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A Collaborative Electronic Commerce Project for an MIS Course: Constructing Online Catalogs

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Abstract

This paper features a study on the use of electronic catalogs and retail storefronts as a concrete collaborative class project for an Management Information Systems (MIS) course with an Electronic Commerce theme in the Business curriculum and a survey of the MBA students that undertook this project in response to the course requirements. Survey results provide positive indications for the achievement of the goals of collaborative inquiry, team-based and active learning, constructivist pedagogical approach, and learning by doing. The technical details of the project are also described in the study.

Introduction

This paper reports the experiences of the MBA students at the School of Business, Monclair State University, in building electronic storefronts using Merchandizer software (www.merchandizer.com), which is a requirement in their MIS course that has an E-Commerce theme. Merchandizer is a software solution marketed by HipHip Software (www.hiphip.com). Using the survey technique, student feedback was gathered from two MBA classes that took the course during the summer and fall 1999. Data was conducted to measure students' perceptions of the quality of their overall learning experience and their ability to gain collaborative team work skills, discipline-specific skills in building an electronic storefront and catalog, skills in using the Merchandizer software, and various forms of thinking skills.

The E-Commerce focused course was taught by combining the pedagogical principles that surround a number of appropriate teaching strategies: cooperative learning, constructivist approach, active learning, and learning by doing. In a cooperative learning environment, the instructor organizes content and topical activities around tasks, problems, and projects that student teams with a balanced mix of abilities and backgrounds are designed to undertake (Adams and Hamm, 1996). Cooperative learning also provides valuable opportunities for students to work together across gender and ethnic lines as long as communication skills, prior achievement, expectations, friendships, and group status are factored in (Chizhik, 1999). The constructivist pedagogical approach invites students to build personal meanings out of the material taught and encourages them to reflect on how new knowledge builds on their previous base of understanding (Pankratius and Young, 1995).

Merchandizer Software Features

Students were asked to build an electronic retail storefront for either consumer-to-business or business-to-business commerce using Merchandizer Software, an online solution that allows users to build and manage an electronic storefront with just a browser software such as Netscape Communicator or Microsoft Internet Explorer

Merchandizer software makes use of frames or windows appearing within the browser's display area, each of which displays the contents of a different HTML file (Carey, 1998). The software also allows storebuilders to divide their product lines in a hierarchical fashion, first into groups, then, into subgroups, and finally, into catalog items. The group and subgroup headers become navigational links in one frame, displaying product pages or other HTML pages or entire web sites. The frame concept facilitates the navigation of the customer through the storefront.

Once groups, subgroups, and catalog items have been defined, students enter product information either of two ways. They can enter the information using simple template-based electronic forms that allow them to submit information like product name, code, description, and price. Alternatively, they could use preformatted Microsoft Access tables that essentially mimic the wizard online templates. These tables are more convenient to fill out when merchants have hundreds or even thousands of product items or SKUs to enter into the storefront.

Merchandizer has features like a search function, a UPS-based shipping table, and sales tax calculation. Merchandizer keeps track of all sales transactions, customers, and prospects (those who visit but do not buy). A report generating facility gives students information on the most saleable products, customers who buy most from the store, aggregate sales figures for the week or the month, and areas of interest of prospective buyers. The software can also autogenerate email messages to prospects about special promotional activities the store is conducting.

Version 3.0 of Merchandizer offers students additional features: easy translation of the web site into any language; ability to insert forms with special buying instructions before the shopper checks out; offer global coupon numbers to shoppers so that they can accumulate their purchases and eventually receive discounts on items; ability to submit the store site to top search engines; more managerial report forms that can be generated from the sales transaction data; a personalization field for each catalog item for shopper input that will be carried over to the order tables; and ease of uploading and downloading Access tables, among other more advanced features.

The web hosting service is important because of the backend office component of the online store. Backend office processing requires the availability of web servers that can store order transaction data in databases that can later be accessed using some form of structured query language so that reports and statistics could be generated for managerial decision making. The extensive requirements of a storefront make this storefront project too challenging for the normal capabilities of a typical university's academic technology support group. It is far better to sign up with a web hosting service---if reasonable fees could be negotiated with the company--- and have their technical support staff provide the services necessary for optimizing all functionalities and features of the storefront for the students.

Methodology

This study used the survey technique using a written questionnaire, which was administered to two classes of the MIS 503, Management Information Systems course at the MBA level. Data was gathered during the summer and fall of 1999. Both classes had the theme of "Electronic Commerce" and the project assigned to the students was the construction of an online retail storefront for either consumer-to-business or business-to-business commerce. Students were assigned in teams of four to five students. Each team was in charge of a storefront web site, which was maintained and supported by HipHip Software. The technical support staff that advises the students and oversees the web servers that host the software and product information entered by the students is located in Miami, Florida. Survey data was analyzed using descriptive statistics, correlations, and simple regressions among key variables.

Findings

The sample consists of 43 students at various stages in the MBA program and majority of them hold full-time jobs in industry in the New Jersey and New York areas.

Students were asked to respond to a five-point Likert scale that used the value "1" as the anchor for "Strongly disagree" and "5" for "Strongly agree." Most of the students felt that the retail storefront project was an important learning experience overall (mean=4.44). Students found the project instructive in terms of teaching them new ways of doing business over the World Wide Web (mean=4.35). They also thought that the project taught them skills they could use after the completion of the course, particularly the setting up of an online Web site for a product or service (mean=4.30). They also felt the project gave them a chance to create Web site content that was meaningful to the entire team (mean=4.30). In the construction of the storefront site, they thought that they learned the following specific skill sets in decreasing order of importance: design issues for creating an online catalog (mean=4.30); overall planning issues for preparing an online retail web site (mean=4.14); web site product information and content issues (mean=4.07); advertising (mean=3.84); and product/service promotional activities (mean=3.74).

The next important set of findings relate to the students' perceptions of how this project enhanced their ability to collaborate with peers in a team setting. Most students found the project a good venue for encouraging collaborative teamwork (mean=4.40). Communication skills were paramount in getting the work done (mean=4.33). While standards for personal accountability were set within the team setting (mean=4.30), members made sure they also helped each other out (mean=4.28). The project clearly taught the students a variety of group process skills: (a) looking out for the best interest of all concerned over and above one's own personal interests (mean=4.26); (b) arriving at mutually acceptable solutions (mean=4.26); (c) dividing the work equitably among members (mean=4.23); (d) practising interpersonal social skills (mean=4.21); (e) learning from members' different ways of thinking (mean=4.21); (f) learning positive interdependence (mean=4.21); (g) respecting a diversity of opinions (mean=4.16); and (h) striving for goals as a team rather than as individuals (mean=4.12).

They gained a better understanding E-Commerce as a subarea of MIS (mean=4.07). The storefront project, which is a natural cross-over between marketing and MIS, made them more aware of the interdisciplinary connections within the business curriculum (mean=3.95). They perceived the project as a venue for learning about E-Commerce vendors of hardware and software (mean=4.28), consulting services (mean=4.12), professional associations (mean=3.79), and job openings (mean=3.63).

It is very likely that the positive experiences reported, thus, far would not have been possible if the Merchandizer storefront software itself were difficult to use. Most students found learning the software a fairly easy task (mean=4.19) and that they found it was a reachable goal to be skillful in the use of it (mean=4.14). The Merchandizer software templates were easy to understand (mean=4.07) so that students were able to

learn them on their own without extensive instruction (mean=4.05).

Two important attributes of students in the sample were measured: frequency of computer use and length of time spent working with the computer. In a simple regression procedure, it was found that frequency of computer use significantly predicts students' perception of the ease of learning the Merchandizer software at the significance level of $p<.10$ ($F=3.24284$; $p=.0791$). In two other simple regression runs, it was found that the students' perception of the project as having enhanced collaborative team work predicts their perception of the storefront as being an important learning experience overall ($F=11.42868$; $p=.0016$) and their ability to create a web site with content that is meaningful to the entire team ($F=3.59981$; $p=.0648$). Then, students' perception of Merchandizer as an application software that was easy to use predicted their organizing skills in arranging web site information so that the site could be presented more effectively ($F=12.27518$; $p=.0011$).

When taken together as two independent variables in a regression equation, both the students' perception of the project as having enhanced collaborative team work and their perception of Merchandizer as an application software that was easy to use predict a number of dependent variables. Significance levels were tightest for their organizing skills in arranging web site information so that the site could be presented more effectively ($F=7.28378$; $p=.0020$) and their perception of the storefront as being an important learning experience overall ($F=7.14604$; $p=.0022$). Both independent variables in a regression equation also significantly predicted student's perception that the storefront project encouraged creative thinking ($F=4.12591$; $p=.0235$), their perception that the project enhanced their integrating skills or their ability to put information or content together ($F=3.40767$; $p=.0430$), and their perception that the project developed useful skills in web site development they could use even after the course was over ($F=2.62482$; $p=.0849$).

The association among selected variables using Pearson's correlation values was also investigated. Only those variables that bonded very strongly at the significance level of $p<.0001$ are shown here.

Learning important lessons in determining web site product information and content issues correlated strongly with the following seven variables: learning positive interdependence in the team (.4999); learning different ways of thinking in the team (.5271); achieving the goals as a team (.5511); considering the storefront project an important learning experience overall (.5193); creating web site content meaningful to the team (.4843); developing skills usable even after the course such as building a web site (.6225); learning overall planning issues in a storefront (.6334); and learning design issues for an electronic catalog (.6854).

Learning how to achieve goals as a team correlated strongly with five other variables: perceiving the project as encouraging collaborative team work (.7380); learning to communicate with team members (.7264); learning positive interdependence (.8872); learning interpersonal social skills (.8041); and learning how to achieve goals as a team (.9168).

Learning design issues for creating an online catalog correlated strongly with the following four variables: perceiving the project as encouraging collaborative team work (.5269); learning to communicate with team members (.5038); learning different ways of thinking in the team (.5784); and learning how to achieve goals as a team (.5380).

Learning different ways of thinking in the team correlated strongly with four other variables: perceiving the project as encouraging collaborative team work (.7333); learning to communicate with team members (.7026); learning positive interdependence in the team (.8792); and learning interpersonal social skills (.8245).

Conclusion

Not only does the WWW provide an environment that perfectly simulates Electronic Commerce activities, but the web hosting service also provides information technology support to universities that are unable to afford the hardware, software, and manpower requirements of mounting Electronic Commerce projects. A possible improvement of the project for the future would be to design "mock" legacy applications like product, customer, and sales order databases so that data could be imported and/or exported between the application databases in the "legacy" system of the store and the electronic storefront. Survey results positively indicate that the goals of collaborative inquiry, team-based and active learning, constructivist pedagogical approach, and learning by doing could be achieved in an E-Commerce focused course project.

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