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No more business as usual

By John A. Bielec

As information technology relentlessly transforms universities into eUniversities, traditional organizational structures and decision-making processes often do not keep pace – and that’s a dangerous precedent

Network-centric, client-server environments have brought incredible opportunities to today’s university. They have also fostered a much more complex and fragile environment than anyone ever expected.

Drexel and its academic partner, MCP Hahnemann University, for example, receive student applications via the web, as do many other higher education institutions. Students get their grades that way and can avail themselves of many university services with a few keystrokes on their PCs. University employees likewise have access to their benefit information. eMail has become critical to daily activity for every student, staff and faculty member.

In short, technology has become integral to the university’s day-to-day business. It *has* to run 24 hours a day, seven days a week, 365 days a year. When a piece of the IT puzzle is not in place, the institution’s business is disrupted.

Similarly, the academic transactions of a university are becoming more dependent on the technology of eLearning. The environment has evolved from one in which the curriculum was central to one in which students are central, with the ability to customize the experience they receive from the institution.

Often this process evolved in a decentralized way, with individual faculty moving innovation forward. Now it has become much more of an institutional rather than a faculty product, with the university increasingly imposing rules, structure and format. As with a university’s business systems, technology now makes learning content and services available and interactive 24/7/365.

So, we have evolved into eUniversities – not necessarily by plan, but often *de facto* as technology has evolved. We also have become more vulnerable to the threats that can compromise our business and academic missions. These threats, for example, include everything from the inevitable and unintentional technical glitches to the malicious attacks of hackers and viruses.

When such things occur, members of the university point their fingers and wonder how such things could happen. The obvious answer, of course, is that there are bound to be problems with anything as complex as a university IT system. One look at the multiple layers of hardware and software connected through local- and wide-area networks should be enough to convince anyone. Add client end-user support and desktop applications,

web and application front-end servers, back-end database and backup servers – well, you get the idea.

But IT complexity is not the only reason. To one degree, it is also the desire and need for open access to computers in the university environment that creates problems. To another, it is the speed of technological change. Internet time is compressed by a factor ranging from 6 to 8 – which means that changes that once would have taken three to five years to happen in an institution not too long ago are now taking place in the course of 6 to 9 months.

But those are the realities of our technology-bound time and place. The real problem is neither complexity nor openness nor the speed of change. The truth is that, more often than not, things happen because universities generally have not fully embraced or appreciated their situation. As a result, they have not built the infrastructure necessary to respond to these conditions and prevent or at least mitigate their impact.

Put another way, the solution to the problems of the eUniversity lies within an institution's organizational structure, and in the development of the roles and responsibilities necessary to manage technological change.

Universities are highly process-oriented, deliberate and often reactive about decision-making. But if an advisory committee meets three times over the course of a term and takes two or three terms to come to a decision to implement a technology upgrade, that is equivalent to four to five years of internet time.

We simply can't wait that long to act. Today, response must be quick and decisive to insure the smooth and effective operation of a university's information systems. Even more importantly, timely and intelligent response is critical to the success – even the survival – of the university itself in the 21st century.

The challenge – given the complexity and fragility of university information systems, and the current disjoint between the eUniversity environment and traditional ways of doing business – is to change the way we make decisions. In the eUniversity, business as usual just won't work.

I believe there are several things that universities can do to build a stronger infrastructure and the organizational and management processes needed to support it:

Develop active strategies that address the technological elements of the information system.

For starters, that means building network redundancy in storage and backup procedures. Limit the hardware family and software family of products you support. Constantly scan web pages for new releases and problems reported by other users of the same products. Keep up with patches and security from hardware and software vendors. Monitor and manage the network and equipment. Reduce the level of complexity anytime you have the opportunity.

Collaborate in developing solutions, share information, and seek help when you need it.

That help can come from web sites, user groups, associations and other institutions. The idea here is to recognize that almost every problem, while it may be new to you, likely has been documented by someone, somewhere, sometime—and perhaps in a very short order.

Here's a case in point. When Drexel was hit with the "love bug" virus on May 4, 2000 at 6 a.m., first we attempted to control it. By 7 a.m. we realized we couldn't, so we immediately cut off access into the network and began looking at all the Asian sites to see if anyone had a solution. By 1 p.m. we had developed our own solution for cleaning up desktops. We posted our solution on the web to various associations, including lists maintained by EDUCAUSE and EUNIS, and by 4 p.m. we had logged over 4,000 downloads of our fix from as far away as Russia.

Provide adequate resources, recognizing that buying technology is neither a one-time nor a long-term investment, but rather a continual series of expenses for upgrades with short life cycles.

Develop organizational structures that can look at as many pieces of the puzzle for a single solution, as opposed to structures that are Balkanized and shift responsibility. Decentralize application ownership on a functional level, but support core technology on a central level. Provide the best training possible for users to maintain and upgrade their skills.

Recognize that active, timely decision-making is critical, but at the same time increases risk. Then take steps to mitigate those risks.

Try to use vendor products that have a high market share and, thus, a greater likelihood of long-term viability (even if they are more expensive). Conduct pilots to prove concepts before implementing a new technology campus-wide.

Another case in point illustrates this strategy, as well as the proposition that university decision-making style must and, even more importantly, *can* change. Drexel is now a 100-percent wireless campus, but we did not implement the technology campus-wide at the outset.

Our proof of concept pilot was conducted from late 1997 through early 1998, when we implemented wireless technology in our library and student union "cybercafé." It was a success. We proved the concept that we could make those spaces wireless fairly effectively, and they would have a high user-adoption rate. Equipment available then was of an early model, and was not one we wanted to roll out across the campus. So we decided to wait until the technology's speed increased and standards evolved.

Last spring the standards were close to complete, and by December 2000 we had completed the campus-wide roll-out. End of story? No. Realistically, the life of the

present product is not more than three years, but we have already positioned ourselves for next upgrade.

There is no escaping the fact that university client-server environments are both complex and fragile. On the technology side, a university system is made up of dozens of elements, all of which must be continually upgraded and maintained. On the human side are the university's organizational structure, roles and responsibilities, which also require "upgrades" to effectively manage the information system. We must recognize the interaction of these pieces and the vulnerability of our systems as a whole and work together to strengthen them if we are to remain afloat in the virtual world of the 21st century.

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