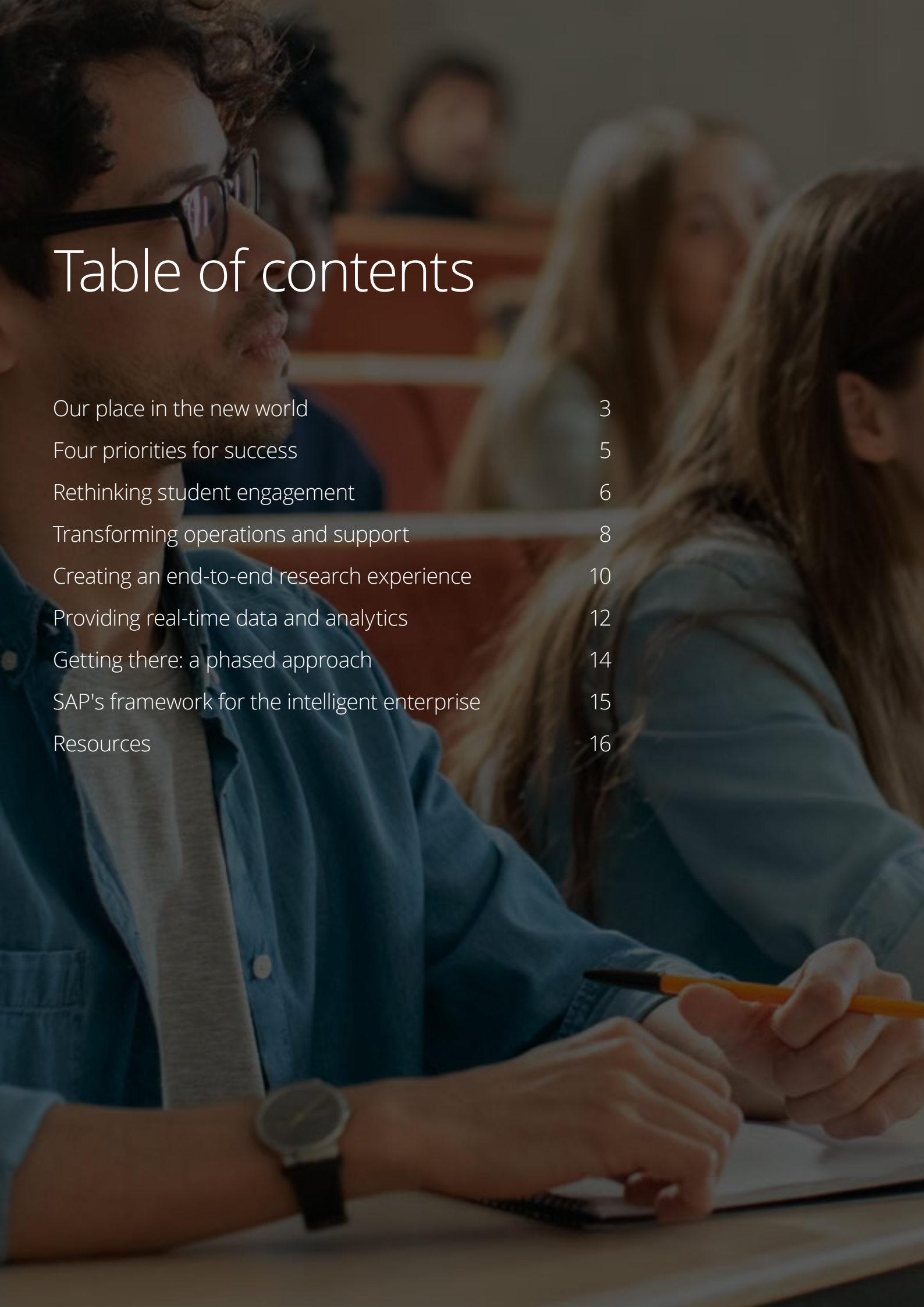
Deloitte.

The Intelligent Enterprise for the Higher Education and Research Industry

Helping to establish superior student and faculty engagement through integrated solutions delivered across an intelligent enterprise



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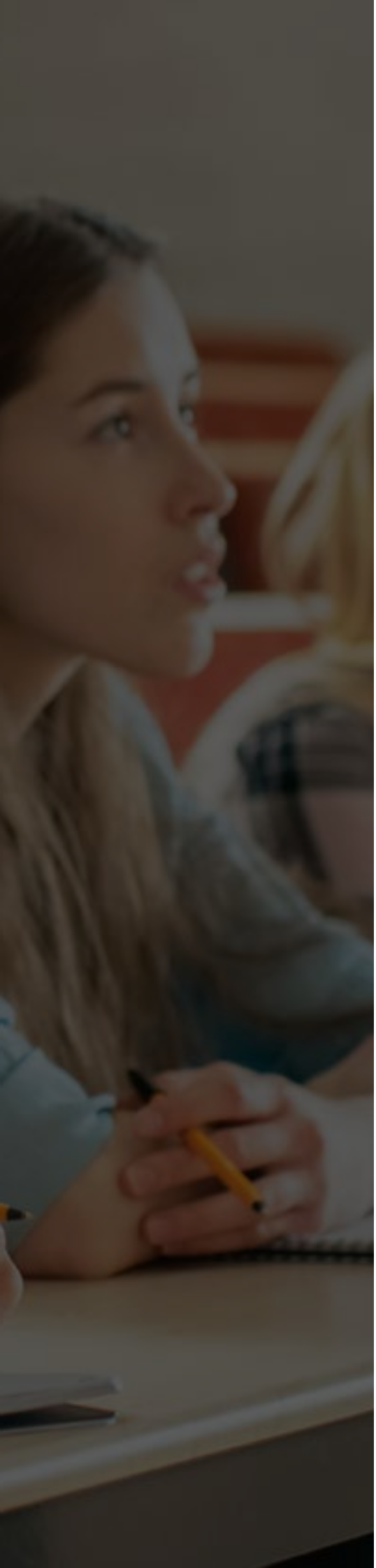


Our place in the new world

Global “megathemes” are affecting higher education and research, providing new opportunities for growth.

- **Experience-based economies** continue to evolve and are forcing new operating models to gauge client perception for input and value.
- **Robotic process automation and machine learning** are dramatically shaping the **future of work** at an accelerated pace, driving the need for alternate skill sets, training, and experience.
- Demographic changes are forcing **mismatches** in the availability of **skilled workers** region by region and globally to meet changing technical and professional demands. This affects both the university workforce and budgets, but it also shapes the future workplace for graduates.
- The **gig economy** is growing fast, with 16.5 million people in the labor force having **contingent** or **“alternative work arrangements”** that require continuous learning and skills development within fluid workplaces and cross-organizational support structures.[1]

1. “ US Gig Economy: Data Shows 16m People in 'Contingent or Alternative' Work ,” The Guardian, June 7, 2018.

The higher education and research industry is being reshaped by four major trends.

- Closed campuses, economic pressure, and changing dynamics are challenging the value of education in the view of the millennial generation, especially those seeking work with a sense of purpose.
- Global online and open coursework has become the new normal with the current pandemic, increasingly being integrated as the "global campus" aggressively evolves.
- Proactive student engagement is increasing to adapt classes and teaching based on student experiences, to meet expectations for "success."
- Real-time, "always-on" mobile support is expected now more than ever across the enterprise and virtual campus.

Being able to address these global megathemes and industry challenges will determine who will be among the winners in the next 10 years. Successful operating-model innovation, process optimization, and workforce productivity are directly linked to delivering great customer and employee experiences.

In fact, research indicates that the best-performing institutions are pulling away from the rest and widening the performance gap. They are doing this by creating a landscape where they deliver seamless virtual support, superior experiences, and greater value, successfully adopting new technologies and new working environments to deliver winning solutions and services more efficiently.

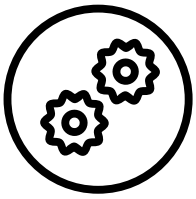
According to a July 2018 study by Forrester Consulting commissioned by SAP, innovative organizations focus on digital priorities to help them achieve digital transformation.[2]

2. " Emerging Opportunities to Deploy Industry Processes in the Cloud ," Forrester Consulting on behalf of SAP, July 2018

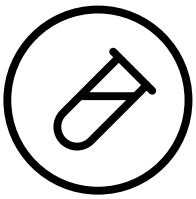
Four priorities for success

We have identified four strategic priorities necessary for higher education institutions to transform their core mission and operational support.

Rethinking student engagement



Transforming operations and support



Creating an end-to-end research experience

Real-time data and analytics

Rethinking student engagement

To effectively meet current student expectations, intelligent outreach must begin while the student is still a prospect, and must evolve across individual student experiences.

"Always-on" is not jargon; it is the expectation of every millennial holding a smartphone. Recent history has shown that many colleges and universities were unprepared for forced online learning and necessary virtual support environments. Effective student engagement will be predictive and responsive, bringing together customer experience data with university business or operational data for end to end intelligence.

The Vision

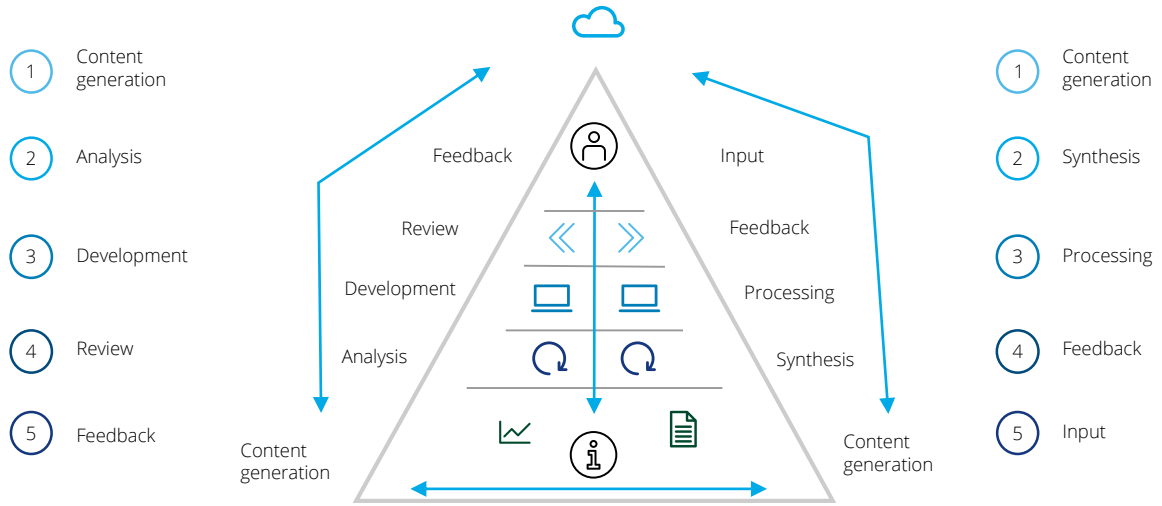
By 2025, advanced student outreach and constant support will be key to the intelligent university strategy and critical to competitiveness, as will be the universities' renewed focus on student engagement throughout (and beyond) their educational journey.

The Journey

The journey begins with the recognition that the student is the focus of integrated services. To establish and develop this customer relationship, institutions must build and support a real mobile, interactive online presence with features such as live customer chat on the front end, integrated with analytics and logic on the back end.

Systems will monitor students in a 360 degree manner, on campus or off campus, sensing interest with sentiment analysis and crowdsourcing, and pairing requested institution features and services. Student experiences and support needs will directly drive system and service change. Embedded analytics within those communications channels will gauge student needs and requirements in real time and will help the university meet their expectations (see Figure 1).

Figure 1: Superior Student Outreach



69% of students surveyed feel that digital learning technology has improved their focus.[3]

3. " New Survey Data: Four Out of Five College Students Say Digital Learning Technology Helps Improve Their Grades ," McGraw Hill, October 17, 2016.

Continual and interactive engagement

The traditional student management model begins with applications, moves to admissions, and includes invoicing, student class scheduling, attendance, course completion – and repeats. Students can often be viewed as nothing more than a number. Administrative or faculty engagement with students can often be limited to problem resolution. The situation is further exacerbated within the current pandemic environment. Engagement models must rapidly evolve.

In the next-generation college and university, student engagement is a living, interactive relationship that begins as a college prospect investigates a university, with the data processed as sentiment analysis. Respective student interests are cataloged, driving tailored interactive outreach. Student information is continually updated to automatically tailor a learning curriculum for the student, whether on or off campus. Comprehensive account and schedule summaries are available on a mobile device; student activities and interests are continually monitored, with real-time support enabled with faculty.

TRADITIONAL SCENARIO

Student prospect meet and greet

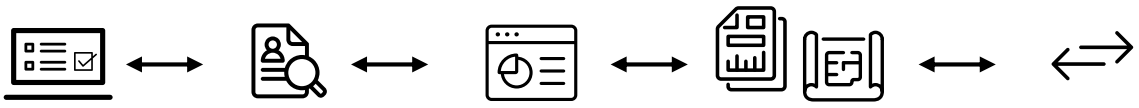
Acceptance and admission

Invoicing

Class scheduling

Lecture attendance

NEW-WORLD SCENARIO



Student reviews university online – executing searches on interest areas.

University monitors prospective student sentiment and develops profiles.

University maintains interactive communi-cation with student from admission through scheduling, adapting curriculum and needs in process.

Student refines class and personal schedule to develop the clearest path to their major curriculum.

Student maintains interactive communication with the university as experiences provide profile and campuswide information updates.

TOP VALUE DRIVERS

3% – 10%

Improvement in service margin

25% – 30%

Improvement in invoice processing time

Source: SAP Performance Benchmarking

Transforming operations and support

A global need for effective utilization of resources is driving end-to-end integration of support systems.

In recent years, universities have tended to invest in "point solutions" to meet urgent priorities. The result has been an inefficient patchwork of products and platforms. With the recent pandemic disruption of traditional campus environments, the precarious balancing act of university systems and budgets has been further elevated.

The Vision

By 2025, individual departments will cease operating as independent entities as economic and customer pressure drives efficiencies. The goal is to create an integrated intelligent enterprise that balances resources and workloads to focus on teaching, research, and engagement (see Figure 2).

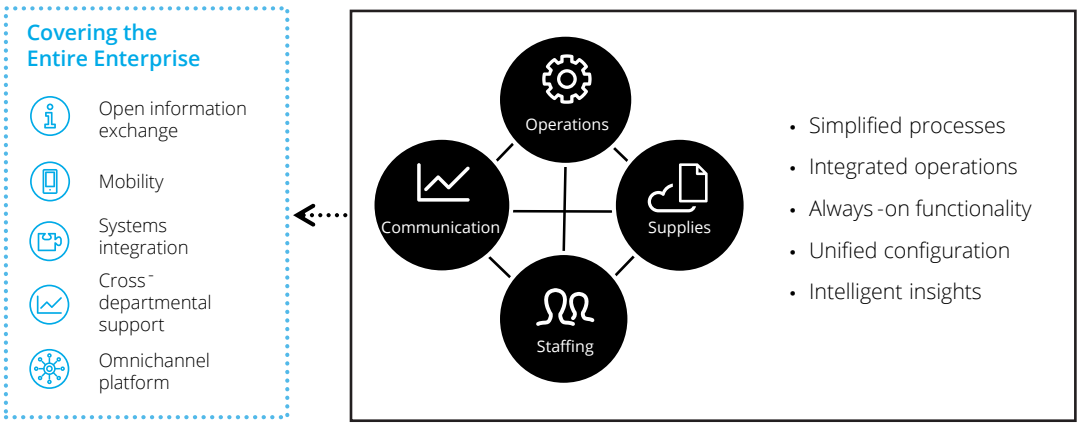
The Journey

The journey begins by taking a full enterprise view with clear targets in mind, focusing on a measurable impact on teaching, research, and engagement both on and off campus. The next step is recognition that transformation means deploying integrated technology operations. The journey to becoming an intelligent enterprise requires seeing the university itself as a collaborative common platform for teaching, research, and engagement, bringing together university administration (the back office) with campus stakeholders (the front office).

The deployment of integrated solutions on a single platform is a key step in becoming an intelligent university. But more important is the provision of integrated data and a "single source of truth" for university metrics across key stakeholders.

Using this platform, technologies such as machine learning, AI, and the Internet of Things (IoT) both generate and consume such data. They are now the single engine of the enterprise: powered by machines; driven by data; managed by people; and measured by success in teaching, research, and student engagement; they are building the next generation of leaders and innovators.

Figure 2: The Vision of Integrated Systems Support



By 2020, more than **40%** of data science tasks will be automated, and the number of citizen data scientists using AI will grow **5x** faster than professional data scientists.[10]

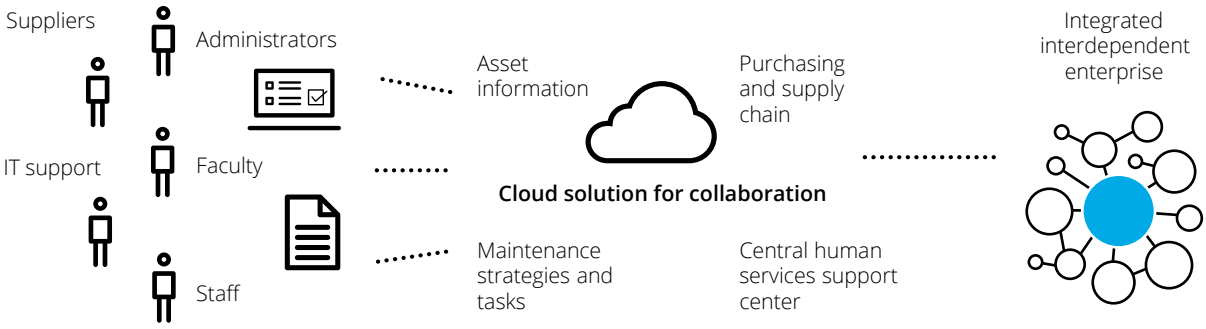
Virtual smart systems and operations

As institutions of higher education continue to seek the means to drive efficiencies and the greatest use of finite institutional resources, outdated legacy systems continue to be identified as demonstrating inadequacies.

The transformation for the institution begins with a thorough review of the current IT infrastructure and operating environment to identify workflow impediments and unnecessary tasks. Final transformation to become an intelligent enterprise would include a dramatic investment and movement of all systems and support to an analytics-driven and flexible cloud platform that can integrate across the organization to help facilitate the shared service environment.

TRADITIONAL SCENARIO

NEW-WORLD SCENARIO



TOP VALUE DRIVERS

12%

Reduction in employee turnover

74%

Improved efficiency when operating KPIs are tracked

Source: SAP Performance Benchmarking

Creating an end-to-end research experience

Universities are complex entities that operate across multiple priorities, streamlining shared service environments and minimizing administrative burden to maximize research focus.

University operating structures are the result of institutional history, not necessarily strategic planning. Budget balancing is constant, and the "new normal" focus on student engagement may compromise research priorities. Efficiency and reduced administrative support are critical to maximizing resources. Shared service environments and integrated support structures will be critical.

The Vision

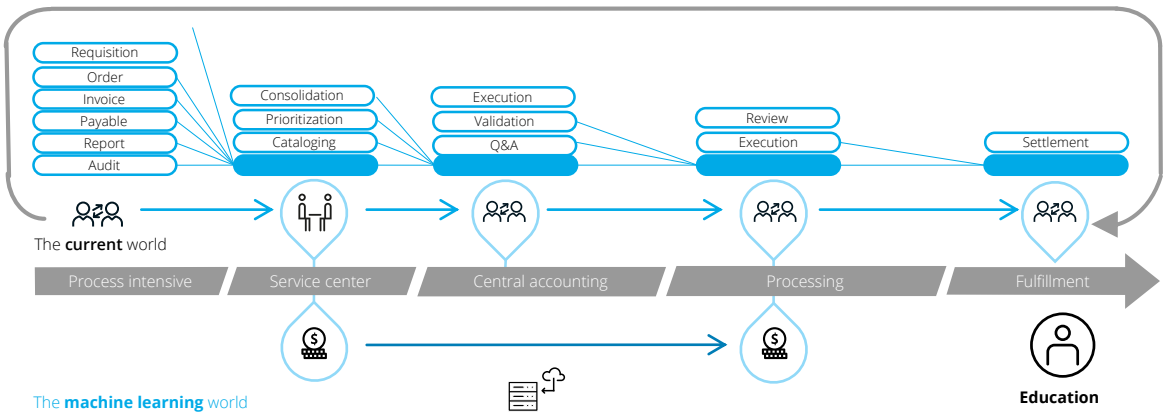
By 2025, administrative tasks will be reduced through automation, allowing for a renewed focus on research missions. Enterprise systems will increasingly be self-driving, standardizing research processes for grants management and reporting, This will allow for the human focus on managing outcomes against the strategic research goals, research productivity, and meaningful outcomes. The result will be the evolution of an integrated platform for high-velocity research.

The Journey

Enterprise change begins at the "enterprise" level, with a recognition of the need for comprehensive processes. The university must evolve, regardless of the organizational structure, into a platform for leading-edge research vision and execution. Integrating the business platform across departments, projects, and grants categories will allow researchers to focus on their primary mission.

Centralization, standardization, and automation will be key steps in the journey toward the intelligent university of the future. That university will be characterized by shared services, real-time data, and a single source of truth for that data. There will be complete transparency of costs and expenses across the enterprise. Administrative tasks will increasingly be automated. For example, grants management payables and receivables will be managed by machine learning (see Figure 3).

Figure 3: Complete Digital Representation of Shared Research Services and Support



70% of surveyed higher education faculty members join administrators in supporting the use of open educational resources to increase student engagement while combating escalating economic challenges of outdated resources (such as textbooks). [4]

4. " Conflicted Views of Technology: A Survey of Faculty Attitudes," Inside Higher Ed in partnership with Gallup, October 2018.

Managing intelligent, integrated processes

The inefficiencies in traditional college and university operating structures are inherent in the siloed nature of separate departments and research teams that too often act as autonomous islands. This includes general support, with specific issues in purchasing, supplies, and accounting, all supported with traditional ordering, invoicing, payables, and receivables. The result is multiple groups and departments with multiple redundant workstreams and overstocking supplies.

Digital and smart support structures of the next-generation institution will use advanced technology, such as machine learning, to automatically maintain inventory and supplies across the enterprise. Grants funds can be segregated but still allow centralized ordering and payments, pooling purchasing for economies of scale but maintaining strict accounting segregation across projects. This will negate most standard accounting practices and routine tasks to enable more focus on research.

TRADITIONAL SCENARIO

Administrative staff members from each department or research group identify a supply shortage.

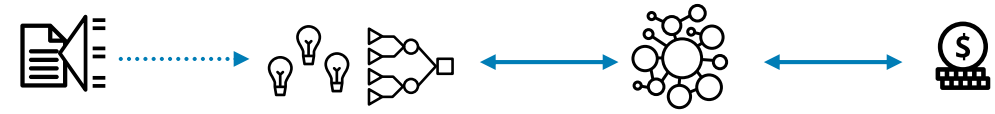
Department-by-department orders are created and forwarded to procurement.

Research group and department invoices are each created to execute orders, with documentation forwarded to accounting.

Invoices are each paid out of the general ledger, and orders are executed.

Varied products are ordered and shipped to numerous points across campus. Accounting in each department and research division performs a month-end audit and review to balance accounts.

NEW-WORLD SCENARIO



Supply inventory is monitored and measured in real time with smart sensors.

Supply reorders are identified with automated processing and matched with the respective funding account. Grants categories are segregated with individual journal entries.

As accounts make automated payments and as supplies across research teams and departments are measured, any necessary restocking is executed.

Inventories are updated and new supply alerts are sent to each department as accounts are replenished and available cash can be reinvested.

TOP VALUE DRIVERS

20% – 30%

Reduction in R&D costs

Up to 10%

Reduction in total costs

Source: SAP Performance Benchmarking

Providing real-time data and analytics

To meet student and faculty expectations for superior engagement, both on and off campus, institutions' information must be available in real time and allow analytical insights.

Digital institutional platforms must provide insight into the student and faculty experience. Recent challenges through the pandemic have highlighted shortcomings in many college and university support structures. The smartphone and tablet of every student are currently the nucleus of their social world and their online outlet to society. Yet often students cannot use these smartphones to access university systems and support. To change this, universities must become equally "smart," or intelligent. This integration can be further extended to support smart research and smart operations.

The Vision

By 2025, university systems will be integrated to provide the student customer with a single real-time view of the institution, classes, schedules, and finances, enhancing the student experience (see Figure 4).

The Journey

The journey begins with the recognition that the student and the faculty are the codependent customers. On the system side, an integrated, platform approach must be implemented to facilitate mobile access by single sign-on. This enables automation aspects of communication, with integrated forums or chatbots as examples.

The mobile device can now support the focus on student and faculty engagement. The infrastructure will also provide real-time data and a continuous feedback loop regarding student activity and experiences. This insight will be used not only to improve student success but also to influence university planning to further improve student services and academic offerings.

Figure 4: Connectedness with Real-Time Student and Faculty Information

Integrated applications
Smart technology searches for synergy or conflicts

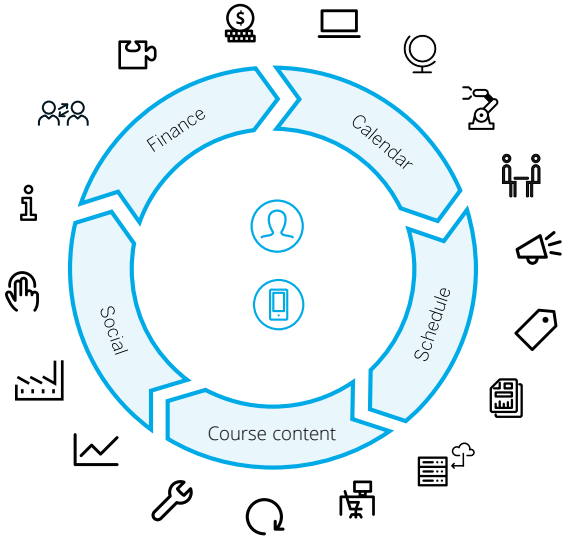
Continual updates
Automated and seamless

Always on, always available
360-degree uptime

Mobile
Unilateral system platforms

Real-time customer service
24x7 real-time support

Security and tracking
Seamless with campus



84% of students surveyed feel that digital learning technology has improved their efficiency and effectiveness.[5]

5. " New Survey Data: Four Out of Five College Students Say Digital Learning Technology Helps Improve Their Grades ," McGraw Hill, October 17, 2016.

Expanding information reach with online integration

Putting the student and faculty customer point of view at the center of service decisions is a key prerequisite for success in the digital age. It means capturing information, analyzing the findings, and providing feedback from both the equipment and the people using it. Data compilation and synthesis are constant. And the analysis does not stop at the front desk of the registrar's office. Colleges and universities need to become customer-centric enterprises. The ability to focus on their most valuable customers is one of their key priorities. Since immediate access to information is important for faculty and students, institutions want to prioritize the delivery of services based on what those customers demand. SAP S/4HANA® enables colleges and universities to prioritize customer input more reliably and efficiently while providing valuable insights on how to allocate the necessary resources and balance budgets to meet key needs.

TRADITIONAL SCENARIO

Student initiates inter-library search for old periodical necessary to source a research report.

System malfunctions and aborts numerous search attempts.

Student contacts library staff and outlines the nature of the problem, seeking an alternate research route.

Interlibrary system is scheduled for maintenance and sits dormant for two weeks.

Student research is a failure, and topic and white-paper focus must be altered to use whatever resources are available.

NEW-WORLD SCENARIO

University library designs IoT-enabled equipment to capture resources across participating libraries.

University monitors student project in real time and sends suggested information repositories and related topics.

Current data is merged with new data and automatically located by an IoT-enabled research tool.

Student refines research thesis based on accumulation of new resources, managing back successful sources of information.

Research paper is refined and finalized, with student automatically documenting a successful research string and successful resource locations.

TOP VALUE DRIVERS

29%

Increase in active reporting

10%–20%

Increase in customer satisfaction

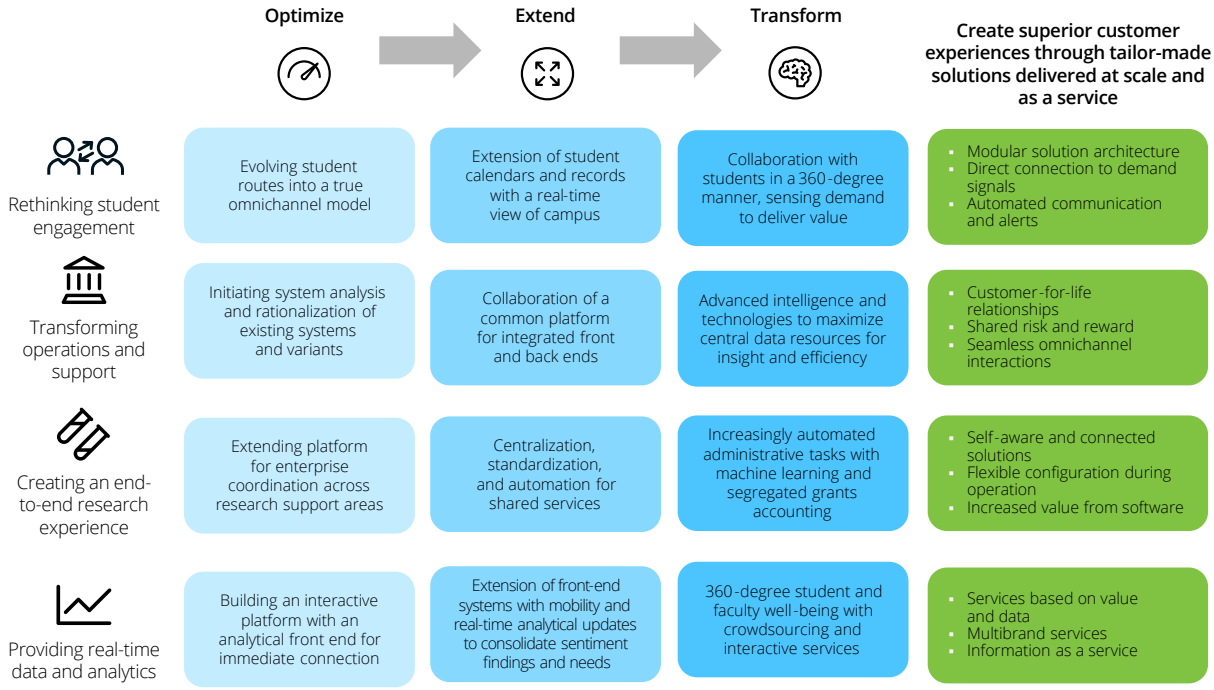
Source: SAP Performance Benchmarking

Getting there: a phased approach

Institutions will become intelligent enterprises on three distinct tracks as they evolve their strategic priorities to match their vision. They will optimize operations, extend services and support, and transform traditional college and university campuses.

- **Optimize** what they already do by implementing a stable and scalable digital core to make processes more transparent and integrated
- **Extend** their current processes by connecting them to the real world using IoT technologies
- **Transform** their business using a constant stream of data enabling new service-driven business models (see Figure 5).

Figure 5: Strategic Priorities Across the Maturity Framework



SAP's framework for the intelligent enterprise

Most organizations understand what is happening in their business, but they may not always know why.

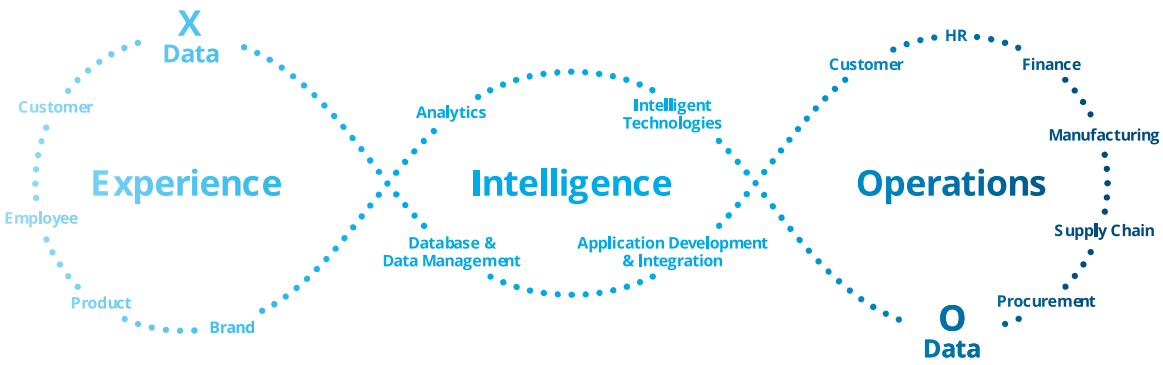
They know what's happening because they have systems that capture operational data (O-data) – about their customer transactions, supply chain, manufacturing, spending, and the activities of their workforce. They can see that data through reports and dashboards. They can see trends and predict what will happen next.

But to influence what happens next, companies need data about the interactions that people have with their products and their business. Experience data (X-data) captures beliefs, emotions, opinions, and perceptions – the "why" something is happening. And when companies know why something is happening, they can make an informed decision about the best way to respond.

To win in this experience economy, intelligent enterprises connect experiences with operations. They use both X-data and O-data to guide their business decisions. Intelligent enterprises collect insights from customers, employees, products, and brands at every touch point. They use powerful technologies to automate and integrate their data, processes, and applications, enabling them to sense risks, trends, and opportunities. And they act on this intelligence across every part of their business (see Figure 7).

Only SAP has the strategy, expertise, and solutions to deliver on this vision, enabling intelligent enterprises to turn insight into action.

Figure 6: SAP® Intelligent Enterprise Framework



Contacts

Goedele Weynants
Director Employee Data
gweynants@deloitte.com
+ 32 2 600 62 71

Kristof Mantels
Director Employee Data
kmantels@DELOITTE.com
+ 32 2 749 59 39

Deloitte.