AMCIS 2000 Proceedings

Americas Conference on Information Systems (AMCIS)

2000

The Virtual Interactive Case Project in the Systems Analysis and Design Course

Neil C. Ramiller
Portland State University, neilr@sba.pdx.edu

Follow this and additional works at: http://aisel.aisnet.org/amcis2000

The Virtual Interactive Case Project in the Systems Analysis & Design Course

Neil Ramiller, School of Business Administration, Portland State University, neilr@sba.pdx.edu
Deborah Ohlsen, Lucent Technologies, Inc.

Abstract

A team-based term project is a common feature of the systems analysis and design course. However, instructors often face a difficult choice between field projects and written cases. Field projects offer students a more realistic experience; however, they are more difficult to focus properly, tend to produce uneven opportunities, and are prone to problems with client access and reliability. This paper reports on a hybrid, technology-assisted approach that attempts to achieve some of the advantages of both approaches.

Introduction

A team-based term project is commonly the centerpiece in the undergraduate systems analysis and design course (Dewitz, 1996; Dennis & Wixom, 2000). The extended nature of the assignment permits students to engage in a more complex, realistic, and potentially ambiguous problem than narrower exercises can supply. Also, the term project provides an experience in integrating lifecycle activities across a single systems-development effort, and makes it possible to produce a richer team experience.

Typically, the instructor faces three options for conducting the term project:

Option 1. The students identify their own clients and problems, with the instructor reviewing them for relevance and feasibility.

Option 2. The instructor lines up candidate field projects for the students.

Option 3. Students work on a written (text-based) project case.

These traditional options for the term project have some nagging limitations. In this paper we consider some of these limitations. We then offer a proposal for a hybrid, technology-assisted course project that attempts to capitalize on the relative strengths of these options while ameliorating their weaknesses. A report follows on a pilot effort using this hybrid approach.

Traditional Options for the Systems Analysis & Design Project

Figure 1 compares the three options along four dimensions. With respect to *topical scope*, under Option 1 projects often fail to involve problems that significantly engage the core concepts and techniques covered in the systems analysis and design course. One or more of the crucial elements – process modeling, data modeling, interface design, and so on – may substantially be missing. Option 2, in which the instructor lines up potential projects for the students, is more attractive in that the instructor has a better opportunity to review candidate projects directly with the prospective clients. However, careful investigation of the opportunities can, in some cases, be highly demanding on the faculty member's scarce time. Option 3, a written case study, offers the most reliable scope. Basically, "what you read is what you get." The instructor can conduct, up-front, a thorough evaluation of the case's appropriateness. In fact, identifying relevant cases is made even easier by the availability of case collections written specifically with systems analysis and design in mind (Dewitz, 1996; Hunter, 1998; Trower, 2000).

With regard to *comparability*, the projects undertaken ideally will present student teams with equivalent opportunities. Fairness is clearly at stake, here. However, because of the great variability in field projects, differences in the quality of the opportunities are common under Options 1 and 2. This is not an issue when students use a written case project.

Where *client access and reliability* are concerned, under Option 1 students often have difficulty identifying and engaging a potential client. A good deal of stalling and thrashing may ensue, eating up valuable time and making it difficult for the students to meet course deadlines. Option 2 is clearly superior in this respect, since the faculty member does the initial footwork. Under both Options 1 and 2, however, there is a risk that the client will provide insufficient interaction and may even withdraw completely. Also, delays typical of systems development projects in industry may occur, making it impossible for students to keep up with the course timeline and causing some groups to miss certain key assignments altogether. Meanwhile, under Option 3 the client is fictional, so access and reliability are not an issue.

Central to the experience of systems analysis in industry is *interactivity and discovery*. Systems analysis is fundamentally about "finding out" by means of interaction, particularly with clients (users). In this regard, the tables turn and Option 3 now proves the

Figure 1. Strengths and Weaknesses of Term Project Strategies

	Option 1	Option 2	Option 3
Topical scope	highly subject to inadequacy	moderately subject to inadequacy	adequate
Comparability	low	low	high
Client access & reliability	highly subject to problems	moderately subject to problems	not an issue
Interactivity & discovery	rich	rich	poor

Option 1: Student-arranged field study.
Option 2: Instructor-arranged field study.
Option 3: Text-based case study.

weakest. The text-based case provides no interactivity. Moreover, written cases are typically overly complete and "cleaned up"; after all, they have to contain sufficient detail to support the analysis exercises targeted by the course. The result is that the element of discovery is largely reduced to a matter of reading – a woeful deficiency, since discovery is so fundamental to the analyst's task.

A Proposal: The *Virtual Interactive Case Project*

In light of the difficulties raised by the traditional options for the course project, we have developed a hybrid approach that combines features of the field project and the written case project. Specifically, a written case is provided along with a "virtual client." The virtual client is a real person who acts as a fictive representative of the firm featured in the case story. The virtual client is available to answer student questions, and to interact in other ways, via electronic mail and the course website. The goal of this hybrid approach is to keep the scope, fairness, and reliability that a written case affords, while introducing an element of interactivity and discovery similar to that enjoyed in field projects with real clients (refer again to Figure 1).

We call this form of class project the *virtual interactive case project*. It is "virtual" in two senses: (1) the case is electronically mediated, since the client and students never meet face to face, but instead do all their communication through email and the web; (2) the case is not, per se, about an actual business.

The instructor's challenge in staging the virtual interactive case is to manage a heterogeneous document stream (see Figure 2). The case is launched by means of a *base scenario* that describes the business in question, provides an assortment of sample business documents, and sets up the search for potential problems in the current business processes. A series of *assignment sheets*, issued over the course of the project, then guide students in producing the project deliverables. Follow-up *client memos*, posted at the course website, "drop bread crumbs" that help point the way on specific assignments. The instructor may also post *instructor bulletins*, as needed, to provide clarification concerning the goals and requirements of the specific assignments.

Student teams send their questions about the business via *email* to an address specifically established for the virtual client. The instructor reviews all the emails exchanged, and sometimes consults with the virtual client ahead of time on his/her responses. This helps to keep the overall effort on track. It can also give the instructor insight into any misunderstandings that the teams may be suffering from more generally. These misunderstandings can then be corrected by means of an instructor bulletin or announcements in class.

Piloting the Virtual Interactive Case Project

The concept of the virtual interactive case project was recently pilot-tested by the authors in a quarter-term undergraduate course on systems analysis and design, involving seven teams comprising three or four members each. The first author was the instructor. The second author, a senior systems analyst with 15 years of industry experience, played the role of the virtual client. The first author developed the case story concept and created the assignments, while the second author wrote the base scenario itself. The authors collaborated on the client memos.

Figure 2. Managing the Document Stream in the Virtual Interactive Case Project
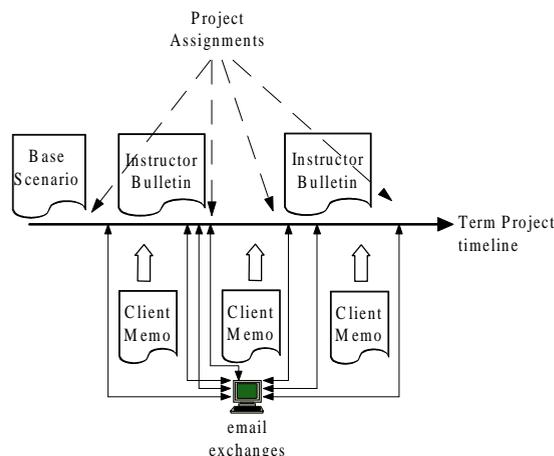
The Base Scenario. In the story's basic plotline, an entrepreneur owns and operates a business buying and selling Disney-related memorabilia. She has developed a large network of contacts for acquiring her products, and she also roams the countryside attending collectors' expos and estate sales. A small staff assists her in processing orders, managing inventory and shipments, and marketing efforts. Her business, which is managed primarily on the basis of paper records, has by now gotten so large that problems are starting to occur. The advent of the web also poses a threat – and an opportunity. Figure 3 shows the first few paragraphs of the base scenario. The base scenario, which runs to several pages, was distributed in class as a handout and also posted for downloading at the course website.

The Project Assignments. The project assignments included a baseline project plan, a data structure analysis (data model and data dictionary), a process analysis (DFDs and accompanying process specifications), and user-interface design specifications. Where clarifications were needed, the instructor issued follow-up messages by email or made general announcements in class. The formal *Instructor Bulletin* feature, discussed above, was not used in the pilot case. Student teams submitted project deliverables in hard copy using conventional project workbooks. Solutions to the project assignments were posted at the website.

Memos from the Virtual Client. The base scenario hinted at problems in the business; however they were revealed in greater detail in follow-up client memos. These memos, posted at the course website, were also used to prompt teams to move in an appropriate direction on a given assignment. A portion of a memo is shown in Figure 4. This particular memo, posted shortly after the data modeling assignment was issued, raised complexities in the data not spelled out clearly in the base scenario. To a degree, the content of the memos was shaped by the surfacing of areas of potential confusion, as revealed in students' questions in class or submitted by email to the instructor or virtual client. Through posting at the website, memos were made available equally to all teams, as their principal purpose was to help keep the class as a whole on track while providing a reasonably level playing-field.

Email Exchanges. Students exchanged some two dozen emails with the virtual client. An example appears in Figure 5. The industry partner answered each inquiry within a day of its being sent. As the principal author of the base scenario, she was able to answer most student inquiries without first consulting the instructor. Occasionally, the industry partner and instructor conferred on responses. In all cases, the instructor was copied on the messages exchanged. A few times an

Figure 3. Opening Paragraphs of the Base Scenario

Systems Analysis & Design
Term Project: Base Scenario

Introduction
Annette owns a small Pacific Northwest mail order company called **DisneyStuff** that deals in Disney memorabilia. The items sold vary from low ($5.00) to high-priced (over $1000). Some are one-of-a-kind items such as autographs and props from Disney movie productions. Some are limited edition items such as pose-able Mickey dolls made in the 30's and 40's. And some are mass-produced items, such as pin-on buttons showing Disneyland, Mickey, Goofy, etc. All items are collectibles, and none can be found in the Disney store or Disney catalog.

Annette employs 6 people. Nancy, John, Brad and Babette are all part-time employees and do all the order processing. Nancy and John work from 8 am to 12 noon. Brad and Babette work between 1 pm and 5 pm. The office is closed between 12 and 1 for lunch. Annette's only full-time employee is Cindy, who is in charge of inventory, order status reporting, billing and accounts receivable. Matt, the sixth employee, takes care of shipping and receiving. This is also a part-time position, with Matt working from 1 pm to 6 pm each day.

Acquisitions
Annette spends about half her time scouring the country for new items to add. She also handles "special orders" – those orders that can't be fulfilled from existing inventory. In these cases, she develops a personal relationship with the customer, and manages the entire process through to its conclusion. Often in these cases, the customer may have to wait several months, while Annette locates the item. Acquisitions is what Annette really enjoys – after all she started the business because she was a Disney memorabilia collector herself. This allows her to collect on a massive scale.

Marketing
Annette puts out a catalog monthly which she sends to the people on her mailing list. The mailing list consists mainly of people who have ordered items from her before. She has grown her customer base for the most part haphazardly, based on personal contacts and word-of-mouth. . . .

---

exchange of messages prompted a follow-up communique from the instructor to the student team in question, offering additional clarification and guidance. Email exchanges were kept confidential, in order to provide a competitive reward for engaging with the client and

Figure 4. Portion of a Sample Memo from the Virtual Client

MEMO
October 28, 1999

TO: 4-2-0 Consulting
FROM: Annette Monticello, DisneyStuff Inc.
RE: Some other problems

I had a problem the other day I thought you should know about. I don't know if this is something the new system can help me with. I recently acquired a large collection of movie posters at an estate sale in Indiana. I didn't have time to put them on the inventory list before leaving town again for a convention in Bangor. Before I left, I managed to write up some notes about pricing these items. Nothing firm, you know, just some preliminary ideas.

Well, while I was away, Babette got an inquiry from a customer who was looking for a particular poster promoting the original release of Fantasia. Not a Disney collector, really. A music historian, she said. Some guy who teaches at Columbia. This guy had seen a picture of the poster in a book on Leopold Stokowski. You know, he was the orchestra conductor in Fantasia. Well, Babette had heard about my new posters, so she and Cindy rooted around in my office and found the poster. In fact, there were four copies of it. And they found my notes on pricing the new posters and used a number I'd written down about the Fantasia posters. The customer bought all four posters.

It probably serves me right for always telling my people, "Whatever else happens, make the sale!" The problem is, I didn't intend to price all four of these Fantasia posters the same. One was in prime condition, wrapped and rolled in a tube, and virtually untouched. One was a bit faded. Two were folded. I really needed to get each one on the inventory list separately, with its own price and a description of its condition. . . .

asking good questions. (The value of these exchanges was not lost on the students: one especially competitive team added "CONFIDENTIAL" to the subject line of its messages.)

Observations

Our experience in the pilot study helped us identify a number of issues in implementing the virtual case project. First of all, *who should play the role of the virtual client?* While the instructor conceivably could play this part, a more convincing staging of the case will in most cases be achieved by having an industry partner serve as the virtual client. This ensures that two distinctive voices are clearly maintained (the instructor's and client's); plus, the collaboration helps to produce a richer case. The job of virtual client, however, should not simply be "thrown

over the wall" to the industry partner. *Instructor and industry partner need to collaborate closely* on the level of ambiguity and inconsistency with which to challenge the students. The goal is to present a reasonable and interesting challenge that forces students into seeking out answers, and yet does not completely stymie them, given their level of experience and the available time.

Where does the base scenario come from? Perhaps it is best simply to write one. This is less difficult than it sounds, especially for an instructor with a measure of industry experience. The industry partner may also be able to provide a good case concept. A case is probably most readily developed based on an actual business, although some simplification and streamlining will typically be necessary to make the case tractable as a student project.

Figure 5.   A Sample Email Exchange

From: **disneystuff@worldnet.att.net**
To: [student's email address suppressed]
Subject: Re: Shipping
Date sent: Tue, 16 Nov 1999 04:36:10 +0000

Corrina,

Well, gosh, we've spent a lot of time learning what the best thing is to do when we need to ship part of an order. Finally, we've come to the place where we send them a packing slip that indicates the order number and all the ordered items, and for each item, whether it is in this shipment or not. One time I remember it got really weird: a customer ordered about a dozen items. We ended up needing to ship it in three shipments. In that case, each packing slip repeated all the items in the order and indicated whether or not they were "included in this shipment", "backordered", or "shipped previously".

Annette

> Hi Annette!
>
> We were wondering what information you send to your
> customers when you ship their order. Do you send a
> packing slip and/or an invoice? Or is there something
> else you send? What is your process when you send a
> customer part of their order, and have to tell them that
> you don't have the rest yet?
>
> Thanks for your help,
> Corrina

How much detail should be proactively served up to the students? The base scenario should be less complete than the typical text-based case, in order to leave gaps and ambiguities that students must seek to fill through interaction with the virtual client. The same is true for subsequent client memos. The level of detail is a means to control both the level of challenge for the students and the ensuing workload on the industry partner.

Finally, how effective was the pilot test? On the positive side, a number of the students' inquiries to the virtual client were perceptive and sophisticated. Also, the inquiries were diverse in character – different teams did not ask the same questions over and over again. Finally, the pace of the interaction was sustained well across the stages of the term project. Nevertheless, we regard the observed level of interaction between the students and the virtual client as relatively modest. Enhancing this is necessary in order to realize more fully the advantages in *interactivity and discovery* that the virtual interactive case project is designed to deliver.

Offering a less complete base scenario would be one way to prompt a higher level of student-client interaction. More strongly incentivizing students' interaction with the client – for example, through direct rewards in the form of participation points – would also help. Perhaps the most effective way to raise the level of interaction would be to make the case part of a more thoroughly collaborative learning environment (Adams & Hamm, 1990; Johnson & Johnson, 1991). Making team-based learning pervasive in other activities of the course, not merely in the project, would help to diminish students' habitual passivity. It would also better promote the expectation that communication is at the core of the course – as it is, indeed, at the core of systems analysis and design practice in the real world.

Instituting steps to increase the level of interaction begs the question of how much interaction can practically be sustained by the individual serving as the virtual client. This issue is of particular concern where use of the virtual interactive case is considered for much larger class sections. The answer to that question must await further experimentation with this project format. So, too, must a firmer idea of the practical benefits of this approach. While the pilot study afforded some impressions concerning the enrichment of the students' project experience, it remains to measure, under more controlled conditions, such outcomes as improvement in assimilation of core systems analysis concept and enhancement of problem-solving capabilities.

In summary, the pilot test of the virtual interactive case project showed promising, if admittedly preliminary, results. As part of a broader program of collaborative learning in the systems analysis and design course, this approach appears likely to help the faculty member more closely achieve that balance of richness and control that is often so elusive in the term project.

References

Adams, D.M. and Hamm, M.E. *Cooperative Learning: Critical Thinking and Collaboration Across the Curriculum,* Charles C. Thomas, Springfield, IL, 1990.

Dennis, A. and Wixom, B.H. *Systems Analysis and Design: An Applied Approach,* John Wiley & Sons, New York, 2000.

Dewitz, S.D. *Systems Analysis and Design and the Transition to Objects,* McGraw-Hill, New York, 1996. Dewitz, S.D. *Project Workbook for Systems Analysis and Design and the Transition to Objects,* McGraw-Hill, New York, 1996.

Hunter, M.G. *System Development Case Studies,* Irwin McGraw-Hill, Boston, 1998.

Johnson, D.W. and Johnson, R.T. *Learning Together and Alone: Cooperative, Competitive, and Individualistic Learning,* Prentice Hall, Englewood Cliffs, NJ, 1991.

Trower, J., (Ed.) *Casebook on CD-ROM to accompany Systems Analysis & Design: An Applied Approach,* John Wiley & Sons, New York, 2000.