The Value of a Project-Based Approach to Teaching Electronic Commerce in MBA Programs

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Abstract

Many MBA programs include an exposure to electronic commerce (e-commerce), but often that exposure falls short of providing the student with a practical experience to help them understand how businesses use the Internet to generate sales, provide information, and gain market share. A project-based approach to e-commerce offers the MBA student a pedagogically comprehensive learning experience that builds upon assigned readings, major and minor assignments, and a project that explores one of seven aspects of e-commerce systems. E-commerce as a field of study is particularly well suited for project-based teaching. The project-based approach exposes the MBA student to real-life scenarios and offers exposure the major considerations involved in e-commerce systems. The approach provides choice for students to focus their learning experience on a particular area of interest. The implementation of an e-commerce project facilitates the understanding of e-commerce implementation strategies from both business and technology perspectives, and the effects of strategy decisions on business performance. This article describes a project-based approach to teaching e-commerce, discusses lessons learned and the future evolution of the course, and offers recommendations for other institutions who may wish to implement a project-based approach to teaching e-commerce.

Keywords: project based teaching, electronic commerce, pedagogy, hybrid instruction, MBA.

1. INTRODUCTION

While businesses strategically deploy electronic commerce (e-commerce) systems to generate new revenue and improve customer relationships, most MBA students are not prepared to make wise business decisions about e-commerce investments. An article in *The Economist* (2004) states, "… no company can any longer afford to ignore the Internet, even if it does not itself sell much or anything at all online." Yet, most MBA programs rely on textbooks, case studies, and business journals to explore e-commerce issues, which do not adequately prepare MBA students to lead e-commerce initiatives (Epstein, 2004).

The project-based e-commerce course at Lawrence Technological University (LTU) is designed to familiarize MBA students with current and emerging e-commerce strate-

gies. The course is centered around the implementation of a real-world project proposed by students and approved by the instructor. The course content addresses a range of topics including sales and marketing, Internet technologies, e-commerce infrastructure, electronic funds transfer, process improvement, business transformation, security, web design, ethical issues, and business plans for new technology ventures (Kakish, 2004a). The course aims to educate a new generation of managers, planners, analysts, and programmers in the promise and reality of e-commerce.

Students who have enrolled in the e-commerce course have found the course to be a valuable learning experience, providing them with the opportunity to plan, design, and architect an e-commerce system in a monitored learning environment. As most LTU MBA students are working professionals, students who have developed an e-commerce application are immediately able to transfer this knowledge to the workplace, and are therefore better prepared to lead or manage e-commerce projects.

The Importance of e-Commerce

Simply defined, e-commerce is the ability to transact business digitally among individuals and groups over the Internet. With the abundance of price comparison and "intelligent purchasing agents" available on the Internet, consumers are able to shop for the best quality and cost, which will further promote the popularity of e-commerce (Currie, 2004).

The deployment of E-commerce (Business to Consumer – B2C, Business to Business – B2B, Business to Employee – B2E, Business to Government – B2G, etc), continues to expand despite the bursting of the dot-com bubble (Epstein, 2004). With the advent of e-commerce exchanges (vertical industry portals), most large businesses have mandated the use of online transactions to their downstream vendors. Even the federal government has introduced e-commerce for federal contracting. Businesses can take advantage of the new local, national, and global online markets by implementing and managing e-commerce systems. The United States Small Business Administration states that "the Internet is proving to be a significant business leveler, allowing small and medium-size companies to compete with the giants on the same global playing field" (Small Business Administration, 2003).

e-Commerce Challenges

E-commerce is not without its challenges. The legacy "brick and mortar" business world has evolved over hundreds of years, but we are attempting to automate the business world using e-commerce in a small fraction of the time it took to evolve the physical commerce world (Nevaer, 2002).

Several key issues must be resolved as we evolve our e-commerce business world. One issue is the importance for all businesses to establish trusting relationships with their customers. Companies with established reputations in the physical world can rely on those trust relationships to create trust on the Internet (Lucas, 2002). A related challenge to new companies is the relative anonymity of companies attempting to establish a new Internet presence (Lubbe and Van Heerden, 2003). The removal of geographic business boundaries and the resulting increase in competition is another issue faced by companies expanding their reach using e-commerce.

International e-Commerce Issues

A critical e-commerce issue often not addressed in the classroom is the international nature of most e-commerce activities (Schneider, 2005). Most companies realize that the only way to do business effectively in other cultures is to adapt their business model somewhat to those cultures (Samii and Karush, 2004). A common approach used to adapt a Web site to other cultures is to provide local language versions of the site content. Researchers have found that customers are far more likely to buy products and services from Web sites in their own language, even if they can read the language used on the original site. While a significant percentage of global e-commerce sites use English, only 370 million of the world's 6 billion people speak English as their native language (Ratner, 2003).

Another challenge to global e-commerce is trusting the behavior of the other party in an e-commerce transaction. Established companies with established reputations can build global trust faster than a new company without a global reputation, as their brand conveys some expectations about how the com-

pany will behave when a transaction is processed (Raisinghani, 2002). Other aspects of e-commerce fall outside the domain of brand reputation. Dispute resolution, for example, is handled in different ways in different countries. Businesses must be aware of the differences in language and customs that make up the culture of any region in which they intend to do business, as well as the laws in the various countries where they plan to conduct business.

Businesses that successfully address trust, language, and culture issues still face the challenges posed by variations and inadequacies of global Internet infrastructure. In many countries the telecommunications industry is either government owned or heavily regulated. In some countries, the existing Internet infrastructure cannot reliably support advanced e-commerce (Nikravesh, 2004).

2. SIGNIFICANCE OF THE PROJECT-BASED TEACHING APPROACH

Project-based teaching is considered an effective approach to maximizing learning. In project-based teaching, students work in teams to explore real-world problems, develop solutions, and share their learning with their fellow students. Project-based teaching allows students to enhance the value of their learning by attempting to answer questions relevant to them (Dengel, Junker et al., 2004). Benefits of project-based learning include deeper knowledge of subject matter, increased self-direction and motivation, and improved research and problem-solving skills.

Engaging students by challenging them to solve hands-on, real-world problems is a great motivator (Tatnall, 2004). According to Bruce Alberts, president of the National Academy of Sciences, "Everybody is motivated by challenge and solving problems, and we don't make use of that in schools enough. Project-based learning gives everybody a chance to sort of mimic what scientists do, and that's exciting. And it's fun if it's done well" (Curtis, 2001).

Project-based learning that freely crosses disciplines provides significant opportunities to enhance traditional instructional approaches. Using project-based learning, students conduct research using a variety of sources, and they collaborate among themselves and with other teams in the class. The twelve to fourteen week timeframe of a class project affords students ample time to conduct their research.

One of the major advantages of project-based learning within a MBA program is the integration of theory with real-world practice. In the workplace, professionals do not spend several hours listening to authorities deliver lectures; rather, they spend their time applying what they know to solving real-world problems, and learning from the process. Project-based learning provides this opportunity along with the theoretical and practical experience brought to the project by the instructor.

Sylvia Chard, professor of education at the University of Alberta, defines project learning as an "in-depth investigation of a real-world topic worthy of student's attention and effort" (Curtis, 2001). She advocates using a phased approach:

- Phase 1 involves an initial discussion of a project topic, including student's first-hand experiences related to the topic;
- Phase 2 involves fieldwork, sessions with experts, and various aspects of gathering information, reading, writing, investigating, and architecting; and
- Phase 3 is the presentation of the project to an audience.

The e-commerce course uses this approach to integrate theory and practice. The ability to plan, architect, design, and optionally create web pages using a project-based approach provides students with a framework from which to lead future projects.

There are other alternatives to teaching e-commerce effectively, including lecture based teaching and case-based teaching. However, for the working professional who is interested in obtaining an MBA, project based teaching enables the student to apply key e-commerce concepts, events, and challenges to real-world e-commerce applications in various industries.

The e-Commerce Course

LTU uses a project-based approach to teach an e-commerce elective course in its MBA

program: Business Strategies in Electronic Commerce (Kakish, 2004a). The course uses a variety of instructional techniques, assignments, lectures, and online discussions to support the e-commerce project that serves as the key learning element of the course (Kakish, 2005).

This course familiarizes students with current and emerging e-commerce strategies and technologies. Revenue enhancement and transaction cost reduction models are emphasized. Emerging technologies such as ubiquitous wireless and mobile commerce (m-commerce) are addressed. Other course topics include:

- E-commerce sales and marketing;
- Internet technology for business advantage;
- Managing electronic commerce funds transfer;
- Reinventing the future of business through electronic commerce;
- Business opportunities in electronic commerce;
- E-commerce website design;
- E-commerce security;
- Social/political and ethical issues associated with electronic commerce
- E-commerce software and hardware; and
- Business plans for technology ventures.

Learning Objectives: Students are given the opportunity to customize their learning experience by focusing on the areas that cover their own objectives and topics of interest. Depending on his/her own areas of interest, the student will:

- Gain real life exposure to e-commerce concepts such as electronic exchanges, e-marketplaces, B2B, B2C, B2E, B2G, etc.;
- Have an understanding of the basic elements of e-commerce, the ways in which businesses use value chains to identify e-commerce opportunities, and the influence of the World Wide Web on the emergence of e-commerce;
- Establish a basic knowledge of the general technical structure of the internet:
  - Utility programs that can trace and locate internet host sites;
  - Common internet applications including telnet and FTP, TCP/IP and other protocols used to transmit data over the internet;
  - Use of markup languages including SGML, HTML, and XML;
  - The differences among internets, intranets, and extranets; and
  - The client-server architecture of the web.
- Gain an understanding of the revenue models for selling on the web, creating trust and building loyalty, and other effective strategies for evaluating, marketing, purchasing, and supporting e-commerce systems;
- Develop an understanding of the strategies that businesses use to improve purchasing, logistics, and other support activities, electronic data interchange (EDI), supply chain management and how businesses are using the internet and web technologies to improve it, and how businesses are creating electronic marketplaces that make purchase-sale negotiations easier and more efficient;
- Gain a reasonable knowledge of the key characteristics of the major auction types, strategies for general and specific consumer web auction sites, strategies for business-to-business web auction sites, how businesses can use virtual communities to increase brand awareness and sales, and strategies for web portal sites;
- Learn about the environments of e-commerce including: international electronic commerce, laws that govern electronic commerce activities, ethical issues that arise for companies conducting electronic commerce, conflicts between companies' desire to collect and use data about their customers and the privacy rights of those customers, and taxes that are levied on electronic commerce activities;
- Gain an understanding of the web server hardware and software considerations;
- Develop an understanding of the basic functions of e-commerce software, characteristics to look for in an externally

hosted e-commerce solution, electronic store models, software for small and medium-sized to large e-commerce sites, supply chain management software, customer relationship management software, and automated content management software;

- Obtain an understanding, at a high level, of security issues and technologies of e-commerce systems: secrecy, integrity, necessity, threats and countermeasures, methods to enhance security in application servers and database servers, and how using certain internet protocols can help increase security;
- Gain an understanding of payment systems for e-commerce, how companies operating online collect payments from customers, credit and debit card processing for electronic commerce transactions, the implementation of electronic cash systems, and how electronic wallets work;
- Develop a solid understanding of issues relating to planning and implementing a e-commerce system, identifying the value of e-commerce initiatives, and aligning implementation plans with strategies; and
- Be able to plan, architect, design, and *optionally* create web pages that read and set object properties, interface with an objects event handler, and call methods of an object.

Pedagogical Approach: Since the advent of the dot.com revolution, e-commerce has gained wider acceptance as an area of study in many universities. Many MBA students took their undergraduate degree prior to the dot.com era, so do not have an academic exposure to e-commerce topics.

The pedagogical value of the course is enhanced by addressing a comprehensive set of e-commerce topics, balancing technological and strategic aspects of e-commerce, and using real-world case studies to maintain a clear business focus. These experiences support the e-commerce project, completed by small groups of students, each team viewing the project from one of seven different perspectives. By providing each student the opportunity to learn through doing, students will be better able to integrate the course content in their own unique ways. In the words of one student:

> "… in my own experience, the project forced me to consider the details of my own business's site. At present my small business deals with only two area schools and most communication takes place over the phone. Designing a web presence forced me to consider, for example, how product would actually be shipped; What third party service I would use.; Where would I order shipping boxes and what size?; Do I need packing material? How would I get the packages to the delivery service (pick-up or delivery); what will be the delivery time-line and what are the implications of offering next-day or two-day service through the web site? How does all of this affect the bottom line and the price of the product? How much of the cost of shipping materials should be passed on to the customer, and is that price still competitive?" (Kakish, 2004b).

Another student stated:

> "… I also looked at the technology issues with greater understanding and began to appreciate the need for a reliable web-hosting company and the business implications if I needed to execute a contingency plan. I began exploring the idea of using banner ads and giving thought to other companies with which I could possibly develop a strategic alliance" (Kakish, 2004b).

The pedagogical model blends textbook concepts with real-world projects, in-class and online lectures, individual assignments and student-selected individual activities, and project documentation and group presentations. The project-based approach was selected due to its recognition as one of the most effective methods of gaining maximum benefit from the learning experience (Segovia, 2002; Straub, 2004; Steinfield, 2003). There are three distinct aspects to this project-based approach to e-commerce teaching:

- Assigned and optional textbook readings supported by weekly lectures;

- Individual assignments as well as mini assignments or "activities" that explore the concepts discussed in the readings; and
- Most importantly, the completion of a real-world e-commerce project.

Course Delivery and Technologies: A variety of sources are combined to make up the course material, including a prescribed textbook, optional readings that address specific e-commerce topics, use of supporting technologies, and the instructor lecture notes and PowerPoint presentations. All of these materials are organized into a comprehensive Blackboard™ course management environment.

The text used for the course is *Electronic Commerce – The Second Wave* (Schneider, 2004). This text is focused on the MBA student and supports the theme of the course. The text offers its own discussion questions and chapter assignments, but these were not used in the design of the course.

Class sessions are three hours long and are held once a week over a 15-week semester. Most sessions are held in a classroom, with an occasional online synchronous session using Blackboard™ or Gradepoint™. Class sessions focus on short lectures of key topics, reviews of assigned readings, and discussing real-world business cases; these discussions are reinforced with asynchronous Blackboard™ discussion forums. The balance of the classroom session is devoted to the real-world project.

A variety of technology tools are used by some or all of the students in the course, depending on their areas of interest:

- Internet data retrieval and research (Required);
- Online communication via email accounts (Required);
- Use of Blackboard™ (Required)
  - Group collaboration and Communication;
  - Digital Drop Box;
  - Announcements and Updates;
  - Course Material; and
  - Submitting assignments, receiving assignment feedback, and viewing grades.
- Word Processing Software such as Microsoft Word™ or OpenOffice™ (Required);
- Web Browser Software (Required);
- Presentation Software such as Microsoft PowerPoint™ or OpenOffice™ (Required);
- Database – Microsoft Access™, Oracle™, or other relational database approved by instructor (Optional); and
- Personal Web Server, Microsoft IIS™, or other Web Server Engine approved by instructor (Optional).

Individual Assignments: Students are required to complete two individual course assignments and three mini-assignments.

The first individual assignment requires the students to prepare a five-page summary report on topics including dot.com businesses, electronic exchanges, predictions/trends for e-commerce, Internet2 developments, and search engines. The second individual assignment is a consultancy role-play where students consult with a tier-2 automotive supplier to recommend a Web hosting solution.

The mini-assignments allow students to apply their knowledge to real-world cases. Students choose three of 16 available activities consistent with their areas of interest. These activities can be selected to support the course project.

Course Project: The course project uses teams of two to four students to select a business issue which can be addressed by an e-commerce solution. Many students select an issue within their own company, or may select an issue in support of an entrepreneurial venture. The team then chooses to focus on one of seven project areas based on their interests and technical skills (Kakish, 2004a):

1. **Application Architecture Group:** This group is responsible for the design of the application architecture of the e-commerce system. This includes the development of business requirements, requirements analysis, functional specifications, and a comprehensive technical design document that can be given to

programmers for system prototyping and development.

2. **Infrastructure Group:** This group is responsible for the design and definition of hardware, middleware, and system software for the e-commerce system.
3. **Data Group:** This group is responsible for the design and definition of a data model, data types, and data flows needed by the e-commerce system. The group prepares a high-level data architecture and methodology for capturing, collecting, classifying, cleansing, and storing data.
4. **Software Development Group:** This group is responsible for the software development and testing of the e-commerce system. This group prepares data, content, test scripts, and designs and builds an algorithm.
5. **Security Group:** This group is responsible for defining the security environment for the e-commerce system. This group designs a security model with classes of users and privileges, methods by which data is exchanged and protected, and defining a high-level security architecture for securing financial transactions.
6. **Project Management and Implementation Group**: This group is responsible for creating a project plan for the e-commerce system. The group prepares a communication plan and reporting framework.
7. **Sales and Marketing Group**: This group is responsible for developing the sales and marketing strategy for the e-commerce system. This group implements a revenue model, creates an effective web presence, communicates with prospective customers, defines customer relationship strategies, and creates a brand management strategy.

Each student group assumes that the other six project areas are addressed by other project teams. For example, two student groups could focus on sales and marketing for two different businesses. If two or more student groups choose the same business, they may focus on different topic areas and coordinate their work. It is also possible to choose one business for the entire class to study, and to form up to seven student groups to address all aspects of an e-commerce project.

Assessment and Evaluation: A mid-term and final examination are used to assess student learning. Both exams consist of approximately 50 questions of various types. The overall grading scheme for the course is shown below:

Deliverable	Weight
e-Commerce Search and Report	50
Web Hosting Consultant	100
Midterm Exam	200
Final Exam	200
Three e-Commerce Activities	150
Group e-Commerce Project	150
Group Project Oral presentation	150
Total	1000

3. LESSONS LEARNED

The e-commerce course has been taught to over 200 students in the United States and Canada over the past five years. Based on student learning outcomes, student evaluations, and personal observations, a number of observations have been made to help improve future versions of the course:

- **Student Diversity of Interest:** A number of students have expressed an interest in addressing more than one aspect of the e-commerce project. This has been addressed by creating additional mini-assignments, which students can link to the course project.
- **Additional Project Aspects:** Effectively building a comprehensive e-commerce system can be a lengthy and complex endeavor. A frequent suggestion made by students was the addition of more project categories, especially relating to international e-commerce, intellectual property and copyright, privacy, and supply chain management (Kakish, 2004a). Additional topics can be incorporated based on the course schedule, availability of supporting materials, and compatibility with course objectives.

- **Project Preparation, Updates, and Presentations**: Managing the progress of students over the entire semester is a challenge for a course using project-based teaching. Issues observed have included team harmony, diversity of student backgrounds and technical skills, distribution of project workload, and the discipline needed to document project progress on a regular basis. We have responded to these challenges by providing students with a two-week period at the beginning of the course to select their team members, including a peer evaluation as part of the course project, and assessing the contribution of individual team members based on the group project presentation.

4. FUTURE DIRECTIONS

Since its inception, the e-commerce course has been well received by most students, receiving an average evaluation of 4.4 on a 5-point scale. Despite this positive feedback, there is always room for improvement. There is a constant need for updating project aspects such as e-commerce law, supply chain improvement, and international e-commerce issues. There is a potential to subdivide the e-commerce course into a MBA-focused class and an Information Systems-focused class to accommodate the wide range of student technical skills. The course can be easily modified to reflect the emergence of new technologies in web servers, e-commerce software packages, e-commerce security packages, and customer relationship management.

5. CONCLUSION

The Business Strategies in e-Commerce class provides exciting and meaningful opportunities to apply MBA concepts to e-commerce using the project-based learning approach. Applying project based learning the field of studying e-commerce has proven to be effective because it allows students to experience first hand challenges and opportunities from real-world projects. The approach provides choice for students to focus their learning experience on a particular area of interest.

Students learn about a variety of e-commerce business and technology strategies while addressing a range of e-commerce issues as part of a project team, directly implemented into a real-world e-commerce project. Such approach offers the students exposure to the major considerations involved in e-commerce systems. The implementation of an e-commerce project facilitates the understanding of e-commerce implementation strategies from both business and technology perspectives, and the effects of strategy decisions on business performance.

The course has succeeded in educating a new generation of managers, planners, analysts, and programmers in the realities and potential for e-commerce. The project-based approach to the study of e-commerce truly enables the business student to put theory into practice.

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