E-COMMERCE TEACHING AND INFRASTRUCTURE ISSUES: EXPLOITING OPPORTUNITIES FOR USING APPLICATION SERVICE PROVIDERS

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ABSTRACT

Application Service Providers have burst into the E-commerce scene in the last year, bringing with them the promise of bypassing expensive shrink-wrap software for downloadable, almost free, task specific software. This situation presents an opportunity for E-commerce instructors to build quickly build an infrastructure for their courses, despite few resources and limited computing personnel support. This article presents an overview of ASP tools to support e-commerce classes and discusses the possibilities and issues related to their use.

One of the key decisions in teaching e-commerce is which technology platform to use. With students clamoring for marketable skills, there is strong incentive for teaching e-commerce on the platform of the moment. However, the rapid turnover in platform trends, and difficulties with hiring and keeping computing personnel with the skills to manage them, make it extremely difficult to keep up with industry trends.

Ironically, an industry trend may present a viable solution to this dilemma. An Application Service Provider (ASP) is a company that provides applications over networks like the web (Delmonico, 1999; Cope, 2000). They are strongly positioned to battle the shrink-wrap software vendors of the world. The premise is that individuals or groups with a web connection can access applications that they need when they need them — all that is required is a computer that has the appropriate web browser software running. For example, a service called blox.com provides special purpose spreadsheet software (e.g., spreadsheet templates to compute financial ratios) via its web site. This model has been extended to services as well so that one can now do things like save files and get tech support online instead of using local resources (Costa, 2000; Georgia, 2000; Schaal, 2000). Furthermore, many of these applications and services are provided free of charge, thanks to the advertising business model and the race for customer acquisition.

The ASP model presents an attractive option for individuals teaching e-commerce and is definitely an option to consider seriously. Foremost among its attractions is that it gives students practical experience with an emerging software and services distribution model. On a pragmatic level, the ASP model provides easy, often free, access to applications that can be quite sophisticated. Students can access the applications from any computer that runs browser software — even from scaled down network appliances and personal digital assistants. Most of the time, lab and class podium set up is minimum to nil as generally, appropriate web browsers are already installed in these computers.

This paper describes the use of ASPs for teaching E-commerce. The context will be a projects-based e-commerce class. ASP application in such a class will be discussed in terms of support for teams, support for the products of each project (e.g., a web site), and support for instruction and class maintenance. Extensions to other types of classes and future directions will also be discussed. We start off by discussing the key elements of the

projects-based e-commerce class that will serve as a context for our discussion.

CONTEXT: UNDERGRADUATE PROJECTS-BASED E-COMMERCE CLASS

E-commerce classes are especially amenable to projects-based classes because projects are compact, effective and motivating settings for teaching key business concepts. Students get the chance to apply concepts to a real business problem. They learn important skills for operating in an e-commerce context — not only technical skills, but also so called "soft skills" like operating under uncertainty, teamwork, and project management. Students are required to work with diverse team members to figure out how to reach the goal of completing a project within one school term. Students also can add a practical, completed project to their resumes and have a concrete project experience to speak of when interviewing for jobs.

The projects class we will use as a context here is one where students are required to design a new business based on the e-commerce business models and concepts discussed in class. Students prepare a scaled-down business plan, a prototype of their web site, and a presentation that discusses key elements of their plan and demonstrates the web site. The business plan includes a description of the business and its managers, a well-documented assessment of the size of the target market for the proposed business, a marketing and promotions plan for reaching the target market, projected costs and benefits, and a description of the operations of the company. The prototype must include elements of the initial design of the company web site. While the company site need not be fully functional, they are rated based on how well they integrate with the business model and follow basic principles of web design as discussed in class. A sample syllabus is included in the appendix to this article.

We have used this model in e-commerce classes taught in the last 4 years. We have found that students find the entrepreneurial, creative nature of the project quite motivating. Student teams have been known to "camp out" in the school's computing labs to work on their projects. The goodwill generated by the entrepreneurial experience is also quite useful in helping the students overcome the enormous uncertainty related to the project. Particularly in the undergraduate level, where classes tend to be quite structured, such uncertainty is quite uncommon and can be distressful. While most students enjoy the experience for what it is, it has been heartening to have several of them come back a year or so into their first jobs and comment about how much like their "real" jobs the class was.

A projects-based e-commerce class such as that described above requires three general types of tools. The first type is composed of tools that students can use to support their work in teams. These are generally tools for collaboration like groupware and intranets. The second type is composed of tools that students can use to create the deliverables — a project plan and web site. These are generally tools for building documents (e.g., business plans), and web application development. The third type of tool is that which supports the instruction and maintenance of the class. This includes not only tools for tracking student progress, but also tools for supporting the maintenance of class projects — e.g., backing up data, tech support. These three categories of tools and examples of how they are provided in an ASP context will be discussed in the next section.

ASPTOOLS: TEAMWORK, DELIVERABLES, AND INSTRUCTION

The ASP market is very new but is growing at a rapid pace. Cahners In-Stat estimates one billion dollars of investments in infrastructure to support ASPs in 2000 (Georgia, 2000). The sites discussed below are early examples in a rapidly growing field. Already this crop of ASPs show great promise for instructional support, as is evident in the listing presented in Table 1. All of the ASPs listed in the table provide at least some part of their services free-of-charge – often but not always in exchange for banner ad space on a user's desktop. While this list is more than sufficient to support an e-commerce class, readers are encouraged to spend some time scouring the web for new offerings that will surely have arisen by the time they read this article. Also, as is typical of the web, the status and service offerings of the ASPs listed here will continue to evolve. We will discuss this current crop according to the aspects of an e-commerce class that they support – teamwork, deliverables, or instruction and maintenance.

Teamwork

Software to support teamwork must help students to manage their project and maintain communications

throughout the term. This is also a way to introduce them to rudimentary versions of intranets and groupware. E-groups, E-circles, and Yahoo all provide essential tools for achieving this. These tools include calendaring, email, document sharing, private chat and instant messaging (Schenk, 2000). We have encouraged teams to use these tools not only to manage their activities, but also to gain insight into the demands of moving some team activities (e.g., team meetings) to a virtual platform.

Deliverables

The deliverables that are required in our example projects based class are a prototype web site and a business plan. There have been many ASP offerings in support of site building. Free services now make it possible to generate forms and storefronts — applications that were difficult to teach and support just over a year ago. At the most rudimentary level, students can build prototypes of sites using very user friendly tools provided by ASPs like Homestead and Geocities. These are quite sufficient for capturing the key design elements of a site, without its functionality. For example, students can build a prototype composed solely of html pages, so that product database look-ups do not access a product database but rather provide a hard-coded page with a product listing. However, several ASPs provide services that make it possible to connect web pages to databases –e.g., bitlocker (McCormick, 2000) — and even build fully functional storefronts – e.g., ohgolly, bigstep, freemerchant (McCormick, 2000).

Business Plan development is also well supported, as evidenced by the lengthy list of shareware, demo and free software available for download at C-Net.com. Two business plan sites that we include here have additional benefits because of their affiliation to highly legitimate and rich information resources – The Wall Street Journal and the Small Business Administration. Both of these sites provide a wealth of additional information, links and resources to help students learn more about the business climate surrounding e-commerce and their particular project idea.

Instruction and Maintenance

This last category covers ASPs that provide support for the instructor in an e-commerce class. This includes support for technology, class communications, and grade tracking. In the technology front, back-up services are readily available through various ASPs – like X:drive and NetDocuments (Costa, 2000; Schenk, 2000). These services provide an off-site, secure location for backing up important files related to the class. Additionally, online tech support for student questions can be obtained via the expert systems found at Pitstop (Schaal, 2000).

ASPs providing traditional communications tools like e-mail (hotmail), mailing lists and newsgroups (egroups) support asynchronous class communications like announcements and homework submissions. A prototype presentation software service provided by blox can support synchronous communications such as class presentations and lectures. An intriguing service to experiment with is meeting support provider webex. This highly promoted dot-com provides free services for meetings with up to four people at the same time. One possibility is to extend class explorations into virtual communications by holding at least some office hours on this platform.

Spreadsheet software provided by blox or databases provided by bitlocker can be used for grade tracking. These are scaled-down analogs of applications like Excel and Access that are typically used for this function. E-circles provides a useful timesaver for monitoring group activities that take place in their platform. An intelligent agent periodically sends an email to any e-circles member informing him/her of any changes to the e-circles the he/she is part of. Thus, instructors can have their students include them in their e-circles. Once this is done, the instructor has a convenient way of being notified of any activity occurring in the class teams' ecircles.

While there is much support for classes on ASP platforms, as mentioned in the beginning of this article, the issue of shrink-wrap software is an important one. The following section will explore ways of addressing this issue.

SHRINKWRAP ANALOGS?

While ASPs greatly facilitate the deployment and use of software for e-commerce instruction, there is the drawback that it is a new and emerging platform. Given the attention they are garnering, it is conceivable that future standards will be found in the ASP space. However, in the current time, most recruiters are looking for students with knowledge of traditional, shrink-wrap software. This is an especially important issue for undergraduates who

TABLE 1
SOFTWARE TO SUPPORT PROJECT BASED E-COMMERCE CLASSES

Class Aspect Supported	Software Category	Company Name and URL
Teamwork	Groupware	e-groups http://www.egroups.com Yahoo Calendar http://www.yahoo.com e-circles http://www.ecircles.com
Deliverables	Web Sites	geocities http://www.geocities.com homeStead http://www.homestead.com
	Database Generated Sites	bitlocker http://www.bitlocker.com
	StoreFronts	ohgolly.com http://www.ohgolly.com BigStep.com http://www.bigstep.com Freemerchant.com http://www.freemerchant.com
	Business Plan	Wall Street Journal http://wsj.miniplan.com Small Business Administration http://www.sbaonline.sba.gov/starting/businessplan.html smartonline http://www.smartonline.com
Instruction and Maintenance	File Storage	x:drive http://www.xdrive.com NetDocuments http://www.netdocuments.com idrive http://www.idrive.com
	TechSupport	pitstop http://www.pitstop.com ePeople http://www.epeople.com/home.jsp
	Class Monitoring, Grade Tracking	ecircles http://www.ecircles.com bitlocker http://www.bitlocker.com blox http://www.blox.com
	Class Communications	egroups http://www.egroups.com hotmail http://www.hotmail.com webex http://www.webex.com
	Presentation Software	blox http://www.blox.com

are likely to be starting off with jobs at a more operational level, which require quite specific software skills. Beyond emphasizing to students that they are learning the concepts rather than narrow, expendable skills, three approaches may be used to remedy the situation.

First, students may be provided with an equivalency table such as the one in shown in Table 2. This lists the shrink-wrap software packages and platforms commonly used to deploy applications supporting e-commerce teamwork and deliverables. Students can learn the software on their own, perhaps by using them at the school's computer labs, checking out packages from a software library, or using trial software provided by the vendors.

Second, the e-commerce class could start off with a module where students review trial versions of the software packages that provide them (as listed in table 2) and compare them to the applications provided by ASPs. Students gain familiarity with traditional packages. This approach has the added bonus of building student skills in software evaluation.

Third, the projects based e-commerce class could be taught in tandem with a technically oriented class

TABLE 2
SHRINK-WRAP SOFTWARE TO SUPPORT
E-COMMERCE TEAMWORK AND DELIVERABLES
(*TRIAL VERSIONS AVAILABLE)

Class Aspect Supported	Software Category	Company Name and URL
Teamwork	Groupware	Microsoft Outlook Microsoft Netmeeting http://www.microsoft.com Lotus Notes http://www.lotus.com/
Deliverables	Web Sites	Adobe GoLive* http://www.adobe.com Macromedia Dreamweaver* http://www.macromedia.com Allaire Homesite* http://www.allaire.com Microsoft Frontpage http://www.microsoft.com
	Database Generated Sites	Microsoft Visual Interdev Microsoft Frontpage Microsoft Access http://www.microsoft.com
	StoreFronts	Intershop http://www.intershop.com Microsoft Windows DNA http://www.microsoft.com
	Business Plan	PlanWrite http://www.brs-inc.com/pwrite.html Palo Alto Software Business Plan Pro http://www.paloaltosoftware.com/

that uses traditional shrink wrapped software as its platform.

OTHER CLASSES AND FUTURE DIRECTIONS

The ASP support described above can easily be extended to other types of e-commerce classes, specifically, MBA level classes and non-project based e-commerce classes, at both the undergraduate and masters levels. The strategic focus of MBA classes make them even more amenable to the use of ASPs. Most MBA students already have facility with key business productivity tools. They are more interested in learning of technology trends and business models. An e-commerce class built on an ASP platform, while giving MBA students a feel for web technologies' potential, is more useful as a compelling example of emerging trends both in technology and business models. Their experience with ASP tools can be used as a springboard for discussing the viability of the ASP model and its future direction. For non-projects based classes, ASP tools can provide students with quick and user-friendly hands-on activities to illustrate e-commerce concepts – without requiring much set-up from the instructor. These activities can either be incorporated into the class requirements or suggested as supplementary activities.

In the future, the ASP model could transform the whole infrastructure to support technology classes by breaking down the barriers between bricks and mortar education and virtual space – both within the classroom and beyond university borders. With the growth in PDAs and in the number of ASP offerings

accessible via these devices, it becomes possible to envision a classroom where every student has a PDA with wireless web access to ASPs. Class configurations can be transformed on the fly, either by rearranging students physically as we do now, or by having different PDAs communicating with each other via the web or the infrared ports on each device. Class group activities can be facilitated by ease of document and application sharing among students and with the instructor. For example, a team can collaborate on a spreadsheet downloaded from blox.com, passed among team members via the PDA infrared port, sent to the instructor PDA via the infrared port for quick reviews, and uploaded to a file storage server like X:drive at the end of class for grading by the instructor.

ASPs also suggest the potential for breaking down the barriers between universities. The ASP model can be used to share information technology resources – and costs – among several institutions. For example, an MIS department that has invested resources and time to developing a series of classes on ERP software may act as an ASP for other universities interested in providing the same classes – in exchange for help in recouping development and maintenance costs. These collaborative arrangements may also extend beyond universities to software vendors and book publishers. ERP vendors such as SAP and PeopleSoft are entering the higher education market at the same time that they are providing hosted solutions (e.g., mySAP) on infrastructure that will be shared across universities. Book publishers such as McGraw-Hill have already started this trend by providing web-based support materials for the textbooks they publish. By seeing themselves as ASPs, or perhaps by partnering with an ASP and technology vendors, publishers can provide full software support for the exercises and activities in their textbooks. Instructors adopting their textbooks can then spend less time building the technology infrastructure to support their classes and more time in designing motivating and rich learning experiences for their students.

CONCLUSION

As discussed above — the ASP model has tremendous potential for providing sophisticated, accessible, and low cost support for e-commerce classes. It certainly deserves serious consideration by any instructor designing an e-commerce class. It greatly simplifies the set-up of e-commerce classes—a very important consideration given the cost of setting up and maintaining university computing labs and classrooms. Furthermore, universities have a lot of difficulty sourcing and keeping competent computing services staff and management. ASPs open up the possibility of bypassing local computing staff and/or leveraging competent staff across several universities. In the current context, where good MIS personnel are only a headhunter call away from being on someone else's payroll, any approach that shares these personnel and maximizes their compensation is key to keeping a safe distance between that headhunter call and your indispensable OracleDBA.

REFERENCES

Cope, James. (Apr 24, 2000). "Definition for ASPs Emerging," *Computerworld.*

Costa, Dan. (January 28, 2000). "NetDocuments: Virtual Space for Rent," *ComputerShopper.*

Delmonico, Dayna. (Nov 15, 1999). "ASP Market Rapidly Unfolds," *Informationweek.*

Georgia, Bonnie. (April 18, 2000). "Never Buy Software Again," *PC Computing.*

McCormick, John. (May 2000). "Online Forms Here," *ComputerShopper.*

McCormick, John. (June 2000). "Priceless Web Pages," *ComputerShopper.*

Schaal, Dennis. (May 23, 2000). "E-Support Goes Live," *ComputerShopper.*

Schenk, Rob. (May 2000). "Collaborate at Web Speed," *ComputerShopper.*

APPENDIX
SYLLABUS FOR A SAMPLE PROJECTS-BASED E-COMMERCE CLASS

Web Entrepreneurial Strategies

This class provides an introduction and overview of the business issues addressed and engendered by the emerging technologies associated with Electronic Commerce and Networked Computing. The goal is to build a basic understanding of these technologies and their impacts so as to make informed, creative, and socially responsible decisions about their use in business settings. Topics include Silicon Valley culture, intellectual property issues, Marketspace, business-to-business e-commerce, the impact of emerging technologies on the marketing, finance and information technology functions of organizations, and trends in the economy and careers.

The class is highly experiential in approach, requiring students to undertake hands-on computer exercises and projects as an essential part of the learning process. Aside from providing an engaging avenue for learning the course content, these activities are designed to be opportunities for thinking critically about the impact of technology on key issues such as the ownership and production of intellectual property, the management and coordination of teams, and the design of work and incentive systems.

Texts:

The Nudist on the Late Shift by Po Bronson, Random House, 1999 (Required)
Several Articles that we will download from Harvard Business School Press (Required)
Web by Design: The Complete Guide by Molly E. Holzchlag, Sybex, 1998 (Optional)
Web Design in a Nutshell by Jennifer Niederst, O'Reilly, 1999 (Optional)
101 Ways to Promote Your Web Site by Susan Sweeney, C.A., 1999 (Optional)

TABLE A
GRADES AND REQUIREMENTS

Requirement	% of Final Grade
Individual Class Participation	10
Individual Web Idea and Web Site	10
In-Class Exercises and Homework (Group/Individual)	20
Group Web Idea and Web Site	20
Group Report on Target Market and Marketing Plan	20
Final Exam	20

TABLE B
CLASS SCHEDULE

Date	Class Activity	Reading/Assignment (Due at the beginning of class)
1/03/00	Class Set-up	Order and Start Reading The Nudist on the Late Shift by Po Bronson HW1 — Getting started with a web idea
1/04/00	Class discussion of HW 1 – Web Ideas Web Business Models Web Development Lab Session	HW2 — Designing your Web Site
1/05/00	Entering the MarketSpace Web Development Lab Session – Building your marketspace	Optional Reading "Creating New MarketSpace" by W. Chan Kim and Renee Mauborgne, Harvard Business Review Refine/Practice Individual Presentations
1/06/00	Individual Web Presentations Form Teams	
1/07/00	Forming Teams/Deciding on your Team Project	Group Field Trip to Sony Metreon Submit Group Contract
1/10/00	Identifying your target Market Lab Class: Online Research Tools	Group HW #1 Bricks and Mortar vs. High Tech Malling Group Contract due Set up your e-circles
1/11/00	Silicon Valley Culture Lab Class: Online Market Research (cont'd)	Finish Reading Bronson's Nudist
1/12/00	Building your Marketing Plan Lab Class: Online Resources for building a Marketing Plan	Read "The Customer Experience" by Scott Kirsner, NetCompany Fall, 1999
1/13/00	The New Workforce and Workplace In Class Exercise – Designing your company's human infrastructure	Read "New Jobs for the New Economy" Business 2.0, July 1999
1/14/00	Working Session — V 1.0 of final paper	
1/17/00	University Holiday	HW5—Send me an email version of your group's paper by 23:59 on 1/16/99
1/18/00	Web Infrastructure and Technology Trends Lab Class: Online Resources for Building E-commerce Sites	Read "The Big Technology Players in 2000 Will Be Familiar Names" Wall Street Journal, January 7, 2000
11/19/00	Of Angels and Capitalists – Getting from Ideas to IPO	Read Po Bronson's "Steve Jurvetson, Venture Capitalist"
1/20/00	Final Presentations	