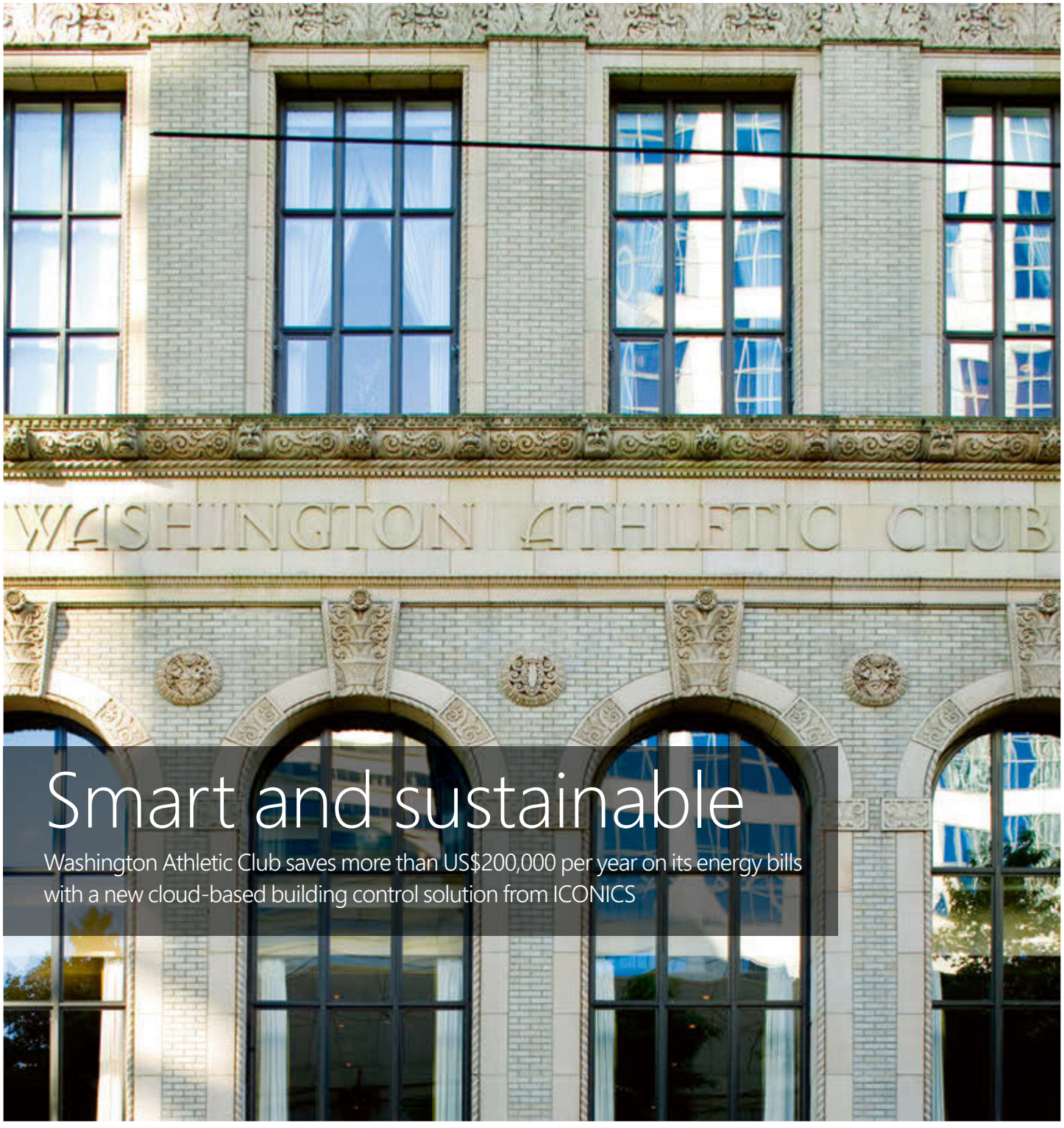
TOUCH

"We needed to stop information from falling through the cracks. NC4 Street Smart has allowed this and has made crime fighting much easier for us"

Mike Diekhoff, Bloomington Police

MICROSOFT TECHNOLOGY IN THE PUBLIC SECTOR

SUMMER 2014



Smart and sustainable

Washington Athletic Club saves more than US$200,000 per year on its energy bills with a new cloud-based building control solution from ICONICS

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Out with the old, in with the new

Two years ago, Washington Athletic Club rolled out a cloud-based solution from ICONICS to monitor its energy usage and regulate consumption in real time. The organisation is already saving more than US$200,000 per year on its energy bills. Rebecca Lambert finds out more

As six-time winner of the 5-Star Platinum Club of America award, Washington Athletic Club (WAC), based in downtown Seattle in the US state of Washington, has a long-standing reputation for being one of the best athletic clubs in the US. More recently, it has also gained recognition for its energy saving efforts and is now considered to be one of Seattle's greenest buildings – no small feat for an 84-year old construction based somewhere that is consistently ranked among the top green cities in the country.

Two years ago, WAC partnered with project contractor MacDonald-Miller Facility Solutions in a bid to optimise energy performance and reduce its carbon footprint. The ambitious project involved overhauling all of the building's legacy energy systems and replacing them with one digital system from ICONICS that monitors usage and regulates consumption based on real-time needs. Following the project's completion, first year energy savings were in the region of US$200,000 – 10% above target, amounting to a 25% reduction in total energy use. This year, the building expects to save even more.

"Since it was built in 1930, WAC has been committed to making continuous upgrades to its facilities to meet the needs of its more than 12,000 members and retain its prestigious reputation as one of the nation's top athletic clubs," says Paul Lowber, WAC's chief financial officer. "One of our ongoing challenges has been how to keep the building contemporary and ensure it runs as efficiently as possible. We've always tried to be good stewards; we were into conservation before conservation was cool! But this latest project has really taken our green credentials to another level."

Financial sense

At 21 stories high, the club is home to 109 hotel rooms; five floors of fitness amenities, including a full-size basketball court and swimming pool; banquet and conference rooms; retail outlets; and more. Any project covering this kind of scale was always going to be a massive undertaking, and a costly one.

"The building has been expanded twice since it was constructed," says Bill Cohen, the club's vice president of operations. "In 1955 we added a four-story extension and then in the 1970s we built a further eight floors on top of that. The result was that we had three distinct areas of infrastructure and, therefore, three different philosophies for managing the building's heating, ventilation and air conditioning. To put it kindly, we had a real hybrid energy system to deal with. None of the subsystems talked to each other very well and we had two separate areas of digital control that really didn't like each other. So while we knew we could make improvements, we also knew it was going to be very costly, and this held us back."

In fact, when MacDonald-Miller Facility Solutions came up with a proposal that showed WAC just how much money they could save, and how quickly they could realise

Recognising success

ICONICS has recently been announced the winner of the 2014 Microsoft CityNext Partner of the Year award. Chosen for its ability to help customers, including WAC, realise tangible benefits from solutions such as the MobileHMI App, ICONICS exemplifies how partners can take advantage of Microsoft technology to address the most pressing challenges for cities and help them do more with less.

"ICONICS is extremely honoured to have been selected for this prestigious global award from Microsoft," says Russ Agrusa, president and CEO of ICONICS. "This award recognises innovation and success at providing software solutions that help customers reduce consumption and environmental impact. Our CityNext involvement reinforces the strength of our relationship with Microsoft, as well as our commitment to providing our customers and partners with cutting-edge energy and sustainability solutions the world over."

those savings by implementing ICONICS' new building control system, it sounded almost too good to be true – so much so that the project was shelved for a year.

"The statistics were compelling, but we were just going through the recession so we were selective about the projects we were going to start," admits Lowber. "Then some funding came through and MacDonald-Miller agreed to offset the rest of the costs of the project via actual energy savings over the next seven years. This meant we wouldn't be out of pocket and that really got our attention!"

Alongside MacDonald-Miller's payment scheme, funding from a US Department of Energy grant and Seattle City Light incentives helped pay for the project upfront. Both of these initiatives are related to Seattle 2030 District – an interdisciplinary public-private collaborative working to create a groundbreaking high-performance building district in downtown Seattle that will consume 50% less energy by 2030.

"We decided to just go for it," says Lowber. "Now, we're wrapping up year two and it looks like we're going to be saving well over US$200,000 again."

"It would probably have taken us ten years to complete this project and get to the stage we're at now if we'd tried to do this by ourselves," adds Mike Young, WAC's building operations manager. "It's been nothing but a win-win situation."

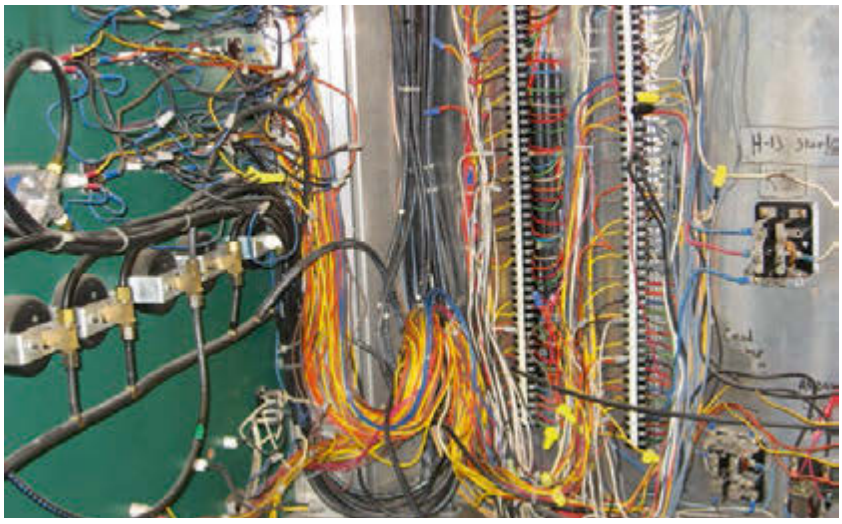
Smooth transition

The project involved replacing and integrating WAC's legacy control systems with a new building automation system from ICONICS, converting a three-way, constant-volume chilled water system to a load-based, variable-volume system, and replacing pneumatic actuation with electric, load-based kitchen ventilation controls. Today, the entire building's heating, ventilation and air conditioning are controlled by one digital system that monitors usage based on real-time needs.

"Working hand-in-hand with MacDonald-Miller, we pretty much tore the building apart and put it back together in about a year and a half," says Cohen. "We did a lot of the work upfront – we strung the wires, mounted the hardware and installed a lot of the equipment – and then went back and started changing everything over a piece at a time. This approach allowed us to change to the new system relatively seamlessly – we never had to turn anything off, so people in the building weren't even aware of what was happening. We just switched the controls from old analogue to new digital – at times we even did it in the middle of the day and nobody noticed."

Managing from the Microsoft Azure cloud

The MobileHMI App developed by ICONICS is a cloud-based business and visual intelligence solution, and is now being used by the WAC team to monitor energy usage throughout the building. Connected to the



WAC's old analogue energy control system (top) was replaced by modern network-based digital controls (bottom)

Honeywell AX Building Management System via BACnet/IP, the solution provides real-time access to key operational performance indicators through energy performance dashboards and analytics reports. This allows Young and his team of engineers and technicians to remain informed at any time.

MacDonald-Miller considered different ways of deploying the software at WAC before choosing MobileHMI. "One option was to install an on-premise solution," explains Jeremy Richmond, building performance manager at MacDonald-Miller. "But we realised that this would create a lag getting technology upgrades, and cause issues if we wanted to get data offsite to assist with trouble shooting. When ICONICS first started talking about running a solution on the Microsoft Azure cloud computing platform, we were very interested in it. Today, we are extremely pleased with the results of implementing ICONICS on Microsoft Azure."

Running on a single computer at WAC, the MobileHMI App aggregates all of the building's data in the cloud and pushes it back down to the computers and devices at WAC and MacDonald-Miller, allowing both teams to analyse real-time information.

"The ICONICS software is a really valuable tool," says Richmond. "Because it's hosted in the cloud, it can be accessed from a range of mobile devices, plus it's robust and scalable. In this particular deployment, it's handling over 2,000 data points, but it can deal with even more if need be. It also takes some of the guessing out of the equation, in that it allows you to see where the problems may or may not be in a facility."

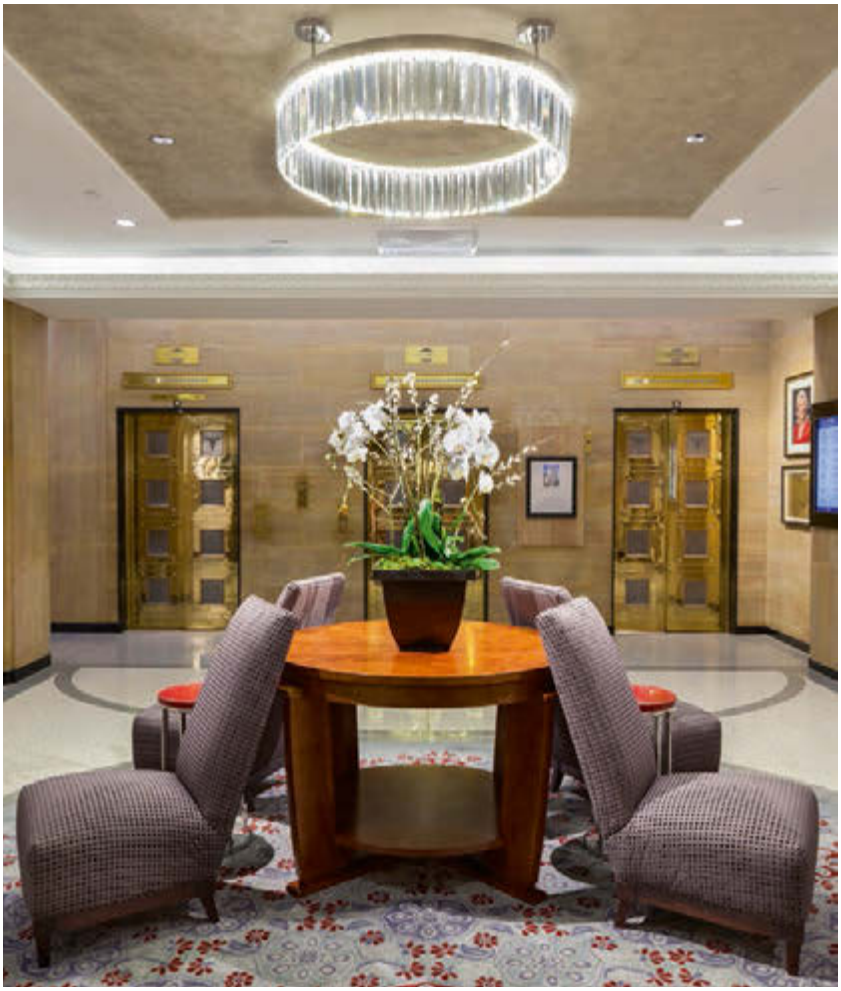
And because MacDonald-Miller has access to the same information as the club, in some instances it picks up on issues before WAC does. "Working together, we can diagnose problems much faster," says Richmond.

Tangible benefits

From one dashboard, the WAC team can track and control every aspect of the building and monitor over 2,000 data points in real time. What's more is that if they find a problem, they can look back at the history of a particular set of data points and see where the change occurred. "It's an invaluable trouble-shooting tool," says Cohen. "It's light-years from the way we used to do things."

The ICONICS MobileHMI App is also helping to dramatically reduce energy consumption throughout the building. "It's staggering how much less energy we're using by having the ability to turn things down or off and only use them when the environment calls for it," says Young. "We've experienced real success in our group exercise spaces, for example. On any given day, our exercise spaces can be used for a whole range of activities including yoga, Pilates and aerobics. Some of those classes like a nice cool room, especially the spinning group, but the yoga class likes a warm environment. With the new system, we have the ability to drive the temperatures up and down at will. And we can schedule those changes with very little time between classes. It's really handy and, most importantly, it takes the controls off the wall."

The team is achieving similar results in the kitchen area. "We used to turn all the extractor fans on as soon as we fired up the kitchen at 6am," says Lowber. "Those fans would run all day until we closed at 10pm. Now, with the sensors and a system that measures the air quality in the room, the fans come on automatically when they're needed. It's a much smarter system and it allows us to use a third of the energy than we did before."



WAC is now considered to be one of Seattle's greenest buildings

A true partnership

Key to the project's success has been WAC's partnership with MacDonald-Miller. "They were fundamental to the success of this project," says Lowber. "They did all of the work and we watched over their shoulders to learn how the system operates. Over the last two years they've helped us with the fine-tuning and they continue to ensure we're using the equipment as effectively as possible. Because they have access to our system, they can provide immediate assistance without having to send out a technician each time."

Even though WAC is already achieving impressive results, the work doesn't stop there. "We're working closely with the WAC team to help them use their data-rich environment to further modify their building practices and become even more energy efficient," says Perry England, vice president of building performance at MacDonald-Miller. "We've achieved impressive savings already, but we can do so much more. Our next step is to get the team accessing the MobileHMI dashboard via mobile devices so that they can always see what's going on in the building no matter where they are."

Based on this project's success, MacDonald-Miller has already rolled the ICONICS system out to other buildings. "Microsoft Azure gives us massive scalability and makes the MobileHMI App an extremely adaptable solution," says England. "We can take what we've done with WAC and apply it to a small building or a large campus – in the most cost-effective way. Regardless of the types and sizes of buildings we are managing, we can provide them with full business analytics. Microsoft Azure has undoubtedly been key to this project's success. We have been able to give WAC a business model that has turned their building into a cash machine."

For anyone still unsure whether to embark on a smart energy saving project, Paul Lowber, Bill Cohen and Mike Young have two words of advice: don't wait. "Do it now," says Lowber. "The technology is already out there, so don't wait for the next big leap. Our financial agreement with MacDonald-Miller has meant that we haven't had to pay upfront, but the energy savings we're making so far would have ensured a fast return on investment anyway."

"And whatever you do, make sure that the system you install is scalable," adds Young. "We have confidence in our solution and know that it will scale and adapt to our needs. Having access to unlimited computational horsepower is invaluable."

Allowing full visibility of buildings' equipment

Melissa Topp, director of global marketing at ICONICS, explains how fault detection and diagnostics is influencing a paradigm shift in the way organisations monitor, detect and repair faults within building equipment

Widespread smart city initiatives and government sustainability incentives are putting pressure on public sector organisations to reduce consumption and cut energy costs. Because of this, ICONICS have seen increasing interest in smart buildings solutions that improve monitoring of building automation equipment and energy systems to identify faults and improve efficiency.

A major challenge is getting insight from disparate energy systems and building automation equipment that span organisations' campuses or facilities. Facility managers lack a single view of their facility and, without the ability to correlate the data, they're unable to recognise patterns that equate to the loss of millions of dollars in energy costs.

Some organisations are cautious of smart building solutions because of a preconception that they will have to rip and replace all the equipment in their buildings. But that's not the case with ICONICS' Facility AnalytiX. Because it is an open integration platform, any building automation equipment or device can be integrated into the solution.

ICONICS' Facility AnalytiX is driving a paradigm shift away from retro-commissioning to continuous commissioning. Historically, facility managers of large campuses such as universities, government organisations, hospitals or airports will follow a maintenance schedule and work their way through each building to monitor every piece of equipment and system. In some cases, they may only get to some buildings once every five years. And after reviewing and repairing the faults, the equipment starts to degrade again as soon as they leave the building. In contrast, Facility AnalytiX allows users to have full visibility of their entire facility and continuously casts a net for faults. The solution then allows them to dig further into the fault information and make informed decisions about where to spend resources based on costs and priorities.

Based on fault detection and diagnostics (FDD) technology, Facility AnalytiX has three main features: customisable rules for detecting faults; dynamic cost calculations to help prioritise faults; and visualisation to diagnose and repair faults.

Facility AnalytiX comes with more than 300 tested and preconfigured fault rules for common building automation equipment, while advanced diagnostics suggest probable causes for faults. Historic trends are also provided so users can view how many times the fault has occurred over recent weeks, months or even years to determine a recurring problem. All of this is visualised as easy-to-consume text, graphs or charts. For improved mobility, users can deploy the solution on a cloud connector and access the data from anywhere at any time, meaning a facility manager can monitor the status of equipment across multiple buildings and campuses while working in another facility.

Once public sector organisations are successful with monitoring and repairing faults, they are then able to involve citizens in their wider sustainability strategy. For example, students could be given access to data regarding which dormitory is the most energy efficient, to incentivise them and encourage a wider acceptance of the strategy. Likewise, neighbourhoods could compete for the most efficient energy usage or the lowest water consumption. Involving all possible stakeholders in the process is the secret to a truly successful deployment, with Facility AnalytiX as its cornerstone.

> "Any building automation equipment or device can be integrated into the solution"

Melissa Topp
ICONICS

Facility AnalytiX's dashboard provides easy access to information

City Scale Efficiency

Can You Fit an Entire City in the Palm of Your Hand?

ICONICS offers advanced software solutions that help your organization's productivity. Our real-time animated dashboards, fault detection technology and energy analytics provide you with insight into operational efficiencies. ICONICS visualization and control solutions run on any mobile device and enable city scale infrastructure such as building automation, water treatment, utilities, transportation systems and much more.

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