

IoE-Driven Capabilities Help San José State University Create ‘Anytime, Anywhere’ Learning Experience



EXECUTIVE SUMMARY

Objective

- Make technological improvements to promote “anytime, anywhere” learning experience

Strategy

- Began with wireless assessment, then worked with partner to upgrade equipment and increase bandwidth by installing additional access points throughout campus
- Five-year plan includes immersive video technology and unified communications

Solution

- Wireless network throughout campus; upgraded wired infrastructure; virtual computer labs; upgraded data center; WebEx for collaboration among students, faculty, and administrators; video-conferencing rooms for remote education exchanges; Lecture Capture for an archive of classroom discussions; digital signs for communication; IP video phone network integrated with messaging and virtual meeting capabilities

Impact

- Increases avenues of learning, with significant cost savings for university
- Enhances the learning process by stimulating innovation
- Creates safer, more informed campus community.

Background

In January 2014, Cisco released the results of an in-depth analysis of the economic benefits of the Internet of Everything (IoE) for the public sector. Cisco’s model revealed that some \$4.6 trillion in “Value at Stake” would result from the adoption of IoE capabilities across 40 key public sector use cases over the next 10 years, including smart water, smart buildings, smart energy, smart parking, and more (<http://bit.ly/1aSGIzn>).

As a next phase of its analysis, Cisco engaged Cicero Group, a leading data-driven strategy consulting and research firm, to undertake a global study of IoE capabilities across these 40 use cases – how the best public sector organizations are “connecting the unconnected,” as Cisco terms it. To that end, Cicero Group conducted interviews with dozens of leading public sector jurisdictions – federal, state, and local governments; healthcare organizations; educational institutions; and non-governmental organizations (NGOs) – to explore how these global leaders are leveraging IoE today.

The research examined real-world projects that are operational today, are being delivered at scale (or through pilots with obvious potential to scale), and that represent the cutting edge of public sector IoE readiness and maturity. The aim of the research was to understand what has changed in terms of the jurisdictions’ people, processes, data, and things, and how other public sector organizations can learn from (and replicate) the trail blazed by these global IoE leaders. In many cases, these jurisdictions are Cisco customers; in others, they are not. The focus of these jurisdictional profiles, therefore, is not to tout Cisco’s role in these organizations’ success, but rather to document IoE excellence, how public sector entities are putting IoE into practice today, and to inform a roadmap for change that will enable the public sector to address pressing challenges on multiple fronts by drawing on best practices from around the globe.

In 2012, Ms. Vahey met with campus officials to determine the vision and needs of the university. They wanted to promote an environment that would seamlessly blend technology and education in a way that fosters learning, safety, and a sense of connection.

About San José State University

San José State University (SJSU) is part of the California State University educational system, which is in the midst of an ambitious technological upgrade. The five-year development began in 2012, and includes a wireless network throughout the campus; upgraded wired infrastructure; virtual computer labs; upgraded data center; WebEx for collaboration among students, faculty, and administrators; video-conferencing rooms for remote education exchanges; Lecture Capture for an archive of classroom discussions; digital signs for communication; and an IP video phone network integrated with messaging and virtual meeting capabilities for faculty and staff.

Terry Vahey is associate vice president of information technology services and chief information officer for San José State University. In this role, she oversees the university's technological infrastructure and improvements. Ms. Vahey joined the university in 2012 as deputy CIO and assumed the role of CIO in 2013. She came to San José State from California Polytechnic State University at San Luis Obispo, California, where she most recently served as director of technology services and information security officer.

Objectives

When Ms. Vahey joined the project two years ago, the university's wireless Internet offered unreliable and limited bandwidth, with only 700 access points scattered around the large campus. The university struggled to serve its students as technology and the expectation of wireless access grew. "When a new model of smartphones would come out, you'd see something on the nightly news about universities not having enough bandwidth. That definitely happened here at San José State," said Ms. Vahey. "People would get dropped and the connections weren't secure, depending upon the density of where they were, such as how many students were in a particular classroom. Students in the class might be able to connect today, but they couldn't connect next week, for example."

In 2012, Ms. Vahey met with campus officials to determine the vision and needs of the university. They wanted to promote an environment that would seamlessly blend technology and education in a way that fosters learning, safety, and a sense of connection. "It's really about providing students access to academic materials anytime, anywhere, and use of technology that is part of their whole education here," she said.

Ms. Vahey articulated the program's vision: "We have a strategic plan that identifies the vision of five goals. Three affect what we're doing today with infrastructure: Unbounded Learning, 21st Century Learning Spaces, and Agility Through Technology. They're visionary and create focus and direction to meet our goals. The principles outline an innovative and engaged learning community. To align with Vision 2017, we are implementing an infrastructure that enables collaboration for our campus community. This includes Wi-Fi ubiquitously across the campus, video and conferencing, as well as virtual labs and data center technologies."

Ms. Vahey began with a wireless assessment, and then chose to increase bandwidth and install an additional 1,800 access points throughout the university campus. The installation process is ongoing, and upon completion will bring the total to 2,500 access points. They will provide reliable and secure Internet access in virtually every building, including classrooms, study spaces, dormitories, and staff areas.

Strategy

Ms. Vahey began with a wireless assessment, and with a partner upgraded equipment to increase bandwidth and install additional access points throughout the university campus. “What we’ve done is interpret [our goal] to provide Wi-Fi ubiquitously across the campus and in all the classrooms,” she said. When finished, the updated wireless network will bring greatly increased bandwidth and more than triple the number of access points to reach virtually every building, including classrooms, study spaces, residence halls, and staff areas. Ms. Vahey believes the increased availability will promote the “anytime, anywhere” learning experience that the university seeks to encourage.

Other major projects being implemented under the five-year plan include immersive, global video lectures and lecture capture for students, and unified communications (messaging, video phones, and desktop video conferencing) for university employees.

“It probably will take us until 2017 to complete our objectives in the campus strategic plan, but we will have transformed daily activities in a positive manner for our campus community in that short time,” she said, adding, “I’m excited for our students and faculty to be part of evolving the delivery of education here at San José State, to able to do things with other universities, in new ways..”

SJSU has governance and ownership over its recent technological infrastructure upgrades, and the IT department, which Ms. Vahey oversees, is charged with managing the project.

SJSU is a not-for-profit institution and is publicly owned and operated. It receives revenue from the payment of tuition and fees, and other support and grants from federal and state governments. SJSU had a budget of \$28 million for the upgrades to its technological infrastructure. The first part of the program was funded by the sale of SJSU’s Educational Broadband Service spectrum. Additional funds come from the university’s IT services budget, a new student fee, and funds from the continuing education program.

Solution

Wireless Network

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Video Lectures and Lecture Capture

SJSU has scaled technology deployment in the classrooms based on need. This includes installation of six fully video-conferencing- and recording-enabled classrooms that Ms. Vahey terms “next-generation classrooms.” “In the classrooms

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San Jose State University

that we call next-generation classrooms, we have just about everything you can imagine,” explained Ms. Vahey. “In the classrooms that are not next-gen, we’ve got things that are in varying levels, ranging from document cameras to SMART Boards to multiple screens.” Upgrades are ongoing and vary by classroom.

The immersive video lecture system allows SJSU educators to exchange teaching opportunities with students and visiting lecturers around the world within the classroom. Participants can see and hear one another, and participate live in the education process regardless of location.

Lecture-capture technology, also installed in select classrooms, allows the recording and future review of classroom content. The system allows recording from any H.323 or Session Initiation Protocol (SIP) video-conferencing system. The recorded lecture can then be published and viewed using a webcasting and video-sharing program that allows easy archiving and retrieval. Students can watch the content on desktops or mobile devices.

The system uses Vyopta vPublish and integrates with SJSU’s Student Information Services to publish the content for easy archiving and retrieval. vPublish applies SIS metadata during the creation of the content, automatically tagging each video with relevant information and eliminating the need for manual input. The system also creates defined security groups, automatically routing the video captures to the right locations.

Ms. Vahey says that lecture capture is very helpful, not just for students absent from class, but for those needing further review as well. “Here at San José State, we have a pretty high number of international students,” Ms. Vahey pointed out. “Being able to review portions of the lectures again helps when English is a second language, and when the subject matter is dense. Students can review the lecture as often as they like, and prior to a test.”

Employee Communication

Ms. Vahey found a varied collection of phone technology upon undertaking the campus upgrade, and early examination revealed a need for a uniform campus system that brought faculty and staff together. “We ended up getting a unified communications system using IP technology so we could incorporate some of the other technologies that we were going to end up putting on top of this infrastructure,” she said.

SJSU faculty and staff were provided with desktop video-conference capabilities and a unified communications system that included new video phones. The video technology especially was selected in keeping with another campus goal of promoting a “helping and caring” atmosphere.

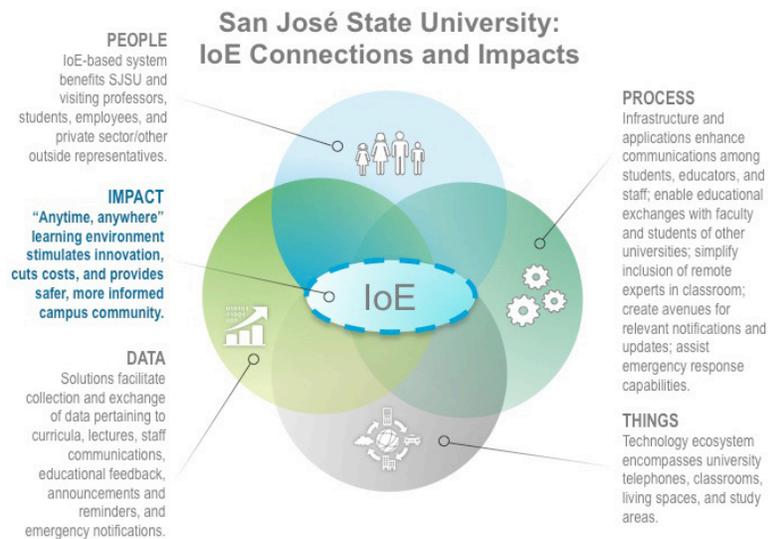
Ms. Vahey believes the technology has done much to bring the campus together. “We chose video phones to foster a sense of connectedness and to enable collaboration with the campus community,” she explained. Ms. Vahey indicated she feels that the increased face-to-face communication has helped to lessen the distance, saying, “You do have more of a sense of connection.” The phones can also serve as a campuswide emergency broadcast system.

The new phones fit smoothly into existing technology, and have been very popular. “It’s an integrated system,” explained Ms. Vahey, “With the feature called Reach Me Anywhere, I can be talking on my desk phone and decide to walk to my meeting or go home, and I can hit my mobility button and the call goes to my cell phone. Seamlessly, the caller hears nothing more than me talking,” she said.

Another upcoming project will increase student awareness, unity, and safety through a system of electronic signs placed throughout the campus. These will be used for emergency notifications, as well as campus announcements and updates.

Installation of immersive video conferencing in classrooms has greatly assisted learning exchanges with universities and organizations around the globe. Via live video feed, educators, students, and professionals from places such as New York, Viet Nam, and Afghanistan interact with students and faculty in SJSU classes.

Figure 1. San José State University: New and Better Connections.



Source: Cisco Consulting Services, 2014

Impact

Installation of immersive video conferencing in classrooms has greatly assisted learning exchanges with universities and organizations around the globe. Via live video feed, educators, students, and professionals from places such as New York, Pakistan, Viet Nam, and Afghanistan interact with students and faculty in SJSU classes. “That was one of the things that was most exciting for us – the ability to do that for people and give them the technology to basically bring the world to the students,” Ms. Vahey said.

Ms. Vahey indicates that the response has been strongly positive among educators grasping the significance of the next-generation classrooms, and they are putting the technology to good use. “People come in from remote locations; usually they’ll be either visiting professors or visiting experts from industry or another country. In addition, we also have professors who will go to other locations and teach in another city or country. We have them set up with Afghanistan, Vietnam, and Pakistan,” she said.

Increased connectivity also supports the “anytime, anywhere” educational ethic of the university. This capability makes it easy to access online educational content,

and to modify and notify students about course requirements. It also facilitates communication between educators and students, and among campus employees. Additionally, students appreciate the ability to review archived video lectures in preparation for tests.

Ms. Vahey highlighted another creative use of the technology. One professor with connections at a major ad agency in New York City and London utilizes the technology to allow students to present their ad campaigns to advertising professionals across the country and get their professional feedback. “Now that they have TelePresence in their room, when [students] are presenting their material and their project, it’s presented on the screen behind them. Since we have three screens in the class, they have an opportunity for the people from New York to join their class, and the remote participants can see the students.” The speed with which the exchange occurred surprised even Ms. Vahey. “That’s what’s really cool. Using the technology in the course occurred instantly, as soon as we had those rooms available. That’s not something that we had expected, to have that be so soon.”

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Video-conferencing and collaboration technologies assist the learning process by stimulating innovation. “We have partnerships with several universities where we help them learn how to do training and education in specific technologies, or specific genres of education,” Ms Vahey explained. “Instead of having to travel over there as frequently, we are able to conduct classes and meetings with them via TelePresence and WebEx.” This new capability results in increased avenues of learning and a significant cost savings for the university. “In terms of psychology value, the faculty who are using the new technology are absolutely thrilled with it. They love being able to bring the world to the students,” Ms. Vahey stated.

The technology also contributes to a safer and more informed campus community. The system of electronic signs, soon to be installed throughout the campus, and the InformaCast emergency broadcast system expected to be available on the phone system this year, both allow instant notification and provide valuable information in case of emergencies.

Lessons Learned / Next Steps

Ms. Vahey has learned several important lessons in the process of completing her many projects. Overall, she describes the largest challenge as one of public perception. Educators might be impatient with classroom interruptions, or unaware of the progress being made. “We need to make sure we show our successes along the way. It’s really hard for people to understand progress without seeing it, especially when there are expenses going into IT,” Ms. Vahey said. She describes the problem with an analogy: “We’re flying a 747 [and] we are changing out one of the engines, and we’re acting like the people inside still get to have their dinner. Some of our challenges have been getting that to be right the first time, and communicating it to the campus.”

Ms. Vahey has hired a PR assistant to help present accomplishments in a favorable way, highlighting the individual success stories of the large-scale project. “We’re tripping along the way, but if you’re doing some good things, then you need to be telling people, and that’s a big lesson. We’re getting better at that.”

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Figuring out the exact configuration of the next-generation classrooms was another challenge, and important for optimizing the results. “If you set the room up [properly], a person feels fully immersed, like they’re in a space with a person there, they are with you,” she said. “That really needs to include several things, especially if you’re doing it in a big room. It needs to include sound equipment and speakers, recording equipment, microphones, screens, and displays, and they have to be set up the way that aligns with your expectations. Our challenges have been getting everything to work the way we expect it to, every time. It took us a few times through our pilot phase to find the right setup; learn about the tips that were necessary, as it was all new to us; and get some expertise built within our teams.”

Because of the newness of the technology, the speed of implementation, and the importance of “getting it to be right the first time,” Ms. Vahey is considering hiring a consultant to assist in optimizing the many new systems. She is hiring additional staff as well.

By 2017, Ms. Vahey anticipates full completion of SJSU’s wireless network, wired network upgrade, data center upgrade, computer labs, WebEx deployment, VoIP deployment, video-conference deployment, installation of the electronic sign notification system, and the addition of many more next-generation classrooms. She plans to complete an additional 30 upgraded classrooms this year, including 10 currently under construction and another 20 beginning in summer 2014, bringing the campus total to 36 by the end of the 2014 academic year.

“We are transforming the way we deliver education, conduct meetings, communicate with each other on campus and off, and the way our campus community collaborates,” Ms. Vahey concluded.

More Information

For more information, visit <http://www.sjsu.edu>



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