Managing Innovation and Student Expectations: Going Beyond the Roadmap

Digital disruption is raising student demand for personalized experiences on devices and wearables. Institutions of higher education need to innovate in rapid cycles to address these expectations by shifting focus from long-term roadmaps to continuous digital innovation.
Executive Summary

Organizations today are forced to innovate at the same speed as consumer electronics updates, as digital technologies – such as smart devices, wearables and personalized online experiences – upend consumer expectations with little notice. Yet many institutions of higher learning have not kept pace with student demands for more convenient, customized experiences delivered on their device of choice. To remain relevant, institutions must discard their traditional three- to five-year technology roadmaps and adopt a robust technology infrastructure and planning strategy that will accommodate ongoing innovation.

As we have seen in other industries, loyalty will not carry the day in higher education. Millennial learners will go where they perceive their needs for engagement are being met. In this new world, speed to market is often more important than product maturity – all the more reason that multi-year planning cycles are no longer sufficient.

In contrast with traditional software development practices, innovation moves from free-range ideation, to identifying discrete opportunities, to quickly abandoning ideas that don’t work and rapidly scaling up initiatives that succeed. By following these principles, institutions will discover a pathway that is more flexible and enduring than a roadmap to launch engaging student experiences, delivered through digital innovation.
Drivers of Digital Transformation

Multiple forces are driving the need for digital transformation. Rapid technology advancements are shrinking product development cycles; students are growing ever more tech-savvy; and new modes of obtaining an education are resulting in decreased loyalty to educational providers. Here is a closer look at these developments.

- **Shrinking product development cycles due to rapid technological advancements:** Innovation cycles for products and services are shorter than ever. For example, the length of time between the release of the Apple II in 1977 and the Apple III was 41 months; the timeframe contracted to just 18 months between the iPhone 1 and the iPhone 3G. Now, Apple's overall product update/release cycle is roughly every six months.¹

  The compressed time expectations from the consumer electronics business have made their way into higher education. Before 2010, no institution had plans to deliver mobile educational content, but within a year, virtually every organization had an app or plan to launch products and services that could be consumed on a tablet device. The emergence of tablets completely transformed the educational segment, taking interactive content, personalization and adaptive learning to the next level. Now, higher education institutions need to continue innovating at the speed of consumer electronics updates from technology giants like Apple, Google and Amazon.

- **Increased student expectations:** Students of the millennial generation (and younger) find it difficult to understand why they can’t reserve a dorm room or add/drop a course via a mobile app. Everything else in their lives takes place on the device – why not their college-related tasks, too? Yet at most institutions, students must still fill out a form on an online portal to enroll in a class, apply for housing, connect with an advisor or access career services. That doesn’t track with the one-stop-shop experience that students expect, anytime, anywhere, on any device.

- **A growing number of cost-effective choices for learning:** Students can now choose from a plethora of free, “good-enough” educational content on the Web, such as massive open online courses (MOOCs) and free tutorials on YouTube. Debt-sensitive millennial learners may be attracted to the many lower cost options becoming available.² (For more on the topic of content democratization, see our white paper “Democratized Content Is King.”)
The democratization of content has increased the need for quick, continuous innovation. Students are becoming less willing to wait for the beginning of the school year, travel to a particular location and pay high fees to get an education; they increasingly expect learning opportunities to be on-demand, life-long and affordable.

Because of the sheer number of choices in the digital environment — and the speed with which they appear — students will not remain loyal to one education provider but will migrate to the most effective, affordable and easy-to-use engagement. If a solution does not meet the student’s perceived needs, she will move on to one that does.

To keep up in this environment, institutions of higher education and their technology organizations are striving to increase agility, enable innovation and deliver better student experiences. The digital transformation taking place extends beyond the SMAC Stack (aka, social, mobile, analytics and cloud technologies) and touches business processes and business models.

Despite their awareness of the need to innovate, 79% of IT budgets in higher education are dedicated to business-as-usual operations, while 15% goes toward incremental upgrades to current systems, according to the 2014 CDS Benchmarking Report. That leaves just 6% to be spent on innovation on average. Whether higher or lower than this benchmark, investments in innovation need to be money well spent.

Compressed Cycles of Change

Within this new landscape, traditional planning cycles have fallen by the wayside, as speed-to-market becomes a top priority – even more important than product quality. Customers today are willing to tolerate beta products as long as they are assured of quick updates and constantly improving features. In the tech sector, for example, Google’s Gmail remained a beta product from the time of its public launch in 2004 until 2009. By that time, the e-mail system had accumulated 146 million users.

In education, “minimum viable courses” (MVCs), or “bite-sized” chunks of learning delivered at the right time and place, will become more common in many areas, including technology, engineering, corporate training and self-help. MVCs can be launched with bare-bones content to a core group of students and then be extended through multiple releases, with particular attention to student feedback. Every element of the course – content, format, delivery – can be customized and fine-tuned to student needs. Traditional models of establishing credentials (beginner, intermediate, expert) would also change, with students gaining core expertise in specific areas (or micro credentials), along with working knowledge in related subjects. For example, earning a micro credential in financial statement preparation could be accompanied by working knowledge of related subjects, such as equity, taxes and variance analysis.

New credentialing mechanisms are already impacting the professional education space. Udacity’s Nanodegrees, for instance, are a new kind of credential in the technology sector that students can earn by completing a MOOC program. Other non-traditional credentialing systems, such as badges, honors, leaderboards and status on trusted social forums, could also gain acceptance among employers, especially in areas of high demand and low supply.
Cloudy Crystal Ball

Of course, it is difficult to predict which products and services will ultimately be successful. In the early part of the century, there was much buzz about social networks and social content, but it took until the presidential election of 2008 for social to go mainstream in the U.S. Between 2007 and 2008, Twitter experienced a surge of 400,000 users per quarter to 100 million per quarter.\(^6\)

Synchronous, video-based learning and distance education were not embraced when they were first made available decades ago because they were technology-driven innovations rather than demand-driven initiatives. Existing bandwidth could not support rich data streams delivered to a variety of devices and platforms, resulting in a poor user experience. Moreover, a general acceptance of virtual interaction had yet to emerge. But when the conditions are right — and user needs are fully understood through approaches such as human-centric design\(^7\) — technology adoption can spread quickly.

To deal with this uncertainty, combined with the rapid cycles of product innovation, organizations need to compress traditional product development cycles. Institutions of higher education that do not align their business processes and technology with shrinking product development cycles risk losing market relevance (see Figure 1).

Georgetown University Embraces Rapid Innovation

Educational institutions no longer have the luxury of multi-year technology plans. At Georgetown University, for example, the widespread availability of MOOCs spurred the institution to evaluate its curriculum to determine which areas were generic and interchangeable vs. which were unique competencies.\(^8\)

Evaluators determined that basic courses, such as Intro to Statistics, Intro to Biology and other 100/200-level courses, could be pulled out and delivered at a lower cost. According to CIO Lisa Davis, Georgetown went from “zero mobile presence” to hosting 35,000 students, professors and alums on a mobile platform in just two years’ time.
The Future of Education Will Be Personalized

As digital disruption continues, the possibilities for innovation span the entire student journey (see Figure 2). Today, for example, students selecting a college might spend time on student forums; seek peer opinions on Facebook and Twitter; watch relevant YouTube videos; peruse targeted print, TV and online ads; and explore college-match websites and apps. In this scenario, many institutions simply send out information in the hopes that their messaging reaches the right ears. Most institutions don’t use a highly targeted method for identifying worthy prospects with the greatest likelihood of matriculation.

In the near future, with minimal investment, institutions will assume a more active role. Using big data-driven analytics, for example, they could develop highly personalized promotions. Candidates who might previously have escaped notice could receive personalized messages, content and even scholarships and grants, laying the foundation for a relationship. Institutions might also offer campus tours through virtual reality headsets, as well as virtual lectures from professors to sample.

Institutions could also offer a wide range of options based on the prospect’s preferred learning styles, including gamified approaches, remote learning and personalized guidance. They could also connect prospects with acquaintances who have taken an applicable course or attended the school.9
The options continue following matriculation. Today, students might join online and offline student groups, collaborate online for assessments, use apps and affiliated services (for needs such as library services, attendance tracking and course selection) and choose e-textbooks over more expensive print volumes. All of these capabilities offer a major advantage over the completely manually-based process of 20 years ago.

But think what might be possible in the future. Institutions could create capabilities to automatically push lessons to student mobile devices, using digital assistants like Siri, Cortana and Google Now. Services could be increasingly automated, such as wearable-based attendance and extracurricular tracking, usage-based auto-payments, reminders for pending tasks and gamification of student activities.

Providing small units of educational content and capabilities on-demand – including instructions, assessments, labs, etc. – will enable institutions to implement change more quickly and with minimal overhead. It is not surprising, then, that many players in the education sector are moving from traditional sub-segments, such as publishing, certification, training and assessment, to a common one: learning services.

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Increasingly, students will no longer pay for a textbook or a course but for one or more units of content that can help them achieve a learning outcome. These learning units will be delivered instantly and on the student’s device of choice.

While it is impossible to know with certainty which new practices and paradigms will take hold in the higher education space, it is clear that content and service offerings will become more relevant, personalized, targeted and on-demand across the student journey, from selection, to lifecycle services, to personalized educational content.

Here are two hypothetical examples of what this might look like, from the university’s and the student’s points of view.

**The Digital University**

“Pinnacle University” (PU) uses a real-time algorithm that leverages prior admissions data and social media mining to target prospective students who are likely to apply, matriculate and complete their degrees. The system enables PU to create a comprehensive profile for each prospect, using demographic, social, academic and professional parameters, which provides the admissions office with individualized guidance to develop targeted promotions, including scholarships, course suggestions and weekend classes (see Figure 3, next page).

Throughout the student lifecycle and with the student’s permission, PU proactively tracks a wide range of information, including student profiles, cultural fit, academic data, fee payments, college experience data, faculty/staff reports and other institution-specific variables to build a predictive model for the likelihood of student success. The system also identifies effective interventions to prevent dropouts and improve satisfaction. By leveraging the online data generated by prospective students (aka, their Code Halos10), PU is able to gain further insights.
When students enter their senior year, PU maps their skills to current job openings and industry trends to create a holistic student profile, based on their adaptive learning outcomes, professor feedback, extracurricular activities, social interactions, internships, previous experiences, etc., to provide career and job guidance. PU’s placement team then works with recruiting agencies to match students with job openings that have a strong chance of being a good fit.

**The Digital Student**

Bob, a math grad student, sits for a differential calculus test and scores poorly. His personalized learning system automatically records the test result and fine-tunes his upcoming learning interventions (see Figure 4).

By late afternoon, the math app on Bob’s Apple Watch knows he has boarded a subway to go home for the weekend, based on his GPS location and previous travel history. It prompts him to solve a few extra questions on the topics he got wrong earlier in the day during the train ride.

Later that evening, Bob cannot remember the formula for differentiation of quadratic equations and asks Siri for help on his iPhone. Siri interacts with the math app and shows him all the associated formulae on-screen.

**Digital Future: Student Perspective**

Test performance is updated in real-time, and course-corrections are immediately set in motion.

Digital assistants like Siri, Google Now and Cortana are integrated into the solution.

Learning interventions are executed, based on location and personalized learning history.

Social media data mining provides admissions with guidance and enables targeted promotions.

Social media data mining provides admissions with guidance and enables targeted promotions.

Predictive models of student success enable the university to identify effective interventions.

Student skills can be mapped to job openings using a holistic cognitive profile.

Digital Future: University Perspective

![Figure 3](image3.png)

![Figure 4](image4.png)
These digital approaches to education may seem daunting to institutions that still work with traditional planning and execution cycles. Educational institutions face a tough choice — either plan to innovate rapidly and continuously, or fall behind for good.

To meet the demands of digital innovation, institutions need to innovate, and such innovation cannot be accomplished using traditional technology planning roadmaps. While roadmaps are built on the ideas of certainty, safety and planning (see Figure 5), digital disruption calls for more agile approaches, such as rapid ideation and “fail-fast” prototyping. Continuous innovation cycles are replacing fixed roadmaps, as they offer the ability to launch new service capabilities that are both secure and compliant.

Continuous innovation requires an extensible, adaptive technology foundation that can keep up with the fast-changing technology landscape. Rather than building or buying a single platform, the current state of thinking is to implement technologies that integrate well. This approach enables innovation cycles to happen in short intervals, allowing new capabilities to be deployed on an ongoing basis.
Three- to five-year technology roadmaps are no longer sufficient; institutions need to adjust their planning processes and focus not on fixed technology roadmaps but on a technology infrastructure — tool sets, processes and new organizational structures — that enables innovation (see Figure 6).

**An Innovation-Enabling Framework**

With traditional software development, project teams often started by slicing off a small piece of the larger effort (“thinking small”) and then planning a big rollout of the capability (“starting big”). Today, institutions need to reverse that by shifting to the principles of “thinking big” and “starting small,” in addition to “failing fast” and “scaling quickly.” These are the guiding principles for managing digital innovation.

Additionally, institutions need to adjust their planning processes, and mindsets, to focus not on fixed technology roadmaps but on implementing a foundational technology environment that enables rapid innovation cycles.

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With the foundational technology environment in place, organizations can follow a three-step approach to enabling a collaborative process for innovation:

1. **Discover.** This step consists of implementing a focused, managed, collaborative discovery process to curate, triage and assess new ideas. Organizations should gather a team of stakeholders and experts and invite them to collaboratively “think big,” identifying the areas of highest potential impact. Encourage the team to cast a wide net, thinking both internally and externally. By bringing together all the relevant points of view and stakeholders in one place, the discovery process can progress rapidly.
Accelerating Digital Innovation

We work with institutions of higher learning to transform their traditional planning cycles and move to an approach that ensures continuous innovation. Our Digital Works Accelerator Process follows our recommended three-step framework (see Figure 7, above):

- **In our IdeaLab,** we encourage institutional leaders to expand their vision of the possible.
- **In our Collaboratory,** we start small and fail fast, often ideating and prototyping more than one idea at a time. Our toolbox includes an integrated rapid prototyping technology toolkit for developing enterprise digital solutions, using the right mix of skills, intellectual property, technology, community and alliances for a jumpstart to value. (Watch this video to learn more.)
- **In our Foundry,** successful ideas scale quickly, with delivery to the target audience and maintenance of the final product.
2. **Prototype.** Rapid ideation and prototyping are at the heart of the continuous innovation cycle. Many different prototypes should be developed concurrently, with the intent on realizing quick value, as well as quickly recognizing when an idea is not viable. The team leverages an iterative process and a common physical space to visualize and co-create digital experiences. Principles of design thinking are used to ensure that the process or experience being digitized connects humans to strategy. A foundational technology toolbox enables accelerated prototyping. (For more on design thinking, see our Cognizanti journal article “How Design Thinking Can Power Creative Problem-Solving, Drive Change and Deliver Value.”)

3. **Pilot and scale.** Pilot projects help the organization gain real-world feedback and ensure readiness to scale through effective orchestration of people, process and technology. Using a “command center” within IT, organizations can oversees multiple digital initiatives at the same time, as well as connect new and legacy technologies, manage business process change and ensure security, privacy and compliance.

To ensure relevance in the digital future, institutions and their technology leaders must employ a three-step approach like this that is built around a suite of advanced SMAC tools. This approach will also help organizations avoid being locked into long-term technology roadmaps that quickly lose relevance in a fast-paced world of technology change.

**Moving Forward: A 100-Day Plan for Innovation**

Institutions of higher education can follow a three-step, 100-day plan for enabling continuous innovation:

1. **Think big (30 days).** Create a cross-disciplinary and cross-departmental innovation group, with representatives from technology, marketing, student affairs, product development, faculty, academic affairs and administration. Examine your existing technology infrastructure, asking questions such as whether it is future-proof; whether it can expand to any channel, anywhere; and whether it uses sufficient digital security controls. Then, gather insights about students and their ecosystem. Identify the types of experiences that will make their learning more seamless. Target digital enablers that will reduce organizational overhead and improve efficiencies.

2. **Start small (30 days).** Hold workshops in which the learnings from the “think big” phase are shared. Pick a target, such as a student group or a particular interaction, to focus on the greatest need and potential reward. Possible groups could include students, regulators and internal departments. Work with your organization’s innovation group to find three to five ways to address student needs.

3. **Fail fast (40 days).** Design each of the solution concepts iteratively until one is selected as the most promising. Create the minimum prototype needed to test the concept with a select portion of the target audience. Identify the tools needed to build the prototype and deploy the pilot. Once you are finished, repeat the process.
An Ongoing Cycle of Innovation

The impact of digital transformation on education will be more profound than in most other sectors, as learning is a fundamental human activity. Digital is helping educational institutions not only run more efficiently but also differentiate themselves from the rest of the pack. While it is difficult to predict which products and services will be most successful, it is certain that the pace of change will be fast, and the cost of missing out on technological innovation is irrevocable.

Today’s digitally-savvy students will seek the most effective and engaging educational solutions. Thanks to the pace set by digital giants such as Apple, Google and Amazon, students’ expectations will continue to grow with each innovation wave.

To thrive, institutions must optimize operations and abandon long planning cycles and technology roadmaps. Instead, they need to leverage fast prototyping, testing and implementation to develop critical capabilities and deliver them into the hands – and onto the devices – of students, before they move to an educational provider that fulfills their digital needs.

Footnotes
10 For more on Code Halos, see our book and white paper, http://www.cognizant.com/code-halos?gclid=CP2twLXvxlMgCFQsXHw0dp04G_g.

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