Achieving the Smart Campus of Tomorrow Today

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Summary

The number of devices connected to the internet is expected to skyrocket over the next several years, from roughly 20 billion today to more than 75 billion by 2025. This expanding network of connected devices, sensors, machines and cameras, which make up the Internet of Things (IoT), is increasingly being used by institutions of higher learning, as well as individuals, businesses, cities and government agencies, to improve lives.

Many devices connected to the internet are able to generate valuable data that can help create technologically connected, smart campuses. These campuses can electronically monitor activities, including student attendance, security operations, campus lighting and classroom usage, that administrators, staff, and faculty members can use to make better decisions about how to operate more efficiently, effectively and safely.

Improving student success and tightening security are the two most pressing priorities of colleges and universities today, according to Educause, a nonprofit association that seeks to advance higher education through technology. A modern IT infrastructure equipped with smart solutions can help in both of these areas.

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Improving Student Success and Security

"Campuses have a responsibility to not only provide a quality education for students, but to provide a safe place to learn and to operate with an appropriate allocation of resources," says Stephen Opferman, senior director of innovative technologies at Lumen, a leading information technology company that provides voice, networking and cloud technology solutions to the education sector. The end to end IoT solutions it offers include sensors, data analytics and visualization.
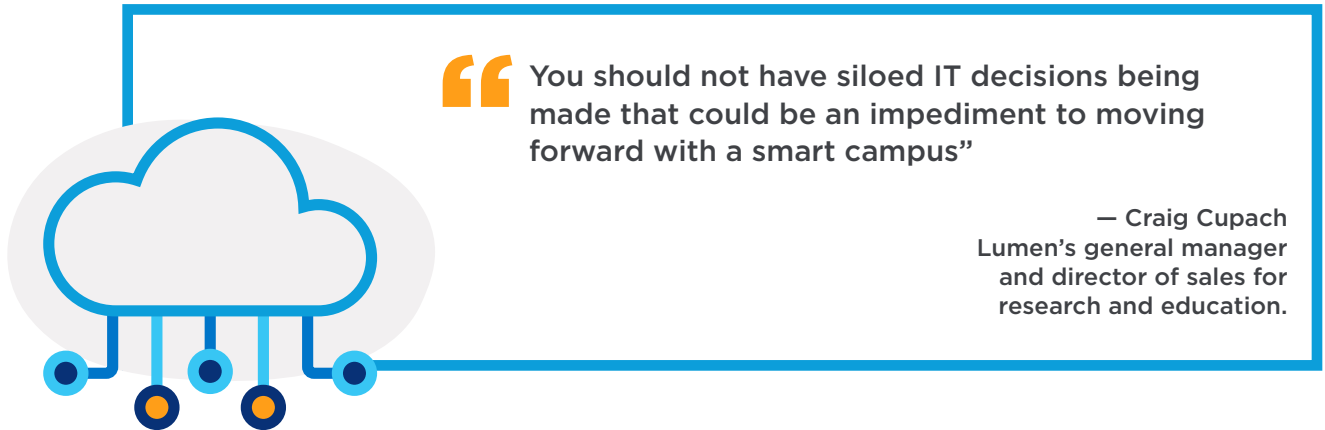
From a security standpoint, campuses can use IoT to control door locks and link security systems, alarms and video systems. Some systems can help students identify the safest walking route to or from class. Students can even use smart technologies to set an alert that will contact campus police if they don't reach their destination by a certain time.

"Students have to feel safe and secure on campus so they aren't worrying about their personal safety," Opferman says. "That distracts from learning."

Overall Strategic Plan

While many institutions of higher learning are in the early stages of exploring IoT, others are farther along. Budget constraints can often be an initial stumbling block, but the longer-term savings, new revenue generation and data-driven academic benefits can frequently offset upfront costs. Using smart technology to maintain a better environment for students goes a long way to retaining them, thus protecting the institution's budget from enrollment declines.

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Institutions are finding they need to develop an overall strategic technology plan based on their own unique missions, needs and cultures. No longer can they just look to the IT department to make technology decisions. Instead, they must pull together a wider group of decision makers from many divisions, including facilities, security, academics, athletics and student life, all of whom must look at how the institution can better use technology via a broad, strategic lens. Institutions need strong leadership and an effective technology partner to get all the stakeholders, who in the past might have competed for budgets and importance, to align.

❝ You should not have siloed IT decisions being made that could be an impediment to moving forward with a smart campus"

**— Craig Cupach
Lumen's general manager
and director of sales for
research and education.**

The Network Is the Foundation

Before a campus can deploy widespread smart projects, it needs to have a secure, reliable IT infrastructure in place with strong network capability, speed and coverage. A partnership of several public universities in Oregon is working with Lumen to build a high-quality shared network across the state . More than 1,500 miles of optical fiber lines are being installed to provide faster and more secure broadband connectivity.

"The network is still at the core of a smart campus," says Cupach. "It really comes down to the actual fiber and network in the ground and how it connects to applications. Having an adaptive fiber network that can spin up applications in the right cloud at the right time and place is essential."

Making Smart Assessments

Once a strong network is in place, IoT connections can be added fairly rapidly. Many institutions have already taken steps to use IoT to regulate lighting, heating, air conditioning, and other systems to improve efficiency and cut costs. "Adopting smart technologies means you can make some smart assessments about how you're using your existing infrastructure and how you can maximize it for student success," Cupach says.

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Smart technologies can also help institutions assess students' success outside of academics. Officials can pull together data from diverse sources to track such factors as involvement in clubs, sports, and events to figure out who is engaged with the campus and who is not. "Looking at whether students are getting good grades is not the only factor that indicates whether they will stay," says Chip Swisher, Lumen's Smart Solutions Practice Director.

Improving the Campus Experience

IoT is positively impacting student satisfaction. Smart dorm technology, for example, allows students to trackwhether their laundry is done, adjust thermostats, control room lights, and much more. At some universities, sensors installed in parking spaces help students find open spots faster. Sensors can also track traffic patterns and pedestrian crossings to determine if any logistical or safety changes need to be made.

Smart stadiums also improve the overall campus experience for students, alumni and visitors. Electronic signage can prompt fans to place snack orders online or to access instant replays on personal devices. Apps can tell fans where to find the shortest bathroom lines. Colleges can also sell ad space on the portals and loading pages to build new sources of revenue.

Wireless Connectivity for Sports Fans

It is critical for a campus to have enough wireless connectivity to serve the fans who might be accessing it at the same time. Lumen annually connects to 200 sports venues across the country via a fiber broadcast network, and it can bring that expertise to higher education. "If you can improve the sports fans' experience, it can drive a lot of revenue," Cupach says.

While smart technologies have many benefits, they do raise some concerns about information security and personal privacy. Technology experts say institutions have to be sure their IT partners are building secure networks that guard against intrusions and cybersecurity threats. Institutions also have to take proactive steps to protect identities and personal information.

Proving Ground for New Technologies

Northern Arizona University, which is transforming into a smart campus, is committed to learning more about how smart technologies affect the people and organizations they serve. In February, the university, in partnership with Lumen, created a new innovation lab that will explore case studies of towns, cities and campuses that are already using IoT, artificial intelligence, robotics and other cutting-edge smart technologies.

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Lumen is providing equipment, identifying test cases, and helping to build an IoT curriculum. The company hopes to establish similar partnerships with other universities. Labs, such as the one at Northern Arizona, could be a proving ground for new technologies and can help train the technology workforce of the future.

We have an obligation as a higher education institution to foster those advancements that improve the human condition"

— Dr. Steven Burrell
vice president for IT and chief
information officer at
Northern Arizona

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Unlimited Potential

While IoT is advancing rapidly, colleges and universities are increasingly realizing the breadth, depth and importance of smart technologies in their institution's quest to better serve, educate and protect students. The potential is unlimited for institutions that find the right technology partner.

> " This digital transformation for campuses and society at large is not going to end any time soon. Ultimately, it could be a case of, if you don't join it, you will lose out on many benefits."
>
> — Opferman

Let Lumen help you build the Smart Campus today.