CAUDIT
Top Ten
2020
The most significant technology-related topics for higher education in Australia and New Zealand
The Council of Australasian University Directors of Information Technology (CAUDIT) is an incorporated Not For Profit Association with membership drawn from all universities in Australia and New Zealand, plus the nearby Asia Pacific region, as well as a number of major Australian research organisations and teaching organisations. Members are represented by the most senior IT person in their organisation – generally their Chief Information Officer, Chief Digital Officer or Director, IT.

CAUDIT’s purpose is to support each other in leading the application of digital capabilities to transform education and research.

Three key strategies provide the focus for CAUDIT’s activities:

• CONNECTING
• ENABLING and
• CHALLENGING our members.

CAUDIT provides networking opportunities, negotiates collective procurement agreements, provides professional development, undertakes benchmarking, and fosters collaboration through the sharing of thought leadership, experiences and best practice among its members.
Welcome to CAUDIT’s 2020 Top Ten

Information and communications technologies have enabled remarkable transformations in higher education and research.

Continuing to deepen the impact of an institution’s digital capabilities relies on engaged dialogue between decision makers, students, teachers, researchers, and professional staff. Dialogue, interaction, collaboration, inclusiveness – these are the foundations for strategic ICT application and development.

CAUDIT’s 2020 Top Ten Topics report is designed to contribute to conversations about ICT’s essential and potential application in higher education and research. Top Ten rankings are the product of a survey completed by CAUDIT Member Representatives. The survey is adapted each year to reflect emerging and current technology-related business priorities.

Like earlier Top Ten booklets, this 2020 edition supports ICT leaders to contextualise institutional goals, expectations and needs within a sectoral perspective. To better encapsulate the sector’s ICT focus, the Top Ten Working Party clustered 2020 Top Ten topics into three major themes:

• Strategic Direction
• Digital Agenda
• Transformation

These themes signal to institutional stakeholders the importance of purposeful, targeted improvements in ICT services and capabilities.

Now, more than ever, as universities and research organisations adjust to disruption – both internal and external – the 2020 Top Ten report supports your conversations about essential and potential ICT contributions. Such conversations are critical when unanticipated events, like COVID-19, challenge institutional missions, planning frameworks, and policy environments.

Thanks to the 2020 Top Ten Working Party members who have contributed invaluable perspectives, advice, and insights to topic contexts and analysis of survey data.

- Nicole Fishers
  Associate Director, Digital Business Services and Deputy CIO
  Flinders University

- Stuart Hildyard
  Chief Technology Officer, ICT
  La Trobe University

- Louise Howard
  Director, IT Infrastructure & Cloud
  Griffith University

- Justin Richardson
  Associate Director – IT Services
  The University of Auckland

- Peter Seddon
  Associate Director of Strategy and Architecture
  The University of Western Australia

Anne Kealley
CEO, CAUDIT
Drives the Digital Agenda
Which leads to Transformation
Strategic Direction
Revealing the Themes

The 2020 Top Ten topics are grouped into three themes. The topics are listed here under the themes they are allocated to.

Under each theme, topics are shown in the order they were ranked by 44 Australian and New Zealand CAUDIT Member universities participating in the 2020 Top Ten survey.

Theme 1: Strategic Direction
#4 Strategy
#5 Delivering Services
#8 Cultural Change
#10 Sustainability

Theme 2: Digital Agenda
#1 Information Security
#6 Data-enabled Institution
#7 Digital Integrations

Theme 3: Transformation
#2 Supporting Student Success
#3 Business Transformation
#9 Research Support

Why group the topics?
In looking at the final top ten topics, a number of relationships and overarching themes are self-evident. Defining the Strategic Direction sets the Digital Agenda and leads the process of Transformation.

The themes help focus conversations in our institutions about the role of digital technology, now and in the future.

Each theme stands as a fertile domain for collaboration and innovation, both within an institution and between institutions.
Reading the Topic Pages

A single page is devoted to each Top Ten topic where a brief description is provided about that topic’s scope and influence. This description is intended to be accessible to all those who work and study in higher education and research institutions.

There are also common design features on each topic page. These are explained here, and we hope they will further assist you to assess institutional impacts and sectoral contexts for each topic.

Keywords: Security / Risk / People

This is the topic’s ranking in 2020.

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An empty slot means the topic did not appear in that year.

Three keywords are listed at the top of each page, below the topic title. Keywords are a shorthand reference for the main concepts within a topic’s scope. The keywords here are allocated to Information Security. Like all keywords in this report, they indicate the topic’s primary opportunities and/or pressure points.

Here you can see how a topic’s rank and significance have changed over the past three years.
Strategic Direction

Strategic Direction draws together four topics. In 2020 Top Ten rank order, they are:

#4 Strategy
#5 Delivering Services
#8 Cultural Change
#10 Sustainability

An Overview

Sustainable high performance is a continuous expectation of higher education and research institutions. Information technology is pivotal to meeting that expectation. It is an enabler of institutional relevance, reputation, and longevity.

Diverse constituencies place a complex variety of day-to-day demands on an institution’s digital capability. These demands must be balanced with the continuing evolution of digital capability in ways that serve each institution’s long-term strategic intent.

Information technology fulfills its enabling role most constructively when institutional culture values the potential of digital capability to shape user-oriented service designs, productive work practices, and innovative strategic opportunities.

Strategy, supported by cultural change, directs the delivery of services which ensure the sustainability of endeavour and the institution.
Aligning IT with the organisation’s strategies to ensure its future in a digitalised world

High performance digital capability underpins delivery of strategic intent, central as it is to student success, research activity and networks, and community and industry engagement.

An institution’s ICT capability – which includes staff expertise as much as platforms and applications – must address current strategic needs. At the same time, digital capability must be consciously evolved in ways that enable achievement of medium- and long-term goals designated in institutional vision statements. Successful strategic transformation fundamentally relies on a strategy that secures a balance between immediate and future strategic objectives, and that aligns digital and non-digital initiatives.

In seeking that balance, it is crucial that institutional decision-making is informed by an understanding of which ICT alternatives furnish the best strategic investments in the institution’s preferred future. Responsive, reliable, secure digital capability is essential to strategic decision making in higher education and research institutions. The strategic potential of ICT is most effectively realised when digital expertise is involved directly in strategic decision-making processes.

Achieving strategic alignment is an inclusive exercise. Success depends on ICT expertise engaging in ongoing iterative exchanges about strategic needs and directions with senior executives, academic and professional staff, and students.

### Changes in Significance

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Embedding agility, scalability and cost effectiveness across activity to deliver value to students and staff

Students and PhD candidates. Alumni and tutors. Research leaders managing multisite projects. Finance and HR professional staff. Stakeholder profiles in higher education and research institutions are multidimensional. They demand ICT services as diverse as where they access them from, and the devices they use. Their service expectations change as work practices and relationship to the institution evolve, and as social acceptance of technological advances take hold.

Yet users hold varied expectations about access, security, service speed, and reliability. Their priorities put a premium on agility: the capacity and capability to maintain and develop contemporary ICT services. Agility is viable only in the presence of tested ICT policies, functions, systems, and processes. Agility has firm foundations that support people to articulate goals underpinning their decision-making capacity and scope.

Budgets matter. Whole of institution priorities and scalable ICT infrastructure allow an institution to accommodate varying service demands: steady, fluctuating, growing, shrinking, diversifying. Scalability has implications for organising ICT functions so there is scope to further institutional priorities and meet service demand. An end-to-end perspective is critical, covering cost to build, to integrate with institutional IT architecture, and to maintain.

Service delivery is value in action. Agility, scalability, and cost effectiveness are its foundations.

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Cultural Change

Keywords: Innovation / Mindset / Collaboration

Changing organisation culture to prompt new ways of working

Organisational culture encompasses habits of mind and familiar practices. It is as dynamic as the accumulation of knowledge. In research and higher education institutions, culture is instrumental in how ICT is perceived and valued, how it is used on a daily basis, and how it is incorporated into diverse activities like blended learning and research designs. In an innovative institutional culture, the ICT professional’s remit embraces dimensions from devising institutional strategy to sharing accountability for business unit outcomes.

Operating models structured to develop a culture of change and collaboration across an organisation facilitate cross-functional teams in their work. Collaboration that drives business process improvements and automated workflows is key to improved employee experience. Critical to success is deciding the ‘why?’ and communicating it across the organisation. Work practices like human centred design, design thinking, and agile delivery by default, can all drive cultural change, and new ways of working.

ICT’s contribution to cultural change is evident when ICT interfaces are designed to engage all users, to reflect values like respect, or to sustain innovative work practice. It is evident when work units collaborate to develop operating models that serve all stakeholders, and optimise benefits available from IT.

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Developing ICT funding models sustaining core services, supporting innovation, and facilitating growth in the context of increasing demand and limited resources

Though innovative new technologies continuously emerge, often from within higher education and research institutions, available resources often constrain implementing those deemed likely to advantage the sector.

Enthusiasm for changes to ICT capability is commonly deeper and wider than ICT budget allocations. This reality is complex, and consequently institutions constantly review their information technology spend with sustainability and value in mind. To satisfy growth in ICT services demand without a proportionate increase in funding is achievable when the right platforms are built, skilled people are in the team, and appropriate ways of working are adopted.

One sustainability perspective emphasises dependable access to ICT services, catering for day-to-day operating essentials. This maintenance perspective is critical. It may include refreshing a legacy system’s functionality, or revisiting digital integration options for an existing information technology suite.

Another crucial sustainability perspective entails investing in innovation and new digital capabilities. Many factors influence such investment decisions. Relevance, competitiveness, or reputation may rest on information security, artificial intelligence, or predictive analytics capabilities that legacy systems cannot support.

Sustainability and innovation are partners. ICT budgets must support activity that applies the institution’s digital capabilities in new ways to meet current or unanticipated needs, or deliver improved user experiences.
Digital Agenda

Digital Agenda is shaped by three topics. In 2020 Top Ten rank order, they are:

#1 Information Security
#6 Data-enabled Institution
#7 Digital Integrations

An Overview

Higher education and research institutions rely on well-adapted digital tools that translate data into reliable information and usable formats. Astutely curated data have many purposes, from informing strategic decision-making and student learning designs, to monitoring laboratory access.

Digital integrations facilitate collaboration. Teaching, learning, research, administration and engagement depend on frictionless information access to help inspire and maintain interactions and networks on campus and around the globe.

This highly differentiated, multi-user operating environment characterises institutional vibrancy. It is also an inviting target for cybercriminals.

A productive digital agenda integrates the data-enabled institution with assertive, proactive information security.
Embedding an Information Security approach to enable institutional outcomes

Information, in all its forms of access and use, is critical to all activities in higher education and research institutions. A host of technology platforms and devices is employed to share, experience, or use information in a versatile mix of end-user friendly formats. The number and diversity of people, and range of organisations, engaged in collaboration signify institutional vibrancy and relevance.

This energising complexity also entails threats to privacy, business operations, and institutional reputation. Cybercriminals and state-sponsored actors initiate sophisticated attacks on the integrity and operational efficiency of higher education and research institutions. The threat scope increases with shifts to the cloud, Internet of Things, and automation.

Alongside regulatory compliance, institutions meet cybersecurity threats with equally sophisticated internal information security safeguards. Frequency of cyberattacks, and potential for adverse consequences, has increased with the advent of COVID-19. The principal safeguards for institutional outcomes and individual privacy is a robust policy and governance framework that ‘designs in’ security from the outset, and incorporates ongoing user awareness training.

Maintaining a skilled threat detection capability, and regular communication about information security, are paramount. Information security practice is quickly evolving from a purely defensive ICT approach to a proactive mindset combining technology, process, and people.

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Enabling strategic decision making through the application of tools such as Artificial Intelligence and Machine Learning

Universities and research institutions are data rich environments – detailed student information from recruitment, enrolment, assessments, results and graduation; research data; and reporting to regulatory authorities. Institutions increasingly rely on Artificial Intelligence (AI) and Machine Learning (ML) applications to glean strategically meaningful information from many sources, internal and external.

These powerful analytical tools can deepen understanding about many aspects of an institution. They can illuminate practices that improve student retention, guide efficient programming of preventative facilities maintenance, extend the viable reach of research projects. They can empower academic and professional teams with information to underpin strategic choices. They can enhance an institution’s ability to define risk and mitigation measures.

ML and AI modelling can be applied to behavioural and non-behavioural data points that support market growth by driving conversion and inspiring demand, improving student experience and digital capability. Secure access to the right data, and insights to make the right decisions, can also accelerate collaborative action across higher education and research sectors.

Harnessing analytics, machine learning and artificial intelligence generates business value and changes how technology services are delivered. Maintaining the enterprise edge requires careful data collection, storage, and analysis – all enabled by data platforms, data governance and analytics strategy.
Digital Integrations

Keywords: Enterprise Architecture / Integration / Data

Leveraging enterprise architecture frameworks to facilitate smooth integration of data, systems and services

The ICT ecosystem of higher education and research institutions is complex. It continuously evolves to meet challenges and demands of its diverse users. It must respond within financial bounds while ensuring value for money.

Students, scholars, and professional staff customarily turn to an array of ICT platforms and applications that are enablers of their goals, practice, and performance. Room bookings, library access, data repositories, load planning, student records, group work assignments – these are commonplace examples of IT-supported interaction, data storage, and institutional planning. These are often unconnected and manual ‘stitching’ of information is required to extract value. A comprehensive enterprise architecture framework can ensure optimal operational and interactive viability of that array of platforms, systems and applications.

Digital integrations integrate disparate information technology strands. ICT professionals apply their expertise to create frictionless user experiences. Digital integrations empower our institutions to respond quickly to challenge, flexibly to opportunity, and consistently to the everyday. That frictionless experience emerges from close collaboration between ICT professionals and the community of users.

The digital transformation necessary for responding to these demands depends on digital integration that connects people, systems, and data. Successful digital integrations depend on an operating model that supports continuous delivery.

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Theme 3

Transformation

Transformation is driven by three topics. In 2020 Top Ten rank order, they are:
#2 Supporting Student Success
#3 Business Transformation
#9 Research Support

An Overview

Social, economic, professional, and personal transformations are motivating factors and consequential impacts of what higher education and research institutions do.

The transformative mission of higher education and research necessitates constant realignment of information technology services. They must be adapted to escalating, diversifying, and distinctive requirements of researchers, students, teachers, business units, managers, and institutional leaders.

Huge disruptive influences, as experienced in the first half of 2020, enforce and accelerate these changes.

Information technology is a medium for realigning, reimagining, and recalibrating teaching methods, learning environments, research designs, and business processes. Information technology facilitates and supports institutional transformations.
Supporting Student Success

Keywords: Teaching & Learning / Personalised / Technology Alignment

Improving student outcomes through the strategic alignment of technology

The COVID-19 pandemic is accentuating the centrality of ICT in contemporary higher education. Supporting student success as an institutional priority now pivots on seamless online access to teaching and learning, library resources, trusted assessment, and remote student support services.

The enforced shift to online higher education at scale is just the first key step in retaining students. It is the ‘new norm’. Learning analytics in support of student outcomes is an established focus of institutional research and practice. This confluence of digital and pedagogical sciences is now gaining momentum, because it is even more pressing to identify early those students at risk in remote and online learning environments.

Higher education ICT specialists are navigating rapid change in partnership with academics, teaching and learning experts, and student support services. Together they are helping reimagine sites of learning using relatively novel strategies more widely, such as deploying augmented reality in wet labs and clinical teaching contexts. The complexity of such change for students collaborating with peers, or interacting with tutors, also entails complex information security implications.

Intense collaboration and experimentation under pandemic conditions is yielding lessons for high-value ICT contributions to student success in post-pandemic higher education contexts.

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Positioning ICT as a catalyst to support the transformation of education and research, along with transforming the institution’s business functions

Business transformation takes hold when opportunity is picked from the midst of disruption with ICT expertise key to successful outcome. Examples abound in higher education and research institutions: from interactive virtual learning spaces and 3-D printing, to online assessment and proctoring. Collaborating at scale and in the cloud is generating new research opportunities. Behind such examples lies a mindset both strategic and practical.

Success relies on discerning the best fit between ICT options and strategic intent. This kind of informed agility is evident when interest groups across an institution team up to identify and formalise strategic priorities, deliver high-value outcomes and delineate pathways for implementing solutions.

A transformative ICT solution is one that works for all users. One tailored solution will help off-campus students share resources. Another will enable researchers to manage industry, international, and cross-discipline collaborations.

Business transformation depends on integrating expertise from many fields, including the capabilities of an ICT workforce that is trusted, skilled, knowledgeable, and adaptable. These attributes are best nurtured through forward-thinking professional development. They underpin focused engagement between the higher education and research sector and ICT vendors; engagement which guides development of digital platforms that meet the sector’s business transformation expectations.
Research Support

Keywords: Research Infrastructure / User-centricity / Governance

Providing a sustainable research support model servicing the needs of all researchers

Research support varies according to the strategic and operational contexts of each higher education and research institution. Yet common motivations influence fit-for-purpose design of institutional models. As the 2019 Top Ten Topics report observed, ‘High impact research is a government policy concern, a facilitator of funding flows, and a determinant of institutional competitiveness, reputation, and rankings.’

Outstanding data collection, storage, sharing, analysis, and security capabilities are critical. But every research support model goes further, accommodating timely, distinctive, diverse functionality.

Effective support systems adapt continuously to changes like new research engagement metrics, adjustments to grant criteria, or funding cycles. Applicants access current information about competitive funding schemes (internal and external), institutional policies, and grant application writing support and review mechanisms. Researchers and administrators need reliable, flexible systems, infrastructure, and networks that facilitate project management, facilities access, and financial and human resources transactions.

Multi-institutional research projects and industry-funded projects demand interoperability between institutional and external ICT systems. Customer Relationship Management systems can assist through tracking engagement with research stakeholders – industry, government agencies, alumni – that are important sources of future research funding. Efficient, enabling research support models connect researchers with ICT tools that are indispensable to achieving high value research outputs and outcomes.

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About the 2020 Top Ten Survey

Participation base in 2020

Forty-four university members and one research organisation completed the 2020 Top Ten survey. The 2020 Report is based on responses from the 44 university Members.

Methodology

The 2020 Top Ten program started with CAUDIT staff undertaking a literature review, and tracking higher education and ICT-related articles. This established a list of 78 potential topics.

The 2020 Top Ten Working Party reduced this long list to a working list of 27 topics. CAUDIT’s Executive Committee then produced a short list of 20 topics which all CAUDIT Members were then invited to rank. To provide Members with each topic’s focus, a descriptive statement was included in the survey.

As for 2018 and 2019, to further assess each topic’s significance and likely duration of relevance, Members were asked to indicate:

- the level of strategic impact each topic is likely to have for their institution in 2020, and
- the time scale over which each topic is expected to have strategic importance for their institution.

Changes to Topics in 2020

In sum, 20 topics were considered in 2020. The 2020 Top Ten Working Party introduced one new topic, reintroduced three topics, and deleted one topic from 2019.

Introduced in 2020
- Funding Agreement Compacts: New

Reintroduced in 2020
- Enterprise Architecture:
  First listed in 2014 – ranked #16.
  Listed again in 2016 – ranked #19.
- Identity & Access Management:
  First listed in 2014, and again in 2015 and 2016. Ranked #10 in each year.
- Personalised Learning:
  First listed in 2015 – ranked #13.
  In 2016, ranked #18.
  In 2017, ranked #17.

Deleted from 2019
- Educational Technology:
  First listed in 2016 – ranked #4.
  In 2015, ranked #7.
  In 2016, ranked #5.
  Fell to #8 in 2019.
How have topic rankings changed?

The trends chart below summarises the most significant technology related topics engaging universities in the past three years with their ranking each year.

The number denotes each topic’s ranking in each year. A topic’s rankings are linked where the topic was ranked in successive years.
To elaborate on the significant impact of each topic in 2020, CAUDIT Members were asked to use a six-point scale to rate each topic’s significance/impact in 2020.

Ratings for the 2020 Top Ten topics are summarised below in ‘2020 Top Ten Topic Significance/ Impact in 2020’.

Combining Very High (77.3%) and High (20.5%) significance / impact in 2020, for almost every participant, at 97.8%, the top ranked topic, Information Security was of the most significance / impact in 2020.

Aligning with their 2020 rank, the next three topics also were considered to have significant impact in 2020, with #2 Supporting Student Success (rated Very High by 72.7%), #3 Business Transformation (56.8%) with #4 Strategy (53.5%). The other six Top Ten topics also follow this pattern with progressively lower Very High rating with their descending rank.

Half, or just under half, of respondents identified five high impact topics: #6 Delivering Services (54.5%), #7 Digital Integrations (52.4%), #8 Cultural Change (52.3%), #9 Research Support (52.3%) and #5 Data-enabled Institution (46.5%).
To indicate strategic relevance over time to their institution of each topic, CAUDIT Members used a six-point rating scale. Ratings for the 2020 Top Ten topics – presented in 2020 rank order - are summarised below.

The most pressing topic was #5 Data-enabled Institution with the highest immediate short-term (less than 2 years) consideration of 51.2% together with the highest medium-term impact – 2 to 5 years – of 32.6% - in aggregate 83.6% - and the lowest Ongoing rating of 16.3%.

For the other nine 2020 Top Ten topics the two most conspicuous indicators were Ongoing impact and immediate or short-term impact (less than two years). The medium-term horizon of 2 to 5 years was of much lesser consideration.

For half or more participant universities six of the 2020 Top Ten topics were considered Ongoing: #1 Information Security (68.2%) with both #2 Supporting Student Outcomes and #10 Sustainability at 61.4%.

Only just under 5% of universities felt they had adequately addressed both #4 Strategy and #9 Research Support at this time.

### Top Ten Topic Timeframe for 2020

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<tr>
<td>Business Transformation</td>
<td>34.1%</td>
<td>25.0%</td>
<td>40.9%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy</td>
<td>30.2%</td>
<td>11.6%</td>
<td>53.5%</td>
<td></td>
<td></td>
<td>4.7%</td>
</tr>
<tr>
<td>Data-enabled Institution</td>
<td>51.2%</td>
<td></td>
<td>32.6%</td>
<td>16.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivering Services</td>
<td>34.1%</td>
<td>11.4%</td>
<td>52.3%</td>
<td></td>
<td></td>
<td>2.3%</td>
</tr>
<tr>
<td>Digital Integrations</td>
<td>47.6%</td>
<td>14.3%</td>
<td>38.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural Change</td>
<td>31.8%</td>
<td>15.9%</td>
<td>50.0%</td>
<td>2.3%</td>
<td></td>
<td>2.3%</td>
</tr>
<tr>
<td>Research Support</td>
<td>38.6%</td>
<td>18.2%</td>
<td>2.3%</td>
<td>36.4%</td>
<td></td>
<td>4.5%</td>
</tr>
<tr>
<td>Sustainability</td>
<td>25.0%</td>
<td>11.4%</td>
<td>61.4%</td>
<td></td>
<td></td>
<td>2.3%</td>
</tr>
</tbody>
</table>
More pressing with increased significance

Three trends are evident for the top ten topics from 2019 to 2020.

Except #9 Research Support, all 2020 Top Ten topics increased in significance. Three of these also had more pressing shortened timeframes and six were afforded extended timeframe relevance.

Of the three more pressing topics, most strikingly from 2019 to 2020 #6 Data-enabled Institution increased in significance, nearing immediacy. For both #3 Business Transformation and #5 Delivering Services their higher significance levels were across slightly shorter time frames.

Though #9 Research Support experienced a drop in significance from 2019 to 2020, a more pressing time horizon is evident for 2020.

### More Pressing Timeframe from 2019 to 2020

- **#9 2020 Research Support**
  - 2018
  - Higher Significance

- **#3 2020 Business Transformation**
  - 2019
  - Shorter Timeframe

- **#6 2020 Data-enabled Institution**
  - 2019

- **#5 2020 Delivering Services**
  - 2019

- **#9 2020 Research Support**
  - 2018

- **#3 2020 Business Transformation**
  - 2019

- **#6 2020 Data-enabled Institution**
  - 2019

- **#5 2020 Delivering Services**
  - 2018
Less pressing but with increased significance

Six topics increased in significance in 2020 against a longer time frame than in 2019.

Strategy moved to a closer proximity with the top two topics on the significant impact-timeframe plane.

Though #4 Strategy and #1 Information featured the largest gains in significance of these six topics, their longer time frames aligned with the increments for the other four topics. Both #7 Digital Integrations and #8 Cultural Change were very similar in changes in both significance and timeframe from 2019 to 2020.

The smallest increases in significance were by #2 Supporting Student Success and #10 Sustainability.