2009

Revitalizing a Struggling MIS Program on a Shrinking Budget

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ABSTRACT

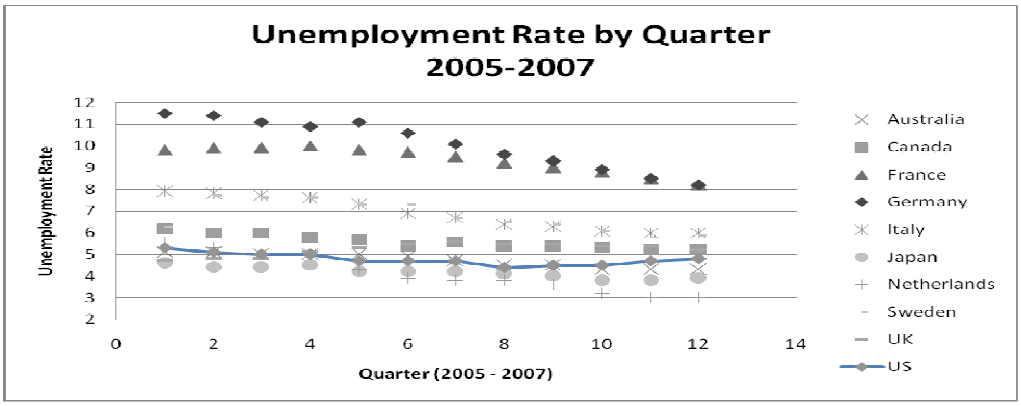
With rising unemployment figures and the current economic crisis, the job outlook for graduating students is dismal. However, when economic forces stabilize and companies start rebuilding their workforce, technically skilled employees should be in demand. Few, if any, jobs are untouched by either the direct or indirect impact of some form of information-based technology. News reports have emphasized the increase in U.S. outsourcing to overseas employers, yet examination of U.S. Bureau of Labor Statistics data and economic "think tank" white papers indicate that outsourcing is not the problem that we are led to believe. When the job/applicant demand begins to grow and student interest fails to peak, what, can we as educators, do to attract and retain the current generation of students in technology-oriented majors? This paper addresses some of the steps taken at one regional institution to sustain their MIS program while increasing student interest in the field.

Keywords

Enrollment, IS Employment Outlook, MIS programs.

INTRODUCTION

Since the dot.com bubble burst in 2001, media representation of the outlook for careers in information technology has been bleak. However, when comparing the published unemployment rates of the world's top economic powers, the U.S. has fared significantly better than one would be led to believe (Figure 1). Recently released U.S. Bureau of Labor Statistics' projections to 2016 indicated that information technology-based job opportunities were expected to be on the rise. Likewise, the number of replacement job opportunities was expected to climb as well as Baby Boomers transitioned into the retirement phases of their careers (BLS, 2008). In addition, an increasing number of reports indicate that outsourcing technology-based job roles has not been the economic silver bullet it was once thought to be (Jensen & Kletzer, 2008). As technology educators, we wait expectantly for the popularity pendulum to swing back toward technology-oriented fields of study. However, the longer we wait without taking action, the greater the risk of losing our programs, due to the spiraling effect created by decreasing budgets that generate cost cutting measures forcing the elimination of low enrollment sections, courses, and ultimately programs. Thus, the question that this paper addresses is, "What is the outlook for IT oriented careers and educational programs, in light of the current economic downturn? If the outlook is promising, what can we, as educators, do to rescue struggling programs during a period of financial crisis?"



Bureau of Labor Statistics - Foreign Labor Statistics http://www.bls.gov/fls/
Figure 1- A Comparison of World Unemployment Rates

LITERATURE REVIEW

The literature review examines workforce projections and trends by drawing upon research regarding economic projections published in mid 2008 by the U.S. Bureau of Labor Statistics, outsourcing, and IT workforce trends. Although some of the projections were published prior to the economic downturn, the information can still provide value. By examining economic projections provided by corporations and research institutions in light of current economic conditions, faculty can get a general feel for the employment trends, future required skills, and possible changes to programs of study and academic courses.

IT Employment Landscape

Prior to the downturn that has recently dominated market conditions, the U.S. Bureau of Labor Statistics published their 2008 economic projections for 2006-2016. Their projections indicated that, over the next decade, total employment would be expected to increase by 10% to 15.6 million jobs (BLS, 2008). Although this overall projected growth figure was less than the 15.9 million (12%) employment projection made for the previous decade (1996-2006), the anticipated slowdown in growth was attributed to the replacement of retiring Baby Boomers rather than the creation of new jobs (BLS, 2008). Although the Bureau of Labor Statistics' calculation accounted for the need to fill active, but vacated, positions, from this vantage point, one can assume that the "replacement need" figure was over-estimated. Many Baby Boomers may extend their careers after watching their retirement nest eggs dwindle.

Although some growth (6.9%) was expected to be realized in information services, most of the growth was expected to take place in service related industries including professional and business services, social services, health care, and retail (Table 1). Although the declining economic condition does not support these anticipated growth patterns, when the market rebounds, these projections may provide insights into potential employment areas.

Industry	2006	2016	Percent
Professional & business services	17,552	21,644	23.3%
State and local government	19,262	20,696	7.4%
Retail Trade	15,319	16,005	4.5%
Health care and social assistance	14,920	18,954	27.0%
Leisure and hospitality	13,143	15,017	14.3%
…	…	…	…
Information	3,055	3,267	6.9%

Source: Bureau of Labor Statistics: http://www.bls.gov/news.release/ecopro.nr0.htm

Table 1 -U.S. Job Outlook (2006-16) –Employment Rates for Top 5 Industry Sectors (including Information) (000's)

Table 2 examines specific technical areas addressed by the U.S. Bureau of Labor projections. Significant increases in employment were anticipated for Internet publishing and broadcasting (42.9%), computer systems design and related services (38.3%), and data processing, hosting and related services (32.8%). Smaller improvements were expected to take place in other focus areas of the technology industry including telecommunications as well as Internet and other information services. However, a marked decline was expected to take place for Internet service providers and Web search portals (-27.0%). This expected decline may have been in response to mergers, consolidation of services, and business failures.

Industry	2006	2016	Percent
Telecommunications	973	1,022	5.0%
Internet and other information services	469	536	14.3%
Internet publishing and broadcasting	35	50	42.9%
Internet services providers and Web search portals	122	89	-27.0%
Data processing, hosting, and related services	262	348	32.8%
Other information services	51	50	-2.0%
Computer systems design and related services	1278	1768	38.3%

Source: Bureau of Labor Statistics: *http://www.bls.gov/news.release/ecopro.t02.htm*

Table 2- US Job Outlook (2006-16) – Employment by Industry (Technology) - (000's)

Table 3 examines the Bureau's projections for the performance of specific occupations through 2016. Double digit growth was expected to take place in almost all technology associated occupations with seven occupations projected to experience at least 25% growth over the next decade. Four of the occupations with projected declines (highlighted in gray in Table 3) are

associated with data entry (-4.7% and -7.2%), system monitoring (-24.7%), and coding (-4.1%). The decline expected in these positions may have been as a result of the increased use of automated processes and rapid application development tools.

Occupation	2006	2016	Percent
Network systems & data communications analysts	262	402	53.4
Computer software engineers, applications	507	733	44.6
Computer systems analysts	504	650	29.0
Database administrators	119	154	28.6
Computer software engineers, systems software	350	449	28.2
Network & data computer system administrators	309	393	27.0
Computer specialists	3200	4006	25.2
Computer and Information Scientists	25	31	21.5
Computer and information systems managers	264	307	16.4
Computer specialists, all other	136	157	15.1
Computer support specialists	552	624	12.9
Computer programmers	435	417	-4.1
Computer operators	130	98	-24.7
Data entry and information processing workers	492	457	-7.2
Data entry keyers	313	299	-4.7

Source: Bureau of Labor Statistics: http://www.bls.gov/news.release/ecopro.t03.htm

Table 3-US Job Outlook (2006-16)– Occupational Employment and Job Openings – Technology-oriented (000's)

When economic conditions begin to improve and business situations more closely resemble those prior to the market decline, the tables provided above may help point students toward jobs and industries in which they may want to search for employment opportunities in technical fields.

Offshore Outsourcing

Offshore outsourcing does not appear to be the employment nemesis that news sources have led their audiences to believe. In his testimony before the Senate Joint Economic Committee, Alan Blinder noted that, "…fewer than a million U.S. service jobs have been lost to offshoring to date. A million may sound like a lot, but in a nation with over 140 million jobs, it is not even one month's normal turnover" (Blinder, 2007: p.1). Jensen and Kletzer (2008: p. 1) described jobs that were likely to be outsourced as, "relatively low-wage, low-skill jobs." They further went on to project that the result of offshoring would be an offset increase to the number of high-wage, high-skill jobs in-shored (Jensen & Kletzer, 2008). Hoving (2007) noted that IT departments will move towards a portfolio of both internal and external IT services with external partnerships developed on a selective basis. Thus, offshoring may facilitate adjustments to organizational structure and thus, associated employee skill requirements.

IT Workforce Trends

Research associated with IT workforce trends has also indicated a shift in skill requirements. In the first phase of a collaborative study conducted by a group of 20 researchers associated with the Society for Information Management Advocacy (SIM), the group examined IT workforce trends and implications among client firms, primarily, Fortune 500 firms (Zwieg, et al., 2006). The authors interviewed 81 senior level IT department executives, between May and October 2005, regarding their current and future workplace trends and requirements for IT skills. The authors found that an increasing

number of organizations were enlarging their in-house IT departments with employees having project management and business-focused skill sets. Concerns were raised about the need for future mid-level managers having both IT and business skills, while the number of new career entrants had been on the decline. The study found "a shift in the mission of the information system function from delivering technology-based solutions to managing the process of delivering solutions" (Zwieg, et al., 2006, p. 102).

Zwieg, et al. (2006) found that the number of domestic third party providers is expected to increase for the supply of technical skills oriented toward back office operations. The authors, however, also noted that most IT departments would probably not take this path. A core level of IT skills would continue to be required in house. Likewise, a growing number of skills associated with systems analysis and design as well as business analysis would also be sought internally. From their research, the authors found that, overall, entry-level IT candidates were deficient in communication skills. The authors also noted that entry-level positions, requiring systems analysis skills, would most likely be filled with applicants having undergraduate or graduate level business or MS/IS degrees (Zwieg et al., 2006).

A follow-up paper, published in *Information Systems Management* by a subset of the Zwieg, et al. authors, examined projected IT changes between 2005 and 2008 for three classifications of firms categorized by organizational size (Simon, Kaiser, Beath, Goles, & Gallagher, 2007). The classifications, into which the authors divided the organizations, consisted of Fortune 500 firms (revenues greater than US$ 3B), large organizations (revenues between $500M and US $3B), and small and medium-sized enterprises (SMEs) (revenues less than $500M). The article noted that, of the companies surveyed, the number of full time equivalents was expected to increase in the IT departments of Fortune 500s (47%), large corporations (44%) and SMEs (67%). An increase was also expected in the number of third-party IT providers in Fortune 500s (59%), large corporations (56%) and SMEs (42%) (Simon et al., 2007).

One of the areas addressed in the Simon et al. (2007) manuscript focused upon employee skills and job openings. Survey respondents were asked to indicate the top ten skills that were critical to keep in-house and the top ten most desired employee entry-level skills. Table 4 provides the skills indicated by at least two of the three categories of the population. Of those skills identified, very few of the skills required a strict technical background. Table 5 lists the entry and mid-level position titles with the greatest number of openings at the respondents' organizations as indicated by at least two of the three organization categories. Similar to the findings noted in the Top Ten IT Skills table (Table 4), most of the jobs required a combination of business and IT knowledge rather than a strict adherence to technical capabilities.

Top Ten Critical Skills Kept In-House	Top Ten Most Desired Entry-Level Skills
• Functional Area Process Knowledge* • Industry Knowledge* • Company Knowledge* • Business Process Reengineering* • Project Planning/Budgeting/Scheduling* • Systems Analyst* • Project Leadership	• Systems Analyst* • Programming*^ • Systems Design* • Desktop Support/Help Desk^ • Communication • System Testing • IT Architecture Standards^ • Voice/Data Communication^ • Database Design/Management • Industry Knowledge • Managing Stakeholder Expectations • User Relationship Management
* Signifies that all three groups indicated the skill was important. ^ Signifies a skill requiring a more technical background	

Source: Information technology Workforce Skills: Does Size Matter? (Simon, et al., 2007)

Table 4 - Top Ten IT Skills

Entry-Level Positions	Mid-Level Positions
• Programmer* • Systems Analyst* • Help Desk* • Programmer/Analysts	• Project Manager* • Systems Analyst* • Programmer* • Sr. Systems Analyst
* Signifies that all three groups indicated a number of openings for this position	

Source: Information technology Workforce Skills: Does Size Matter? (Simon, et al., 2007)

Table 5-Most Job Openings

In 2009, Bullen, Abraham, Gallagher, Simon and Zwieg published the second phase of the IT workforce trends study which examined the trends from the perspective of an IT provider. The results in the second phase of the study were similar to those found in the first phase in which desired IT skills have shifted toward project management, business domain knowledge, and user relationship management skills rather than a strict focus on a technical skill set. The seven sought after skills that emerged out of both studies were: industry knowledge, BPR/reengineering, change management, communication, IT architecture and standards, security, and managing third party providers (Bullen, et al., 2009). Five of the seven skills were classified as nontechnical in nature. In addition, the second phase survey of the providers indicated that two skills that will emerge in the near future as being important to keep in-house include the ability to work globally as well as in virtual teams (Bullen, et al., 2009). Thus, IT oriented roles need employees with more business, leadership, and interpersonal skills rather than strictly focusing upon technical capabilities.

Although current economic conditions are not ideal, few industries have been immune to its effects. Research indicates that IT-oriented jobs and individuals with IT management skills will be needed, however this message needs to be communicated to the students. Thus, steps need to be taken to market the major to current and potential students as well as revamp current course offerings to keep students interested while addressing the changing trends in market skill requirements. The following sections address maintaining and revitalizing MIS programs, encouraging potential students to consider the major, and preparing students to fill future job openings.

BREAKING THE SPIRAL

Like many universities, the MIS program at the author's institution was created during the heyday of the Internet boom. Classes swelled as students flocked from other majors to ride the wave generated by the popularity of the Internet. Soon after the program was created in the business school, similar programs with different flavors were developed, proposed, and established in other colleges of the University. Not long after, the dot.com bubble burst, students started migrating toward majors in finance and marketing, and the remaining technology students were divided among three similar programs in three different colleges.

For a time, the MIS program was allowed to limp along as the pendulum of students swung toward other programs in the College of Business. However, while waiting for the pendulum to swing back, the economy took a nosedive and state education allocations experienced cuts. The University was asked to look for areas in the budget to cut and one of the first places identified was the removal of low enrollment classes from the Spring 2009 schedule. Now, MIS, a program that was already reduced to offering one section of core courses each semester and rotating offerings of upper level electives, was hit with further cuts. The question has now become, "How do you encourage students to consider a major that may, or may not, offer the classes that they need to take?" And, "If no students enroll in the remaining classes, how will the program survive?" Finally, "If the courses and the program do not survive the chopping block, then how do you graduate the students who are currently in the program?"

Stabilizing the Situation

Cancellation of low enrollment courses occurred during the last week of Christmas break. Course loads of adjunct faculty were reduced and some of the full time faculty were reassigned to other courses. Students in dropped classes were juggled into different but similar courses. One course, on which the ax fell for the spring semester, was the capstone MIS course. The capstone course in the Computer Science Department was used as a substitute with the course requirements modified to fit the educational background of the MIS students. Until enrollment numbers increase, the author's MIS program will be using the Computer Science Department's course as an alternative to the MIS capstone course. Additional course alternatives from the other colleges' programs will also be utilized as alternative courses such as networking topics from the School of Polytechnic Studies and additional Computer Science Department courses. The department will also evaluate the MIS

courses offered in the College of Business in relation to the similar programs offered in the other colleges to determine how they can be adjusted to fill elective requirements of those majors.

Revamping and Repositioning

In an effort to revive our current program, each of the professors in the major was assigned multiple official course syllabi to evaluate and revitalize. After several years and editions of using the same authors' textbooks for the introductory MIS course, a different textbook author was selected. A more reader-friendly textbook was chosen in hopes of enticing students to read more about the field, reduce the "boredom" associated with the major, and, hopefully, encourage students to pursue additional MIS coursework.

While the faculty were revising their assigned syllabi, they were also asked to consider new elective classes that could be developed to interest a broad range of students and complement programs both within and outside the College of Business. Given our limited teaching resources, one of the restrictions on course development was that old courses would be replaced by new course offerings. Elective choices would thus need to be forward thinking, beneficial to students and future employers, meet the needs of the program, as well as capable of being covered by current faculty on staff. By offering elective courses that a wide range of students can take, the program can be positioned as an option for strengthening the IT skills of other majors rather than focusing entirely on obtaining new MIS majors. As students fill seats and classes can assuredly be offered, the focus will shift back to building the MIS program.

Once a set of broad-based MIS electives have been developed along with a temporary course offering and substitution schedule, the department can again start emphasizing the value of a concentration in MIS. This, however, may need to take an alternative form other than the traditional MIS major such as the development of a minor, the development of continuing education certificate programs, or possibly educational partnership programs with employers.

Development of a Minor

One of the first steps taken to address falling enrollments in MIS courses at the author's institution was the development of a minor to encourage students to broaden their marketability and supplement their current programs of study. Although the MIS minor is marketed to all areas of study, accounting students, who are preparing to take the CPA exam, may benefit most. MIS courses will provide partial fulfillment of their 150 credit hour CPA exam requirement and may also prove beneficial to students preparing for the auditing portion of the exam. As new electives are developed and the program revitalized, additional major areas will be targeted.

Continuing Education Programs

If, and when, the Bureau of Labor Statistics' projections occur (2008), the current aging of the Baby Boomer population and the subsequent vacancies they will leave in the workplace will create an opportunity for universities to pursue or enhance their continuing education programs. Certificate programs can be offered as both an alternative to a minor or to encourage a structured continuing educational sequence. Relationships can be developed with area employers to provide these courses on-site or to develop specialized workshops and technical training to address their specific technical needs. Programs can be developed to retrain existing employees, who are currently familiar with their organization's culture and business processes, to be reassigned to one of the technical vacancies.

Increased Awareness

Once alternative plans are in place for providing courses to MIS students, a concerted effort can be established to advertise the major as well as other MIS alternatives and, hopefully, rebuild the program. A plan to communicate technical career opportunities to current college students, as well as those in high school and elementary school, needs to be developed.

Recruitment

In an effort to advertise the minor at the author's institution and to recruit beginning freshman and sophomore business students to the field of MIS, the author created a short presentation to be given in the introductory computing skills course. A series of eight presentations were given over five days. The original presentation included approximately twelve slides and was expected to last for approximately five minutes. After about three minutes, the author could see the students' eyes glazing over and their attention diverted to other things. The presentation was then cut to approximately seven slides and three minutes. The slides were condensed to focus content on classes in the major, classes in the minor, starting salaries of jobs in the field, and two slides on the student chapter of the Association of Information Technology Professionals (AITP). Graphics and animation were respectively increased throughout the presentation. Although the reduced format seemed to hold the students' attention better and longer, no additional students appeared at the AITP general informational meeting

from the classes in which presentations were held. Although marketing efforts must take place within the campus community to attract currently enrolled university students to consider MIS coursework, prospective students should be addressed as well.

College Days

Like most, if not all universities, the author's institution offers prospective high school students the opportunity to spend a day on campus and learn what the institution has to offer. One hour of the students' tour includes a visit to the University's recreation center where a department fair is waiting. Each program on campus sets up and mans an exhibit to describe their field of study, emphasize job opportunities in that field, and answer questions of potential students and their parents. Later in the day, colleges provide open houses where students can meet some of the professors and students to learn more about programs, careers, classes, as well as student leadership and organization opportunities. Handouts developed for distribution to interested students and their parents contain information regarding the Bureau of Labor Statistics economic and salary projections for the field of MIS.

Community Involvement

The author's institution regularly hosts a regional competition for area high school FBLA (Future Business Leaders of America) chapters. This provides the high school students with an opportunity to visit the University with their peers, participate in fun activities in a collegiate atmosphere, gain a familiarity with the campus, and meet some of the professors and students. MIS faculty can take this opportunity to interact with students and increase their awareness of MIS as an area of study. Ensuring that signage advertising MIS and related career opportunities in the field is posted during on-campus high school events would also be beneficial.

Summer Camps

Efforts must also be made to reach students at an early age. To attract potential future students as well as encourage academic interests in scientific fields, the author's university provides short term summer day camps in areas such as forensic science and game programming. Students are able to learn programming concepts in a structured, yet entertaining format to which they can easily relate.

Signage and Communication

Regular updates in the college email newsletters and occasional email blasts can be used to notify current students of upcoming AITP events and meetings. Advertisement posters can also be posted throughout the college to advertise the major, AITP club activities, and career opportunities. As MIS students obtain job offers, faculty should make a concerted effort to make other students aware of the opportunities their peers are obtaining. One method for increasing the awareness of recent hires could be to develop a "Successful Hires" board in the student commons area of the college or outside the department office. This board could contain pictures of recently hired graduates/students with their new employer's name, the date they were hired, and their expected date of graduation. In addition, the board could have a section dedicated to internships in which the students' pictures are displayed with their employer and a brief description of their roles in the organization. These boards could give students ideas for possible internship or job opportunities, illustrate that jobs are available for graduates in their field, as well as display the correlation between internships and job placement.

Student Involvement

With the decline in MIS majors at the author's institution came the associated decline in membership in the student chapter of the Association of Information Technology Professionals (AITP). The Spring 2009 semester experienced a significant increase in enrollment due to one student's interest in building the club. One interested student talked with other MIS majors in one of his classes and encouraged them to join which led to several friends deciding to join. In one of the club's recent meetings, the students started brainstorming on what they could do to motivate other students to join the organization. A wealth of marketing opportunities lie within the students themselves. Thus, the key to revitalizing the program may be through getting the current set of students involved in the marketing process.

Employers Efforts

Potential employers may also be interested in providing input and guidance on encouraging and developing future prospective MIS employees. Through surveys and input provided by campus recruiters, faculty can determine what skills are most important to their regular employers as well as trends and developments in the employers' industries.

Experiential Learning Opportunities

Characteristics of today's college students indicate a desire for hands-on learning. Co-ops, internships, and experiential class projects provide current university students with the opportunity to gain real life experience while allowing the employer to observe the capabilities of a potential future job applicant. Some programs may be able to tailor students' coursework to better fit the job requirements of the employer/co-op/internship provider. A direct relationship may be able to be developed where the employer regularly provides co-op/internship opportunities for prospective student hires.

Tours and Campus Visits

Although their job opportunities and internships may be tight, many companies still desire to build relationships with universities and their students. Many companies are still willing to provide business tours to student groups and send company representatives for campus presentations. These interactions can help both faculty and students gain valuable insight into current market conditions from the perspective of industry employers.

CONCLUSIONS

Although the current economic outlook is quite dismal for students seeking employment in almost every field of study, projections prior to the market decline indicated a promising future for students in information technology fields. The 2008 projections published by the U.S. Bureau of Labor Statistics provided significant supportive evidence for a positive outlook for the future of MIS had the economy maintained its previous momentum. Thus, when the economy rebounds and IT jobs generated by the stimulus package begin to open, the prospect of opportunities in MIS related careers look promising. While we wait for those anticipated changes to arrive, it is important that MIS programs revamp their course offering and start developing a plan to attract and retain students into their programs. It may also be necessary for some programs to develop a sustenance plan to get them through the lean times as budget cuts eliminate low enrollment courses and, possibly, entire programs if a plan is not in place. In addition, MIS programs need to take action to eliminate the negative stigma associated with the future of IT careers and encourage students to pursue MIS as a field of study.

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