ISSN: 1545-679X

Information Systems Education Journal

Volume 4, Number 67 http://isedj.org/4/67/ August 31, 2006

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Recommended Citation: Morgan and Aitken (2006). The Business of Information Technology: An Integrated, Multi-disciplinary Approach to a Capstone Experience for Management Information Sciences Students. *Information Systems Education Journal, 4* (67). http://isedj.org/4/67/. ISSN: 1545-679X. (Also appears in *The Proceedings of ISECON 2005:* §3132. ISSN: 1542-7382.)

This issue is on the Internet at **http://isedj.org/4/67/**

The **Information Systems Education Journal** (ISEDJ) is a peer-reviewed academic journal published by the Education Special Interest Group (EDSIG) of the Association of Information Technology Professionals (AITP, Chicago, Illinois). • ISSN: 1545-679X. • First issue: 8 Sep 2003. • Title: Information Systems Education Journal. Variants: IS Education Journal; ISEDJ. • Physical format: online. • Publishing frequency: irregular; as each article is approved, it is published immediately and constitutes a complete separate issue of the current volume. • Single issue price: free. • Subscription address: subscribe@isedj.org. • Subscription price: free. • Electronic access: http://isedj.org/ • Contact person: Don Colton (editor@isedj.org)

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The Business of Information Technology: An Integrated, Multi-disciplinary Approach to a Capstone Experience for Management Information Sciences Students

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Abstract

This paper describes the development, implementation, and subsequent modifications of a capstone course first developed by Franklin University in 2003. The course is a multi-disciplinary capstone course serving four majors: Finance, MIS, Human Resources, and Marketing. Students engage in a 15 week study, focusing first upon their major, meeting the requirements specific to their program, and second as part of a team consisting of students from each of the majors brought together to deal with a business opportunity. Each team acts as consultants for a company experiencing a variety of business issues in HR, Finance, MIS, and Marketing. The case study is complex, consisting of real-world issues, challenges, and opportunities. The teams develop strategies that directly address the issues and exploiting opportunities, culminating in a professional oral and written presentation.

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1. INTRODUCTION

Franklin University is an independent, not-for-profit, metropolitan institution of about 6,500 students, located in Columbus, Ohio providing student-centered, lifelong higher education in a global context. We focus on excellence in teaching, appropriate technology, and measurably effective learning. The University provides undergraduate and graduate students, many of whom work full-time or part-time, both the breadth of knowledge and the career-focused applications required of a balanced education. We are an open enrollment University, whose students are in their early 30s. The University is fully-accredited by the North Central Association of Colleges and Schools.

Franklin University was founded in Columbus in 1902 under YMCA sponsorship as the School of Commerce. It has since become central Ohio's leading educator of working professionals offering Baccalaureate degrees, primarily in business and technology disciplines. Franklin has a small full-time faculty, with the majority of courses taught by adjunct professors, who are working professionals and teach in their respective areas of expertise. Our curricula integrate the theoretical and the applied, focusing on skills and experience that the students will face in the business world.

In 2003, Franklin University began a multidisciplinary capstone course for four majors: Finance, Management Information Systems (MIS), Human Resources, and Marketing.

Students from the four majors enroll in a 15-week course in which they first focus on their major and personally meeting program requirements, then secondly as members of a team consisting of students from each of the majors. Each team is created to deal with a business opportunity. The teams act as consultants for a company experiencing a variety of business issues in HR, Finance, MIS, and Marketing. The case is complex, as well as complicated, consisting of real world issues and opportunities. The students develop the strategies and action plans to determine how best to resolve the issues, and address the opportunities. Work culminates in creation of a professional, oral and written business presentation, delivered to an audience consisting of business professionals in the field, as well as university professors.

Recent discourse on interdisciplinary and multidisciplinary courses available in institutions of higher learning focuses on teaching students to peek over the walls of their discipline and work together to create a new understanding of the value of their education (Geisler, 2002; Martinez, 2005; Davis and Comeau, 2004, Thompson, 1996). Many scholars suggest that the student benefits significantly, gaining professional knowledge in understanding the perspectives each discipline brings to a problem or concept.

At Franklin University, the recognition of the value in joining students came from observing the business team model. When solving a business problem, most corporations pull together a team of experts from different fields, such as Human Resources, Marketing, Finance, and Management Information Systems. The team must work together to look at the problem from the perspective of each member, and generally, uses each member as a sounding board to discover the best possible solution (Wildblood, 2005). Doing a problem in isolation may be helpful for a student, but it provides only limited applications-based experience. The students will not be given many opportunities to solve major problems in isolation.

The Franklin University approach approximates the professional world and provides students with an opportunity to solve a real-world problem as members of a team. This approach emphasizes conceptualization (a higher order learning skill) and refines team skills, presentation skills, and communication skills necessary for cooperatively written reporting---all skills needed in the business environment (Thompson, 1996). Because the majority of students at Franklin University are adult learners currently in business positions, they bring to the teams business performance skills which they then share. Learning takes place on several levels for the students. They are learning from their peers, their program professors, and from the professors in the other disciplines. Thus, they experience a multi-disciplinary, collaborative approach that mirrors the real world.

2. AN INTEGRATED, MULTI-DISCIPLINED CAPSTONE COURSE

In 2003, the Program Chairs for Management Information Systems, Finance, Marketing and Human Resources went on a retreat to see if they could develop a more meaningful capstone experience for our senior students. It was determined that the course would be primarily a multi-disciplinary strategy course in which students would act as a consulting firm, charged with developing a three-year strategy and implementation plan for a fictitious corporation (Great Cups Coffee). The consulting teams would consist of members from each of the four disciplines who would need to work as an integrated team to develop the Marketing, HR, and MIS sections of the strategy, while ensuring that their implementation plan was financially and fiscally viable. The final team assignment is a formal presentation of the strategy and implementation plan to the senior management team of the Great Cups Coffee Company.

The course is a traditional 15-week course, the first 10 weeks of which are dedicated to discipline-specific materials, followed by five weeks reserved for team activities. The case study of Great Cups Coffee is used as a backdrop to allow students to demonstrate their knowledge of the specific disciplines, as they proceed through the course. For example, in the MIS area we have assignments that include the following:

- The strategic influence of Information Technology
- IT issues in mergers and acquisitions
- Project Management

- Systems Analysis and Design and Requirements Engineering
- Enterprise Architecture
- Network and telecommunications design
- Electronic commerce and website design
- Database architectures and Data Mining
- IT Strategy and Alignment with the business processes

In addition to discipline specific material, the students receive instruction and assignments in general business strategy and the performance of internal and external industry analyses and the conducting of analyses of competitors.

Prior to formally breaking the students into teams, we administer a basic "People Skills" assessment classifies each student as "Analytical," a "Driver," "Amiable" or "Expressive" (Bolton, 1996). The teams are then built, based on members' discipline assessment results. Initially, a personality assessment indicator was not used during the team selection process and we found that teams with predominately one style tended to be dysfunctional. If the teams were dominated by analytical types, they tended to get stuck in "analysis paralysis." If they were dominated by "Drivers," intra-team conflicts frequently had to be mediated by the professors. Teams dominated by "Amiables" developed difficulty making decisions and moving forward. Teams with a mixture of styles tended to the most effective. We have also recently instituted a formal stewardship agreement that each team must develop and sign that covers items such as:

- Specifying desired results (the outcomes to be achieved)
- Setting guidelines (the rules by which to operate by)
- Identifying available assets (member talents and external resources)
- Defining accountability (team and individual member responsibilities)
- Determining the consequences (penalties for non-compliance; rewards for compliance)

We also found that, for the most part, the students did not know how to make an effective presentation. In the first run of the capstone, we did not provide any training on making effective presentations, under the assumptions that they had learned these skills during their other coursework. The first sets of presentations lacked the desired effectiveness in either the quality of the presentation or in adequate communication of the salient facts to the senior management team. We have since added training on how to make an effective presentation that focuses on its structure and those organizational elements that result in cohesion, the Dos and Don'ts of PowerPoint (Rule of 7s), effective use graphics, effective speaking (don't read the slides, make eye contact, don't use non-words, show enthusiasm, etc.) and practice.

3. THE MIS CAPSTONE

The MIS capstone is broken up into six modules:

- MIS and Business Strategy
- Management Information Systems
- IT Architecture
- Database Systems and Data Analysis
- Special Topics
- Career Goals

In the first module we evaluate various methods for strategic analysis and try to select one that is most appropriate for the Great Cups of Coffee (GCC) case. We then use that case, as well as other case studies, to identify the influences that the Management Information Systems have on strategic management.

The second module continues with the GCC case to examine how best to employ appropriate concepts and techniques of project management and apply system design methodologies in support of business process improvement opportunity. In this module, the students conduct an industry analysis of the coffee industry to be used in the strategic plan and begin to assess the strategic, organizational, and operational interrelationships between information technology and business processes.

Module three focuses on the technical and business considerations for developing information technology architecture, identifying the business processes within an organi-

zation and the role of information technology within the processes, and the relationship that the process has to the mission of the business. Emphasis is placed on the flow of work, data, communication, and the resources that are used in business processes. An analysis is conducted on the advantages of distributed systems within the context of collaborative technologies (such as groupware) and enterprise applications (such as knowledge management).

In Module four, attention is turned to data and database issues in modern corporations, modeling a database solution to support GCC and analyzing various architectural solutions for the database implementation. Students then propose appropriate data analysis tools to assist in the business decision-making process. We also conduct an analysis of GCCs competitors to be used as part of the Strategic Plan.

In Module five, students develop a detailed physical view of the system architecture that reflects the hardware, software, and network building blocks. They then focus on the development of the Strategic Plan in both its written and oral presentation forms.

In the last module, after students have made their presentation, the focus becomes more forward looking. The final two weeks are spent with the students reflecting on their learning from the personal experience of working in a cross-functional team. We also guide them to begin thinking about future career goals and to identify how they propose to maintain professional currency and identify relevant professional organizations that can assist in realizing career goals.

4. THE CASE

As previously mentioned, a case study was developed to help the students focus on the strategic aspects of their disciplines. The case, although invented, reflects the over 75 years of cumulative work experience of the program chairs and details experiences, challenges, and opportunities culled from actual occurrences. The case represents the experience of four friends who started a coffee business in 1992 as Great Cups of Columbus with 14 stores in Columbus, Ohio. The friends, two of whom previously had been coffee shop managers and two of whom had been regional managers for a large corporation, founded the company, when the large corporation decided to sell off its 14 stores as a failed business. Each of the four friends had individual expertise in one of the areas of business integrated into the study: finance, marketing, information systems, and human resources.

The owners grew the company to over 40 million dollars by 1999 and began to diversify by purchasing a deli operation on Chicago and an ice cream operation in Pittsburgh. By 2002, revenue had leveled off, and earnings were on the decline. Each of the three operations was using different Information Technology (Microsoft in Chicago, UNIX in Pittsburgh and AS/400s in Columbus), each had different Human Resource policies, and the sales and marketing operation for each of the businesses was different. The students' challenge, acting as a team of management consultants, is to evaluate each aspect of the business and come up with a financially viable strategy for IT, Marketing, and HR to present to the senior executives of GCC. We have generated some interesting scenarios ranging from selling off businesses, closing the least profitable stores, or franchising the entire operation.

IT strategies have generally been less creative with most MIS majors recommending movement to a single software/hardware platform with a WAN, wireless connectivity for the stores, and a store management system. They struggle most with the cost aspects of the assignment, i.e., understanding the total cost of and operations for their proposed systems and begin negotiating with the finance member of their team for the appropriate level of funding.

5. LESSONS LEARNED

After the initial term, the team of professors from the four disciplines reviewed the course and felt that several changes needed to be made to increase the course effectiveness. Five major changes enhanced the course significantly, resulting in an increase of student recommendation of the course from 78% to 96%.

Coordination among faculty is a key success factor for this course. The professors teaching the courses are all adjunct faculty, so the coordination of the weeks when all four disciplines meet is very important. The first

term the class was taught, the course managers for each program set up the large joint classroom, arranged for multi-media equipment, and split the class into teams for the professors. The professors arrived and each discussed individual expectations for their students. This arrangement was not very dynamic nor particularly productive for the students. To create some excitement and make the class more productive, the ownership of what occurred during the class sessions when everyone met was delegated collaboratively to the professors teaching the course. They held a coordination meeting, divided up the tasks, and took ownership of the joint nights. The presentations to the students were more polished, more cohesive, and more interactive, and the professors and students enjoyed much more stimulating and engaging discourse from those joint meetings.

Another issue for the students was the amount of time set aside to complete the team assignments. Originally, team time was to be done out of class as part of the time allotted for out of classroom work. The first teams complained often that they needed to meet with the professors so that guidance could be provided, questions could be answered, and clarity of the issues could be established. The classes now have team time built into class time, during which the professors are available in the role of the owners. As part of the capstone experience, the professors act as the owners of the company, each with knowledge about the business from a particular discipline and experience. They provide answers to the team questions based on the case, but they never provide solutions.

The professors also coordinate the presentations, which are held on one night in up to four separate rooms. Each professor provides three other resources knowledgeable in the respective disciplinary fields to act as one of the owners during the presentation. Each presentation room has one professor and three other "owners," so that all disciplines are present. The "owners" read the case and are prepared to play their role. The students present to this panel as though they were the owners, and having unfamiliar faces in the presentations provides a realistic experience as well as additional challenges for the students.

Using the case as the basis for individual class work, the finance class originally focused on disciplined-based assignments for the first ten weeks of the course, and on case assignments for the remaining five weeks. The assumption was that students would be able to transfer the skills learned from discipline-based assignments to understanding the case assignments. However, this arrangement led to student confusion. The MIS, HR, and Marketing classes focused wholly on the case for all assignments. We learned from these students, that to successfully analyze the case, all team members needed to spend the entire 15 weeks with this focus.

Most of the skill and knowledge needed to understand the complexities of the case were covered in the prerequisite courses for the capstone in MIS, Marketing and HR. During the Marketing and HR capstone classes, the students review the materials and take a final exam covering that knowledge. Their individual and team assignments focused on the case. For the Finance class however, the students were given different assignments and were expected to transfer that knowledge to the case when the teams were formed. This difference resulted in the Marketing, MIS, and HR students having easier access to the case than Finance students, and students perceived this to be unfair. To level the playing field, more assignments in Finance now use the case information as their basis.

The process of assigning team members needed a lot of attention. It was apparent, from the first running of the course, that adequate coordination and support of the teams was lacking. Randomly assigning students to teams was not very effective. Realizing that maximum student benefit and experience depended in part on a carefully rationalized team membership selection process (a process that the real world tries to design), the course development team added a personality test from Robert and Dorothy Bolton (1996), in which students interview one another and complete an evaluation, the results of which place each student into one of the following quadrants: "amiable," "expressive," "analytical," "driver."

The teams are then formed with at least one person from each discipline, each team also

having as much variety as possible based on the "people skills," as indicated from the personality evaluation. The coordination of the team assignment is left to another professor, brought in specifically to assign team membership and to instruct on how to work effectively in teams. This new process allows the students to have a better understanding of how personality influences communication. It also provides a little interaction when forming the teams. Part of that night's activities also consists of a discussion on how to work effectively as teams. The students are provided with a team-building activity that not only elicits immediate interaction, but also provides them with the understanding that assiduously following directions increases chances of success. For example, although carefully directed to pay attention to details such as maintaining a professional appearance and painstakingly designing the PowerPoint presentation, the range we found in groups following these principles was substantial. Clearly, the sense of audience, so essential to making presentations, is a concept that eludes some students.

Teams also learn that effectively addressing conflict management within the group, increases efficiency and minimizes the number of times professors are called in to solve team disputes, a common occurrence in the first classes. The students are then directed to create a stewardship agreement that outlines the behavior and the consequences for not following that behavior within the team. Allowing the students to set the guidelines and agree to actions provides a solid basis for working in the capstone team as well as teams in their future. Fewer team problems requiring professors to intervene have cropped up in the classes since the teams were given these opportunities to form a strong team.

The students required information and training on effective presentations. In the pilot class, the presentations at the end ranged from excellent to very poor. It was assumed that business professionals at the capstone level would understand and apply the concepts of effective presentations. Reacting to the inaccuracy of our assumption, the course development team began creating an interactive lecture on effective presentations given a week before the teams are to make their own presentations. The lecture includes a discussion on dressing professionally, building effective PowerPoint slides, transitioning from speaker to speaker, knowing the materials, and determining what to present. Since the implementation of this short presentation, the student presentations have improved dramatically overall, although there is still a range of excellence. However, the range is now more likely to stem from the level of commitment the students have to the project, not on their presentation skills or lack of them.

6. NEXT STEPS

The capstone is being offered as an online course this summer, creating a different set of challenges. The limits of the online environment include providing a way for students to collaborate and a way to view the presentations. Our current course management software primarily uses bulletin board postings, chat sessions, and audio-bridges to simulate the interactive aspects of this capstone. At this time, presentations will be made via PowerPoint slides accompanied by an audio-bridge. Team interactions will take place via e-mail and the chat facility. Since these tools do not seem optimal, we have launched an investigation into new tools that provide a more collaborative and dynamic online environment.

As of this writing, there is no data to suggest that we will need to change or modify the course online. However, we are open to the possibility that there will be opportunities to fine tune the online sessions to increase the effectiveness.

7. CONCLUSIONS

The students seem to enjoy and benefit greatly from this course. In evaluations from the last two terms, 100% of the students indicate that the course meets or exceeds their expectations, and 96% say they would recommend this course to other students. In their written comments, the students particularly like the fact that the course is designed to pull all of the learning outcomes for the entire MIS program into one course and they like the multidisciplinary, integrated teamwork because "working with the other majors gave a good idea of how businesses run." Summarizing our lessons learned, when designing a course such as this one it is important to keep mind that

- Coordination among faculty is a key success factor. Coordination among the faculty teaching the course is important so the students get consistent advice.
- Use of the case as the basis for individual class work keeps the students' focus on the case and prepares them for their final strategy presentation.
- Team assignments need a great deal of detail and attention. Our initial assumption that students knew how to effectively work in teams was incorrect. Students need some training in team interactions. The personality testing and stewardship agreement enhanced team performance significantly.
- Our assumption that student knew the basics of giving effective presentations was also erroneous. They require guidance in all aspects of effective presentations.
- Online instruction brings its own set of challenges, especially for the team assignments and presentations. This is the next major challenge we face in continuing to make this capstone work effectively for both our online and face-to-face students.

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