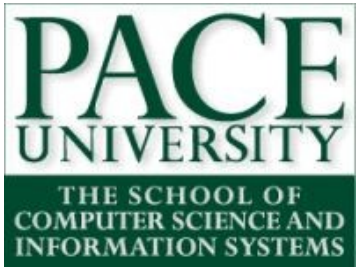
Incubating the Next Generation of IT Offshore Outsourcing Entrepreneurs



Christelle Scharff

Olly Gotel

Sopheap Seng

ITE 2005

Outline

- IT Offshore Outsourcing
- Issue for CS education and CS students
- Responding to IT Offshore Outsourcing
- Our response: Providing Students with an IT Offshore Outsourcing Software Development Experience
  - Preparation
  - Setup
  - Preliminary findings
- Future work

Offshore Outsourcing

- **Outsourcing** is the delegation of tasks or jobs from internal production to an external entity (such as a subcontractor). [Wikipedia]
- **Offshoring** can be defined as relocation of business processes (including production/manufacturing) to a lower cost location, usually overseas. [Wikipedia]
- **Offshore Outsourcing** is the practice of hiring an external organization to perform some or all business functions in a country other than the one where the product will be sold or consumed. [Wikipedia]

IT Offshore Outsourcing ☺

- IT Offshored jobs include:
  - software development, software maintenance, IT documentation, telephone support, remote networking monitoring, software reengineering, systems management, and IT admin & operations [Wired, 2004]
- The Bureau of Labor Statistics projects that CS and IT jobs are among the fastest growing in 2002-2012, with 40-55% increases [BLS, 2003]
- Commonly cited reasons for IT Offshore Outsourcing include:
  - cost, accessing specialized skills or facilities, being able to increase or decrease developer head count as needed, and increasing development speed
- Over 70% of CIOs feel the cost factor is overrated in IT; typical savings are 15-25% the first year, and up to 40% later on [CIO Insight, 2003]

IT Offshore Outsourcing ☹

- The revision of the 2002 Forrester Research report predicts that:
  - 830,000 jobs will move offshore by the end of 2005
  - 3.4 million jobs and $136 billion in wages are expected to shift overseas by 2015
  - 25% of IT jobs will move offshore by 2015
  - 93% of IT workers are concerned by offshoring
- IBM and Accenture are rapidly expanding offshore activities

Issues for CS Education and CS Students

- Decline in CS enrollment
- Entry-level jobs are migrating to service-providing countries
- We can NO more prepare students for the *dotcom* world
  - What technical and "softer" skills will students need to employ to work and communicate as productive members of a multi-cultural software development team?
  - What roles will students play in a global market place?
    - World-class engineers, managers, and entrepreneurs

Responding to IT Offshore Outsourcing

- Provide real-life Offshore Outsourcing software development experiences by collaborating with institutions outside of the United States
  - Provide a balanced and first-hand view of the advantages, disadvantages and potential of IT Offshore Outsourcing
- Understand what are the skills students need to be productive in Offshore Outsourcing software development
  - Monitoring how students interact on project
  - Monitoring students communications (groups issues, problems, workarounds…)
  - Monitoring software engineering practices that work or do not work
  - Examining the link between communications activity with process undertaken, stages of project, deadlines and quality of product

Our Response

- Collaboration between Pace University in the US, and Institute of Technology of Cambodia (ITC), Phnom Penh
- Simulating Offshore Outsourcing in the classroom in software engineering capstone courses

Arrangements Prior to Semester

- Discussions/agreement with the corresponding professor
  - Country, culture, school system
  - Students background
  - Internet access
  - Creation of the syllabi
  - Projects
  - Tools/software engineering practices to be used
- Choice of communication tools (emails, chats, blogs, mailing lists, wikis…) and definition of a protocol of communication between professors, students, students/professors
- Definition of the roles of the students/professor

Setup: Projects

- Project 1: ITC Schedule Builder and Classroom Assignment System
  - Generate/view schedule and classrooms assignments and availabilities w.r.t. existing courses and faculty preferences
- Project 2: ITC Students Information System
  - Students registration management
  - View students information
  - Grades management
  - Courses management
  - Attendance management
  - Provide statistical results
- Constraints
  - Standard and protocols (documentation, coding, communication, software process..)
  - Use of Java, JDBC, Java Servlets, Oracle, Eclipse

Setup: Project Milestones

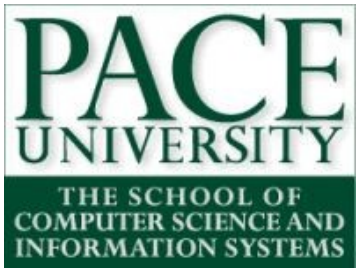
- Team bonding and initialization of the communications (1 week)
- Requirements (5 weeks)
- Design (4 weeks)
- Mid-semester presentations
- Implementation (2 weeks)
- Testing (2 weeks)
- Presentations (Last week of class)

Setup: Teams & Communications

- 5 teams, 19 Pace students, 13 ITC students
  - Students choose their teams
  - Projects are assigned to teams
- Extended teams: Reversal of traditional roles
  - Customers/end-users in Cambodia (2-3 students)
  - Developers in the US (3-4 students)
- Communications
  - How? Chats (AOL instant messenger), emails (mailing-lists), face-to-face meetings (local teams)
  - Initialization of the communications (first week of class)

Setup: Roles & Responsibilities

- US students:
  - "Capture" the requirements
  - Propose design options
  - Implement the software
  - Test the software
  - Handle requirements changes and integrate feedback
  - Deliver a software for their client
  - Report on the ITC team
  - Answer a weekly questionnaire
  - Maintain a web page for the project, maintain a blog, save all chats, archive emails
  - Describe and reflect on the software engineering process and communication protocol followed
  - Present their work professionally
  - Do a demonstration of their software



Setup: Roles & Responsibilities

- Cambodian students:
  - Describe environment/problem/software
  - Review and give feedback on the requirements, design and testing documents
  - Test the software
  - Report on the Pace team
  - Answer a weekly questionnaire
  - Accept or reject the software
  - Present their experience
  - Do a demonstration of the software

How to monitor Students Work?

- Strict deadlines
- Regular deliveries (with review/feedback and iteration)
- Weekly recording of the communications of the local and extended teams using an online questionnaire
- Maintain blogs, archive emails, save chats
- Interviews of the students by the professor and an external evaluator
- Reflections on the software engineering and communication processes

Communication Questionnaire

- To record chats, emails, face-to-face meetings
- When did the communication take place?
- Between whom the communication took place?
- What was the main topic of the communication?
- Was the communication more on planning, checking or a mixture of planning/checking?
- Was the communication useful or not?
- Use of http://www.questionpro.com

Preliminary Findings: Issues

- Availability of the client
- Very demanding client
  - Changes in requirements
  - Addition of functional requirements
- Coordination (semester/trimester and vacations)
- Language barrier

Preliminary Findings: Positive Points

- Software engineering
- Involvement of a client
- Multicultural experience
- Experience reflects a typical IT Offshore Outsourcing scenario (albeit reversal of traditional roles)
- Learn to overcome/deal with issues related to IT Offshore Outsourcing
- This experience helps students become more entrepreneurial
  - Discover the opportunities of being entrepreneurial in IT Offshore Outsourcing
  - Thinking about organizational/social/wider implications of what they are doing
  - Accountable and have to work with people they have never physically met

Preliminary Findings: Questionnaire Results

- Emails > Chats
- Chats take place mainly between 9 pm and 12 am
- Less chats as the project proceeds
- Emails are sent to the local or extended team rather than to an individual
- Communications are many to many, or through a mediator
- Students talk about the same things in the emails and chats
- Chats are used more for checking
- Emails are equally used for checking and planning
- Face-to-face meetings are used more for planning

Future Work

- Analysis of this semester results to be in a more knowledgeable position to repeat the experience
- Setup for next year:
  - Initial face-to-face preparation and agreement period with the Cambodian team during a field trip
  - Students should get a flavor on how to initiate and work out the ground rules for such projects
  - More bonding activities
  - Both sets of students will experience and learn about the problems and skills associated with both sides of the IT Offshore Outsourcing equation
  - Use of more sophisticated collaborative tools

Future Work

- How to influence and make suggestions to change the CS curriculum and better prepare our students in the IT Offshore Outsourcing context?

Thanks

- Pace University Students
- ITC Students
- AUF (Agence Universitaire de la Francophonie)