From Managing Expenditures to Managing Costs

Strategic Management for Information Technology

By George Kaludis and Glen Stine

INTRODUCTION
It has been two decades since Howard Bowen initially posited the first law of higher education financial management: “Raise all the money you can; and spend all the money that you raise.” In the intervening period, institutions of higher education have been generally loath to defy Bowen’s Law and have sought to develop better processes for controlling expenditures (often enabled by new technologies) rather than attempting to control actual costs. Perhaps nowhere has this approach been more perfectly operationalized than in campus budgeting for information technology (IT), whether for instruction or other purposes. …

Yet institutions now face a world where policymakers, trustees, and students are applying increasing pressure to hold the line on costs. More immediate for many institutions, new competitors for students, including for-profit providers, and other market forces may force reductions in price for certain programs or services, requiring institutions to change their cost structures to remain competitive.

In this context, it is critical to draw the distinction between the management of expenditures and the management of costs. For the most part, colleges and universities have managed expenditures through budgeting and other fiscal controls like procurement procedures within the institution. Managing costs, however, encompasses broader issues like depreciation, assets and liabilities, and activity measurements and opportunity costs. Strategic management of costs may require analysis of economies of scale, returns on investment measurement, and scalability of the technology being implemented.

If one assumes that personal computers and the Internet are transformational, even “disruptive” technologies, then, for many institutions, a substantial part of the technology infrastructure has become a “utility” much like electricity and the heating plant, some portion of which are capitalized while others are an ongoing operating expense. These infrastructure costs include the development of campus networks and the provision of minimally configured personal computers, network connections, and e-mail technology with appropriate network servers. For some institutions, the utility infrastructure will include the provision of a purchasing or licensed platform through which to offer Web-based coursework. These utilities are generally “managed” through direct subsidy of the departmental budget or through some charge-back/cost recovery mechanism. As a utility type of expense, management of the costs will depend heavily on institutional policy and plans for provision and expansion of the utility, and will be partly driven by other issues like the needs of administration and institutional economic factors like indirect cost recovery and research funding.

That is, does the method of charging for the infrastructure allow for the recovery of the expenditure through either direct charges to grants and contracts or by applying those expenditures to the institution’s indirect cost rate? The basic approach to controlling costs is to limit access to the utility, and when access control is not feasible or functional, institutions must find ways to absorb the expansion costs. The relatively unplanned and non-integrated set of decisions to develop the infrastructure means it occurs without substitution for other areas of expense. Over time, the use of PCs has changed the way most faculty and other staff conduct their business and may have led to cost substitution, but few institutions were either able to recapture the savings or to plan systematic reinvestment. An example of the change in the way work is conducted can be seen in the fact that faculty and staff now produce finished papers rather than using secretaries to meet these needs. In the main, this change in work has not been recaptured by a systematic budgetary approach.

The following three basic and unavoidable principles apply when managing the cost of information technology:

1. The uses of instructional technologies will only increase costs of instruction when that technology is used to supplement existing activities or be an add-on to current courses.
2. The cost of instructional technology must be measured as part of a whole process or activity, not as a stand-alone cost. That is, the development and use of instructional technologies will inevitably require new expenditures to acquire those technologies; cost savings, if any, must come in the application of the technology to other activities associated with the use of IT, e.g.,…

Each of these principles challenges current management thinking and the state of current management practice at most colleges and universities. We treat each of the principles and the management challenges it poses below.

The CHALLENGES TO MANAGEMENT

Data from the Campus Computing Survey . . . show that most campuses are employing information technology in the institutional program to supplement and depart from traditional course offerings. This strategy allows institutions to use traditional faculty and department structures as the primary mode of operations. Costs are not likely to be the primary consideration and rates of expenditures will be based on the availability of the support infrastructure and marginal allocations of funding through regular budget processes. More faculty are interested in learning to develop information technology applications for part or all of their courses, and institutions are likely to be limited by the availability...
of technical talent to support both the needed technology infrastructure and the faculty support functions. This situation will limit institutional expenditures, but may not actually manage costs. The approach, however, will limit institutional effectiveness and sustainability. H. Graves, the president of Eduprise.com, calls “random acts of progress” which he distinguishes from “global progress.”

Under this strategy or scenario, the task of management is essentially to manage the expenditures of the utility, which now includes course development support and new institutional investments. Costs are high because expenditure management is the resource allocation tool. New kinds of proactive management decisions may more effectively manage costs. What and how many courseware systems will be licensed? Will the institution do its own Web hosting or purchase the service? How will student enrollment transactions be handled? Will the technology enhanced courses work? How will faculty support functions be developed and managed? What issues are concerning faculty seeking significant support or even supplemental salary for course development, in particular Web technologies and royalties owed, and responses to individual faculty initiatives to develop instructional technology? Typically, these questions will be handled within the traditional decision making mechanisms and processes of the institution. The overall result is likely to be high cost and low impact, with incremental expenditures for changing the systems and their implementation to handle the old processes and higher costs for maintenance and renewal. Institutions willing to dramatically redesign their administrative transaction processes and activities to take advantage of the ERP systems typically lower their overall cost of a transaction. They also created significant new management opportunities and processes.

Institutions choosing to implement new ERP systems with the same administrative and management procedures were then faced with extraordinary expenditures for changing the systems and their implementation to handle the old processes and higher costs for maintenance and renewal. Institutions willing to dramatically redesign their administrative transaction processes and activities to take advantage of the ERP systems typically lower their overall cost of a transaction. They also created significant new management opportunities and processes.

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The desire, even with much of the technology infrastructure in place, may not be enough to allow an institution to become a major competitive force in distance learning. In a long prospectus touting internet to deliver services as a fun-
e-knowledge businesses using the competitive force in distance learning arena, institutions can
be content producers, course distributors, learning support centers, or be simply non-participant in the instructional use of information tech-
nologies need to serve as a benchmark against which to test plans and activities. For example, an institution that seeks to develop new and expanded markets using technology needs to act considerably different from an institution that plans to de-
velop, protect, and perhaps expand on-campus or existing continuing education markets. Even within on-campus markets, institutions having enrollments of traditional undergraduate students are likely to need to invest differently from institutions with large non-traditional or graduate enrollments. Finally, technologies can be fully developed by the focal institution or can be used only after a fully tested purchasable product is available. Institutions will face different "management of cost" issues by deciding where they want to fit on a continuum from "bleeding edge" to "total non-participate" in the instructional applications of information technologies. Even within the distance learning arena, institutions can be content producers, course distributors, learning support centers, or course and degree providers, dep-
dending on their enterprise strategy.

Wit Capital Corporation provides the following admonitions about what value will require in the market:

1. The focus on "Value Added" content, delivery, or services to sustain a competitive advantage.
2. The use of brand and reputation not just for narrow audiences, but for all that must evaluate the service (including students, employers, parents and businesses who might want to purchase services). Since location will be less important, establishing rep-
utation will depend on type, level, quality, and price of ser-
ices, not faculty reputation.
3. The development and mainte-
ance of a strong management team, management processes, and management action that can move quickly and decisively to have a winning approach.
4. First movers have advantages, but these advantages are based on quality relationships, particu-
larly corporate and strategic al-
liance relationships. Few compa-
nies (or institutions) will be able to provide a comprehensive set of services.

Wit Capital indicates that tradi-
tional higher education currently offers weak competition to emerg-
ing for-profit providers in the major growth of e-knowledge commerce because of higher education's in-
ability to leverage capital and con-
front these issues.8

Alternatively, focusing on on-
campus uses of IT, Carol A. Twigg identifies the following eight criteria against which an institution can assess its own readiness to reduce costs and enrich learning through information technology:

1. The institution must want to reduce costs and increase academic productivity.
2. The institution must view tech-
nology as a way to achieve strategic academic goals rather than as a general resource for all faculty and for all courses.
3. The institution's goal must be to integrate computing into the campus culture.
4. The institution must have a ma-
ture information technology or-
ganization(s) to support faculty integration of technology into courses or it must contract with external providers to offer such support.
5. A substantial number of the in-
stitution's faculty members must have an understanding of and some experience with integrating elements of computer-based instruction into existing courses.
6. The institution must have a demonstrated commitment to learner-centered education.
7. The institution must have estab-
lished ways to assess and provide learner readiness to engage in IT-
based courses.
8. The institution must recognize that large-scale course redesign using information technology in-
volves a partnership among fac-
ulty, IT staff, and administrators in both planning and execution.9

Conditions and issues such as the ownership of course materials, the role of non-faculty in course deliv-
ery, and faculty compensation man-
agement must be addressed by most institutions to successfully manage the enterprise and associated costs.

ANALYZING RETURN ON INVESTMENT AND STRATEGIC ASSET MANAGEMENT

Because the instructional applica-
tions of IT will inevitably require the expenditure of funds, analysis of the return on the investment (ROI) and the use of strategic asset management provide strategies for cost management. ROI, while usu-
ally seen in strictly quantitative or
ing their strategic assets as part of a significant decisions about deploying institutions need to make overt and institution chooses. The point is that management depending on the model an support strategic assets management strategy. Many institutions with different cultures of information technology. Different institutions can better manage the cost development and depreciation costs, in particularly those with high development, and those with high developmental and depreciation costs, institutions can better manage the cost of information technology. Different institutions with different cultures are using a number of models for this management strategy. Many outside vendors are also willing to support strategic assets management depending on the model an institution chooses. The point is that institutions need to make overt and significant decisions about deploying their strategic assets as part of a cost management approach.

Truly managing the cost of information technology will also require cost measurement processes and understandings rarely evidenced in higher education. Twigg points out the value of activity-based costing, but only after assignment of certain expenditures to fixed institutional costs. Thus, both measurement methodologies need to be employed. Understanding the half-life of certain technology, certain content and knowledge, and similar issues are essential for building cost strategies based on depreciation. Predicting markets and market responses may also be a significant issue for determining ROI and thus management of costs. Because a large portion of the potential cost reduction from the use of IT will come in the form of time and effort savings of current personnel, institutions will need to understand how to recaputare and put to productive use that time and effort. Beyond the expense in dollars and cents of information technology applications, certain non-tangible costs in terms of an institution’s reputation and current market position may be equally significant and will require searching analysis. Large enrollment courses, particularly those with either many sections or several types of delivery activities like labs or discussion sections, present substantial opportunities for reducing instructional cost and improving learning. Institutions whose reputa- tion is built around small sections and high direct faculty involvement will need a high ROI to begin to substitute technology for the small enrollment reputation. Similarly, increasing opportunities will appear for institutions to purchase course content and even outside delivery with potentially significant savings and learning improvements, but institutional reputation must be a significant consideration. Institutions renowned for providing leading self-service technology solutions cannot forgo continuing investment in these technologies to support instructional applications of IT. Strategic assets may be sold or licensed to outside businesses, but a cost consideration must include reputation management and current market position management. There may be opportunities to develop economies of scale through institutional consortia or partnership arrangements, but there are likely to be reputation considerations, which can add to or reduce costs. All these considerations suggest that an institutional investment strategy must also include a corresponding exit strategy; i.e., management processes to avoid costly expenditures. Because institutions are not generally good at eliminating programs and many institutions have current investments in antiquated technologies for instructional delivery, the rate of technol- ogy and content depreciation costs are going to increase and this will further outdate existing infrastruc- ture investments. Cost management, thus, requires planned exit and risk mitigation strategies rarely found in the academic management of colleges and universities.

IN CONCLUSION: COST MANAGEMENT REQUIRES A PARADIGM SHIFT Information technology will strain not only the instructional budgets and current policies of many institu- tions, but will also strain the managerial skills and experience of their leaders. As we have suggested, IT costs can go unmanaged, but the costs will be high and are unlikely to meet significant institutional goals. On the other hand, IT presents sig- nificant opportunities. Those oppor- tunities will not be realized without management skill in the as- sessment of technology invest- ments, both from the point of ROI and at levels like buy and potential financial terms, can use qualitative criteria as well. That is, by measur- ing the progress an investment returns against a set of stated goals, the ROI can be compared against other investments that the institution might make. This process assumes that an institution can identify and measure the goals or strategic agenda that it seeks to accomplish and is willing to explore a series of investment opportunities for capital or other funds to which it might have access. Investment funds can be generated from many sources, including fund raising, capital fund- ing, debt, or operating funds after fixed costs have been met. The largest allocable resource at most institu- tions is the time and effort of faculty and staff. Increasingly, institu- tions are using for-profit corpora- tions as a means of generating equity and potential venture capital for the development of new markets and delivery systems.

Strategic asset management takes a broader view of the assets of the institution than that found in financial statements. For example, intellec- tual property generated and owned or licensed by an institution has substantial potential value. Many institutions have developed tech- nology transfer operations to deal with the potential value of inventions, patents, and licenses in the institu- tiona. By more systematically applying underutilized assets, particularly those with high developmental and depreciation costs, institutions can better manage the cost of information technology. Different institutions with different cultures are using a number of models for this management strategy. Many outside vendors are also willing to support strategic assets management depending on the model an institution chooses. The point is that institutions need to make overt and significant decisions about deploying their strategic assets as part of a cost management approach.

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At the following four levels:

■ At the infrastructure or utility level, the management of costs is not only to determine whether the expenditure will be made, but also how fast and which technologies provide the greatest functionality at the lowest price to meet institutional needs.

■ At the Comprehensice Enterprise Model planning and strategy level, institutional positioning, strategy, and technology are brought together in an integrated package. Using technology for experiences and "random acts of progress" can be an expenditure-controlled process, but not a cost management approach. Without a realistic approach to developing the institutional strategy, costs cannot be managed and priorities for enterprise progress established. Because the strategy mix is different for every campus, no singular approach is available to manage the cost of IT, even within institutions that appear fairly comparable. Indigenous enterprise planning must be a key element.

■ At the level of institutional management, practices and policies will need to be transformed to accomplish the set of desired global or enterprise-wide progress outcomes. Institutions unwilling to transform current practices and approaches to instruction and service delivery will not find ways to manage costs for new types of IT.

■ At the level of strategic investment, appropriate assets deployment and measured return on investments and new management processes skills and experiences will be essential. The technologies have great potential for transforming instruction, cost structures of institutions, and institutional opportunities to manage overall costs.

The deployment of information technologies will have a high impact on the institution. Lowering costs (or insuring net returns) will require that other activities and management practices within an institution be transformed as well. Thus, for many institutions, a conservative approach to investment makes the most sense. For a few on the "bleeding edge," costs will not be a primary consideration. For all others, management of costs, investments, assets, and relationships presents tremendous challenge and opportunities, the level of which depends on institutional goals, competition, and strategic agendas. Cost management is an active process, certainly not integrated into the current practices of many institutions, and best not left to chance.

Endnotes
4. ERP systems are used by colleges and universities as well as other for-profit and not-for-profit enterprises to manage transactions and store data and information related to those transactions. Institutions usually have ERP system applications in the financial, human resource, and student management areas. These applications are licensed for institutional use from large software application providers, but the applications are fit to the institution.
5. Legacy systems are also transaction management system for payroll, accounting, registration, and other similar functions. The software architecture and technology for these systems is out-of-date and, in many cases, no longer supported by the original software vendor.
6. Shadow systems are record systems that organizational subunits create to track their business operations parallel to formal organization-wide systems. For example, if accounting statements are routinely late, inaccurate, or do not include up-to-date financial commitments, institutional units will "keep their own books.
11. Self-service technology solutions allow, for example, students to be admitted, plan their major, audit their progress, register for courses, apply and receive financial aid, and pay bills through technology rather than standing in lines or having to obtain unnecessary signatures.