

How to Survive in Interesting Times

Chief information officers (CIOs) at colleges and universities work each day under the ancient Chinese curse, “May you live in interesting times.” With the rapid evolution of information technology, the good technology decisions made by CIOs today tend to look less astute after several years, especially to the non-IT people who run the institution. For example, the uneventful, but very expensive, passing of Y2K, combined with the implosion of so many of the dot-coms, damaged much of the mystique that IT groups possessed. Knowledgeable people tried in vain to point out that the dot-coms collapsed not because information technology revealed its shortcomings but because the dot-com entrepreneurs knew little or nothing about the businesses and markets in which they were trying to compete. But the damage was done; IT had lost its halo.

During a time when most state-supported and many other higher education institutions struggle with budget cuts, numerous articles in journals and newsletters expound the economies and virtues of IT outsourcing and downsizing. Adding insult to injury, a year ago the *Harvard Business Review* published the article “IT Doesn’t Matter.”¹ Despite the provocative title, the author, Nicholas G. Carr, recognizes the critical role of information technology; he is concerned, however, about possible overinvestment and incorrect focus. In a response published in *EDUCAUSE Review* (November/December 2003), the veteran Berkeley IT guru Jack McCredie made a coherent argument that IT still matters greatly in colleges and universities and will continue

to matter in ways not yet fully known. But deep in their hearts, many senior administrators and many faculty members do wonder if IT is worth the cost and hassle. An EDUCAUSE Executive Briefing on the funding of information technology states: “Quite simply, total costs for IT are increasing at a rate that exceeds higher education’s ability to pay.”²

At a minimum, the events of the last several years should send a clear message to presidents and other senior college and university officers to look more closely at information technology. Administrators almost certainly will (and should) ask, “How much IT spending is enough, and what areas or issues deserve priority?” A rational person might well conclude to spend less on information technology and/or to redirect IT spending to different areas. The recent events should also send a message to CIOs to carefully rethink what they are doing and how they are doing it. CIOs do indeed live in interesting times.

Value-Based IT

CIOs and their IT organizations can probably survive and even thrive in these interesting times, but in the process, information technology may change significantly. To thrive, IT must evolve to a value-based model—that is, must focus more clearly on producing organizational value commensurate with the cost. Economic theory offers the conceptual base for identifying the value of IT, and other resource inputs, to an organization. In economic terms, a college or university represents an organization that converts inputs to outputs. In other words, a college can be described by a production function f , where

$$\text{Outputs} = f(\text{Input}(1), \dots, \text{Input}(n)).$$

At a college or university, the outputs might consist of education, research, and service and the inputs of faculty, staff, buildings, equipment, and information technology. The IT input represents a grouping of resources—that is, staff, buildings, and facilities—all dedicated to performing the IT function.

If information technology and the other inputs are set at optimal levels, microeconomic theory specifies that for a small investment of equal cost for each and every input at an optimal point, then (1) marginal cost equals marginal revenue, and (2) the marginal revenues of all inputs are equal.

In theory, the CIO can maximize the value of IT by allocating funds to each project and area until the marginal cost of the last unit added exceeds marginal revenue. At the level of practical application, however, many problems arise: marginal revenues for IT, and for all the other inputs, are exceptionally difficult to estimate; most investments come in large, not small, increments; and inputs interact with each other. Yet even though using microeconomic theory to “maximize” the value of IT raises serious problems, the theory can nevertheless highlight some important methods for achieving more “satisfactory” outcomes.³ CIOs, for example, can move in the following directions:

- CIOs tend to look mostly at costs and efficiencies inside IT, arguing for more money “to improve IT.” CIOs instead need to argue for improvements in education, research, and service—that is, they need to look externally at

the value that a dollar spent on IT contributes to outputs. Presidents focus on outputs and on such constituents as students, alumni, donors, and legislators. To the extent that presidents think about inputs, they think about those with the clearest connections to the outputs: faculty members and perhaps buildings but seldom IT.

- CIOs must try to demonstrate that an investment in IT produces a marginal value in education, research, and service equal to or greater than a similar investment in other inputs. IT competes for resources with all of the other inputs to the production function. The president has to choose between IT and more faculty, higher salaries, cleaner buildings, more attractive grounds, etc.
- CIOs start with a potential comparative advantage. The unit costs of IT continue to decline while the unit costs of most other inputs—faculty, staff, facilities—are steadily increasing. In addition, IT can substitute for many other inputs. For example, electronic media-based courses that are available on the Internet can, to some degree, substitute for faculty and buildings.

A CIO who focuses on the goal of increasing the value of IT may end up with a much stronger case to survive and thrive. Within IT, different allocations of funds may produce very different net marginal revenues or outputs.

IT Problems

Administrative systems provide examples of the problems facing CIOs. In the early years of computing, administrative systems were the central focus of IT groups. Over time, administrative computing declined in importance, for several reasons. Educational and research computing then began to develop. More important, institutions recognized, implicitly or explicitly, that once administrative systems meet basic requirements, investments in unique, innovative, or additional capabilities yield little or no marginal value for education, research, and service. Over the next decade, expenditures for administrative IT will probably decrease. In this situation, the theory suggests that IT should strive to meet a

“satisfactory” set of requirements at minimum cost.

For example, a financial system that meets legal and regulatory requirements and provides occasional reports is all an institution needs. Colleges and universities make mostly long-term financial decisions. Significant day-by-day decisions occur rarely except perhaps in such peripheral areas as food service. Correct functioning, reliability, and high availability offer more value than innovation and custom tailoring. Packaged systems or other forms of outsourcing tend to represent the long-term low-cost solutions to providing the required capability. For a while, users who wanted systems that did things “their way” sustained a major role for IT. But the trend is clear: institutions will purchase packages or will outsource services for most administrative functions. IT may operate the package, but the vendor will develop, maintain, and improve it.

In recent years, the once glorious hope of IT—educational and research computing—has largely disappeared into a black hole of decentralization. Research groups have long coveted to control their own computing, and with desktop supercomputers, they now can. Students have PCs. Though IT groups have poured their creative energies into the campus network, IT is now left with little more than the expense and management of the network. Here again, the trend appears clear. Network capabilities are at or approaching commodity status for both hardware and software. Colleges and universities purchase, or can purchase, most institution-wide tools—e-mail, statistical packages, Blackboard-type course support—off the shelf. Local innovation and unique applications probably require marginal costs that exceed any marginal value for education, research, and service. In this environment, IT’s main value comes from technical knowledge, a vulnerable position. Sooner or later, a vendor will come along with a proposal to outsource what’s left of IT at a lower price.

IT: A Future Role

The future still looks very bright for information technologies. The question is whether CIOs can translate the advantages of the technologies—decreasing unit costs, broad substitutability for other

inputs—into a bright future for their IT organizations. If CIOs follow traditional roles, the IT organization well may end up as a glorified telephone office.

CIOs and IT organizations should place more emphasis on partnership or alliance relationships to develop innovative, “high-value” IT applications within discipline areas in the institution—the IT equivalent of interdisciplinary research. Interdisciplinary groups work best when each participant understands at least the fundamentals of the other’s disciplines. Many academic areas already possess a foundational level of knowledge in information technology. IT people need to acquire at least a foundational level of knowledge in the application areas. The most interesting application areas probably involve education and research, but some interesting administrative areas no doubt still exist.

By using a knowledge-intensive, high-value approach, IT can move into areas where package applications do not apply and areas where outsourcers may have little expertise. By choosing areas of value to the education, research, and service functions of the institution, IT can generate marginal value that exceeds the marginal cost. As an added advantage, by building a good relationship with partners, IT can also strengthen its political support. Properly executed, this approach may help IT to survive and thrive in interesting times.

Notes

1. Nicholas G. Carr, “IT Doesn’t Matter,” *Harvard Business Review* (May 2003), 5–12, reprinted in *EDUCAUSE Review*, vol. 38, no. 6 (November/December 2003): 24–38.
2. EDUCAUSE Executive Briefing, “Funding Information Technology,” December 2003, <<http://www.educause.edu/ir/library/pdf/pub4002.pdf>> (accessed March 22, 2004).
3. Herbert A. Simon won a Nobel Prize in Economics in part for his concept of “satisficing”—the idea that effective managers find “satisfactory” solutions because maximization is too difficult or too costly in practice. See James G. March and Herbert A. Simon, *Organizations* (New York: Wiley, 1958).

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