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Implementing an E-Business Curriculum: Opportunities and Issues

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ABSTRACT

The impact of Electronic Commerce and E-Business on the global economy is undeniable. The promise and potential of the new "e-business" paradigm is the driving force behind the tremendous demand for IT professionals with both a technology and a business background. As the size and scope of the global E-Market continues to grow, institutions of higher education will devote more of their time and resources to its study. This article examines issues arising from the implementation of an E-Business curriculum. The authors discuss the current E-Business environment, from the perspective of the viability of the E-Business paradigm and the effect of recent environmental events and trends as they relate to curricular issues. The Challenges of implementing an E-Business curriculum are discussed and opportunities for enhancing current curricular approaches to the study of E-Business are proposed.

INTRODUCTION

By their very nature, academic programs in Information Systems/Information Technology (IS/IT) must be continuously revised in order to keep pace with ever-increasing rate of change in the application of Information Technology in business and industry. Developments in information technology and its application in business and organizations must find their way into the IS/IT curriculum and this must be accomplished rapidly by the standards of most academic disciplines. In this regard, no application of information technology has been as significant as the set of technologies and business processes known collectively as E-Business. Numerous institutions of higher education have added E-Business or E-Commerce to the litany of their curricular offerings within the last two years (Augustine and Surynt, 2001). However, given recent events associated with E-Business and the "New Economy" (e.g. the bursting of the dot.com bubble, the tech stock downturn, and the virtual disappearance of venture capital sources for E-Business start-ups) many institutions have been forced to rethink their curricular commitments (Harrington, 2001).

E-BUSINESS IN THE CURRICULUM

Over the past two years a significant number of universities have created curricular offerings in the area of E-Business. In general, E-Business programs tend to focus either on E-Business technologies, or on the processes underlying E-Business. A wide variety of programs exist at both the graduate and undergraduate level. In research conducted during the fall of 2000, the authors identified three major degrees offered at the graduate level, MBA, MS and the MEC (Master of Electronic Commerce). At the undergraduate level degrees offered include a BA, BS or BBA in Electronic Business/Commerce, Bachelor of Commerce, Bachelor of Business and Electronic Commerce, and a Bachelor of Electronic Commerce. The author's research (Augustine and Surynt, 2001) identified a total of 26 university level institutions worldwide that offered degrees or concentrations in E-Business. Of these 14 offered graduate level programs. At that time only 12 schools offered undergraduate degrees in E-Business. Of these schools, only 7 are located in the United States. These figures do not include the myriad of institutions offering certificate programs in either E-Business or E-Commerce. Certainly, the numbers cited here had increased, at least until the "bubble" burst for the dot.coms in early 2001.

Program Focus

In general, E-Business programs tend to focus either on E-Business technologies, or on the processes underlying E-Business. The latter approach tends to make up the majority of E-Business curricular offerings. This can be probably attributed to the relative difference in terms of time and resources applied to developing individual course offerings that focus on E-Business processes as they impact the traditional functional areas of business as opposed to developing courses that focus on the creation and/or application of the enabling technologies associated with E-Business. For example, cost in terms of time and resources associated with developing a course in Internet Marketing would, in most cases, be less than developing a Programming class that focuses on and utilizes cutting edge web technologies. Thus, at a time when, even the normally cautious top tier of business schools were "racing to add [e-business] courses" (Kerievsky, 1999) it was simply easier and quicker to develop courses that dealt with business processes (a known quantity). These courses would often concentrate on how these processes were being adapted to the new business models that were being developed, implemented, and tested in the world of commerce.

New Realities

The one constant throughout all of the paradigm shifts that have characterized IS/IT curricula, is the fact that technology curricula tends to follow the application of technology in business and industry. The economic impact of the demise of the dot.coms and the decline of the tech stocks was bound to affect the development and implementation of technology curricula, especially those associated with business schools. According to an article that appeared in Fortune Magazine:

> "Last winter Stanford's new e-commerce elective was the hottest thing on the business school's campus, with 28 students using their single "silver bullet" to secure one of the 66 available spots [in the class]. This quarter there are empty seats … the bursting of the dot.com bubble means that the nation's top business schools, which just two years ago rushed to pepper their curriculums with e-commerce case studies, courses, and even majors, are now downplaying those changes and planning to absorb e-education into the general curriculum" (Harrington, 2001).

It was inevitable that E-Business curricula would have to react to the new realities of the business environment in the same way they did when they were first developed. This phenomenon poses important questions for academics. Specifically, is it necessary to change the curriculum in response to developments which may be cyclical and if so, what changes need to be made?

URRICULUM IMPLEMENTATION

The Authors were involved in developing and implementing an E-Business curriculum during the period in which the growth of E-

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Commerce seemed to be unlimited. The curriculum developed was one of the early entries in terms of undergraduate majors (at the time the curriculum was developed it was one of only seven undergraduate majors in E-Business or E-Commerce in the United States, see Augustine and Surynt [2], 2001). The curriculum development effort actually represented a curriculum transformation in which an existing undergraduate Computer Information Systems major (CIS) major was replaced by an E-Business Technology major.

The CIS major that existed at the beginning of the transformation process was based on the IS '97 Model Curriculum developed by the IATP/ACM/AIS task force (Davis, et.al, 1997). To the extent possible, course topics in the new programs are mapped to the IS '97 model curriculum. Due to the nature of the new programs however, not all model curriculum suggestions are relevant. To be more precise, the E-Business phenomenon as we know it today did not exist in 1997. Most academics and corporate recruiters would agree that certain courses and course topics should be required of any business technology major. Programming, DBMS, telecommunications and networking, etc. are relevant no matter what technology career a student has in mind. The key difference in the new programs is the way these topics are presented. The *context* of the tools and techniques required to support B2B, B2C, etc. is necessarily different from that of the past. Web programming, page design, site design, portals, web servers, application hosting, management services; these are all new technologies and topics of vital importance to anyone hoping for a career in E-Business. Therefore, the focus of all courses in the program is the Internet, the World Wide Web and associated technologies. The curriculum implemented included the following course components (see Table 1).

Although this curriculum is based on a CIS curriculum model, since it is housed in a Business School it was especially important to give adequate coverage to business topics in addition to the CIS curriculum's traditional technology components. To this end the courses on E-Commerce and Enterprise Systems Management were purposefully structured to provide a strong business component to the major. This business orientation to what is, in essence, a technology oriented curriculum is an important element in the overall implementation of the curriculum. The foundation and core courses offered in Business schools can provide that unique mix of technical expertise and business foundation that gives our graduates the tool-set, needed to succeed in E-Business. Conversely, the mix of technology topics found in an Information Systems (IS) curriculum, whether it is called IS, IT, or CIS can be tailored to meet the challenges of the current IS paradigm. Currently academic institutions are faced with another paradigm shift; one brought about by the emergence of the global Internet, the resultant growth of Electronic Commerce (e-commerce), and the emergence of what has been called "the new economy". Because of the constant and rapid rate of developments in information technology and its application in business and organizations, it is imperative that these developments find their way into the IS curriculum and this must be accomplished rapidly by the standards of most academic disciplines. In this regard, no application of information technology has had as significant an impact as the set of technologies and business processes known collectively as E-Business. Over the years IS/IT programs have evolved from a mainframe/centralized computing orientation, to one emphasizing the desktop and end user computing, to the current emphasis on client/server and networked computing. Given the fact that the typical IS/IT program is housed within a Business school or college this new orientation has the potential to dramatically change the shape of IS and perhaps even Business education.

Table 1: Curriculum based on a CIS curriculum model

Course Title	Course Content
Introduction to Information Technology	Windows, Internet concepts, Spreadsheets, Database, Introduction to Web pages and the World Wide Web.
Java Programming for the Web	Introduction to Java Programming with specific emphasis on the use of Java for Web Development (Applets, etc).
Advanced Web Programming	Advanced Java Programming, Object Oriented Programming.
Electronic Commerce	E-Commerce and E-Business concepts to include comparison of classical business models and E-Business models.
Web Application Tools and Techniques	Web Design and Implementation. This includes the use of web site creation software and software oriented to the creation of web content (graphics, video, animation, etc).
e-Business Communication Networks	Network Concepts and Administration, Web Server administration, Internet technologies, web site and web application security issues.
e-Business Database Development	Database Design and Implementation for E-Business Applications. Standard database design and development course oriented toward developing databases that are used by Web applications.
Enterprise Systems Management	Enterprise Processes and ERP Systems. Specific focus is on ERP Systems for E-Business and ERP Systems delivered via the E-Commerce model.
Application Development for e-Business	Project based course with a hands-on component oriented toward developing E-Business applications using Web Based Technologies. (These include, Server-Side technologies (ASP and PHP), XML, CSS, DHTML, Web database access technologies, etc.)
Analysis and Design for Web-Based Systems	Systems Analysis and Design as applied to web applications

E-BUSINESS CURRICULUM IMPLEMENTATION ISSUES

There are significant problems involved in the implementation of any IS curriculum which represents a significant change from its predecessor. These issues shape the content, form, and even the life span of any technology oriented curriculum. Implementing an E-Business curriculum adds a new set of challenges for the academic institutions offer which them. The following section discusses some of the more important challenges involved in implementing an E-Business curriculum.

Scarcity of Resources

Perhaps one of the most perplexing problems facing universities today is the allocation of scarce resources among various curricular areas in order to maximize the effectiveness of the institution and at the same time satisfy the demands of its various stakeholders. By their very nature, academic programs in IS/IT must be continuously revised in order to keep pace with ever-increasing rate of change in the application of Information Technology in business and industry. Change of this type cannot be accomplished without cost. Unfortunately, by their nature, academic programs in IS/IT will often consume a larger share of resources than more traditional curriculum offerings. Any changes in a hardware platform, software, or the competencies required of faculty represent significant expenditures for an academic institution. Often, these institutions are not willing to underwrite a significant change in a technology oriented curriculum unless the benefits or payoffs can be clearly discerned a priori. Until the demise of the dot-coms and end of the tech stock boom, the benefits of an E-Business curriculum seemed apparent even to the administrators of the most traditionally based institutions. Justifying new or increased expenditures on a curriculum model that some are claiming will amount to little more than another "academic fad" will, however, become increasingly difficult.

Desired Outcomes for Program Clients

Many academic institutions are facing heightened demands concerning the nature of their product (academic programs) from their clients (students) and from the organizations that ultimately employ them. From the client point of view, students (and their parents) see a degree (by itself) as an insufficient result of their significant investment of time and money. These stakeholder groups are increasingly expressing an interest in a more direct connection between academic programs and their ability to obtain satisfactory employment. Since, typically, IS/IT programs have been housed in Business Schools, the fit

between corporate recruiters and the skills of program graduates has always been an issue. Since E-Business represents such a new and in some ways radical departure from traditional business models, the task of finding organizations that require the specific skill sets that are built into an E-Business curriculum represents more of a challenge than the custodians of IS/IT programs have experienced in many years, at least since the point in time (sometime during the 1990's) that number of IS/IT positions available first exceeded the supply of graduates. E-Business programs have no real track record in terms of their graduates and many organizations continue to recruit graduates with more traditionally grounded technology skills. This challenge, however, may only be transitory. As more businesses adopt E-Business models, as it appears that they are (Rangan and Adner, 2001 and Useem, 2001), the skill sets provided by E-Business curricula and those required by industry should move into much closer proximity.

Will the New Economy Survive?

Since the phenomenal growth of the tech sector, especially the dot-coms, fueled the demand for E-Business curricular offerings, it is certainly germane to ask if this "New Economy" will survive. Though much has been written on both the sides of this argument, there is nothing to suggest that the E-Business models that have been developed over the last few years are invalid. It is merely the implementations that are considered to be faulty. As futurist Alan Toffler argues, "To think that the new economy is over is like somebody in London in 1830 saying the entire industrial revolution is over because some textile manufacturers in Manchester went broke" (Useem, 2001). Rather than dooming the E-Business model, current developments suggest that the demise of the dot-coms has (somewhat indirectly) lead to in a new wave of interest in E-Business. For example, within the last six months the two giants of retailing, Wal-Mart and K-Mart have reacquired their E-Business spin-offs and integrated these E-Business components into their core business, this phenomenon, which could be labeled "brick-and-mortar-dot.com" may offer a glimpse of the true future of E-Business.

E-BUSINESS CURRICULA: THE OPPORTUNITIES

In spite of the challenges of implementing an E-Business curriculum, the authors believe that the opportunities far outweigh any downside risk associated with the significant commitment of time and resources required. Implementing an E-Business curriculum has provided the opportunity for:

The Definition of a Distinctive Information Systems Program

An IS/IT program grounded in CIS curriculum models must become truly distinctive if it is to provide relevant and high quality IS education. To incorporate new and emerging technologies, to integrate these technologies with the coverage of traditional and "new economy" business models, and to upgrade the educational competencies of IS/IT faculties requires more than adding an "e" to the beginning of the names of a few courses. The market will eventually recognize those programs that are distinctive and those that merely repackage an old product.

Develop Graduates with Unique Skill Sets

If we believe that E-Business will not "go away" and that the "new economy" offers the opportunity for developing distinctive IS programs, then it follows that the graduates of these programs must possess a unique set of skills. These skills must include many of the traditional IS/IT core competencies, newer technology skills oriented toward the web and the technological challenges of doing business over large distances, and a firm grasp of the basics business models. Many current programs may offer graduates with one or two of these skill sets, but the truly distinctive (and we believe, ultimately, successful) programs will produce graduates with all three.

Valuable Insights

The Internet/Web technology model is not the first, nor will it be the last information technology paradigm that will form the basis for IS curricular models. The experiences gained in successfully implementing curricula that represent such a dramatic departure from pervious programs will help prepare IS educators for the challenges of the next paradigm change. Given the need to produce curriculum change that is resource friendly and to quickly connect to our stakeholder groups (business firms, parents, and students) the lessons learned in implementing an E-Business curriculum should serve us well in developing the next "curriculum of the future".

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