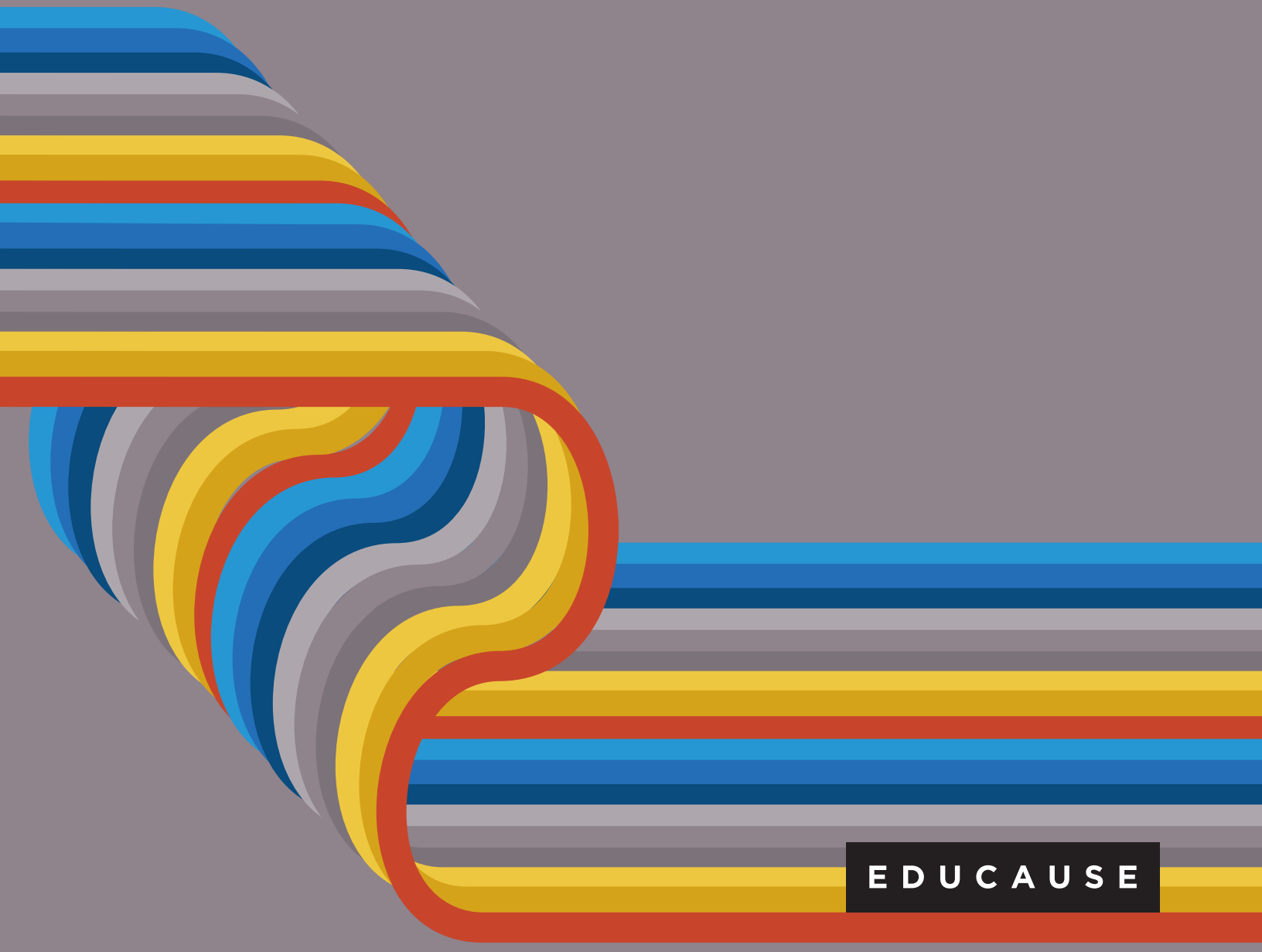
EDUCAUSE CENTER FOR ANALYSIS AND RESEARCH

The Changing Face of IT Service Delivery in Higher Education



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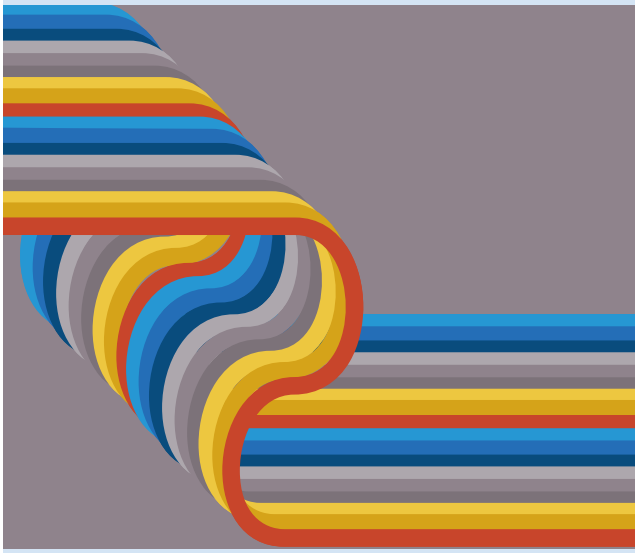
Contents



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Introduction

The methods by which information technology (IT) services are delivered at colleges and universities are in a state of flux. Traditional approaches that focused on the local development, maintenance, and management of campus technologies are giving way to a new paradigm that explores solutions from without.

The confluence of two distinct trends in demand and supply have necessitated the transformation of IT service delivery, or "the set of technologies, tools, and resources that IT provides in support of the institution's mission, as well as the manner in which those services are provided."[1] On the demand side, institutions of higher education continue to find resources limited and budgets shrinking; because service requirements and expectations for service provision have not declined—and are in fact increasing in certain domains—innovative solutions to make do with less are required. On the supply side, technological advances, especially in the realm of cloud-based computing, have created a number of alternatives that may meet the needs of financially challenged colleges and universities.

IT leaders appear to be sensitive to the shifting sands beneath their collective feet and anticipate changes in the focus of their IT organizations. In a recent ECAR survey of IT leaders, we asked CIOs to rate their organization's management focus currently, in 5 years, and in 10 years. Respondents could choose any value between 0 (indicating a focus primarily on managing infrastructure and technical resources) and 100 (indicating a focus primarily on managing vendors, services, and outsourced contracts). Figure 1 depicts the distribution of responses for the three time periods. Currently, CIOs are generally focused on the management of infrastructure and technical resources. However, in the next five years, CIOs expect a significant shift toward the vendor, services, and outsourcing management end of the spectrum. An even further shift in the same direction is anticipated by the end of the decade.

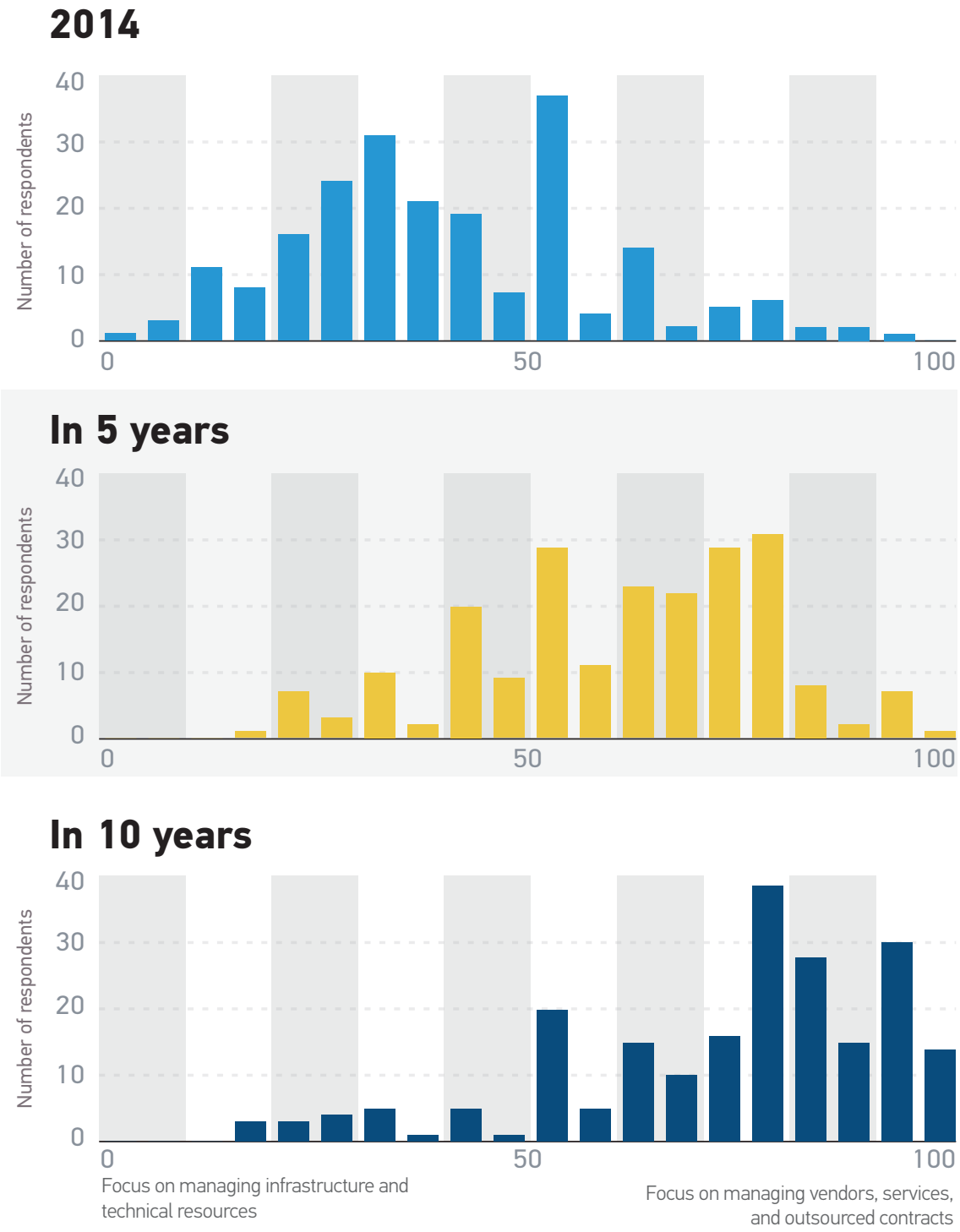

Figure 1. CIO management focus ratings: 2014, in 5 years, and in 10 years

If these tectonic shifts in the focus of IT organization management occur as predicted, IT as we have known it may evolve into something unrecognizable. As CIOs prepare for the coming transformation of higher education IT, we should expect to observe fundamental changes in how services are delivered to constituent populations. In fact, we are beginning to see those changes already at some institutions, with the creation of service delivery catalogs that provide information regarding the service offerings and supporting technologies.[2] Among the most talked about methods of service delivery considered in this ECAR series of reports on IT service delivery are:

- Migrating services to **the cloud**
- **Outsourcing** services to another party
- **Sharing** services with other institutions or pooling resources via purchasing consortia [3]

These changes to service delivery models have important and serious consequences for how IT units are organized and what they comprise. The impact of changes to the IT service delivery models is the subject of this report. We explore the current landscape of service delivery in higher education and consider the relative importance of different factors used by IT leadership to make decisions about different service delivery options. From there we move to an examination of the effects of the respective service delivery options on IT workforce composition.

This report is the second in a series of ECAR publications on service delivery models in higher education. The first of these, *IT Service Delivery Models in Higher Education: Current Methods and Future Directions*, examined the current state of service delivery during this period of transition.

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Key Findings

- **CIOs believe the next decade will bring a shift in their management focus** from primarily managing infrastructure and technical resources to primarily managing vendors, services, and outsourced contracts.
- **Cloud-based computing options are the most popular alternative model of service delivery among those considered in this report.** Outsourcing is the second most popular option, followed by sharing services with other institutions, a model rarely deployed by itself.
- **The most important factors when considering changes to service delivery models concern the characteristics of the product or solution.** Products and solutions rather than staffing issues are the driving forces behind the changing face of IT.
- **All alternative service delivery model options in this study are having an impact on workforce composition.** Although most institutions report no changes to the size of the IT workforce, increases in roles associated with onboarding the new service delivery model and decreases in roles associated with traditional in-house services are reported by institutions that do report change.
- **The top 5 roles experiencing growth across institutions are related directly to the cloud-based projects themselves.** The number of institutions hiring more data integration specialists, security and privacy specialists, legal specialists, contract negotiators, and vendor managers—all of which are related to cloud-based solutions—is significantly greater than the number of institutions shrinking those positions

Products and solutions rather than staffing issues are the driving forces behind the changing face of IT.

Service Delivery Models: The Current Landscape

The shifts in the methods by which IT services are delivered to clients are already under way, often guided by financial considerations. As documented in the preceding ECAR reports on IT workforce and service delivery in higher education, IT organizations continue to find themselves having to do more with less.[4] Higher education budgets continue to languish at pre-recession levels. Meanwhile, IT budgets have been increasing slowly, but steadily, to maintain existing services and to expand into new domains.[5] One way for IT organizations to expand their service offerings is to reduce the total cost of ownership (TCO) by changing the service delivery models employed.[6] Technological innovations and the emergence of service-oriented vendors have prompted many IT units to consider moving services off campus. There does not appear to be, however, a single trend for how institutions are shifting the burden of supplying services; instead, the methods vary, in part, by institution size and type.

Types of External Services Used

The confluence of increased demand for more, improved, and innovative IT services with decreases in available resources to supply those services has prompted IT leaders to reconsider the service delivery model paradigm. Their efforts reveal three viable options as potential solutions to alleviate these pressures without compromising quality of service:

- **Cloud computing**—the use of remote servers and networks that allow for real-time data processing and storage—is the most popular of the options considered, partly because it affords institutions the ability to customize their solutions while still managing and controlling many features of the service provided.
- **Outsourcing services** to other contracted parties who own, maintain, and manage the services for the university or college is the second most popular option.
- **Sharing services** with other institutions either through discrete bi- or multilateral agreements or through preexisting consortia is another service delivery option whereby the costs of any basket of services are distributed across institutions.

To date, the popularity of these service delivery options appears to be uneven and dependent on a couple of different factors. Although cloud solutions may not be the first option CIOs consider for new projects,[7] our data suggest that it is the most popular one, with 85% of respondents indicating that their institution has moved at least one service to the cloud. Outsourcing is the second most frequently cited method used by CIOs to restructure the service delivery model, with 44% of respondents indicating that at least one service has been outsourced to another party. Only about one-third (35%) of institutions, most of which are part of systems,[8] report having agreements with other institutions or using purchasing consortia to share services. This may be due, in part, to concerns about limitations on the options available, contract parameters, and customizability of services.

A large portion (94%) of respondents indicated that their respective units are engaged with at least one of these three options, and a majority (54%) of institutions represented in this study are combining approaches to restructure their service delivery models (see figure 2). Combining cloud services with outsourcing is the most popular of dual combinations (22%), followed by cloud-based and sharing services (13%), and sharing or outsourcing services (4%). Another 15% of institutions are using all three approaches.

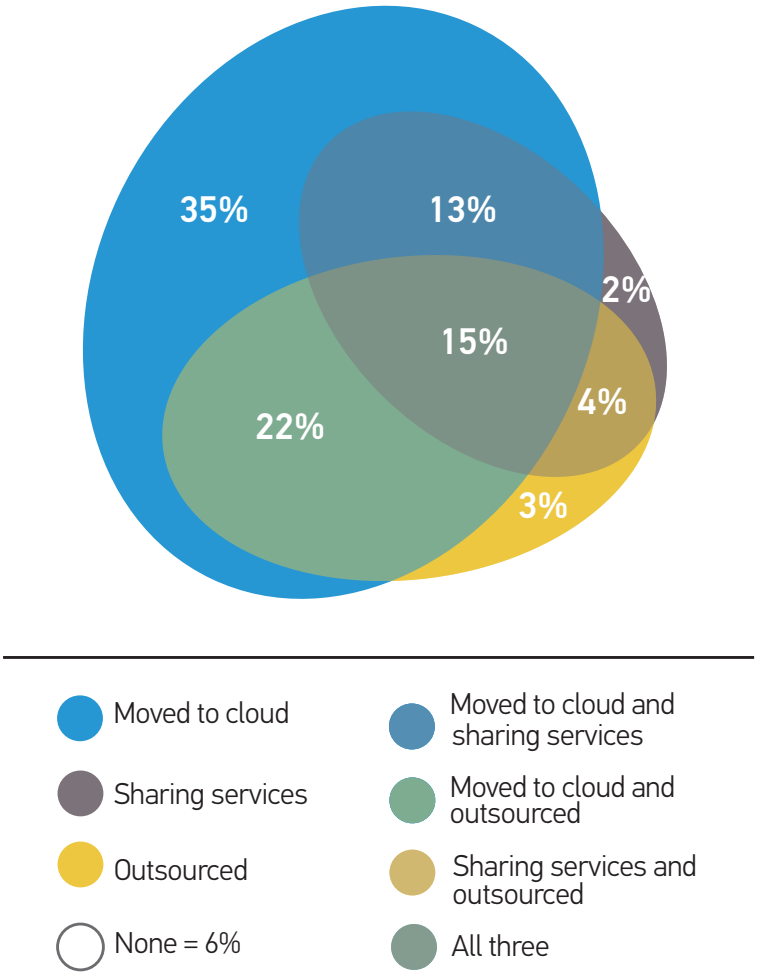

Figure 2. Approaches to changing service delivery models: moved to cloud, sharing, and outsourced

As noted, both the size[9] and the type[10] of institution are related to the number of service delivery approaches taken. Smaller institutions (<3,000 FTE) tend to use only one of the three options outlined here, with most of them choosing to migrate services to the cloud.[11] Conversely, a majority of midsized and large institutions

(63% and 71%, respectively) are using at least two of the possible options. In terms of institution type, a slim majority (52%) of private institutions reported using only one approach, which tends to be cloud based. On the other hand, two-thirds of public institutions (67%) have added a combination of two or three service delivery models to their portfolio, a result unsurprising given that the nature of public higher education IT lends itself to sharing services with other units.

One reason cloud options, especially software as a service (SaaS) options, are so popular is that they appear to be easy solutions that provide obvious and immediate cost savings.[12] Conversely, concerns about control over noncloud services and fears of losing IT positions over time may lead some institutions to balk at pursuing outsourced options. Institutions may also eschew the cost savings associated with sharing services with other institutions—either through bilateral agreements or via purchasing consortia—because negotiating packages that are agreeable to all parties may be too difficult.

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The high number of institutions selecting cloud-based services, however, may have more to do with the IT marketplace than with internal considerations. The supply of cloud IT infrastructure has been growing by leaps and bounds in recent years.[13] One report suggests that the expansion of cloud-based solutions offered by vendors may be responsible for higher education's increased appetite for this service delivery option.[14] In fact, the same report suggests that vendors need to proactively facilitate the marriage of higher education to cloud-based solutions by clearly demonstrating the areas where they could have the greatest impact.[15] To this end, it is possible that the range of service delivery options that vendors are making available in the marketplace is too narrow and limits higher education institutions' choices, thereby removing much of the decision-making calculus from the hands of IT organizations.

Factors Impacting Service Delivery Model Decisions

Although institution type and size certainly create opportunities for and present constraints on the choices IT leadership has available when making decisions about whether to share, outsource, or cloud-source services, we wanted to know more about the micro-level thinking that shapes those decisions. Specifically, we asked respondents to rate on a 100-point scale[16] the importance of 15 issues of consideration when making decisions about altering service delivery models.

When examined by service migration option, the averages and standard deviations of the means of the 15 items were fairly similar to one another.[17] Moreover, the average importance of factors tended to be fairly high, suggesting that everything about which we asked is moderately important to those making decisions about restructuring service delivery models. There was also a great deal of consistency regarding the items that were considered the most and least important factors across the three options. It is to these factors we now turn.

Three of the 15 items (reliability, quality of user support, and alignment with institutional goals) were in the top 5 most important considerations across all service delivery model options (see figure 3). A similar consistency is apparent in the least important factors considered when making decisions about changing service delivery models. Four issues appear in the bottom five across all three categories, although the order varies slightly by category: contract length, effect on the workforce, market reputation and popularity, and speed of deployment.

The most important issues CIOs consider when contemplating changes to institutional service delivery models to include options that move services off campus appear to be typical IT concerns: solution reliability, user support, costs, adaptability, and ease of use. Secondary issues, many of which are not explicitly IT in nature, are among the least important; these include deployment speeds, product popularity and reputation, and contract length. The availability of consortium options matters somewhat only when an institution is considering sharing options with other institutions with which it might have an ongoing relationship.

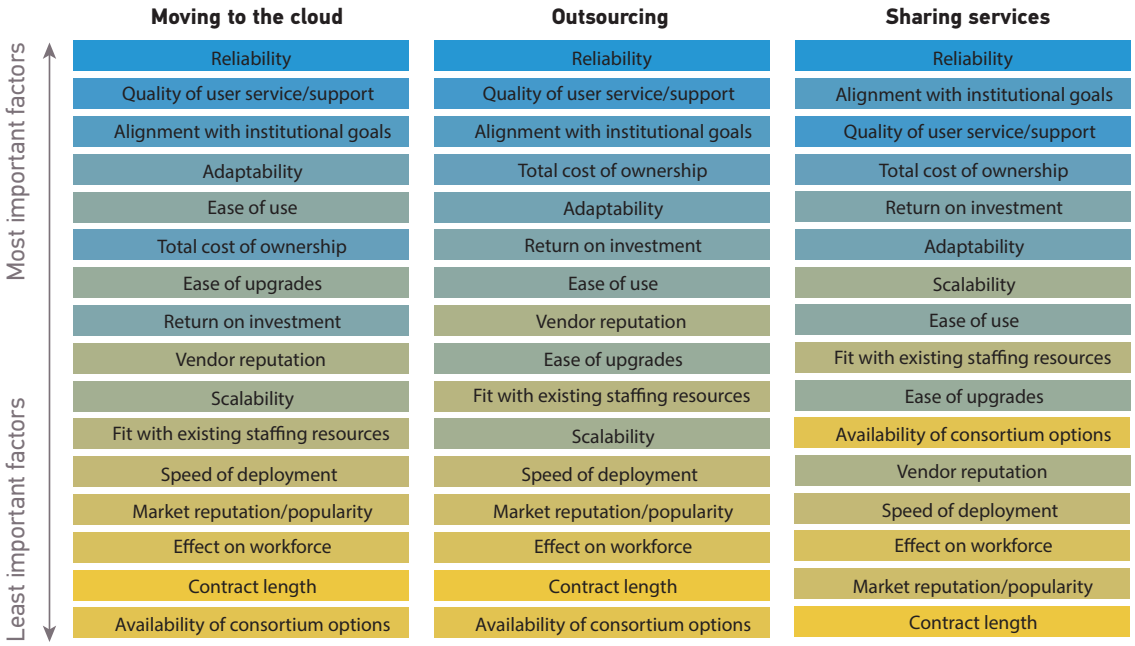

Figure 3. Rank order of the importance of factors considered during service delivery model decisions, by approach

For our purposes, more interesting is where considerations of the effect on the workforce and fit with existing staffing rank among factors considered during service delivery model decisions. For each service delivery option, the effect of changes on the workforce ranks among the least important. The fit of existing staffing resources falls into the lower half of factors for outsourcing and sharing resources with other institutions; it ranks among the bottom five when making decisions about cloud-based services.

On the one hand, CIOs could be aware that changes to service delivery will require changes to the existing IT workforce. Given that the No. 1 EDUCAUSE Top 10 IT Issue for 2015 is "Hiring and retaining qualified staff, and updating the knowledge and skills of existing technology staff," we might expect these factors to rank higher. Alternatively, it may be that CIOs understand the impact of changes of service delivery models on the IT workforce but are compelled by other considerations to proceed undeterred. Or, as Emily Deere of the University of California, San Diego, suggests, it might be that CIOs do not understand the impact as well as "managers on the ground floor [who] have a much keener sense of what is going to be needed to create this transformation with the current staff and/or hire new staff."

One possible way to bridge this gap might be to build a staffing plan into the service delivery change plan, including an analysis of the costs associated with possible outcomes.[18] Another option might be to partner with human resources (HR) to ensure that the institution has the expertise and resources to support staff and organization through disruptive changes to the delivery of services.[19]

Reliability, quality of user support, and alignment with institutional goals were in the top 5 most important considerations across all service delivery model options

Workforce Implications

Altering the composition of an institution's IT service delivery model has implications for the distribution of roles and positions at that institution. Fears pervade of a reduction in the staff as a result of offloading services to cloud-based systems, outsourcing services to third parties, and sharing services with other institutions. Although about one-third of CIOs and managers anticipate that outsourcing and moving resources to the cloud will reduce positions in the next couple of years,[20] other evidence suggests that such concerns are overstated, as the overall net number of positions in central IT has remained largely stable or increased in recent years.[21] In fact, data collected for this report indicate a similar pattern: Either no changes or increases in the number of positions have occurred due to service delivery model shifts. What we do observe, however, are small reductions in more traditional IT positions associated with in-house systems and services and increases in positions oriented more toward contracting, installing, and maintaining services that are cloud based, outsourced, and shared.

Impact of the Cloud

Cloud-based service solutions are credited with increasing all types of IT roles and positions. However, the top 5 roles experiencing growth across institutions appear to be related directly to the cloud-based projects themselves. Specifically, the number of institutions hiring more data integration specialists, security and privacy specialists, legal specialists, contract negotiators, and vendor managers is significantly greater than the number of institutions shrinking those positions. This finding is consistent with the anticipated move toward increased IT focus on managing vendors, services, and outsourced contracts over the course of the next decade. Furthermore, it is in keeping with previous ECAR findings that job creation is tied, in part, to the need to fill positions in new areas created because of cloud-based service migration.[22]

When asked about what has happened to a number of roles and positions as a result of moving services to the cloud, an overwhelming majority of respondents indicated that positions and roles have remained unchanged, neither increasing nor decreasing, in every category (data not pictured).[23] Only two types of roles appear to have lost more positions than they gained due to cloud-sourcing services: system administrators and application developers. Compared with the 9% of respondents reporting increases in system administrators, 14% indicated that those positions have been culled. Similarly, about 25% more respondents indicated that application developer positions have been eliminated than those indicating that positions have been created. If more systems and software solutions are being migrated to the cloud, it makes sense that the demand for system administrators and application developers would, in fact, decrease. The same might also occur for application managers, although respondents have not yet reported that change; nine institutions reported gains and nine reported losses due to migrating services to the cloud (see figure 4).

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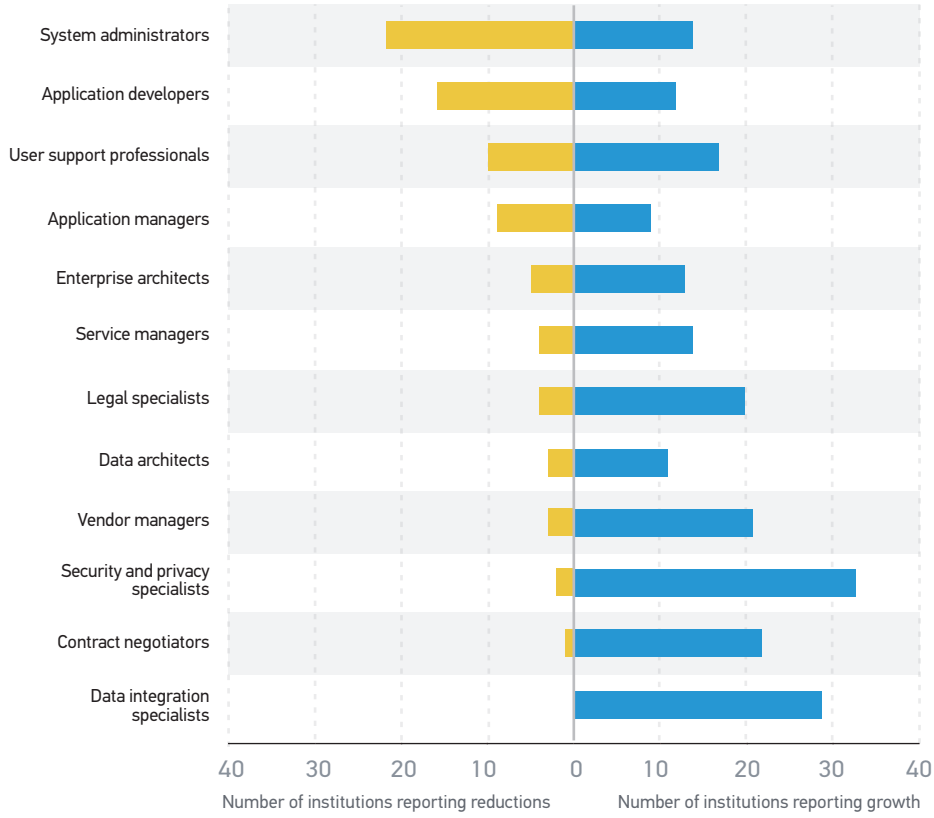

Figure 4. Changes in roles/positions resulting from moving services to the cloud

Impact of Outsourcing

Again the overwhelming majority of respondents reported no change to their staffing of any of the 12 positions about which we asked.[24] However, the type of roles and positions that respondents report growing as a result of outsourcing are what we might expect (see figure 5). For two types of positions—data architects and data integration specialists—no institutions reported eliminating positions, and 18% of respondents indicated new growth in those areas. Although 23% of respondents indicated that they have increased the number of security and privacy specialists because of outsourcing, only 2% reported having decreased positions in that category. Similar patterns of gains to losses prevail across the next four categories: legal specialists, vendor managers, service managers, and contract negotiators. Of the 13% of respondents reporting changes to their enterprise architect positions, two-thirds reported growth in that job sector. Overall, a majority of those reporting changes indicated that they are creating more positions than they are eliminating.

Figure 5. Changes in roles/positions resulting from outsourcing services

Compared to the impact of cloud-sourcing services, a very similar pattern of shrinking positions and growing roles is evident across institutions engaged in the outsourcing of services. Again, the most frequently reduced positions are those with a focus on locally developed and sourced services: application developers, system administrators, application managers, and user support professionals. For each of these types of positions, between one-and-a-half times (user support professionals) and eight times (application managers) as many institutions reported cutting them as expanding them.

Impact of Sharing

As with the previous service delivery approaches, sharing services with other institutions has not led to changes to the size of the workforce, as a majority of respondents reported neither gains nor losses to the positions we asked about (data not pictured).[25] Of those positions experiencing changes, security and privacy specialists (three out of four respondents) and data integration specialists (eight out of nine respondents) are again among the most frequently cited roles that are being expanded, rather than

contracted, at institutions that are sharing services with other institutions (see figure 6).[26] However, user support professionals and service managers replace legal specialists and contract negotiators in the top 4 types of positions increasing as a result of sharing services.

Figure 6. Changes in roles/positions resulting from sharing services with other institutions

The impact of sharing services appears to show overwhelmingly no changes in the workforce across institutions. Moreover, the pattern of roles to which institutions reported changes is less clear under sharing regimes than we observe when services are moved to the cloud or outsourced. Among those experiencing changes, systems administrators (16%) and application developers (15%) continue to frequently experience reductions, but vendor managers, data architects, and enterprise architects move up in the list of top 5 most decreasing roles.

The Changing Workforce

Overall, when we compare the number of respondents who reported the shrinking and growing of various roles and positions as a result of changes to their respective campus service delivery models, a clear pattern emerges. Only three IT roles, each strongly associated with the more traditional campus IT function of managing infrastructure and technical resources, are facing more reductions than increases, on average: system administrators, application developers, and application managers. Given the predicted shift in CIO management focus in the next 5 to 10 years, we might expect to see the number of institutions reporting declines in these positions increase.

Each of the other positions about which we asked are experiencing more expansion than contraction, especially those associated with the predicted shifts in management focus on managing vendors, services, and outsourced contracts. Specifically, respondents reported that security and privacy specialists, data integration specialists, and user support professionals are experiencing growth as a result of migrating services to the cloud, outsourcing services to third parties, or entering into service sharing agreements with other institutions. If CIOs are correct about the direction of service delivery management, we might observe the numbers of institutions reporting growth in these positions increasing in the next decade.

Security and privacy specialists, data integration specialists, and user support professionals are experiencing growth as a result of migrating services to the cloud, outsourcing services to third parties, or entering into service sharing agreements with other institutions.

Although these changes to the workforce are consonant with the themes regarding service delivery that we identified elsewhere, they raise two particularly interesting and noteworthy issues. First, in the 2014 ECAR report on the higher education IT workforce, developers were among the top 10 positions and skill sets that were identified as being in short supply. This stands in stark contrast to the data for this report showing a reduction in such positions. One possible explanation for this might be methodological—that is, the respondent sample for the workforce study might be considerably different from the one drawn for the current study. Another is that the data collected for the workforce study may have coincided with a spike in higher education conversations about mobile application development that have subsided presently and/or been supplanted by concerns over service delivery issues. Although important, projections need to be tempered, given that the relatively small number of responses we are dealing with at this level of analysis limits generalizability.

Second, some tension appears to exist between the impetus behind overhauling approaches to service delivery and the steps taken to achieve desired outcomes. Specifically, moving services to the cloud, outsourcing them to vendors, and sharing services with other institutions are driven by the need to reduce costs and increase savings. However, the changes to the service delivery model seem to lead to an expansion of personnel in workforce roles necessary for managing the new

service delivery modes. Although some positions are recuperated from reductions in certain roles, the overall picture suggests growth and, by extension, increased rather than decreased costs. Those wishing to understand costs and cost savings more fully may choose to examine the total cost of ownership of new service delivery platforms, such as the one detailed in the ECAR working group paper *TCO for Cloud Services: A Framework*.[27]

Conclusion

Shifts in service delivery models are well under way in higher education. The opportunities to move services to cloud-based systems, to outsource them to third parties, or to share them with other institutions are being embraced widely and are having a profound impact on the composition and administrative organization of IT.

In terms of IT service delivery model changes, an overwhelming majority of institutions appear to be engaged in at least one of the new alternatives, with cloud-based service solutions being the most popular. As institutions have made these changes, we observe corresponding shifts in the composition of IT staff, with the focus moving from the administration of traditional technologies to the management of services.

One of the more surprising findings of this study is that the effect of alterations to the service delivery model on the workforce is among the least important factors considered during the deliberative phases of the process. This finding appears at odds with the No. 1 IT issue of 2015: hiring and retaining qualified staff and updating the knowledge and skills of existing technology staff.[28] This may be due to a lag in the evolution of staffing models as they relate to service delivery, a general lack of awareness of the impact that changing service delivery models has on staffing, or a willingness on the part of CIOs to make these adjustments to service delivery despite their effect on the workforce. Regardless, we know that changes in service delivery models have an impact on the composition of the IT workforce. Making issues related to existing staff and future workforce composition more prominent helps IT leaders prepare themselves and their staff for the potential disruptions that may result from the evolution of the service delivery model.

Recommendations

- **Ensure that an IT staffing plan is part of the service delivery model change plan.** Formalizing a plan that clearly outlines changes to the composition of IT department staffing demonstrates that IT administration takes workforce issues seriously, allows IT staff to prepare for impending changes, and helps IT administration better calculate the total cost of ownership. Furthermore, work to help human resources understand and be prepared to partner on the emerging IT needs resulting from changes to service delivery models.
- **Create a formal change management program to help staff understand how changes to the service delivery model will impact them.** One way that IT administration can demonstrate its concern for and support of the staff during the transition period would be to establish professional development programs that target emerging competencies required under the new model.
- **Consider the total cost of ownership before moving services to the cloud, outsourcing services, or sharing services with other institutions.** The potential cost savings in one or more areas may be offset by the increased number of personnel and skill sets required to support and maintain the new approach(es) to service delivery.

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Methodology

The survey data reported are based on 230 respondents to the IT Service Delivery Survey, except where indicated. Some of the data in this report are from the 2014 Core Data Service (CDS) and are referenced as such. Invitations to participate in the IT Service Delivery Survey were sent to all EDUCAUSE primary representatives with instructions to have CIOs complete Part A of the survey (which asked questions about the future of IT service delivery) and to have either CIOs or qualified delegates complete the remainder of the survey.

Acknowledgments

I wish to offer special thanks to Emily Deere, Executive Director of Enterprise Information Systems at the University of California, San Diego, and to an anonymous subject matter expert who lent time and expertise to reading multiple drafts of this report.

Notes

1. Jacqueline Bichsel, *IT Service Delivery in Higher Education: Current Methods and Future Directions*, research report (Louisville, CO: ECAR, April 2015), 3, available from the ECAR IT Service Delivery Research Hub.

2. ECAR IT Service Catalog (ECAR-SC) Working Group, *The Higher Education IT Service Catalog: A Working Model for Comparison and Collaboration*, ECAR working group paper (Louisville, CO: ECAR, April 10, 2015). For an example, see the University of Minnesota IT service delivery catalog.

3. Unless otherwise indicated, the terms "sharing," "sharing services," or "shared" mean to possess and use services in common with others. This is not to be confused with the formal IT concept of "shared services."

4. Jacqueline Bichsel, *Today's Higher Education IT Workforce*, research report (Louisville, CO: ECAR, January 2015), available from the ECAR Higher Education IT Workforce Research Hub; and Bichsel, *IT Service Delivery: Current Methods*.

5. Bichsel, *IT Service Delivery: Current Methods*.

6. For more information on TCO, see the ECAR-TCO Working Group, *TCO for Cloud Services: A Framework*, research bulletin (Louisville, CO: ECAR, April 24, 2015).

7. Joshua Bolkan, "Report: Few CIOs Give Cloud Solutions Appropriate Consideration," *Campus Technology* (March 16, 2015).

8. Bichsel, *IT Service Delivery: Current Methods*, 19.

9. χ^2 (6, N = 189) = 20.00, $p < .01$.

10. χ^2 (3, N = 194) = 17.23, $p < .001$.

11. Bichsel, *IT Service Delivery: Current Methods*, 14.

12. In 2013, Marconi University in Italy reported a savings of 23% on its total infrastructure bill after moving its e-learning platform to the cloud. Jonathan Brandon, "Marconi University Saves 23 Per Cent Moving from Colo to Cloud," *Business Cloud News* (October 7, 2013).

13. See Phil Wainewright, "Cloud ERP Replacement Doubled Last Year to 24%—Forrester," *diginomica* (May 9, 2014); and "Worldwide Cloud IT Infrastructure Market Grows by 14.4% in the Fourth Quarter as Service Providers Continue to Expand Their Datacenters, According to IDC," *IDC* (April 16, 2015).

14. Navneet Johal, *2015 Trends to Watch: Higher Education: Leveraging IT to Benefit the Institutional Mission* (San Francisco: Ovum, 2014), 8.

15. Ibid., 3.

16. For this scale, 0 = Not at all important and 100 = Very important.

17. Statistics for the importance of factors considered when making decisions about each of the service delivery model options are as follows: Cloud (Mean = 71.9; Std. Dev. = 11.1); Outsource (Mean = 71.6; Std. Dev. = 10.6); and Sharing (Mean = 68.8; Std. Dev. = 10.2).

18. The Total Cost of Ownership framework outlined in *TCO for Cloud Services: A Framework* provides some excellent suggestions for taking workforce impact into account.

19. Bichsel, *Today's Higher Education IT Workforce*, 38–39.

20. Bichsel, *Today's Higher Education IT Workforce*.

21. Ibid., 19.

22. Ibid., 20–21.

23. Of these roles/positions, application managers was the most stable category identified (87%), and security and privacy specialists was the least stable (73%).

24. Of these roles/positions, enterprise architects and service managers were the most stable categories identified (87%), and security and privacy specialists was the least stable (75%).

25. Of these roles/positions, legal specialists and application managers were the most stable categories identified (87%), and security and privacy specialists was the least stable (70%).

26. Note, however, that because so few institutions reported sharing services with other institutions (only 35% of our respondents), the number of institutions reporting gains and losses due to sharing is considerably small. Although our data do not possess the power to allow for generalizations to the population of higher education institutions on this point, we offer the comparisons to round out our discussion. Readers should exercise caution when interpreting or using the results for this section.

27. ECAR-TCO Working Group, *TCO for Cloud Services: A Framework*.

28. Susan Grajek and the 2014–2015 EDUCAUSE IT Issues Panel, "Top 10 IT Issues, 2015: Inflection Point," *EDUCAUSE Review* 50, no. 1 (January/February 2015): 17–18.