



# The digital road to recovery for Australian Educational Institutes

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# Update to Optus Education Customers



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## Foreword

**Disrupted like never before, digital transformation is now key to a strategy of recovery.**

Australia's higher and vocational education sectors have been a major economic driver for the past two decades and a symbol of this country's evolution into a knowledge-intensive economy.

Education ranks in the top five export industries nationally, driven in the past by a rising tide of overseas student demand, particularly from China and the subcontinent. From a domestic perspective, enrolments have been fuelled by lower barriers to participation in education.

COVID-19 has had the effect of creating an immediate and profound brake on revenue and enrolments – with the prospect of more disruption to come.

All universities and TAFEs are urgently reviewing their strategy and operations to identify short-term cost efficiencies and revenue-generating opportunities. But the impact of COVID-19 is not restricted to finances.

It has fundamentally changed traditional operating models and made remote learning and working not only viable, but potentially permanent.

Education institutions are looking at what is likely to generate the greatest and quickest returns on investment and for many of them the standout candidate is investment in technology that touches every aspect of education.

Optus has a unique vantage point to assess what's happening in the sector, particularly through the eyes of Chief Information Officers (CIOs). It commissioned this white paper to synthesise the views of experts within the university and TAFE sector, as well as industry, in order to help institutions, identify sector-wide versus institution specific imperatives.

The white paper is focused on the recovery from COVID-19 rather than the response, recognising that effects of this global pandemic will fundamentally re-shape the way we think about every function of delivering education.

# Executive summary

## The impact of COVID-19 on education will be significant, and long-lasting

### Snapshot of the impact on higher education and its core 'customers'



Higher education one of the hardest hit sectors in the Australian economy

**\$19B**

Forecast revenue loss over three years<sup>3</sup>



Every source market impacted by COVID-19 travel bans

**Initial impact of COVID-19 was initially confined to inbound students from China, but travel bans have impacted every source market.**



International student revenue to drop, threatening jobs

**\$3B**

Forecast drop in international student revenue in 2020<sup>4</sup>

**21,000**

Number of higher education jobs that are threatened<sup>4</sup>



Impact on revenues will not be evenly distributed across institutions

**Seven universities have insufficient available cash and investment reserves to offset prediction losses in international fee revenue for 2020<sup>5</sup>**

## Digital is a primary lever to deal with a range of new and pre-existing challenges faced by the sector

### New demands on the education sector



Assuring campus safety for staff and students



Engaging students and cultivating relationships even when they are off campus



Mass migration to remote learning and teacher support



Transition to activity-based administrative work and research



Balancing strategic and short-term demands

## Major conclusions for institutions trying to re-imagine themselves in recovering from COVID-19

- Digital is driving strategy – it's no longer just an augmentation tool.
- Connectivity is now critically important and underpins the entire university and TAFE operation.
- Cyber security has been elevated given every function – from teaching, to research and campus operations – are now network-dependent.



# An unimaginable operating context for universities and TAFES



Australia has seen more than a decade of growth in education enrolments and profitability – until 2020.

The impact of COVID-19 on higher and vocational education has been immediate and profound, creating significant health and economic headwinds for Australia and major challenges for education institutions and systems.

Unemployment is expected to increase to 10%<sup>1</sup>, meaning younger workers will have more difficulty finding and maintaining employment, and GDP is expected to reduce by 1.32% over the next year<sup>2</sup>, with the true impact not likely to be understood until a vaccine is developed for COVID-19.

## COVID-19 has eroded the commercial sustainability of education institutions

Cost-cutting drives are being pursued across the sector as institutions shore up balance sheets. Given employee costs represent 57% of total university spending, further reductions in this area are inevitable to reflect the decline in student enrolments<sup>3</sup>.

Few universities have enough cash and investment reserves to withstand a sustained reduction in international fee revenue. Universities are actively planning and implementing various strategies to mitigate potential losses.

The most important strategies will include<sup>4</sup>:

- Delaying or scaling back of uncommitted capital works and other major projects
- A rationalisation of course and subject offerings
- Reduced staff numbers.

Major fee changes are on the horizon for domestic students with the Australian Government supporting discounted student fees for courses in fields of national priority (nursing, teaching, allied health and others)<sup>5</sup>.

<sup>1</sup> <https://pursuit.unimelb.edu.au/articles/the-young-australians-hit-hard-during-covid-19>

<sup>2</sup> <https://www.pwc.com.au/publications/australia-matters/economic-consequences-coronavirus-COVID-19-pandemic.pdf>

<sup>3</sup> <https://theconversation.com/covid-19-what-australian-universities-can-do-to-recover-from-the-loss-of-international-student-fees-139759>

<sup>4</sup> <https://theconversation.com/covid-19-what-australian-universities-can-do-to-recover-from-the-loss-of-international-student-fees-139759>

<sup>5</sup> <https://www.dese.gov.au/covid-19/higher-education/higher-education-faq#Short%20online>





# New demands are being forced on to the education sector

The response phase to COVID-19 has highlighted the best of the sector and proven that institutions can adapt quickly to new pressures. Optus has seen challenges and responses fall into five categories:

## 1. Assuring campus safety for staff and students

Major operational challenges were presented to universities and TAFEs as the gravity of COVID-19 became clear. Foremost among those was how to rapidly close down campus operations and embrace new hygiene measures and enforce social distancing for students and staff who remained on campus.

As publicly funded institutions, the duty of care to staff and students is extremely high and new measures needed to be designed and adopted to manage critical risks. In the most extreme cases, campuses needed to be shut down altogether for extended periods in line with government advice and directives.

Problems faced		How organisation responded	
Assuring the safety of students and staff that had to remain on campus across multiple locations	 <p><b>Canberra Institute of Technology</b> RTD Code 0101   CRICOS No. 00001K</p> <p>Canberra Institute of Technology (CIT) is the sole provider of TAFE programs in Canberra with a strong focus on traditional trades and providing for the needs of a digital economy including via its commercial arm (CIT Solutions)</p>	Range of new protocols put in place related to physical safety	<p>Simultaneously maintaining a focus on the long-term including digitisation of a new purpose built facility at Woden which will house the majority of CIT's tech-intensive programs</p>
Preserving a strategic mindset in the midst of short term pressures to ensure that its planned premises are future-proofed and dynamic			
Optus role			
 <p>Providing core services including mobile and network connectivity</p>	 <p>Contributing to CIT's digital roadmap process including potential digital services to drive future efficiency and productivity</p>	 <p>Contributing thought leadership and connections via the Singtel network</p>	







## 2. Engaging students and cultivating relationships for students that are off campus

Student engagement is a major priority for universities and TAFEs. It underpins the capacity of institutions to differentiate and a close connection to students is recognised as a significant pre-determinant of academic success and retention.

Much of the student engagement activity in universities and TAFEs tends to focus on the physical campus, including significant recent efforts to activate campuses and encourage social and peer-to-peer interactions among students.

The quest for improved student engagement has also driven a range of changes to the way campuses are physically designed, with a focus on collaborative environments, social spaces and learning commons.

Maintaining a virtual connection with students is particularly critical in relation to international students – some of whom were enrolled in Australian institutions for face-to-face experiences but were never able to physically attend campus.

Problems faced		 <b>THE UNIVERSITY OF WESTERN AUSTRALIA</b> University of Western Australia (UWA) Group of eight universities based in Perth with a strong research pedigree and teaching focus	How organisation responded		
International students stranded in home countries			Deployed Involvio student engagement platform		
Imperative to create sense of belonging among its student cohorts			Created communities of interest and peer networks among international cohorts		
Highly restricted access to campus			Strong student feedback and engagement with plans to expand the suite of services offered to students		
Optus role					
	Integrator for the Involvio student engagement deployment at UWA		Provide cyber security services to UWA which underpin its major systems		Design and deployment of underlying Network infrastructure and wireless connectivity

## 3. Mass migration to remote learning and teacher support

COVID-19 has created an overnight shift in the predominant operating model for teaching and learning. Many Australian universities and TAFEs have had to move to remote arrangements for teaching and learning. In some jurisdictions this has been temporary while in others, particularly Victoria, there has been a delayed prospect of a return to campus in the immediate future.

Approximately over 1.3 million higher education learners needed to shift to remote ways of learning overnight (calculated based on number of higher ed learners classified as Internal and Multi-Modal)<sup>6</sup>.

Teaching staff have adapted to new ways of working, including teaching via video platforms such as Zoom, Webex and Microsoft Teams which have all experienced surges in demand. For example, Zoom downloads increased 1,270% during COVID-19.<sup>7</sup>





*“The shape of campus is going to be radically different: including the notion of coming to work,” – Jonathan Churchill, Chief Digital Officer at James Cook University*

Moving students online is only part of the challenge. COVID-19 has created the additional need for professional development to be delivered via technology without compromising quality.

<sup>6</sup> <http://highereducationstatistics.education.gov.au/>

<sup>7</sup> <https://itbrief.co.nz/story/covid-19-zoom-downloads-explode-as-people-work-from-home>



Problems faced		 <p>South West TAFE Regional Victorian TAFE servicing some of the most disadvantaged learners in the state across three campuses and with strong industry connections.</p>	How organisation responded		
Variable staff skill level in relation to digital learning			Rolled out Smart Classroom technology with Optus (on Cisco Webex platform)		
Pressure to transfer courses quickly in response to government directions			Digitised a range of course offerings including using technology to gain access to remote subject matter experts		
Digitising the learning environment for courses that are highly practical in nature			Ran professional development across TAFE workforce within a fortnight resulting in high levels of teacher confidence and excellent student feedback		
Optus role					
	Deployed Smart Classroom technology across South West TAFE including dedicated end points		Facilitated connections to ecosystem partners to increase uptake		Provision of network infrastructure to deliver secure, resilient connectivity

#### 4. Transition to activity-based administrative work and research

Administrative staff have also been impacted and work from home has been universally adopted. Over 1 million Australians have had to shift to working from home as a result of COVID-19.<sup>8</sup>

In the higher education sector, this has impacted more than 120,000 employees who have all been impacted by campus lockdowns (based on the number of higher ed full-time and fractional full-time staff, 2018)<sup>9</sup>.

The move to more activity-based and remote working has challenged traditional working cultures and placed strain on accountability frameworks and operating procedures. These strains and tensions have become more acute as the situation evolves.

Research is also challenged. 40% of academic researchers in the UK feel the pandemic has undermined their confidence in applying for grants that are not focused on COVID-19.<sup>10</sup>

In Australia, the aftershocks of COVID-19 could strip Australia of 14,000 full-time employee (FTE) researchers, diluting its capacity for innovation when it is most needed.<sup>11</sup>



8 <http://www.roymorgan.com/findings/8383-roy-morgan-coronavirus-crisis-impact-on-employment-april-24-2020-202004240654>

9 <https://docs.education.gov.au/node/51701>

10 <https://www.timeshighereducation.com/blog/three-challenges-facing-academic-research-during-covid-19-crisis>

11 <https://www.timeshighereducation.com/news/pandemics-impact-australian-research-protracted>

Problems faced	 <p><b>JAMES COOK UNIVERSITY</b> AUSTRALIA</p> <p>James Cook University An internationally-renowned research and teaching university with main campuses in Townsville, Cairns, and Singapore and ranked in top 2% of the world's universities.</p>	How organisation responded
Immediate transition to work and learn from home arrangements		Risk-based approach to resource prioritisation, with digital investments taking priority over capital works projects
Operating budget pressures		One of the first campuses in Australia to have students returning to campus after the first wave of COVID-19
Managing risks associated with changing COVID-19 conditions in two jurisdictions (Australia and Singapore)		

### Optus role

	<p>Provided underlying Network infrastructure, WiFi and Mobile Network connectivity</p>		<p>Investment in an IoT Research Chair to drive a longer term automation agenda at the university and in industry</p>		<p>Co-designing potential digital services for the medium to long-term</p>
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## 5. Balancing strategic and short-term demands

Institutions must fundamentally re-imagine their core functions while trying to save around 20% of operational costs.

In many cases institutions are treating the crisis as an accelerant for innovation and change, particularly given commercial challenges won't be addressed by incremental measures.

Tactics to rein in spending have ranged from deferred building works, driving cost savings and efficiencies across existing operational and technology assets to hiring and travel freezes and executive pay reductions.

Problems faced	 <p><b>LA TROBE UNIVERSITY</b></p> <p>La Trobe University Research and teaching university with a network of metro and regional campuses in Victoria and a major focus on first in family and low SES students. Home to Optus Cyber Security Research Chair</p>	How organisation responded
Rapid transition to remote learning / working including regional campuses		Continued developing digital strategy recognising need for medium term view not just short term workarounds
Significant budget challenges from decline in international students		Bolstering IT capacity to support remote working and learning requirements
		Heightened focus on innovation agenda and industry partnerships as part of its Innovation Precinct investments

### Optus role

	<p>Appointment of Optus Cybersecurity Research Chair recognising importance of secure Network connectivity</p>		<p>Co-designing innovation and collaboration strategy at the university to help in the COVID-19 response and establishing National Industry Innovation Network (NIIN)</p>		<p>Technology partnership spanning networks and managed services with up-scaling to meet COVID-19 demands</p>
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# Demands on technology and the acceleration of digital

Digital technologies have been at the heart of the response from universities and TAFEs. This has taken a number of forms; from the more obvious (e.g. demand for additional video conferencing, network connectivity and mobile services) to the less visible (e.g. bolstering of cyber security arrangements, cloud virtualisation and streamlining of workflows as previous analogue processes had to be digitised).

Given the prominence of digital, it's perhaps not surprising that the demands on the IT function increased, and the prominence of the CIO was elevated.

Vector Consulting. 'The Tipping Point for the Digitisation of Education Campuses'. October 2020.

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***"Through the COVID-19 response the impact that technology has on critical business metrics has been acknowledged across the enterprise. This should increase the pace of digitalisation going forward..."***  
**– Peter Powell, CIO, La Trobe University**

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## Surging demand for connectivity and pressure on technology platforms

The COVID-19 response saw a surge in internet congestion driven by work and learn from home uptake and an 80% increase in demand<sup>12</sup>. Video has been the primary driver of increased connectivity requirements<sup>13</sup>.

In moving to online channels for learning and working, institutions have also been exposed to a much greater threat from a cyber security perspective. Defence Minister, Linda Reynolds, declared that malicious cyber activity was "increasing in frequency, scale, in sophistication and in its impact"<sup>14</sup>.

Internet security groups and governments have warned that cyber criminals were exploiting the disruption caused by COVID-19 to initiate a range of phishing and malware attacks<sup>15</sup>.

Australia has committed to invest \$1.35 billion in cyber defence over the next decade, which will include recruiting 500 cyber 'spies'.

Education and training institutions are particularly vulnerable given the sensitivity and value of data they hold, and historical under-investment in their own security.

Approximately 77% of university leaders say their current approach to cyber needs improvement, 58% say their data protection policy and approach needs significant improvement and 65% intend to increase cyber security spending<sup>16</sup>. Finding budget for these measures has never been more challenging, or important.

12 <https://www.abc.net.au/news/2020-04-01/coronavirus-internet-speeds-covid19-affects-data-downloads/12107334>

13 <https://www.abc.net.au/news/2020-04-01/coronavirus-internet-speeds-covid19-affects-data-downloads/12107334>

14 <https://www.theguardian.com/australia-news/2020/jun/19/australia-cyber-attack-attacks-hack-state-based-actor-says-australian-prime-minister-scott-morrison>

15 <https://www.ft.com/content/f424fa3b-69ec-4300-9787-245b57fefa69>

16 Vector Consulting. Securing Australia's education institutions. July 2019.

## COVID-19 has accelerated a range of trends that were already happening in the sector

Commentary from the sector, particularly CIOs, has emphasised that COVID-19 simply brought forward reforms that were already in progress.

The recovery phase from COVID-19 is not likely to see a 'snap back' to the way education and training operated in 2019, but rather a permanent and radical change.

Trends that will be amplified or accelerated by COVID-19, according to experts in the sector, include:

### Digitisation of learning and the student experience

Trends prior to COVID-19		Accelerant effect of COVID-19		
1	Uptake of blended learning to deliver student choice and deliver access and equity	Virtualised learning has become a given, not a 'nice to have'	Changed focus to the quality of blended learning, not just its availability	Rapid uplift in teacher adoption on virtual learning tools and up-skilling
2	Rollout of smart classrooms that provide immersive capability and allow students to participate fully in live classes from a remote location		Focus on tools, end points and technologies that generate data capable of informing more personalised learning approaches	Interest in student engagement tools and platforms to drive community and collaboration
3	Mobile first approach to student learning and engagement materials			
4	Investment in learning analytics			
5	Micro-credentials and short courses: just in time learning not just in case			

*"The question we need to ask ourselves as a sector is how am I going to genuinely engage with students and how can data help me make that process more meaningful, targeted and valued." – Peter Powell, CIO, La Trobe University*

### Digitisation of campuses to drive efficiencies and improve utilisation

Trends prior to COVID-19		Accelerant effect of COVID-19		
1	Space utilisation monitoring to drive better planning and use of spaces	Investment in smart buildings to drive energy efficiencies through automation	Demand for new digital services including booking of spaces and triangulating people's movements around campus for contact tracing	Flexible remote working arrangements and requisite investment in policies / systems
2	Automating recording of student attendance using WiFi beacons			
3	Focus on operational efficiencies including integration between digital platforms and building management systems (e.g. heating and cooling driven by occupancy)			
4	Predictive maintenance of facilities for using digital tools			

*"The way we are going to use our campuses will be much different and we will want to get much better utilisation. Universities have a lot of real estate and we will need to think very differently about how we optimise these assets." – Jonathan Churchill, Chief Digital Officer, James Cook University*



# Driving operational efficiencies in IT

	Trends prior to COVID-19	Accelerant effect of COVID-19
1	Major focus on adding functionality to core university systems (student management, learning management and building management) to meet demand	<b>Imperative to take complexity and cost out of IT management as CIOs are asked to do more with less, primarily through automation</b>
2	Automation of IT functions particularly in relation to the network where rapid configurability has been enabled by artificial intelligence	
3	Major upgrades to campus connectivity including WiFi to support students' education and non-education requirements and improve the resilience of critical systems	

*"I'm sure there will be proportionally more spending on digital than physical real estate, but overall as an institution we will likely have a smaller footprint, be more frugal and more focused" – Jonathan Churchill, Chief Digital Officer, James Cook University*



# Looking ahead to the recovery phase



The recovery phase from COVID-19 isn't uniform across Australia and is unlikely to be linear.

Some Australian states will be delivering on campus learning while others could be largely restricted to online for some time.

Despite this, COVID-19 has created an even greater investment case for technology to underpin a blended learning and administrative operating model.

The dual imperatives are:

- Driving cost savings and efficiencies in relation to existing services, recognising that the economics of education are radically different.
- Genuine digital transformation to accelerate recovery and expand services to meet the future needs of students, researchers, staff and industry.

## The building blocks of digital transformation

Digital transformation must be needs-driven. Several CIOs have spoken about the starting point being a detailed needs analysis of the learner.

The skill is in interpreting student feedback and projecting into the future, given no one really knows what our economy and society will look like.

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*"COVID-19 has acted like an accelerant for shifts that were already happening. It's just happened much faster than it might have otherwise. As an institution we have been really focused on the role of technology in terms of the campus and teaching, which has helped us in our response and will certainly assist in the recovery." – Ian Callahan, Chief Operating Officer, Curtin University*

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The commercial reality is that needs must be prioritised and not all institutions can or should offer the full range of digital services. The number one priority for most universities from a technology perspective is to get the foundations in place that will enable a university or TAFE to react, adapt and gain competitive advantage in the future. These include:

### A robust and resilient network layer including network services

Education institutions have moved well beyond needing to enable voice and video services. The demands on education and training networks are driven by the need for a true unified communications environment that supports students and staff to do what they need to do regardless of the technology platform.

Networks and related services have become an even more critical focal point for institutions preparing for a future that is almost certainly going to be blended from both a learning and working perspective. Much of the innovation related to networks is focused on a few specific technologies:





- **Software-defined network (SDN):** The development of software defined networks is one of the single biggest technology innovations related to connectivity infrastructure in recent years. SDN allows automation and configuration at the software layer of the network and offers several advantages, including:
  - On-demand network bandwidth with flexible charging to respond faster to unpredictable changing conditions.
  - Smart, predictive and pre-emptive control. Services can be programmed, changed and provisioned on demand.

These changes in demand are forecasted to become even more acute in the recovery phase from COVID-19 and will mean that universities and TAFEs can respond much more quickly and save costs when demand eases.

Traditionally, managing dynamic changes to networks have almost been impossible due to the numerous manual interactions required. SDN automation platforms enable institutes to visualise, manage and change their network services (ratcheting up and down) in response to demand.

Through single online interfaces and flexible contracts, institutes will be able to design their network to flex based on commercial and performance thresholds. They will be able to move from a static, labour-intensive network, to a network that intelligently flows and adapts to meet growing digital demands of students, academics, researchers and staff.

Digital transformation recovery plans across institutes will require highly agile networks that can cater for unforeseen demand, rapidly changing student engagement activities and the creation of new business models.

Institutes that leverage SDN technologies be able to deliver a simpler and improved customer and student experience. By enabling multiple SDN functions on the network, institutes will be able to benefit greatly from complementary services, including integration and orchestration with Edge Software-defined Wide Area Network (SD-WAN) solutions, network-based services, security services, cloud services, management and Analytics capabilities which will all form part of key components in University and TAFE digital transformation plans.



$$[a+x] < \left(x + \frac{1}{h}\right)_{x+a}$$


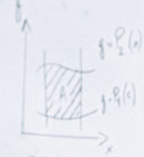
$$\int \pi \left(\frac{r}{h}x\right)^2 dx = \int \frac{\pi r^2}{h^2} x^2 dx$$

$$+ \frac{5}{x} + \frac{1}{x^2} = \cdot P_i(2c)$$

$$+ C (a+x)^n = \sum_{n=0}^{\infty}$$

$$= \int \pi \left(\frac{r}{h}x\right)^2 dx = [a+x]$$

$$+ \frac{5}{x} + \frac{1}{x^2}$$

$$y = f(x) = y_2(x)$$

$$y = \frac{a^2 - b^2}{x^2 - a^2} \left( \frac{R_2 - R_1}{a - b} \right)$$

$$\int (dx) = ac - \frac{a \cdot b}{b - a} \ln \left( \frac{a+x}{a-x} \right)$$

$$\int_0^a \frac{a \cdot b - (b^2)}{b(a+x)} dx = \int_0^a \frac{b(a-x)}{b(a+x)} \left( \frac{a+b}{a-x} \right)$$



**WiFi6:** This has become the new standard for technology-enabled education and training institutes. WiFi6 provides a range of advantages including superior location tracking – increasingly important for asset monitoring and utilisation – and capacity to deliver connectivity when and where it’s needed

**5G:** While the technology itself is reasonably nascent the interest in 5G is intense. Most Australian universities and TAFEs will have access to 5G within the coming 12 months and planning is underway to identify which applications and services can be placed at the edge of the network; one of the main advantages of 5G.

Locating applications and services at the edge enables greater control and visibility, reduced costs and increased capacity for innovation. An example of innovation is the development of AWS’ Wavelength technology which delivers ultra-low latency applications for 5G devices and enables users to request access to specific wavelength zone to optimise performance at a local level.

There is a lot of focus among university and TAFE CIOs on what a next generation architecture looks like for 5G; one that is cloud native, software-defined and high availability.

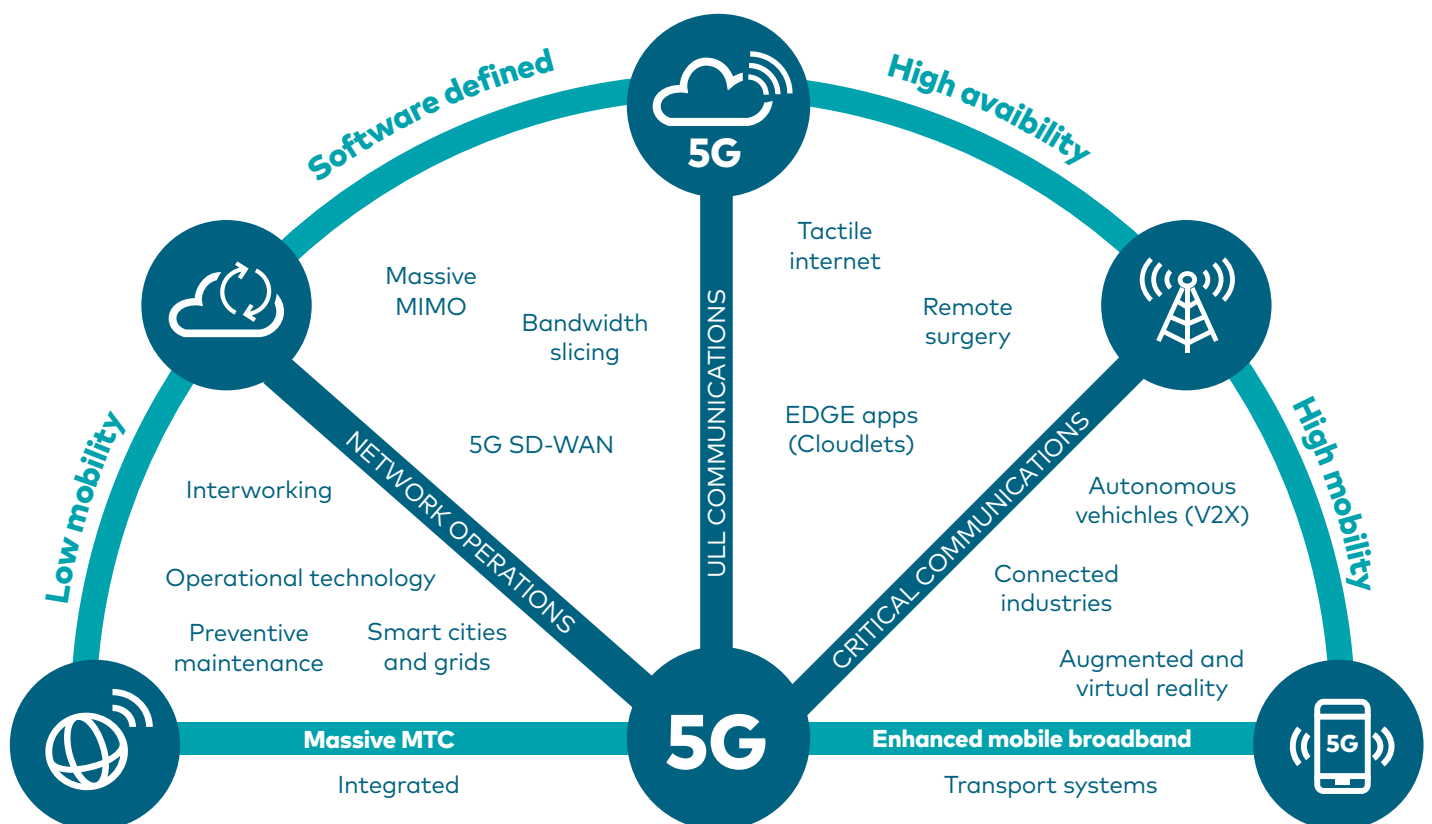
A priority should now be placed on how institutes can prepare their campuses for a future 5G environment where students will have access to:

- High speed connectivity everywhere
- Can learn as they go, on-campus
- On the way to and from campus and in the home
- Remote locations enabled by new 5G connected tablets, laptops and hand-held devices.

Preparing a 5G foundation will enable a platform for a digitised campus that will provide immersive learning experiences, application and Edge Artificial Intelligence (AI) based facility management, automated processes to drive greater institutional efficiency and zero touch services.

## 5G: Next-Gen Architecture

Cloud native





## Secure education and training networks

COVID-19 has heightened concerns about security on several levels, including:

- The move to remote access for learning and working has increased load on legacy infrastructure and given universities and TAFEs less margin for error with overloaded systems.
- Students, staff and partners are being required to access proprietary systems and data from home networks which were not configured or dimensioned for this purpose. This has also served to increase the number of ways in for cyber attackers (i.e. via consumer grade and private networks in the home).
- Interest in contact tracing and real-time occupancy information is forcing institutions to collect non-anonymised data which therefore makes the data they hold more valuable to potential attackers.
- The range of applications and use cases is increasing daily, including applications related to safe return to campus. Many of these applications are IoT-enabled which broadens the attack surface.
- Business processes have had to change quickly and there is a fear that vulnerabilities have been created in the quest to create short-term workarounds.
- Concerns about university staff being conduits to foreign government interference.

Given the growing complexity and increased risks involved in securing systems and applications many universities and TAFEs are seeking to fast track automation efforts and move away from point solutions to fully managed security environments.

This not only provides greater visibility and control it also allows institutions to dynamically adjust their security posture as circumstances change and manage security at the network, device and application layer.

As institutes become increasingly digitised, data security is now an immediate priority. The capacity to protect data will require early and ongoing vigilance for security challenges arising from existing and new technologies as well as user behaviours that might create vulnerabilities in secure systems.

As institutes drive towards more adaptable models of remote learning and employee work behaviours to support customer and student engagement levels, this goal will increasingly be supported by the integration and analysis of multiple sources of data.

As new forms of data are integrated into the way in which institutes communicate, new vulnerabilities will arise, and risk perceptions are likely to change. Ongoing risk evaluation is therefore a critical recommendation for implementing new technologies across institutes.

### Choice and reliability in the integration of applications, including collaboration

Increased operational complexity and the accelerating pace of change inside the technology environment is creating major headaches for CIOs.

In many cases it's not possible for institutions to lock in on a single standard or vendor, creating integration challenges. Collaboration is a good example where institutions must manage a range of platforms including Microsoft Teams, Cisco WebEx and Zoom and ensure they integrate effectively.

This same situation is playing out in a range of applications including cloud services which are not only increasingly hybrid in nature, but also multi-vendor.

This is forecast to increase in importance as the market moves towards infrastructure/software as a service, cloud-based enterprise applications, managed contact centre and cloud-based video conferencing platforms.

Whilst universities and TAFEs have been well progressed in embracing the benefits of collaborative technology, there is now an increased awareness in higher education that collaborative technology could improve two fundamental areas. That is to give students unlimited access to educational resources, no matter where they are, and improve administrative collaboration.

Cloud collaboration technologies can help connect teams of faculty and students across the continent and around the globe helping them to work together in a seamless and secure manner sharing each other's expertise and perspective.

The ability to implement new learning models will drive continuity of learning and flawless learning experiences and engage virtual experts to enrich and expand learning as well as deliver distance learning to reach new kinds of students both on and off campus.

In a similar way, embedding communications and collaboration into the business fabric of institutions can help to accelerate achievement of their strategic goals and rapidly develop new business models to help stabilise financial pressure and drive cross-departmental collaboration to improve decision making and continuity of learning and operations.

There is a growing expectation that technology will be more adaptive and immersive. Cognitive collaboration delivers powerful AI and machine learning capabilities like people insights, facial recognition, real-time transcription and in meeting digital assistants. Cognitive collaboration is transforming the virtual team experience.

## More than ever, education and training institutions are going to rely on partners they can trust, and Optus has a major role to play

At a time of acute change, no institution will be able to specify all future requirements with absolute confidence. Institutions will need to respond quickly as the situation changes (as it inevitably will) and strong partnerships with industry, including suppliers, are going to be even more important to navigate the recovery.

Optus sees itself as having three primary roles in assisting with the recovery:

- 1. Delivering robust and resilient connectivity:** Optus' history is in traditional networks but technology developments in areas like 5G, IoT, SDN and WiFi-6 have created profound changes and opportunities. The expectation is that networks are not necessarily built but rather something it will procure as a service (along with an array of complimentary network services). The need for large capital projects to

fund networks and cyclical network refresh activities is therefore changing and Optus has had to adapt by investing in its underlying network infrastructure assets ahead of demand (particularly in the case of an emerging technology such as 5G) and develop a host of smart and intuitive network services, such as Liquid Infrastructure, to drive a multiplier effect on customer value.

- 2. Providing integrated service management:** Optus' entire model is driven by the need to create an end-to-end service that incorporates network connectivity and services, self-management and automation, online portals and reporting, service desks and support, asset management and professional services. Institutions are increasingly seeking to remove complexity from the management and delivery of IT including managing hand-offs between suppliers, whilst driving maximum cost savings and efficiency and streamlining integration.

- 3. Deep subject matter expertise in education and a track record of genuine partnership:** As a Network and service provider, Optus recognises that its capacity to deliver value quickly and design solutions that work requires specialist expertise. This is particularly true in education, which has complex and varied requirements spanning teaching, research and administration. Optus' expertise has been built on successful deployments in the sector with large and small universities, TAFE systems and government agencies in partnership with a range of leading technology vendors. Optus also has significant partnerships in place, with the sector recognising that Optus' own future and relevance is dependent on access to the research expertise, innovative capacity and skilled graduates produced by the sector. These partnerships have helped Optus better understand the core drivers of education institutions and ensure that our partners potentially benefit in ways beyond access to technology and services.

## Conclusion and taking the conversation further

At Optus Enterprise, we're passionate about creating compelling customer and employee experiences, and bringing to life the spaces and things that make this possible.

It's about empowering our customers to thrive in an age of unprecedented digital disruption.

It's why Optus Enterprise is trusted by thousands of Australian organisations who value a partner who understands the full breadth of managed technology and services – from solutions like 5G to system integration, managed security, consulting and professional services.

Backed by the international strength of the Singtel Group and the power of our smart and secure networks, regional strength and local expertise, Optus Enterprise brings together best-of-breed partners to create the solution that's right for your business.

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