

**BEYOND TRADITIONAL METHODS: EXPLORING THE EFFICACY OF
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Abstract

With the vigorous promotion of the construction of smart campus by the ministry of education in China, the development concept of smart campus will have broad application prospects. However, colleges and universities are still at the stage of digital campus and there are many problems which needs to be solved. It is difficult to complete the transition from digital campus to smart campus. The main problem is that the campus data has only been digitized but not informational. The purpose of this article is to study smart campus management system in universities out of China. This study aims to discover the design and implement a complete smart campus management system by analyzing the system design principles and design goals. There is currently a limited understanding of how the smart campus is conceptualized and practiced. This paper addresses this gap by using a systematic literature review.

Keywords : Smart campus, smart campus management system

Introduction

Smart campus is an emerging concept enabled by digital transformation opportunities in higher education. Smart campuses are often perceived as miniature replicas of smart cities and serve as living laboratories for smart technology research, development and adoption along with their traditional teaching, learning and research function. Finding an institution that carries a good reputation has become increasingly important to students, as more and more people hold degrees and compete for compelling jobs after graduation. In many instances, the reputation of universities and third-level education institutions is shaped by rankings on a national and international level. However, the academic ranking of the higher education institution is not the only point of critique of students. Four most important points of criteria are the availability of academic majors, cost of attendance, location and on-campus facilities and amenities.

The modern students are digital natives and their expectations exceed dusty libraries and a professor writing formulas on the blackboard. like in their personal lives, they want to have a well-rounded and seamless experience with technology that integrates into their everyday life and just does everything in a smarter way. Siemens said that “The campus of tomorrow is digital, agile and flexible”.

What exactly needs to change for the old traditional campus to become a modern Smart campus that speaks to students? What are the advantages of having a smart campus? The smart campus serves as an interface between smart homes and smart cities. Through an intelligently connected everyday university life, digital native are offered new experiences that they already know and use from their private lives. Like many other smart applications and experiences, it I about communicating with other systems devices or the internet.

A smart campus starts with ubiquitous, reliable and wireless connectivity- both indoors and outdoor. A digitally connected university that uses these smart applications in everyday life on campus in a wide variety of situation. The solutions range from preventive monitoring to individual room control and smart access control. Some of the questions asked may be : what is the room number of the class for subject Biology 323, where is the nearest color printer, how to get to the library quickly and how to find the most recent journal article for digital mapping. Smart campus applications provide an overview of a constantly changing campus. They show students and academic staff what is happening around them and guide them to their destination the quickest way possible. In summary, a smart campus connects devices, applications and people to enable new services, improve efficiencies and enhance the experience of students and staff on campus. It offers entirely new opportunities to the organization itself with a potential increase in operational efficiency, cost savings and the improvement of public safety. The smart campus provide a digital foundation that favours implementing new services that make life, learning and work much more efficient and easier for student and university staff. For instance, campus ID cards registered on the smart campus system can confirm the presence of students and lecturers at events where attendance is mandatory. This allows lecturers to bypass the process of requesting attendance or passing lists for students to sign in. in addition to that, the campus IDs can be combined with smart payment, making payment transactions in the university canteen or at the university bookstore and clinic much quicker. The internet infrastructure can reduce both costs and the ecological footprint, as a large part of the building management processes can be automated. For instance, sensors connected to the network can be used to monitor both the usage of room and overall building. This will instantly and automatically make electricity and heating consumption adjustments. The same is applicable for more conscious, ecological water consumption. The more the smart campus use devices and applications as part of their infrastructure, the more efficient operational processes can be streamlined and automated. The possibilities with smart campuses is almost endless. Directions, electronic locks for lockers, mobile check-in's in student flats, automated lending of books, intelligent parking, mobile booking of study rooms, ordering food in the cafeteria, or checking the availability of fitness equipment via an app are all examples of smart campus applications. Whether one is looking for the room number for a class or a specific book or journal in the library, something is constantly changing on campus. Smart campus applications will give students, lecturers and visitors an overview. They show students, lecturers and academic staff what is happening around them and guide them to their destination in the quickest way possible. The administration also benefits. If there are disruptions somewhere on the campus, anyone can report what is wrong via an app. Smart campus applications also help staff with planning and documentation tasks for the campus infrastructure. As a summary, smart campus technologies can help to design life and learning to meet the students' needs. It can create more flexible learning environments. This is also known as smart learning. Further more modern and digital work processes can be implemented. A better balance between passive learning, active research and collaboration can be set up. Learning spaces for efficient work, whether alone or together with fellow student can be created. This allows for flexibility. Besides that, energy consumption can

also be reduced by cutting down on wastage. This also applies to reduction in electricity costs. At the same time sustainable resource management can be increased. Student engagement policy can also be enhanced. This will improve the quality of work and life for students and staff. In addition, student satisfaction will be increased through student engagement techniques.

The principle of smart campus

Students are digital natives who are used to systems that act and react in an innate and effortless way. Smart campuses have to be like this and the underlying platforms should allow for interaction in various forms like video, gesture, voice or touch to create a seamless, intuitive user experience.

Design thinking is a problem-solving approach centered around the people interacting on the campus. This ensure the real value is delivered to the end-user. Thinking about their daily problems, solving the problems and upgrading the system will bring the experience of using the smart campus system to a higher level and transform the experience in the campus.

The student engagement technology and built-in, platform need to have the capabilities to grow and develop. They need to be in line with the future development of the campus and match the current and changing needs of campus life. An optimized smart campus solution should utilize a domain-driven architecture centered around micro services. This is to ensure the flexibility to evolve with the campus over time. This will enable the resources to be fully utilized to meet the challenge of changing needs of the end-users.

Adaptability and scalability are important factor that are connected mainly with cost. To be successful, smart campuses should consider data-driven experience that is created by leveraging digital tools and technologies. Smart campus solutions have the power to support students by crossing the physical campus border and can support virtual online classrooms.

The case of How Hello Lamp Post

Hello Lamp Post turn the campus of one of the universities in Canada into a smart campus. An effective student engagement and communication tool was introduced. Hello Lamp Post was designed to engage students and staff on campus innovatively to support the parking and access services team. Static objects like parking meters, lamp posts, elevators and others were made interactive and ready to have unique conversations with everyone on campus in and around parking lots. Parking and access services are gaining new insights into challenges within parking and mobility across campus. Hello Lamp Post was able to provide the smart campus with a wide, resilient network for student communications which is available 24 hours everyday for the week at the point of access. This system has managed to provide a continuous feedback for the university to address the students' and visitors' difficulties commuting to campus.

Applying smart technology to college campuses has been recognized as a way of future-proofing universities to become more adaptable. Smart campuses that help foster student engagement allow governing bodies to understand the patterns around various activities and

initiatives within a campus. This will help a school foster inclusion and support equity. Initiatives designed around inclusion and diversity can provide valuable and actionable insight.

Glasgow Smart Campus Digital Masterplan

In the United Kingdom, the Glasgow Smart Campus Digital Masterplan sets out the project's explicit goals, which mainly aim to drive innovation by fostering a culture for change and exploiting technological evolution. This digital masterplan is not a technology strategy. It is a planning and guidance document with people and information at its core. It provides the basis for understanding Glasgow University's smart campus vision and supports the design and delivery of that vision, whilst bringing insight into how they will embrace digital ways of working to unlock real value. Whilst providing visibility into the strategic direction of the Smart Campus initiative, the digital masterplan serves to act as supporting material for market engagement, illustrating both expectations, desired outcomes and a narrative for its development. It defines the key elements for a plan that will ultimately form the implementation methodology for the Smart Campus end solution. The digital masterplan brings together the goals and aspirations of the University and demonstrates a systematic concept to enable design of a solution from the market. It defines the Smart Campus objectives and vision, outlining the key features and desired outcomes that should be addressed during solution inception. Apart from that, it identifies key benefits to be realised through adoption of a solution. The plan highlights the importance of a balanced relationship between technology, people and information; and provides a high level, indicative implementation plan by way of a roadmap with sequential steps that are aligned to the Smart Campus vision streams. This university also design a roadmap to ensure that the objective and vision is achieved according to the plan. The Smart Campus is designed to extend beyond the boundaries of the physical campus, integrating the City of Glasgow, University satellites and facilitates national and global connectivity of its people and systems. The vision for a Smart Campus is more than educational, whilst it seeks to improve the experience of students, staff and the community it interacts with; it is also efficiency and outcomes driven, with expectations for greatly reducing the carbon footprint and operating costs of the University going forward.

The plan for universities in China

The Universities in China recognise the need to move beyond a traditional educational environment, where the current model in some instances is no longer fit for purpose. It is the responsibility of the present administration to create a world-class learning and teaching environment and deliver the best possible outcomes to the students, staff and the wider community. Recognising the necessity to maintain if not improve upon its proposition and survive in increasingly evolving pedagogical conditions, considering competition, growth and revenue, the Universities in China plan to embark on an ambitious programme, comprising of extensive refurbishment and major development of exciting new buildings and public spaces. A core component of this transformation is the Smart Campus initiative. Simply put, the initiative seeks

to install helpful technological interventions and digital capability into the fabric of the Universities to enhance learning, research and the operational efficiency of the compound. In summary, this digital masterplan outlines the ambition, vision and objectives of the Smart Campus. Besides, it promotes this unique opportunity and explains ‘why now’. It also defines the desired outcomes to be achieved through the end solution. The initiative provides an indicative implementation roadmap with sequential activities. Besides, it highlights key benefits to be realised and critical success factors. It indicates primary motivators, associated challenges, expectations and actions and acknowledges the adoption of the Gemini Principles as guiding values. It articulates the components of an end solution and their relationships; and proposes next steps for procurement, design, implementation and operation.

The smart campus initiative in China will be created with an outcomes focussed approach, providing insight into what is to be achieved rather than prescribing exactly how the solution should be designed and delivered. This will encourage both innovation and flexibility within the market place, but ensure that focus on the end objective is retained.

Summary

As a conclusion, setting up smart campuses needs many references. This paper review only two cases, one in Canada and the second one in the United Kingdom. The researcher chooses an aspect where the same problem is faced in China as well, the problem of parking. From here more aspects can be brought into the smart campus management system.

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