Calculating the Costs of Distributed IT Staff and Applications

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 of importance to colleges and universities. More information can be found at the ECAR working groups website.

Introduction

As most higher education institutions continue to experience rising costs, reductions in funding from nontuition sources, and growing pressure to curtail tuition increases, the need to know and manage the total cost of IT across campus has never been greater. Although data on the cost of central IT services are relatively obtainable, data on distributed IT expenditures remain elusive.

CIOs frequently depend on processes and controls around network, data center, and other capital expenditures to know what services and technologies are deployed, but, with the emergence of cloud services, the ease of IT integrations, and the overall consumerization of IT, these controls may not be as effective. 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.

EDUCAUSE and NACUBO (the National Association of College and University Business Officers) partnered to form a working group to focus on calculating the costs of distributed IT. The result is this paper, which discusses the barriers to calculating the cost of distributed IT, suggests strategies on how to overcome those barriers, and includes clear definitions around what counts as a distributed IT expense and what types of distributed personnel should be counted as IT staff. The aim is to provide higher education institutions with a clear way to provide these data on the annual EDUCAUSE Core Data Service (CDS) survey so that they can use the resulting data for benchmarking and to identify trends in this space. There may be other costs associated with distributed IT that are not determined as part of the CDS survey that can be attributed to an uncalculated potential for risk. While there is no way to determine the expenditures associated with these risks, the CDS survey can help

Definitions

Central IT: The centralized IT services and support organization reporting to the highest-ranking IT administrator/officer in the institution.*

Distributed IT: All staff who do not report to the CIO and all resources that are not within the CIO’s purview, though the CIO often has some level of authority and/or responsibility over the distributed IT services.

Decentralized IT: Departments or units of the institution that provide all or nearly all of their own IT services, without reporting directly or indirectly to the CIO or equivalent office.

* This definition comes from the CDS Survey Glossary.
provide information and assessment as to whether centralized or distributed technology aligns more closely with the business needs and risk acceptance of the institution.

The ultimate goal, then, is twofold:

- To furnish higher education institutions with a clear way to provide distributed IT cost data on the annual CDS survey so that institutions can use the resulting survey data for resource allocation benchmarking and to identify trends in this space.
- To provide technology and business professionals, as well as those charged with governance, a means of determining the scope and extent of distributed applications and a means of assessing and managing the security and other business risks to the organization.

### Understanding the Impact of Distributed IT

For the purposes of this paper, we will use the term *distributed IT* to encompass both distributed and decentralized IT (all noncentral IT). The term *decentralized IT* describes departments or units of the institution that provide significant portions of their own IT services, often creating duplicate services at the institution. In addition, decentralized support models do not report directly or indirectly to the CIO or equivalent office, thereby limiting institutional coordination and/or awareness. In contrast, *distributed IT* support models engage with centralized institutional services in myriad ways but are recognized by the presence of high-level communication and coordination. In this model, the CIO often has some level of authority and/or responsibility over the IT services that are provided.

Accounting for the total cost of IT across institutions is paramount to effectively forecasting and planning for resources. Distributed IT costs will become increasingly important to be able to assess the dollars spent in all areas of IT to comprehend IT’s overall costs and manage limited resources.

Beyond the scope of controlling or managing IT costs, there may also be increased institutional risk when applications are distributed. The advent of cloud computing has made it easy for distributed applications to grow, often with less control or visibility into processes or appropriate institutional data stewardship. These risks could become future cost structures if not addressed. Along the adage of “You can’t secure what you don’t know you have,” risk will be reduced as we have greater visibility into all IT systems across campus.

The need for a clear understanding of what should be included in IT costs continues to grow, particularly as new technological applications (such as the Internet of Things) continue to proliferate across our campuses. NACUBO’s “Cost of College Study” suggests developing “a common methodology for calculating the cost of an undergraduate education at the full range of colleges and universities around the country.” To accomplish this goal, institutions need to have a way to describe *all* the activities related to IT, e.g., staff, applications, and enterprise systems. There is a need to provide common naming and definitions to ensure that we get the right costs structures categorized consistently. For example, many items that were once analog are now digital—these “new” technology areas might be document-imaging systems replacing filing cabinets or electronic access control replacing conventional locks and key distribution.

### Assessing the Value of Distributed IT

The growth in IT services has typically resulted in increased institutional overhead. Many IT systems will make institutional processes more efficient, but instead of reducing staffing to recoup dollars to pay for
the IT systems, departmental resources are usually redeployed in other areas. This makes it difficult to show any financial ROI for IT expenditures.

Assessing IT distribution and understanding how it complements central IT is about relationships, communication, and appreciation, as well as analysis of the dollars spent. Institutions must consider the value of the services to the institution, as well as the responsiveness and agility to address special needs.

Why Measure the Cost of Distributed IT?

With a clearer understanding of distributed IT’s costs, organizations will be better prepared to predict overall IT trends and cost structures and thus be better prepared to make strategic, informed decisions on resource allocation. If the majority of IT resources are not centralized and if distributed IT resources are not accounted for, there will be suboptimization in a number of venues.

IT Strategy: The structure of campus IT relates to its effectiveness in supporting the institutional mission. Where and when are resources best deployed to achieve objectives? How do we help executive leadership understand the value and impact of campus IT, rather than just focusing on the costs of running the central IT unit? Without a clear understanding of the scope of IT activity on campus, it’s hard to plan for the implementation of strategic objectives in a concrete way.

IT Governance: Effective IT governance requires that campus leadership assess risks globally, rather than simply focusing on functions housed in the central IT department. Decentralization can lead to a lack of insight about data, systems, and services that exist outside the central unit, which could inhibit fully informed decision making. Financial information is one of the most reliable and accessible types of information on IT available to most campuses and is a good place to start the investigation.

IT Management: Understanding the distributed IT landscape can facilitate communication and coordination across campus IT delivery sites. Campus IT partners can help identify opportunities for cooperation, standardization, and service improvement. Campuses can work toward responding to IT demand, budget, and cost pressures in a unified way. Determining the cost of distributed IT can be a valuable first step to visualizing and understanding IT’s scope and value.

IT Benchmarking: Many campus central IT departments seem similar, relative to the scale of their institutions, but we can’t be sure we’re comparing like to like when we don’t know the level of decentralization of a given campus. Better data collection on distributed IT expenditures can help increase the value of the CDS survey to all campus IT leaders.

Current Estimates of Distributed IT

The annual CDS survey asks institutions to provide estimates of distributed IT expenditures and distributed IT staff FTE. Respondents are given the option to indicate “unable to estimate” if they are unable to determine an estimate for these items. Of the 828 institutions that responded to the CDS 2014 survey, only 50% were able to provide estimates of distributed IT expenditures (see table 1). The ability to estimate distributed IT expenditures ranged from only 37% of doctoral institutions (63% unable to estimate) to 63% of community colleges (37% unable to estimate). Community college responses, however, mostly reflected the lack of distributed IT expenditures at their institution (51% responded with $0). Doctoral institutions, on the other hand, were most likely to provide an estimate greater than zero (only 8% responded with $0).
Institutions were slightly more able to provide estimates of distributed IT staff. Of all CDS 2014 responding institutions, 63% were able to provide this estimate (ranging from 48% at doctoral institutions to 73% of bachelor’s institutions; see table 2). Again, doctoral institutions were most likely to indicate the presence of any distributed IT staff (only 7% responded with 0 FTE). Community colleges were most likely to not have any distributed IT staff (57% responded with 0 FTE).

### Table 2. CDS 2014 question on distributed IT staff FTE response distribution

<table>
<thead>
<tr>
<th>Carnegie Classification</th>
<th>No Staff FTE (0)</th>
<th>Some Staff FTE (&gt;0)</th>
<th>Unable to Estimate</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>AA</td>
<td>57%</td>
<td>12%</td>
<td>31%</td>
<td>100%</td>
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<tr>
<td>BA</td>
<td>48%</td>
<td>25%</td>
<td>27%</td>
<td>100%</td>
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<tr>
<td>MA</td>
<td>38%</td>
<td>27%</td>
<td>35%</td>
<td>100%</td>
</tr>
<tr>
<td>DR</td>
<td>7%</td>
<td>41%</td>
<td>52%</td>
<td>100%</td>
</tr>
<tr>
<td>All 828 participants</td>
<td>35%</td>
<td>28%</td>
<td>37%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Barriers and Higher Education Recommendations

Because of the varied roles and potential differences in scope of central versus distributed IT staff and costs, there are a few significant barriers to capturing and similarly reporting data in central and distributed IT. These barriers include difficulty identifying distributed IT staff, lack of agreement around what constitutes an IT expense, lack of standardized approaches to distributed IT transaction data, and difficulty identifying the numerous owners of distributed IT costs. Each of these is described below, along with recommendations on how to address or minimize each barrier. Recommendations for changes to the CDS survey are included separately in the section “Recommendations for CDS.”

#### Difficulty Identifying Distributed IT Staff

As IT services and needs grow and change over time, distributed units may assign duties and titles in a fashion that does not align with that of central IT. For instance, distributed IT personnel may be part-time employees, they might have different or blended titles, and they might have different or blended responsibilities and job descriptions. Because surveys such as the CDS survey that aim to find out more about these staff are typically completed by central IT personnel who may not have all of the information associated with distributed IT units, it may be difficult to identify distributed IT staff.
Specific challenges include:

- Job titles that aren’t easily identified as IT positions
- Disagreement on or misunderstanding of how to define IT work vis-à-vis business responsibilities
- How to count student IT labor

Another problem is that many activities that were formerly regarded as IT are common and many staff have experience undertaking those activities in the consumer space (e.g., agreeing to licensing terms for cloud services). In many cases, staff who perform IT increasingly aren’t IT staff (for instance, building staff who may have to deal with a building’s technical infrastructure or systems).

**Recommendations for Higher Education**

In spite of these complexities, gaps, and evolution, it’s important to identify and quantify IT staff. Institutions should develop guidelines to determine whether someone counts as IT staff:

- There is a need to develop consistent job descriptions and titles that can be used by central and distributed IT and that are aligned with the [IT domain definitions](https://www.cds.maryland.edu/20160210_d0271056227e) included in the Core Data Service survey. Additionally, institutions should map existing IT staff roles to these domain definitions. Finally, institutions should identify whether data are being captured elsewhere—for instance, in human resources or in budget offices—on these job areas/families for benchmarking and engage with those departments to help define IT staff and services.

- The head count of FTE distributed staff should be tied back to the [U.S. Bureau of Labor Statistics Standard Occupational Classification 15-0000: Computer and Mathematical Occupations](https://www.bls.gov/ooh/computer-and-information-technology/). This classification is used for both the Integrated Postsecondary Education Data System (IPEDS) survey and College and University Professional Association for Human Resources (CUPA-HR) surveys (note: CUPA HR data and definitions can be downloaded through the CDS). Using this classification may be an early way for institutions that don’t have another way of querying who should be categorized as distributed IT staff to get started. If they do have a query, comparing the results to this classification is a good way to verify that the numbers are accurate.

- A standardized methodology is necessary to accurately measure the investment of staff resources in IT systems. The following is recommended for counting IT-related staff:
  - **Central IT Staff**: Everyone who works for central IT should be considered an IT staff member (even if she is not in a traditional IT role). In addition, all expenses paid out of the central IT budget should be considered IT related.
  - **Distributed IT Staff**: Staff who don’t report to central IT but who work 50% or more on IT activities and who have IT staff job titles (e.g., programmers, DBAs, etc.) consistent with the CDS domain definitions should be counted. These staff will typically be discovered via HR or budget queries. This approach will almost certainly underestimate the total amount of distributed IT work, but the consistency across institutions and over time outweighs that gap.
  - **Part-Time Staff**: Each institution should develop a guideline for how to count staff who wear multiple hats or are considered “part-time IT” (for instance, if only 20% of a person’s job is IT related). Our recommendation is to establish 50% IT as a threshold: If a staff member spends 50% or more of her time in IT activities, she is counted as IT staff.
  - **Student Workers**: Student workers should minimally be counted in key areas—such as classroom/lab support and event management—where much of the ongoing work is performed by students.
Lack of Agreement around What Constitutes an IT Expense

As technology uses and services become increasingly common in higher education, determining what does and does not constitute an IT expense becomes a bigger challenge. Something that may have been categorized as IT during its nascent period may not be under IT as it becomes de rigueur. The most challenging areas include:

- **Cloud Services**: Most institutions consider cloud services an IT expense like any other. For the purposes of the CDS survey, cloud-services expenses may be identified in both central and distributed IT questions. If the service is paid by central IT or provides a core service that is beneficial to the campus as a whole, that expense is considered a central expense. If the bill is paid by another department and presumably provides a service primarily for departmental use, the expense is considered a distributed IT expense.

  Institutions vary, however, as to how these costs are classified both in procurement and in the general ledger. It may be advantageous to have a staff member in procurement who understands IT-related expenditures and can track them appropriately. Knowing where these expenditures are taking place across the institution is important in understanding the potential additional risk posed to the institution when IT isn’t managed by central IT.

- **Maintenance Contracts**: Maintenance contracts should have an accounting commodity code that identifies them as an IT expense. IT maintenance expenses paid by a department other than central IT should be considered a distributed IT expense. A separate general ledger account designation to separate maintenance expenditures from initial license expenditures can discern between a large, one-time capital expense and ongoing contractual maintenance.

- **Capital Asset Acquisitions and Professional Services**: It can be challenging to separate IT-related expenses from others in capital asset acquisitions (e.g., new construction or major renovation projects). However, identifying these costs will help institutions comprehend the extent to which IT is a central component to institutional initiatives and is fundamental in understanding the total cost of IT. A similar approach must be applied to professional services that include IT. Generally speaking, professional services provided by an IT vendor or company will be considered an IT expense. As with other institutional procurements, a closer look at the expenditures might help focus on which aspects of the expense are IT-related.

CIOs and chief business officers (CBOs) need to work together to get a better and more complete look at distributed IT expenses. Key to this is a common language that helps them identify what constitutes an IT expense. But defining a common language to identify IT costs requires agreement among CIOs and CBOs about what is and what is not within the IT domain. Some examples of IT costs include:

- Applications that utilize enterprise data, regardless of whether the application is supported centrally
- Equipment or infrastructure supporting the institution’s IT applications
- Personnel who support one or more IT applications for at least 50% of their time

In addition, the following functions typically fall within the definition of IT costs:

- ERP applications
- Internet connectivity
- Data centers
- Data security
- Data storage
Teaching and learning applications

Research computing

Alternatively, expenses for staff who use but don’t maintain applications, data storage, or data administration are not IT costs. A current trend in higher education is the leveraging of scale and synergies around shared services for various administrative tasks such as travel, procurement-to-pay, transactional processing of accounting, budgeting, and human resources activities. Clearly the IT applications to support these functions are IT costs within the above definitions, but the staff using these applications are not IT costs or IT FTE.

Recommendations for Higher Education

To have a complete picture, CIOs, CBOs, and institutional researchers need to collaborate in determining the costs of distributed IT. In addition, the quality and completeness of responses to distributed IT–related questions in CDS (particularly Question 30 of Module 1 and all of optional Module 8) would be enhanced through the joint efforts of representatives of the CIO and the CBO in the compilation of the costs and FTE data. We strongly encourage CIOs to enlist the participation of a representative from the business side of the institution in gathering the data from all major departments at the institution.

As technology becomes more pervasive, institutions should distinguish between IT staff and users of IT systems. The CDS IT Domain Definitions should be used to assist with determining what counts as IT work versus normal business functions.

To design a consistent coding scheme in the general ledger, the following account codes (discussed in more detail above) 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.

- Cloud services
- Maintenance contracts
- Capital asset acquisitions
- Professional services

Lack of Standardized Approaches to Distributed IT Transactional Data

There is generally a lack of standardized approaches to distributed IT transactional data (e.g., personnel, IT equipment, software licenses, and maintenance) between institutions and between departments within the same institution. The growth of distributed IT applications has raised the importance of the institution’s knowing how such applications are funded; how risks are identified, assessed, and mitigated; and how the overall costs of distributed IT impact the institution in achieving its mission. Until the overall impact of distributed IT is addressed at the enterprise level in terms of resource allocation, risks, and efficiency/effectiveness, individual units within the same institutions are on their own to account for the costs of distributed IT within their general ledger accounts.

This problem can be addressed through clear guidance on risk assessment and account coding of the costs of distributed IT applications through the institution’s IT governance process. Agreement between the CIO and the CBO is essential in developing risk management and general ledger accounting policies, as well as consistently applying these policies in practice.
Recommendations for Higher Education

- The use of consistent account codes starts with specifying how distributed IT costs will be evaluated by the institution (e.g., in budget development or in participation of the CDS survey, including benchmarking with other institutions). The chart of accounts should reflect sufficient granularity to support management’s evaluation of the costs of distributed IT. (Suggestions for account codes within the general ledger are presented in the “Lack of Agreement around What Constitutes an IT Expense” section.)

- To identify and assess the enterprise data security risks of proposed distributed IT applications:
  - Central IT needs to be engaged in some level of security and risk management, even for distributed IT work. This is largely due to the reality that external organizations and university leadership largely look to the CIO for oversight and incident response when things go awry.
  - New governance models are needed to ensure that cloud and other IT systems and services are still operated with appropriate levels of institutional risk.
  - The CIO needs to facilitate and connect distributed IT to appropriate risk management, internal control, and legal expertise, even in cases where central IT is implementing or operating the application.

Difficulty Identifying the Numerous Owners of Distributed IT Costs

To get a full picture of distributed IT costs, financial reporting needs to be done in collaboration between central IT, distributed IT, the budget office, and the controller’s office, as appropriate. However, it can be difficult to fully identify the numerous owners of financial data related to distributed IT, particularly as individual colleges, schools, and departments increasingly require technology solutions to help with design processes (including those supported by distributed IT applications) to support their unit-level mission. There is a need to consistently apply policies for managing risks and to track distributed IT costs to provide a more holistic picture and to improve institutional data gathering.

Recommendations for Higher Education

- Controllers (institutional financial reporting areas) should be brought into the process early, during the planning stages, so that budgets can be developed that accurately capture distributed IT costs.

- Identify the distributed applications at your institution that have application controls that influence the accuracy and completeness of transactional data crossing the boundary of the institution; this is likely to be most of the distributed applications. The impact of these distributed applications can be assessed in their number, their diversity of revenue and expenditure cycles impacted, and the dollar amount of such cycles versus the applications within the institution’s ERP.

- The completeness and accuracy of the institution’s CDS response is likely to improve if there is an effective partnership between representatives of the CIO’s office and the CBO’s office. In spite of best efforts to standardize accounting codes within the general ledger and human resource classifications, there will remain some need for interpretation and judgment of the unit-level data that will be enhanced by the joint efforts of technology and business.

- The value of the CDS survey to the institution will be in the decisions that it enables regarding centralized and distributed IT. Therefore, the highest-level business decisions (e.g., decisions around resource allocation, risk assessment, IT strategy, IT infrastructure, and operational metrics) should first be articulated and then referred to in making judgments about collection and classification of data.
The following steps are recommended to reach a clearer understanding of overall IT costs and thereby improve fiscal responsibility, reduce risk, and improve understanding of the institution as a whole:

- Both central and distributed IT services should be added to an institutional service management portfolio maintained by central IT to ensure the following benefits: 
  - Tracking the fiscal and human resources associated with each service and within each organizational unit that has a distributed IT component
  - Quantifying ongoing service requirements
  - Identifying and quantifying the faculty, staff, and students served by distributed IT applications

- In addition, the following activities should be conducted on an annual basis:
  - An annual report on the data that are prepared for and produced from the CDS survey to determine distributed IT costs and assess impact
  - An assessment of distributed IT in the aggregate units on campus

**Recommendations for CDS**

The working group presents the following recommendations for changes to the CDS survey in order to help with the identification of distributed IT costs.

- CDS should reference this white paper so that respondents can refer to it for guidance, particularly around determining whether someone should be considered IT or not.
- The CDS survey should include a worksheet to help institutions with their analysis so that they can arrive at the metrics identified in this paper.
- Dashboards should be implemented in the CDS reporting website that are specific to distributed IT content, e.g., the number of people and services supported per increment of distributed IT resource. Tracking such measures over time could lead to an understanding of whether IT environments are becoming more or less distributed.
- CDS language should be updated to define central IT, distributed IT, and decentralized IT as is done in this white paper. CDS questions should be updated to use “distributed IT” to mean both distributed and decentralized IT.
- To make a closer connection between the various distributed-IT questions in the survey:
  - **Module 8**: Instead of using the current wording of “Another unit on campus has primary responsibility” change the wording to “Distributed IT has primary responsibility.”
  - **Module 1, Question 6**: Change the current wording from: “Shared between central IT and other admin or academic unit(s)” and “Primarily other admin or academic unit(s)” to “Shared between central IT and distributed IT” and “Primarily distributed IT.”
- The CDS Advisory Group should track answers to Module 1, Question 30 to see if the clarification provided by this document has an effect on the results. Question 30 states, “If no IT personnel were employed outside the central IT organization, enter 0.”
- CDS should include new questions specific to distributed IT:
  - A question should be added that asks for the numbers of distributed IT student FTE, with the inclusion of an “unable to estimate” box.
A question should be added that asks if an institution’s distributed IT is part of its overall service management portfolio.

A question should be added that asks whether current IT governance processes include distributed IT, where respondents reply on a scale that ranges from none to tracking, to reviewing/recommending, to risk and compliance monitoring.

- CDS should develop a crosswalk between the CDS domain definitions and the IPEDS/CUPA occupational category 15-0000 (computer occupations).

- CDS should conduct more research on what new questions can be asked that would help institutions identify how many users (e.g., faculty, staff, and students) are being supported by distributed IT.

**Conclusion**

EDUCAUSE is working in partnership with CIOs, CBOs, and institutional research professionals to identify and assess distributed IT costs through CDS. It is widely assumed that IT costs will become more distributed in the coming years due to commoditization, the move to the cloud, and overall growth of IT. Increased involvement on the part of business officers will yield new ways in which the CDS survey results can be put to valuable use and will result in the survey findings’ having impact across a broader audience. Obtaining accurate and useful data on distributed IT fiscal and staffing resources is an achievable goal that requires buy-in by distributed leaders, which is accomplished by open communication and shared understanding of the goals of the CDS initiative.

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Citation for This Work


Notes

1. NACUBO, “Cost of College Study.”
2. See CDS 2014 Module 1, Question 30.
3. For more, see the EDUCAUSE web page on [Carnegie Classifications](http://www.educause.edu/carnegie).
4. IT professional services are “Services that are consultative in nature, in contrast to the other categories, which tend to be technology based; these may be a combination of customer-facing and non-customer-facing services. Includes IT training, consulting/advisory services, business continuity/disaster recovery, enterprise architecture, portfolio/project management, and ITSM.” See ECAR, *The Higher Education IT Service Catalog: A Working Model for Comparison and Collaboration*, working group paper, April 10, 2015: 8.
5. For more about the differences between FASB and GASB, see Larry Goldstein and Sue Menditto, “GASB and FASB,” *Business Officer*, January 2005.
6. To learn more about the service management portfolio, see “Related Concepts: Portfolio, Catalog, and Requests” in *The Higher Education IT Service Catalog*.
7. The 2015 CDS survey included some early modifications based on these recommendations. They include:
   - “Another unit on campus” and “other academic or admin unit” was changed to “distributed IT” where that language referred to IT services (M1Q6, M2Q1, M4Q3, M6Q1, M8Q1).
   - A new student FTE row was added to M1Q30, as well as additional wording about asking the CBO for help.
   - Added “including distributed IT” and “not including distributed IT” options to the service portfolio question (M1Q7).