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### **A CIO's Question: Will You Still Need Me When I'm 64?**

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#### **INFORMATION TECHNOLOGY**

For information technology, at least in higher education, invisibility constitutes success. As an instrument rather than a goal, IT succeeds by advancing other goals like research, teaching, and service. So it is bad news when a dean at my university not only knows who I am and what I do, but doesn't like it.

Suppose the dean wants to buy nonstandard equipment through a nonstandard channel. On the university's behalf, I object to those choices; I also believe that the entire purchase is unnecessary because the equipment would allow the dean's school to duplicate existing services that the university provides centrally. The dean responds by arguing that the interests of individual schools should outweigh collective university interests, and that having a chief information officer -- that's me -- serves no useful purpose. To the dean, my job seems to consist entirely of interfering in school affairs.

Whether the school should be allowed to ignore established procedures is not in itself terribly important. But whether colleges and universities need a CIO is important, given that we're expensive, hard to find, and hard to keep. Do colleges and universities need chief information officers like me? Will they need us in the future -- say, in a decade, after I'm 64?

Think back 10 years. In 1994 personal computers had been commonplace for almost a decade. Relatively few were networked, and the big issues facing colleges were whether to build dormitory networks and modem pools, and how to pay for them. A text-based technology called Gopher was just giving way to something called the World Wide Web, and each was used chiefly to send simple text to distant users. Students and faculty and staff members did most of their academic and administrative business in person, by phone, or on paper. Central administrative systems generally were accessible only to clerical workers, not end users. Instruction involved lectures, section meetings, discussion groups, and documents like textbooks, articles, and problem sets. Researchers used computers extensively, but generally in isolation. Technology was important,

but it wasn't central.

The CIO's job back then was to change all that. The first goal was to set up extensive networks, enabling computers to connect to servers and one another with as few obstacles as possible. Once networks allowed users to interact more easily with remote systems, the goal became to create protocols and mechanisms for making network transactions simpler and more secure: authentication, authorization, encryption, file transfer, client-server architecture, etc. At the same time, e-mail gradually replaced paper memoranda and then telephones as a primary communication medium, leading to a new goal: to make central network services reliable, capable, and flexible. Professors' handouts and libraries' reserve-reading rooms gave way to Web pages, with the help of instructional-management systems. Isolated research computers were replaced by networked ones.

Today the dean at my university would probably argue that we have met most of the goals of 1994, and thus we no longer need a CIO. Most colleges and universities now have pervasive networks, accessible to everyone everywhere. Users interact directly with administrative and academic systems. E-mail, instant messaging, and cellphones are everyday tools. Information technology is a utility like electric power, available consistently and pervasively across most of higher education. The instrument has become invisible, and so, the dean seems to believe, the need for a CIO has also disappeared.

But the dean is wrong. Achieving specific technical goals, however important they are, is only part of what a CIO does. Four interrelated elements justify a CIO's job today and in the future:

Central systems. Today these come in two principal flavors: administrative systems like student records, human resources, and finance; and networks, including both telephony and data communications. At one point departmental data networks were common. Even today, departments often maintain "shadow" administrative systems for greater flexibility or confidentiality. However, no college or university can manage without substantial centralization of systems, if only because internal boundaries are too diffuse for departmental systems to be comprehensive enough, and because institutions face increasing requirements to maintain, analyze, and report data centrally.

Given that central systems interact extensively and must be reliable, they require a certain degree of formal organizational support. That support is quite technical and must be managed by someone like a

CIO -- as even the dean would have to agree, after a little thought.

Economies of scale. This element is simple and traditional: The more one buys from a vendor, the better deals one can negotiate. When different buyers negotiate with vendors, as happens at a college without centralized procurement, they usually get good but not great discounts. With central management -- which the University of Chicago operates through incentives rather than mandates -- an institution has enough business to negotiate more effectively with one vendor, and still buy enough from a second vendor to keep the first one on its toes. Perhaps even more important, especially as margins and discounts shrink, concentrating business with one or two vendors makes it likely that they will be eager to keep an institution happy.

Without a CIO, much of that clout would be lost to decentralization, and universities would spend more on the products and services in question. It's worth observing, though, that for people like the dean, that part of a CIO's job is unwelcome: Economies of scale come at the expense of local choice.

Standards. For reasons of policy and efficiency, and because of legal constraints, colleges and universities dictate certain practices and proscribe others. That has long been true for administrative-computing matters like access to data. We cannot permit people using a campus network to operate computers in ways that interfere with others, with central systems, or with the network itself, and we must ensure that network-based applications operate efficiently and are resistant to misuse.

Choosing standards is messy because any standard entails different costs and benefits for different systems or users. Moreover, standards interact with one another. A CIO rarely has the authority and knowledge to prescribe standards, but is well suited to serve as an arbiter when the inevitable conflicts arise.

Advocacy. The typical college or university spends 5 percent to 10 percent of its operating budget on information technology. Some of those dollars are used for the infrastructure, while others go more directly to teaching or research; some are spent centrally, others on the departmental level; some make an institution different from its competitors, others have the opposite effect.

Particularly as funds become scarcer, deciding how much to invest in information technology, through what mechanisms, and for what purposes becomes a difficult universitywide challenge. Schools compete with one another, administrative departments, and central

activities for money and control; the president, provost, and executive vice presidents negotiate with deans, vice presidents, and directors. Such negotiations must reflect a consistent, strategic view of information technology and its institutional role. Developing and espousing that view is the fourth and most rapidly evolving element of a CIO's role.

A CIO advocates not only internally on behalf of information technology, but also externally on behalf of the institution. Over the past few years that task has involved many of us in negotiations at the national and international levels. In the past it focused on relationships with key equipment vendors; in the future many of us predict that it will concentrate on outsourcing certain administrative services. It's hard to see anyone but a CIO performing the role of external advocate because it requires a delicate balance between technological and substantive concerns, as well as the ability to commit the institution quickly to a course of action.

I have omitted from the list two items that a 1994 CIO might have included: the use of information technology for instruction, and support for individual computer users. Many institutions still include those functions in the CIO's portfolio, but they no longer have to be managed centrally.

As instructional-management systems, multimedia tools, simulation environments, and similar resources have become more accessible, departments have been able to produce effective instructional technology, not necessarily with help from the central administration. Similarly, although support for computer users remains a vexing and expensive business, a reasonably large department can provide it as effectively and efficiently as an even larger central organization. In the first case, technological advances have reduced the need for central involvement; in the second, many departments now have enough computers to get reasonable economies of scale. In both cases, however, a university can choose whether to assign the responsibility to a central entity or to departments -- and if the choice is centralization, there must be a CIO in charge.

What, then, of the future? When I'm 64 and contemplating retirement, should I advise my university to replace me?

The answer is yes. Just as the specifics of my current job are different from those of my predecessor in 1994, my successor in 2014 will have tasks different from mine. But the key elements of my role will remain important to the university, and it will not make

sense to divide them among other senior administrators.

The dean's successor and mine, here at the University of Chicago and elsewhere, will still argue about who should make decisions, about school versus university interests. Those arguments will remain important, and we should not suppress them. They will promote continuing evolution in the CIO's role, but they will leave the importance of that role intact.

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