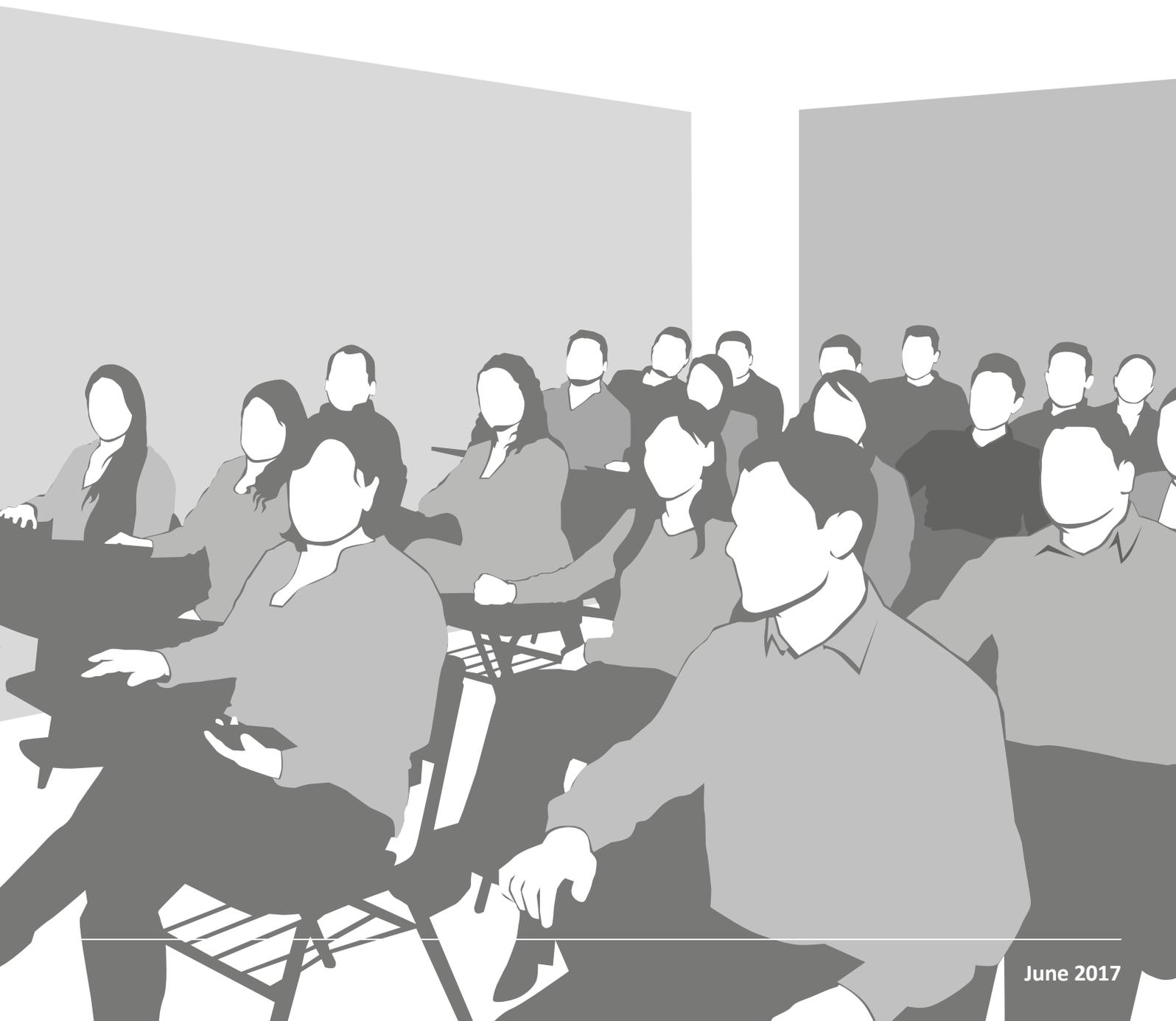


WHITE PAPER

Higher Education: Changing the IT Landscape of Higher Education.



Introduction

Universities and other higher education establishments are faced with increasing pressure to deliver high quality, competitive and cost effective education for students who are driven by the awareness that there are many choices in today’s knowledge economy. And, with ever increasing tuition fees, students continue to actively challenge universities to provide them with a value for money education as well as a rich academic experience.

Traditionally the UK has been second only to the United States as the most popular destination for international students, with a reputation for world-class research opportunities and initiatives. The UK attracts students from all around the world, however, Long-Term International Migration (LTIM) statistics estimated that the number of people arriving to study in September 2016 was 136,000 - down 32,000 from the year before¹. Increasing tuition fees for international students (now topping £35,000 per year for some courses), as well as concerns over Brexit and the increase in competition amongst UK and foreign universities are all contributing to the recent stagnation of applications from international students.

“If we are to continue to succeed as a knowledge economy, we cannot stand still, nor take for granted our universities’ enviable global reputation and position at the top of the university league tables. We must ensure that Education is also fulfilling its potential and delivering good value for students, employers and taxpayers who underwrite it.” Jo Johnson MP, Minister of State for Universities and Science².

A survey into how students choose a university found employability, teaching, the student experience and research are the top four priorities when choosing where to study³. In this increasingly mobile and digitised society, universities must be prepared to offer flexible and easy to access learning opportunities that will enhance the student’s educational experience. They must provide the right IT systems and infrastructure that is capable of keeping up with the ever increasing demand by sourcing reliable, fast, secure and scalable services that not only meet expectations, but exceed them. Today, both students and staff are experienced consumers of technology and expect much more than just a superfast internet access. In short, they not only expect but demand a premium secure user experience.

The Student Experience

To remain competitive within the sector universities must continue to look ahead and innovate. Technology provides opportunities to help tailor the educational experience to the needs of the individual learner. Not only can students choose where and what to study, better information will help them decide how they choose to study, whether it is a traditional 3 or 4 year full time undergraduate degree or a more flexible route⁴.

The rise of popularity in MOOCs (Massive Open Online Courses) means a greater number of students have access to online courses, which provide greater flexibility, convenience and personalisation of the course pace. By offering this type of learning, universities can engage with a wider audience and at a time that is convenient for learners. Online courses also mean that students and lecturers are able to provide feedback instantaneously and in “real time”, which enhances the experience even further.

Technology is not only a means to engage with current staff and students, but it can also be an attractive lure to secure enrolment numbers. According to the IPSOS Millennials Social Influence Study (2015), choosing a university has become an important buying decision and is strongly influenced by peer review. The report states that “user reviews are 20% more influential on purchasing decisions than any other media” and that savvy millennials “trust user-generated content 50% more than any other media”. Increasingly this also applies to choosing a university or higher education establishment⁵.

Any network outages or security breaches are often reported through social media and cause significant reputational damage that could economically impact higher education organisations. Consequently, it is of vitally important that universities have robust and secure infrastructure in place to ensure a premium end user service.

We found that attacks are already happening in UK universities:



Almost all universities (**87%**) have experienced at least one successful cyber attack.

Over a third (**36%**) of UK universities are blighted by a successful cyber attack each hour.

83% believe cyber attacks are increasing in frequency and sophistication.

These are not just small-scale events to be brushed aside. Consequences range from threats to student’s personal information, to IP loss and anti-competitive behaviour.

Some universities are moving to cloud-based systems that are more agile for responding to peaks and troughs in demand due to the transient nature of the student population. As identified in the Government Transformation Strategy, technology should reach into higher education establishments and change the way they operate⁶. Harnessing new technologies, such as cloud-based platforms have the potential to revolutionise student's learning experience by enabling a wider range of options for teaching, earning and research while providing an enhanced secure platform of which to share ideas and data.

One such university that has embraced cloud technology to resolve these challenges is Middlesex University London. With over 25,000 students originating from over 140 countries and over 2,500 staff, Middlesex University experiences extreme peaks and troughs in usage with each student having access to, or owning an average of 3 devices. Students can BYOD (Bring Your Own Device), which potentially could put more pressure on their IT systems, but by using a Cloud based IT infrastructure this requirement is not only easily managed, but also governed by a central IT policy. Some universities also supplement their tuition income by opening up their campuses during offpeak times offering rental accommodation and conference facilities, highlighting the need for an IT system that is flexible and can adapt to variations in usage.

Using Technology to Revolutionise IT

The changing demands on an ever-evolving IT landscape and an increased emphasis on cyber security and the imminent arrival of General Data Protection Regulation (GDPR) in May 2018, means that universities must evolve and revolutionise the way their IT systems operate.

Some establishments have executed a "cut and paste" approach, matching new technology to fit into existing legacy applications and infrastructure. Simply shoehorning a software or hardware solution into existing technology is not the answer, these clumsy, out-dated systems hinder organisation with their lack of flexibility, reliability and security. In the long run this approach is likely to be costly and inefficient and does not take into account what new system will be required to do, it simply allows the university to continue to keep afloat, but doesn't move them forward. By taking a holistic approach and looking at the users' and the organisations long term requirements is the most effective way of developing new IT infrastructure. Universities and other higher education institutions require IT services that can be cost-effective, scalable, secure and flexible and should be looking at companies that can respond to these requirements and offer proven solutions that scale to adjust to their specific demands.

For example, Middlesex University which boasts one of the most diverse, multinational and multicultural communities of students and staff of any university in the UK, with almost 19,400 students and 1,900 staff from 140 different countries has led the sector in the early adoption of flexible cloud-based solutions that are agile and, where required, chargeable on a pay as use basis. In order to achieve this, the university's procurement department worked alongside IT to develop the right initiatives and implement it across the board in measured stages to ensure minimal disruption to the organisation and its users. Using the flexibility provided by the Cloud, Middlesex University can easily turn on additional services, such as server provisioning, central processing units (CPU) and Network bandwidth to ensure that reliable, modern hardware is underpinning systems and activities at all time. The flexible service provides Middlesex University with the agility to scale services to cater for short periods of time when additional capacity is required, for example, in response to new multi-partner academic research projects. It also means that test and development environments can be scaled back when they are not required to achieve further cost savings.

A Brave New World

With the implementation of GDPR fast approaching, it is imperative for organisations evaluate their policies, procedures and their service providers to safeguard the business from the potential liabilities of breaching GDPR. And, whilst the GDPR is an EU Regulation it has already passed into the UK statute books, the Government has confirmed that a post-Brexit UK must still prepare for the new regulation. Universities operating on a European and global scale must adhere to the regulations when processing EU students' data⁷.

It is no longer sufficient to just be concerned about the processing and protecting of user's data. Being better connected and more digital brings significant benefits and incentives for both students and staff, however the influx of intellectual property being shared, downloaded and uploaded provides more potential for cyber criminals.

The UK has a solid reputation for being one of the world's top research and innovation destinations, producing more academic research than any other country besides the United States. A recent study by VMware found that due to academic research's value to the economy, some organisations and individuals are "prepared to take any measure necessary to get their hands on university data, including committing cyber-crimes". The study found that a staggering 87% of universities surveyed have experienced at least one successful cyber-attack and 83% believe that cyber-attacks are increasing in frequency and sophistication. They also found that 64% don't believe that their university's existing IT infrastructure will protect them against cyber-attacks in the next 12-18 months⁸. If UK universities wish to continue to attract the best students from both home and abroad, measures must be taken to avoid reputational damage and associated data breaches from cyber-attacks, which will seriously threaten their ability to compete for applications and associated funding.

It is also quite clear that educational institutions want to increasingly concentrate on their core capability of education and research. They are now adopting the stance that many enterprises take of needing a consumable model for Cyber Security. The opportunity for scalable, PAYG (Pay As You Go) Cyber Security is only hampered by the lack of imagination by vendors of key security technologies. Service providers as a whole perceive the opportunity and are currently taking (kicking and screaming in some cases) the vendors to the “party” with all manner of consumable models. Unfortunately, both vendors and the supply channel are still rooted in delivering models dependent on perpetual licences with annual support. From a consumable point of view any greater than a commitment of an hour is considered too long and consequently the days of the perpetual licence are limited.

Once we get to a truly consumable environment, then we can ensure that every element of the higher educational world is protected from threat ensuring that it is possible for financing to be cost effective with a known ROI.

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Maintaining IT control in a Global Classroom

Universities and other higher education organisations are unique in that they are ‘open-door’ societies, which allow free movement of people and information. The implications on data security and protection applies not only to intellectual property of the staff and students at the institution, but also to the personal data of the individuals. Therefore, universities will need to consider their overall data strategy and the challenges of managing multiple data pools, with appropriate controls on segregation and access⁹. IT policy control must safeguard confidential pieces of work, such as research, so that access is only granted to authorised users and is protected by real-time forensic security.

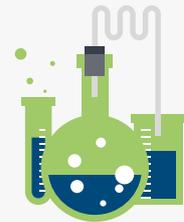
Attacks on student data are common, but critical research IP is also highly vulnerable:



43% have had student data attacked, including dissertation materials and exam results.



25% have experienced critical intellectual property theft.



28% have had grant holder research data attacked.

In addition, the nature of these attacks is not always sophisticated. It is not just external threats tapping into confidential university information. Over half (52%) of UK universities claim full-time domestic students pose a risk to cyber security.

The global nature of UK universities means that remote and collaborative working is an essential working practice, especially with today's digital savvy users. Universities must be forward-thinking and commercially-minded and choose an IT partner who is able to provide scalable, flexible and cost-effective solutions to meet the complex and rapidly changing needs of a higher education institution.

Conclusion

Successful digital transformation for higher education relies on targeted investment in centralising and unifying data, replacing existing systems where there are inherent inefficiencies. Eradicating inefficiencies will help to reduce running costs, increase data accuracy - and raise the standard of service offered. Universities will find that by migrating to cloud-based systems their IT staff have more time to pro-actively support the needs of the organisation and its extended learning community so that they can implement new strategic projects to support growth. They will gain better control of their data, as well as the assurance of application service levels so that they can take advantage of the new breed of software defined networks. With this digital transformation, consumable models for cyber security will become the new norm in the race to prevent security attacks and reputational damage.

Why Exponential-e?

When Exponential-e was founded, we set out to build the best privately-owned Network in the UK. Today, 14 years and millions of pounds of investment later, we believe we own it.

Our privately-owned, VPLS Network sits at the core of everything that we do. It is the sole reason why we have a track record of rolling out the most innovative Cloud and Network solutions in the UK, before our competitors have even thought of them.

Because it is a true Layer 2 and a wholly owned Network it is also more flexible and scalable than the MPLS Networks that many British businesses are made to run Cloud and business solutions over.

As Network and Cloud pioneers, we are able to provide far more than WAN optimisation for the Cloud. Exponential-e provides both the overlay and the underlay, so our customers get a comprehensive service that integrates SD-WAN, SD-CLOUD, and security over a single, homogenous VPLS Network.

Our SD-Cloud offering comes with the control portal and devices, as well as the management, support, monitoring and QoS our customers need. That means we can offer our customers SLAs that cover the entire user-to-application journey, and should the worst happen, we can also provide business continuity and disaster recovery much faster.

References

¹ Migration Statistics Quarterly Report: May 2017 - Office for National Statistics -

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/internationalmigration/bulletins/migrationstatisticsquarterlyreport/may2017>

² Success as a Knowledge Economy: Teaching Excellence, Social Mobility and Student Choice (May 2016) - Department for Business Innovation and Skills -

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/523546/bis-16-265-successas-a-knowledge-economy-web.pdf

³ What Would A Student-Created University Ranking Look Like? - Top Universities -

<https://www.topuniversities.com/blog/what-would-student-created-university-ranking-look>

⁴ Success as a Knowledge Economy: Teaching Excellence, Social Mobility and Student Choice (May 2016) -

Department for Business Innovation and Skills -

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/523546/bis-16-265-successas-a-knowledge-economy-web.pdf

⁵ Millennials Trust User-Generated Content 50% More Than Other Media - Mashable UK -

<http://mashable.com/2014/04/09/millennials-user-generated-media/#R4eRimi2cGq5>

⁶ Government Transformation Strategy, February 2017 - Gov.uk -

<https://www.gov.uk/government/publications/government-transformation-strategy-2017-to-2020/government-transformation-strategy>

⁷ The €20 Million Question: Will you be ready for the General Data Protection Regulation? (May 2016) - Association of Heads of Universities Administration -

<http://ahua.ac.uk/general-data-protection-regulation/>

⁸ University Challenge: Cyber Attacks in Education, 2016 - VMWare

⁹ University Challenge: Cyber Attacks in Education, 2016 - VMWare



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Innovation is at the core of Exponential-e, and has been since our inception in 2002. We wholly own our superfast Network, and our fusion of complementary technologies - a carrier-class Network and Cloud infrastructure - means we can deliver enterprise applications at wire speed for a superior end-user experience. We deliver scalable, dynamic and bespoke solutions. Renowned for our responsiveness, coupled with our customer centric approach, and a UK based 24 / 7 x 365 service desk, means we offer unrivalled expertise.
