Developing Growing Need for Soft-Skills in IT Professionals

Dewey A. Swanson
Associate Professor, CPT
812-348-7238
dswanson@puc.iupui.edu
Julie Phillips
Associate Professor, OLS
812-348-7207
japhillips@puc.iupui.edu
Nancy Wilson Head
Associate Professor, CPT
812-348-7211
nhead@puc.iupui.edu
Purdue University School of Technology
4601 Central Avenue
Columbus, IN 47203
Fax (812) 348-7258

Abstract

In this paper we will examine the need for "soft-skills" by information technology professionals. Based on a partnership between Purdue University and Cummins Inc. we will examine the increased need for skills that allow companies to successfully outsource many of the programming and technical positions offshore.

Outsourcing is not new to industry. By outsourcing information technology corporations are finding a way to become more nimble and flexible. Seeking to cut costs in today's sluggish economy companies are looking offshore as a way to significantly cut IT costs. The offshore outsourcing has in many cases meant lost jobs to IT professionals with Fortune 500 companies. However, for those IT professionals left and those coming into the workforce with companies it may mean retooling or refocusing skills that will allow companies to develop and maintain systems that are joint efforts of company's in-house off-shore outsourced staff.

Purdue University's Statewide School of Technology sites have a long tradition of working with industry to provide employees with the ability to work in the ever-changing technological environment. Our Columbus, Indiana campus has a long and successful partnership with Cummins Inc. a Columbus based Fortune 500 company. In the past year we have been working with Cummins to develop a program to retool valued IT professionals at Cummins. The focus is on turning Cummins from a traditional IT organization into one that is increasingly based on dealing with offshore outsourcing skills such as programming and support. The skills required in-house will focus more on the "soft-skills" as Cummins transitions employs from programming to business/system analyst positions.

We will discuss the "soft-skills" that will be needed to survive in this changing work environment. The students that universities are providing to the workforce need these skills. We will look at the program developed based on our partnership with Cummins and how it can benefit

Purdue. Finally, we will discuss the lessons learned and how other institutions can benefit from a similar partnership.

Background

Outsourcing in IT

IT outsourcing refers to using outside companies to provide IT resources such as labor, software, infrastructure and hardware. Offshore outsourcing uses companies located abroad to provide these services. Outsourcing has been around for over ten years in the United States. According to the Gartner Group offshore outsourcing is gaining steam in the United States. According to Gartner Group the draw is lower costs, coming mainly from the use of less expensive labor (Perez, 2003). India is the largest provider of offshore outsourcing for the U. S. Gartner states that with increased quality and less difficulty of offshore engagements it has become more effective model over the past three or four years (Perez, 2003). A report issued by Foote Partners LLC states that by 2005 as many as 35% to 45% of U.S. and Canadian IT workers may find themselves replaced by offshore workers. Some types of IT work can be done for 20% to 50% less in places like India, and Eastern Europe (Hoffman, 2003).

Industry Partnership

Purdue University's School of Technology has a long history of responding to the industry needs in order to enhance the social and economic development of the state. A partnership that has developed over the years is between the Purdue University location in Columbus, IN and Cummins Inc. a leading worldwide designer and manufacturer of diesel engines and related products for trucks and other equipment. Purdue University entered into a joint venture with Cummins Inc. in 1997 in an attempt to benefit Purdue, Cummins and the local community. In this venture the company provided the university funding to: purchase a state-of-the-art computer lab, purchase software, add a faculty member to the Computer Technology Department (CPT), and develop courses using the latest software. Purdue University in return provided: a cost effective training alternative, a nearby source for training information technology personnel, training that utilizes the Oracle database management system, college credit toward a Purdue degree in Computer Technology and university professors to teach the courses. The program named Advanced Information Technology Training Program (AITTP) started as a one-time effort that has evolved into a program offered twice a year since the initial offering in 1997. The Advanced Information Technology Training Program (AITTP) is a program where Purdue University offers six credit courses and a project delivered in a compressed format for Cummins Inc. employees and individuals from the community. These courses have focused in database administrator (DBA) skills. Students go through the program as a cohort group. Since its inception there have been over seventy graduates of the program accounting for over ten percent of their worldwide IT staff.

Cummins Offshore Outsourcing

Cummins like many companies has been hit hard by the economic downturn in the United States. With the economic pressures Cummins has found the cost savings of offshore outsourcing attrac-

tive and have pursued that with a firm in India. Cummins estimates that currently about seventy percent of their IT staff is in applications development and support. To effectively compete management determined that they would need to reduce that to about thirty percent of their IT staff. As many companies Cummins has been forced to downsize and IT staff has not been exempt.

One of the original goals of the AITTP program was to take valued employees with outdated skills and retool them to be effective personnel in Cummins changing IT environment. They reasoned it better to retool these employees that were already in the community and familiar with the Cummins culture than to recruit all new workforce. Many COBOL programmers were retrained as DBAs and Oracle Developers by the AITTP program.

The skills Cummins needed in the move to offshore outsourcing are Business/Systems analyst skills. Anyone reading the trade magazines can see that outsourcing is littered with as many failures as success stories. Cummins aware of that fact and from their own experience with contractors determined they would need to retool existing employees in business/systems analyst skills. Specifically, to be successful with offshore outsourcing Cummins needed professionals that could create tight specification packages that could be passed to offshore programmers. They also needed these professionals to be able to effectively team with these contractors and users to develop and support applications.

Program Focusing on Soft Skills

Program Development

Cummins approached Purdue in the summer of 2002 with a proposal to develop a program to educate/train Business/Systems Analyst. The program was initially to be based on the AITTP program: several credit courses offered in a compressed format. One of the major issues that managers had with the AITTP program was that students were away from their job for twelve weeks. This is difficult in good times but with a leaner IT staff this was not feasible. For this reason Purdue staff and Cummins staff met to develop an alternative format that would be effective. One of the approaches used at Cummins was Six Sigma training where staff would come in for one to two weeks of training and then go back on the job and apply that training on a project and then repeat the process for the next phase of training. This format would cause less of a strain on department workloads. Having settled on this format content and whether the course would be credit courses or continuing education would be an issue.

Cummins, Inc. IT managers (Columbus and overseas), contractors and Purdue University School of Technology professors met to brainstorm what skills a Systems/Business Analyst needs in order to be successful in this new role of outsourcing. The list included technical skills, but there was an overwhelming degree of people skills identified. This seems to be the trend in the industry as demonstrated by the following quotation. "When companies outsource they need to consider a host of "people" issues. The most important is communication which is critical to a successful relationship." (Jones, 1997) Based on the brainstorming exercise the Purdue University professors designed a 2 week, non-credit course that covered two distinct areas: technical and

soft skills. The soft skills that were included for the Systems/Business Analyst training are as follows:

1. Communication Skills
    a. Communication in Transition
    b. Communication Skills (speaking, writing, listening, feedback)
    c. Communicating with Customers (Kano's Model of Customer Perceptions, Taguchi Loss Function, PDCA, Voice of the Customer, Customer Feedback)
    d. Intercultural and International Communications (Definition of Culture, Frameworks for Examining Culture, Cross Cultural Communication Difference, Enhancing Cross Cultural Communications)
2. Teamwork Skills
    a. Developing a Mission Statement
    b. Developing a Vision Statement
    c. Teams/Process (Team Norms, Team Empowerment, Intra-Team Relationships)
    d. Team Meetings
    e. Team Decision Making, Problem Solving, Quality Focus
    f. Managing Conflict
    g. Resolving Differences
    h. Team Assessment

Training on the above soft skills would consist of mini-lectures, case studies, class exercises, videos, quizzes and exams. The approach taken by the professors is an application of the skills learned. These two categories of soft skills were deemed critical to training Systems/Business Analysts since Cummins, Inc. mission is to outsource IT work to India. The training program that was developed was then presented to Cummins, Inc. managers for their review and approval.

Soft Skill Issues and Emerging Program

For several months Cummins management and technical staff continued to review the proposed training. After much internal review the technical staff balked at sending staff to a class that focused on "soft skills" even though those were the skills that had emerged from the meetings. A comment made by one manager was "people should already have these skills". The consensus was that communication skills should have been developed in college and on the job. Cummins training professionals disagreed and pointed to the skill set that emerged from brainstorming session. After more negotiations between Cummins training staff and IT managers they compromised. Instead of a continuing education course Cummins agreed to have Purdue offer two courses in their Systems Integration track (a track used to prepare students to become Systems Analyst). The courses had "soft skills" as part of the course content but tend to have more of a technical focus.

The first phase would be to offer CPT 280 - Systems Analysis and Design Methods, in condensed format (five days and a final exam) and students would then be given a Cummins specific project that they would work on in teams similar to Cummins' Six Sigma training. They would have three progress reports with the team of instructors teaching the course and a final presentation. The course would be delivered in a team approach using four instructors, three from the

Computer Technology Department (CPT) and one from the Organizational Leadership and Supervision Department (OLS). The "soft skills" sections mentioned previously communication and teaming would be delivered by the OLS professor. Cummins ask Purdue to deliver two sessions (fifteen students per session) of the CPT 280 in the summer 2003. Following is the course description and content for the CPT 280 course:

CPT 280 Course Description

This course is an introductory systems analysis and design course for systems/business analysts. The course presents an overview of information systems and the system development life cycle. Course emphasis focuses on structured tools and techniques that the programmer or analyst uses to design/develop/document information systems, some of which include:
(1) Fact finding and requirements gathering
(2) Data and process modeling
(3) Feasibility analysis
(4) Pre- and post-implementation testing
(5) Support requirements. The course also introduces Oracle Designer in the lab portions of the course.

CPT 280 Topics

(1) Why Do Businesses Need Analysts?
(2) Skills For A Successful Business/Systems Analyst
(3) The Business/Systems Analyst's Team
(4) Systems Development Life Cycle (SDLC)
(5) Requirements Gathering
(6) Process Concepts
(7) Introduction to Designer 2002
(8) Data Verification/Modeling
(9) Requirements Verification/Modeling
(10) Process Verification/Modeling
(11) Feasibility Analysis
(12) Cost-Benefit Analysis
(13) Net Present Value Analysis
(14) Payback Analysis
(15) Requirements Packaging
(16) Pre-Implementation Testing
(17) Project Completion
(18) Implementation Plans
(19) Post-Implementation Testing
(20) Support Requirements
(21) The Project Repository
(22) User/Owner Satisfaction Surveys

Later a second phase would have students selected from the two CPT 280 sessions to take the CPT 380 Object-Oriented Systems Analysis and Design course. Following is a course description for the CPT 380 course.

CPT 380 Course Description

This is an advanced systems analysis and design course for future computer programmers and systems analysts. The course presents an overview of the migration from using structured methods for information systems development to using object-oriented methods and concepts. Course emphasis focuses on the object-oriented tools and techniques used by modern day system analysts to perform systems development. It will cover:
(1) The differences between object-oriented and structured methods
(2) The principles of objects and object-oriented concepts
(3) A unified approach to systems development and the UML notation
(4) Object-oriented modeling diagrams
(5) Object-oriented methodologies
(6) Managing an object-oriented project.

Practical examples will be used to demonstrate the object-oriented concepts and methods, plus students will receive hands on experience by working in a team environment to solve a business problem using object-oriented techniques. This course will also survey other important skills for the systems analyst, such as fact-finding, communications, project management, and cost-benefit analysis.

Conclusions

With a weak economy the climate is ripe for offshore outsourcing which can provide a way for companies to save on application development costs. As surveys have shown the trend will continue to gain steam throughout the decade. Companies taking the approach of Cummins that they would like to retain valued employees will find a growing need to retrain these employees in the skills required to stay competitive in the global economy.

Although our involvement in this program was instigated because of Cummins growing move to outsource offshore many companies have been looking for employees with strong "soft skills" even if they are not doing similar moves as Cummins. Companies are looking for employees that are not only technically strong but that communicate well. A complaint often heard is that students are technically strong but weak in oral and written communication skills. A survey of Central Indiana companies sponsored by Indiana Information Technology Association and Ivy Tech State College tends to confirm this. Sixty-one companies responded, and the consensus was that when workers could be located, they turned up short on the communication skills. "You find people who have great technical skills, but you can't put them in front of a client" said Ron Brumbarger, president of BitWise Solutions in Carmel (Heikens, 1999). A survey of the Indiana Information Technology Association (INITA) stated in each category of employer, the biggest deficiencies were not in technical skills but in interpersonal skills. In fact, over sixty percent in each category listed interpersonal skills as a deficiency among job applicants as compared to generally forty to sixty percent in the different category of employers who listed technical skills

(INITA, 1999). As interesting was when employers were ask to prioritize current and anticipated (over the next 3 years) skills required, the "soft skills" made up eight out of the top ten skills required with teamwork, verbal communications, written communications all in the top five skills named (INITA, 1999).

What does this mean for the university and programs like our CPT program at Purdue University? First, as we have found there is a need for the so called "soft skills" and this need will only grow over the next decade. With Cummins we found a way to partner with industry in a "win-win" situation that brought additional funds to our Columbus campus but also provided much needed skills to Cummins existing staff. However, on the downside we found that the technical managers at Cummins reluctant to spend their limited training dollars on these skills. The predecessor AITTP program was a much easier sell that brought the university four times the money brought in by this program mainly because the focus was on technical skills (granted also that the economic climate was also better). We need to do a better job of selling industry that their employees don't just have the skills of teaming and communications.

The other implication from this is that we as educators need to incorporate these skills into our curriculum. This doesn't have to mean adding courses to the curriculum although that is a possibility. Including skills into our classes that promote teamwork, oral and verbal communications can make our students more marketable in the global economy that they will be facing when they enter the IT workforce.

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