An Adaptation of the Case Study Method Applied to Information Systems and Technologies

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This teaching innovation began with the search for a method of teaching a capstone experience (senior project) class in information systems. The goals of a capstone experience class for students include: 1) creation of a final project significant enough to demonstrate their technical skills; 2) provide a group (team) experience that will prepare them for work in the IS field; and 3) enable students to integrate materials from all areas of the IS major subjects (software development, telecommunications, database design and development, systems analysis).

Existing IS curricula do an excellent job of preparing students to apply specialized technical skills. The business advisory council for the IS&T department valued the technical classroom background but wanted students with problem-solving abilities, ability to work in teams, a Abig picture@ focus, and superior communication skills. The ideal capstone experience would be to provide a simulated experience of a business problem for students that integrates the knowledge from basic coursework, requires an understanding or ability to discover the cross impacts of technologies and business, includes the life cycle of a system, and allows students to work as a team. Could a complex case study provide the necessary skills?

Case studies provide an opportunity to discover in the details of a business decision, the roots of a profitable decision or the reasons for failure. Discussions concerning the circumstances of a business case study can provide students with opportunities to work in a group, use their business skills to interpret the facts of the case, and introduce students to the complexity of decision-making in the business world. These benefits have been difficult to apply to the discipline of information systems. The retrospective nature of case studies do not often lend themselves to presentation in a field such as information systems characterized by rapidly changing methods and

tools. Additionally, there is a scarcity of case studies that emphasize the technical details that would be relevant for students in information systems. Instead, case studies have favored more generic business problems and descriptions that all business majors can use and discuss. A search of the literature for a case study large and substantial enough to occupy students for a significant amount of time yielded no suitable candidates.

The living case

The case designed for the senior project class consisted of a Request for Proposal (RFP) sent by a fictional automobile insurance company that requested responses from consulting firms in order to assist them in solving a potential Year 2K computer problem. The fictional company, Low Ball Auto Insurance, had delayed in checking their desktop applications to ensure Year 2K compliance.

Particularly at risk were the thousands of spreadsheets in multiple versions of Lotus 1-2-3 and MS Excel that drove the financial and accounting activities of the corporate headquarters. The RFP covered the description of the business, the significance of the problem, the technical issues such as the network design, servers, and distribution tools available, as well as the rules for responding. The case study was written as an RFP to provide students the opportunity of working with a routine part of the IT process (bidding out services) and to provide a high-level description of the cross-impacts of the various components (i.e., the network design's impact on potential software distribution) that would test the student's understanding of how an infrastructure can impact business operations. High-level technical diagrams were included with descriptions of the tools, hardware, and staff available to implement any proposed solution. Students were to provide the following deliverables within a written response to the REP: Company background and financials (fabricated); Resumes for team members; Technical approach of the proposed solution; Project plan for the duration of the project; Costs of the project.

Outcomes

Fifteen students with senior status registered for IS&T 4730 in the Fall, 1999. The majority of the students (14/15) were employed full-time in entry-level IT positions in local industry. The students ranged in age between 22 and 25. The students had previously received only brief experience/exposure to case studies and working in small groups within the existing business curriculum. Exposure to the content of RFPs was presumed from a required course in Managerial Communications. A half-day seminar in using MS Project was offered early in the semester. The students would use MS Project in order to track their deliverables within the group, to develop a project plan in the RFP response, and as a means of determining the cost for the project bid.

Students were asked to form teams of 3-5 members. Four teams were formed (T-Web, Ztech, M3 Consulting, and Laser Fusion) with each creating a company logo (used on all official correspondence), marketing materials, and a fictional financial statement for the prior year. Each team was required to elect a team lead (project leader) that was to be the primary interface between them and the project manager (the instructor). The instructor provided coaching only in the design of an effective technical resume. The resumes were used as part of the RFP response to substantiate the qualifications of the consulting firm.

The RFPs were distributed to the students after instruction in MS Project and the formation of the teams. A bidder's conference with the company representative (the instructor) was held. The bidder's conference provided an opportunity for students to design questions necessary for them to proceed with answering the RFP. Students were told that if they didn't ask the right questions they would miss information necessary to propose an effective solution.

Students worked together over the remaining few weeks of the semester to build a written response to the RFP. The written responses were summarized into a final oral presentation that was delivered to a group of IT executives and the instructor. Four executives were selected from area industry. The IT executives were given copies of the RFP and the student responses and urged to craft questions for each group that were designed to determine the worth of the solution and the preparation of the individual student. After

the student presentations the IT professionals voted on the best response. The course grade was determined by four factors: 1) Peer evaluations; 2) Quality of the written response; 3) Oral presentation and answers to questions; 4) IT professionals comments.

Lessons learned

Problems in the implementation of this exercise were evident from the beginning of the semester. Areas of concern to the instructor and students were: student involvement in the exercise: team dynamics; ability to read and integrate technical material; and inadequate preparation.

Teams formed based on friendship, with one team consisting of those without Afriends.@ One group elected a team lead that failed to do anything during the semester and left the work to one person to pull together. Toward the end of the semester, students made frequent visits to the instructor's office to complain about various members of their group. The peer reviews performed by students on their own team did not reflect the level of complaints that were voiced by students about team members that failed to do assigned work. Instead, peer reviews uniformly graded each other as superior.

Students had difficulty carefully reading the technical details of the RFP and in asking questions about the impact of the existing infrastructure. Despite the reality that the desktops at LowBall Auto Insurance did not have CD-ROM drives, 3 of 4 groups proposed a solution that included using a CD-ROM to update software. The living case provided a description of a slow network with inadequate bandwidth for existing traffic, yet all four groups provided solutions that included using SMS II to deliver software to the desktop with an alleged Aminimal@ impact to business operations. The absence of knowledge in critical areas of systems management and networks led to a considerable student frustration that they didn't understand the project. Several students and team leads requested more guidance and expressed an inability to Aget started.@ It appeared to the instructor that the students were uncomfortable with an assignment that included no clear solution.

The students expressed a considerable amount of anger in their reviews of the course. Their comments centered on the

following areas of concern: inadequate preparation by the instructor and the inability to determine the value of the exercise. The students believed that the instructor should have taught more material to assist them in completing the exercise. After the final oral presentation, students verbally expressed that they learned <u>more</u> from the presentation than they had learned from the instructor the entire semester. They appreciated the comments from the IT executives and felt that the probing questions helped them understand the impact of IT projects on business operations and technical decisions.

The IT executives were impressed with the quality of the student's proposals. The executives were instructed to ask hard questions that they would ask vendors in the same circumstances. The questions asked provided the students with indirect knowledge as to how they had Amissed@ critical details or failed to think through the implications of a decision. The IT executives assessed the final work as being comparable to the variety and quality of consultants that exist in the Areal world.@

There were a number of lessons learned from this first-time exercise that have improved the offering the second time. Among the changes that have been implemented:

! Provide more background to the students as to the nature of the course and its benefits to them
! Coaching of students in reading RFPs (a sample is now provided and reviewed)
! Inclusion of additional material reviewing technical specifications and IT concepts
! Weekly meetings with the <u>entire</u> team with penalties for failure to attend

Summary
The goal of this teaching innovation was to develop a method of delivering a simulated experience in solving a real world business problem as a team that required significant technical understanding. Traditional case studies and simulations were not available to accomplish the goals of delivering a complex problem that required students to utilize their entire repertoire of technical and business

skills. The development of a living case study included using the RFP as a vehicle for solving a significant business problem which required that students apply their IT and business skills while working in a realistic project-driven environment. Using the living case study method in IT offers benefits to instructors that include: a controlled experience, a current technology problem, an opportunity to train students in the verities of project planning and management, and interaction with the problem via requirement to present the solution to current IT professionals.