THE CIO AGENDA FOR A DECADE OF CONVERGING CURVES (PLUS CLIFFS AND CLOUDS)

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The decade that began on January 1, 2020, signals the convergence of clear and foreseeable contextual, economic, and technological trends that will affect each of the 4,298 colleges and universities that compose the US higher education industry.¹

The effects of these trends—both in terms of bold new opportunities and in terms of potential existential challenges—will differ among types of institutions and within types, yet all will be affected in some way.

For those of us in higher education information technology, these trends should spur a broad rethinking of institutional approaches for, and uses of, technology in what will very likely be an increasingly competitive decade. This is an opportunity to advance innovation in what we do, and to realign some of how we do it, if we are to best enable, protect, and extend the noble mission of education, research, and service that has long defined the purpose of the academy.

Trends as Converging Curves
The trends include contextual, economic, and technological shifts that manifest in nonlinear ways as accelerating or decelerating curves when graphed over time. Some curves put pressure on institutional leaders to react; other curves severely constrain the range of possible actions. Some curves have already been widely discussed; other curves have received limited attention. At least ten curves are converging in ways that will present opportunities, pressures, and constraints in relatively short periods of time.
Contextual

1. Evolving Demands for the Institutional Mission. Colleges and universities are navigating shifting public, governmental, student, and parent perceptions regarding the purpose and role of higher education. Should higher education focus more on skills for a first job or more on a broader education for an evolving career? For public institutions, many states are emphasizing higher education as a means of workforce development while states compete to attract and retain employers. States are also increasing the use of performance-based funding models that tie funding to graduation rates, degrees in certain STEM disciplines, and gainful employment indicators. Likewise, public funding increases often are not going directly to institutions; rather, tuition assistance is being made available through institutions to students from lower-income households for use at any in-state institution. This further empowers students as shoppers in a competitive market.

2. Diminishing Public Trust. Overall, we are seeing a decline in the public’s trust in many types of institutions—not only higher education but also religion, government, law enforcement, and some social organizations. Notable factors for this decline regarding higher education include the 2019 “Varsity Blues” admissions scandal, perceptions that the price of higher education is outpacing its value, burgeoning student debt, increased social unrest on campus, lowered opinions of the relevance of the curriculum, and the view that students are being coddled as “snowflakes.”

3. Shifting Student Demographics. Nathan D. Grawe’s widely referenced book Demographics and the Demand for Higher Education (2018) aptly illustrates how we will see a large decline in the number of 18-year-olds later in this decade due to fewer children being born during the last major recession—the result of what the economic forecaster Harry Dent has dubbed “the demographic cliff.” Grawe’s work also outlines how these shifts in “traditional” students (those ages 18 to 21) will vary by regions of the country and will have varied effects on different types of institutions. Likewise, the number of international undergraduate students in US institutions declined in 2019 for the first time in twelve years, and international graduate student enrollment fell for the second year in a row. Counter to these trends, there are accelerating opportunities with nontraditional students who seek educational experiences other than residential, four-year undergraduate degrees.

Economic

4. Accelerating Discounting. The growth in discounting—the gap between published tuition prices and actual revenue received (“net tuition”) via internally funded scholarships—favorably reduces the cost of attendance for some students. Yet the practice has the doubly insidious effect that higher published prices fuel negative public perceptions of rising costs to students whereas in reality, discounting reduces the net tuition available to fund the internal work of teaching and student services.

5. Changing Financial Outlook. In 2018, Moody’s Investor Service downgraded the higher education sector to “negative outlook” for financial stability. Analysts cited factors such as costs growing faster than revenue, discounting, and shifting demographics. In late 2019, Moody’s raised its outlook to “stable” but with many caveats that drew distinctions regarding the likely effects of the curves on varied types of institutions. S&P Global Ratings again reported a negative outlook for the third consecutive year. These ratings could mean higher interest and operational costs for those institutions that borrow to finance construction or other large initiatives. Thus, many colleges and universities are increasingly turning to public-private partnerships to outsource and thus avoid using their own capital.

6. Expanding Substitutes. Coding camps, corporate training, and degrees from
mega online institutions are offering learners in every location more alternatives for acquiring an education and developing job skills. These increasingly convenient forms of education extend new opportunities for nontraditional students who benefit from a favorable price and a shorter time to completion. Some employers are developing direct, employer-paid education benefits for these services.

**Technological**

7. **Growing Cloud Subscriptions.** Software-as-a-Service (SaaS) and Infrastructure-as-a-Service (IaaS) continue to add to recurring costs every year. Collectively, these rent-your-own computing services can represent a faster pace to a solution, but as a bundled software, hardware, and maintenance solution, they can also increase the risk of longer-term supplier lock-in if pricing or service goes awry. The relative ease of acquiring cloud services has also unleashed a proliferation of student, faculty, and departmental subscriptions; greater institutional data fragmentation among bundled providers; service duplication; and higher switching costs among suppliers. Annual price increases that outpace inflation are already rampant, and many of the advanced uses of machine learning and artificial intelligence will increasingly be bundled in these subscription services.

8. **Rising Expectations for Constituents’ Journeys.** Colleges and universities are playing catch-up with consumers’ internet-optimized customer experiences. Students, faculty, staff, parents, and alumni—collectively, higher education’s “constituents”—often encounter fragmented campus services based on a functional specialization by department (e.g., Admissions, Registrar, Bursar, Housing, Advising, Alumni) rather than services that are designed for constituents. Higher education leaders need to rethink how our institutions are organized in order to modernize constituents’ journeys that achieve desirable outcomes.

9. **Atrophying Staff Skills.** The acceleration of cloud-based IT services and optimized constituent journeys reveals a skills gap for many institutions. A wave of Baby Boomer retirements will accelerate the need to both replace and reskill the IT workforce in cloud-based systems that have a greater reliance on configuration and integration through APIs. Conversely, some systems are likely to remain on-premises or even expand, and local skills to evolve and integrate those types of systems may become rarer.

10. **Escalating Cyber Risks and Privacy Regulation.** There is no foreseeable end to the escalating cyber risks and evolving digital privacy expectations that colleges and universities must address. The increased automation of attacks, ransomware, and even assaults by possible state actors already require growing investments in and recurring costs for mitigation efforts including cybersecurity, policy, audit, privacy practices, and cyber resilience.

As those of us in higher education confront these curves, our institutional instincts are to methodically diagnose and react to each of these trends in compartmentalized ways—for example, those in the Admissions Office study changes in student demand and discounting, the CFO worries about overall costs to trim budgets, the CIO investigates trends in vendor software platforms or technical cybersecurity. Committee members spend months or years assessing which varied incremental options may work best as each trend begins to manifest as a problem. The convergence of the curves, however, presents a new kind of challenge to these instincts. It requires bolder, faster, more integrated, and more holistic leadership actions in shorter periods of time. Why?

- *Competition for targeted students will continue to increase very quickly as the supply of higher education (i.e.,*
capacity in seats and enrollments) grows while the demand for higher education (i.e., from traditional students) begins to diminish for some institutions. Aggressive discounting and larger marketing expenditures will accelerate to prop up enrollment numbers, and each of these trends will further reduce the funds available for the institutional mission. Across higher education, innovation in programs and experiences will give students—both traditional and nontraditional—more options to shop residential, blended, and online programs for the best match to their interests in perceived quality, reputation, and net price.

The capital budget for making major investments will be further strained as institutions face a competing set of urgent investments. These will include (a) modernized or new facilities to appeal for both faculty and student recruiting; (b) innovative educational offerings for new courses, certificates, and degrees; (c) brand-building marketing campaigns; and (d) major IT system replacement efforts or process reengineering. Downgraded credit ratings for some colleges and universities will make borrowing more expensive and will add recurring costs to already strained operating budgets.

The “Five Forces” View of Higher Education

One very useful framework for illustrating how multiple forces and trends converge to affect an industry, such as higher education, is Michael Porter’s Five Forces Model. In short, weaker forces enable institutions to easily generate more revenue than their real costs over time. Stronger forces make this difficult or impossible unless institutions achieve a major change in their ability to generate revenue or to operate more efficiently—often much, much more efficiently. Figure 1 shows an adapted version of Porter’s model for higher education.

For some institutions, these forces reveal vast opportunities that are consistent with their mission to expand their educational and research offerings to increase revenue while concurrently achieving greater efficiency in costs. If executed well, that approach can have quite favorable results,
and the larger public universities with strong brands are well positioned to do this. For other institutions, higher cost operations relative to an ability to garner revenue from any source may put their very existence as an independent institution at risk. Robert Witt and Kevin Coyne recently observed: “For the vast majority of private nonprofit colleges, the only route to survival—in any form—will be through the college’s own internal actions to improve its value and efficiency. Those who fail this test will not merge into another institution—they will simply cease to exist.”17

Likewise, Grawe also advocated for an urgency of leadership action ahead of these curves: “The challenges facing higher education are multiple, and most of them will be made more difficult as prospective-student pools shrink in the next decade. Before the brunt of the birth dearth is upon us, now is the time to address the cracks already visible in our practices and financial models. By attending to non-demographic threats, we may just find that the demographic stresses are reduced.”18

As we consider the convergence of these curves and their potential effects, it may feel jarring to view the noble mission of higher education through the economic crassness of a competitive industry. Yet the economic forces that are now converging were unleashed more than a decade ago when the financing of higher education shifted from a historically subsidized public good to an increasingly private good with the attendant behaviors of a marketplace.19

The CIO’s Agenda

These converging curves present opportunities for CIOs and their partners to help reshape their institutions for the decade ahead. In response to increased competition, the change agenda for almost all institutions will be to grow revenue, reduce costs, or both, and each of these actions is highly reliant on improved IT-enabled capabilities. For many CIOs, their institutions need them to work as change agents who assertively reach across the campus to help lead rapid transformation.

The “Proactive with Purpose” Agenda

CIOs who have already established deeper trust and credibility with other campus leaders and important committees have a great opportunity to draw on that trust to drive a “Proactive with Purpose” agenda. This includes three sequenced initiatives:

1. **Aggressively integrate data, and transform it into information for decision support.** Decision makers at all levels need more integrated views of disparate institutional data that is presented in the form of actionable insights. These insights can help make the case for institutional change and improve allocation of scarce resources.20 Many institutions are awash in data in insulated repositories and reports, yet drawing meaning from that data as contextualized information with internal and external trends is often highly laborious, if not impossible. Departmental views that were often created for narrow managerial purposes are an inadequate basis for strategic decision support to plan for and address the converging curves. CIO leadership can rapidly improve the quality of information.21

2. **Clarify and accelerate the pace of IT governance and funding simplification.** Leaders at many institutions may have the information and may know what to do, but the IT governance processes regarding who has input rights and who has decision rights for recurring IT decisions may be unclear, bureaucratic, or dysfunctional.22 As the need for IT services has evolved over forty years, most institutions need to realign the flow of IT funding to better match the services that should be efficiently funded and operated as common-good services for everyone, or institutions need to decide which services will benefit from the additional overhead costs of charge-back models to ration use or allocate precise costs. In short, IT governance with broad input rights in the form of deep relationships across an institution and very narrow decision rights as responsibilities of the CIO and
a few other leaders is best suited to the hastening pace of the decade ahead.

3. Adapt business processes to dramatically improve constituents’ journeys and operational efficiency for a future-ready mindset. The view of the CIO spans many departments. The CIO is uniquely positioned to help lead both improved journeys for constituents and essential operational efficiency. To be effective change agents, CIOs will need to broaden and deepen their understanding of how process improvements can contribute to effectiveness and efficiency. This work spans areas including brand building, marketing, student recruitment, student success, faculty and staff human resources processes, finance, procurement, compliance, alumni engagement. In a 2017 research brief, Peter Weill and Stephanie L. Woerner illustrate the paths that institutions can take to evolve from the traditional “Silos and Spaghetti” quadrant to the “Future-Ready” quadrant. They also outline the problems that arise when either an efficiency or a constituent-facing effectiveness agenda is pursued in isolation. The greatest efficacy over time is through a concurrent, incremental plan that targets both improving operational efficiency and reengineering constituent-facing experiences (see figure 2).

The “Reactive Reality” Agenda

All CIOs find limits in some areas of their institution. Culture, resources, or personality factors may be the cause, but the reality is that the range of possible CIO actions is very constrained. For these situations, CIOs need a “Reactive Reality” agenda, in which narrower, achievable actions can still contribute to navigating the curves:

1. Work through others who are leading change initiatives. When the breadth of the CIO’s vision across an institution cannot be translated into direct institutional action, the best step is to work with and through others who are leading changes. Assess if there are opportunities to make those efforts achieve more than their initial plans for both efficiency and constituents’ experiences.

2. Stop or slow the proliferation of duplicate systems and data fragmentation. When an institution’s weak IT governance approach to systems and processes proliferates duplication and data fragmentation, CIOs can sometimes slow or stop that compounding dysfunction. Tactics include focusing greater attention on already selected and deployed solutions, rallying varied groups to ally and align on a direction, and working with the Procurement Office to invoke a CIO approval step for cloud-service contracts.

3. Know the costs for central IT services and the IT costs for the institution as a whole. Knowing the full costs of IT services helps the CIO make wiser decisions for in- or outsourcing and for opportunities

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**Figure 2. Pathways to a Future-Ready Institution**

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to consolidate for efficiency. Light-weight, activity-based costing exercises for central IT services can yield a world of insight to get beyond political squabbles. Don’t avoid these foundational efforts due to the size of the undertaking; start with basic measures, and enhance them over time to provide insights for campus budgetary discussions. Likewise, work with the Finance and Human Resources Offices to appropriately code other IT costs across the institution to reveal full IT spending. Some institutions may be underinvesting in information technology relative to the opportunities of the converging curves whereas others may be spending too much or inefficiently.

4. **Steer cost-cutting exercises toward improving processes.** As budgets tighten, reach out to partners to improve a process or constituent journey even if the immediate pressure is only for trimming budgets. Initial process-improvement goals are often modestly incremental in their aspiration, but CIOs can press for increased automation to reduce costs through disintermediation of entire processes that are no longer valuable.

5. **Seek a better deal through economies of scale.** The efficiencies in real economies of scale occur when aggregating highly common units of some system or service. Larger institutions can often achieve efficiencies through internal aggregation, and smaller institutions may seek to do so through partnerships. There are no economies of scale in the attempted aggregation of dissimilar units, so standardizing processes and configurations is often an important antecedent to seeking real efficiencies.

**All Agendas**

All agendas must include an accelerated institutional shift to a cyber-resilient mindset that goes beyond our historically successful approaches to cybersecurity. The unending risks of vulnerable technology, human error, and increasingly sophisticated nefarious actors all over the world mean that institutions of all kinds face potentially debilitating risks at an unprecedented pace and scale. Cyber-resilience means getting all of the basics right in technology practices, policy, and behavior and also being able to continue operating during a major cyber event. For many institutions, cyber risks have remained systemically unaddressed; mitigating those risks requires paying new upfront and recurring operational costs in a planned way, rather than a reactionary way to a major incident. Likewise, the troves of institutional data being gathered via numerous sources—from Wi-Fi logs to emerging tracking apps—will require new policies and compliance as privacy concerns grow in the societal and legal domains.

**Questions for Institutional Leaders and Boards**

The efficacy of any CIO agenda to help navigate the decade ahead can be increased or impeded by the actions of other institutional leaders and also governing boards. These groups should assess if an institution’s IT structure and strategy are best positioned to help achieve institutional goals. Many colleges and universities enter the decade with a baseline of inflexible legacy software systems and processes that are departmentally optimized rather than constituent-journey optimized—the “Silos and Spaghetti” quadrant of figure 2. They face mounting cyber risks and a growing operational budget for critical IT services, without an aspirational goal that targets a strategic purpose. As noted by Weill and Woerner, the path to future-ready institutions is not easy. Also difficult to achieve is cultural change in the operations of institutions as they seek to innovate in academic programs, find new delivery methods for both residential and online components, and grow research efforts (for research
institutions). In most cases, the lead time for substantial change is one to three years.

Boards and campus leaders should work with their CIO—and with the aid of consultants when necessary—to ask and answer the following questions:

- Are our choices for information technology—including its costs and efficacy—aligned with the institutional strategy and needs for the next five years?
- Do we have a clear understanding of our total IT footprint for the institution, encompassing all schools and departments, in terms of costs and risks?
- How did our IT spending change over the last decade and over the most recent five years, what did we learn, and what do we wish we might have done differently?
- Do we have the right IT roles and leadership for the decade ahead?
- Do we have sufficient scale in our IT systems to operate at efficient costs?

Many of the changes for the decade ahead require navigating institutional politics, authority, and change-tolerance culture. Each of these may require exceptional support from board members and campus leaders if urgency is required.

All institutional leaders should also assess where the curves provide new opportunities. Colleges and universities may have prime opportunities to grow in some or all aspects of their educational offerings, being constrained only by the pace at which they can add internal capacity in faculty, housing, and services. Other institutions may see niche areas where their excellence can help command strong interest from students and also low discounting. Still others may find opportunities for cost efficiencies through internal consolidation or even multi-institutional mergers. 26

“Act Decisively”

Depending on one’s point of view, colleges and universities have proven to be either remarkably adaptive to changes over the centuries or stubbornly recalcitrant to adapt. The longevity of colleges and universities affirms that institutions have been adaptive, yet the decade ahead portends the challenge of converging curves that will test the faculty, administrative leaders, and governing boards in unprecedented ways. Some institutions will grow, some will merge, and others will exit.

Grawe adds a timely insight for the early years ahead: “In a recent conversation about potential threats to higher education, W. Joseph King, president of Lyon College and an author of How to Run a College, made an astute observation about today’s environment. When you see the lowest birthrate ever recorded, he said, the challenges of demographic change are simply a reality that all colleges are going to need to face. ‘But,’ he added, ‘it’s not just the demographics.’ In other words, as important as demographic forces will be in coming years, colleges must act decisively to control the many things that are within their power.” 102

The role of the CIO as an essential leader and partner has never been more important or more urgent as institutions adapt to the converging curves. Effective uses of information technology will be part of almost every action, and opportunities abound to help higher education institutions recruit and retain students, operate more efficiently, and innovate in our core mission of education and research. 3

Notes

27. Grawe, “The Enrollment Crash.”

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