

A man with a beard is holding a young child in his arms. They are outdoors, under a tree with green leaves and small red berries. A woven basket hangs from a branch above them. The scene is bathed in warm, golden light, suggesting late afternoon or early morning. The man is looking at the child, and the child is looking up at the basket.

**Accenture
Technology Vision -
How the trends apply
to higher education**

We live in two parallel realities, one of atoms and one of bits.

We increasingly move seamlessly between our digital and physical worlds in nearly all aspects of our lives. This is also the case in the higher education sector. Nearly all students – even campus-based students – will learn online or remotely for at least some portion of their degree. They now access information across multiple channels and platforms as they learn, live, and administrate their lives at the institution. They also collaborate with humans and computers, but usually not at the same time. Transitioning between them can be challenging, confusing, or impossible.

That is all changing. The next wave of education transformation will shift from building isolated digital capabilities to creating the foundations of a new reality—a shared reality that combines of physical ones of atoms and our digital ones of bits.

As covered in [Accenture's Technology Vision 2023](#), our annual forecast of the most important tech trends reshaping business, the path forward will be to build a singular shared reality for an institution's constituents. For the higher education sector, this includes students, staff, faculty, alumni, and the broader community.

Universities are at an exciting precipice of technological innovation, one that is not just digitizing operations but putting that digital foundation to work. However, educational institutions must provide active leadership to ensure that there are guidelines to interacting with these technological innovations in a responsible manner.



Four Technology Trends

From generative AI to the metaverse—with technology advancing at accelerating speeds and becoming more woven into everyday life—it is important that the education sector prepare for the future. This year’s higher education companion to the Accenture Technology Vision 2023 explores how the four tech trends identified are shaping the future for educational institutions.



Digital identity

ID for everyone and everything

Emerging forms of foundational ID like Learning and Employment Records are breaking down the walls that divide the physical and digital lives of students, faculty, staff, and future employers



Generalizing AI

The radical edges— and possibilities— of intelligence

Strategic deployment of AI tools can improve university services for students, staff, and faculty. However, this will require universities to understand their capabilities, track how they are advancing, and ethically promote those technologies.



Your data, my data, our data

Why transparency will become your most precious resource

Institutions will become increasingly focused on data transparency, new data management architectures, and a thoroughly cybersecurity-trained workforce.



Our forever frontier

The big bang of computing and science

Universities will need to ignite a new science technology revolution in order to propel students to take advantage of the vast innovation opportunities that are emerging.



+ Digital identity

**ID for everyone
and everything**

Digital Identity: ID for everyone and everything

Schools are a core identity anchor of each of our journeys. They ensure resilience, security, and opportunity through the providing of critical credentials we need to navigate our lives. The possibilities for institutions to maximize impact for stakeholders—student, faculty, staff, and alumni—by standardizing identity practices are staggering.

Emerging forms of foundational ID are breaking down the walls that divide the physical and digital lives of students, faculty, staff, and future employers – **84%** of higher education executives agree their organizations are innovating around digital identity via tokenization.

A continuous challenge in higher education is the successful credential transfer process. Currently, students who transfer lose **43%** of their credits during this process*. Digital identity technologies like verifiable Learning and Employment Records (LERs) can solve a critical problem in the transfer process by reconceptualizing the methods of recognition, documentation, and proving of student achievements throughout their learning journey.

Finding balance

While the next generation expects institutions will inherently know who they are and what they've accomplished— automatically making connections across different universities, schools, and departments – convenience must be balanced with security. Institutions need to future-proof themselves for a world where data sharing and ownership is dramatically different.

*Forbes: [“The Dual Credit Risk in High Schools”](#)



Digital Identity

What's happening now?

RMIT University leveraging blockchain for student credentialing

Royal Melbourne Institute of Technology (RMIT University) partnered with Microsoft to deploy an innovative solution for identity management.

By partnering with Microsoft and Condatis, RMIT developed a solution which allowed, via the Microsoft Authenticator app,

- Students to access libraries and discounts
- Alumni to send transcripts from RMIT to prospective employers, and
- Confirm satisfactory completion of select required trainings

[RMIT future-proofs the university-to-student connection with Microsoft Entra Verified ID](#)

EBSI simplifies the exchange of educational credentials between partner universities

The European Blockchain Services Infrastructure (EBSI) partnered with the Royal Spanish MINT and two Una Europa universities to pilot the exchange of verifiable credentials between academic institutions in cross-border settings including Spain, Belgium, and Italy.

Through the exchange of educational institutions between their partner universities, EBSI provided the infrastructure to help students attain verifiable ID credentials, Student IDs, transcript of records, and diplomas.

EBSI's infrastructure attempts to reimagine mobility in Europe by making student documents impossible to fake and easy to verify anywhere and anytime.

[EBSI Verifiable Credentials Success Stories](#)

Where we'll see this trend in higher education:

Students

Enable seamless transfer credit articulation through blockchain enabled verifiable credentials to expedite transcript request process, enabling students to eliminate hiccups, reducing manual work for universities to validate, and driving fewer lost credits.

Faculty & Staff

Improve interoperability between devices and tools with replacing passwords with identity credentials and biometric identification to improve data security in research projects and lowering the potential for data breaches.

Alumni & Community

Enhance engagement by allowing alumni to earn alumni credentials, stored in digital wallets and secured on blockchain, to be exchanged for university and community event admission.

Digital Identity

Challenges

For a central digital identity solution, there are limits imposed by existing regulations as well as cultural barriers. The key is enabling governance and programs to efficiently facilitate the move to modern identity platforms. CIOs should consider the need to re-tool the workforce on securely maintaining new platforms. As LERs become mainstream, universities will need to understand what other data should be issued to students to prove their abilities, creating a push for institutions to rethink their platforms.

Schools must consider the variety of stakeholders with vested interest in data, security, and identity. There is a growing expectation from the actual students that they can receive their learning credentials in a way that allows them to own and self-manage (e.g., having a digital diploma at their fingertips), and so institutions will have to meet this demand. While students, parents, staff, and faculty have much to gain from increased personalization, legislatures and governing bodies may question the security of centralized digital identity management.

What can your institution do now?

- Connect with institutions like Arizona State University's [Trusted Learner Network](#) that are reimagining how to digital identity on their campus to understand their process – what may benefit at your institution?
- Join organizations and initiatives focused on expanding digital identity to the higher education industry, such as the [Digital Credentials Consortium](#) and the [European Blockchain Standards Infrastructure](#) – how can you be on the frontier of the digital ID innovation?

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Your data, my data, our data

Why transparency will become your most precious resource

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Your Data, My Data, Our Data: Why transparency is your most precious resource

Transparency will be a precious resource for schools looking to lead in innovation. Educational institutions have face heightened pressure to be more transparent with data; when asked, educational leaders were **much more likely than other industries** to believe that their key stakeholders exert the most pressure on data transparency. Moving forward, university constituents ranging from students to faculty will continue to put pressure on universities to be more transparent to drive accountability.

As schools adapted to online learning and emerging technologies over the last three years, **66%** of leaders reported that the volume of data in their institution has significantly increased. This is making room for the outcomes that universities know they can get with better data sharing, leading to increased insights from data analytics and providing better student services through 360° Value Integrated Reporting.

Building Trust Around Proper Data Management

Universities will need to ensure that stakeholders feel in control of what data they share and with whom. For this to happen, institutions need to spend time building trust with these stakeholders before new tools can be adopted at scale. This trust will depend on data transparency, new data management architectures, and a thoroughly cybersecurity-trained workforce.



Your Data, My Data, Our Data

What's happening now?

University of Tennessee's public academic data dashboard drives transparency for stakeholders

In 2019, the University of Tennessee published a public dashboard to increase information access to student, faculty, staff, and community stakeholders. The dashboard shares highly sought after academic information, including:

- Enrollment
- Composite ACT scores
- Weighted GPA
- Degrees awarded
- Graduation & Retention statistics

[UT Launches Data Dashboard to Increase Transparency](#)

University of Colorado Boulder creates crime data dashboard to generate public trust

In 2022, CU Boulder created two new dashboards documenting calls for service and calls initiated by the university police department (CUPD). The dashboards are public and can be leveraged by the campus and surrounding community.

CU Boulder's initiative illustrates how the impact of data transparency extends beyond students, faculty, and staff. CUPD already provide a vital public service to the Boulder community, but residents and visitors now have access to relevant crime data.

[CU police embrace growing trend toward transparency with crime data](#)

Where we'll see this trend in higher education:

Students

Develop student portals that give students a 360° view on all aspects of their university life, providing them with the data and insights they need to successfully thrive on campus and improve their overall student experience.

Faculty & Staff

Enhance administrative processes through better 360° data from core applications to understand how to ease administrative burden, insights on what business practices are working, and what additional offerings should be created

Alumni & Community

Use data and relevant analytics to provide the right stories and increase transparency for alumni, highlighting how your university is using their donations to deliver the right outcomes



Your Data, My Data, Our Data

Challenges

As more personal data is collected and utilized, the risk and number of cyber attacks increase. There is also an explosion of data that is being generated and stored on your campus IT systems. To protect sensitive data and avoid breaches, it is critical to train your staff to mitigate the impact of data breaches and maintain stakeholder trust. Complete solutions will require an overhaul of proper data governance, data integration, and cybersecurity controls. By involving your faculty and staff in this data-driven transformation from the outset, everybody will feel included and be able to influence what data is used in ways that work best for your campus.

Educational leaders must also consider legal protections around student data, including FERPA and HIPAA. Institutions should be cautious around sharing disaggregated student data that could be personally identifiable.

What can your institution do now?

- Compare what your institution shared publicly compared to those in regional or academic conference – what dashboards can you create or publicize?
- Evaluate how internal data is shared on your campus, including standards around cybersecurity assessments, data governance, and data democratization – how can your institution leverage digital tools, analytics, and policies to improve decision-making?

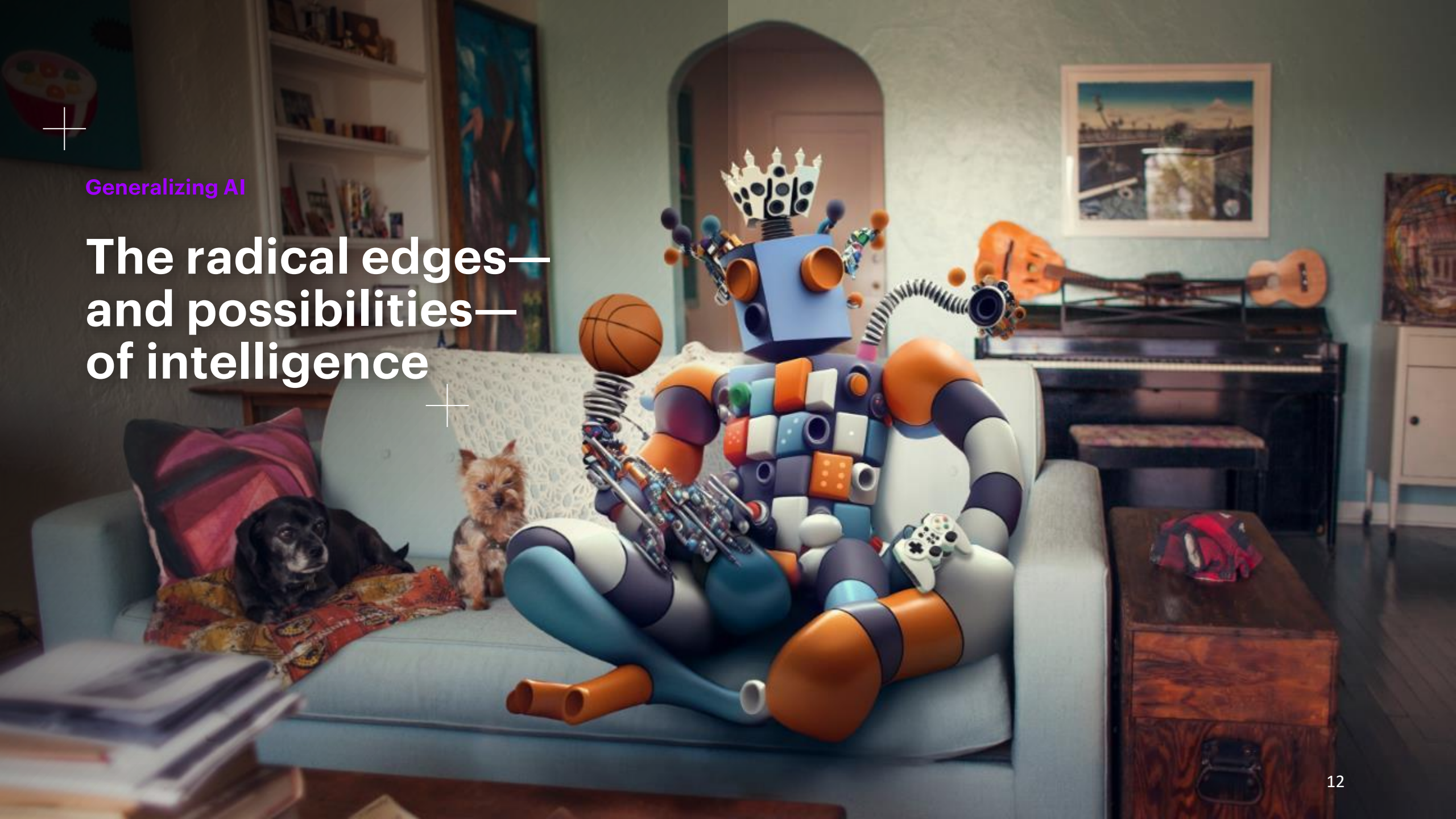


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Generalizing AI

The radical edges—
and possibilities—
of intelligence

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Generalizing AI: The radical edges – and possibilities – of intelligence

Foundation models are becoming one of the biggest step changes in the history of AI, transforming human-AI interaction and how work is done. Generative AI introduces pre-trained models with remarkable task adaptability. Strategic deployment of AI tools can reduce administrative burden on university administrators and impact how they operate and serve constituents, enabling them to devote more time to valuable, human-based services where they are most needed – **82%** of education executives report that Artificial Intelligence is inspiring their organizations' vision and long-term strategy.

However, this drastic change will require universities to understand their strengths and capabilities and track how they are advancing – **69%** of higher education executives anticipate making significant increases in resources their organization dedicates to AI. They also need to ensure that students and faculty are working side by side using these technologies in a responsible and transparent manner, understanding how generative AI tools impact how faculty teach and how students learn.

Responses from faculty in a recent *Chronicle of Higher Education* reader survey seem to indicate that faculty will be engaging with AI:

- ~80%** Plan to add information about how to properly use AI to course syllabi
- ~70%** Plan to change assignments to make AI-assisted cheating harder
- ~50%** Plan to add AI to assignments so students understand its capabilities and limitations
- ~20%** Plan to use AI themselves so that they can better design courses

[Chronicle of Higher Education: "Caught Off Guard by AI"](#)

Aligning on policies and guidelines

As Generative AI technology advances, it will become more commonplace in education. Universities must develop adequate guidelines to support technological usage and confirm how tools will align with the needs of faculty.



Generalizing AI

What's happening now?

National Louis University using AI to Improve student services

At the 2023 ASU + GSV Summit, National Louis University Provost Eddie Phillips gave an overview of how his university uses chatbots, intelligent virtual assistants, and FAQ support to aid students with their questions. Having students engage with these tools helps free up more time for front-line student services staff to have more substantive conversations with students.

[ASU GSV Artificial Intelligence and the Future of Higher Education](#)

Arizona State University using AI to optimize the student success journey

At the 2023 ASU+GSV Summit, Executive Vice President and Chief Operating Officer of Arizona State University described how the university is using generative AI to optimize its course catalog descriptions. Previously, course descriptions were idiosyncratic and confusing in terms of how they are written. AI technology was used to improve the course description language and making these descriptions more present on the web through search engine optimization.

Students now appreciate how they better understand what the course is about. This in turn helps students to achieve success by picking the right courses for their interests and needs.

Where we'll see this trend in higher education:

Students

Given that 43% of college students have used AI tools like ChatGPT*, there is likelihood they will still use it even if its banned. Spend time understanding how this will affect teaching and learning for future generations of students.

Faculty & Staff

Improve campus operations for faculty and staff operations through virtual assistants and predictive analytics.

Alumni & Community

Use features like natural language processing, data discovery, and advanced analytics to get smarter about alumni needs and develop recommendations for more inclusive alumni communities.



Generalizing AI

Challenges

Most colleges, departments, and faculty have yet to develop guidelines on how AI should be used in the classroom. There needs to be some consideration on how to protect sensitive student information when analyzing student data with AI tools. Institutions also need to ensure that AI systems are fair and do not hold bias against any student groups. Ultimately, generative AI tools are coming quickly and will be unavoidable. It is important for faculty and staff to be prepared about how these tools will affect the learning experience.

There is also general uncertainty about pending government decision-making on AI around what will be regulated and by which government entity. Universities must stay vigilant and actively participate in conversations about how AI will affect future of generations of students, staff, and faculty.

What can your institution do now?

- Take the time to use foundation models available to today to experiment with applications for your students, staff, and faculty – how can you explore smaller, easier use cases on your campus?
- Invest in the structure and governance needed for effective use of generative AI – how can you spending time collaborating with others to develop guidelines on effective AI adoption?





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Our forever frontier

The big bang of computing and science

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Our Forever Frontier: The big bang of computing and science

The feedback loop between science and technology is getting faster, with each accelerating the advancement of the other. Additionally, the power of technology is extending beyond information tech (IT) and operational tech (OT) to a new science tech (ST) domain. More universities are widening their innovation efforts to focus on the entirety of this feedback loop—seeing how powerful disrupting the intersection between scientific research and technology can be.

Universities are increasingly focused on solving the world's biggest problems from climate change to pandemics. They therefore have a vested interest in science technology and the vast innovation opportunities that come with it given the potential for these technologies to help students contribute to these global problems in a significant way.

The work of Universities can be amplified by partnering with corporate institutions that have renewed interest in igniting this new science technology revolution. Industrial advances in next-generation computing, space technologies, and biotech will help drive progress in various new interdisciplinary academic disciplines moving forward.

The university as the accelerator

Higher education institutions—ranging from liberal arts colleges to R1 research institutions—will need to think deeply about how technology is driving their scientific research efforts. Investments in strategic industry-academia partnerships are key to accelerating innovation and advancements in technology, and for creating solutions that drive real world impact.

Our Forever Frontier

What's happening now?

IISc and Accenture collaborate for research in Cloud Continuum and Neuromorphic Computing

The Indian Institute of Science (IISc) Bengaluru are collaborating to undertake research and development in cloud continuum and neuromorphic computing at a newly established Accenture Center for Advanced Computing.

As part of this initiative, IISc and Accenture have undertaken collaborative research projects and jointly developed intellectual properties and thought leadership in next generation computing technologies. The outcomes of these projects will include scientific research, software development, and toolkits that utilize quantum computing to improve the accuracy and efficiency of modeling molecular chemistry problems.

[Accenture and IISc collaborate for Research in Cloud Continuum and Neuromorphic Computing](#)

Purdue University and Accenture develop Smart Manufacturing Partnership to prepare student for future careers

Purdue University and Accenture have agreed to a five-year commitment supporting Purdue's mission to prepare a next generation a smart-manufacturing workforce. Smart manufacturing uses digital technologies like AI, cloud, robotics, and 5G to build products.

Through this collaboration, an on-campus Accenture Smart Factory will provide instructional laboratories, design studios, and spaces where students from various disciplines can collaborate on projects. The Smart Factory will also serve as a central hub for joint innovation among Purdue, Accenture, and the manufacturing industry. Ultimately, this program will prepare more students for exciting future careers in smart manufacturing, as well as meet the needs of partners in the industry desperately seeking career-ready graduates.

[Purdue, Accenture sign five-year agreement in support of smart manufacturing](#)

Where we'll see this trend in higher education:

Students

Offer interdisciplinary fields for students like computational chemistry and provide programming with businesses from various industries to help students explore how to tackle the world's biggest problems through utilizing innovative science technology.

Faculty & Staff

Science partnerships with business can propel advances in next-generation computing, space technology, and biotech to drive progress in various academic disciplines.

The Economy

Develop multi-party partnerships and use funding collaborations between governments, higher education, tech start ups and businesses to develop Tech Hubs and advance science in certain areas for the purpose of local economic development.



Our Forever Frontier

Challenges

Reorienting for a new period of science technology acceleration will require coordinating long-term partnerships and the development of multi-party consortia or other arrangements with the private sector to ensure that science and technology are synergistically being developed versus in silos. Universities need to understand the roadblocks and opportunities for partnering with companies to advance scientific development.

The advent of science tech will require fast action as well—innovation compression has already posed as a challenge for many educational institutions, and the pace of innovation is consistently getting faster. Universities will require a deep understanding of how technology is accelerating various academic disciplines, and how these changes will affect what research is being funded.

What can your institution do now?

- Start identifying with faculty on major “big bets” and identify the proper challenge statement – which emerging technologies could have the biggest impact on scientific advancement at your institution, and what topics are your faculty driving that will propel strategic partnerships with the private sector?
- Invest in innovation accelerators developed in partnership with corporations – how will accelerators drive the expansion of science and technology on your campus?



Questions For Universities to Ask Themselves

- 1 Digital Identity: Where are there opportunities for improvement in providing students and faculty the credentials they need to better manage their identities in an increasingly digital world?**
- 2 Data: Where can you build trust as a differentiator in your campus' data management?**
- 3 Generalizing AI: How do we generate standards to promote the use of generative AI for good in Higher Education?**
- 4 Forever Frontier: How can you partner with the private sector on the convergence of Science Tech for your campus?**



Thank you

#techvision

www.accenture.com/technologyvision

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Accenture Labs incubates and prototypes new concepts through applied R&D projects that are expected to have a significant impact on business and society. Our dedicated team of technologists and researchers work with leaders across the company and external partners to imagine and invent the future. Accenture Labs is located in seven key research hubs around the world: San Francisco, CA; Washington, D.C.; Dublin, Ireland; Sophia Antipolis, France; Herzliya, Israel; Bangalore, India; Shenzhen, China and Nano Labs across the globe. For more information, please visit www.accenture.com/labs.

Accenture Research

Accenture Research creates thought leadership about the most pressing business issues organizations face. Combining innovative research techniques, such as data science led analysis, with a deep understanding of industry and technology, our team of 300 researchers in 20 countries publish hundreds of reports, articles, and points of view every year. Our thought-provoking research developed with world leading organizations helps our clients embrace change, create value, and deliver on the power of technology and human ingenuity. For more information, visit www.accenture.com/research.

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About the Technology Vision

For more than 20 years, Accenture has developed the Technology Vision report as a systematic review across the enterprise landscape to identify emerging technology trends that will have the greatest impact on companies, government agencies, and other organizations in the coming years. This year the trends look a decade into the future, while remaining relevant across industries and actionable for businesses today.

Accenture Labs and Accenture Research collaborate on the annual research process, which this year included:

- Input from the Technology Vision External Advisory Board, a group of more than two dozen experienced individuals from the public and private sectors, academia, venture capital, and entrepreneurial companies. In addition, the Technology Vision team conducts interviews with technology luminaries and industry experts, as well as many Accenture business leaders from across the organization.
- Accenture conducted a survey of 4,777 C-level executives and directors across 25 industries to understand their perspectives and use of emerging technologies across their organizations. The surveys were fielded from December 2022 through January 2023 across 34 countries.
- Experiential research and data science to analyze technology developments and advancements.

As a shortlist of themes emerges from the research process, the Technology Vision team works to validate and refine the set of trends. The themes are weighed for their relevance to real-world business challenges. The Technology Vision team seeks ideas that transcend the well-known drivers of technological change, concentrating instead on the themes that will soon start to appear on the C-level agendas of most enterprises.

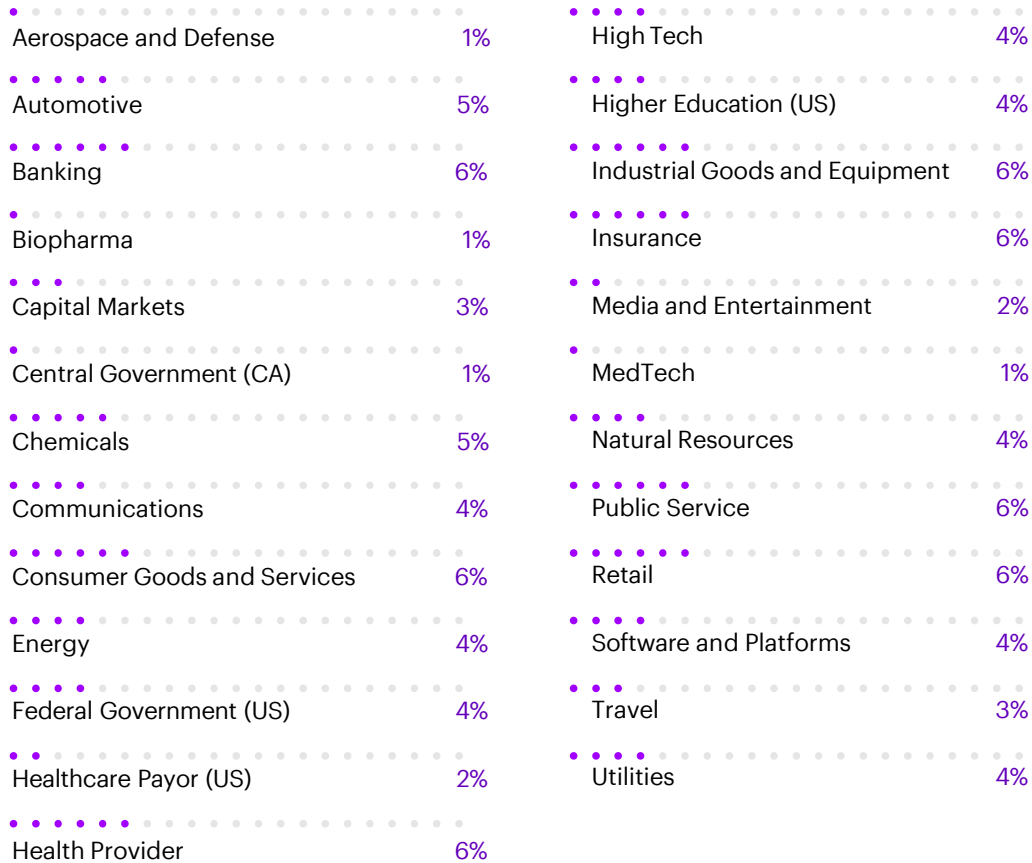


Survey demographics

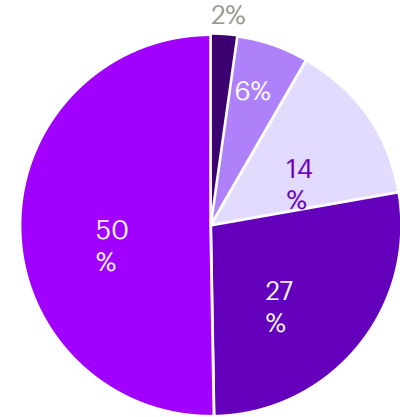
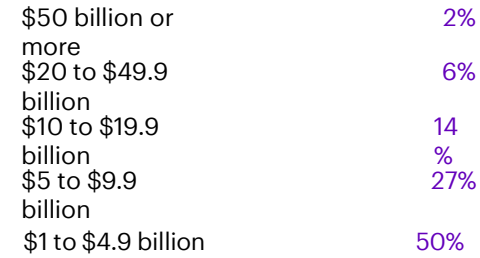
Countries

Argentina	3%	China	5%	Indonesia	2%	Norway	2%	Sweden	2%
Australia	4%	Colombia	2%	Ireland	2%	Poland	2%	Switzerland	2%
Austria	2%	Denmark	2%	Italy	4%	Portugal	2%	Thailand	2%
Belgium	2%	Finland	2%	Japan	4%	Saudi Arabia	2%	United Arab Emirates	2%
Brazil	4%	France	3%	Malaysia	2%	Singapore	2%	United Kingdom	4%
Canada	5%	Germany	4%	Mexico	2%	South Africa	3%	United States	16%
Chile	2%	India	4%	Netherlands	2%	Spain	4%		

Industries



Revenue (USD)



Roles

