

The Place of Information Technology in Planning for Innovation

There is a legend that two great mathematicians were working on a problem in a classroom at the University of Göttingen at the peak of the university's fame. An administrator came in to discuss a budgetary problem with them. He filled the blackboard with financial calculations, stepped back, and asked his colleagues what they thought. When one responded, "Well, there is a very interesting sequence of prime numbers there near the top," the administrator vowed that he would never discuss administrative matters with them again.

This anecdote highlights one of the principal paradoxes faced by college and university leaders. On the one hand, we place great value on the academic freedom that allows our faculty to follow their passion, curiosity, and interest as they pursue their research. We look forward to unpredictable innovations that will lead to unprecedented improvements in human health and welfare or a deeper understanding of the moral and physical universe. On the other hand, as administrators, we must strategically plan and invest to support the research programs of the future, which means that somehow we must plan for what cannot be planned for: the unpredictable.

Ever since my early days as a researcher at the Australian National University, I have been actively involved in the administrative aspects of the research enterprise and have come to understand and appreciate the challenges that both researchers and administrators face in higher education. They are the same all over the world. Our tasks center on a strategic allocation of the intellectual and financial



Illustration by Derek Lea, © 2007

resources needed to answer some of the world's most profound and vexing questions. The eyes of researchers remain locked on those questions and answers, but administrators necessarily focus on the space between the two, filled as it is with information technology, library resources, buildings, and other equipment: the means essential for innovation in research, scholarship, and teaching.

And in the specific case of IT, as I have

progressed from vice president for information technology and chief information officer to vice president for research, to interim provost and vice president for academic affairs, and finally to president of Indiana University, it has become increasingly clear to me that unless one is doing computer science, IT is not an end in itself. Investment in IT at the institutional level is just like investment in any other kind of infrastructure to support research, scholarship, and instruction.

This is not a particularly profound observation, but there is nothing like having responsibility for all of the affairs of a great research university to put this truth into stark relief.

At the most basic level, investment in IT infrastructure is part of the cost of doing business at a research university. At the very least, an institution must provide basic IT resources and connectivity to faculty, staff, and students. But this is no longer enough to ensure that an institution is even minimally competitive. Why? Because research in nearly all academic areas requires advanced IT infrastructure to a greater or lesser degree, and because an institution's ability to attract and retain research faculty—and increasingly, instructional faculty—now depends, in large part, on its ability to provide and support that infrastructure. Students too expect their IT environments to be contemporary and flexible, ready to change dramatically from one generation of students to the next—a period, on average, of only about five years.

The drive to enhance IT in higher education necessarily arises as a result of administrative needs on the one hand and of faculty and student needs on the other. College and university administrations must assess the broader, long-term institutional needs as they create and maintain robust computing and data-storage environments—preserving student and alumni records, providing student services, and supporting faculty and staff needs, along with other crucial tasks. At the same time, faculty—who are researchers of standing, substance, and credibility—must make the case for the IT infrastructure they need, from fast networks to supercomputers, as essential elements of their research and instructional programs.

Ultimately, those making both kinds of investments must be able to justify the expenditures in the same way that they justify the purchase of other large-scale pieces of infrastructure like NMR spectrometers, cyclotrons, or telescopes. Essentially, they must be able to, in business terms, describe what the return on the investment will be, and the expectation is that the return will be considerable. For example, some research administrators use a rule of thumb that an investment

in research infrastructure is expected to yield a three-to-one or four-to-one return in terms of new, externally sponsored research. Others highlight the return in terms of research outcomes—for example, refereed research publications, major new scientific breakthroughs, or patents. More commonly, the return is viewed as some combination of the two.

Sometimes institutions decide to make bets on the future importance of a particular area of IT in the hope that this will lead to a competitive advantage in terms of research or education. But such bets must always be principally informed by the views of outstanding researchers, scholars, and teachers who are single-mindedly focused on advancing their disciplines and how those disciplines are taught and who are not beguiled by the more superficially attractive elements of IT and by chimerical promises.

Five years before the creation of the National Science Foundation (NSF) in 1950, James Conant, the legendary president of Harvard University, argued for a solidly grounded approach to the funding of scientific research: “There is only one proved method of assisting the advancement of pure science—that of picking men of genius, backing them heavily, and leaving them to direct themselves.”¹ Just as we administrators must plan for the unpredictable, so too must we exercise informed leadership and good management that are attuned to the real needs of leading scholars who follow their curiosity and passion. As we keep our eyes trained on that space between question and answer, we must carefully allocate our limited resources so that innovation becomes not a matter of happenstance but a matter of course. The great colleges and universities of the twenty-first century will not emerge by accident. They will be built on the brilliance of their faculty, the wisdom of their leaders, and the promise of their students.

Note

1. James Bryant Conant, letter to the editor, *New York Times*, August 13, 1945. We would today, no doubt, opt for the more inclusive “people of genius.”



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