

Does Your Water System Engage in Social Networking?

We all know about the trend in social media such as Facebook and Twitter, and most of us have seen the movie *Avatar* and know what an avatar is. However, do you know of the new technology that uses avatars for building water systems on social websites? In this new trend, a building has an energy and water dashboard that operators and the general public can access. Buildings with the proper meters installed to monitor water and energy usage now can be set up with apps, widgets, or a Google PowerMeter. These tools can be used for user education, interaction, and even competitions.

WHAT IS A DASHBOARD?

Real-time dashboards such as Lucid Design Group's Building Dashboard Network enable people to view, compare, and share building energy and water use information via the web. Dashboards allow people to log onto a site to monitor the water and energy usage of a particular building. They also translate complicated energy terms such as British thermal units and kilowatt-hours into common terms that anyone can understand. Dashboards even can encourage competition among building owners.

Avatars

On social websites, users upload photos or other graphics as identifying images. Similarly, dashboards incorporate photos, graphics, or other images to personalize buildings or building systems.

Interactive Graphs

Most engineers love graphs and charts that break down building data in many different ways. Dashboards include interactive graphs that display usage data during any timeframe the user chooses. These graphs can be used for formal reporting to building owners, to indicate system problems

when energy or water usage is high, or to educate the general public.

Interpretive Gauges

Dashboards include many other ways to graphically display data. Some pages have graphic gauges similar to those on an automobile dashboard, with green zones to indicate when things are running properly and red zones to indicate when usage is problematic. Gauges can be fun and interactive tools used to educate children or adults about water and energy usage in a building. Gauges also can be shown in dollar amounts much like a gas pump.

Apps

Like the apps that you download to your smart phone, valuable app tools can be used to monitor building systems. Some apps are made for building competitions that can be displayed on a Facebook page. Fans of your page can post comments such as, "I see your dormitory is using a lot of water this month, and as a result you are big losers in the competition. Our dorm is No. 1!"

The apps also can be used by utilities to encourage energy and water awareness, or municipalities can use them to encourage citizens to monitor buildings and alert operators to problems. When we work together to save water and energy, we all win.

Widgets

Widgets are similar to apps except that they are more compact in size and function. For instance, you can install a widget on your computer that displays current local weather conditions. Widgets on a building dashboard can make it easy for facility owners and occupants to review their utility systems every day.

Here are some examples of how building dashboard widgets can be used.

- **Competitions:** If your school, condominium building, or apartment building is involved in a water- or energy-efficiency contest, a widget will list your competitors and give up-to-date information on your status. Graphs, your building's avatar, and gauges can be an interesting way to monitor your team's progress. Energy savings can translate into real cost savings, and as a result, competitions can have a budget with real prizes that make the competition worthwhile.
- **Budgets:** Personal or departmental budgets can be set up with goals. For example, a monthly budget can be set up, and the widget will let you know where you are in the month and how you are doing to reach your goal. It can be set to tell you in dollar amounts or in percentages. Tests have shown that people will use less energy and water if they have access to real-time usage monitoring.
- **End-use breakdown:** Widgets can be set up to monitor where water or energy is used on a particular day or week, which can be valuable information for large building operators. For example, they can break down domestic hot water, plumbing fixtures, cooling towers, boiler makeup, irrigation, and food service usage, or they can monitor the building by floors, wings, or tenants.
- **Community comparisons:** Water usage can be analyzed by properties, streets, neighborhoods, or building types. The user can compare their home or building to similar homes or buildings in the area, or citizens can compare one government building to another. The widget can help identify the worst performers. Sometimes hundreds of dollars are not spent on building improvements because the owner wants to save money. However, a widget such as this can provide data that shows how not spending hundreds of dollars in repairs is actually costing thousands of dollars in energy or water usage.
- **Hourly usage profiles:** Clocks can show hourly usage rates and tag the times of day

when usage is high. This is very important on many utility grids and some water grids. At peak times during the day the utility must buy power from other generators at a much higher rate. Thus, reducing the peak demand can help reduce the amount of power purchased from other sources. Since some utilities charge higher rates at these peak times, building owners can reduce their energy and water costs by moving high energy- or water-consuming tasks to off-peak times. For example, during the summer, it is best to run your dishwasher, clothes washer, or clothes dryer at night. Running these appliances during the heat of the day adds to the air-conditioning load during peak air-conditioning times as well as adding electrical load to the energy grid.

- **Discussions:** Widgets that are live discussion feeds can be used by people to make comments. For example, a college could have a power-off competition between buildings, and the discussion feeds are a place where students can find more information and comments from other students, staff, and faculty about the event. These discussions can be added to individuals' Facebook pages.
- **Commitments:** Widgets can be set up so individuals can make commitments to different efficiency programs. For example, if a community's goal is for 50 percent of the citizens to not irrigate their landscaping during a particular week, the widget could track how many people signed up for the program.

Green Tips and Videos

The building dashboard also can contain green tips, videos, and instructions for water-efficiency do-it-yourself programs.

HOW CAN PLUMBING ENGINEERS GET INVOLVED?

Social networking can be fun and interesting, but how can plumbing engineers incorporate it into their projects?

On new construction projects, water monitoring is easy to set up with little added cost to the project. The key is to find out how many systems will be monitored and then to install meters at these locations.

The first system to isolate with a submeter is the irrigation system because irrigation can use large amounts of water over time. Dashboards can monitor water usage and tell the irrigation system when to turn on and off. They also can connect to monitors that

report and record soil conditions to indicate when irrigation is needed.

The mechanical systems also should be submetered. The cooling tower makeup and boiler makeup especially should have dedicated monitoring stations. Condominium units or apartments should have individual meters so residents can access their individual energy usage.

It can be challenging to incorporate monitoring in existing buildings. For example, some housing units have vertical water risers that feed plumbing fixtures vertically, and as a result, one apartment may be fed from several different water risers. The piping is in the wall, and it is difficult to get access to install meters. Some inexpensive point-of-use meters are available that residents can install on fixtures to monitor water usage on their own. Since the cost of meters is decreasing, eventually systems will be available to monitor water usage at each fixture.

Appliance manufacturers are developing smart meters that allow the appliance to communicate with the utility's electrical grid. During peak electrical demand times, the appliances will not operate. Some utilities are considering reducing electrical rates during off-peak times, so such smart meters can help save significant utility costs.

Google is developing a system in which utility customers can log onto their power meters and monitor power usage. While Google's system currently is available only in select markets, as power utilities upgrade, similar systems will be available to more customers. The same technology can be used for water systems as well. In the meantime, savvy homeowners can install the Google PowerMeter to monitor their usage.

After the meter points are established, the plumbing engineer

next will need to coordinate with the monitoring vendor to specify the correct type of meters that can communicate with the monitoring system.

THE BENEFITS

Building dashboard technology will help educate the general public about water and energy usage, and more informed consumers will result in reduced water and energy usage. The technology can empower citizens and customers to verify claims by organizations or agencies that buildings are running efficiently in reality and not just because they say they are. **PSD**



Winston Huff, CPD, LEED AP, is a project manager, plumbing fire protection designer, and sustainable coordinator with Smith Seckman Reid Consulting Engineers in Nashville, Tenn. He is on the U.S. Green Building Council's Water Efficiency (WE) Technical Advisory Group (TAG). He was the founding editor of Life Support and Biosphere Science and has served as its editor-in-chief. He is editor of Me Green You Green (megreenyougreen.com), a LEED credit data bank. For more information or to comment on this article, e-mail articles@psdmagazine.org.

YARD HYDRANTS SANITARY



- Frost Free
- No Drain
- No Winterize
- Meets ASSE 1057
- No Contamination
- Approved



FREEZE FLOW .COM
Hoepfner Perfected Products
 7796 Oak Spring Circle, Gilroy, CA 95020
 408.847.7615 sales@FreezeFlow.com