Aligning IT Funding Models to the Pace of Technology Change

Enabling Financial Flexibility for Core, Flexible, and Transformative Services

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ECAR working groups are where EDUCAUSE members come together to create solutions to today's problems and provide insight into higher education IT's tomorrow. Individuals at EDUCAUSE member institutions are invited to collaborate on projects that address core technology challenges and advance emerging technologies important to colleges and universities. More information can be found at the ECAR working groups website.

Introduction

In an environment characterized by globalization, increasing competition, rising costs, and debate around the return on investment (ROI) of a college education, institutions need to be smarter and their practices nimbler, neither of which is possible on a large scale without the enablement offered by technology. Technology has enabled efficiencies and innovation in higher education and has seen widespread adoption over the past two decades. Institutions of higher education have leveraged technology as a strategic differentiator, a catalyst for operational improvement, and a fulcrum to drive the reallocation of resources. Technology has grown beyond its original role, when it was primarily limited to a few labs on campus, and today plays an increasingly vital role in institutions' academic, administrative, research, and advancement endeavors. Technology has become, for many institutions, a strategic and mission-centric consideration.

Yet most prevailing IT funding models are based on practices that do not reflect the changing landscape or the necessity of continuous investment. At many institutions, IT funding depends on one-time expenditures or capital-funding mechanisms that are based on building-construction funding models predicated on a life expectancy of 20 years or more. Such models don't provide the stability or flexibility needed for modern IT investments. Even as new service and delivery models promise better technology with a higher ROI, many funding models restrict IT departments to spending on equipment and, less often, personnel. Although software as a service (SaaS) promises more flexible IT services, the misconception is that these services can be rolled out without any resources from IT. In most cases, these new service models carry the companion need for attracting and retaining new kinds of IT professionals, individuals focused on business process, data integration, data governance, vendor/contract management, and distributed security. These skills require retraining existing staff and attracting new employees from highly lucrative private-sector careers. With the rate of technological change, the need to ensure that sufficient resources are available for professional development is analogous to the continuous investment reference regarding hardware and software mentioned above.

The role of technology in higher education has undergone a metamorphosis, but the budget processes at many institutions have largely remained the same. At a time when IT needs to be agile and flexible, financial resources are often stringently allocated and unavailable to assist institutions in transformational

work. Considering the multidimensional challenges facing institutions of higher education, campus communities should feel an imperative to critically examine and address the issues that pervade technology funding.

With that in mind, the EDUCAUSE Center for Analysis and Research (ECAR) brought together a group of high-level IT and finance leaders from a wide range of institutions to work together to understand how to better align IT funding models to the pace of technology change. This group represented 15 institutions, 6 private and 9 public, ranging in size from fewer than 5,000 students (4 institutions) to 5,000–15,000 students (5) to more than 15,000 students (6). The results of this collaboration between technology and business officers provide guidance and suggestions to help institutions make smart, informed decisions about their IT investments.

Where Our Use of Technology Is Taking Us

IT service providers are challenged by the accelerating adoption of technology across all parts of the institution. The need to provide stable, secure services while undertaking innovative projects is straining existing resources. Moreover, IT departments are receiving new types of requests, some of which require IT to be innovators rather than adopters of the tried and true. The need for speed and agility challenges IT staff who are accustomed to designing services on the basis of stability, the ability to customize, and security. IT needs to be able to consider new service delivery models that provide existing services more efficiently, help reduce complexity, and increase the ability to scale service offerings in a sustainable way. The skills needed in IT departments today are changing, as well. Due to the rapid adoption of cloud services, higher education IT leaders need to recalibrate their strategic thinking in evaluating sourcing opportunities. IT departments need to be competent in vendor and contract management and able to assess and respond to privacy and security concerns. The massive amounts of data being produced today show only signs of acceleration in the future, highlighting the importance of data governance, management, architecture, and integration skills that need to be added to IT rosters.

How does this affect funding models? Beyond the need to switch from capital funding to operational funding (for more on this, see the section on Existing Budgeting Models below), higher education must also think about how to fund and resource innovative IT projects. This requires a rapid approval and development process and a willingness to take risks. As this environment continually changes, standard ROI or total cost of ownership (TCO) evaluation models may not apply.[1] New calibration measures may need to be considered that ensure funding requests get visibility while also communicating the importance of the requests. That might include quantitative analyses of the costs of providing specific important services to the campus and measurement of how institutions contain or decrease these costs over time.

Embracing Change and Accepting Failure

Failure is part of the learning experience that can help IT find solutions to institutional challenges. It's not uncommon for a project to fail and then not only lose all current funding but also become an excuse that hinders future ability to move forward. Past failure often serves as a crutch to those who will not embrace change, and these days smart change equals innovation. Changing the culture of how an institution views failure is imperative. By backing the notion that it is safe to make mistakes (within reason!), institutions are better positioned to adapt IT services more rapidly.

In the past, technology choices were perhaps more straightforward. A need appeared, and a solution was identified, architected, and implemented. Costs associated with new solutions were capitally intense, with the majority of the expenditure being spent on labor, hardware, and purchase of software licenses. Solutions were built and then placed on a routine maintenance schedule. Future upgrades to the solution required similarly predictable yet smaller spending on labor, hardware, and software upgrades. This technology model required a funding model with a clear "separation of duties" between operational spending (predictable payment cycles with incremental cost increases) and capital spending (one-time significant expense). Technology solutions were project-based. Capital funds, including for labor, were allocated to the project costs, and capitalization/depreciation expenses usually helped ensure replacement funds over time.

Today, technology is in a constant state of change and improvement. While higher education adjusts and responds to changing models, reduced funding, and other pressures, the broader IT industry is equally driven to respond to changing circumstances. The focus in institutions is on transforming operating models and responding to financial pressures while new products are emerging that are offered as a completely hosted and vendor-managed solution, delivered as a *service* rather than an on-premises, customized system. For example, the proportion of institutions using commercial data center services has risen from 16% in 2011 to 26% in 2014.[2] Driven by user demands, vendor roadmaps, and the need for rapid deployment, many institutions are beginning to move toward cloud-based systems, particularly for the commodity infrastructure items that do not provide competitive advantage. Doing so can provide IT departments with the ability to focus on more innovative solutions that meet the strategic objectives of the institution. However, the challenge for IT leaders is that the shift to vendor-managed solutions challenges the traditional IT funding model of a lump-sum upfront investment with a period of small operational costs before requiring a large upfront investment as part of the replacement cycle. Managed services almost entirely consume operational dollars—IT is not purchasing expensive hardware or software, and start-up costs are typically in contracted implementation, integration, and training. The yearly costs are more like subscriptions, with higher yearly ongoing operating cost. Managed services, by federal guidelines, require operational funds.[3]

Today's technology requires mind-set and financial shifts across the institution. The current funding and sourcing model does not adequately support innovation and new technology. It most often supports physical, in-house, centrally maintained systems rather than virtual, cloud-based, integrated services. Funding models currently assume a central model of acquiring and accounting for services. However, with the variety of cloud-based solutions and the ability of stakeholders to acquire services directly from vendors without engaging the enterprise IT department, greater agility is needed to respond to campus needs. Ensuring that overarching procurement frameworks exist to support the acquisition of cloud services that include security and privacy assessments, as well as payment and budget mechanisms, is necessary to provide governance over campus activity, rather than centralizing the purchase and installation.

In addition, much greater emphasis is being placed on accountability and the measurability of the value of technology investments. This leads to additional opportunities to quantify the amount spent on service delivery to campus. Methodologies such as ITIL (Information Technology Infrastructure Library),[4] long established in corporate IT, are being adopted much more frequently in higher education.[5] These provide the tools for analysis of investments, but they also require a different type of accounting structure and approach to IT budgeting.

Existing Funding Models

Existing IT funding models are often a legacy of a time when technology played a much narrower and more predicable role within the institution. Whereas some evolution in funding models has occurred, additional progress is needed to ensure that smart funding comprehensively facilitates and supports the institutional mission. The challenge for higher education IT leaders is that existing funding models support the operational costs of managing and in some cases growing the IT infrastructure to meet rising demand but often do not reflect the rapidly changing landscape of the nature of IT services and how those services are delivered. Consequently, it is difficult for IT organizations to adopt new and different service models because funding often reflects a last-century model of IT services and delivery. Additionally, while demand for IT services and demands placed on technology infrastructure continue to increase, the level of IT funding as a percentage of institutional budget has remained flat. EDUCAUSE Core Data Service (CDS) survey results indicate that from 2011 to 2014, the IT budget for nonspecialized U.S. institutions has hovered around 4.3%.[6]

IT Funding Sources

The primary sources of funding IT in higher education generally include the following:

Tuition/Fees: Nearly all IT organizations in higher education receive a significant portion of their funding from tuition and various fees. In some instances, this may be the only source of funding that the central IT organization receives. Although tuition and/or fees is clearly the most prevalent type of funding, significant reliance on this source brings challenges, especially in recent years when institutional and technology-related expenditures have often outpaced the rate at which institutions can adjust tuition and fees. This potentially creates increased competition for such funds and negatively impacts IT's ability to meet increased demand for new and different services.

Technology-Specific Fees: As the prevalence and visibility of information technology within higher education have increased, many institutions have established technology-specific fees, providing some measure of transparency to the students regarding where such fees would be used. In some cases, technology-specific fees generate a substantial portion of revenue. The amount and structure of the fees vary significantly between institutions, as do the specific purposes for which such fees can be used. In some instances, the IT unit has full control over how such fees are spent; in others, a governance body may have significant input into how the funds are used. Advantages of such fees include the aforementioned increased transparency and the ability (in most cases) to roll unspent funds forward to the next fiscal year. Additionally, an increase in such fees directly funds additional technology investment, whereas increases in tuition may or may not result in any increase in technology funding.

State Funding: For many public institutions another significant source of funding for IT efforts is a portion of the state funding allocation provided to the institution. In the recent higher education funding climate in which states have been reducing such allocations, any significant reliance on such funding for technology infrastructure or services clearly brings some measure of risk, particularly as reliance on information technology continues to increase, with a commensurate rise in the need to invest in it.

Chargeback/Cost Recovery: A significant number of institutions charge constituents for the services provided. Although not a source of external funding to the institution, chargeback/cost recovery is generally viewed by IT units as a distinct funding source, generally used to support specific types of

operations and services. If chargebacks accurately reflect costs for services provided, this approach is generally accepted by IT's customers and offers a sense of transparency and trust in IT services. However, in some cases, overcharged services have been used to subsidize underfunded services, resulting in a lack of understanding or appreciation for the true costs of the services provided and a loss of trust in IT.

Grant/Research Funding: Institutions also seek grant and research funding to support technology needs. These monies can be helpful when focused on specific technology resources for campus, such as NSF funding for advanced campus research networks. However, grant funding for IT resources does include some challenges. Because grants are often received for very focused needs, they tend to impact relatively few members of the campus population. Additionally, in some cases grant funding is not recurring, and the institution may or may not provide follow-on funding to maintain the technology once the grant has expired. A more sustainable approach in the use of research funding is for institutions to allocate a portion of research overhead or indirect cost recovery to core IT infrastructure and support.

Gift/Endowment Funding: On rare occasions institutions receive IT funding support through donor gifts and endowments. This can be extremely helpful when pursuing a large initiative in which technology plays a part, such as constructing a high-tech building or a high-tech research lab. In these scenarios institutions often face the same issues as with grant funding for IT: The project (and funding) is specific—touching a limited number of campus clients—and the funding is not recurring (i.e., it is seed money), is difficult to maintain, and may require a match that is often not budgeted.

IT Funding Methods

The above types of funding sources can generally be classified into four funding models: allocation based, revenue based, special allocation, and chargeback.

Allocation-based funding is typically a fixed amount of money provided by an institution's central administration using general institution tuition, fees, and/or state monies as the funding source(s). Allocation-based funding models can be simple to create and provide a stable, known amount for developing a budget. This model recovers IT operating costs based on criteria other than usage (e.g., revenue or number of FTEs). A challenge with allocation-based funding model is that it is often seen as a recurring allowance from the previous year and does not always accurately reflect current operating expense obligations, known capital expenditures, known multiyear hardware refreshes, or the inevitable cost of replacing institution information systems.

Allocation-Based Funding	
Typical Funding Sources	▪ Tuition ▪ Fees ▪ State monies
Pros	▪ Can be simple to create ▪ Can recover IT costs based on criteria other than usage (e.g., revenue, number of employees)
Cons/Challenges	▪ Recurring allowance not always equal to the actual recurring costs/needs to sustain ▪ Unless specifically built in, no buffer for opportunistic initiatives

Revenue-based funding is allocated on the basis of the fluctuations in an institution's number of students and is generally provided through an institution's tuition, fees, and technology-specific fees. Revenue-based funding, when coupled with a complete inventory of the costs of services provided, can provide both transparency of how services are funded and a mechanism for "charging the cost of doing business." This model can also provide a mechanism to fund predetermined and approved new initiatives, which creates the opportunity for a collaborative approach to strategic planning. This model's benefit of positive fluctuation can also be a risk (negative fluctuation of revenue based on enrollment, etc.).

Revenue-Based Funding	
Typical Funding Sources	▪ Tuition ▪ Fees ▪ Technology-specific fees
Pros	▪ Can fluctuate positively ▪ Can offer transparency of offering services required ▪ Provides a buffer if additional revenue exists
Cons/Challenges	▪ Can fluctuate negatively ▪ May have to pay back the funds if students drop courses ▪ Difficulty of meeting fixed IT costs, especially in low-revenue years

Special-allocation (set-term) funding is often referred to as "capital" or "seed money" for one-time purchases and new initiatives within a specific period of time. Special allocations are typically funded through grants, gifts, endowments, or special initiatives. Special-allocation funding is helpful because it can be used as quick funding for a specific need and is a supplement to the approved annual budget. This method of funding can also be challenging because it is often not funded beyond the original implementation of the initiative; is not documented in the portfolio of known initiatives (which can compete for other resources, such as personnel resources); and may not fully cover the cost of implementation (e.g., an unanticipated matching $50,000 grant that was not budgeted).

Special-Allocation (Set-Term) Funding	
Typical Funding Sources	▪ Grants/research ▪ Gifts/endowments ▪ Special initiatives
Pros	▪ Quick funding for a specific need ▪ Outside the normal budget
Cons/Challenges	▪ Not always funded beyond original scope or for multiyear projects ▪ Not always in known initiatives plans ▪ May not fully cover initiative

Chargeback funding recovers IT costs by charging individuals, departments, or business units based on actual usage and cost(s). A benefit to the chargeback model is that it can be much more transparent for business units to know what they are being charged for. The challenges to the chargeback model are that

it can be difficult (and expensive) to build and can be difficult to decide on pricing. To ensure adequate funding, a service may end up being subsidized, potentially decreasing transparency. With chargeback funding, IT may be seen simply as a service provider, enabling business units to terminate services in favor of external providers, leading to unforeseen costs and possibly an overall negative outcome for the institution.

Chargeback Funding	
Typical Funding Sources	▪ Typically uses funds obtained from tuition/fees or the other sources that have been described previously
Pros	▪ Can show users exact usage costs
Cons/Challenges	▪ Can be difficult (and expensive) to build and decide on pricing ▪ May supplement or subsidize services to provide funding for other areas (e.g., telecom to network), resulting in loss of subsidy if services are terminated ▪ Could encounter opposition, particularly when the model or what is being charged for is unclear or when the charge is for is for something users think they should not be charged for (e.g., Internet)

To adequately account for the growing costs associated with maintaining an IT strategy, institutions may choose to use a combination of funding sources and models to develop their budget strategies.

Existing Budgeting Models

Several factors influence how an IT budget is built. The mix of funding sources described above is one factor; other key influencers include institution size and mission (i.e., the institution's Carnegie Classification). Large institutions, or those with research or medical centers, often employ a decentralized model of IT support and budgeting. In these cases, core IT infrastructure (e.g., network, central data center, IT security and policy, general computer labs, and administrative systems) is often centralized while local IT services (e.g., end-user support, classroom support, specialized computer labs, direct support for research, and research data centers) are managed and budgeted in a distributed fashion.[7] Budgeting at institutions with significant grant or other external revenue sources must take into account requirements of those funding sources. With those considerations in mind, IT budgets generally include the following elements:

- **Running costs:** These costs are typically labeled as operating budget items and include salaries, software licensing and support, hardware maintenance, infrastructure costs (e.g., network), consulting, and contracts for externally provided services (e.g., cloud). Many of these are fixed costs, including debt retirement on multiyear projects. There may also be a contingency budget line, though contingency is often built into discrete budget line items but not explicitly named.
- **Growth costs:** These costs are usually capital items in the budget, including equipment replacement and major software or hardware upgrades.
- **Transformation costs:** These costs are most often new endeavors tied to strategic IT and institutional initiatives and may be spread across several fiscal budget years.

Results from the 2014 EDUCAUSE CDS survey shows that, among nonspecialized U.S. institutions, 79% of central IT operational expenditures is for running costs, 13% for growth costs, and 6% for transformation costs.[8] With modest variations, these percentages are about the same across all specialized institutions. Several factors affect how these costs are incorporated into the IT budget:

- **Operating Costs:** Operating costs are generally calculated based on the previous year's expenses, noting any increases due to salary/benefit increases, new personnel, new software commitments, and escalations in maintenance charges. In recent years even these costs have been difficult to cover due to flat or decreasing budgets. A challenge for many IT leaders is that while a university may call for a flat or reduced budget, external vendors and service providers often have an automatic escalation built into their contracts. Many IT leaders have also seen that reductions in or elimination of the capital equipment budgets have required "must do" equipment replacements to subsist by scraping up unspent operating budget funds. Kenneth C. Green of the Campus Computing Survey refers to this as "budget dust" funding.[9] Of course this is not sustainable and has forced many IT departments to hold equipment beyond its expected life or move to a model of leasing equipment.
- **Capital Funding for Equipment Replacement:** Some institutions have been able to successfully make the case for consistent capital funding for equipment replacement. As networks rapidly expanded over the past decade and most campuses have adopted a "wireless everywhere" requirement, some IT leaders have been able to point to technology fees as at least one source of replacement funds. Unfortunately, many universities have funded equipment replacement, or expansions, with a series of one-time investments rather than an annual incremental investment. With ubiquitous access to the Internet now common, universities must support this expectation with consistent funding.
- **IT Costs outside Central IT:** Some IT costs may not be reflected in the central IT budget, appearing instead as line items in the budgets of other areas of the university. IT staff may manage large projects, but the project budget remains outside IT. For example, the cost of implementing a new research administration system may be the responsibility of the IT unit, even as the budget for the project resides in the central research office. Fixed costs such as the expense to maintain a generator back-up system for the data center may be reflected in the facilities budget rather than the IT budget. How these real costs are reflected in budget reports may have unintended consequences in how they reflect the total IT budget for an institution.[10]
- **Contingency Funds:** Contingency funds are often not specifically identified in the IT budget but may be derived from funds that are unspent due to changes in plans, reductions in costs, or unrealized inflationary expectations often built into requests for software funds, services, travel, training, or other "soft" costs. This funding mechanism is ad hoc and unreliable, and it is often only a one-time source of funding. Also, depending on institutional budget models, it may not be available to all IT organizations.
- **Strategic Initiative Funding:** Strategic initiative funding in the budget is a luxury that most IT groups do not have. In recent years IT governance groups have been an important source of support as IT leaders look for funding for strategic initiatives. New facilities or additional staff, a new learning management system, enhanced user support services, moving administrative systems to the cloud, security initiatives, and other important projects can often get stronger support from a cabinet or board if they have the endorsement of a governance group.

With this kind of funding, there is often a period of review and negotiation until a final amount is agreed on by leadership and included in the total budget for the new fiscal year. Typically this means an IT budget is submitted and approved for activity that will take place anywhere from 6 to 18 months later (or longer if it is a public institution in a state with a biennial budget process). The longer the budget process, the less agile IT can be to adapt to quickly changing circumstances. Variations to the process are based on the institution. Capital and operating budget creation may follow parallel but separate paths, and budgets for new projects may follow yet another path for approval. There may be different governance and advisory committees with input on budget building. For example, budgets based on student technology fees may go through an approval process with a technology fee committee. The IT leader may have control only over nonpersonnel items, while budget for all staff is handled centrally.

The complications with purchased IT services in today's world make labeling expenditures as operating expenditures (OPEX) or capital expenditures (CAPEX) a challenge. Notably, the growing adoption of cloud services has blurred the line between CAPEX and OPEX.[11] For the purpose of this paper, CAPEX is a business expense incurred to create multiyear benefit. For example, institutions might invest in new assets—such as buildings, machinery, or equipment—or it might upgrade existing facilities, increasing their value. Many infrastructure investments such as network components, storage, and servers are examples of capital IT expenditures. CAPEX may also include depreciation of plants and machinery that are used in the production process. OPEX is an expenditure that is required for the day-to-day functioning of the business, such as software and hardware licensing and/or maintenance, wages, utilities, and repairs.

In most cases, the costs for cloud services, at least for SaaS, seem to be accounted for as OPEX. As cloud-based services evolve and provide more and better capabilities, it contributes to the OPEX "grow" side, at least, and in some cases may be the "transform" side of the business. However, accounting for all of the cloud service cost as OPEX lends itself to be categorized as "run" expenditure.

IT Showbacks: An Alternative Approach to Promote Accountability

Although the concept of IT chargeback—which attempts to allocate the cost of IT services to the constituencies that consume those services—should work, in practice it can lead to situations of both inter- and intradepartmental conflict. IT showbacks are a modified approach to accountability that eases these conflicts. The total cost of providing IT services is still calculated and apportioned proportionately. The significant difference is that there is no bill or payment involved. The record of consumption and associated costs shared with the user organization is intended to drive awareness and inform decision making.

Many IT leaders have seen budgets tightened over the past several years, while expectations of IT services have increased. This budget tightening has limited flexibility and taxed already busy IT staffs. Budgeting is often an exercise where success is measured by being able to meet the status quo. The budget process generally follows one of two paths. The main differentiation is whether the IT leader creates the budget or reacts to one created by someone else. If the creator, the IT leader oversees the development of the institutional IT budget request for the coming fiscal year. Further, the IT leader has a seat at the larger executive administration with the finance leader, the president, the provost/chancellor, and other institutional leadership. The reactor path presents the CIO with a budget for the coming year

developed by whatever office controls budget creation. The IT leader and the central IT department respond to this draft, but budget creation is controlled by others outside central IT.

Finally, there is the area of influence the IT leader has over the total institutional IT budget. Does the IT leader only have purview over the central IT budget, or is there opportunity to influence budgets from the distributed IT departments? Is there a central campus council or committee that reviews all IT budget requests? Does that review include specific detail on budget items? For example, is there review of budget requests for contracted services? If so, what triggers the review—a dollar amount threshold or some other criteria? Does the IT leader participate in the total budget deliberation or only the IT portion? The position and influence of the IT leader determines how much voice IT has in all these processes. Is the IT leader part of the leadership team where the key budget decisions take place, or does a proxy represent IT at those deliberations?

IT and the Institution

As described above, the expectations and demands placed on IT are straining the legacy financial and budgeting models. In response to the changing needs of the university community, IT is transforming itself from a capital-intensive, premise-based solution provider to a value-generating service provider leveraging on-premises, cloud, and hybrid solutions and services. IT is becoming a "service enabler" by empowering administrative and academic units, students, and researchers to efficiently achieve their mission and goals. Although funding and budgeting models vary by institution, the overarching challenge is to efficiently and effectively allocate a limited resource (e.g., tuition, state appropriations, etc.) to support the mission of the university. Moving forward, financial and budgetary realignment is needed among colleges and universities across the country to continue to meet the demand for technology among students, faculty, and staff.

Strategic Alignment

For technology to realize its full potential as a strategic enabler to the institution, there must be strategic alignment at the highest levels of leadership about how and where technology will be put to use to support institutional functions and mission. The objective of strategic alignment is to enhance the culture and relationship between IT and the university executive leadership. Throughout higher education, a wide variety of organizational structures may influence the effectiveness of the IT leader. Organizational structures should not inhibit the development of collaborative relationships between the IT leader and other academic and administrative leaders. To successfully secure sustainable funding for IT, the IT leader should work in partnership with the appropriate leader and have access to the appropriate leadership groups. If the university executives and financial leaders do not "understand" IT, it is incumbent on the IT leader to help inform and educate them about the value IT brings to the university and why it should be viewed as a strategic asset. There is a need for a common taxonomy and definitions to facilitate discussion and reviews of the funding of OPEX and CAPEX. To influence the changes needed to fund IT, the relationship between IT and senior leadership needs to be strong, open, collaborative, and transparent—in other words, a partnership.[12] Whether the IT organization at an institution is viewed merely as a cost center or as a strategic asset enabling the institutional mission is a direct result of the understanding and thinking in the executive leadership team.

Transparency and Value

Independent of the funding methodology or philosophy, a critical and important shift to transparency needs to be made within IT. As funding becomes more limited (e.g., low or no tuition and/or fee increases) and competition for funds increases, IT needs to demonstrate the value and impact it brings to the core mission of the university and show that the services provided are competitive with those of external vendors. This is especially true given the growth of cloud-based services and the commoditization of IT, which often provide end users with a way to access or broker such services outside IT.[13]

Stakeholders—whether university executives or students—have different sets of needs, and communications should reflect each audience's frame of reference. Communications should include effective reporting—for instance, the incorporation of IT financial metrics in funding and expenditure reviews—as well as tools such as a well-articulated service portfolio or, at a minimum, a well-articulated service catalog.[14]

As IT transitions to a service-oriented model, the ability to market services and demonstrate their positive impact on the institutional mission is key.[15] IT underpins nearly all that happens at an institution, and the ability to effectively provide services in a timely and nimble way is crucial to the business of the organization. In order to be agile in addressing the changing demands and options for sourcing, IT leaders need the business acumen to forecast future trends, understand demands, and work within the financial structure of the institution.

The Importance of a Correct Budgeting Framework

To support the overall IT funding philosophy, a clear and comprehensive budgeting methodology and structure is needed. The cornerstone of a good budget model is to have the appropriate systems and accounting structure in place to capture the funding and expenses with sufficient detail to develop reports and future budget/funding projections.

At the highest level, the account structure should be able to segregate CAPEX from OPEX by service. Additional classifications could differentiate between hardware and software purchases, support agreements, service agreements for cloud services, etc. The key is to develop the accounting structure at a level for appropriate decision making and to minimize the overhead of instituting such a structure. A common taxonomy will help ensure that a standard framework and definitions are understood across IT and financial units.[16] Adoption of a new accounting structure will need to take place in collaboration with the financial organization and will require training and education. Equally important to having a well-designed accounting structure is having a dynamic budgeting application that allows for easy reporting and possibly service/funding analysis.

Even with a well-configured ERP, this system alone may not be sufficient to provide an in-depth analysis and view of total cost of ownership, cost of services, business value, and transparency. A relatively new approach, information technology financial management (ITFM), has entered the market that allows multiple points of interface—e.g., general ledger, human resources, and service management—to provide a greater view of the operation as a whole. Ultimately people who are well versed in accounting, finance, and information technology will provide the expertise to configure, sustain, and analyze results from ITFM systems.

Proposed Framework to Fund IT

The largest share of IT budgets has traditionally been consumed by core infrastructure and services, and significant effort has gone into finding the funds to feed these areas. Similarly, the efforts of IT staff have been consumed with the operational aspects of those core services. These core services also include projects—such as upgrades to existing infrastructure and the addition of new services—that transition into being core services as they are completed. Such projects are frequently major efforts that also require significant resources. Only after funding is allocated to the development, maintenance, and growth of the core IT infrastructure and services are any remaining resources allocated to experimentation and innovation. These often small and unpredictable amounts are usually the first casualties when budgets tighten and funding gets scarce. As such, it is not unusual to find that that there is nothing in an institution's budget for IT experimentation or innovation.

This model limits the ability for IT to adapt—especially in today's world defined by advances such as the Internet of Things and ubiquitous access. Of course, not every new technology will have staying power, but the current IT funding structure doesn't sufficiently allow IT the opportunity to move quickly and adequately embrace new opportunities to better serve academic communities. The key to ensuring that IT is effective, responsive, and supportive of the institutional mission is to employ a funding model that enables agility and flexibility. To move toward such a model, we suggest a simplified three-tiered framework for IT budgeting that rebalances funding to provide a consistent base of resources to each tier of the framework. This model also takes into account the need to be flexible to appropriately reflect an institution's unique strategic direction, operational needs, and risk tolerance. As with any model, funding levels for the three areas should be reviewed periodically and rebalanced as needed based on institutional or external changes.

The proposed IT funding framework consolidates the wide variety of funding models currently adopted throughout higher education into three categories:

- Core Services
- Flexible Services
- Experimental Services

Whereas most institutions allocate funds to each of the three categories, the commitment of dollars beyond core services is often opportunistic, sporadic, unpredictable, and, all too frequently, by luck and by chance. We propose that the IT budget include a percentage for each of these three areas. It changes the dynamic from incidental—often accidental—growth and exploration of new options to intentional dedication of resources so flexibility and agility become an integral part of the budget and funding cycle. The ability and appetite for such budgeting will vary by institution, as will the funding sources. A starting point for discussion might be 60–70% for core services, 20–30% for flexible services, and 5–10% for experimental services.

It is well understood that institutional culture, organizational structure, and IT service delivery methods (centralized versus decentralized) vary greatly throughout higher education. The framework comes with several base assumptions:

- It assumes there is a shared understanding across the institution of what IT services are available, regardless of whether that service is on premises or in the cloud.
- It also assumes there will be variations in how those services are funded; public institutions, for example, have funding opportunities unavailable to private colleges and vice versa—local context is important here.
- The framework assumes a middle ground of five years for budget planning. Some large infrastructure investments, such as an upgrade of the campus cable plant, may have a 10-year or longer amortization schedule. At the other end, opportunities with new technologies and services may need the agility to refocus significant resources on a two-year (or shorter) horizon.
- Finally, there is an explicit assumption that any IT budget and funding framework necessarily needs to be dynamic and revisited regularly for updates and modifications.

The IT funding framework is intended to trigger creative thinking about what may be applicable within a specific institution, given that what works for one institution may not work for another. Additionally, IT services may migrate from one type of funding model to another as they mature.

Core Services

Core services are baseline services that are typically funded centrally. They include mandatory compliance or regulatory items (e.g., human resources, student information, financial, IT security, public safety, etc.), as well as services central to the operations and mission of the university (e.g., network/Internet connectivity, e-mail/calendar systems, telephony, data center, etc.). This area includes existing services as well as efforts to grow existing services (i.e., add enhancements and new functionality with existing services).

- **Funding Type:** Central allocation based on approved service and funding request and/or special allocation funding
- **Funding Mechanism:** Service proposal that includes a value proposition describing:
  - Initial investment costs through an anticipated and agreed upon life cycle (which could be as short as 1 year or more than 10, depending on the service)
  - The quantification of estimated benefits
  - A well-articulated description of the qualitative benefits

  The funding proposal should include one-time costs plus all anticipated operational needs.
- **Funding Approval:** IT funding proposals need to be reviewed and approved by a governance body—either via formal governance or university leadership—with the authority to prioritize the needs across the university and allocate funds accordingly. Service approval should not be granted unless funding for both one-time and recurring expenses are provided.
- **Funding Review:** Depending on the nature of the service, a status report should be provided to the governing body between every 12 to 24 months. The report should highlight actual versus projected costs, service performance and impact, and funding adjustments as needed.

Flexible Services

The use of flexible services can rise or fall as needed, providing agility to the individual, department, and institution. Flexible services may be allocated on a longer (two years or more) or shorter (two year or less) time frame to allow for rapidly changing conditions. These services—which may be provided for a single or small group of departments or for a more substantial portion of the institution—go beyond the "standard" set of core services described above and are discretionary to the end user (for example, additional storage or unique features specific to a department's needs). Services scoped for a single or small group of departments may be funded from those departments rather than centrally and require funding approval appropriate to that decision.

- **Funding Type:** Allocation (central or distributed), revenue based, or chargeback
- **Funding Mechanism:** Service proposal that includes:
  - ❖ A description of benefits
  - ❖ Funding estimates with time frames appropriate to the anticipated service life (including one-time and recurring operational needs)
  - ❖ Anticipated demand/consumption of the service

  The proposal should include an estimated cost per the defined measure (e.g., FTE, storage consumed, network bandwidth utilized, etc.).
- **Funding Approval:** IT funding proposals need to be reviewed and approved by a governance body, either formal governance or university/departmental leadership. Service approval should not be granted unless funding for both one-time and recurring expenses is provided.
- **Funding Review:** On an annual or biennial cycle, a service status report should be provided to the governing body highlighting actual versus projected costs, service performance and impact, and required funding or rate adjustments as needed. Services that have become widely adopted may be candidates to move to core services (and central funding), and those that cannot be delivered at a competitive rate should be considered for retirement or outsourcing, if viable.

Experimental Services

Experimental services are those that are new to the institution, with less-defined benefits and a higher risk of failure. Institutions should develop appropriate strategies to ensure a predictable set of funds is available to allow functional and IT areas to test and expand the boundaries of what is possible. Through collaboration with the financial organization, a positive business case could be developed to demonstrate the value of allowing IT to accumulate funds via carry-over of fund balances, redirection of a percentage of the savings in the IT budget, and an agreed annual institutional allocation. With this, IT will be better positioned to help foster innovation, test emerging technologies, and assist strategic initiatives in new ways. It could leverage these resources for rapid response to unanticipated needs, demands, and opportunities. To maintain transparency within the university, the financial organization, appropriate governance groups, and senior leadership should have visibility into the status and use of these funds.

This dedicated pool of technology funds should be managed by the IT leadership for the use and benefit of the entire institution. The central IT organization can make use of these monies for transformative work,

and they should also be available to other innovative departments and individuals across the campus or system. One option is to provide an open "grant proposal" process in which any faculty member, staff member, or student can put forward ideas for funding consideration designed to improve the institution in some way.

Services initially funded in this budget category could mature and be built into future budget cycles as flexible services. Some may even become core services. The dollars invested for any single new service or technology would be modest. By design, a number of these innovative investments would not grow beyond an experimental service. Some might only work for a few individuals or within a department. For those, funding from this central budget will presumably not continue, leaving it up to the smaller unit—a department or an institute, for example—to decide whether to continue funding it. Other new services funded for one or two budget cycles might simply prove to be infeasible and be discontinued.

- **Funding:** Carry-over, saving from IT budget, agreed-upon institutional allocation
- **Funding Mechanism:** Service proposal with a description of:
  - The functional gap being served
  - The new service
  - The duration of the experiment (not to exceed two years)
  - The key measures to be considered before transitioning the service into production mode
- **Funding Approval:** A steering committee of stakeholders comes together during an agreed cycle (at least twice a year) to review, evaluate, and provide seed funding to projects that have the greatest potential.
- **Funding Review:** Postimplementation, funded projects would be required to complete an evaluation describing whether the proposed benefits are beginning to be realized. Based on the results of that evaluation, ongoing funding would then be approved via either the flexible or core service processes described above.

Conclusion

The heart of this recommended three-tier framework is that it builds agility into institutional IT services, allowing modest expenditures in new and innovative services for rapid deployment and a pathway for growth into becoming a core service. Within acceptable budget boundaries, experimentation is encouraged. This is something we accept in academia in our education and research missions. Learning means trying new things and acquiring new skills with an understanding that along the way there will be some results that don't match expectations. The core of research is to test hypotheses in the pursuit of new knowledge, with the certainty that not every hypothesis will prove out and not every experiment will succeed. Although this culture of experimentation and risk is a cornerstone of higher education, it has not been similarly applied to the budgeting and funding of IT.

Campus leaders must start thinking differently about IT funding models. The models currently in place at most institutions are not sustainable if we want to truly make IT a strategic asset. IT funding models should be part of an overall institutional strategy on leveraging technology to achieve strategic objectives. With the emergence of cloud services and changing IT staff skill sets, IT leaders need the flexibility to

holistically manage the IT CAPEX, OPEX, and salary budgets. Also, some of the savings enabled by institutional IT projects should flow back to the IT budgets to create a sustainable funding model.

With the changing IT landscape, it is the responsibility of the IT leader to work closely with campus stakeholders to tie institutional technology needs with the institution's strategic plan and mission. This will ensure that funding for IT projects that enable such activities is factored in elsewhere and that the campus does not rely solely on the IT budgets to support such projects. It is becoming increasing important that the IT leader is part of the institutional planning and budgeting process so that technology is not an afterthought but is a strategic asset and a differentiator for the institution.

Where to Learn More

Education Advisory Board: "Reinventing IT Services" (a link to streamed webinars is at the bottom of the pages)

- Part 1: Achieving Scale and Accelerating Opt-In to Common Infrastructure
- Part 2: Applications, Labor, and Future Investments

EDUCAUSE Resources

- Adižes, Tamara, et al. *The Higher Education IT Service Catalog: A Working Model for Comparison and Collaboration*. ECAR working group paper, April 8, 2015.
- ECAR IT Service in Higher Education Research Hub.
- ECAR Working Group Proposal: IT Service Management.
- ECAR Preparing Your IT Organization for the Cloud series.
- EDUCAUSE Library: IT Funding.
- Estrada, James, and Michele Norin. "Funding Technology: Replacing a Broken Model." Presentation at the EDUCAUSE 2014 Annual Conference, September 29–October 2, 2014, Orlando, Florida.
- Grochow, Jerrold M. "Federal Indirect Costs Affect Total Cost of Ownership." *EDUCAUSE Review*, April 13, 2015.
- Hacker, Thomas J. "Empowering Faculty: A Campus Cyberinfrastructure Strategy for Research Communities." *EDUCAUSE Review*, July 14, 2014. See, in particular, Table 1. Comparisons of Three Different Funding Models.
- Kraemer, Ron. "Advancing Without New Resources." *EDUCAUSE Review*, July 14, 2014. This article includes a list of the Top-Ten Potential Sources of Funds.
- Lang, Leah. *2013 CDS Executive Summary Report*. Research report. Louisville, CO: ECAR, February 2014.

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Notes

1. Teri Abbo et al., *TCO for Cloud Services: A Framework*, ECAR working group paper, April 24, 2015.
2. EDUCAUSE Core Data Service survey, Module 5, Data Centers I, Question 1.
3. As was noted in Abbo et al., *TCO for Cloud Services: A Framework*, "On-premises solutions may have more upfront (capital) expenses and lower ongoing expenses while cloud-based solutions may have a more consistent level of annualized expenses." For more about how federal guidelines play into this, see Jerrold M. Grochow, "Federal Indirect Costs Affect Total Cost of Ownership," *EDUCAUSE Review*, April 13, 2015.
4. See ITIL.
5. For more about ITIL, service catalogs, and the increased focus on service delivery in higher education, see Tamara Adižes et al., *The Higher Education IT Service Catalog: A Working Model for Comparison and Collaboration*, ECAR working group paper, April 8, 2015; Jacqueline Bichsel, *IT Service Delivery in Higher Education: Current Methods and Future Directions*, research report (Louisville, CO: ECAR, April 2015); and D. Christopher Brooks, *The Changing Face of IT Service Delivery in Higher Education*, research report (Louisville, CO: ECAR, August 2015). See also the new working group project on ITSM.
6. EDUCAUSE Core Data Service survey, Core Metrics, Question 3.
7. See ECAR-COST Working Group, *Calculating the Costs of Distributed IT Staff and Applications*, ECAR working group paper (Louisville, CO: ECAR, August 20, 2015), for more information on the role that distributed IT plays when it comes to costs.
8. EDUCAUSE Core Data Service survey, 2015, Module 1, IT Expenditures, Question 22, Central IT Expenditures by Run, Grow, and Transform. For capital expenditures, the numbers are 60% for run, 20% for grow, and 10% for transform. These numbers are consistent for all three years this question has been asked (2013–15).
9. James L. Morrison, "The Role of Technology in Education Today and Tomorrow: An Interview with Kenneth Green, Part II," and Kenneth C. Green, "Budget Dust," *Converge*, June 2000.
10. ECAR-COST Working Group, *Calculating the Costs of Distributed IT Staff and Applications*.
11. For more on CAPEX, OPEX, and the cloud, see Abbo et al., *TCO for Cloud Services: A Framework*, which states, "On-premises solutions and cloud-based solutions typically have different expense cycles and significant differences in capital versus operational expenses." Further, "Funding models for sponsored research add complexity in comparing costs between purchasing computing equipment and using cloud options for sponsored research." More on how this plays out with federal funding can be found in Grochow, "Federal Indirect Costs Affect Total Cost of Ownership." In addition, the Financial Standards Accounting Board (FASB) has issued guidance on accounting for cloud computing expenses that further shows the blurring between CAPEX and OPEX; see "Proposed Accounting Standards Update—Intangibles—Goodwill and Other—Internal-Use Software (Subtopic 350-40): Customer's Accounting for Fees Paid in a Cloud Computing Arrangement" (August 2014).
12. For more about the importance of a strong relationship between IT and business partners on campus, see ECAR-COST Working Group, *Calculating the Costs of Distributed IT Staff and Applications*. See also Jim McGittigan and Barbara Gomolski, "Opex vs. Capex: CIOs Should Partner With CFOs," Gartner, May 21, 2015.
13. This trend is further discussed in the ECAR working group paper *Calculating the Costs of Distributed IT Staff and Applications*, which notes, "Whether distributed IT applications are cloud- or premise-based isn't as important as knowing that they are increasing in number, are often easier to acquire (and install) than central IT applications, and have significant implications to technology and business issues at higher education institutions." The paper further points out that this comes with potential institutional risk because the growth of these distributed applications may also mean "less control or visibility into processes or appropriate institutional data stewardship." The ECAR working group paper *Preparing the IT Organization for the Cloud: Developing Cloud-Aware IT Governance* identifies the benefits of working with central IT and cloud-aware governance, including that "the institution can better coordinate cloud offerings and reduce the risk of duplication, missed buying-power opportunities, resource inefficiencies, and lack of a clear service definition to the community."

14. For more about the value of and a model for creation a service catalog, see the Adižes et al., *The Higher Education IT Service Catalog*. In addition, the value of a service portfolio and catalog was highlighted in ECAR-COST Working Group, *Calculating the Costs of Distributed IT Staff and Applications*.

15. See the ECAR IT Service in Higher Education Research Hub.

16. The call for a common taxonomy between financial and IT units was also made in ECAR-COST Working Group, *Calculating the Costs of Distributed IT Staff and Applications*: "To design a consistent coding scheme in the general ledger, the following account codes…are required to capture the granularity of distributed IT costs when paid for by any unit outside central IT. In addition, the appropriate personnel and committees at NACUBO should codify these suggestions for their Financial Accounting Standards Board (FASB) and Governmental Accounting Standards Board (GASB) member institutions."