

E-COMMERCE COURSE PROLIFERATION IN UNDERGRADUATE INFORMATION SYSTEMS CURRICULA

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ABSTRACT

This research examines undergraduate information systems related curricula at AACSB accredited schools in the United States for the purpose of determining whether programs have adopted the curriculum recommendations established by IS'02 [5] regarding the inclusion of an E-Commerce course in undergraduate Information Systems programs.

This research is useful to information systems educators as a barometer against which they can measure their own programs. This research is useful to employers interested in the responsiveness of the educational community to their need for the information technology professionals with e-commerce related skills. This research is important to curriculum developers needing to know whether and how quickly their recommendations are being adopted and integrated into degree programs.

Keywords: E-Commerce, Undergraduate Information Systems Curriculum, Model Information Systems Curriculum, IS'02

INTRODUCTION

Information Systems curricula require that students be educated in many facets of information systems including fundamental understandings of hardware, software, networks, databases, languages, system development methodologies, and other related topics. Due in large part to the discipline's relative youth (the discipline did not exist prior to the proliferation of computers), there is minimal standardization of curriculum content across institutions. Instead, curriculums are developed based upon the experiences of program faculty and are based upon preferences expressed by the local business community and by employers of the program's graduates.

Formalized development of Information Systems (IS) curricula began in the early 1970s [1, 2]. Since that time, both the ACM and DPMA have offered their respective versions of IS model curricula in the 1980s [4]. Over the years, several groups such as the Association for Computing Machinery (ACM) and the Data Processing Management Association (currently AITP – Association of Information Technology Professionals) developed model curricula that were adopted by many institutions as a basis for their degree programs. Supporters of the ACM and AITP model curricula, together with the designers of other curriculum models, have worked together to develop the IS'02 model curricula for information technology education [5], which consists of eleven courses. The course list, taken from the Model, is provided as Appendix A

An important component of the IS'02 model curriculum [5] is a course titled “Electronic Business Strategy, Architecture and Design” which was added to the IS '97 Model [3] in recognition of the fact that, “at most universities, a course in Internet based commerce has been

either a required course or a popular elective for several years” [5]. The Model Curriculum prescribes “Electronic Business Strategy, Architecture and Design” as a required course for Information Systems majors and minors. The recommended catalog description for the new course is reproduced as Figure 1 and the course’s specific Learning Objectives are provided as Appendix B.

<p style="text-align: center;">IS 2002.2 - Electronic Business Strategy, Architecture and Design</p> <p>The course focuses on the linkage between organizational strategy and networked information technologies to implement a rich variety of business models in the national and global contexts connecting individuals, businesses, governments, and other organizations to each other. The course provides an introduction to e-business strategy and the development and architecture of e-business solutions and their components.</p>
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Figure 1 - Electronic Business Strategy, Architecture and Design - Catalog Description

While the IS 2002 Model Information Systems Curriculum serves as an important guideline for Information Systems related programs of instruction to use for developing their curriculum, the Model’s adoption is not required by any of the bodies that accredit business schools or information systems programs. Instead, a portion of the Model’s value lies in the degree of voluntary adoption of its recommendations by educational institutions.

For this reason, it is important to track the level of voluntary adoption of the IS 2002 Model. This research moves in that direction by examining the level of adoption of a key component, in fact the only significant key component that changed since the Model was first published in 1997, of the Model – E-commerce. For this initial examination, AACSB accredited business schools within the US were used as the barometer against which adoption of the model was measured. The rationale for this decision will be more fully explained in the Methodology section that follows.

HYPOTHESIS

Given the existence of the IS 2002 Information Systems Model Curriculum and the Model’s recognition of the fact that in courses in Internet based commerce have either been required courses or popular electives for several years, it follows that Information Systems curriculums within leading universities will have integrated some type of e-commerce course into their curriculum. Our hypothesis will be artificially limited to US-based institutions for this initial investigation in order to facilitate data collection.

<p>H1: Leading United States-based universities’ Information Systems (or related) business curricula will include at least one course whose focus appears to include the type of E-Commerce learning objectives outlined in the IS 2002 Model</p>
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RESEARCH METHODOLOGY

Ideally, it would be desirable to perform a detailed examination of both course titles and content drawn from a global sampling of educational institutions, matching data to the e-commerce related learning objectives provided within IS 2002's Model Information Systems Curriculum with the goal of determining which courses and which learning units match those prescribed by IS 2002. Unfortunately, this approach was not feasible due to several limitations.

First and foremost was the challenge of identifying an accurate list of all Information Systems programs and derivative titles. A second limitation arose from problems associated with translating information presented by foreign institutions into English. A third limitation involved developing a methodology to use for acquiring and analyzing individual course syllabi to determine whether or not each course actually covered the detailed learning objectives outlined within the IS 2002 Model. A final limitation involved establishing a definition for 'leading educational institutions' that could be used to select institutions who could serve as barometers for the level of early adoption of IS 2002's recommendations.

As a compromise, only United States based institutions were sampled. Within that sample, AACSB accreditation [6] was employed as the filter that identified 'leading educational institutions' and to serve as a pointer to Information Systems-related programs within schools or colleges of business. Finally, catalog course titles were used to determine whether a particular course met the specific learning objectives outlined within the IS 2002 Model. The author recognizes that selecting this methodology allowed for the introduction of potential errors due to out-of-date or misstated course titles. Nonetheless, this compromise was favored over the alternative methodology of searching course descriptions and faculty syllabi to determine course content. It is acknowledged that course titles that are overly generic could result in classification or omission errors. The alternative methods were deemed too cumbersome and did not ensure that errors would not still occur.

The response rate was dependent upon the availability of the list of AACSB accredited programs and upon the availability of each institution's instructional program and catalog information on their web site. The AACSB web site displayed 242 institutions during mid-April of 2003 when the data was collected. Of these 242 institutions, 133 represented that they had programs related to Management Information Systems, Information Systems, Computer Information Systems, Accounting Information Systems, Business Information Systems, or a closely related title. The web sites for each of the US-based institutions listed on the AACSB's web site was visited and searched for courses of study that included Information Systems or a related term in their title. Of the 133, three institutions offered two different information systems-related programs and one institution offered three different information systems-related programs. Twenty of the 133 candidate institutions did not have sufficient information available online to be able to adequately research their programs. For the remaining 113 institutions the courses that comprised the core program and electives were searched to identify those courses whose titles indicated that the course was reasonably matched with the learning objectives prescribed in the IS'02 Model Information Systems' Electronic Business Strategy, Architecture and Design course. The results that follow are based upon data collected from the remaining 113 institutions, representing 188 different degree programs.

RESULTS, CONCLUSIONS AND NEXT STEPS

The results of this research are encouraging and indicate that institutions either already had courses related to the curriculum in their catalogs or had recently added them in response to market demands or to the IS '97 and IS 2002 Model's recommendations. One hundred sixty-five unique courses were identified within institutions that met the e-commerce learning unit criteria. The types of courses included criteria related to web page development, understanding e-commerce systems, developing e-commerce systems, managing e-commerce systems, programming for web-based systems, designing systems for web-based applications, Internet and web-based law, as well as case courses. The data is still being analyzed and the results of this analysis will be shared at the conference and in an upcoming journal article.

The data collection process is being evaluated, as well, to be able to do a more thorough and accurate job of identifying courses whose title does not necessarily indicate that the course is related to e-commerce. Many programming and systems analysis and design courses are suspected of containing significant e-commerce content and should be – but were not – included in this initial study. Likewise, the issue of identifying special topics types of courses must be considered.

The rate at which institutions have adopted and included e-commerce courses in their core curriculums appears to be high and should continue to rise over time. Research is needed to understand the rate at which e-commerce courses are being added, the rate at which existing courses are being reengineered to recognize the importance of e-commerce, and the course titles that institutions are using to present their e-commerce courses. Likewise, it is important to expand the scope of this study beyond the United States given that e-commerce is an international phenomenon.

REFERENCES

1. Ashenhurst, R. L. (Ed.) 1972. "A Report of the ACM Curriculum Committee on Computer Education for Management." Association for Computing Machinery, 1972.
2. Couger, J.D. (1973) Curriculum Recommendations for Undergraduate Programs in Information Systems. *Communications of the ACM* (16:2), 727-749.
3. IS '97 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems. Retrieved March 13, 2001, from <http://www.is-97.org/rev/Review1.asp>
4. Nunamaker, J.F., Couger, J.D., and Davis, G. (1981) Information Systems Curriculum Recommendations for the 80s: Undergraduate and Graduate Programs, *Communications of the ACM* (25:11), 781-805.
5. IS 2002 Model Curriculum. Taken from: <http://www.acm.org/education/is2002.pdf>, March 14, 2003.
6. AACSB Schools Accredited in Business - Ordered by Country, State, Name. Taken from: <http://www.aacsb.edu/General/InstLists.asp?lid=3>, March 14, 2003

Appendix A

IS 2002 MODEL CURRICULUM COURSE DESCRIPTIONS

The IS 2002 Model Information Systems Curriculum [5] consists of a core of ten courses.

<p>IS 2002.P0 – Personal Productivity with IS Technology</p> <p>This prerequisite course enables students to improve their skills as knowledge workers. The emphasis is on personal productivity concepts using functions and features in computer software such as spreadsheets, databases, presentation graphics, and Web authoring. Although identified as a course, this material can be delivered as self-study modules, as modules associated with other courses using the software, or as a full course.</p>
<p>IS 2002.1 – Fundamentals of Information Systems</p> <p>This course provides an introduction to systems and development concepts, information technology, and application software. It explains how information is used in organizations and how IT enables improvement in quality, timeliness, and competitive advantage.</p>
<p>IS 2002.2 – Electronic Business Strategy, Architecture and Design</p> <p>This course examines the linkage of organizational strategy and electronic methods of delivering products, services and exchanges in inter-organizational, national, and global environments. Information technology strategy and technological solutions for enabling effective business processes within and between organizations in a global environment are considered.</p>
<p>IS 2002.3 – Information Systems Theory and Practice</p> <p>This course provides an understanding of organizational systems, planning, and decision process, and how information is used for decision support in organizations. It covers quality and decision theory, information theory, and practice essential for providing viable information to the organization. It outlines the concepts of IS for competitive advantage, data as a resource, IS and IT planning and implementation, change, and project management.</p>
<p>IS 2002.4 – Information Technology Hardware and System Software</p> <p>This course provides the hardware/software technology background to enable systems development personnel to understand tradeoffs in computer architecture for effective use in a business environment. System architecture for networked computing systems and operating systems will be covered.</p>
<p>IS 2002.5 – Programming, Data, File and Object Structures</p> <p>This course provides an exposure to algorithm development, programming, computer concepts, and the design and application of data and file structures. It includes the use of logical and physical structures for both programs and data.</p>

IS 2002.6 – Networks and Telecommunication
This course provides an in-depth knowledge of data communications and networking requirements including networking and telecommunications technologies, hardware, and software. Emphasis is upon the analysis and design of networking applications in organizations. Management of telecommunications networks, cost-benefit analysis, and evaluation of connectivity options are covered. Students learn to evaluate, select, and implement different communication options within an organization.
IS 2002.7 – Analysis and Logical Design
This course examines the system development and modification process. It emphasizes the factors for effective communication and integration with users and user systems. It encourages interpersonal skill development with clients, users, team members, and others associated with development, operation, and maintenance of the system. Structured and object oriented analysis and design, use of modeling tools, adherence to methodological life cycle and project management standards.
IS 2002.8 – Physical Design and Implementation with DBMS
This course covers information systems design and implementation within a database management system environment. Students will demonstrate their mastery of the design process acquired in earlier courses by designing and constructing a physical system using database software to implement the logical design.
IS 2002.9 – Physical Design and Implementation in Emerging Environments
This course covers physical design and implementation of information systems applications. Implementation in emerging distributed computing environments using traditional and contemporary development methodologies.
IS 2002.10 – Project Management and Practice
This course covers the factors necessary for successful management of information systems development or enhancement projects. Both technical and behavioral aspects of project management are applied within the context of an information systems development project.

Appendix B

Learning Unit Goals for the Electronic Business Strategy, Architecture and Design course

- to present organizational value and supply chain concepts, and distinguishing characteristics of traditional versus evolving organizations utilizing internet technologies
- to present and distinguish between types of e-commerce business relationship types including B2B, B2C, B2G, C2C, C2G, G2G
- to present and explain value and supply chain concepts and examples with respect to evolving e-commerce business relationships
- to present consumer issues that are frequently solved in e-commerce systems including shopping carts, human computer interface designs, interactions with payment processing mechanisms, and relationships to information technology development and support
- to present concepts and specific examples of e-commerce functionality found in common business relationships
- to present and explain ethical, contractual, and regulatory issues involving domestic and trans-border interactions involving interorganizational business relationships
- to present, discuss, and explain hardware and software system components commonly utilized in implementation of inter-organizational systems
- to present, develop, explore, and illustrate the nature and use of IS development methodologies in an interorganizational setting, and to discuss responsibilities at all life cycle stages
- to explain and consider the obligations for protection of individual privacy as well as organizational security in interorganizational systems