

Chapter 5
E-Business in Higher Education

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Web Portals and Higher Education
Technologies to Make IT Personal

Richard N. Katz and Associates

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E-Business in Higher Education

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E-business for universities is first and foremost about improving service to their diverse clientele.¹ New e-business models promise to radically change the service culture of the university and greatly improve the efficiency and effectiveness of service delivery. Especially noteworthy is service customization, or “marketing to one.” In effect, each client is afforded an opportunity to view the institution in ways that make the most sense to the client, as opposed to a more generic and group view orchestrated by the institution.

Second, e-business is about community building, and especially the development and nurturing of learning communities. By *learning community*, I refer to groups of people engaged in collective inquiry on the Web. Paul Shrivastava (1999) notes that “learning occurs from interaction in the network and from learning materials and databases. In work settings, learning communities are also ‘communities of practice’ that consist of knowledge workers engaged in problem solving. They include multiple forms of learning and engagement from formal coursework, research and scholarship, work practices, and informal information scanning and sharing.”

The Web creatively links together the university’s many learning communities (alumni, current student body, the general public) and affords new opportunities and ways to communicate, educate,

and generate support (such as chat groups, e-mail and e-forums, personal links and listservs, ride boards, elections, and surveys).

Third, e-business promises to change how we teach and learn. Computer-mediated and interactive instruction to Web-linked learning communities, together with new public/private teaching partnerships (division of labor), will encourage and support changes in the conduct and organization of teaching and learning. Information technology will present the possibility of greater customization of courses and programs, combined with enhanced flexibility of delivery.

Fourth, e-business is far more about strategy and business redesign than technology. The Internet and the browser are tools that make e-business possible, but new business strategies and models of service delivery are needed to make it successful and to capture the imagination and loyalty of students, faculty members, and staff members.

Because e-business has the potential to affect a wide variety of university services and how we teach, it is worthwhile to identify those areas most likely to be affected, as well as opportunities for, barriers to, and measurable benefits and costs of implementation. Also addressed are areas that are most promising to pursue.

Service delivery and teaching need to be realigned and/or redesigned around the Internet and the use of portals. Roles, responsibilities, and reporting relationships change markedly. Note that such changes have significant organizational and human resources (HR) implications, which must be addressed in a comprehensive and strategic manner as well.

What Does E-Business Encompass?

E-business encompasses a vast array of activity, including the following:

- Distribution of information (content distribution) and communication—for example, Web searching, news,

reference tools and digitized library material, e-mail, and chat groups

- Education and training—for example, technology-enhanced learning (TEL), Web-based courses and testing, video streaming, course delivery to distributed locations, multi-institutional and consortia-based education programs, and health care delivery
- Provision of staff and student services via the Web and a common portal, providing referrals and dynamic links to other ISPs—creating, in effect, a one-stop service
- Optimization of business processes through linked transactions, automation, and self-help—for example, on-line applications and payment of admissions fees, on-line purchasing, and loan programs
- On-line, collaborative research
- Electronic grant and development initiatives
- Customization of service delivery
- Electronic authentication/identification
- Selling and buying of goods and services
- Extension of market reach to new and global markets via distance education
- Promotion of brand awareness and loyalty
- Building of communities, especially learning communities
- Management of relationships and coordination of activities with business partners, as well as redefinition of business relationships

- Management and support of relationships with the university's many constituencies
- Management of risk and compliance

Why Is the University Challenged by E-Business? Issues and Contradictions

Popular belief suggests that the traditional university is under enormous pressure from private corporations (and some public institutions) that use e-business to start new universities in the world of virtual space. Unfettered by the need for classrooms, libraries, dormitories, and football teams, and able to recruit and employ a non-resident and highly competitive faculty, these corporations (now over five hundred in number) presumably have a competitive advantage in market reach and low overhead. For-profit education companies such as the Apollo Group and DeVRY, Inc., focus on career-oriented education in fast-growing fields such as business, electronics, applied arts, and health care. Their enrollments are growing to where they hold nearly 2 percent of the overall market share and they are growing at over 10 percent yearly (Blustain, Goldstein, and Lozier, 1998). They have at this time a predictable stream of earnings, demand for their programs is solid, and they are innovative in the development of curricula and education delivery that appeals to both students and employers. Other players include corporate universities, such as Motorola, GM, and McDonald's, which educate their own employees, and mega-universities, such as the Open University, which service well over 164,000 students in over forty countries. And recently, Michael Saylor announced that he would use \$100 million of his software profits to create free online education provided by thousands of educators (*New York Times*, Mar. 2000).

Popular belief, while often compelling, is often simplistic and requires further scrutiny if we are to understand external challenges

to the traditional university. More precisely, what is it about the traditional university that places it at risk in the e-business environment? Concomitantly, recognizing factors that put the university at risk, how does the university adjust to and mitigate these risks? It should be noted from the outset that e-business is more than the virtual university. The use of the browser and Internet can be applied as easily to educational processes as it can to the hosting of university administrative and business processes.

Puryear and Melnicoff (1999) offer insight from the private sector. They recognize five realities that affect the competitiveness of traditional businesses in the new business environment. I extend their arguments to the university and add to them.

Vertical Integration

Vertical integration occurs when “all elements of the business are managed and produced within the business/corporation and where nothing is outsourced” (Puryear and Melnicoff, 1999). Alternatively, horizontal integration involves the location and integration of the best of breed services, within or without the institution, which provide more cost-effective similar services. Because in using the Internet the cost of collaboration and interaction is low, e-business often makes it cheaper to collaborate with external vendors than to own and produce all aspects of the business.

Numerous e-business vendors are now in the market, successfully serving a variety of functions. In the area of on-line admissions we find, for example, CollegeNet and EMBARK. Varsitybooks.com and Textbooks.com sell textbooks. On-line procurement is available from CommerceOne and Ariba. SallieMae, eStudentLoan, and other, similar, firms are providing a variety of services in areas of bill presentment and the management of loans and collections. All of these can be integrated into the institution’s Web site.

Universities are reluctant to outsource for a variety of reasons. Political factors, loyalty to existing employees and processes, and inertia restrain the integration of external vendors into the service

calculus. In the absence of comparable data, the belief persists at many higher education institutions that internal units can do the job better, which may well be the case. But it is my belief that the trend will be to outsource. Cherished management of such perceived core business as issuance of transcripts, financial aid, and course delivery may well be transferred to external vendors in the future. All parties agree to operate within a horizontal and integrated business arrangement, which is designed by the university in collaboration with external vendors, in the interest of providing the highest level of service to the customer.

Another related dilemma is the hierarchical and silo structure of some university service units. The challenge is to build seamless structures without centers that are highly networked, flexible, and easily modified. Services must be less bureaucratic, meaning they must involve paperless transactions, fewer forms, and no lengthy approvals. Certification processes must become simpler, and in some instances, we must accept more self-certification (for example, placing greater responsibility and accountability in the hands of those we serve).

Some services need to be shared more than is now the case—for example, financial and human resource (HR) functions. Many small departments use part-time and rather amateur employees to manage financial and HR functions. The new enterprise systems permit greater efficiencies in these areas and they demand more expertise if their planning and assessment functions are to be used to full advantage.

Centrality of Physical Assets Versus Knowledge-Based Products

Formerly, for private businesses, the creation of knowledge was a cost of doing business and an ultimate source of value, but not a source of revenue. Revenue was generated by the sale of goods and services. The world is very different today, as knowledge has become a very valuable commodity. It is increasingly the business of the nation and the business community.

The creation of knowledge has long been the business of the university and a source of revenue through the dissemination of information as well as royalties on patents and copyrights. Physical assets remain critical to providing high-quality research and instruction as well as building community and loyalty to the institution. However, e-business allows intangible assets to be leveraged across a wider customer base, and that is a challenge for the university. For example, it is no longer necessary to co-locate services with physical assets, such as distance education or Web-based student services. Physical library holdings will give way, in part, to efficient and sophisticated access to massive amounts of diverse and rich electronic information.

Perhaps most important is the possibility of syndicating courses and course materials through on-line instruction (see Werbach, 2000). Long prevalent in the media industry, syndication presents a major opportunity in the digital environment. Infinite numbers of people can use and reuse modular information distributed through thousands of independent distribution points (Web sites). Universities can syndicate content by drawing and archiving materials from numerous partners. A wonderful example is the Distributed Learning Network, sponsored by the Midwest Higher Education Consortium (MHEC), which is a consortium of universities providing digital course materials for use throughout the consortium. Universities can also choose to deliver these courses to students throughout the world. UCLA Extension has formed an alliance with the Home Education Network to distribute their courses via CD-ROM on-line and via satellite. Unext.com has partnered with Stanford, Chicago, Columbia, Carnegie Mellon, and the London School of Economics to develop course materials for a "global university."

The universities must decide how to partner, with whom, and what role to play. Will they be primarily providers of content to syndicators and their distributors, or will they choose to syndicate not only educational material, but also, for example, advising access to library materials.

Information-based products are scalable, and each item that you sell costs no more than the last one you delivered. Costs approach zero after an initial investment in research and development. The first business unit to capture a percentage of the market locks in the standard and a majority of the business. This argument is especially familiar in discussions of the merits of the virtual university.

The former assertion is probably a myth, as the ongoing costs of quality education and service and course delivery on distributed systems remain as high as ever or higher. However, the services do scale and the quality of services delivered is presumably better. And as I previously noted, opportunities for syndication of reusable digital course materials is continually increasing.

Student services provides a good example, as does access to library information. The University of Minnesota student Web site receives more than thirteen million hits a month and three million pages of information are downloaded. The numbers continue to grow dramatically. Clearly, the old mode of delivery involving paper and person-to-person contact at advising sites did not begin to meet the demand for information. Presumably, students are receiving more, timely, and better information and have a better opportunity to make better academic choices. The value of these services has increased for the student.

More problematic for the university is a more aggressive entry into and capture of a percentage of the distance education market. Timing will be critical and time is being lost to external vendors. Business plans are needed to determine demand, potential return on investment, and so forth. Open, nonproprietary, and extensible Internet protocols must be developed through organizations such as the Distributed Learning Network, sponsored by MHEC. Included here are object-oriented authoring tools, Internet communication protocols (e-mail, message management), and Internet collaboration protocols (chat, application sharing).

In the interim, higher education has not come to view Web-based distance education as a disruptive technology (Christensen,

1997). Current customers do not value it. The clients who are interested (adult knowledge workers) are not yet recognized as a sufficiently sized market to warrant investment. Faculty members are not prepared, nor are they interested in developing materials and teaching in this arena. There is an absence of enabling policies. The leadership is not committed, there is a lack of capital to support what is seen as a lower priority, and there is no plan to guide transformation.

The Internet offers many new possibilities—especially the building of learning communities that take advantage of new pedagogically sophisticated computer-mediated instructional materials and teaching techniques. Lectures and coursework can be organized and archived in a network. Materials, such as e-books, can be used and reused throughout the university and imported from other institutions. They are readily customizable and flexible and can be delivered live and synchronously over the network, or they can be delivered asynchronously anytime and anywhere. Already, Time Warner Trade Publishing, Alfred Knopf, Random House, and Simon & Schuster have announced that they will release e-books using Microsoft's new reader text-display software. Time Warner has indicated an interest in soliciting and publishing original manuscripts on-line through a Web site called IPublish.com, which is similar to Xlibris. Xlibris publishes books, secures ISBN numbers, and makes materials available for custom printing orders through Amazon.com.

Currently, our strategy is one of reaching niche markets, primarily by the professional schools. *Syndication* remains a foreign term in our vocabulary. Our delivery remains too faculty-centric, in my opinion, rather than learner-centric. The new audience of new-economy adult learners seeks convenient and flexible access to education and just-in-time delivery of information. They will want greater control over what is taught and when and how it is taught.

As long as the cost of delivery and development of instructional materials remains high, the market will be slow to develop. In the interim, we do not have an overall business plan or (syndication)

strategy to address this market and its potential. Minimally, we need to maintain lifelong relationships through portals with our alumni by providing continuing education. In this way, we are able to maximize the yield on existing customer relationships.

Perfect Information

In the past, sellers did an enormous amount of customer research to determine the buyers' needs, preferences, and behaviors. Missing in the equation was the ability of customers to do similar research on the quality, price, and availability of goods and services. Customers were dependent upon advertising, a few consumer guidebooks, and word of mouth. This has totally changed with the browser and the Internet; now buyers can compete to the point of determining price. Customers have an enormous number of choices with the click of a mouse. And they are almost instantaneously able to compare both qualitative and quantitative data, which they can use to make a decision. Note: I am informed that several small private colleges have allowed students to bid on tuition.

The ramifications for the university are enormous, and an interesting example is the role of the admissions office. Traditionally, the admissions office has been the gatekeeper of information about a particular institution; now, students are routinely bypassing the office and going directly to faculty members and external sources of information via the Internet for information about programs of interest. More so than ever, it is critical that the admissions office use e-business to better understand the needs of students and customize their services and processes to attract them to the university. The ability to fully understand the preferences and priorities of students and their parents is mandatory. It is also the case that the admissions office will need to explore horizontal relationships with external vendors, as students can apply to multiple colleges via private on-line application services. In short, the admissions office will need to use e-business to create targeted, on-line marketing campaigns, manage customer relationships, and analyze site and application usage.

A similar argument can be made for the alumni office and institutional relations. The university, more so than many other organizations, has a complex set of constituencies that increasingly have and want more information about their university. Universities increasingly will need to find ways to respond to this demand.

Short Time Frame

Once upon a time, commerce depended upon the design of a product, means of production, marketing, planning, and sales personnel—all coordinated by a single entity and coming together in a physical place. This is not the case with e-business. Supply chains can be forged quickly through desktop computers, and the life cycle of many products is short.

University research, to a degree, has been distributed across institutions. It has been quick to adapt to the Internet. A greater challenge exists in the missions of teaching and outreach, especially when these services are provided at a distance. These remain vertically integrated activities and likely will need to adapt quickly to horizontal integration if they are to succeed. I believe we will see entertainment companies with strong capabilities in packaging and distributing content emerge as potential partners with universities, with faculty members providing content. This assumes that universities will develop the will and ability to build curricula much faster, especially in continuing education and lifelong learning. And they will need to create the curriculum together with their students and their students' employers. In the twenty-first century, more and more of our faculty members will primarily serve as designers of learning experiences, processes, and environments. The first indication of this trend is the emergence of commercial portals such as Blackboard and eCollege.

Note that these emerging partnerships will inevitably stress current contractual relationships with faculty members and their institutions. The faculty member who produces it currently owns his or her course material. As opportunities arise to sell these products to

external vendors, universities will lose revenue and control of the learning process, especially as the outside vendors move upmarket from short courses and skills training to less expensive freshman courses that students will try to transfer to their home institution. Harvard University has already taken action against several of their faculty members who have moved into this market. A very critical question is, who owns a university course, as a course becomes more mobile in the Web environment?

Joint Creation of Goods and Services by Providers and Their Customers

Joint creation (or co-creation) is a collaboration of the customer and producer working together to create a product. The challenge for the company is to decide with the customer what value added is for both parties. The private sector provides interesting examples. In the area of buying, for example, Dell meets customer needs through customer customization of products that are built to order. And companies increasingly add value by providing software through downloading rather than by selling and mailing disks. The challenge is to find new ways to distribute goods and services at a cost considered reasonable by the customer. Interesting examples at the university include grants management and Web-based student services that were jointly built by administrators, students, and staff members. The real challenge will be in the substance, design, and delivery of education, especially for adult learners.

How Do We Proceed and Who Will Be Affected First?

E-business implementation proceeds in phases. Typically, units begin by using the Web to acquire or provide information on-line. Examples include description of policies and procedures and on-line catalogs and syllabi. The University of Minnesota has proceeded further

in key service areas through the integration of internal services. Key examples are purchasing and procurement (Forms Nirvana) and one-stop student services. Purchasing, for example, goes from a paper process to an electronic paper process and then to a decision-support environment with opportunities to plan and assess performance as part of the buying decision. On-line university catalogs offer one-stop purchasing with the university's preferred vendors and goods, favorable pricing, and enforcement of purchasing policies (including more flexible spending limits for approved items), streamlined accounting, and monitoring of purchasing activity and inventory.

What awaits is the transformation and emergence of services that integrate outside organizations into our business strategy and processes. Partners, be they suppliers or customers, will increasingly be brought deeper into university processes and vice versa. This will require a much greater degree of openness and transparency on the part of the university than is currently the case. E-business benefits from speeding up and automating the university's own internal processes and also from spreading efficiency gains to the business systems of its suppliers and customers. We may need to both reengineer and reinvent much of what we do.

This has major implications for the university's enterprise system. Needed in the coming phase are electronic links that provide a seamless flow of information between an enterprise customer and its partners. Enterprise application integration is defined as the sharing of data in support of shared business processes among any connected applications or data sources. In its simplest form, integration can mean the ability to export data files from one application and import them into another application, possibly undergoing some translation between different data formats. More sophisticated forms will allow the partners to invoke actions in a target system. The current reluctance of units such as the registrar or financial aid to permit such participation results in much greater work for their customers—faculty members, admissions offices, advisors, and so forth.

Another example of the phased development of e-business is the design of the Web page or portal. The earliest pages at the University of Minnesota were organized by content or institutional organization. According to my colleague Carl Jacobsen of the University of Delaware, with this model the physical campus runaround becomes a runaround by mouse. Better strategies are portals organized by customer or context. For example, our student and staff one-stop portals are substantial improvements over earlier designs. They can be further narrowed by context—for example, students registering or parents visiting campus. But best yet is the customization of the page for each individual interacting with the university. At Minnesota, this is illustrated by One Stop—at Onestop.umn.edu. This portal is, in effect, an abridged version of the institutional Web site tailored to the individual, which can be added to, subtracted from, and modified at will. It gives each user a unique, personal, and preferred perspective of the university.

Portals, when used by all members of the university community as their desktop, will radically change how we do business. The units that are mostly likely to be affected first by portals and e-business are service units that function as intermediaries between a producer and a consumer of a good or service. It is probably the case that where you have the greatest risk you have the greatest opportunity. These units in particular must work with customers to find ways to provide value that customers are willing to pay for. And their costs must be factored into whatever solution we come up with. Units that currently provide intermediate services, such as the registrar or bookstores, need to rethink how they are organized, the service paradigm they employ, how they are funded, their division of labor, and the possibility of outsourcing cherished processes.

The bookstore provides an excellent example. The bookstore at the University of Minnesota is currently getting out of computer sales. They simply cannot compete in price, ready customization of products, and subsequent delivery, given the emergence of on-line

sales and service. The next challenge is the sale and delivery of new and used textbooks. Already, textbook vendors are sending e-mails to students and faculty members, offering better prices to students and referral fees to faculty members. Auction sites are appearing for student-to-student sales of used books. American publishers are now assessing the demand for and delivery of e-books. How does the bookstore add value in this environment?

It can add some value by offering its own e-sale of books, which our bookstore has done. It can deliver quickly, which is important, as students tend to buy their books at the last moment and usually after they have completed any drops and additions of courses. And the bookstore can have a generous exchange policy for used books. But it can add major value if it partners with other university services and fully integrates its business processes. For example, on completion of on-line registration, the student is given a consolidated book order for his or her classes, which can be ordered and paid for through the student's university account in one stop as part of the registration process. Identifying these horizontal links and building integrated and Web-based processes is key to success throughout the university.

E-Business Service Models

E-business typically begins with units providing supplier-centric applications, which are essentially passive Web sites. Customers are provided with the ability to check on the availability of courses and view instructor as well as pricing (tuition and fees) information. More valuable to an organization and its clients are user-centric or self-service applications. These are often active or interactive Web sites that provide, for example, on-line account inquiry and maintenance, employee benefits management, purchasing and expense reporting, bill presentment and settlement, degree auditing, and so forth. Customers are allowed to securely view their account information, manage their accounts, analyze information, and initiate transactions on a 24x7 basis.

Many of the e-business models in use are business transplants. Amazon.com, for example, uses a Web site as a storefront to sell physical goods that are delivered by a third party. Business-to-customer models like this are likely to be adopted by a number of university units engaged in external sales. Libraries can use this approach to deliver or renew books. Another example is a sell-side e-business that addresses marketing and sales and handles order management fulfillment. Included here are catalogs, configurators, shopping carts, order management, and payment. University auxiliaries are most likely to adapt this business model. Also under development are buy-side business-to-business applications that are used by organizations to manage their purchasing.

Another recent development of a business-to-business application is the advertising-based e-business. Here, third-party fees support the operation of a free service. The alumni association and athletics have been approached by an e-business business that develops specialized portals for free. Both parties share in advertising and sales revenues that are generated by clients using the portal. Subscription-based Web sites are a variant that has application at the university as well.

Of great interest are new business models that are made possible or necessary by the Internet. Especially noteworthy are e-business models based on auctions, which are of various types, such as Yankee, Dutch, and reverse auctions. The reverse auction is of particular interest to the university. Here, a consumer-to-business model is used, which permits buyers to post a price they are willing to pay for an item, and the site then facilitates a match with a seller—for example, Priceline.com. Used textbook sales (a consumer-to-consumer e-business model) may ultimately be relegated to such auction sites, which probably ought to be developed by the university in cooperation with the bookstores. Related sites could be developed for classified ads, as is the case at the University of Delaware.

Noteworthy, too, is software to manage constituency relationships. For example, constituency e-mail management applications

are now available to facilitate all phases of the communication between units and their clients. The programs have the ability to route incoming e-mail messages to appropriate destinations. Another feature is audited call director functionality, where a workflow mechanism is used for moving incoming messages through a series of steps necessary to generate a response. The programs employ knowledge- or rule-based systems capable of creating or suggesting an appropriate response to each message. Case management systems allow incoming e-mail messages that are continuations of previous interactions to be associated with the history of that interaction. No less important are sophisticated tracking and trend analysis capabilities that further enhance management of customer relationships.

The capacity to exploit a rich body of data is what makes these systems potentially powerful for the university. In addition to transactional data, information can be collected on who visits Web sites and with what frequency and for how long, as well as what banners they hit. This supports one-to-one marketing and the ability to better respond to customer preferences. There are enormous policy ramifications here, which will be discussed later in this chapter.

Many university units, such as admissions, the alumni associations, institutional relations, and the foundations, will use such systems. Rather than reinvent the wheel dozens of times throughout the institution, a central strategy would be very useful here.

Last, and perhaps most interesting, is the emergence of “infomediaries,” a word coined by John Hagel of McKinsey. Infomediaries sell information about a market and create a platform on which buyers and sellers can do business. In so doing, they add value as intermediaries between suppliers and their customers. Key, here, is the willingness of the customer to pay for the added value. An example is Chemdex, which is an aggregator of multiple vendor catalogs into a single, searchable Web-accessible database. Buyers in fragmented markets can select products at up-to-the-minute prices and get product information in a single contact point for service.

Chemdex markets research chemicals to universities and pharmaceutical companies. Pricing becomes far more competitive as the customer effectively buys at an auction or commodity price of the day (Kaplan and Sawhney, 2000).

This development has enormous ramifications for university stores as well as for how purchasing sets up business systems to take full advantage of newly created auction markets for goods needed by the university community. Some of our intermediary businesses, like the financial aid office, may survive by becoming infomediaries, in the sense that they rationalize and aggregate previously unstructured encounters between them and their customers. For example, greater emphasis may be placed on capturing customer information and developing detailed profiles of an individual's need requirements.

Rebuilding Value or Supply Chains in Education

E-business is premised upon finding ways of adding value to established and linked business processes. By analogy, e-business in education will focus on finding value in the teaching process, which includes curriculum development (programming), content development (production), learner delivery (delivery), learner acquisition, assessment, articulation, and credentialing. These links can be pulled apart, becoming a virtual value chain that is nonlinear, a matrix of potential inputs and outputs that can be accessed and distributed through a wide variety of channels.

Other higher education value chains involve service areas and include marketing (providing information to prospective students), admissions (qualifying and selecting students), enrollment services (registration, billing, and financial aid), academic support (advising and tutoring), student services (placement, counseling, and information technology help), and credentialing (grades, degrees, certificates, and transcripts). The University of Minnesota has come a long way in this area with the development of on-line registration

systems, advising portfolios, and one-stop portals where transactions, planning, performance assessment, and marketing functions have been developed.

The consequences for higher education are huge, as hundreds of new companies, each specializing in one link of the value chain, can and will emerge. These companies may supply products and services to institutions or they may decide to bypass them and go directly to students. An example is SMARTHINKING, which is an Internet company that provides human, real-time, on-line academic support at any time of day for core courses in higher education.

Students can feel overwhelmed by the flood of information available to them through the Internet and the university libraries' large collection of on-line and print resources. Research Quickstart and Quickstudy are two Web-based tools designed to make research more manageable and effective for undergraduate students.

Research QuickStart (<http://research.lib.umn.edu>) is a wizard-like tool that generates dynamic Web pages for over two hundred subjects. Students can use Research Quickstart to access a selective list of subject resources chosen by librarians who are information experts in their discipline. Quickstart subject pages contain links to on-line subscription databases and Web sites, as well as listings of print resources when appropriate.

QuickStudy (<http://tutorial.lib.umn.edu>) is a Web-based tutorial that teaches students information literacy skills necessary for research in the University of Minnesota libraries and on the Web. QuickStudy's eight modules contain lessons on a variety of topics, including designing a research strategy, conducting an effective keyword search, evaluating Web sites, and citing sources. QuickStudy lessons also contain exercises and quizzes to help students practice what they have learned.

Portfolio is a powerful advising tool that allows students to incorporate a rich array of their collective work and life experiences into a site that can be shared with advisers, employers, and others with whom the student wants to share information.

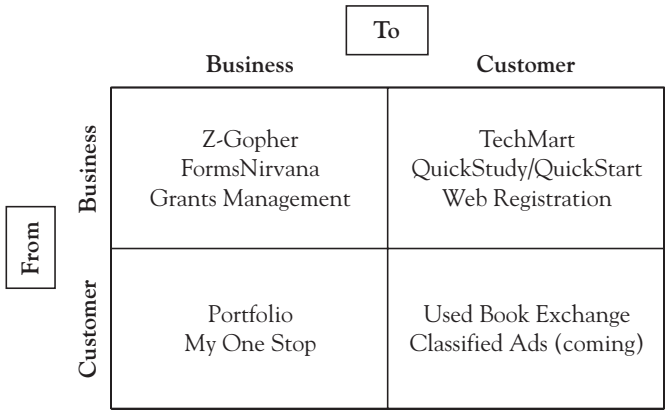


Figure 5.1. E-Business Models

Trends and Issues

Delivery of Education and Conduct of Research

The new information technologies associated with portals and e-business are likely to have a profound impact on how higher education’s mission is delivered. In particular:

- Information technology will present the possibility of greater customization of courses and programs, combined with enhanced flexibility of delivery.
- The communication of research is likely to be more varied, with formal publication playing a less significant role, while the current improvements in access to research findings and library collections are likely to accelerate.
- To stay competitive in the new environment, knowledge workers have to stay current. As a result, lifelong learning will be the dominant paradigm for higher education in the twenty-first century. Information technology is driving an increasing emphasis on establishing

and maintaining effective learning relationships with students throughout their lives. The knowledge age requires constant, individualized learning, and information technology supports such learning.

- The Internet is associated with interaction, unlike television, which is associated with passivity. As a result, the Internet becomes a far more interesting tool for distance education. Not only can students receive information, they can also practice the application of that information in the context of previous knowledge. The Internet provides much more than two-way video and voice communication. It allows authenticated and confidential submission of homework assignments and even tests, the ability to replay lessons or information on a 24x7 basis, and the ability to collaborate remotely with other students on projects.

Service Issues

The technologies under discussion will also influence how institutional services are organized and delivered and the very strategies around which institutional services are developed.

- University service units will become more client-focused and seamless. The new enterprise systems and organization are designed to provide students, faculty members, and staff members with greater quantity and quality, as well as timely accessibility to data that is integrated and supports institutional and personnel strategic planning and decision making. Service units will help build and support an environment in which their clients are provided knowledge and know-how to apply information to a given problem. Central administrators will drive decision making down into the organization with minimal intervention.

- Services will be provided electronically rather than in a paper mode and without intermediation by the staff. Services will be increasingly accessible at any time from any place. Intermediary services become less relevant as students, faculty members, and staff members are able to have direct contact with the producers of services.
- Value-added activities such as planning, performance assessment, and marketing play an ever-increasing role in the design of systems and services that replace improvements in transaction processes and efficiency as the primary drivers for change.

Risk and Conflict Management Issues

E-business is raising a number of new policy questions that need to be addressed in the future. In some areas, such as libel and defamation, it may simply be a matter of modifying existing policy to accommodate the digital environment. Other areas, such as copyright, patent, and trademark infringements (intellectual property) and privacy, are more problematic. The unprecedented ability of institutions to acquire personal information, to combine this information in unique ways, and to store massive amounts of this information will raise significant privacy and security issues. What responsibilities do we have as an institution to safeguard the information we capture about our community? What are our responsibilities under the Family Educational Rights and Privacy Act of 1974 (FERPA)? Are we protecting faculty and institutional intellectual properties? What policies and regulations are needed in the handling of digital data and information? Areas that need to be addressed include

- Academic policies on credentials and accepting of credits for on-line courses
- Self certification (by the client)

- Authentication processes (security, digital signatures, unauthorized access)
- Greater access to data (privacy) and user rights and responsibilities
- Policies on data administration and management and management of licensed software information resources
- Neglected sites that make inaccurate, anachronistic, and obsolete information available to outsiders
- Denial of access or repudiation of service (resource usage—for example, Napster) and acceptable use and user responsibilities
- Copyright, patent, and trademark infringements (intellectual property)
- Commercial use of campus resources and electronic payments
- Advertising
- Defamation
- Legal and regulatory issues (taxes and tariffs, regulated products, freedom of speech, illegal activities)
- Local decision making and accountability
- Americans with Disabilities Act (ADA) compliance

Universities currently have many certification requirements that are cumbersome and incongruent with the concept of student empowerment. Do students need to be “certified” to take courses through as many prerequisite course requirements as there exist today? Research at the University of Minnesota has indicated that students who self-select courses regardless of prerequisites perform

in those courses as well as or better than students who had met the requirements.

Data Administration and Management

How are the data going to be shared, and who should have access to what data? What institutional record policies are needed, especially with regard to who owns what information? What are the official data when units develop “shadow” systems and institutional databases are not integrated? Such a situation makes it very difficult to manage information in a way that ensures its accuracy and integrity.

Authentication

Increasingly, in a networked environment, institutions will need to have ways to authenticate that people accessing particular data are who they say they are. This is related to the challenge of establishing a system that can authorize an individual for access to particular data. Such authentication and authorization systems depend on having information policies in place that address who can access what data.

User Rights and Responsibilities

Policies regarding user rights and responsibilities, including commercial use of campus resources, are necessary. Also, resource usage must be addressed. Recent episodes involving the use of Napster have demonstrated the need for students to understand their need to use the resources responsibly. Users have not only rights but also responsibilities in the networked information environment. And colleges and universities should ensure that students are educated about these rights and responsibilities.

Academic Policies

Credentialing standards need to be adopted that support and promote high-quality e-learning in our institutions. Current practices

are generally strict and there is a tendency not to accept credits from other institutions, especially for on-line courses. In an e-learning environment, campuses will have to revisit these kinds of policies. The university will need a comprehensive policy that addresses this and other barriers that current policies present to e-learning.

Advertising and Revenue Distribution

Although some institutions have policy in this area, there are more issues in a networked environment than there have been in the past. There are many opportunities arising to generate new revenues from advertising on Web sites. One of the greatest problems has to do with subunits on campus contracting with vendors on their own, in the absence of institutional policy addressing the specifics of Web advertising. There are also sponsorships possible in this new environment that institutions need to consider and manage. This raises an issue as to where the revenues should go from such sponsorships and contracts. Click-through revenues are on the increase, and this was seen as a possible source of revenue for institutions, but there is a need to manage this practice, as well. These issues prompt the need for policy in this area.

Pricing Policies

With e-learning on the rise, institutions will need to reexamine their pricing policies, especially to enable market-based pricing and to accommodate out-of-state or international students as e-learning allows more distant participation. (See Shapiro and Varian, 1999, on the economics of information and differential pricing.)

Organizational Issues

- Organizational structures do not align with functions (such as e-business and classrooms).
- Organizations must be flatter, less hierarchical, and broader in function, with greater control of resources in

order to support the new service environment. There is a shift in power and control in the new environment.

Personnel Issues

- Within the next decade, new jobs at the university will increasingly require analytic ability, creativity, and familiarity with new technologies.
- Flexibility in jobs and the need for generalists will require broad banding of jobs.
- Automation, paperless transactions, and one-stop self-service shifts greater responsibility and participation in administrative services to the customer, and this changes the need for labor as well as the division of labor within the organization.
- Student services, HR, and grants management professionals will become generalists serving as facilitators and navigators in an information-rich environment that is shared by provider and client alike.

Note

1. E-business is defined herein as the transformation of key business processes through the use of Internet technologies. E-commerce refers to trade transactions carried on by buyers and sellers over the Web.

References

- Blustain, H., Goldstein, P., and Lozier, G. "Assessing the New Competitive Landscape." In R. N. Katz. *Dancing with the Devil*. San Francisco: Jossey-Bass, 1998.
- Christensen, C. M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston: Harvard Business School Press, 1997.
- Kaplan S., and Sawhney, M. "E-Hubs: The New B2B Marketplaces." *Harvard Business Review*, May-June 2000, pp. 97-103.

- Puryear, R., and Melnicoff, R. M. "The eEconomy: It's Later Than You Think." *Outlook*, 1999, 2, 33-43.
- Shapiro, C., and Varian, H. *Information Rules: A Strategic Guide to the Network Economy*. Boston, Mass.: Harvard Business School Press, 1999.
- Shrivastava, P. "Management Classes as Online Learning Communities." *Journal of Management Education*, 1999, 23(6).
- Werbach, K. "Syndication: The Emerging Model for Business in the Internet Era." *Harvard Business Review*, May-June 2000, pp. 85-93.