The Potential Impact of Offshore Outsourcing on Information Systems Education Programs

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Introduction

As recently as the 1999-2000 academic year, the most sought after graduates were those completing degree requirements in a wide variety of information systems based programs. Many graduates were enticed by lucrative signing bonuses as organizations prepared for the dreaded uncertainty of Y2K. Information systems and computer science programs and courses were in great demand as most students wanted to demonstrate that they had developed significant competency in using computers and understanding the value of information systems.

Now, four short years later, many information systems professionals are unemployed, and many others are fearful of losing their well-compensated positions to outsourcing initiatives. Particularly distressing is the fact that many of these outsourcing initiatives are offshore. The dislocation of information systems related employment opportunities in the United States is becoming significant. Chief Information Officers in companies across the country are beginning to realize the magnitude of the potential loss of talent, knowledge, and performance. The U.S. Department of Labor projects that by 2010, nearly 300,000 computer-related jobs will be lost to offshore initiatives.

This paper will examine the impact of today's offshore outsourcing movement. It will also include a discussion of the potential impact on our education programs as a result of a decreased number of entry level career opportunities and a commensurate decline in interest in information systems education.

The Outsourcing Movement

Previously, when the term outsourcing was used, we interpreted it as meaning that an agreement had been reached with an outsourcing organization in the region. Job opportunities stayed in the region and in the U.S. However, the current trend is to outsource jobs to offshore service providers. The jobs currently being outsourced go beyond application development and maintenance. Business processes such as claims processing, financial analysis and even U.S. tax return preparation are now being outsourced Herera (2003) and Thibodeau (2003). An Indian IT services giant, Wipro lists about 350 clients, about 70 percent Fortune 1,000 companies (Herera).

The chart of salary comparisons below reveals one of the primary reasons for the movement to offshore providers (Herera).

	U.S.A.	India
Engineer	$90,000	$23,000
Software Developers	$50-75,000	$7-10,000
Call Center Agents	$23-32,000	$2,300-3,200

U.S. companies need to remain competitive in the world market, and offshore outsourcing currently offers feasible combinations of cost and service. Offshore vendors offer quality methodologies such as Software Capability Maturity Model (CMM), People CMM and ISO 9000, capabilities that most U.S. organizations lack on an in-house basis (Morello, 2003). A recent survey conducted by the National Retail Federation (NRF) revealed that 26% of 57 retail executives polled are making offshore outsourcing a strategic initiative for 2004 (Sliwa, 2004). Although Sears is undertaking an outsourcing initiative that will impact 270 of its 1,160 IT staff, it will continue to have U.S.-based project managers, architects, developers, business analysts and testers (Sliwa). Furlonger et. al. caution that because of the wide cost differential for services ($100 per hour in the U.S. typically equates to $20 in India) an A.T. Kearney study predicts 500,000 financial services jobs in the U.S. are at risk for offshore outsourcing through 2008. Thus, the outsourcing movement goes beyond IT.

In a recent Computerworld article, Bart Perkins (2003) contended that offshore outsourcing is here to stay, but issued the following set of questions that should be explored before making an offshore commitment:

- Which cost/service trade-offs are you willing to make?
- How much risk can your company tolerate?
- How will you make decisions and resolve disagreements with your offshore partner?
- How important is Software Engineering Institute certification? Does your company require Software Capability Maturity Model (CMM) Level 5 processes?
- Do you have several low risk projects that would make good pilots?

Offshore outsourcing also has a negative side to many organizations. Customer complaints about poor service have been prevalent. Dell decided to bring its corporate PC tech support back to the U.S. Customers have complained about inflexible technicians, English that was not understandable and bad telephone connections (Johnson, 2003).

A recent article by Harper (2003) summarized data from the U.S. department of Labor and Forrester Research, Inc. depicting the far-reaching impact of offshore outsourcing. The chart follows:

Number of U.S. jobs moving offshore

Job Category	2000	2005	2010	2015
Management	0	37,477	117,835	288,281
Business	10,787	61,252	161,722	348,028
Computer	21,171	108,991	276,954	472,632
Architecture	3,498	32,302	83,237	184,347
Life sciences	0	3,667	14,478	36,770
Legal	1,793	14,220	34,673	74,642
Art, design	818	5,576	13,846	29,639
Sales	4,619	29,064	97,321	226,564
Office	53,987	295,034	791,034	1,659,310
Total	102,674	587,592	1,591,101	3,320,213

Source: U.S. Department of Labor and Forrester Research, Inc. All numbers have been rounded

Another area of great concern is data security and privacy. India, for example, has no formal data privacy law (Vijayan, 2004). Vijayan further states that it is difficult to control how data is transmitted, accessed, used, stored and shared.

Thibodeau (2003) states that U.S. firms are quite comfortable offshoring application development and maintenance, but the willingness to outsource business processes such as claims processing is also growing. Concerns about security, privacy and intellectual property protection have prevented infrastructure outsourcing on a large scale. However, offshore providers are setting strict personnel rules to ensure security, and some now feel that a significant increase in outsourcing infrastructure support will likely occur within the next year (Thibodeau).

Andrew Grove, Intel Chairman, is very concerned that the U.S. is facing a competitive crisis and may lose its position as the world's most innovative technology provider. Grove is also concerned by the fact that more than 50% of graduate students in technology and science are foreign nationals and because of immigration policies the U.S. is unable to retain foreign talent (DiCarlo, 2003).

Implications for College and University Technology Programs

The dilemma that computer science and information technology educators face deals with program content and employment opportunities for graduating students. The graduates of our computer science and information systems programs will likely have fewer entry level opportunities than has traditionally been the case.

We are faced with an array of unanswered questions. How should we, as educators, advise our students? Are we preparing them for a job market that does not exist? Who are the potential employers of our graduates, and what are their needs over the next four years? Should our technology education programs be a supplement to another functional area to which technology can be applied? What is the current impact of offshore outsourcing, and what will it be in the next four years? What is the potential for future opportunities in your region? Is all of the media attention devoted to offshore outsourcing overblown? Are we reacting appropriately to a changing environment with appropriate program updates?

All of the questions posed above are worth considering and discussing. However, the challenge lies in being able to change and adapt. The author has long contended that technology-related educational programs must be dynamic and must adapt to an ever-changing marketplace. This is not to dispel the importance of simply having programs that teach people to think, analyze and solve problems. Those attributes are a "given." But, technology professors must be more willing to embrace change than many of their counterparts. Although it is nearly impossible to keep pace with the rate of technological change, we must ensure that our students are properly prepared.

A recent survey of the 20 members of the Duquesne University School of Business IT Advisory Board was somewhat encouraging (Duquesne, 2004). The advisory board members agreed there would be entry level positions available through 2010. This notion is strongly endorsed in the article by Santana (2003). The article bases many of its conclusions on data provided by the U.S. Bureau of Labor Statistics.

Santana actually reports that there will be a huge shortage of IT workers due to the retirement of millions of baby boomers. The report also states that there is already a shortage of properly trained professionals in the prime age work pool (ages 26 to 54) and only half of the retirees can be replaced by this pool. Santana concludes that the current slump in IT positions, due largely to economic conditions and offshore outsourcing, will not last very long. The Bureau of Labor Statistics also reports that eight of the ten fastest-growing occupations in the foreseeable future are technology-related as summarized in the chart below (Harper).

Where the jobs are

	# jobs added	% increase
1. Computer software engineers, applications	380,000	100
2. Computer support specialists	490,000	97
3. Computer software engineers, systems software	284,000	90
4. Network and computer systems administrators	187,000	82
5. Network systems and data communications analysts	92,000	77
6. Desktop publishers	25,000	67
7. Database administrators	70,000	66
8. Personal- and home-care aides	258,000	62
9. Computer systems analysts	258,000	60
10. Medical assistants	187,000	57

The Duquesne University survey is interesting in that it identifies a number of desirable skills that are complementary to a purely technical education. For example, the highest rated skills desired by the executives surveyed include:

- Ability to align IT projects with business goals
- Strategic planning
- Process analysis
- Project planning
- Customer relationship management
- Web applications
- Data Warehousing and Mining

The implication of the importance of the above list is that higher order skills are the mandate for the future. The question is will our students be ready for the challenge? If not, should we examine and revise the content of our programs? A program that ceases to be relevant can be embarrassing to an institution. An even more embarrassing dilemma occurs if a student spends four years preparing for a career, only to find they are not prepared to pursue the career opportunities available in the region.

Morello's research (2003) summarizes three areas of concern that may arise as a result of offshore outsourcing. The first is a loss of future talent. College students in the U.S. and the United Kingdom will not prepare for a technical career that they perceive is moving to an emerging market. The current job slump will not last forever, but when the need for IT professionals increases, domestic talent will not be available.

A second concern is the loss of intellectual assets. This concern is centered on how far outsourcing can go. As organizations begin to outsource areas of core knowledge, they must also determine a way to protect and maintain control of their major areas of core knowledge.

Finally, Morello reports that overall organizational performance can be impacted as many organizations already have a fragile employee/employer relationship.

Recommendations and Conclusions

If we assume that some of the positions that previously served as entry level opportunities for our students go offshore, several options should be considered. One option might be to analyze the most difficult positions to fill in an IT organization. As we consider these positions, we must also determine the knowledge base required for qualification and deliver that knowledge base in our programs. Unfortunately, it is the author's view that many of the positions listed require both knowledge and considerable experience. Mok, (2003), reports that organizations are experiencing great difficulty filling the following positions, in the order listed:

- Database Administrator
- Internet/Web Architect
- Network Architect
- Network Engineer
- Security Analyst

Mok also identifies skills in Oracle administration, PeopleSoft, Unix and general enterprise resource planning (ERP) - related skills.

A second option would involve considering the design of an educational program that develops competencies in five areas in an effort to "offshore-proof" your career. Once again, experience may be a key ingredient in qualifying for the positions. The areas named in Santana's research include the following:

1. IT Requirements Analysis – fitting system requirements to organizational processes.
2. Business Process Design – reviewing existing workflows, recommending and designing new processes, and identifying tools.
3. IT Contract Management – aligning outsourcing and contract strategies that align with budgets, missions and strategic goals.
4. IT Business Relationship Management – building and maintaining a critical network of organizational relationships.
5. IT Architecture Planning – specifying technology strategies to support organizational goals.

A final option is to encourage students to become "versatilists." Kidd (2003) defines a "versatilist" as "someone who can apply depth of skill to a progressively widening scope of situations and experiences, gaining new competencies, building relationships, and assuming new roles." In the context of a business school program, this might be translated as an IT student who is cross-functional with other disciplines such as accounting, supply chain management, or marketing. The author is an avid advocate of this approach. The author has been a long-time advocate of IT being an applied rather than a pure stand-alone discipline. Hayes (2003) indicates that the job of the pure programmer is turning into a commodity, and that to maintain job security, programmers must understand business processes and be capable of automating and streamlining these process in their new role as business technologists. As the chart presented earlier in this paper indicates, the U.S. Department of Labor also provides data on many other fields that will be affected by the offshore movement as this strategy is not limited to the IT workforce alone (Harper). Santana (2003) also stresses the importance of "soft skills" such a communication and change management to supplement one's technical skills.

As educators, we must continually assess our program content, and in the spirit of continuous improvement, make adjustments to ensure currency. Our students rely on us to do this well. Several options were presented in the paragraphs above for consideration. The world of information technology is not "business as usual." In addition to the rapid pace of technological change, economic conditions and offshore outsourcing threaten to cause upheaval in the area of entry level job opportunities. This is of paramount importance to technology programs in higher education as we are preparing our students to compete in this constantly changing environment. Without wanting to leave the impression that I am over-reacting, the author encourages all to examine our educational programs and our job markets, and make the necessary program changes to synchronize the two related areas.

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