

# Beyond the Technology

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## ABSTRACT

In this paper the authors discuss the accumulated incremental changes fostered by IT and how they change campus culture and life for all members of the campus community. This presentation is a user-centered perspective looking not at how infrastructure and resources have changed, but rather how IT changes make a differences (positive or negative) in teaching, learning, working and living on campus. A better understanding of the impact UCCs (University Computing Centers) have on all aspects of campus life can improve planning and training. This challenge arises from the ubiquitous presence of IT on campus affecting all aspects of campus life – learning, teaching, working, and living. Technology’s capability, availability, reliability, and ease of use lead to changes in roles, responsibilities, expectations, access and relationships among and between faculty, staff, students and administrators. Computer center services play a significant role in identifying and addressing these issues as users’ adoption or rejection of these resources is determined not by the power of the technology, but by user perceptions of how IT’s power facilitates their accomplishing their objectives.

## Categories and Subject Descriptors

K.6 Management of Computing and Information Systems  
K.6.1 Project and People Management - Strategic information systems planning

## General Terms

Human Factors, Management, Performance

## Keywords

Technology, Change, Planning, Campus Life, Institutional impact

## 1. INTRODUCTION

Technology is a means, not an end. Measuring an institution’s IT status and progress in terms of its capabilities and capacities (e.g. miles of fiber, numbers of gigapops, or storage volume) is indicative of a technological determinist’s perspective where technology is an end in itself and the institution and campus community are expected to adapt to accommodate the power and potential of the technology.

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While technological capacity is important, in the larger scheme of institutional mission technology is better measured in terms of the difference it makes (positive and negative) in fulfilling institutional mission and goals, that is the difference it makes in teaching, learning, living and working on campus.

Information technology’s integration into higher education is intended to further the mission and goals of academia, but – like other new technologies such as the telephone – its introduction engenders unintended consequences. Technology has no “predetermined impacts.” The potential that developers infuse into technology frequently lies hidden, awaiting users to see the power and potential that its creators did not envision [17, 18]. “Technologies such as computers (or pencils) don’t have predetermined impacts; it’s their uses that influence outcomes.” [1] If technology is truly a tool to facilitate the achievement of institutional mission, the computer center’s purview must extend beyond just providing resources and services. The UCC’s charge must extend to knowing and understanding the actual uses to which the technology is put, and how the technology enhances or diminishes the efforts of both its users and non-users. In short, UCCs need to manage not only the technology but also the differences that technology fosters across campus.

## 2. RESPONSIBLE TECHNOLOGY

The mission of university computing centers is to ensure that their institution provides what Dewey termed “responsible technology” [4]. The National Research Council of the Academies of Science [12] reports that universities and colleges in general, and research institutions in particular, need to address “managing the great discrepancy between technological and institutional change, and exploiting the new technological capabilities. . .” while retaining the unique nature and mission of their institutions. The Academy goes on to recommend the development of tools and strategies to document and understand how IT changes the institutions themselves. The Academies’ recommendations go beyond the technology, recognizing that the cumulative changes fostered by IT change responsibilities, expectations and relationships among and between members of the campus community and discipline constituencies.

The multifaceted issues surrounding IT’s overt and latent impact are complex because the technology and its hidden potential are embedded throughout an organizational context -- a context of traditions, roles, expectations, responsibilities, and relationships [13]. The ubiquitous nature of information technology on today’s campuses means that additions and changes to infrastructure, resources and applications significantly impact the campus as they change the very context of an institution [14]. The introduction of computers on campus in the ‘60s and 70s, the arrival of personal

computers, the establishment of campus networks, the arrival of the Internet and the Web, the creation of wired and now wireless campuses: each of these changes not only affect workflow, but also roles, responsibilities, satisfactions, relationships, traditions, and expectations on campus [3, 10, 15]. These non-technology consequences are frequently overlooked in planning for IT changes even though they impact teaching, learning, researching, working and living in an academic community. In instances where they are considered they are often undervalued, even in retrospect [5].

### 3. THE CHALLENGE

The current fiscal state of higher education places an increasing demand for assessment, accountability and performance measurements throughout higher education [11], even as campus investment in information technology continues [2]. To justify IT expenditures decision makers too frequently fall into the technological determinist's mode of pointing to quantifiable data [7, 9] covering a wide range factors -- dollars invested in IT, the number of wired classrooms, etc. When trustees and legislatures seek to learn how those investments have actually changed the institution (for better or worse), the answers are too often limited to anecdotal accounts [16]. On too many campuses there are no tools or strategies in place to identify and evaluate the differences that IT initiatives have fostered. Technologists can point out the increased speed of data reception and transmission, but can't tell how that increased speed has made a difference (positive or negative) in the quality of what is being done. Without understanding the difference that technology makes there is no way to effectively manage the changes that occur, mitigating the impact when negative and enhancing it when positive. The challenge is to develop innovative methodologies and strategies that enable institutions to recognize and manage those impacts [6, 8].

The requirement is not to become a social constructionist, as opposed to a technical determinist, but to integrate in the planning and support activities of an institution consideration of the impact of IT, not just its power. From the computer center's perspective this means learning more about their customers: What are they *actually* doing and not doing with technology? How is that use, or lack of use, reflected in their work, study, research and lives? What has been gained and what has been lost due to the introduction of a new resource or application? Libraries offer an example: the professional lives of librarians have been significantly changed by the Internet and search engines. What was gained is access to specialized collections, data resources and otherwise inaccessible works for faculty, students and staff. What was lost is the personal and professional satisfaction librarians gained from interacting and working with faculty and students to identify and locate resources. At the same time, researchers feel liberated from having to trek across campus to the library and *wasting time* digging through the stacks (something they consider an advantage). However, as the insights and guidance of a librarian are bypassed, the researchers miss seminal works that are available only in print, or are unaware of works that are digitized, but not accessible via GOOGLE [19].

### 4. THE ROLE OF COMPUTER SERVICES

UCCs have always been tasked with a multifaceted mission serving the needs and demands of a broad range of users (from experts to neophytes), administrative decision makers and planners, and staff who run the business and record keeping sides of the institution. Its mission has never been an easy one. As technology and applications become more sophisticated the populations of users proliferate and the demands and skill levels of users become increasingly diverse. Throughout this dynamic growth in complexity and power computer center staff are tasked with delivering services and supporting users -- they are the ones who: operate and maintain the hardware, applications and infrastructure; provide training; field the questions; offer support; and, are the recipients of users' ire when nature, technology, or the user's own lack of skill lead to frustration. UCCS are the point where technology's potential and users needs intersect.

In the interactions between users and computer services staff are buried nuggets that reflect the differences that technology change has fostered. In the press of getting things done these nuggets are frequently ignored. Gathering the technical specifics about a problem or question provides useful data for addressing system failures or improving technical training as frequent complaints or problems indicate problem areas that need attention. Automated help desk applications facilitate tracking these problems. The data these applications collect is useful, but limited. It is narrowly bounded, focused on the technology -- it can tell how many faculty are having trouble using Blackboard's testing facilities, or indicate peak traffic bottlenecks on campus, but it doesn't indicate how teaching, learning, researching and working have changed due to the application in question. For example, at one institution an upgrade to the course management software was followed shortly by increasing calls to the help desk with complaints about accessing resources through the CMS application. Firewalls were found to be the problem and users were advised how to work around the problem to gain access. The technology problem was addressed, but no one in the computer center learned about how the course management tools changed teaching and learning. Were students upset because they couldn't access the digital equivalent of class handouts, or disappointed because they couldn't participate in an interesting online exercise? Was technology saving a dreaded commute to campus, or making a course more interesting? While environmentalists might find the former of interest, a board of trustees might be more inclined to support further investment knowing about the second.

How well technology serves the mission of the institution is determined not by the power of the technology, but by users -- how they adopt and use it or ignore and reject it. To look beyond the technology, UCCs need to develop strategies and tools to capture data from users and non-users that reflect how technology actually changes what they do: How has it improved or impeded teaching, learning, research, working, and living. The raw data indicating gains and losses are readily available but usually lost in the press of technology's incessant demand for dealing with immediate details. Computer centers need to make a concerted effort to seek out and capture data that goes beyond the operational details of applications. What are users trying to accomplish, not just what application package is being used? Why did a user choose this particular application, or why did they choose not to use that application? What does the application enable the user to accomplish that they were not able to accomplish before? What does it limit or prevent? The goal is to

capture a richer description of the user's situation in order to better understand how technology actually helps or hinders their efforts. In many instances staff members in the computer center already have this data from their interactions with users. But there is no requirement or systematic means to capture it, and so the richness is lost. What is left are generalizations that may or may not be useful for future planning as they lack the specificity to have impact.

The solution is two-fold: making computer center staff aware of the need for going beyond the technology, and having a systematic way to capture the richness of users' experiences – the situations, decisions, causes, and impact. It is more than the usual incident report completed at the help desk to catalogue and categorize complaints and problems. What is needed is a means to create a collection of critical and important factors related to how technology changes the teaching, learning, researching, working and living on campus. Such a collection will not only inform computer center planning, services and training, but it will provide the foundation for justifying to administrative decision makers how technology makes a difference on campus.

The long term benefits of going beyond the technology are better informed planning for resources and services, and the ability to provide stronger justification for increased future investment in IT.

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