



From digital student to smart citizen

How urbanization and the growth of smart cities is driving the digitization of higher education

A Collabco White Paper

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70% of the world's population will be living in cities by 2050

UN study (2015):

If you had to choose a shining example of a world-leading smart city, you'd be hard pressed to find one better than Boston, Massachusetts. It ranks in the top three US smart cities almost every year and is successful because it combines three main ingredients: a smart and innovative population, boasting more than 70 universities, a strong entrepreneurial ecosystem with North America's highest rates of patents and venture capital investment per capita, and 'smart government' that allows citizens to transact online as well as providing data via smartphone apps – transport ticketing for example - upon which to base efficient civic decisions. These three components merge together seamlessly in a symbiotic eco-system where urbanization drives the demand for education because of the higher level skills requirement of the economy, whilst education drives urbanization because its where educated and skilled people choose to live and find work.

However, urbanization comes at a price. Unprecedented growth in our cities means that they must work smarter to sustain their populations and to maintain a quality of life for citizens. Growth places demands on infrastructure such as buildings and transportation as well as the need for basic utilities and resources. We must find ways to be more efficient, deliver more services via mobile technology, optimize existing infrastructure and use citizen participation to create better land-use decisions, whilst navigating bureaucracy to achieve creativity and entrepreneurialism.

In short, physical infrastructure must work alongside the increasingly digital one in order to help cities deliver on their promise, and since higher education institutions are intertwined with the future of our cities, it's imperative that they digitize too. Only by doing so, can they continue to provide a highly skilled, digitally-savvy workforce, world leading research, technological innovation and business support that makes them so central to success – not just of the city, but of the wider global economy.

In this white paper we consider how digitizing university and college campuses can place higher education at the heart of smart cities and citizen data capture, whilst helping to attract the best students to their institutions.

An emerging role

Through 2018, 90% of Smart City information technology investment will support socioeconomic initiatives to reduce economic divides, grow domestic industries and attract skilled workers.

Source: IDC FutureScape: Worldwide Smart City 2016 Top 10 Predictions

The role of universities and colleges as hubs for research and development, as well as centers for educating individuals that will lead the projects of the future, is clear – but the size and scale of most university campuses also makes them ideal candidates to take advantage of smart city-style solutions for their own transport, communications, energy efficiency and budgeting issues. Such is the size of many of the US's university campuses and their student and teaching populations, that they represent a city within a city, providing the opportunity to research and develop smart city technologies, putting them into practice on campus and attracting some of the brightest students to their institutions at the same time. Campus technology acts as a test bed for wider application beyond an institution's four walls whilst developing a skills base and attracting more talent to the university.

"We truly live in global community and technology is a crucial tool to facilitating connections across the world. College graduates need to have 'smart' competencies to not only solve the problems of today, but of those tomorrow. Fulfilling their responsibility to serve their communities, colleges and universities can not only leverage their various resources to collaboratively create smart cities, but also synergistically involve students, thus creating experiential opportunities for them to develop these critical skills."

Gavin Henning, catalyst, associate professor of higher education and director of educational administration programs, New England College.

Big data

To Enhance Service Delivery, by 2018, 75% of State and Local Organizations Will Use Externally Generated Citizen Data in Transportation Management and Real-Time Crime Centers.

Source: IDC FutureScape: Worldwide Smart City 2016 Top 10 Predictions

The University of Chicago, in a joint initiative with Argonne research provides a real life example. In the first instance, it placed 20 sensor nodes collecting data on the campuses of the University of Chicago and Northeastern Illinois

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University to measure sound intensity, light, temperature, humidity, barometric pressure, vibration and air quality with a view to making efficiencies. Having received \$3.1 million from the National Science Foundation as part of its Smart Cities Initiative, it now has a mandate to place 500 sensors more widely around the city of Chicago by 2017. The project demonstrates how the university is central to helping a major US city improve quality of life for its citizens.

There will be innumerable uses for the data collected, helping inform the city on so many levels, including practical issues such as providing traffic controls to improve air quality in certain neighborhoods, and faster response to standing water and flooding by providing rainfall measurements on a block-by-block basis. But it goes further than that – the possibilities for granular decision making based upon the data collected are simply endless - the city will have the ability to measure how the vibrancy of the streets can depress crime rates or bolster emotional well being. Big data provides the backbone to decision making when looking for these efficiencies and improvements, and is essentially becoming integral to urban planning in the 21st century.

As a consequence of such a project, the university at the heart of the project gains too. It will grow its reputation as a knowledge center for urban planning and smart city development, and will continue to attract student talent based upon their interest in such subjects, whilst developing degree programs to reflect the projects they play a central role in.

Campus technology

“Holistic engagement via digital channels is a must for the modern university. Students expect to connect with everyone from admissions officers to alumni representatives. Having a strategic engagement plan in place will help drive delivery of consistent communications and content throughout an institution.”

Eric Stoller, higher education strategic communications consultant & blogger at InsideHigherEd.com

Probably the biggest challenge for higher education is the increasing competition they are under to attract and retain such talent, not just in terms of students, but also staff, faculty, and researchers. Most of America's state universities used to show little interest in the international market place, but since budgets have been cut, things are changing with renewed focus on lucrative overseas students too. Universities also provide the city and the business community with a stepping-stone into international markets. Their influence abroad may also help to attract the best international talent to the city, helping to bolster the local economy.

Attracting students from digitized nations such as Hong Kong, China, Singapore and the UK means that US universities must offer the same level of digitization in their learning experience as digitally savvy millennial students have come to expect in their personal lives. The creation of truly digital campuses enables them to embrace not only a connected learning experience, but also allows them to embrace the Internet of Things and provide their own 'citizen' or student data for university efficiencies and the wider city. Technology is what students demand; it's what draws them in, enables them and keeps them there.

By contributing so centrally to the growth in smart cities, universities position themselves as forward thinking tech hubs with a lot to offer – an attractive place to learn and a strong reputation with businesses for providing highly skilled graduates with real-world knowledge.

The opportunities

In planning for our smart cities, universities, city leaders and businesses must work together. Higher education plays a pivotal role in developing and testing new technologies, turning ideas into prototypes and beginning to unlock and analyze urban data for the good of citizens. Universities are best positioned to act as coordinators for both economic and social developments not just at a local level, but also at a regional, national and even international level by reaching out to foreign students, researchers and lecturers.

Cities should aim to be both smart and adaptable, with universities educating a creative and highly skilled workforce, and partnering with city leaders to use data and technology to improve the urban environment. The symbiotic relationship between city and higher education pays dividends both ways: universities will increasingly be able to offer students exciting projects and courses tailored towards smart city developments whilst forging closer links with the wider business community, and driving the digitization of their campuses to achieve both.

The result is an attractive city to work in, driven by a strong knowledge economy, creating the jobs of tomorrow that ultimately attract a new intake of the brightest digital students looking to study in a connected 21st century campus environment. Those universities that can help the urban conurbations in which they thrive to move from industrial to information based economies, will be the most attractive higher education institutions to both students and future employers. They will guarantee opportunities at the heart of the smart city economy where digital students will graduate to become smart citizens, and the lifecycle can begin again.

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