

## **University Budget Reduction Strategy: Web Services**

### **Discussion**

The organization of web-related technology services is based upon need and function. The university's diversity in web services reflects the diversity of university operations and constituencies. The needs and management practices of a large and diverse college like Agriculture and Life Sciences are very different from the needs and management practices of a smaller, more focused college like Design, as they are from Veterinary Medicine, with its clinical practices and hospital operations. The diversity of web services in these three example units reflects the operational diversity and the solutions to unique needs.

Websites and web applications exist because units have business operational needs; the staff and support operations that create and maintain these sites have been apportioned in response to these business needs. ("business" = administrative, academic, and outreach activities of the university) The proliferation of diverse groups and techniques we see on campus reflects a complex interaction of diverse business practices (necessitating localization) and a paucity of enterprise-level web-related services.

Therefore, to optimize the web technical operations and tools, the business practices that use these operations and tools must first be optimized. If there is commonality in the latter, there can be commonality in the former.

With the exception of some senior application developers, few university staff have full time responsibilities for web-related work. Content is typically created and managed by the people engaged in the business operations (from faculty to administrative staff)—again, the technology simply serves the business. With a few exceptions in some communications units, web-related work is typically a very small part of the total duties of both content providers and technical support staff. In most cases, the "public face" web presence is essentially an unfunded mandate and is supported by "found" labor resources, whose primary duties lie elsewhere.

In some units, much of the continuity of knowledge about administrative practices, business rules, data analysis, and reporting is maintained by the technology staffs. Their technical work is thus inextricably intertwined with their role in business operations.

A complicating factor here is that the university has no common set of definitions for web-related terms and activities. It is almost impossible to inventory activity on campus without prior definition of terms that will lead to a common understanding of what is being investigated. The true cost of web applications is very hard to determine. Original labor cost, cost of maintenance, algorithms for amortization of cost over the life of the product—there is no standard methodology for determining any of these.

Is there a recognizable level at which web-related activities are most likely optimized in terms of responsiveness and cost effectiveness? Evidence suggests that it may well be at the college and major administrative unit level, not further up. Greater commonality of interest, function, management practice, and the most immediate chain of command are elements that must be considered in the determination. In addition, the required degree of local knowledge about unit business practices and their history may greatly diminish the effectiveness of services beyond this level.

The central issue is management of web-related services rather than technology per se; management must make the decision to create operational uniformity sufficient to warrant technology uniformity. If, for example, the UFOs decided that they will observe a uniform reporting process based upon uniform data, then significant cost savings could be achieved through the development of a single application that serves all. Technology will do what is asked of it, but it cannot effectively develop policy.

It is important to differentiate between the public (publishing) and the functional (applications) elements of web sites. It is also important to recognize the difference between academic web services (e.g., recruitment, discipline-specific information, specialized programs, course support, faculty web presences) and administrative support (data acquisition and processing, reporting, finance, and the like).

Publishing organizations with similar functions (e.g. Engineering Communications, CALS Communications Services, NCSU News Services, NCSU Creative Services) may find sufficient commonality of need that they could potentially use the same tools and reduce overall cost. Other administrative units may also be interested in common tools, e.g. a CMS.

If the university administration required that all academic departments in all colleges follow strict standards for their departmental websites—standards for graphics, content elements, content comprehensiveness, navigation, and interactivity—then an enterprise-level CMS might be cost-effective over time because a CMS can tightly control variability. Again, this is not a technology question; this is a management question about the definition of business need.

Along these lines, the university is currently developing and will enforce visual identity standards. The implementation and enforcement of these standards should not, however, be the primary driver for implementing a major technology tool. A mandated use of a common CMS primarily to achieve a uniform visual identity would inappropriately force a "solution" on unrelated problems.

### **Supporting Data**

A 41-question online survey was distributed to the colleges, major academic support units, and major administrative units, with instructions to further distribute to subsidiary units as appropriate. The survey was not intended to return a great deal of quantitative data—rather, it was designed to provide pointers toward the complexity of web services throughout the university and to generally indicate the degree of resources that are currently being used. 49 units responded.

The majority of responding organizations currently use PHP, Cold Fusion, or both, as well as Javascript. This result suggests that scripting is a significant part of the campus web infrastructure and should be recognized and more robustly supported. Combined with information about databases used, it appears that LAMP is emerging as the most common web infrastructure. There are potential cost savings here, depending upon how LAMP services are provided (see below).

The amount of equipment and labor resources devoted to web servers appears to be, overall, quite small. The total number of physical servers reported is under 50 (excluding units such as EAS, DELTA, and Urban Affairs, who have specialized missions), and the total FTE devoted to web servers is 5 from 20 reporting units (14 of whom report less than .05 FTE each devoted to web servers). The use of virtual servers is growing, and there appears to be reasonable interest in a centralized hosting solution with virtual servers, with 31 of 49 answering “yes” or “maybe” to a question about interest in OIT offering web hosting services.

The 49 respondents reported approx. 836 people involved in providing web content. Excluding Urban Affairs (which has a specialized mission), only 10 people across the reporting units are devoted fulltime to web content creation, and 5 of those are in Creative Services. Web content thus does not seem to be promising activity for cost savings.

In the area of web applications development, interpretation requires some segmentation. The Libraries, EAS, and Urban Affairs—each of whom has a specialized applications-intensive mission—reported 78 people involved with some aspect of applications development, with a total FTE of 68. This indicates a high concentration of developers, most of whom are full time. The rest of the units reported 60 people

involved in development, with a total FTE of only 24, indicating much more part-time activity and more diverse job roles. Whether there is actual or partial duplication of effort in the realm of web applications development will require much more detailed study with standard terminology.

Without standard cost estimation tools and more detailed further investigation, it is impossible to determine if a strong movement toward centralized hosting would result in any net cost saving or, if it would, over what period of time. Respondents also have significant concerns about the scope and quality of services that could be provided.

The survey results may be viewed at

<http://ceres.cals.ncsu.edu/surveybuilder/ViewTestResults.cfm?testid=8057>

(access restricted by unity ID)

### **General Conclusions**

The overall conclusion of the task force is that migration of campus web presences to managed campus services will not result in cost savings overall. Some savings may be possible in some units with common functions where there is the need for a high degree of management control enabled by use of a CMS. In most cases, however, the colleges and major administrative units are where cost optimization already occurs.

There are, however, some areas in which further, careful investigation is warranted, provided that terminology and cost estimation standards are established first:

- Centralized web server hosting, with required services at competitive costs
- Centralized database server hosting
- Support for tools to enable collaboration, code sharing, and greater communication among application developers, as well as to reduce or eliminate true duplication of products
- Greater uniformity of core business practices across the operating units
- Centralized data storage services, with required services at competitive costs

We suspect that further investigation will yield the identification of opportunities for enhancement of the quality, consistency and reliability of university web-based content and services. We do not believe that there are easily achievable cost savings of any great significance.

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