Understanding the Value of IT

Understanding the value of IT on campus is vital to making the tradeoff in costs and benefits, but many factors can interfere
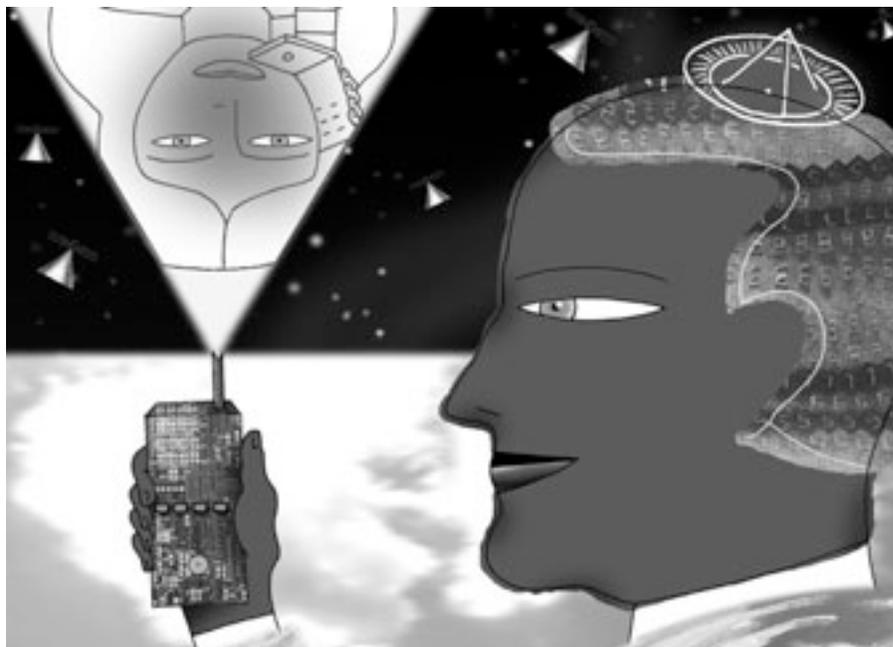
By **Phil Goldstein, Richard N. Katz,** and **Mark Olson**

I n the late 1990s, the wealth of nations rose and fell based on their abilities to participate in the so-called "new economy." The new economy, of course, was fueled by information and communication technologies. Less than five years later, we no longer hear of the new economy, most of the world languishes in recession, and a sharp debate has begun about how much information technology is enough.[1]

Higher education's investment in IT has achieved both unprecedented scale and breadth. In just one short decade, terms like enterprise resource planning (ERP), wireless networks, and course-ware have become as common a part of our vocabulary as library, student union, and athletic field. The past decade has seen the widespread consolidation of academic and administrative computing and the rise of the chief information officer (CIO) as a vital member of the campus leadership.

Technology projects now approach bricks and mortar as the largest investments a campus will make. It is hard to find a campus today not investing tens of millions of dollars in a new ERP system, a network upgrade, or another IT project. If you doubt how intrinsic technology has become to the life of a campus, you need only observe the paralysis that ensues when the campus e-mail goes down.

As technology has assumed a large and more vital role on the campus, it has also come under greater scrutiny. With millions of dollars at stake and institutional and executive reputations at risk, campus leaders are paying more attention than ever to their IT choices. Exec-

utives are routinely asking,
- Why do I need to make this particular technology investment?
- What benefits will the institution realize?
- Am I spending too much on technology?
- How much technology do I need, and why?

Few would debate that significant investment in technology is required just to be an institution of higher learning in the twenty-first century. The decision then becomes how much, which technologies, and to what purpose.

EDUCAUSE and the National Association of College and University Business Officers (NACUBO), with the support of Cap Gemini Ernst & Young (CGEY), Gartner, Microsoft, PeopleSoft, and SAS, convened a two-day meeting in

April 2003 of 70 leading CIOs and chief business officers (CBOs) to explore the value of information technology. The group assembled to discuss the following issues:
- What is IT value and why is it important?
- How can it be measured and communicated?
- How can decision making about IT projects be improved?

The group's work took place in the CGEY Accelerated Solution Environment, a place and facilitation methodology designed for deep immersion and rapid problem solving. This article presents the major conclusions reached by the attendees at the IT Value Forum and suggests a direction in shaping the industry's discussion of information technology's role and utility in the academy.

Why Now? Higher Education's Perfect Storm

The context for discussing the value of information technology is as important to understanding the issue as the discussion itself.

You need look no further than today's headlines to confirm that higher education is enduring hard financial times. Falling endowment returns, decreases in state funding and increases in costs for financial aid, health premiums, and energy have left institutions with scarce dollars for new investment. Instead, institutions must cut, and cut deeply. Hiring freezes, layoffs, and across-the-board budget cuts have become commonplace. Institutions have reduced capacity to take on new investments and have little margin for error to absorb unanticipated costs or under-realized benefits.

This economic downturn is all the more jarring because it follows closely a significant boom. The late 1990s saw higher education prosper financially. This financial boom coincided with the emergence of the commercial Internet, the growth in distance learning, and the adaptation of corporate ERP systems to higher education. During this time, higher education invested significantly in new technologies—sometimes out of necessity, sometimes reflexively, and sometimes for their sheer promise. Throughout this period the question, What is the value of technology? was asked, but rarely answered or acted upon. Instead, higher education (like all industries) aggressively pursued larger and more complex technology projects.

The legacy of these investments is mixed. In many cases benefits are unclear, yet to materialize, or hard to justify in light of the investment. Higher education's leading and early investments in networking are indisputably valuable. On the other hand, high-profile ERP projects, while tactically necessary at many institutions, often over-promised benefits or over-spent budgets. Several of those projects have become part of higher education lore—perhaps apocrypha—for their large budgets and long timetables.[2]

Distance learning and course man-agement systems are still largely in their infancy. Clearly they have had an impact on higher education.

In the long run all these technologies—including ERP—will no doubt play a vital role on campus. They were introduced with such hype, however, that they have left the industry overly skeptical of the value of any technology project.

Does IT Value Matter?

Higher education has seen its own irrational exuberance about technology give way to wariness and skepticism about its utility. The IT Value Forum convened against this backdrop: extreme cost pressures and skepticism of technology brought on by what many presidents and business officers consider to be spiraling IT costs. The first question that the group addressed was, Is this issue real? In fact, attendees responding to a preconference survey reported that enhancing IT's value was a significant issue on only half of their campuses. Some posited that IT value was a question that would disappear as soon as the economy improved. It appears that the IT value issue is widespread, but not universal.

Many participants ascribed permanence to the issue. The counterargument included those who saw the severity of today's financial pressures permanently altering institutional decision making. These participants saw a future where concerns for higher education's affordability and accountability would change the behavior of chief financial officers, presidents, and governing boards. They described a future where all investments—be they a new building, program, or technology—would be subjected to a dramatically increased level of rigorous analysis and questioning.

So, is the value of IT an issue worth discussing? Does higher education need to worry about how to measure and communicate it? Or is this a storm that can be weathered without new formulas, methodologies, and management fads?

On one thing the group was unanimous—their inability to predict the future. Which direction the IT value discussion will take is not known. What is known is that there are fundamental flaws in the way in which the IT value discussion is taking place on campuses today. Regardless of the future, there are ample opportunities today to improve the methods, processes, and effectiveness of technology decisions.

What Is Value? Pitfalls in Today's IT Value Discussion

The deliberations at the IT Value Forum revealed four fundamental challenges inhibiting the discussion of IT value. Before introducing them, it is important to note the definition of information technology as it was discussed at the forum and here. Information technology in the context of a value discussion cannot be limited to hardware and software. Rather, the term must encompass the efforts and expenditures made to adapt organizations, processes, and people to take advantage of technology. Most often, it is in the marriage of people, process, and technology where value is either created or destroyed.

The IT Value Forum identified the following challenges:
1. Defining value
2. Confronting what is required to realize value
3. Structuring the IT value discussion
4. Measuring and communicating value

The First Challenge— Defining Value

The first challenge in measuring the value of IT is to define it. This involves both clarity as to the benefits desired from a technology investment and reasonable expectations as to what is possible. Technology is too complex and changes too rapidly to assign a single return-on-investment (ROI) formula or expected rate of return to all technologies and projects. Given severe fiscal constraints, it is tempting to view projects through the lens of cost savings alone. Too many IT value discussions on campus have become stalled in the following discussion loop:
- Technology is very expensive.
- Therefore, I can only invest in it if it saves significant dollars.
- But, I don't believe that new technology ever saves money.

■ Therefore, technology has no value.

Clearly, this summary oversimplifies the discussion to illustrate the shortcoming in today's IT value discussion. A productive discussion of IT value must recognize that not all technology can be assessed with the same methods or criteria. The typical campus invests in an array of technologies ranging from commodity/utility to early adoption of innovative technologies. These two ends of the spectrum produce different value for the campus and require different metrics and criteria.

The IT value discussion first must recognize the type of technology being implemented—basic infrastructure to innovation—before assigning an expectation of value. Expectations of value must be linked to the purpose of the technology and not just the magnitude of the investment. Today's IT value discussion often breaks down because the default expectations for a large IT investment are a significant cost savings. This is not to say that IT projects should not be treated like other investments and asked to justify their costs, but that projects with a high price tag might not always be able to be evaluated in terms of their cost savings.

If the campus network has become the equivalent of electricity and heat on campus, then the cost of its upkeep and modernization must be evaluated the same way. We would never ask what productivity gains we would get from maintaining the campus electrical distribution system—we simply know the cost of not having it. The same can be said of the campus network. On the other hand, a new imaging system, while a significantly smaller investment, can be evaluated fairly in terms of its impact on productivity and operating costs.

So, the first challenge to overcome is understanding the purpose and role of the technology. How will it be used? Why do you need to have it? Is it a part of the basic infrastructure of the campus? Or, is it a targeted application seeking to improve an individual business process? Assigning the right purpose to the technology guides significantly how and what kinds of value your investment can create.

The Second Challenge— Realizing Value

For many, the value discussion has lost sight of the simple axiom that technology itself has no intrinsic value. Only through its application to an institutional process or activity is value created. This important distinction significantly enriches and complicates the IT value discussion. It implies several things.

First, it implies that the cost of a project is much more than the sum of the costs of acquiring new hardware and software. It must also include the costs of deploying the technology in such a way as to produce a change in how the campus operates. It includes investments in retraining staff and the time spent altering business processes and management methods. Only through these changes do automation and improved information begin to yield value.

Often, these changes are the most difficult to make. They challenge how the institution is organized and operates. They disenfranchise some and empower others. So, the cost side of the equation must consider the political capital needed to make these changes. If you have the budget for the technology but lack the political capital to make change happen, the potential value will decrease significantly.

Second, the idea that IT's value is realized only through its application implies a much richer discussion of potential benefits, suggesting that the real benefits of a new technology are locked up in the second- and third-order impacts that it brings about. For instance, many data warehousing and executive information systems are justified by their potential to enhance decision making. However, it is insufficient to end the conversation with the creation of new and accessible information, for in that, no new value has really been created. How will this information be used? Who will use it? What kind of decisions could it support? Will institutional leaders use newly accessible information in decision making, and will decisions in fact be arrived at faster or be better?

To really understand and project the value created through this new system requires a vision for what other changes

could potentially be made to leverage that technology. For example, let's extend the discussion of the benefits of improved access to management information. Suppose this information can be used to evaluate the effectiveness of the institution's student recruiting efforts. Projecting further, let's assume that the information will enable the campus to discontinue expenditures that do not succeed in attracting applicants from the campus's target population. Now, the benefit is not management information. Instead, it has become the ability to secure an incoming class of equal quality at a reduced cost.

Finally, the distinction between technology and its application implies a need for a decision-making process that is much more iterative than many campuses use today. The process cannot begin and end (as it too often does) with a one-time look at costs and benefits. Rather, executives need to build an understanding of how their campus can derive value from a particular technology. What would have to change? Can those changes be made? Similarly, the focus must return repeatedly to the cost side of the ledger. Is enough being invested in the project to get the predicted benefits? If the full potential benefits of the project are too difficult to attain, then can the project be done for less? Perhaps the most important lessons learned from the experience with ERP systems is not just that the benefits were over hyped, but that it took too long for someone to ask, Can't we do this for less?

The Third Challenge— Structuring the IT Value Discussion

Participants in the IT Value Forum reported that their campuses had been or were being held back by not having the right structure and participants to discuss IT value. This was true for all three levels at which IT value is evaluated within the institution:

■ Strategic—How well is technology supporting the strategic goals of the institution?

■ IT organization—Is the IT support organization effective and efficient?

■ Project—Is a particular technology project worth pursuing?

Gaps in structuring the IT value discussion exist at all three levels.

At the strategic level, often the IT plan is developed separately from the campus strategic plan. Too often, IT practitioners are not in the room to help discuss the possibilities and investments in technology required to support an institutional priority. As a result, individual IT projects come to campus decision makers out of context and lacking a clear link to an institutional strategy.

Evaluation of the IT organization itself is also problematic. Most often, there is no agreed upon set of metrics on which to base the evaluation of the organization. Or, the metrics are not sufficiently flexible to measure the varied businesses in which the IT organization finds itself. As noted before, the typical campus invests in a broad array of technologies, from infrastructure to innovative. The IT organization therefore finds itself in a commodity business operating a utility—the network. Also, like a consulting company, it oversees projects and implements new solutions. Finally, it is a research and development organization that must vet and develop new solutions to unanticipated problems. No single set of metrics can evaluate the totality of such an organization.

Finally, it is at the level of the project proposal that the challenges of IT value are felt most acutely. For starters, too many projects are proposed by technology leaders and reviewed by business leaders. This is a problem in and of itself, as IT professionals at best should only represent the cost side of the benefits equation. Only in collaboration with business leadership can they completely articulate the potential benefits of a technology project.

The Fourth Challenge—Metrics

The fourth challenge in articulating the value of IT lies in our ability to measure it. Here higher education faces a series of complications. First, there is no single accepted method for measuring IT value. Given the diversity of technology higher education is acquiring, perhaps no single model can or should

be adopted. Second, and more problematic, is the lack of baseline data against which to measure progress.

Few projects begin with a careful collection of baseline measures of productivity, cost, or other factors that could then be used to document the impact of a new technology. Still fewer campus staff are sufficiently trained in analytical methods to effectively develop a set of measures for a business process or organization. Outside the laboratory, higher education is not a measurement-driven enterprise. Metrics are resisted culturally and philosophically.

Academic technologies present unique challenges in projecting and assessing value. Often, the work these technologies support requires long time frames to achieve results. Therefore, it is difficult to look to the experience of others to guide your own decision to invest in a particular technology. Or, by the time a research or learning outcome has been achieved, the technology that supported it could be obsolete. In other cases, the time to completion might be shorter, but the methods for evaluating effectiveness have not been developed or are not widely accepted.

IT Value—the Path Forward

The group of CIOs and CBOs that convened for the IT Value Forum unanimously agreed that whatever the future holds for the issue of IT value, it is a dialog worth having and improving on campus. Building further understanding of the realistic contribution that technology makes to an institution and improving the collaboration of business, academic, and technology leaders in IT decision making are two essential steps. To that end, EDUCAUSE and NACUBO, in collaboration with CGEY, will continue to provide a forum for the industry to discuss the value of IT. Other session sponsors remain committed to developing methodologies with EDUCAUSE and NACUBO to promote the measure of institutional agility, the business value of IT, and other factors. In addition, the EDUCAUSE Center for Applied Research (ECAR) will undertake major research on this subject for publication in 2004.

Enormous investments have already been made in technology from which the industry still has a chance to reap benefit. Still more decisions about new technologies lie on the horizon. Creating a common vocabulary and guidance as to the methods for planning, evaluating, and communicating the effectiveness of these technology investments would be a valuable addition to higher education's toolkit.

The participants in April's IT Value Forum described a new landscape and set out the direction that has been described to shape and improve the dialogue about IT value. In the coming months, EDUCAUSE and NACUBO will jointly sponsor further dialogue and development around each topic:

■ *Institutions need to more tightly link their IT planning to strategic planning.* The most reliable way to assert the value of IT is to meet the challenge of linking directly to an institutional priority. Institutions with the greatest success at this have directly embedded IT planning into their campus strategic planning. IT implications and costs for each strategic goal are considered as they are developed.

■ *Measures of value (and expectations) need to be matched appropriately to the type of technology.* A framework needs to be established that reasonably describes the types of benefits that can be derived from different types of technology investments. This needs to work hand in hand with suggested strategies to measure benefits derived from these technologies that consider a broad range of value that can be created, including productivity, enhanced reputation, cost savings, and improved effectiveness.

■ *IT projects need to be supported by a straightforward business case.* Like any major investment, IT proposals should be accompanied by a business case. The purpose of the business case must not be simply to inflate a projection of benefits to justify an expense. Rather, the business case should be a means to focus decision makers on the

kinds of benefits possible, what it will take to capture them, and the risks of doing nothing. The business case should be an iterative tool that looks at the options for pursuing a project, including the varying levels of costs and benefits that can be achieved.

■ *IT decisions need to be made with broader participation and shared accountability between IT and functional area leaders.*

Any CIO presenting the case for an IT investment alone is starting with a flawed project. The case for an IT investment must be developed and made jointly by technology and business or academic leaders. Only through a joint effort can the full benefits of a potential IT investment be explored. Functional area leaders are in the best position to know how a technology could enhance their capability and how complex it will be to pursue that change.

■ *IT organizations need to adopt the quan-*

tification and communication of IT value as part of their mission.

As noted previously, the industry needs to develop a set of flexible metrics that reflects the diverse missions and services of the technology organization on campus. Individual institutions can then pick from those metrics the ones best suited to measuring their particular organization. IT organizations must also develop better methods to communicate technology's impact on their institutions. Like any communication challenge, messages and methods must be tailored to the diverse audiences that make up our institutions. Here again a partnership with business and academic leadership will be crucial.

EDUCAUSE, NACUBO, and their partners will remain committed to this important issue. Future gatherings and publications will focus on further developing the ideas raised at the IT Value Forum and turning them into practical tools and guidelines for the

industry. We are grateful to all those who participated in the IT Value Forum and thank them for their continued assistance.

Endnotes

1. N. G. Carr, "IT Doesn't Matter," *Harvard Business Review*, May 1, 2003.
2. R. B. Kvavik and R. N. Katz, *The Promise and Performance of Enterprise Systems for Higher Education*, EDUCAUSE Center for Applied Research, Vol. 4, 2002. This study concludes that while the majority of ERP projects were delivered on time and on budget, a significant and highly visible number of implementations deviated substantially from budget and schedule.

Phil Goldstein is Vice President of Cap Gemini Ernst & Young. Richard N. Katz (rnkatz@educause.edu) is Vice President of EDUCAUSE and Director of the EDUCAUSE Center for Applied Research. Mark Olson is Executive Vice President of the National Association of College and University Business Officers.