

# IT Contemporary

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December 2020



# **The Smart Campus**

## **Reshaping the future of higher education**

**A fast-track to more effective use of technology in higher education**

### **Executive summary:**

This report will explore how the experience of the Covid-19 pandemic has put the foundations in place for universities to reshape the way they deliver higher education and manage their facilities into the 2020/21 academic year and beyond.

With input from two Russell Group universities, HPE and ucisa, the paper offers examples of how technology can help higher education run more efficiently and demonstrates how lessons learnt through innovating at speed can continue to benefit institutions in the months and years ahead.



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## Leading the way

In response to the global Covid-19 crisis, universities across the world launched successful online learning programmes in a matter of weeks and put effective systems in place that enabled staff to continue working from home.

Much of what the sector has learnt in this time has worked well, but the experience of shifting teaching and learning online has highlighted the need to forge a new path to a more efficient and sustainable future with innovation at its core.

## Learning-centred transformation

Technology has an important role to play in the new higher education landscape. There are a range of innovative tools that can save time, improve the way institutions are run and deliver value for money for students, while keeping the essence of the higher education experience alive.

Jon Holgate, head of IT infrastructure at the University of Cambridge sums up the delicate balance for IT teams. ***“Campus life and the experience of learning from leading subject specialists face to face is what going to Cambridge is all about for students. It is part of our DNA. The technology we use must support the continued delivery of on-site learning, whatever shape it may take.”***

So, what can universities do to move to a more data-driven, digital future in the years ahead while preserving the beating heart of live learning in higher education?

## What HE can do now

Taking the first step can be relatively simple as the information institutions need to make key decisions, drive greater efficiency, and improve services is already available. It is being gathered automatically by their Wi-Fi, security cameras and other systems.

By analysing this real-time data, universities can get a clear understanding of where people are on campus at any one time or identify peaks and troughs in the use of teaching spaces and communal areas.

Harnessing this information will become increasingly important. As lockdown restrictions evolve, it can be used to flag hot spots where people may not be complying with social distancing, allowing preventative action to be taken. A one-way system could be trialled, signage increased or change-over periods between classes adjusted to prevent students from gathering in large groups. The data can then be used to monitor the impact of these measures.

The same information can provide clarity on which rooms or spaces have been used too, so that appropriate cleaning protocols can be scheduled in to reduce the spread of the virus.

Getting valuable insight from data is often the start of a journey towards using technology more creatively in higher education.

## Taking smart technology to the next level

For universities that want to take their use of technology one stage further, there are several areas for next steps.

### 1. Maximise physical space

With restrictions on the number of people who can be on-site at any one time expected to continue for some time yet, institutions are increasingly looking at tools that will help them to optimise the spaces students and staff use each day.

An institution could introduce route optimisation tools that use building utilisation and occupancy data to predict bottlenecks in the corridors and stairways between buildings. Mapping tools could allow different scenarios to be played out to see how adjustments to building access might help to alleviate overcrowding. And the students using these areas could be directed to alternative routes through an app on their phones.

Data from track and trace software and heat maps could help to ensure classes are scheduled in rooms that allow enough space for social distancing. And an online booking system could help manage the use of facilities such as laboratories and libraries by automatically recommending quiet times when students can visit.

These technologies can help universities to better understand social distancing trends and analyse the flow of people around their estates while Covid continues to threaten the continuation of face-to-face learning.

David Morgan, senior manager, computing, and information service at Durham University, feels that this will continue to have a transformational impact long after the current crisis is over, if embraced by the sector.

***“Technology has advanced at speed taking us from basic data analytics to smart devices and app-based tools that can shape new ways of doing things. With people today much more likely to be carrying a smartphone than a university ID card, this will be game-changing for the sector.”***

### 2. Factor in flexibility

Beyond the pandemic, this technology will help universities get maximum benefit from their physical spaces and make it easier for students and staff to navigate their way around the campus.

Room allocation can be changed daily or weekly based on the number of students expected. This, coupled with an app that sends push notifications directly to the mobile phones of students and staff to instantly communicate room changes, provides greater flexibility in the way institutions manage their estates.

This agility will be essential as budgets tighten and universities look to ensure value for money and accommodate students in the most suitable environment.

The move towards greater adaptability is already being embedded at the planning stage of building projects such as the state-of-the-art teaching and learning centre at Durham University, as David Morgan explains.

***“Connectivity and flexibility were essential elements in the design of the new building. It has movable walls, which means we can enlarge study areas at busy times to help ease pressure on the main library and, also reduce the space needed to accommodate smaller groups of students.”***

### 3. Create a new-look student experience

Student engagement tools and discussion boards helped universities to recreate the on-campus learning experience as closely as possible for students when lessons shifted online during lockdown.

Moving forward, the priority will be the delivery of face-to-face learning in a safe and secure environment. But digital channels can continue to play a vital role in helping to attract students if universities are open to exploring how they can be used more creatively.

Deborah Green, CEO of ucisa, offers an example of this from one university. ***“This institution has used the Minecraft 3D digital building game to create a virtual open day for students who cannot physically visit the university and grounds.***

***“Minecraft has been used to give first year students the opportunity to meet avatar versions of their new tutors too. This is a great way to engage students studying abroad or bridge the gap until students closer to home can meet their instructors in person.”***

### 4. Maximise human resources

During lockdown, most universities maintained a critical team of staff on-site to ensure the smooth running of teaching and learning online. This has encouraged institutions to think differently as they open their doors to more students.

The wider use of technology such as AI, bots and automation can help to manage tasks such as student enquiries and reduce administration, enabling staff members who can do so to continue working off-site.

Augmented reality technology can be used to induct staff or students on how to use equipment in a lab before they even need to set foot in the physical space, helping to keep the number of people on-site at any one time to a minimum.

## **The foundations for success**

As institutions continue to plan their next steps, there are three critical areas that many have found need to be addressed to help ensure change does not become an obstacle to success.

## 1. The critical relationships

The IT and estates departments in universities often function as separate entities with their own agendas and priorities. The implementation of smart technology requires careful planning from the outset, so a more collaborative approach is essential.

Institutions need to be able to justify the return on investment from any transformation project and this means bringing people together, right from the start. A strong IT-estates partnership is the linchpin for change and innovation in higher education and building this relationship is mission critical to success.

As David Morgan at Durham University explains, ***“We work very closely with the estates team at Durham to deliver a shared vision of what we want to achieve, and this approach works really well.”***

***“It’s a collaborative relationship where knowledge is shared and options are explored together, so the initiatives we plan and implement meet the needs of students and staff.”***

## 2. Transforming bricks and mortar in a digital age

When the opportunity arrives to redesign offices and public spaces, institutions will want to ensure that plans allow for more personal interaction. In an increasingly digital age this becomes more important, not less.

If the plans require existing or listed buildings to be repurposed, consider sustainability alongside any local planning guidelines. Maintaining fewer, more efficient buildings which are only used as necessary, will pay dividends in the long run.

There is a growing trend for traditional teaching and learning spaces to be adapted to allow for greater collaboration between students on campus. The lines are increasingly being blurred around what constitutes a learning space too, as Jon Holgate from the University of Cambridge explains.

***“We have been looking at how we can provide digital connectivity beyond our walls, reaching students in outside spaces, public buildings or railway stations. This opens up the possibility for the sector to extend learning opportunities out into the wider community.”***

As is the case in any organisation wanting to innovate, a university is not immune to concerns about the use of data and issues around privacy. Being open from the outset about how which information is collected and how it will be used and stored can reassure people.

## 3. The ability to adapt

When budgets need to be stretched further, flexibility will also be needed in managing the IT infrastructure. More institutions may consider the advantages of consumption based as-a-service technology as a result. With a pay per use model, an institution can avoid purchasing equipment to meet a short-term demand for or being locked into fixed usage rates that might exceed their requirements.

It means that if a university wants to roll out a new online learning platform or financial management system, the additional technical capacity needed to run it can be provided in minutes. With no software updates to manage, IT staff are free to focus on ensuring technology supports teaching and learning and there's always enough capacity for growth.

Taking this approach will help to maximise budgets by allowing technology to be upscaled and downscaled as it is needed – this is critical for universities that have typical peaks and troughs in use throughout the year.

## Looking ahead

The reputation of an institution and its proximity to thriving nightlife or a beautiful seaside location might be among the key factors that would influence a student's decision about where they want to study.

Today, decisions could be based on an institution's innovative approach to delivering and supporting learning in a more flexible, hybrid approach.

Our higher education sector may not necessarily have total control over the number of face-to-face lectures they can put on in the months and years ahead. So, the experience they offer students both inside and outside the lecture hall must be far better than they might expect.

## Contributors

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