

Using Electronic Commerce as an Integrating Tool for Teaching Major MIS Concepts

James W. Denton
College of Business and Economics, West Virginia University
Morgantown, WV 25606, USA

William E. Spangler
A.J. Palumbo School of Business Administration, Duquesne University
Pittsburgh, PA 15282, USA

Abstract

The inherently interdisciplinary nature of electronic commerce makes it an ideal basis for an integrative course in information systems. This paper describes the initial design and on-going implementation of a 'pre-capstone' course for undergraduate MIS majors. The course presents the major technologies and operational issues underlying e-commerce to a class of students of various skills and classroom experiences -- with the intention of providing students a more meaningful experience earlier in the MIS program. The effectiveness of this approach will be evaluated upon completion of the course and analysis of the results.

Keywords: Electronic commerce, integrated course, course design, MIS curriculum

Introduction

Teaching Management Information Systems concepts is a difficult task. Many important concepts are abstract, especially to undergraduate students who typically have little or no business work experience. Therefore, we must find ways to provide a realistic frame of reference so that the concepts that we wish to teach may be understood and appreciated fully. A full appreciation of MIS concepts requires that we simulate many of the tools, mechanisms, experiences, relationships, and hazards of the business world in our classrooms. Some of these concepts can be relatively easily defined as technical procedures or processes involving the use of the tools of MIS. Other concepts are more complex, involving human relations issues or the information strategy of an organization. (Becker, et al., 1994)

Most MIS curricula have been developed by identifying key MIS topics to be taught separately, for the most part, in individual courses. For example, in IS'97 (Davis, et al., 1997) several MIS organizations have issued model curriculum guidelines delineating a series of courses beginning with courses in IS fundamentals and personal

productivity tools, progressing through courses in IS theory, IT hardware and software, programming, database, telecommunications and systems analysis, and culminating with physical design and project management courses. The result is a sequence of courses, each presenting an MIS concept in relative isolation until the senior year, when project oriented courses provide a capstone experience. The capstone courses provide a means for students to apply knowledge gained in previous courses and integrate those experiences in a more realistic setting, where concepts are applied simultaneously rather than in isolation.

Our paper extends the idea of a capstone experience to earlier courses in the curriculum, where students may not have yet been exposed to all of the tools and knowledge required to complete a comprehensive project successfully on their own. By using groups of students with different skills, an integrative experience can be provided to students at an earlier stage in the MIS program. In this way, we hope to provide our students with a more meaningful experience as they progress through the MIS program.

Selecting an Integrative Course Topic

The decision to offer a new course in electronic commerce evolved somewhat slowly. When we initially considered offering a new elective to our undergraduate MIS students, we employed what might be termed a traditional 'top-down' approach to planning such a course. That is, we began with the desired goals and objectives of a new course – primarily with regard to the type of knowledge our students would gain from the course – and then began to consider candidate courses that would most effectively achieve those goals. In designing the course, we were guided by a number of interested stakeholders and knowledge sources, including potential employers in private industry, students, and various references in IS academia (including the IS-97 specification).

Our initial investigation led to two major needs: 1) to link MIS concepts more closely with business (and accounting) processes, and 2) to fill certain deficiencies in – and to update -- our curriculum, which suffered from a rather limited scope. In particular, we desired to expose our students to broad MIS concepts and provide some experience with project management. Other courses could address these issues to varying extents, such as an Enterprise Resource Requirements Planning (ERP) course utilizing a specialized system from a company such as Oracle, SAP or PeopleSoft. During this time, however, the popularity of electronic commerce began to rise dramatically, and our business school, like many others, began an e-commerce initiative. With students also beginning to ask about potential offerings in e-commerce, we began to explore an e-commerce course that 1) addressed the needs mentioned above, and 2) appealed to the demands of the internal and external marketplaces. Thus the original approach became a combined 'top-down' and 'bottom-up' (i.e., e-commerce-driven) approach to course analysis and design.

Electronic commerce is an ideal vehicle for an integrative course because it mirrors the interdisciplinary nature of the MIS area. It readily provides a rich environment where issues from the areas of Accounting, Marketing, and Business Law can be considered along with technical concepts such as systems analysis, database design, CGI programming, interface design, and HTML programming. A project in electronic commerce will provide an experiential opportunity for actively solving ill-structured problems in MIS as well as business in general.

A pleasant side-effect is that the platform for electronic commerce is the Internet, which is readily available to educational institutions. This helps to alleviate a common problem faced in project-oriented courses: providing the students with a technical platform that adequately simulates the enterprise systems found in business. By using the Internet as the technical platform

of our system, it will not be necessary to simulate the workings of a large enterprise system to provide a realistic experience for the students. Hosting student electronic commerce projects on a small dedicated server can provide realism without utilizing a large institutional system. It has been demonstrated that a simple personal computer and personal web server software can be used effectively to host student teams in a capstone project-oriented course. (Denton, 2000)

Course Design Issues

The broad nature of electronic commerce allowed us to select a text and an approach to the course that would address our needs as well as satisfy the desire to offer a course in an exceptionally popular area. Specifically, we could use the concepts and technologies of E-commerce, together with an encompassing web site development project, to provide an integrative – and compensating -- experience for our undergraduate MIS students. Considering our needs, we chose a text (Greenstein and Feinman, 2000) that ostensibly is targeted to accounting students, but which offers important benefits for MIS students. Since the authors have both information systems and accounting expertise, the text takes an operational/accounting approach to e-commerce. This allowed us in part to address critically important business process issues that heretofore had been omitted or discounted in our standard MIS curriculum -- including risk management and control, regulation, business transaction processing, electronic payment mechanisms and EDI. On a more pragmatic level, this integration of IS and accounting knowledge is critically important to MIS students, particularly those who wish to pursue careers in consulting with the Big 5 or other firms.

The text also takes a technical approach to e-commerce, discussing security, cryptography, and networking principles. In turn, we chose to supplement the technical issues in the text via an interactive web site development project (also proposed by the textbook authors).

Students learn and/or revisit a number of specific technologies during the project, including

- web page design and development (including HTML, Forms, Javascript, and the use of a web development tool such as FrontPage)
- Common Gateway Interface (CGI) programming using Visual Basic (VB)
- database design and implementation (using Access)

All of the students have had some experience in web page development in the introductory IS class. In that class, they used a tool of some type -- most likely MS Word or Netscape Composer – to develop their web pages, and were exposed to very little, if any, information about HTML and related concepts. Similarly, all of the students have been exposed to fundamental database concepts, and have used a

personal database (Access) to create simple tables, queries, forms, and reports. Some of the students have had a more advanced course in database design, exposing them to more advanced issues such as normalization. Many – but not all – of the students have taken an introductory course in Visual Basic, but are unfamiliar with the nature of CGI and the notion of retrieving and sending data without the use of a VB form. Therefore, HTML and CGI/VB programming were covered in a series of lectures prior to students attempting to implement them in their web sites.

Course Implementation

The implementation of a project-oriented electronic commerce course to students with varying backgrounds presents several challenges. The course must be organized to present enough background material to all students without being too redundant for more experienced students. We must be able to deal with the inevitable frustration of students encountering situations that are ambiguous and problems that are unstructured. We must construct groups that include students with a wide enough range of skills to produce a viable product, but which also are manageable. These challenges, and how effectively they have been addressed, will be

reviewed after the course has been presented and the results analyzed.

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