

The Tower, the Cloud, and the IT Leader and Workforce¹

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Higher education technology leadership is in the midst of a changing of the guard. Many of the community's pioneers have either retired or will retire shortly. These individuals were often their institutions' first or second senior information technology (IT) leader. They presided over the development of both the technological and organizational foundations on which higher education IT rests. Findings of the IT leadership and workforce study conducted by the EDUCAUSE Center for Applied Research (ECAR) in 2007–2008 indicate that the role will be in equally good hands as it passes to the next generation.

The survey on which the ECAR study was based found many of the ingredients for success among respondents. Leaders and aspirants alike hold advanced degrees, exhibit positive leadership styles, and share with their predecessors a commitment to higher education. No doubt as individuals and as a community they will bring new perspectives and ideas born from their unique experiences and the changing world in which they work.

But how will the CIO role that the next generation occupies be different? More specifically, will it be diminished in its authority and importance? *IT Leadership in Higher Education: The Condition of the Community*, a 2004 ECAR study,² looked back on the most recent generation of IT leaders as having led higher education through an amazing set of transitions. In a relatively short period of time, leaders helped to create the modern Internet and initiated an explosion of communication, collaboration, and access to information that today's students take for granted. That study discussed how these leaders ushered in a new era of computing that has touched all aspects of higher education.

Will we look back on that time as the golden era for IT leaders? Despite the many positive signs that respondents reported in 2004, the study raised a cautionary question as to whether we were headed for a period of decline. In 2003, an article in *CIO Magazine* spoke of the "incredible shrinking CIO" whose resources were being cut, influence being diminished, and organization being eroded by outsourcing.³ In 2004,

these issues were seen as warning signs on the horizon, but it was not clear whether they were by-products of a cyclical downturn in the economy, a knee-jerk reaction to the “irrational exuberance” for technology created by the dot-com boom, or something more permanent.

From Prophets to Plumbers

Today, questions about the future of the IT leader’s role are being drawn with even sharper distinction than in 2003. The discussion has moved beyond whether declining finances or the unrealized promises of the past will diminish the role of the CIO, focusing instead on how technology change itself will alter what it means to be a CIO. The rise of “cloud computing” in the minds of some will completely alter how organizations deliver IT services. In theory, organizations will be able to reach into the Internet cloud to access all of their computing services, from basic storage to more advanced functions such as computational computing and advanced business applications. Evidence of the cloud can be seen on campuses today. Institutions are turning to Google or Microsoft to provide e-mail. Others are using software as service models from vendors such as Salesforce.com as part of their administrative applications. Some are even looking at the possibility of buying computing cycles or storage on demand from external providers such as Amazon.

Rise of the Cloud

In the view of some and taken to the extreme, the potential of the cloud is to completely supplant the need for an IT organization or at the very least radically alter its role. Perhaps the most outspoken proponent of this vision of the future is Nicholas Carr. In 2003 Carr grabbed attention with his article “IT Doesn’t Matter.”⁴ In it, Carr argued that technology was becoming so commoditized that it no longer served as a source of competitive differentiation. By extension, Carr argued that a CIO was therefore the manager of commodity technologies and less important to his or her organization’s future success. Technology was a necessary evil, not a source of distinction. More recently, Carr has further evolved his argument to suggest that not even this commodity role will last for much longer. In his latest book, *The Big Switch: Rewiring the World from Edison to Google*, Carr equates the rising computing cloud to mass electrification. He foresees a world in which mass data centers and high-speed networks render obsolete the technical infrastructures of individual organizations. He says, “In the long run, the IT department is unlikely to survive, at least not

in its familiar form. It will have little left to do once the bulk of business computing shifts out of private data centers and into the cloud.”⁵

Where will the CIO be left in Carr’s vision of the future? Not in a very exciting place. Those who share his view of the future seem to suggest that the Internet cloud will shift services outside the institution and shift power from central IT groups to individuals and departments. No longer will institutions need to create organizations to broker technology services on their behalf. Rather, each department or individual will be able to turn to the cloud to assemble the services they need.

Whither CIO Influence?

From Carr’s point of view, the CIO is either headed to the backroom to manage commodity infrastructure or will be responsible for overseeing the transition of that infrastructure to the Internet cloud. What would be left is a hollowed organization and a role that concerns itself with information security, local technical support (which also could be outsourced), and a small number of new innovation services that have not been adopted by the cloud.

Carr certainly offers a provocative view of the future. And his expectations about the ability of the Internet to enable the aggregation of commodity IT services may be dead-on. But does it have to necessitate the demise in importance of the CIO and the IT organization? Being freed of the need to continuously invest and operate commodity services may be incredibly liberating for CIOs and offer a completely different way to conceive of their roles.

Could the rise of the cloud in fact enhance the influence of the CIO? Might a new breed of CIOs be able to shift the conversation from the provisioning of technology services back to how their institution can take advantage of technology? In fact, a 2007 survey of corporate CIOs by the IBM Center for CIO Leadership suggested that CIOs believe their influence in the corporate sector is on the upswing.⁶ The survey revealed several promising results, including these:

- 80 percent of CIOs believe they are valued members of the senior leadership team;
- 69 percent reported significant involvement in strategic decision making; and
- 86 percent of respondents believe their industry leaders are using IT to a large or great extent to create competitive advantage.

According to the survey report, respondents reported greater confidence in their influence and strategic importance in 2007 than they had in the prior year.⁷

Among respondents to ECAR's IT leadership and workforce survey, the majority of senior-most IT leaders also reported relatively positive assessments of their influence. The findings showed that:

- 74.1 percent were engaged often in discussing the IT implications of institutional decisions;
- 62.6 percent participated often in decisions related to the administrative directions of the institution; and
- 69.2 percent participated at least sometimes in decisions pertaining to the academic direction of the institution, including 36.2 percent who participated often.⁸

Organizationally, many respondents were in positions that provided them access and authority to influence broad decision making. In this ECAR survey, 47.8 percent of the senior-most IT leaders were members of the president's or chancellor's cabinet at their institution. In the 2004 ECAR study, 50.6 percent of respondents were members of the president's cabinet; thus, it appears that the organizational authority of the senior IT leader in higher education has neither diminished nor expanded in the past four years. It is possible, however, that the number of senior-most IT leaders with cabinet membership has reached the high-water mark in higher education.

Carr's view envisions that the cloud will have a dramatic and uniform impact on IT organizations, but inevitably there will be variations in adoption of the cloud among higher education institutions. Institutions will likely move services to the cloud at varying paces depending on their resources, their strategy, and the uniformity of their requirements. It seems likely that institutions with smaller IT organizations will gravitate toward the cloud to take advantage of the economies of scale and increased capabilities that vendors can offer in service areas that the IT organizations themselves cannot match. On the other hand, institutions with diverse user requirements and larger resource bases will likely embrace cloud services in more opportunistic and targeted manners. They may move services to the cloud for a portion of the population they serve, but continue to operate the same service themselves for another constituent group. Or, they may only embrace the cloud in areas that free up resources that can move quickly into offering a new, more strategic service. Still other, likely large IT groups may try to become the cloud themselves. They may choose to leverage the same technologies and economics to offer services to other campuses.

The overall point here is that institutions are likely to fall along a broad continuum of adoption practices. It seems unlikely that there will be rapid, dramatic movements of services outside of the IT organization.

Rather than preside over the inevitable transition of their organizations to the cloud, it seems that CIOs will have much to say and do to determine where and how best to capitalize on its potential.

Perhaps the closest analogy is the library. The library in the higher education community has long provisioned library services in a variety of ways. Nearly all libraries, for example, have forsworn cataloging services in favor of centralized services that provide scale and scope economies. Nearly all libraries acquire digital serials and other periodical publications under license from commercial suppliers. Nearly all libraries participate in the shared service of interlibrary loan and in a variety of open source and open content initiatives. Still others have partnered with Google or others to render their collections digital. Under the range of options that present themselves in this richly interconnected environment, academic libraries are simultaneously seeking scale and differentiation, serving their communities by becoming either large repositories of print holdings, hybrids, or deft consumers of materials licensed from others.

Some Alternative Conceptualizations of the Role

To ignore Carr's predictions would be unwise. The long-term potential to completely transform the set of services that IT organizations provide is very real. Financial pressures alone are likely to lead many IT organizations to turn services over to the cloud out of necessity. Shortages in the labor market may be another driver. However, this need not signal the demise of the CIO role in importance or influence. As described earlier, IT organizations will likely make a range of choices regarding their pace of adoption of the outsourcing of IT services. Most organizations are likely to end up with a mosaic of sources for their services including internally provided, externally provided, and collaboratively provided (for example, open source) models.

On the other hand, the movement of services to the cloud is a force for change. Many of the services that are the likely candidates for this form of outsourcing (e-mail, storage, data centers, application software) are the "meat and potatoes" of what IT organizations do today. Many IT leaders derive their power, authority, and seat at the table from their responsibility for the budgets and staffing that deliver these services. While the outsourcing of these services does not have to mean the diminishment of importance of the CIO, it will introduce significant change. If CIOs are not proactive in defining new roles, sources of influence, and authority, it could lead to the eventual hollowing of the job that Carr and others have predicted.

The CIO who performs the role well is much more than manager of the central IT organization. He or she wears several other hats including strategic adviser to institutional leadership, technology consultant to academic and administrative departments, advocate for technology and technology adoption, risk manager, and steward of the institution's information assets. The potential is there for CIOs to stake out new roles and sources of influence. However, these changes will challenge CIOs to think and prepare differently to define these new roles and will challenge institutions to be open to accepting them. The possible added or enhanced dimensions of the role are described next.

Services Architect

The rise of the cloud may diminish the set of traditional services that an institution's IT organization must provide on its own. However, it also presents that institution with a more complex set of options to weigh. Increasingly, choices for provisioning technology services are not limited to a binary decision of make or buy. In fact, there is a more complex set of sourcing options that includes make, buy, collaborate, consolidate, or eliminate the service altogether.

We see this complexity playing out in the area of e-mail. After many years of facing rather simple choices of first building their own e-mail or implementing a commercially vended package, institutions now have broader options to sort through. The historical make-or-buy choice is still there. In addition, institutions can also choose to outsource to a provider such as Google, but continue to act as the intermediary arranging for the provision of the service. Or, they can choose to step aside completely and enable each individual student or faculty member to choose their own e-mail provider. Some still face the challenge of weighing whether there should be one uniform approach to the service (consolidate) or if parts of the institution should be able to elect their own service solution. Each option brings with it a complex set of pros and cons that must be weighed from multiple perspectives. The CIO and by extension the IT leadership team should be both the conveners of and major contributors to these discussions.

Complex services-sourcing options are increasingly available for each discrete technology service. The fluid nature of the environment also suggests that the decisions may not have terribly long shelf lives. Increasingly, the role of the CIO will be to proactively identify the sourcing options for various services and to be the convener of the appropriate stakeholders to weigh the options. The CIO of the future will also

need to be the convener and orchestrator of a more complex set of governance practices and relationships. Historically, IT governance has been mainly focused internally. With increasing numbers of services provided by the cloud, governance will have to extend to include the providers of these outside services, whether they are corporations, consortia, or multi-institutional collaborations. CIOs may find themselves at the nexus of interwoven governance structures. In fact, the ability to convene, facilitate, and manage these internal and external relationships may replace control over dollars as the source of CIO power in the future.

Data Evangelist

Most institutions are only scratching the surface when it comes to leveraging their data to improve decision making.⁹ Technology is rarely the limiting force. Rather, the challenge is to create a culture that demands analysis and requires evidence to support decision making. It requires leaders who ask for data and staff who are skilled at analysis. As institutions face increasing external pressure to measure outcomes and increasingly competitive markets for resources, their appetite for analysis will likely increase. CIOs are well positioned to be the bridge between the technology, the data, and the decision makers within the institution.

The CIO and his or her staff can work in the cabinet room to demonstrate to the leadership the potential to use data. They can also work across the organization to forge alliances with administrative units that are already inclined toward analysis such as institutional research, admissions, or the registrar. CIOs can jointly sponsor proof-of-concept projects that raise the visibility of analytical decision making. They can develop capabilities within their own organization to design metrics and measurement systems at the process, unit, and organizational levels. In fact, analytical design or strategic measurement consulting could become a new service line within some IT organizations.

CIOs must also be leaders at their institutions in conversations about the preservation and protection of data. Information security is just one important part of this role. The CIO is also uniquely positioned to educate the campus about the need for effective data governance including policies to define access rights, processes to preserve common definitions of data, and mechanisms to improve the accuracy of data at the point of capture. The CIO is also the natural leader of initiatives to design and implement technologies and processes that enable the ongoing integration of data across multiple applications and application providers.

The CIO and the IT organization will not be the only potential source of leadership in this area. The library, institutional research, and planning offices are all important stakeholders as well, and rivalry and competition for leadership among these officers and the CIO are inevitable. The topic is broad enough to accommodate multiple leaders, each of whom brings the unique expertise of his or her own organization to the conversation. Many CIOs are already accustomed to leading by influence in areas in which they have little or shared direct authority (for example, shared governance of administrative systems). The data evangelist role is another opportunity for CIOs to gain stature and authority by serving as conveners and facilitators who work effectively across the organization.

Innovation Incubator

The development of the web has no doubt placed more technology and information directly in the hands of individuals. The barriers to technological innovation keep lowering, and individuals need to turn less often to professional IT groups to help them develop solutions. Research labs, individual faculty, and staff have access to comparatively powerful technology tools that enable them to innovate.

As innovation capacity spreads throughout the institution, it presents the central IT organization and the CIO with difficult choices. Does the CIO try to hold back the innovators in order to control risk and the costs and complexity of technology support? Does the CIO take a hands-off approach and hope that a thousand flowers will bloom and the institution will see a return on the multitude of investments made by individual innovators? Or, is there a way that the CIO can influence and support innovation to the benefit of both institution and individual?

These are challenging questions and each CIO will need to find the right balance for his or her institution. However, the solution is not likely to be found at either of the extremes. Clamping down on innovation is unrealistic and counterproductive. Allowing anyone to do anything is too risky and costly an approach for any responsible CIO to take.

One conceptual model that may be useful to adopt is that of the business incubators. Although most incubators of the 1990s failed to live up to the unrealistic expectations placed on them as sources of new business and economic development, they succeeded as physical and virtual places where ideas, money, and expertise were brought together to further an innovation. Rather than build physical business incubators, however, CIOs can embrace the incubator concept of convener of the ingredients of innovation.

For example, a CIO and the IT organization can position themselves as resources that enable individuals to experiment with technology. The IT group can work with academic leadership to provide seed grants, equipment, and technical expertise to support individuals experimenting with new ways to use technologies in areas that are important to the institution. Much like a small business incubator advises and coaches entrepreneurs, they can support and influence individual technology innovators. The CIO role could evolve to be like that of a venture capitalist who makes connections among innovators, helps to secure resources, and works on behalf of the institution to find and promulgate the most successful experiments.

Process Architect

It is quite possible that developments such as software as a service (SaaS) will increasingly remove the IT organization from the day-to-day operations of administrative systems. To the extent this does occur, IT organizations should respond like any other business that sees a portion of its operation become commoditized. CIOs must respond by shifting resources to other activities that deliver higher levels of value to the institution. For example, SaaS may make applying updates to software a commodity service best done outside of the institution. However, configuring business processes to leverage the capabilities of technology to best support the needs of the institution is a unique and valued service that IT groups can move into. Few institutions have expertise in this area and even fewer have designated a senior leadership position to worry about the effective design and deployment of processes.

CIOs can position themselves and their organization to fill this void. This is not to suggest that the IT organization would dictate to financial or student services groups how to conduct their business. Rather, the opportunity would be to create a collaborative service that specializes in the analysis of processes to find opportunities to make the best use of technology. These services can be delivered in the context of technology implementation projects or as part of ongoing improvements to leverage already acquired technology. The CIO can become the primary spokesperson to the campus on how to build the capacity to measure and improve processes across the institution.

Some CIOs may be understandably reluctant to take on this role. As a community, IT leaders have appropriately pointed out the need for functional managers to take more ownership for their systems and processes. Perhaps the time has come to alter that approach. Is it sufficient

to call on functional owners of processes to improve? Or, might more progress be made if IT organizations refocus a portion of their capabilities to facilitate these improvements? At the end of the day, the lack of process change or the inability to maximize benefits from technology inevitably becomes the CIO's issue. Process shortcomings erode confidence in the value of technology and make it that much harder to build support for the next investment.

Orchestrator

Closely related to the role of process architect is the role of services orchestrator. More than ever, tomorrow's higher education IT leader will need to translate an architecture into a legal, technical, and service web that appears to all as an integrated whole. And the creation of a holistic presence must, of course, convey—in a virtual context—the sense of place and self-conception the institution wishes to manifest. This will be extraordinarily difficult. The core skills of tomorrow's IT leaders in this guise will be:

A sourcer of services. This role will include the crafting of a sourcing strategy; the identification, integration, and testing of services to be acquired; the negotiation of license terms; and the establishment of service level agreements and performance standards and liabilities.

An integrator of systems. While the promise of standards-based architectures suggests that some day software will “snap” together, the reality of this promise remains far in the distance. Today's CIO struggles with the rising complexity of large heterogeneous hardware and software that need to interoperate seamlessly while producing transaction logs and other trails that are both transparent and repeatable. This complexity is only likely to increase in the near term as CIOs of the future strive to integrate vended solutions with homegrown solutions and with open source solutions, and so forth. Integration and coordination tasks will for some get even more complex as some IT leaders attempt to achieve advantage by sourcing labor in other locations, including abroad. In such cases, orchestration of time zones, intellectual property laws, national laws governing privacy, access, and e-discovery, and other issues will add to the challenge.

A brand manager. While formal responsibility for managing the college or university's image rests typically with a public affairs organization, the CIO today and increasingly in the future will have a great deal of influence over how the institution is positioned in the cloud. While the institution's cyber presence will likely embody software, services, and processes that have been sourced, distinguished, and integrated “at home,” that presence must appear to the user to have a consistency and feel that says: “Oh, I am

now at UC Berkeley.” In addition, the evolution of the cloud means that the college and university will need to extend its presence into the cloud. Increasingly, for example, higher education institutions are establishing beachheads in Facebook, MySpace, YouTube, and other places where students and prospective students are found. The task of managing that presence in ways that complement the myriad strategies for managing an institution’s presence in bricks and mortar will be daunting.

Information Policy Manager

The promise of the Internet cloud hinges on the proposition that technology is becoming a utility that—like many commodities—can be produced more effectively when aggregated at scale. Moving services outside of the institution enables a shift from managing technology to managing information. Discussion about the data evangelist role already advanced some of these arguments and suggested an opportunity for CIOs to become a leading voice for the use and stewardship of data at their institutions. The information management role extends that argument into the realm of information policy and strategy.

The increased presence of the institution and its individual faculty and staff on the web introduces a broad spectrum of policy issues. The definition and protection of intellectual property rights, the conduct of members of the campus community in cyberspace, and management of the institution’s brand and image on the web are just a few examples. As the institution’s intellectual property goes digital, it also creates a new realm of policies and procedures that must be developed around access rights and privacy. The CIO must be prepared to lead and participate in the policy discussions that will govern this new world of interconnectedness.

From a strategic perspective, the institution must make decisions about its presence on the web. Colleges and universities are very protective of their reputation (with good reason) in the physical world. The world of the web offers much less ability to control image and brand. When any individual can create a video of an event (positive or negative) on campus and put it on the web for all to see, it changes the extent to which any institution can manage its message and control the flow of information. Institutions must be prepared to think about how they can use the tools of Web 2.0 to defend and enhance their images even while these very same tools could be used by individuals to the detriment of the institution.

Institutions must also make decisions about how to invest in their own web presence. What is the value of an institutional island in Second Life? Do alumni want to subscribe to a portal provided by their alma mater?

These are obviously issues that are much broader than technology adoption decisions. But because the CIO will have deep knowledge of how the technology is being used, she or he will have the opportunity to become a part of these strategic discussions.

Proactive Strategist

IT leaders and researchers have long spoken of the need to align technology projects and priorities with institutional strategies and priorities. Alignment is clearly important, but is it enough? University of Wisconsin–Milwaukee Chief Information Officer Bruce Maas argues that “the alignment concept is long outdated as it implies passivity. CIOs need to be proactive and help identify how to help the university respond with technology to reach its markets and provide more effective business processes. The CIO has the opportunity to work with the president and provost to really dig in and find solutions.” The payback, according to Maas, is a change in perception of how IT contributes: “IT has been characterized as a utility, but it is not a utility only. It is better to think of IT and treat it as an investment opportunity that creates innovation.”¹⁰

Contributing more proactively to strategy will be more easily accomplished in some institutions than in others. Institutions differ in their degree of openness to thinking about technology as a strategic asset or the access they provide the senior IT leader to strategic decision making. However, it is likely that everyone can make more progress toward the repositioning of IT as an investment opportunity. Maas’s challenge is also not an invitation to overpromise the benefits of technology as a transformative force. The path from being viewed as a cost center to an area that yields benefit in return for investment is likely through the accomplishment of numerous small demonstration projects rather than overly ambitious claims.

In some institutions the opportunity to contribute to strategy will be a top-down one for the CIO. He or she will have entree to the upper echelon of the institution and will be able to contribute to strategic discussions alongside other institutional academic and administrative leaders. In fact, CIOs may experience the locus of the discussion shifting toward their involvement as institutions try to make meaning of Web 2.0 phenomena and changing student expectations.

For others, the opportunity will lie in developing richer partnerships with individual units. Presenting to an organization ideas to further fundraising success through data mining or partnering with a dean to improve retention by embedding technology in the advising process are equally

valid ways to demonstrate the strategic value of technology. Becoming an indispensable partner to more and more members of the administration will transform IT and the CIO into strategic assets to the institution.

Getting from Here to There

Many of the potential areas of new responsibility described envision the CIO more in the position of influencer than chief. While it would be naïve to think that there is not some level of risk of loss of stature in this transition, the findings of the ECAR IT leadership and workforce study suggest that for many, trying to hold onto direct control over many aspects of technology and its application is a losing proposition. In the future, it is likely that CIOs will increasingly gather power, authority, and stature from their ability to be agile, knowledgeable conveners of stakeholders around a host of issues related to the application and management of technology. It is growing less and less likely that CIOs will be granted seats at the leadership table merely by virtue of running a large organization. This will challenge CIOs to develop different and better relationship-management skills and broader knowledge of the academy. It will challenge the institution to acknowledge, reward, and empower leaders who contribute as much through their ability to influence as through direct command and control.

Interestingly, corporate CIOs appear to be moving in the direction of creating value through influence. In the IBM Center for CIO Leadership's 2007 CIO survey, 53 percent of respondents considered "promoting collaboration between IT and lines of business" to be their highest priority. Further, only 15 percent of the respondents thought their organizations were good at it today.¹¹ Perhaps higher education can emulate what corporations are doing and move the relationship between central IT organizations and colleges and administrative divisions to a higher plane. Rather than seeing their capital consumed in wrestling for control over commodity IT services, CIOs can instead go over the local IT organization to find ways to directly contribute to the strategic agenda of the dean. The political capital and trust gained through such relationships will no doubt make it much easier to rationalize service delivery models and achieve greater influence over decentralized IT spending.

Achieving these somewhat idealized conceptualizations of the CIO role will not be easy. There are many hurdles to be overcome. Time is one obvious problem. The time and energy of most CIOs are easily consumed with concerns of execution: managing projects, fighting service crises, and sustaining the reliability of the infrastructure—all the more reason to look

carefully at opportunities to shed some commodity services as the cloud matures. Similarly, CIOs need to find leverage in their own organization. The only way to have the time to focus on the more strategic agenda is to develop trusted lieutenants who can contribute to both the day-to-day operations and the strategic agenda.

Skills themselves are another potential hurdle. While many respondents professed proficiency in critical skill areas such as influence, negotiation, and communication, that is largely in relation to what today's CIO job requires. The roles described above require CIOs to exert considerable influence through their powers of persuasion and the strengths of their relationships. CIOs will likely need to take their communication skills and their ability to manage internal relationships to even higher levels of proficiency. Likewise, skill areas that were evaluated by respondents as areas of relatively less proficiency, such as managing external relationships, will become even more important in the future. If the CIO is to become the services architect of the future, she or he will need to become skilled in evaluating and managing collaborations with corporations and other institutions.

The CIO will also need to take steps to build new capabilities within the IT organization. To fully realize the roles of data evangelist or process architect, the IT leader will need to be backed up by organizational capabilities. As IT organizations find opportunities to transfer commodity services to the cloud, they will need deliberate people strategies to transform the skills of existing staff or add new staff in these emerging service areas.

Relationships will be critical to the ongoing transformation of the CIO's role. As described in the preceding section, CIOs will rarely obtain mandates to play these roles. Just as their predecessors were pioneers who had to establish the initial contours of the CIO role, the next generation of leaders will have to lead the refinement and extension of the role. IT leaders will need to nurture relationships at all levels and with all parts of the institution. They will need to be conversant in the strategic issues confronting a diverse set of organizational areas. They will need to build trust that encourages other units to invite them into their inner planning discussions. In particular, because of the evolving role of the IT leader, the proximity and importance of some relationships are likely to shift. As the skills and demands of IT leadership shift toward contract administration, services orchestration, architecting, and so forth, the new best friends of the CIO may be found in unlikely spots. Such future friends include the general counsel, risk manager, institutional auditor, librarian, and chief research officer.

The Workforce

The preceding section, which described a reconceptualization of the role of the CIO, could have just as easily been describing new roles for the entire IT leadership team. The impact of cloud computing on the skill sets required of IT leaders will not be limited to just the CIO. The potential new roles for the CIO in many cases represent new or extended lines of service for the IT organization as well. The transition to this new model of IT and IT leadership may evolve incrementally, but it will transform the skill mix required in the entire organization.

New IT Worker Skill Sets Needed

To move IT organizations into some of the areas described above will require not only strong technical staff, but also staff with excellent communication and political skills. More staff will be required who are skilled at process analysis, group facilitation, data analysis, and data management. New professional positions that focus on these skill sets may need to be created in IT organizations. Such positions, in fact, likely exist already in some organizations in their project management offices or in business analyst groups.

As these new skill sets are emphasized, there will be a congruent diminishment in importance within the IT organization for other skill sets. As the cloud realizes its full potential, IT organizations will have a diminished need for staff to manage servers, databases, and perhaps some applications.

As the role of the CIO changes, so will the role of managers and directors. Whether they aspire to be CIOs or would prefer to remain as leaders of specialty areas within IT, they too will need to evolve their skills. It seems likely the future will place a premium on leaders who demonstrate understanding of the broader institution, are skilled at managing internal and external relationships, and are skilled at articulating as well as demonstrating how technology can be applied to address higher education's most strategic needs. What those needs are will evolve over time, but if staff are looking for some places to bet their careers, there are several promising candidates. It seems inevitable that institutions will continue to need specialists who can work with faculty to integrate technology and learning. Likewise, the management of data for research or institutional decision making seems promising. For leaders with more technical interests, integration and architecture seem likely to be high-demand areas as well. The cloud may remove the need for the IT organization to provide some services, but the institution will still expect

someone (the IT group) to be able to blend these disparate systems and services into a cohesive user experience. Gazing deeply into a crystal ball, one might foresee the rise of specialists in cyber marketing. These might be individuals with expertise in plotting how institutions position themselves in virtual worlds.

Will There Be a Shortage of IT Workers?

While we manage this transition in the composition of the IT organization, will we also be experiencing a shortage of skilled IT workers? The data examined as part of the ECAR leadership and workforce research were inconclusive. Demographic projections suggest that the size of the population leaving the workforce due to retirement will be larger than the number of workers coming in to replace them. Further, there has been a reported decline in the numbers of individuals who have pursued degrees in areas such as computer science that often have provided the supply of skilled IT workers. However, other factors play into determining whether we will indeed face an absolute shortage in numbers of skilled workers. A prolonged slowdown in economic growth could mute some of the demand for labor. A decision by baby boomers to defer retirement out of necessity or preference could also mute the impact of the projected shortage of workers.

Among the senior-most IT leaders surveyed in the ECAR study, the majority were concerned that higher education would see a shortage of skilled IT workers and that their institutions would face significant challenges recruiting adequate numbers of skilled IT staff. In light of this concern, it seems prudent that CIOs take steps to prepare for a possible shortage of skilled workers or at the very least a more competitive labor market. To do so requires a much more focused and deliberate commitment to a series of people-management strategies targeted at recruiting, retention, and productivity.

First, institutions need to decide what they are selling to prospective recruits. It is likely no longer realistic or practical to compete against the compensation advantages held by the corporate sector by promising that higher education offers less pressure, reduced work hours, and an idyllic campus setting. Too many of our staffs now work long hours, feel the pressure of major projects and growing workloads, and have been moved to office space off the main campus to make this claim. Higher education needs to identify and capitalize on other areas of potential competitive advantages. The opportunity to stay within the employee's preferred geographic location could be

one important factor. Certainly, at most institutions you can build your career without fear of being transferred from the New York to the Hong Kong office (although some institutions' globalization strategies may change this, too). The relatively smaller nature of some higher education IT organizations may provide them with an opportunity to offer staff environments in which they can take on broader responsibilities and accelerate their career growth.

Sharpening the recruiting message needs to be coupled with a strengthened infrastructure to source talent. More competitive labor markets will require more thoughtful strategies to find the best candidates, in some cases before they are needed. Using the alumni network as a source of candidate referrals and more formally cultivating students as future employees are two strategies that are within reach of most IT organizations. Hiring dedicated IT recruiters to maintain a list of potential job applicants and to help manage the recruiting process is another.

To aid both recruitment and retention, higher education IT organizations must pay more attention to developing career paths for their staffs that tie together growth in skills and growth in compensation. The lack of sufficient career-path and skill-building opportunities seemed to be an area of concern for some of the respondents to the ECAR IT leadership and workforce survey. Those who were less satisfied with career-path and skill-building opportunities reported that they were more likely to leave their current institutions in the near future (less than five years). The study suggests that business continuity planning seems to be spurring a focus on developing succession plans and career paths that focus on building skills several layers down into the organization. This is a positive development that would benefit all institutions. Perhaps the dual pressures of business continuity planning and the possibility of a labor shortage can become twin forces that enable CIOs and human resources leaders to work collaboratively on programs that define multiple career paths for IT professionals and encourage experimentation with compensation programs that reward skill building as well as promotion.

Higher education IT can also become a leader at adopting strategies such as job sharing or flex time to make it easier for staff to balance work and life. A willingness to experiment with these strategies could help mitigate the disadvantage of lower compensation. There also seems to be a potential intersection between "green" initiatives such as telecommuting and strategies to provide flexible work arrangements that may promote improved retention.¹²

It would also behoove IT leaders to focus more on raising the quality of management and supervision in their organizations. Results of the ECAR IT leadership and workforce survey document the detrimental effects on motivation and retention that poor supervisory interactions can create. The higher education literature has long acknowledged that technical staff are not necessarily taught how to lead and manage people as they rise in their careers and are not always prepared for this aspect of their positions. Acknowledging the problem will not be good enough as we move forward. If we do face a labor shortage, staff are not likely to remain working for a boss who is not a good manager. IT organizations also need the gains in productivity that presumably come from a workforce that is motivated because it is well led and managed. Whether through community-wide initiatives, the efforts of regional consortia of institutions, or intra-institutional partnerships with the human resources department or the business school, the IT community needs to invest more in building the management skills of IT professionals before, during, and after they rise into the ranks of management.

Advice to Leaders

Achieving the transition to a new conceptualization of the CIO role will take time. ECAR research does not suggest either an imminent or a revolutionary change. Rather, change is likely to take hold through a series of smaller evolutionary steps that alter the perceptions and expectations of the role. What is important is that the IT leadership community articulates a point of view on the future of the CIO leader. Leaders need to be secure enough to let go of the past. While IT organizations must make responsible decisions about how and when to turn services over to the cloud, they cannot deny its existence. They should not fear that moving services out of the IT organization will make them less relevant or less secure in their institutions.

Paradoxically, the very fact that IT leaders demonstrate willingness to experiment and leverage alternative service delivery models can hasten their transition to a new and more strategic role. It can free up resources within IT that can be repositioned. It demonstrates an openness to change, which can serve as a model for others. It enables CIOs to more forcefully insert themselves in conversations about leveraging technology, rather than arguments about who provides it.

What else should leaders do to prepare for the future? On the top of the leaders' to-do list should be taking steps to broaden and deepen their understanding of the institution. As seen among the survey respondents,

experience outside the IT organization bears a relationship to the IT leaders' sense of their influence, especially on academic issues. IT leaders cannot go back and redo their career paths to gain these experiences, but they can take steps to develop deeper familiarity with the various parts of their institution. Actions leaders can take include the following:

- Allocate more time to meet with deans or department chairs to better understand their priorities (as opposed to their superficial technology needs).
- Seek roles on institutional planning committees.
- Offer to periodically attend staff meetings in other divisions to learn more about the issues they face.
- Seek professional development opportunities in areas outside of technology, or offer to go with other campus leaders to their professional conferences.

It is important for IT leaders to take these actions for themselves and to encourage (or require) their managers and directors to do the same. The relationship-building job is too large for one person to do alone. It must become the responsibility of the whole IT leadership team.

There are also institutional actions that leaders can take that will secure their future roles. For example, many aspects of the strategic role of a CIO will be greatly facilitated by IT governance. CIOs need to create effective mechanisms to learn about the needs and interests of stakeholders and to establish mechanisms to weigh competing priorities across the institution. These aspects of governance will help cement the CIO's responsibility to maximize the leverage the institution creates from its technology investments.

IT leaders must also begin to educate their institutions about the coming opportunities and challenges. Initiating a dialogue of the potential challenges and opportunities presented by the cloud or the impending workforce shortage also provides the leader with an opportunity to start a conversation about the changing role of central IT and his or her own role. It is always better to define your future than to have someone else do it for you.

Lastly, all of the secondary and primary study data urge all IT leaders to focus more on the workforce. As evidenced by the respondents to the ECAR survey, there is significant opportunity to improve staff-management practices. Leaders should require their managers and directors to join with them to provide more frequent communications to staff about the goals and priorities of the organization, become more skilled at providing effective feedback, and demonstrate tangible interest in the career goals and skill development of all staff.

Of course, leaders need to lead by example. They must take the time to understand the career goals and skill-development needs of their own direct reports. Leaders can't wait for a staff member to self-identify as a future leader. They need to reach out to rising managers and directors and provide them with opportunities to build the knowledge and experiences that will prepare them to lead in the future. Not everyone will want to be a CIO. Some will aspire to lead smaller teams or departments. Others will want to be better individual contributors. Regardless of ultimate career goal, it appears that all staff will benefit from opportunities to broaden their skills and perspectives.

More institutions must become proactive in putting in place strategies to meet the challenges of a shrinking pool of skilled workers. As we learned from the ECAR study's qualitative interviews, a multifaceted strategy is required. Change takes time and institutions need to begin now to take steps to make themselves more attractive employers and less people dependent. IT leaders need to build complementary service strategies and human resource strategies that seek opportunities to leverage skill sets of other organizations in areas of common need and to create new skills and positions in areas of uniqueness.

As a community, IT leaders need to look for strategies to build diversity in their organizations. It is in institutions' collective and individual interests to ensure that they have deep pools of qualified candidates for every position in their organizations. With so much to accomplish, organizations must know that every member of their team feels they are in an environment that is taking maximum advantage of their talents. We cannot afford for any of our organizations to become inhospitable to staff based on race, gender, ethnicity, or any other factor.

Advice to Aspirants

There is much that should encourage an aspiring leader to keep working toward the CIO role. Demographics alone suggest that there should be ample opportunities for aspiring leaders to fill. Aspirants can also take heart in the fact that there will be no shortage of challenges for them to address once they arrive in a leadership position. The CIO role is still maturing and as this essay suggests there is room for the next generation to put its own stamp on it. The first generations of IT leaders had to professionalize the role and fight to establish their seat at the table. The next generation will have the opportunity to demonstrate how CIOs should use the seat that they have earned.

On many fronts, aspirants appear to be taking the right steps. The ECAR survey respondents who aspired to the CIO position were much like the current crop of leaders in terms of their skills, educational attainment, and leadership styles. Given our assertions about the future of the CIO role, it would be in the best interests of aspirants to gain as much exposure as they can outside of the IT organization. Gaining experience managing institutional IT governance groups, serving in leadership roles in multi-institutional collaborations, and building experience managing external partnerships all seem like must-have experiences. These experiences will help equip them to step into a role that is becoming more about the application of technology across the diverse aspects of an institution. If aspirants are fortunate enough to become IT leaders at their present institutions, the relationships they build outside of IT will be invaluable as they step into a role that is as much about influence as it is authority.

Maintaining technical knowledge is important. An IT leader must have enough technical skills to be able to earn the respect of his or her organization and be a facile translator of technology's capabilities and constraints to academic and administrative leaders. However, aspirants should not build their technical résumé to the exclusion of all else. Leaders are increasingly valued for their ability to communicate, plan, and manage and develop staff. In addition to focusing on the skills and areas of specialization already discussed, aspirants should also give serious consideration to obtaining a doctorate. As the leadership job becomes one increasingly of influence rather than authority, the need for the PhD credential will likely grow.

In the ECAR study, aspirants to top college and university IT jobs and nonaspirants alike recognized the demands of the job. The question for many came down to whether they thought they could make a difference. If a CIO role is incrementally more time consuming and requires more sacrifice of work-life balance, then respondents wanted to feel that they would be able to make an incrementally larger contribution. In this regard there is cause for optimism. It is unlikely that the CIO role will shrink in responsibility or influence. Neither the talents of the individuals in the CIO roles or the needs of our institutions will likely allow that to happen. Rising CIOs have every reason to believe that they can make a difference.

Summary

ECAR's 2004 study concluded that the condition of the IT leadership community was strong and its prospects for the future were good. The 2008 ECAR study found nothing that would refute that conclusion. Institutions are served by an IT workforce that is dedicated to both

technology and higher education. It is a community in transition that will no doubt see waves of retirement that will alter its makeup. Fortunately, there appears to be another generation of leaders and workers willing to step into their places.

There is reason to be optimistic for the future. Our institutions are still discovering the many ways in which technology and information can enable them to achieve new things. The cliché that higher education IT's best days may still be ahead need not be a hollow promise. However, higher education's IT practitioners cannot afford to be passive about the future. IT leaders will need to take action to define it for themselves and their institutions.

Higher education must also heed the warning signs about our organizations and workforce. Individual and collective action is required to improve the quality of management, mentorship, and skill-development available to our staffs. As labor markets contract, advantages will accrue to organizations that can create environments in which staff want to work through compensation, communication, and opportunities to build a long-term career. The CIO job will not be the right destination for everyone. Our human resources programs need to respect alternative career aspirations and create mechanisms for individuals to be recognized for their contributions in ways other than just promotion to management.

In 2002, Gary Augustson, former vice provost for information technology at Penn State, wrote about the challenges faced by IT leaders. His article acknowledged the many reasons why leading IT is hard but also described why it is so vitally important. Whether you are an IT leader, an aspiring leader, or a member of an IT workforce, the article offers much to validate the efforts you put forth. There is no better way to close this essay than to quote the conclusion of that article:

The information technology efforts within higher education form a key part of the underlying national infrastructure that supports the ability of the United States to be a global leader—whether in driving global economic success or making the world safe for our children and grandchildren. The effective leadership of these efforts is immensely important. The job is not already done. In fact, the job has just begun. IT leadership in the twenty-first century will be the ultimate challenge.¹³

Endnotes

1. This essay is derived from Philip Goldstein, *Leading the IT Workforce in Higher Education* (Research Study, Vol. 6) (Boulder, CO: ECAR, 2008, in press). Throughout this essay, reference is made to the 2008 ECAR IT leadership and workforce study and the survey on which the study was based. *Leading the IT Workforce in Higher Education: Survey Instrument* may be found online at <http://connect.educause.edu/Library/ECAR/LeadingtheITWorkforceinHi/45192>.
2. Richard N. Katz, Robert B. Kvavik, James I. Penrod, Judith A. Pirani, Mark R. Nelson, and Gail Salaway, *IT Leadership in Higher Education: The Condition of the Community* (Research Study, Vol. 1) (Boulder, CO: ECAR, 2004), available from <http://net.educause.edu/ir/library/pdf/ers0401/rs/ers0401w.pdf>.
3. Stephanie Overby, "The Incredible Shrinking CIO," *CIO Magazine* (October 15, 2003).
4. Nicholas Carr, "IT Doesn't Matter," *Harvard Business Review* (May 2003).
5. Quoted in Edward Cone, "Nicholas Carr: Why IT Will Change," *CIO Insight*, January 9, 2008, <http://www.cioinsight.com/c/a/Expert-Voices/Nicholas-Carr-Why-IT-Will-Change>.
6. The survey was conducted jointly by the IBM Center for CIO Leadership in collaboration with the MIT Sloan Center for Information System Research and Harvard Business School.
7. *The CIO Profession: Driving Innovation and Competitive Advantage* (IBM Center for CIO Leadership, October 2007), <http://whitepapers.zdnet.com/abstract.aspx?docid=352948>.
8. Goldstein, *Leading the IT Workforce in Higher Education*, op. cit.
9. Philip Goldstein with Richard N. Katz, *Academic Analytics: The Uses of Management Information and Technology in Higher Education* (Research Study, Vol. 8) (Boulder, CO: ECAR, 2005), available from <http://www.educause.edu/ecar>.
10. From an interview conducted by the author with Bruce Maas of the University of Wisconsin–Milwaukee as part of the 2008 ECAR IT leadership and workforce study.
11. *The CIO Profession: Driving Innovation and Competitive Advantage*, op. cit., 12.
12. Ted Dodds and Richard N. Katz, *Developing the IT Workforce at the University of South Australia* (Case Study 2) (Boulder, CO: ECAR, 2008), available at <http://connect.educause.edu/Library/ECAR/DevelopingtheITWorkforcea/46813>.

13. J. Gary Augustson, "Leading the IT Team: Ultimate Oxymoron or Ultimate Challenge?" *EDUCAUSE Review* (March/April 2002): 18, <http://connect.educause.edu/Library/EDUCAUSE+Review/LeadingtheITTeamTheUltima/40319>.

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