, the ability to obtain detailed information about water use and water leak issues had a positive impact on staff efficiency. Leaks are detected before they become a full failure, and a significant amount of time is saved in locating the meters. Staff also now have detailed information on the water use for their respective parks, and can more accurately optimize water use to ensure that the turf and landscaping is maintained in excellent condition while minimizing water use and waste.

The second impact was a positive effect on the operating budget. First, by detecting leaks that would otherwise go unnoticed, approximately \$2,000/year was saved within the first 2 months of implementation. Second, by optimizing water use, staff anticipated an ability to save another \$2,000-\$4,000 per year. This in combination with the avoided losses that are associated with full line breaks, equates to a savings of almost \$13,000/year, or about 10% of the water budget.

This project had an added benefit for the Town, in that the pilot program helped support a local business, which had a positive effect on local economic development. The Town of Los Gatos looks to encourage small business development, and benefits from the success of these businesses.

- b. Were new technologies used?

Yes, the project was based on the implementation of new water management technology. Aquacue provided the Town of Los Gatos with the full range of its products and services, including the web-based analytics package, the meter-reading Barnacle devices, and the leak alerts. Its system provides detailed information on the water consumption up to an individual meter level at different resolutions (annual, monthly, daily, hourly and every 15 minutes, with potential of increasing the maximum resolution to 10 seconds). With this level of detail, park managers and maintenance workers can easily evaluate the performance of different irrigation devices and calibrate them to improve water use efficiency. Aquacue's software also allows combining water consumption information with the relevant billing data to augment the planning efforts and get water costs under control. The leak alerts featured in Aquacue's software are instrumental to identifying leaks before to avoid incurring significant expenses in terms of water loss or property damage. Aquacue's system keeps track of the town's meters by employing a number of identifying keys, such as a meter's serial number, physical address, billing identifier, or town's own identifier, and provides the mapping tools that facilitate the task of locating the meters.

- c. Was a consultant used?

The Town staff worked with the staff from Aquacue to scope and implement the project. No additional outside consultants were used.

2. Outcomes Achieved

- a. What customer/community needs and expectations were identified and fulfilled?
- As the Town asks its community members to implement their own sustainability practices, it is important for us the model that behavior in our own operations. This

project has allowed us to test new technology that could be used by residents and businesses alike in reducing water consumption.

- b. Has service delivery been enhanced?
 - Service delivery has been enhanced through this project in an indirect manner. Staff now spends less time searching for meters, and locating leaks than in the past. This time can now be spent on maintaining the park landscaping and facilities to ensure the best possible customer experience.
- c. Did the initiative improve access to your government?
 - The Aquacue software dashboard allows staff to get detailed water use information. Town staff is evaluating the option if providing all or part of this information to the public. This will provide general information on water use and the Town’s sustainability efforts, but also provides a direct benefit to those volunteers who maintain planter boxes in our downtown area and are seeking information about watering times and irrigation system issues.
- d. Has the health of the community improved as a result?
 - No community health impacts were seen.

3. Applicable Results and Real World Practicality

- a. What practical applications will be shared?
 - The application of this technology as a means to monitor water consumption in parks and facilities will be shared. Specific results from our pilot program will be discussed, as well as other potential applications of the technology.
- b. How applicable is the idea/program/project/service to other local governments?
 - This technology could be implemented in any organization to monitor water use. For organizations looking to reduce water consumption, one of the first steps is to understand current consumption. The ease of installation and the price point of this technology makes implementation of a project such as this a reality for most organizations.
- c. What results/outcomes will you share?
 - We will share the results of our pilot project including water savings, budget impacts, and staff feedback.
- d. Include any applicable performance measures, if any.

Our study will present the following:

 - Gallons of water monitored
 - Gallons of water saved
 - Money saved through reduction in water use

4. Innovation Study Presentation

- a. Describe your innovation study presentation.

We will use a power point presentation, with photos and video included as appropriate, to highlight the major points of the pilot project and the results. We will also provide a live demonstration of the software dashboard, to illustrate the monitoring capabilities of this technology. We can bring the hardware so that participants can fully understand the small size and ease of installation. We will conclude our presentation with a question and answer session so that participants can have the opportunity to share their water management challenges and further investigate this technology as a potential solution.