



Means
Business

Reimagining the future of higher education

How higher education institutions can leverage technology partnerships to create a tailored smart campus solution



Foreword

It's not news that the higher education sector is being challenged to achieve more. Boosting student satisfaction, driving staff productivity, increasing operational efficiency, and finding new ways to protect and grow revenues are regular issues on the C-suite agenda.

But what could make the headlines is how universities respond to these pressures, because this could revolutionise the sector.

Today's choices could redefine tomorrow's student and staff populations as well as what the university experience looks like. So, it's unsurprising that this debate currently tops the agendas of CIOs, CISOs, and decision-makers across IT, innovation, transformation, and facilities management.

The universities that will come through this time of flux as thriving operations are the ones that are highly conscious of the limitations of their existing approach. They're open to free-ranging, transformational thinking that can roll increasing operational efficiency, driving staff productivity, boosting student satisfaction, and growing revenue streams into one overall strategy.

What's more, precisely because no one has a crystal ball, forward-facing institutions are preparing for a variety of scenarios by increasing their agility and flexibility. 'Being prepared' means investing carefully in future-proofing their capabilities so they can respond quickly to market evolution in ways that can boost their reputation and profitability.

Secure technology is a critical enabler of this strategy. Building a technological foundation that's ready for anything is an established route to operational efficiency savings that include reducing energy usage and an improved network carbon footprint. This foundation also enables increased productivity, transformed user experiences, the support of emerging learning models, and the formation of beneficial research partnerships with industry. Plus, it's the most effective way to keep all options open regarding accessing and leveraging advanced and future technologies.

As a result, any digital interactions they offer – from expanded remote learning to broader pastoral, research or academic support – can be designed to enhance the user experience. This will be key to reinforcing the university's reputation as an attractive destination for international students and research partnerships. In particular, a stellar online experience could prove crucial in addressing the rising undergraduate drop-out rates that are hitting university finances so hard.

We help provide the connectivity, networking, and security services that are the bedrock of a university's ICT infrastructure, and form lasting partnerships to help universities shape and deliver their plans.

This whitepaper takes the example of moving to a smart campus structure to explore how higher education institutions can get the most from technology partnerships to secure their future as an elite establishment.

Samantha Toombs,
Sales Director, Devolved & Local Government
& Higher Education

This paper's mission...

- To explore the factors impacting current decision-making and strategy planning in UK higher education
- To investigate how a smart campus strategy can address current challenges and facilitate a competitive position in the future
- To examine what factors to look for in an effective smart campus technology partner



Introduction

Very few strategy decisions in the education sector are straightforward. The usual reality involves analysing and balancing a range of drivers based on delivering academic excellence, societal obligations, and user-driven requirements. On top of these broad themes comes the necessity to be agile to maximise performance, cost-efficiency, and competitiveness in the higher education market.

Exploring this process in depth reveals that **five core drivers** shape every strategic decision to some extent. Often these drivers are entwined, so work on one will enhance another, adding a further layer of consideration to C-suite planning.

The golden question that education C-suite decision-makers must ask when kicking off any strategy planning is simple:

'How can we make sure this move enhances these core factors?'

The five core drivers of education outcomes

1. The financial crunch

Effectively, home student tuition fees that have been static for ten years now have been officially frozen by the government, reducing potential income significantly. A recent [Russell Group estimation](#) outlines an average university deficit for each undergraduate student of approximately £4,000 a year in 2024/25. Backing this up, [analysis from the Office for Students](#) found that between 2018/19 and 2021/22, the unit of resource for teaching in England declined by 19.3% in real terms. To compound these financial constraints, strong public opposition to domestic fee increases make political support for increases unlikely, making it imperative that universities look elsewhere to make up revenue shortfalls.



2. The imperative to attract international students

With international undergraduate tuition fees averaging at £22,000 a year, there's a competitive market to attract international students who command higher fees. However, when the UK left the EU, European students effectively became international students, with increased fees, resulting in a [53% decrease in the number of EU students enrolling at UK universities](#). In 2022, [one in every five pounds received by UK universities came from international students](#), and universities would like, and may need, to increase this. A global reputation based on a proven heritage in research and development, and an outstanding student experience is key to attracting international students.



3. Establishing essential funding partnerships

Although student fee income is vital, it's important to acknowledge that 44% of university funding comes from non-tuition fee funding, via partnerships with Local Authorities, private enterprise or government. In an environment where fee income is constrained, research is an income stream that has significant scope for growth, if the university can outshine the competition and attract research partners.



4. Ensuring the hybrid learning experience boosts student satisfaction

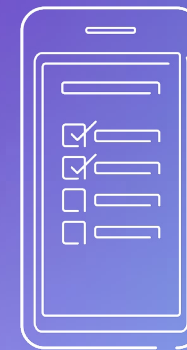
Rapidly constructed remote learning solutions during the pandemic have become the norm for some universities and hybrid teaching is increasing: 28% of university courses are using hybrid teaching for the 2022/23 year, compared to 4% in 2018/19. Plus, 66% of students favour a hybrid approach and 45% want in-person experiences supported by regular online interactions. However, many institutions have yet to bake secure and resilient hybrid learning solutions into their ICT infrastructure to allow them to scale their teaching offer to match current demand and that of any future scenario disrupting in-person learning. This may hold them back from accessing promising opportunities to enhance the student experience.

Universities that can leverage edtech to help students engage individually – and meaningfully – with a wealth of digital materials and resources, can tap into the student body that wants to learn at their own pace and in their own time. But securing this doorway to the university must be a priority, to defend against an increasingly inventive cyber attack landscape.



5. The necessity to improve operational efficiency

Driving down costs is a universal priority in this tight economic climate, and it's a given that universities will seize and maximise any opportunity to reduce costs by boosting the operational efficiency and productivity of infrastructure, its general estate, and staff. This drive entwines with a growing requirement to improve the sustainability of operations. Universities are increasingly interested in how the smart campus concept, effectively applied, can enable the accurate monitoring of carbon emissions, leading to targeted actions to control and reduce them. They're looking for ways to achieve a thorough understanding of how the estate is being used in a post-pandemic world by implementing accurate monitoring to enable intelligent decision-making.



Multiple drivers, one solution

Leading universities are exploring how the smart campus approach can provide a strong foundation for agile and innovative responses to these drivers that can support growth in both reputation and funding.

Constructing a higher education smart campus strategy

In our experience, outstandingly successful digital transformations occur when an organisation combines a clear sense of the benefits they want to achieve with a genuinely future-proofed infrastructure that can deliver them.

So, what does this mean for smart campus strategies?

The smart campus starts with a vision

The vision must lead the project – with a clear sense of the change goals for the next couple of years blended with more open-ended ambitions to take advantage of yet-to-be created capabilities. However, there's a risk that the complexities of putting foundational technologies in place can turn a smart campus project into a stream of siloed IT developments – and universities must watch for this.

It's understandable that technology can dominate, because a broad spectrum of infrastructure is required, starting with a wireless, cloud-centric network able to support Artificial Intelligence (AI) and Machine Learning (ML) capabilities, as well as sensor networks to feed Internet of Things (IoT) applications. It must be able to support the latest in Virtual Reality and Augmented Reality technologies and be capable of integrating campus mobile connectivity, such as private 5G and neutral host, with the public mobile network. And the whole concept must be protected by an integrated and multi-layered cyber security architecture tailored to the university's specific needs.

However, the true strengths of a smart campus lie in its holistic integration – that's what will support future development in any direction - and all concerned should keep this in view for the most effective outcome.

The vision must be ambitious and shared by all

Although getting the technology right is vital, university decision-makers mustn't lose sight of what's truly revolutionary about the smart campus concept - its ability to enable frictionless, touchless, and intuitive experiences that reach into all aspects of the university's ethos, ambitions, and operations. A smart campus breaks free from the bounds of geography and is a foundation for the future. In a fluid and changing learning environment, it offers the potential to protect the long-term viability of the institution.

Higher education CIOs, CISOs, and decision-makers across IT, innovation, transformation, and facilities management must agree a strategy for the institution that focuses on bringing benefits such as improved critical operations, the ability to support new business models and revenue streams, and offering personalised learning pathways to life. And they should also keep scanning the horizon for emerging opportunities that they could incorporate into their vision.

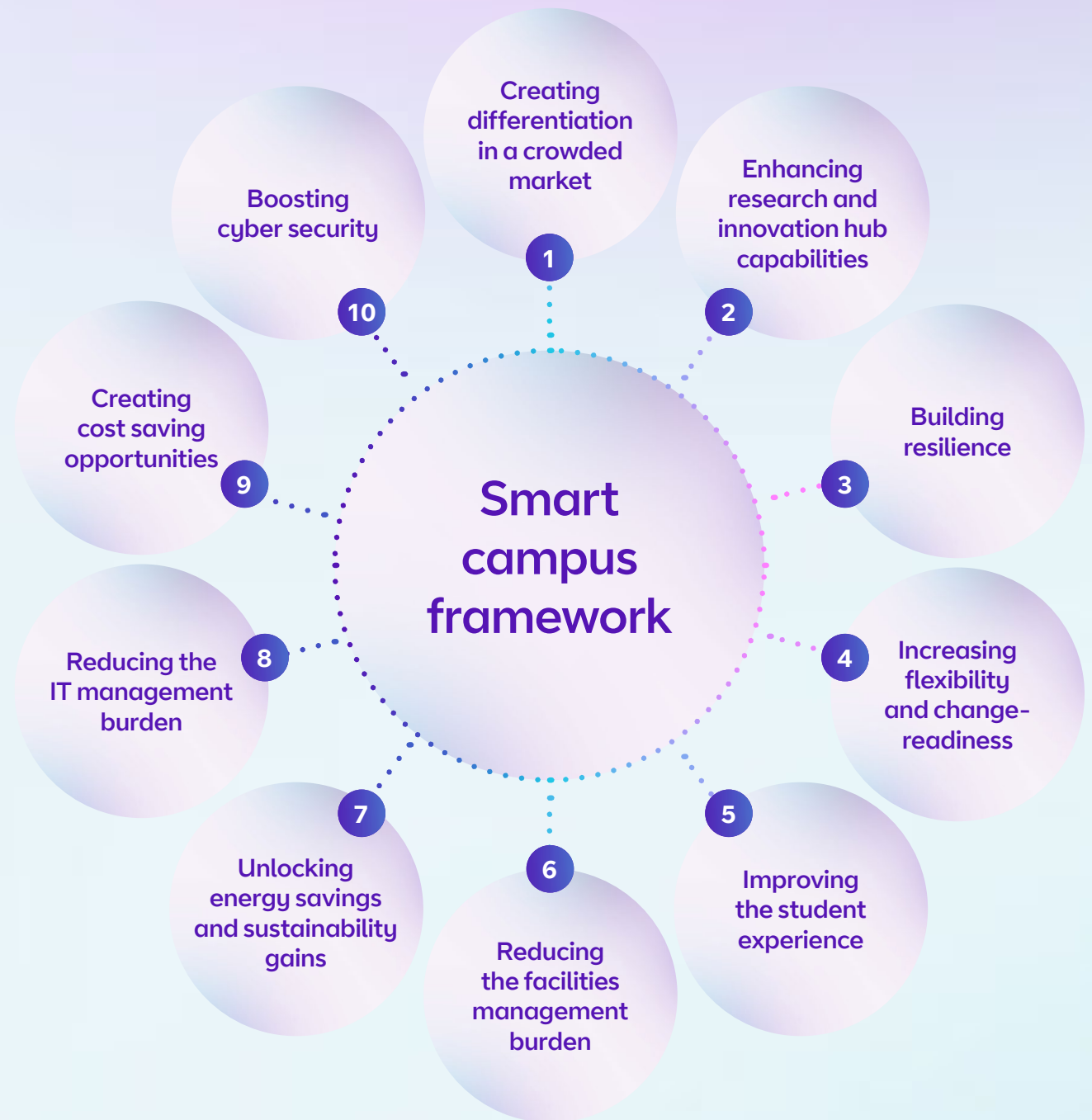
Any smart campus vision is only possible when it's underpinned by the right technology

Establishing a successful smart campus involves refreshing and augmenting current infrastructure so intelligent connected systems can blend the physical and the digital environments in which students, staff and faculty interact. The initial push of transformation involves building a secure and exceptionally reliable network that delivers scalable, flexible connectivity options for devices, applications, and people to enable new services and improve efficiencies.

To unlock maximum value from a smart campus framework, leading universities need to use their advanced capabilities to directly address the main pain points in higher education today.

Ten ways the smart campus addresses today's higher education pain points

A smart campus framework is a flexible foundation for transforming offerings, experiences and improving operational efficiency to reinforce a university's viability. The following areas highlight how early adopters of the smart campus concept have realised value from their investment.



1 Creating differentiation in a crowded market

A smart campus is capable of supporting industry-standard facilities that can enhance an institution's learning status, attract specialist industry partnerships, and establish a world-leading specialisation that's a particular draw for international students. At renowned specialist institutions such as the Royal College of Art and the University of the Arts London, for example, tuition fees from EU and non-EU students made up more than half (54%) of total income in 2021-22, up from just over a third in 2016-17. Installing infrastructure that matches the needs of a targeted vertical is a critical step to becoming a specialist hub. For example, Bournemouth University installed a fully operational TV studio to underpin specialist courses. A strong reputation for tailored, specialised, and excellent student experiences that a smart campus supports helps to establish differentiation and secure revenue streams.

2 Enhancing research and innovation hub capabilities

Existing strong reputations for research and innovation can reach new heights by layering facilities tailored to testbed requirements onto smart campus foundations. Providing industry-standard technology and connectivity at the heart of the university will attract research and innovation partnerships, as well as building links with local community and funding sources.

3 Building resilience

After the scramble to adopt ad-hoc solutions to continue teaching through the pandemic, universities want to make preparations for smoother and more effective approaches to use during any future disruption. Aware that disruption can come in many forms, they want to use their smart campus strategy to ensure business continuity and disaster recovery functionality for any future plans.

4 Increasing flexibility and change-readiness

A key part of protecting and growing student fee revenue streams may involve offering new or enhanced learning models. The robust and agile technology platform provided by a smart campus can underpin evolving forms of digital learning as universities explore and design hybrid, distance or individualised learning models.

This could include taking learning to students in other countries on a full or part-time basis, perhaps via an affiliation scheme with other learning establishments. It could also involve exploiting rising interest in alternatives to conventional degree programmes and the growth of professional and lifelong learning. The responsive, cloud-centric network at the heart of a smart campus means universities can rapidly stand up or wind down capabilities as needed, making experimentation low-risk.

5 Improving the student experience

Great student experiences help to increase applications and can support existing students to continue with their course, reducing drop-out rates. There's significant scope to change perceptions; in 2022, only 37% of students felt they received good or very good value for money from their current experience. Sources of dissatisfaction included teaching quality (31%) and the amount of one-to-one tuition time (20%). However, providing better, more tailored experiences of digital learning to students could help to turn negative perceptions around.

In terms of boosting how students experience the physical environment, a smart campus infrastructure can deliver information about how they interact with buildings and facilities to shape more efficient services that will boost satisfaction. A smart campus can also support a myriad of wireless location and IoT sensors that can also deliver improved experiences, from smart wayfinding and real-time parking information through to a 'network as a sensor' approach that monitors and secures any connection to the network.

6 Reducing the facilities management burden

Including a network of IoT sensors into a smart campus infrastructure can make real-time monitoring of manually intensive observations possible, reducing the need to outsource tasks to third parties and freeing up facilities teams to pursue core goals.

The possibilities are growing all the time, but current popular uses include monitoring air quality, room and area occupancy, using video-based intelligence to enhance safety, and bringing all asset tracking together into one simple solution.



7 Unlocking energy savings and sustainability gains

In a recent analysis of university strategic statements, every university surveyed included a statement in their strategy document that included their sustainability targets, with the majority setting a goal to be carbon neutral by 2030. What's more, growing awareness of sustainability means students are increasingly considering institutions' sustainability measures and credentials when choosing where to study.

Reducing energy use is one of the biggest levers higher education institutions have to cut their carbon footprints and boost sustainability performance. A smart campus framework includes a network refresh that makes the shift to a wireless-first approach. This enables universities to adopt advanced, energy efficient technologies to optimise their network's power utilisation. IoT sensors, too, have a big part to play in identifying how to optimise power consumption, reduce water wastage, or measure air quality.

8 Reducing the IT management burden

With an estimated 95% of network changes made manually, 70% of security policy violations occurring as a result of human error and 70% of IT managers' workloads consumed by manual tasks, university ICT teams are stretched.

A smart campus infrastructure is an effective route to reducing tasks and increasing their productivity. A modern smart campus infrastructure should leverage AI and ML to reduce the burden on IT resources. This can enable zero-touch deployments using templated configuration to assist with consistency in provisioning tasks, as well as supporting in-life change, and issue detection and resolution. Plus, the smart campus shift to monitoring and optimising user experiences also greatly enhances your IT teams' ability to avoid costly outages and to improve resolution times, should things go wrong. Overall, the insights these systems provide support more informed decision-making, boosting the likelihood that future developments will deliver expected returns on investment.



9 Creating cost saving opportunities

Moving workloads to a cloud-centric consumption-based model reduces the need for legacy equipment, networks and data centres that are costly to run and manage. As well as cutting energy expenditure, a smart campus approach can bring operational savings.

10 Boosting cyber security

Cyber security is a growing challenge; in 2023, government research revealed that 85% of higher education institutions surveyed had identified cyber security breaches or attacks in the last 12 months compared to only 32% of businesses surveyed. And yet, only approximately half of higher education institutions have a comprehensive cyber security strategy in place.

Adopting a smart campus framework opens the door to using the latest security solutions to create the advanced defences essential to protecting valuable R&D intellectual property and the functioning of teaching and learning. In fact, advanced cyber security will be vital to attracting research and industry partnerships.

A largely cloud-centric smart campus recognises that the traditional 'trust but then verify' approach isn't fit for today's agile working styles and cyber challenges. Instead, it uses a mix of security technology to create an environment that doesn't automatically trust any individual or device without verification on every access attempt. Following these Zero Trust principles, a smart campus delivers ubiquitous security both on and off-site to any connection to the institution made by students, staff and partners. This consistent security is an enabler for the consistently high level of student experience that's crucial to student wellbeing and ongoing satisfaction.

What's holding smart campus strategies back?

In the light of this strong potential, it would be reasonable to assume all higher education institutions are well along the pathway to a smart campus. Certainly, in a [2023 analysis of universities' strategic statements](#), they all appeared to have plans for a digital first / smart campus development.

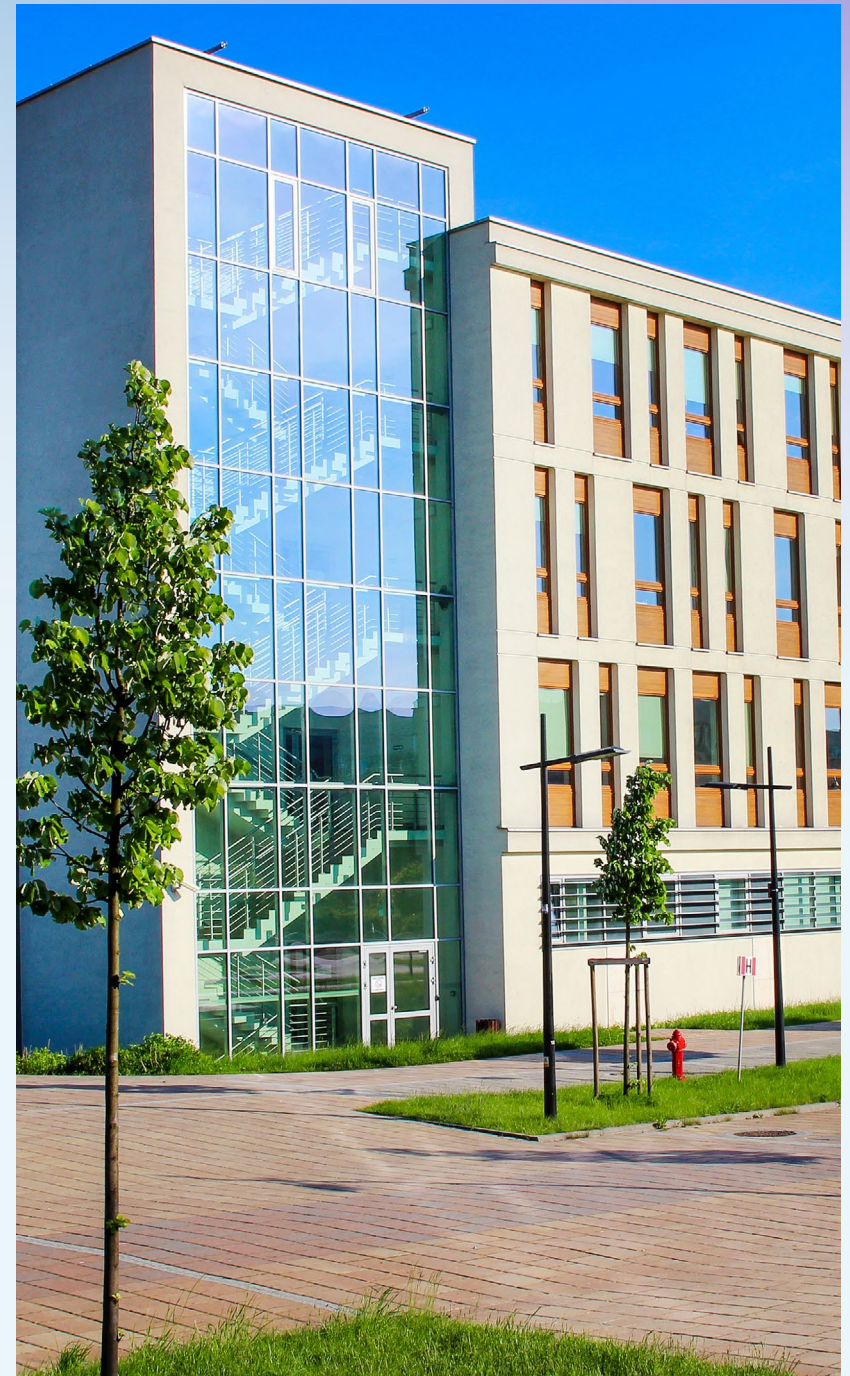
However, few seem to have executed those plans, evidenced by their relatively slow progress in implementing the connectivity a smart campus requires: as of April 2022, [60% of education institutions](#) were either at early or mid-stages of their path to connectedness and only 20% were already extensively connected.

Rather than a concerted shift to smart campus operations, there's currently a wide variation in smart campus maturity.

Universities contemplating smart campus adoption highlight the following barriers to pushing forward:

- financial constraints that inhibit the ability to invest
- a cautious C-suite that wants to 'wait and see' how smart campus take-up evolves, and would like proof of concept options to confirm their decisions
- a lack of internal expertise to plan and implement a smart campus strategy
- concerns over relinquishing control of critical network infrastructure to third-party suppliers and a desire to maintain in-house IT teams
- uncertainty about how greater cloud adoption will affect security vulnerabilities.

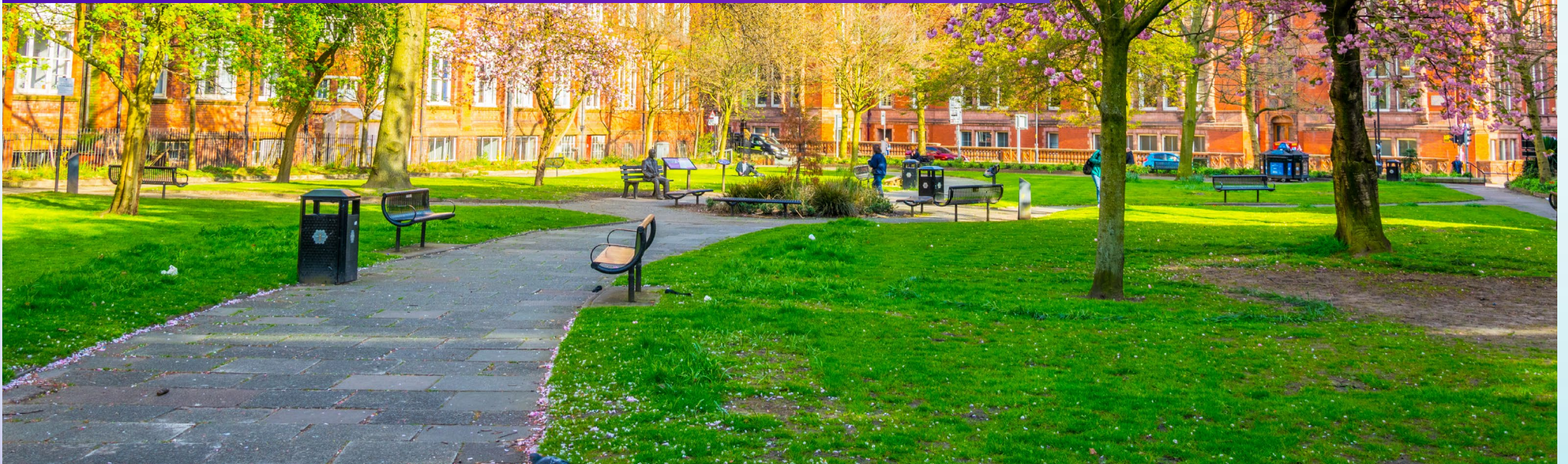
These are significant concerns, which warrant unpacking and specialist guidance to inform decision-making. An effective route for universities to get the expertise they need is to partner with an experienced provider.



A blueprint for an effective smart campus solution

The most efficient way to plan and implement a smart campus solution that meets every one of your institution's requirements is through partnership with an expert provider.

The right partnership will take the heavy lifting out of investigating the options and allow you to tap into market-leading experience. Crucially, it'll also respect and preserve your autonomy, and work with your IT teams with no covert agenda to replace them.





The defining factors of an effective smart campus partner

1. Experience in your sector

The network capabilities underlying a smart campus are widely used across multiple industry sectors, but your solution mustn't be an 'off the shelf' option based solely on this. Higher education is a specialist area with unique user requirements. Challenge your potential partner to share their track record in your sector, and probe for both an understanding of your specific pain points and a willingness to craft a solution from scratch.

2. Strategies to deliver a holistic solution

A strong technology partner will have a heritage of bringing together multiple functionalities across networking, security, and both multi-clouds and industry clouds to deliver seamless connectivity and networking. Yes, getting the technological foundations right is crucial, but it's equally important that your partner understands the wider, aspirational benefits you're looking for and is committed to unlocking them for you.

3. Deep technological expertise

With ambitions agreed, your partner should be skilled in designing, architecting and delivering bespoke technology solutions. Expect discussion and guidance on why and how to replace legacy structures, how to prepare for adopting innovative technologies and what choices would best suit your operations.

Make sure you bring your technology conversations back to how the end solution can help you to streamline processes, reduce costs, become operationally more effective and prepare to adopt future technologies. Focus on the connectivity aspect, and the precise blend of Wi-Fi, Bluetooth Low Energy, LoRaWAN, Private 5G, and neutral host technologies they offer to deliver your ideal wireless-first network strategy backed by market-leading resilience.

4. A vigilance about security

A good partner will be frank about how a smart campus solution changes your security landscape and could increase vulnerabilities in certain areas. However, they'll also clearly lay out how advanced Zero Trust approaches to network access control will ensure that users remain secure whenever they're connected to the campus network.

Ask about how authentication will work, how your network access policies will be applied to segment traffic and determine access permissions. And, above all, question to what level security is woven into all aspects of the smart campus framework to provide comprehensive defences against cyber threats.

5. No preconceptions about what form your partnership will take

Truly collaborative technology partners will respect how you want to operate and, if this involves you retaining day-to-day control, they'll work with that and won't push for a managed approach. In fact, a strong partner will wait for you to select the level and extent of support you require for each technology area, and then wrap that support up into one easy-to-manage contract.

For example, your IT department may choose to manage connectivity in-house, but opt to take a managed Security Information and Event Management (SIEM) service to provide real-time protection across the complex and increasingly global smart campus environment.

Look for whether they provide security advisory services that you can tap into as needed. This could help smooth the process of integrating smart campus network security with your organisational security policy, so your teams can focus on delivering an outstanding stakeholder experience. Or it could involve implementing AI and ML capabilities to help your teams apply your network security policy consistently to mitigate the possibility of human error.

6. Proof of Value services to confirm viability

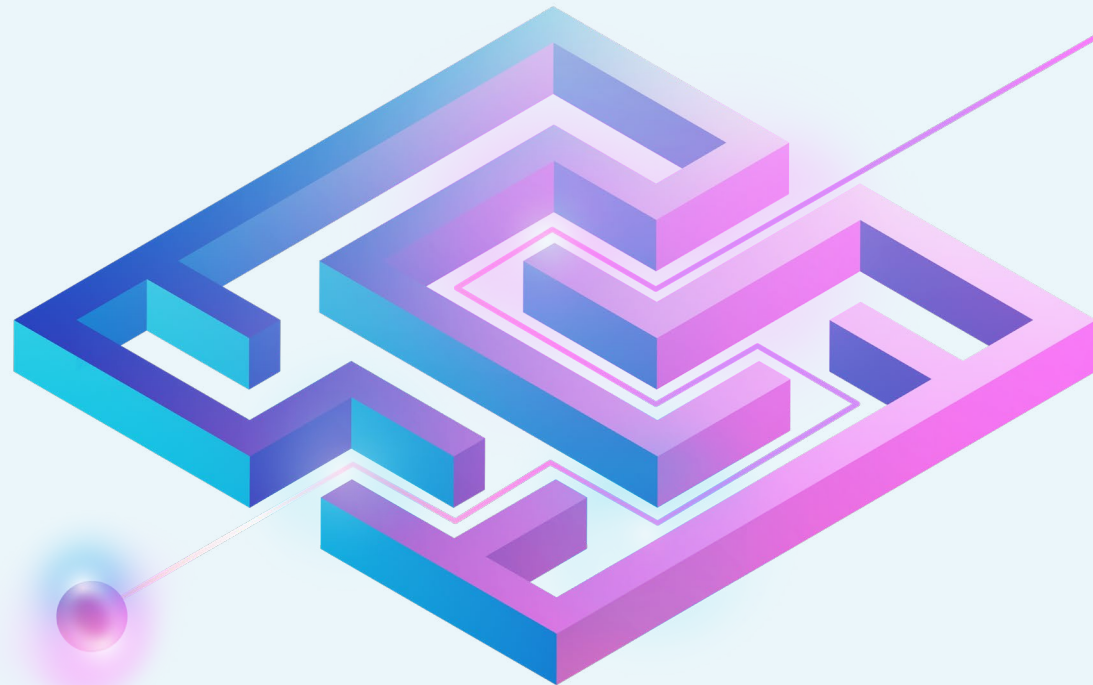
In today's economic climate, any investment needs to be thoroughly researched and validated before it's made. A technology partner should recognise this, and offer Proof of Value services to enable you to confirm that your proposed solution works as expected before you commit to a significant investment.

7. A commitment to sustainability

Sustainability is a vibrant force in all strategic investment decisions today, and your partner must embed this principle into any smart campus design and ongoing relationship. Start by questioning your potential partner about how they're prioritising sustainability within their own operations, and move on to exploring how they can build sustainability into your smart campus by design. Expect them to make practical tools available to unpack how upgrading your network as part of a smart campus approach can assist you in managing your carbon footprint, and how your current and future network power consumption levels will compare.

8. Support to maximise the effectiveness of your smart campus

Even the best bespoke technology solution can fail to achieve its potential if its users aren't fully on board and using it properly. Seek out a technology partner with experience in weaving user adoption and success management services into solutions to ensure the technology is adopted widely and effectively.



Our credentials for partnership

Our market leading connectivity and network

We offer deep experience in delivering robust and advanced connectivity and networks to support any direction your institution wants to take. We have the UK's biggest EE network, delivering unrivalled coverage, capacity and resilience, plus a next-generation 5G core network, and 5G private network expertise.

Advanced tailored cyber security support

We pair this with cyber security solutions that are trusted by leading organisations and government bodies around the world. Our 3,000 security professionals, 350 highly skilled consultants and global security operations centres use our ringside seat on the complex security threat landscape to deliver market-leading managed security services, as recognised by [IDC](#).

Cutting-edge innovation and infrastructure

To this we add our proven heritage in R&D, [innovation labs and test facilities](#) that deliver cutting-edge infrastructure to support the differentiation of your institution in the market.

Our ecosystem of industry-leading partners

As part of our collaboration, we bring access to our ecosystem of industry-leading partnerships with vendors at the forefront of technology, such as Cisco, Juniper, HP / Aruba, Microsoft, Amazon Web Services, Google and technology partnerships with the likes of Riverbed, DELL, Oracle, Poly, Symantec, Palo Alto Networks, Fortinet, Checkpoint, Netscout and many more.

Our ambition is to make purchasing as straightforward as possible, and we are already on the JISC framework for the purchase of Palo Alto Networks and Netscout solutions.

The ability to drive sustainability gains

Growing sustainability, both within our organisation and within our partners' operations, is one of our core commitments. Our platinum EcoVadis rating puts us in the top 1% of sustainable organisations worldwide, and we're on the Carbon Disclosure Project's 'A List' for the eighth year running which puts us in the top 2% of 13,000 reporting companies.



Prepare to excel

Our technology mix that can form a smart campus solution is the result of carefully listening to what universities want to achieve.

If you choose to work with us, we take your goals, and then create a tailored and holistic solution that encompasses connectivity, networking, security, IoT, and collaboration capabilities. To this we add as much management and user adoption support as you want.

[Visit our dedicated webpage](#) for more information,
or contact one of our specialists.



**Means
Business**

Offices Worldwide

The services described in this publication are subject to availability and may be modified from time to time. Services and equipment are provided subject to British Telecommunications plc's respective standard conditions of contract. Nothing in this publication forms any part of any contract.

© British Telecommunications plc 2023. Registered office: One Braham, Braham Street, London, England E1 8EE. Registered in England No. 1800000.

November 2023