

Digital Strategy 2018--2020

Vision

*A leading research university offering
connected experiences that delight people and
empower them to achieve the amazing*

Executive Summary

The University must become a digital business leader to achieve the future depicted by the University Strategic Plan. Digital business leadership in research, learning, and teaching requires the University to be data-driven and customer-experience focused. Transformative and lasting cultural and behavioural changes must occur beyond technology delivery to effect major sustained performance improvement.

This Digital Strategy describes the vision, principles, and capabilities the University needs to flourish within and adapt to a rapidly-changing environment. This Digital Strategy replaces the former IT Strategic Plan, and signals:

- technology and business are now inextricably intertwined and interdependent
- technology investments without clear business outcomes are now difficult to justify

The principles underpinning this strategy drive digital transformation and provide a decision-making framework for service design and investment prioritisation. These principles emphasise the crucial importance of the University placing customer experience at the centre of its decision-making:

- Customer focus is paramount
- The University knows and recognises people as individuals
- Personalisation enriches individual, team, and community experiences
- Single digital identity is maintained across interactions with the University
- Zero compromise in privacy or confidentiality commitments
- Decision-making is evidence-based
- New and emerging technologies create transformative opportunities
- The University will recognise its place in the digital world its customers occupy
- University content is enhanced by creation, discovery, sharing, and preservation practices

The University is not replacing physical delivery with digital delivery. It is creating a suite of digital services to complement its built environment and physical service delivery to create compelling and valued experiences for all constituents. Students, staff, teachers, researchers, and alumni will enjoy greater flexibility and broader choices of when, where, and how they engage with University services.

This Digital Strategy will be updated continuously as the operating environment changes and as we learn together as a community of digital practitioners the extent to which transformation will empower all constituents to achieve the amazing.

Context

The University of Auckland

The University of Auckland is a leading research university ranked in the top one percent of universities worldwide. It faces competition for research income, for the best domestic and international students, and to attract and retain high-calibre researchers, teachers, and staff.

This competitive environment is cast against twin pressures of constrained funding and of meeting the consumer-experience expectations of contemporary University constituents. In response, the University is seeking to improve the experiences it offers, increase its revenue, and reduce its costs.

Higher Education

Universities face significant challenges adapting to digital business — their long-run nature, powerful inertia, and political cultures make changing their business and operating models difficult. Analysis suggests higher education is poised for a digital disruption that will be “long-fuse and big-bang”.

Technology drivers affecting higher education in 2017 emphasise three foundational concerns, all of which are core to this Digital Strategy:

- *Digital Strategy*, articulating the use of technology to better understand and fulfil customer needs and provide customers with desirable interactions and cohesive experiences
- *Analytics*, reaching beyond the foundations of traditional business intelligence and reporting to create meaningful insights from a wide range of previously-untapped data sources
- *Cybersecurity*, ensuring universities and their constituents are provided with a safe and secure environment and protected by effective defences that include people, culture, and technology

The University of Auckland Experience

To provide students a distinctive Auckland Experience, the University is expanding and modernising its built environment by creating new and improved learning spaces, retail and recreational amenities, and high-quality accommodation. The University is also updating its approach to research support, examining how it conducts learning and teaching, and focusing on improving student outcomes.

The University is not replacing physical delivery with digital delivery. Rather, the University is creating a suite of digital services that augment and complement its rich physicality. These digital services are linked to the built environment of the University, and integrated with customer-service physical spaces.

Principles

Principles drive transformation and assist with the communication and governance of strategic change. These principles operate together and contribute equally to guide decision-making in the areas of prioritisation, investment, and solution-selection.

- *Customer focus is paramount*
A customer-focused approach places individual needs and experiences at the centre of service design. The University will form authentic partnerships with its customers to co-design valued, accessible, and inclusive experiences.
- *The University knows and recognises people as individuals*
The University is a humanistic organisation that listens to, communicates with, remembers, and respects people as unique individuals.
- *Personalisation enriches individual, team, and community experiences*
All customers can receive compelling personalised experiences that adapt to best suit individual needs and preferences. People are supported and enabled to find and form digital communities that complement and extend their physical communities.
- *Single digital identity is maintained across interactions with the University*
For convenience and security, a single source of truth for digital identity is maintained, from which consistent information and services are offered to people and to devices.
- *Zero compromise in privacy or confidentiality commitments*
The highest ethical standards and cybersecurity best practices will be maintained in handling, curating, and analysing information about people. The University will demonstrate respect for all of its customers and provide a safe and secure digital environment.
- *Decision-making is evidence-based*
Decisions will be based upon evidence gathered continuously from a range of sources, including voice of customer and business metrics.
- *New and emerging technologies create transformative opportunities*
The University will adopt new and emerging technologies such as artificial intelligence and predictive analytics to create compelling customer experiences.
- *The University will recognise its place in the digital world its customers occupy*
The University will position its own digital services to integrate with services its customers use from the global digital ecosystem.
- *University content is enhanced by creation, discovery, sharing, and preservation practices*
Digital techniques will advance the practices and value of content management, sharing, and curation for the University and for all New Zealanders, promoting openness without breaching confidentiality or copyright restrictions.

University Communities

Communities and the Digital Strategy

The University of Auckland is a diverse organisation comprised of overlapping communities and collectives: many staff are also students or alumni, and most academic staff are concurrently researchers and teachers. The narratives below illustrate how implementation of the Digital Strategy can empower and enable members of the primary University customer communities.

Researchers

Recognising that computational tools and technologies play increasingly important roles in scholarship and research of all kinds, the University must enable and support its researchers to better utilise these technologies.

The University will provide researchers with a suite of useful technical, collaboration, and advisory services tailored to meet general and specific research and collaboration needs. The services researchers need will be easy to discover, well-described, enabled for use by collaborators from inside and outside the University, and offered with personalised, relevant, and timely assistance.

Researchers will also have access to a comprehensive set of sustainable services to manage, archive, share, and publish research data created by the University. Digital techniques will support researchers to publish research outputs with open access and with adherence to FAIR data principles¹, wherever possible.

A research advantage will be established through implementation of the Research IT Enablement Strategy, and through related digital initiatives:

- Research analytics and visualisation will be utilised to foster discovery, to increase the impact and communication of research, and to drive research investment and strategy
- Research management processes will be digitalised and automated in conjunction with implementation of the Improving Research Support Programme
- Researchers will be enabled to share and collaborate easily and securely with partners throughout the country and around the world
- Research workflow and online notebook technologies will be provided to help promote connected, open, repeatable, and verifiable research

Students

Future students will establish continuous relationships with the University as a hub for lifelong learning, beginning at high school and continuing into employment. Through enduring relationships, students will understand the learning opportunities available to them and how they enable future careers and development.

Students will be supported by advisors as they are guided through end-to-end journeys that traverse administrative and academic services, and will collaborate with peers and staff easily and safely, and

¹ FAIR is "Findable, Accessible, Interoperable, and Reusable": <https://www.force11.org/group/fairgroup/fairprinciples>

enjoy improved social connectedness. Student achievements are recognised at an individual level, enabling potential candidates for further postgraduate studies or employment to be identified.

New experiences will be made possible by digitalisation, and implementing this Digital Strategy will support the evolution detailed by the Learning and Teaching Plan. The University will trial, measure, and establish non-traditional course and programme structures based upon microcredentials and nanodegrees. Initially, these initiatives may be targeted to lifelong learning, rather than school-leavers and undergraduates.

Transformation of the University of Auckland student experience will be driven by:

- Supporting the implementation of a student journey that enables students to track their interactions with the University and their academic progress
- Assessing and implementing, in conjunction with the Student Digital Strategy, the ideas and recommendations of the Doctoral Service Delivery Strategic Review
- Reviewing the solutions and processes for Customer Relationship Management used by the University, and understanding how they relate to student analytics and to the student journey
- Using student analytics continuously to enable and validate a holistic understanding of the student experience, and to provide an input to the personalisation of student experience
- Experimenting with and understanding the pedagogical affordance of techniques such as adaptive learning and artificial intelligence

Teachers

The digital platform for learning and teaching enables enhanced pedagogy, and provides a consistent learning environment and personalised experience for teachers. Teachers, including supervisors of research students, are supported and empowered to experiment and innovate with flexible discipline-based pedagogical practice.

Learning and teaching will be supported by digitalised processes and automation to enhance student engagement and the quality of feedback, and to reduce manual administrative effort and paper-based readings and assessments. Teachers can access course-related software remotely from their own devices, with media content for lectures and events being created and shared easily to support flipped classrooms and online courses.

Digitally-enabled learning-spaces will be optimised to meet diverse needs, including real-time interaction and collaboration. New technologies such as augmented reality will be made available to staff to increase digital capabilities in teaching.

Using analytics and digital tools, teachers will recognise the potential individual students have, and provide accurate advice on future studies and careers to prepare them for success. A future digital platform will be composed of integrated learning and teaching solutions enabled with learning analytics for individual students, classes, courses, and the institution.

Globally, digital business is disrupting many professional practices. Techniques such as artificial intelligence are changing the nature of work profoundly. The University will recognise and respond to these technology-driven changes in the design and delivery of its educational curriculum.

A modern, scalable, and flexible pedagogical environment will be established and enhanced by:

- Ongoing development of the Learning Management System, Lecture Theatre Recording, and physical learning spaces driven by teacher experience and pedagogical needs
- Continuous implementation of the graduate profile to further development of skills and capabilities expected of students in all disciplines
- Software-delivery services, computing-laboratory access, and high-performance computing resources that meet personalised learning and teaching requirements
- Learning analytics that optimise the configuration and delivery of digital services for learning and teaching, and inform learning design, provide digital assessment, and enhance early, regular feedback to students and teachers
- Foundations of a next-generation digital learning environment will be commissioned, supported by automated student-concierge and personalised advisory services

Staff

The community of staff includes everybody employed by the University, irrespective of whether they hold a professional or an academic position. All staff will be competent and confident in finding and using digital services, and services will adapt to provide personalised experiences by considering factors such as an employee's position and personal preferences.

Employee experience will be valued and considered deliberately in designing the services and systems staff use and consume. Customer journeys will be designed for staff and provide cohesive, end-to-end experiences. Increased use of online services will reduce paper-based forms and manual approvals, increasing fulfilment speed across all business processes.

Within the next few years, all staff will require digital skills and capabilities more focused upon collaboration, information management, creativity, critical analysis, and adaptive thinking. By 2020, over one-third of skills considered important in today's workforce will have changed. For the most part, these changes will augment, not replace, the capabilities staff possess today. Human Resources will play an increased role in preparing and supporting staff for success: achieving this will require organisational learning and development to provide new content and to embrace new delivery styles. Partnership with Human Resources in all digitalisation projects is now essential to understand and prepare the staff learning and development resources needed for those projects to deliver full potential benefit.

The advent of digital techniques such as artificial intelligence, smart machines, and robotic process automation are driving profound changes in the future of work. As the University begins to adapt such digital techniques, early and sustained partnership with Human Resources to model and understand potential effects on staff roles is crucial. Human Resources will play a leadership role in understanding and managing the effects of change on people and in guiding and supporting staff through change.

The ongoing Service Effectiveness Programme will continue improving the quality, efficiency, and effectiveness of IT services, and of other staff services mediated through the Staff Service Centre and Shared Transaction Centre.

Initiatives related to advancing the digital journey for staff include:

- Measuring and identifying digital skills and capability gaps, and designing effective learning and development experiences to address them
- Modernising and transforming experience platforms for delivering learning and development
- Improving skills and capabilities through benefits of the Recruitment Technologies project
- Continuing to implement and improve digitalised forms, streamlined approvals, and provisioning processes for staff

Alumni and External Partners

The Digital Strategy enables the University to better fulfil its role as critic and conscience of society, and to understand and fulfil the needs of alumni and friends, donors and contributors, parents and whānau, industry and government, peer organisations, key communities, and service-providers from the wider digital ecosystem.

The University establishes lifelong, reciprocal relationships with alumni that connect them to the University and to one another. Adopting a customer-focused approach supported by analytics enables alumni segments to be identified, and communications, engagement, and relationships to be tailored appropriately to the needs and desires of each member. The Digital Strategy builds upon existing initiatives to create detailed insights into alumni relationships that enable the University to better understand, recognise, and strengthen alumni engagement.

Effective strategic engagement with key organisations from central and local government, peer organisations, and industry partners is crucial to building and sustaining the global outlook and international standing of the University. Strong opportunities exist to increase the understanding, visibility, and effectiveness of strategic engagement using analytics, virtual personal assistants, and artificial intelligence. These opportunities include discovery and assessment of strategic-partner relationships, tailoring invitations to key events, and better managing the representativeness and workload of senior leadership at events.

Some initiatives of particular relevance to alumni and external partners include:

- Identifying and understanding opportunities to improve the visibility and coordination of key strategic engagements using digital-business techniques
- Delivering the Alumni Relations and Development *Integrated Digital Services* Programme
- Engaging with the strategic review of *Customer Relationship Management*, particularly from the Strategic Engagement perspective
- Coordinating with externally-facing aspects of the *Improving Research Support* Programme

Foundations for Success

Creating an Environment for Success

This Digital Strategy describes the vision, principles, and capabilities the University needs to flourish in a rapidly-changing environment. The Digital Strategy presents a coordinated approach to transforming service experiences for all University constituents, but does not prescribe strategy for individual business domains such as Research or Learning and Teaching. The foundations for success are outlined below.

Digital Skills and Capabilities

People require adequate digital skills and capabilities to thrive in the modern world effectively and safely, and the University has a responsibility to foster a climate of digital fluency. These new skills neither replace nor render irrelevant the skills and knowledge people possess today. Instead, they augment and complement existing thinking and practice to enable new opportunities and new delivery models.

Adopting a digital capabilities framework will enable the University to determine the needs of its customers, establish training programmes, and design experiences that grow communities and prepare them to become the researchers and leaders of tomorrow.

Equity, both in terms of equitable access to technology and equitable opportunities to grow digital skills and capabilities, must be ensured. Adopting digital techniques that personalise experiences and provide greater flexibility to all constituents will assist in providing equitable access and opportunity. Customer-focused design will consider deliberately the accessibility and inclusiveness of experiences created by University processes, systems, and services.

Digital Ethics

At the core of digital business is the collection, preparation, and assessment of widely-varied and richly-detailed transactional data about people, services, things, and the interactions between them. These data, and the analytical practices applied to them, are essential for an organisation to create valuable customer insights and viable predictive models of concerns such as student success and employee engagement, and therefore to provide its customers with usefully-personalised services and nudge-based interventions.

Basing admission, selection, promotion, and other decisions upon the predictive models and analytics that operate upon these data carries significant ethical responsibility to:

- avoid inbuilt biases in predictive models
- ensure appropriate access to and use of data
- protect the integrity and safety of the data

To substantiate the ethical grounding of the Digital Strategy principle *"Zero compromise in privacy or confidentiality commitments"*, the University must define its approach, governance, and guidelines for the collection and use of rich transactional data, and to the creation and use of the predictive models and artificial-intelligence capabilities that use them.

Culture and Empowerment

Organisations characterised as digital leaders are nimble, comfortable taking calculated risks, have cultures that empower and engage their staff, and maintain ruthless focus on customer experience — such organisations exhibit high *Digital Quotient*. For the Digital Strategy to be successful, the University must raise its Digital Quotient by transforming, at all levels its approach to:

- Decision-making
- Empowering staff by delegating ownership of processes and solutions
- Experimentation and innovation
- Removing silos in order to focus on end-to-end customer journeys
- Accepting manageable risk

Partnering

Creating end-to-end customer journeys demands holistic, rather than silo-based, approaches to service design, requiring new partnering models that span traditional organisational boundaries. Skilled teams aligned to business capabilities will assist faculties and service divisions to gain maximum benefit from central services to form closer relationships with their customers, using methodologies such as roadmapping, design thinking, and Agile delivery.

Opportunities to partner with the University's researchers and teachers will be sought proactively, and will occur through co-design activities and direct consultation.

Partnerships with external organisations, including government, industry, and providers of services in the wider digital ecosystem, will be established to ensure the University maintains a contemporary, inclusive, outward-looking approach.

Application Portfolio Management

A large applications fleet supports the business operations of the University. There is much diversity in the fleet, which includes decades-old enterprise applications, modern software-as-a-service solutions, and a broad collection of homegrown solutions. New factors now determine application-lifecycle decisions, which must consider customer-experience, longer-term, and wider-context benefits than in the past. The applications-management approach will include:

- Business Capability Mapping to identify and categorise applications
- Strategic Application Roadmaps for each business-capability domain
- Planning for migration of older enterprise applications to new cloud solutions
- Implementation of the Applications Service Delivery Model

Strategy and Governance

The Digital Strategy is the primary strategic artefact for technology direction-setting and technology decision-making at the University. Implementation of the Digital Strategy will be governed and monitored actively through existing structures. Implementation governance will be led by the Digital Strategy & Architecture directorate, with regular progress reporting to the IT Advisory Committee and made available to related groups.

Digital Investment Principles

Future investment decisions must be based upon different criteria than those used in the past, while still emphasising key factors such as efficiency and effectiveness. The most valuable investments contribute directly to the performance, character, and capability of the University in ways that are reflected by sustaining or improving the University's global ranking. The digital investment principles describe the decision-making criteria of the Digital Strategy:

- *Customer Focus*: The University will prioritise investments that create and improve customer-facing services and experiences.
- *Compelling Benefits*: The University will prioritise investments that deliver genuinely-compelling benefit-to-cost ratios over those promising lower benefit-to-cost ratios.
- *Increasing Revenue*: Increasing revenue is valuable to the University.
- *Decreasing Cost*: Decreasing cost is of value to the University.
- *Early Value*: Investments that deliver early value, and continue to deliver value incrementally, will be favoured.
- *OPEX/CAPEX*: As the University increases its consumption of on-demand services, the proportion of operational expenditure will increase. Investments in new capability will need operational expenditure, requiring adjustments to the University's base financial model.
- *Managed Risk*: Accepting manageable risk, such as delaying scheduled hardware-refresh cycles, will become common.

Underpinning Digital Capabilities

Capabilities and the Digital Strategy

Digital Capabilities and Technology Delivery

The University must establish digital capabilities underpinned by robust technology services. These digital capabilities create value and opportunities that can benefit all customer communities. The investment required to strengthen or create the digital capabilities must be aligned to the vision and principles of this Digital Strategy. The digital capabilities are:

- Customer Experience Design
- Cloud Enablement
- Awesome Delivery
- People and Teams
- Value Management
- Accessible, Integrated Digital University
- Advanced Analytics Practice
- Artificial Intelligence

These initiatives and actions linked to each digital capability have been identified from sources including the Strategic Portfolio, the IT Service Area Strategies, and relevant service-division strategies and plans.

Customer Experience Design

To become a customer-focused organisation, the University requires a customer experience design capability. This capability consists of a design-thinking practice guided by meaningful analytics and by continuously-updated customer-journey models, and facilitates co-design processes in which customers participate directly. To achieve this requires the University to:

- Provide a rich, immersive campus that integrates digital and physical environments seamlessly to shift service delivery, learning, and research to new levels
- Transform its digital services so all constituents use world-class platforms naturally and without hindrance
- Expand digital skills and tools to become enabling, sustainable, and prepared for future needs
- Focus on true mobility and access for all customers, ensuring all digital services are accessible, inclusive, robust, and secure in all aspects of their design
- Use reliable, rich data as the basis for robust decision-making for all digital design and delivery
- Enable information to be discoverable throughout the digital environment

Cloud Enablement

The University has an overall Cloud Strategy, has adopted some cloud software solutions, and has some internal cloud-like platforms. The University needs the appropriate people, process, and technology capabilities to support the expected growth in the delivery of business functionality through cloud services. This change will not happen overnight, but will follow a measured, pragmatic sequence.

Initially, establishing the ability to integrate quickly and cost-effectively with cloud services is essential to becoming customer-focused and digitally-enabled. Cloud capabilities will be enabled by:

- Establishing a mature and sustainable cloud services environment for the University
- Investing in cloud computing skills for the technology workforce
- Implementing delivery and consumption patterns for cloud computing
- Defining governance models and policies for software-as-a-service agreements

Awesome Delivery

To become effective, substantial change is required to the culture and processes for technical service delivery. Governance and delivery will be realigned towards Agile and DevOps, matched by business commitment to defining needs and engaging in the development process. To achieve this:

- Implement the Application Service Delivery Model
- Understand business drivers, and ensure delivery capability and process support future needs

- Build a DevOps capability using common toolchains and processes across development, delivery, and operations
- Transition to platforms that can be managed with software-defined automation
- Consolidate platform services and apply them across University applications
- Sustain a core capability to support applications while transitioning to new platforms

People and Teams

The goal of *People and Teams* is assembling a technical workforce that is the right size and shape, has the right mix of skills, is organised into the right places, and is available at the right price to deliver strategy successfully.

Building this capability will invest in people and inform the creation of long-running teams equipped and empowered with contemporary tools for delivery. Initiatives to realise these goals include:

- Understanding the workforce and skills requirements needed in 2020 using skills-characterisation and gap-analysis techniques
- Describing and implementing training and recruitment plans needed to establish the people and teams required
- Measuring and adapting continuously in conjunction with Resource Capacity Management

Value Management

An IT Performance practice will be established, seeking cost-reduction opportunities and increases in the business value of the overall service portfolio. This will include evidence gathering, removing low-value activities and services, and ensuring service benefits are fully realised through:

- Defining a service taxonomy, new roles and responsibilities
- Enforcing consistent governance and organisational change management
- Establishing an analytics and reporting practice for technology service-delivery that enables the measurement of benefits and value
- Implementing automated and transparent service costing

Accessible, Integrated Digital University

Adopting a service-centric architecture for delivering all integration and bespoke development activities undertaken within the University will provide every constituent with ready access to all of the data and functionality they need and are entitled to access from University systems and services, enabling a rich ecosystem for innovation.

Pervasive data integration across processes and systems is a crucial underpinning for the creation of cohesive and personalised customer experiences. The patterns and processes for delivering integration services to the University will continue to improve and standardise as benefits from the new middleware platforms are delivered.

Furthering the accessible, integrated digital University requires activities including:

- Evolving the University API and integration capabilities to meet changing needs, including further adoption of software-as-a-service solutions
- Creating and publishing a discoverable library of solution patterns for all technology practitioners to use and to reference as their architecture runway
- Adopting a modern, standards-based framework for building and delivering application solutions
- Standardising tools and optimising development, build, test, and release processes to improve time-to-value and quality for projects
- Using and reusing existing and delivered application functionality as a priority

Advanced Analytics Practice

An advanced analytics practice is required for the University to understand and serve its customers, for evidence-based decision-making, service personalisation, and value management. Access to new data sources such as social media streams and machine-readable log files is needed for advanced analytics. Establishing an advanced analytics capability within the University requires:

- Integrating with and consuming non-traditional data sources and connecting them with analytics and reporting services to support the formation of powerful predictive models
- Ensuring University information becomes more discoverable, more accessible, and more understandable for business users, and adjusting data-governance practices accordingly
- Raising the level of reporting and analytical capabilities across the University
- Providing analytical and reporting tools and solutions with the best return on investment

Artificial Intelligence

The widespread involvement of artificial intelligence in business processes and service delivery is a primary feature of digital business. The University has begun proof-of-concept use of artificial intelligence tools. As deployment of these tools becomes widespread, the University will require access to a sustainable and skilled artificial-intelligence capability. Progressing to the next level requires:

- Establishing an Artificial Intelligence capability in the technology-delivery teams
- Acquiring the skills needed to operate and exploit Artificial Intelligence effectively
- Experimenting with and measuring the value and effectiveness of Artificial Intelligence solution components, and understanding the effect they have upon customer experience

Underpinning Technology Services

The Technology Organisation

The services and capabilities provided by the Central IT organisation are crucial to the functioning of the University. A traditional technology-delivery approach has served the University well, but now the arrangement and delivery of technology services must be transformed to align with and enable implementation of the Digital Strategy.

Connected with and servicing University communities are the faculties and service divisions that use and provide digital systems, processes, and information to deliver the business capabilities that run the University. Through the initiatives driven by the IT Service Area Strategies, the overall digital ecosystem will modernise to become:

- Customer-focused, enabling students and staff to discover and request services easily
- Automated, enabling staff to be more productive and improving student experience
- Modern, enabling access from personal devices at any time, from anywhere, with any device
- Informative, providing key information and analytics to staff and students in a timely fashion
- Integrated, minimising manual maintenance of common data across systems
- Easy to augment, enabling new capabilities to integrate easily with the University ecosystem

Performant and Resilient Services

A trusted platform of core technology services is a prerequisite for the University to offer dependable services that support cohesive customer experiences and provide a firm base upon which to innovate. The University will continue to invest in, improve, and enhance its core technology services, and will:

- Deliver business applications that perform reliably, securely, and efficiently
- Provide infrastructure services that are cost-effective, resilient, scalable, and meet research, learning and teaching, and administrative requirements ahead of demand
- Provide useful, clearly-defined technology services that are easy to discover and consume
- Take advantage of commercial infrastructure services when advantageous

Internet and Network

As a leading research university, and as a university consuming business solutions from the cloud, access to resilient, high-bandwidth, and cost-effective internet and network connectivity is crucial to every aspect of the University's mission. Significant partnerships have been created and sustained with network providers, cloud vendors, and solutions vendors. These partnerships will deepen as the University becomes increasingly digitalised. The approach will ensure supply and security by:

- Delivering internet and network services whose performance meets administrative, teaching, learning, and research requirements
- Providing scalable wireless access to meet user demands everywhere they require it

- Enabling cost-effective high-speed edge (to the desktop) connectivity, especially for research
- Supporting national initiatives in networking and high-performance computing (e.g., REANNZ, NeSI, and Tuakiri)

Identity and Access Management

Identity is an essential underpinning capability for any university, and the role of identity management is deepened in digital business, with emphasis on people-centric, personalised customer experiences, seamless access-management for services and resources, and increased opportunities for collaboration extending beyond the University. Next-generation identity-and-access-management services will:

- Develop existing identity and access management processes and capabilities to support digital business needs and transform customer experiences
- Deliver identity-lifecycle-management, authentication, and authorisation services that interoperate smoothly with on-demand services consumed from the cloud
- Provide non-traditional authentication and authorisation services that cater for mobile clients, programmatic access to University data and functionality, and the Internet of Things
- Introduce new identity-and-access-management processes and capabilities that enable the University to provide personalised digital services to all customers

Cybersecurity

The University's vision for digital transformation is supported by a mature Cybersecurity Strategy that aspires to provide a safe and secure computing environment for the University community and to preserve the confidentiality, integrity, and availability of information about the University and about University customers.

Implementing the Digital Strategy successfully depends upon having robust cybersecurity capabilities that ensure the University complies with applicable security standards and legislation, and ensures the University community has a good understanding and shared responsibility for the organisation's security posture. Initiatives contributing to these outcomes include:

- Implementing the Cybersecurity Strategy, and continuing to update it each year
- Building strategic partnerships to support a national and global Cybersecurity defence network
- Developing security capability in the Internet of Things, cloud, and mobile technologies
- Implementing a Security Policy Framework for the University
- Defining and communicating the enterprise security reference architecture and integrating its content with the policy framework

- Implementing a regular infrastructure-scanning programme and evolving the security-testing practice to better align with Agile methodologies
- Improving monitoring and alerting and expanding incident-detection capability with centralised logging

Foundation

The preparation of this Digital Strategy followed a lightweight design-thinking process that ran from June through December of 2017 and involved more than one-hundred-and-fifty people in a series of interviews, workshops, and review sessions. This process was very different from that of former IT strategies created at the University, and mirrors the core tenets of the Digital Strategy to place customers at the centre of decision-making through deliberate and open co-design and partnership.

The digital principles, investment statements, and digital capabilities of the Digital Strategy are crucial enablers for success of the IT Transformation Programme, IT Function Review, and the IT Services goal of becoming the top-rated higher-education digital-service provider in Australasia.

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