

Beyond the False Dichotomy of Centralized and Decentralized IT Deployment

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As we consider IT deployment in higher education, we must take into account factors that include growing expectations when it comes to access and functionality, the integrative effects of a “network economy,” and the movement toward data as an institutional resource. IT is also playing an increasingly important role in research and education, compelling institutional IT to become more deeply involved with individual academic units. The university’s teaching and research economies are becoming more interlinked while simultaneously regulatory and security requirements escalate rapidly and accountability broadens. It’s true that one of the challenges to operating in this complicated environment has to do with the technology itself—the sheer complexity of technology deployment is increasing and technology requirements continue to change.

But our long-standing IT deployment practices are also breaking down. As universities struggle with how to piece together centralized and decentralized models in a way that will meet the needs of both the institution as a whole and the individual units it comprises, powerful forces are pushing these models toward failure. The centralized-versus-decentralized approach no longer aligns well with the programmatic objectives and regulatory requirements of the university. Hierarchical IT organizations and empowerment through budget and reporting lines are faltering and the organizational chart is failing to describe the real practice of IT. Institutional and departmental IT units can no longer compartmentalize their services and are forced to wrestle with their respective roles, turf, and accountability about services that are inherently integrated. Too often, we refer to IT services provided by a central organization *versus* those provided by individual units or departments. This has become a false dichotomy, creating an unproductive kind of competition among IT operations and preventing our common goal of a seamless, responsive, end-user IT environment.

In this essay, I argue that we need to actively move toward a new model, which I call *service layering*, and away from strictly centralized-versus-decentralized approaches. Even though the technology supports layering, such a move is not likely to happen naturally. It requires definition and practice with new accountability structures, significantly strengthened governance over shared environments, and forms of empowerment that go beyond reporting lines and budgets.

Embracing Local Autonomy and Institutional Involvement

Any consideration of what is needed from an IT deployment model must begin with two value propositions: (1) there is great value in IT deployment autonomy, especially at the school or department levels; and (2) there is equally great value in schools, departments, and individuals operating in a connected environment that supports sharing. In combination, these values become significant forces driving a need for IT deployment responsibility and accountability to be *jointly held* by institutional and local service units—a sea change in deployment context. Today’s technology is not the problem; rather, the problem is that siloed, centralized, and decentralized IT service models fail to adequately address this changing landscape.

The solution lies in a hybrid model. To be sure, certain administrative and business systems must remain institutionally provisioned (centralized) to the end user without the involvement of local IT, while those that pertain solely to one unit require no institutional involvement and should remain decentralized. But many IT services, especially those needed at the “front lines” of research, education, and the academic environment, should be “horizontally layered” as locally managed service components on top of institutional service components to form complete services. Horizontal service layering creates the potential for a “sweet spot” that encompasses the advantages of both institutional and local service delivery.

To better understand the need for horizontal service layering to meet the goals of both the institution and its individual parts—the values outlined above of both autonomy and shared responsibility and accountability for IT services—it is useful to think of the university as a global corporation. In this analogy, each frontline unit has its own unique interests, competing among state, national, and/or international peers much like a line of business (education and research) using human resources (faculty, students, and staff) to generate product (intellectual capital, students ready to enter a profession, successful faculty, social and economic

impact, and a recognized institution). The competition is for students, funding, resources, rankings, visibility, and prestige. Line-of-business success contributes to overall school and university success, making improvements in the flexibility and autonomy of the line of business—where it contributes to these objectives—far more valuable than institutional operating economies.

At the same time, the academic structure is increasing in complexity. Academic disciplines continue to be the predominant front lines of the academic enterprise. While this organizational form has its advantages from the perspective of program quality assurance, other trends such as problem-based research, student educational expectations, and the fusion of research and education are demanding interdisciplinary and connect-edness approaches. The marriage of these disciplinary and interdisciplinary forces produces an overlay structure on the more slowly changing disciplinary foundation. Academic competitiveness among institutions of higher education is played out along disciplinary lines; thus, the education and research “revenue side” of the university benefits when autonomy is combined with institutional involvement to accommodate interdisciplinary and interinstitutional demands.

Finally, the computational research and education enterprise is growing dramatically in scale and complexity such that high-performance computation, database management, visualization, data center, and backup, storage, and preservation of data demand institutional facilities and investment. If each research group is responsible for establishing its own facilities, research autonomy actually becomes more difficult and in some cases infeasible. And yet, the vastly different computational research and education taking place in the humanities from that of the physical sciences, for example, demands variability and autonomy. This is another argument for the layered approach—local management of services on shared, co-owned facilities.

In federating the research and education IT enterprise in support of autonomy, our job is to build a robust and responsive environment heavily defined by *each* line of business. This notion is reinforced in a December 2004 META Group article suggesting that the complexity of IT needs, the diversity of business drivers and risks, and the need for responsiveness and business-specific expertise among lines of business cannot be adequately served with only a centralized IT delivery model; local autonomy also must be embraced.¹ At the same time, it is understood that there is need for “corporate” IT structures to coordinate the relationships among the lines of business and leverage the benefits of being local within the shared economy of the whole.

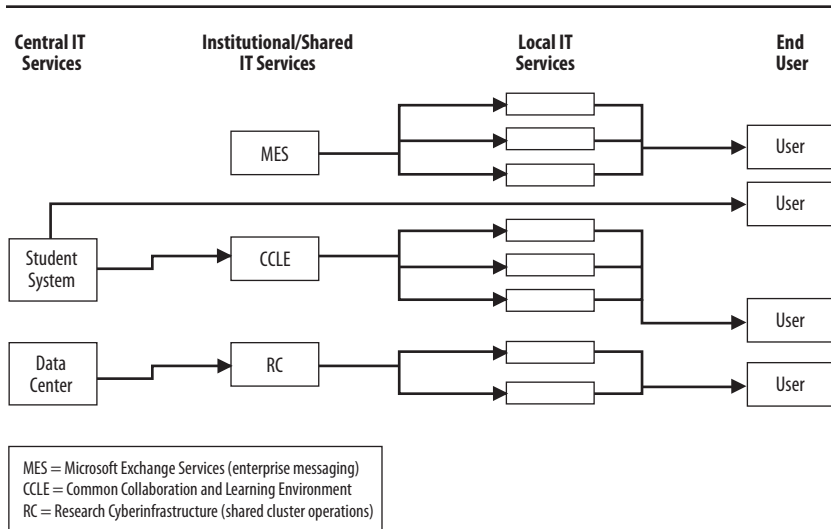
The Layered Model in Practice

Moving to a layered IT deployment model requires a new accountability structure that embraces the marriage of autonomy and connectedness, enabling local and institutional IT to operate jointly in an environment of shared responsibility and coordinated accountability. Autonomy is valued within an institutional structure designed to facilitate interaction, integration, and harmonization. In establishing a vocabulary for this model, we use the terms *coordinated autonomy*² to refer to the deployment context; *layered services* to map the system of operations, support, and accountability; and *sweet spot* to describe the specific point where layered service delivery, responsibility, and accountability resonate between the local and institutional needs.

The layered model has proved beneficial in the service arena at UCLA even for something as commonly used as enterprise exchange services. For example, because of significant value placed on the ability to locally filter different file types and spam as well as on personalized responsiveness for more general purpose functions (such as managing guest accounts), the careful development of management tools that allow for local action and accountability has proved useful. Institutional accountability rests with high availability provisioning of the exchange services and the tools for local management. Local units are accountable to local variations in needs. Institutional and local units take joint responsibility for defining and maintaining the service portfolio sweet spot. Autonomy is embraced and institutional responsibility is preserved. The total service is neither decentralized nor centralized; it combines the advantages of each.

UCLA research faculty have become much more responsive to institutional cluster hosting, storage, and data center services as a result of “grid appliances” deployed as part of a layered services model. Simultaneously, the institution is benefiting from broader access to computational resources, greater standardization, and the avoidance of replicated facilities and operating costs. The grid appliance permits individual owners to locally manage the resource and retain direct authority over how the physical or virtual cluster, paid for by their grant, is used and who can use it. The quid pro quo is to participate in a shared, standardized resource that can provide the owners and others greater capability than the locally owned resource and can broaden secure access of unused cycles to others.

Institutionally, the appliance–resource combinations enable secure access to a range of computational resources, offer geographically distributed researchers ready access, and provide sophisticated tools to view resources, manipulate input files, and submit jobs. Institutional IT is accountable for network, data center hosting services, and the secure operation of the grid and the grid appliances. The Institute for Digital

Figure 1. Illustrating the Layered IT Service Deployment Model

Research and Education (IDRE), representing the cohort of researchers and institutes that wish to take advantage of an institutional infrastructure, is accountable for the governance of the grid services and cluster hosting services (research cyberinfrastructure). The owner is accountable for the cost, management, and research production of the cluster. There is now high faculty demand for institutional IT hosting and shared services.

UCLA has also applied the layered model to a campus-wide desktop/server purchase contract, a software license for Microsoft products (Microsoft Exchange Services), and security policy. Most recently, the model has formed the deployment basis for UCLA's Common Collaboration and Learning Environment (CCLE) in Moodle. Figure 1 illustrates the layering approach.

Making It Work: Changes in Staffing, Governance, and OIT

Moving toward an IT deployment model that both embraces autonomy and extends accountability to increase institutional effectiveness is not easy. To engineer a successful transition, campus-wide and local IT units must construct a plan that identifies and takes into account critical elements of autonomy and accountability. Support staff must establish shared management structures and shared service agreements and put into place a process for resolving conflict. Moreover, strong campus IT governance, as opposed to "decisions by committee," is vital.

Peter Weill and Jeanne W. Ross are often referenced in the context of IT governance and decision making and indeed provide essential constructs.³ I argue that the Weill and Ross approach in practice requires: (1) formal acceptance of the governance organization and processes by the campus administration and the academic senate; (2) executive sponsors with functional and funding authority to champion initiatives; (3) structures and processes ensuring that decisions are ultimately made on functional rather than technological grounds, but with significant technology input; (4) a strategic decision-making and policy body that combines the academic senate and executive administration; (5) integration of IT governance into the campus planning and budget processes; and (6) willingness to invest in the management and administration of a governance structure and process that is comparable to a board of trustees. The single most important campus agreement in the governance process is formal acceptance of a decision matrix that defines which body has responsibility for which decision and what kind of decision. The process of reaching a goal of decision acceptance is long and arduous, but without acceptance there is no governance and decision making, only committee input.

In coordinating this approach, the institutional office of information technology (OIT) must be more than a university services provider and cost center. Such an institutional OIT should manage the IT governance and institutional planning processes, have authoritative involvement in campus IT investment decisions, and have oversight of the campus IT portfolio, architecture, and services infrastructure. It is particularly important to conduct these processes from a position of credibility and neutrality rather than from the “authority” of organizational budget and number of reporting lines. If it is to help foster a layered services environment, the OIT needs to shift from client to board relationships, from budget competitor to co-investor, and from an operational to a balanced integrative focus that accounts for the full breadth of local and institutional objectives. In this way, empowerment stems more from the ability to engage the broadest expanse of line-of-business drivers, priorities, and needs.

The OIT can “see” IT on the campus in ways that no other organization can, and it can translate that view into operational impact. Impact comes first with the capacity for institutional planning and analysis, management oversight of the governance process, responsibility for IT policy, joint decision-making authority on campus IT investments (that is, the decision matrix), and campus “ownership” of architecture. Operational impact follows and depends on the operating deployment structure on campus. This form of empowerment is supported by the analysis of Joseph

Nye, who has observed that this form is likely to be more important than the command-and-control form when campus IT is dispersed (federated).⁴ For this to occur, the institution must be receptive to this role—not an easy task.

Summary

I have argued in this essay that the deployment model is as important, if not more so, than the technology itself for a university seeking to maximize its IT potential. I have further argued that long-standing IT deployment models, which tend to cobble together centralized and decentralized approaches, are no longer working in higher education. I have suggested the need to move toward a hybrid deployment model that continues to provide only local or only institutional control where it makes sense to do so but that also incorporates the layered approach, in which autonomy is valued and responsibility and accountability are shared by institutional and local service units.

I believe that line-of-business autonomy as I have described it is a significant value worth pursuing in a time of powerful trends that also demand institutional solutions: interdisciplinary interactions, interlinking information, and powerful computation facilities for research and education. UCLA's experiences with layering services, building relevant governance, and working in different accountability structures have been very positive—more than sufficient to keep us pressing ahead with the layered deployment model. But we also understand that it is early in a long process of change. Discussion and consideration of the issues raised by this new IT deployment model will help us to move beyond long-standing practices that no longer serve our needs.

Endnotes

1. Brian Burke, *Federating the IT Organization: Enterprise Planning and Architecture Strategies*, META Group Practice 2301, December 31, 2004.

2. Jim Davis, "Coordinated Autonomy," *EDUCAUSE Review* (November/December 2001): 86–87, <http://connect.educause.edu/Library/EDUCAUSE+Review/CoordinatedAutonomy/40298>.

3. Peter Weill and Jeanne W. Ross, *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results* (Boston: Harvard Business School Press, 2005).

4. Joseph S. Nye, Jr., "The Benefits of Soft Power," *Harvard Business School Working Knowledge* (August 2, 2004), <http://hbswk.hbs.edu/archive/4290.html>.

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