E-COMMERCE: ARE YOU READY?

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ABSTRACT

The coming age of E-Commerce has the feel of the old Saturday morning movie with the out-of-control locomotive bearing down on the hapless heroine tied to the tracks. Whether we are prepared or not, E-Commerce is about to overwhelm the way we do business at our colleges and universities.

The only issue to be decided is how smoothly we will adapt to the new way of doing business. The answer to that question is a function of the way we view the evolution of technology and the sequence of steps we take as we change to an E-Commerce environment. Some large universities are well equipped to move right into the E-Commerce environment, but many institutions just do not have the staff to address this impending issue. This paper highlights the emerging trends and describes the issues colleges and universities need to address as they prepare for E-Commerce.

Determining campus readiness for E-Commerce starts with an assessment of the institution's information and technical infrastructure, resources, and staff capabilities. It is also important to develop a strategic plan for E-Commerce. The important point is to get the discussions started on the campus before the train arrives.
INTRODUCTION

Elijah Otis invented the “safety elevator” in 1854, but it wasn’t until Chicago burned to the ground seventeen years later that his technology fundamentally changed the way commercial buildings were built.

The first web browser, Mosaic, was built by the National Center for Supercomputer Applications in 1993, and only six years later few companies, government agencies, and non-profit organizations do not have a presence on the World Wide Web.

In fact, electronic mail and a Web presence are now presumptions for most organizations. Seldom do you see an advertisement that doesn’t include a URL for a website. The Web has become ubiquitous, and E-Commerce is growing at the speed of light, encompassing almost every commercial transaction in some way. No one announced the day the Web became ubiquitous, it just quickly crept into the culture. It was Marshall McLuhan who said “I’m not sure who discovered water, but I’m pretty sure it wasn’t a fish.”

This paper will examine the impact of Web technology on colleges and universities from the E-Commerce and E-Business perspectives, adding a dimension I personally refer to as “E-Administration” on campuses. The impact on roles and responsibilities is discussed, finishing with issues and concerns for colleges and universities to consider.

IMPACT OF TECHNOLOGY TRENDS

It is reasonable to project that technological change will continue to accelerate, increasing pressure on campuses to continuously upgrade their technological infrastructure. The push to move business transactions to the Internet and administrative transactions to the Intranet will require higher bandwidth connections externally and higher speed connections internally.

The U.S. economy will increasingly become global, demanding 24x7 response to requests for information. Larry Smarr, director of the NCSA at the University of Illinois
recently reminded us that: "In the global economy, while you are sleeping two-thirds of the world is awake and up to something."

Among the salutary effects of advancing technology are the ability of network technology to encourage collaboration, to foster alliances and partnerships, and to provide “perfect” market information to customers.

As Charles Emery, Jr., CIO of Horizon Blue Cross Blue Shield of New Jersey puts it: “The Internet increases the volume and accelerates the velocity of information, and we’re all going to have to figure out how that affects every aspect of our business.”

E-COMMERCE and E-BUSINESS

Currently the term E-Commerce refers to electronic transactions between businesses and customers, or the retail business, while E-Business refers to business-to-business transactions. According to Erica Rugullies of the Giga Information Group, “These terms will soon go away. In the future it will just be business.” For the present, however, these are useful distinctions, even though they are sometimes used interchangeably.

At the root of it all, however, it is more about business than about technology. As we learn from the IBM E-Business website, “E-Business is not about re-inventing your business, it’s about streamlining your current business practices to improve operating efficiencies, which in turn will strengthen the value you provide to your customers – value that cannot be generated by any other means, and value that will provide a serious advantage over the competition.”

E-ACTIVITY GROWTH

The projections for the growth of E-Commerce and E-Business in the next few years are astounding. According to Forrester Research in the June 6, 1999 edition of the Economist, business-to-consumer activity will grow from $8 billion in 1998 to $108 billion in 2003. That is a growth factor of 13.5 times. In the same period business-to-business activity is expected to grow from $43 billion to $1.3 trillion, a growth factor of over 30 times.

The classic example given to illustrate the business-to-business use of technology is that of WalMart® and the Pampers® diaper company relationship. According to the story, under the previous system the Pampers planners would estimate the number of Pampers diapers each region would sell, then those diapers would be manufactured and shipped to Pampers regional warehouses. On the other side, the WalMart planners would estimate the number of Pampers diapers each store would sell and order them shipped from the Pampers regional warehouses to the WalMart regional warehouses, from which individual stores would order stock. The cash registers in every WalMart store are linked to an in-store computer which reports sales each night to the central WalMart computer.
At one point the two companies agreed that the Pampers people knew a lot more about the diaper market than the WalMart people, so they gave them direct access to the section of the central WalMart computer containing Pampers sales. The Pampers people used these data to plan their factory production, then shipped the diapers, not to Pampers regional warehouses, not to WalMart regional warehouses, but directly to the individual WalMart stores. Tremendous savings were generated by reducing the number of times diapers were handled and stored on the way to the consumer, so WalMart then suggested that while the diapers were on their shelves they would remain the property of the Pampers company. This system is termed “Vendor Owned Inventory,” or VOI, and is just one example of business-to-business technology.

E-MARKET

Who are all of those e-customers and what are they buying, and how much are they spending? Industry figures from September 1997 and June 1998 indicate the following:

<table>
<thead>
<tr>
<th></th>
<th>Sep 1997</th>
<th>Jun 1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>3.3m</td>
<td>5.6m</td>
</tr>
<tr>
<td>Computer Hardware</td>
<td>2.4m</td>
<td>4.4m</td>
</tr>
<tr>
<td>Computer Software</td>
<td>1.2m</td>
<td>4.0m</td>
</tr>
<tr>
<td>CDs/Cassettes/Videos</td>
<td>2.0m</td>
<td>4.0m</td>
</tr>
<tr>
<td>Travel</td>
<td>1.6m</td>
<td>2.8m</td>
</tr>
<tr>
<td>Clothing</td>
<td>1.8m</td>
<td>2.7m</td>
</tr>
</tbody>
</table>

(millions of individuals)

And these figures are already over one year old.

As could be expected, the rate of increase in the dollar value of Internet sales parallels the growth curve of the number of individuals making those purchases, making the projections mentioned earlier quite possible.

This graph by the International Data Corporation shows Internet Sales since 1995 with projections for the year 2000, and this is just the beginning of the growth curve.
FUNDAMENTAL CHANGES

Many examples of fundamental changes in the way business is conducted are already appearing.

According to industry sources almost 30% of stock trades are now made over the Internet. In the next couple of years that figure is predicted to rise to 50%. At the same time, during the past year the average online stockbroker’s commission dropped by 50%. One recent personal example is an announcement by my investment broker that within six months all buy and sell transactions now handled by U.S. Mail will be handled only electronically, either via e-mail or on their website.

Another example is the trend in the cost of a banking transaction as shown in the following table from a Booz, Allen & Hamilton study.

<table>
<thead>
<tr>
<th>Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.07</td>
<td>if the customer comes into the bank</td>
</tr>
<tr>
<td>54 cents</td>
<td>if the customer uses the telephone</td>
</tr>
<tr>
<td>27 cents</td>
<td>if the customer uses an ATM</td>
</tr>
<tr>
<td>15 cents</td>
<td>if the customer uses a PC link, and</td>
</tr>
<tr>
<td>1/10 of a cent</td>
<td>if the customer uses the Internet for a transaction.</td>
</tr>
</tbody>
</table>

A lot of the banks just don’t get it! Some of them want to charge you extra for doing their work over the Internet.

SIDE BENEFITS

Increased accuracy is just one example of many side benefits from the use of web technology. Cisco says their website has helped cut their error rate on orders from 25% to 0.1% through the use of an intelligent web-based configurator. It would be interesting to know the error rate for transactions in institutional systems like Admissions, Student Records, or Human Resources. My guess is most institutions don’t even know their error rate for data entry in administrative systems.

E-ADMINISTRATION

Clark Kerr, former president of the University of California System, once outlined some of the external events that significantly changed U.S. Higher Education. The advent of labor unions causes major changes in the 1920’s. The Depression in the late 1930’s, World War Two in the 1940’s, the G.I. Bill in the 1950’s and the Civil Rights Movement in the 1970’s all caused major changes. And in the 1990’s and into 2000 the Knowledge Age is causing another major change in the way we operate.
Some of the major activities that will be impacted by the advent of E-Administration are:

**Marketing;** currently it costs thousands of dollars for the placement of a single advertisement in the New York Times or the Wall Street Journal. The annual cost to be listed on the Collegenet website is $100 ($250 for the first year). They are getting millions of hits every month, and there are a bunch of similar websites potential students are checking every day and every night.

**Admissions Inquiries** via external websites were addressed in the previous paragraph. Many of these commercial websites will route the inquirer directly to the institutional website for additional information.

Some of these same commercial websites also provide web-based **admissions applications processing** in such a way that the applicant doesn’t even know they are not communicating directly with the institution.

The latest technological innovation is the establishment of the campus website as an **Internet “Portal”** for students, faculty, staff, and alumni. This activity raises some interesting concerns addressed later in this paper.

Many institutions already offer remote web-based **course registration** to their students, either locally developed or through their proprietary software package. The surprising facet of this application is the reported use of the facility by students at all hours of the night, even from on the campus. We’ve always known that students keep different hours than the rest of us, and now we have traceable proof.

The **conference registration** process for CUMREC and EDUCAUSE on their website is a great example of E-Administration, and colleges and universities can use the same process for on campus conferences. EDUCAUSE reported that almost one-third of the conferees registered on the web, providing excellent advance information about session selection.

The University of Minnesota and many other institutions have already established web-based operations for their **bookstores**. On some campuses, students have already set up an internal “e-bay” type auction for used textbooks, completely bypassing the traditional bookstore operation.
Many of the institutional business processes that were traditionally paper-based are rapidly being moved into the web zone. *Purchase order* processing is one example where the web-based transaction starts on the Intranet, then moves outside the institution to vendors on the Internet.

Some of the administrative applications are following the lead of corporate EBusiness practices.

There are several general characteristics found in the outstanding examples of “web-enabled administration” on campuses. Placing information on the internal and external campus websites is “information pull,” that is, individuals must come to the website and “pull” the information to be informed. The use of “broadcast e-mail” to tell individuals about important new website postings is “information push”. A combination of both “information pull” and “information push” is usually required to ensure widespread campus communication.

For some time many administrative processes will still originate on paper forms. During the transition period it will be important to print the Intranet URL on every paper form, both to relate the form to the corresponding web page and to remind individuals that the transaction can be completed on the Intranet instead of paper. Another way to encourage campus use of the Intranet is to ensure that appropriate Intranet URLs appear in all campus publications. In addition to displaying on campus web links, it is also important to have the institutional website listed on a variety of other websites including area high schools, Collegenet, Peterson’s Guides, et cetera.

**E-ADMINISTRATION OBJECTIVES**

As colleges and universities plan for the use of web technology here are the TOP TEN objectives that should be kept in mind:

1) Make technology “Student-centric”

2) Develop an information structure that allows the institution to function as a cohesive organization

3) Provide open information for decision making

4) Develop applications that transcend organizational units and departments

5) Recreate organizational units to become networked servers and clients, working in a modular, flexible organizational structure

6) Develop complete staff connectivity

7) Encourage staff “web awareness”
8) Start small “pilot projects” early

9) Create campus E-Commerce teams

10) Involve departmental staff in all decisions.

ISSUES & CONCERNS

Several major issues remain as campuses address the world of E-Commerce:

**COST.** For example, according to a recent Gartner Group study, the average cost of developing an enterprise E-Commerce site is $1,000,000. Labor represents almost 80% of that cost, and given the current shortage of technical talent in the U.S., that could increase as much as 25% per year.

**TIME.** The Gartner Group also says that the average site took five months to complete, and all of them went over budget.

**SECURITY.** Campus systems have dealt with security in the past, but the Internet presents an entirely new basket of problems to be solved. Most institutions already have good control over client access through account and password structures, but staff awareness of the issues must be heightened. Internet and Intranet firewalls are also in place at most institutions, but penetration of those firewalls must be constantly monitored. Many faculty and staff members, and in some cases even students, require access to the institutional network from external Internet Service Providers (ISPs). This access will require Virtual Private Network (VPN) software on the institutional network. Finally, some sensitive files and communications may require encryption to achieve adequate security.

**ADVERTISING.** Some institutions are already placing advertisements on their web pages as this practice raises serious discussion among academics. Advertising on institutional web pages requires policy determinations at the very top levels, followed by detailed administrative procedures and a comprehensive program of website monitoring. **Other issues** include control over the institution’s domain name to ensure appropriate use of the institutional identity.

**Internet access** to regional or state providers both public and private institutions is an area many institutions are considering for outsourcing. Off-campus Internet access for faculty, staff, students, and alumni is also being outsourced to commercial providers as institutions learn that there is an unlimited demand for a free resource.
CONCLUSION

Web-enabled technology has already dramatically changed the way every organization operates, and the rate of change is accelerating.

Determining campus readiness for E-Commerce starts with an assessment of the institution's information and technical infrastructure, resources, and staff capabilities. It is also important to develop a strategic plan for E-Commerce. Every campus should assess their readiness for E-Commerce, either internally, or through the use of external assistance. Larger institutions are usually capable of addressing these issues with their own resources, but many smaller institutions are working together through consortia to spread the costs of implementing the new technology required to fully participate in the rapidly arriving E-Commerce world.