Economics of Information Technology

Fall 2010
Instructor: Dr. Yung-Ming Li

Course Information

- Instructor: Dr. Yung-Ming Li
- Meeting time:
  - TH 0900-1200
- Meeting room: MB 312
- Office hours: Tuesday 1000-1200 or by appointment
- Email: yml@mail.nctu.edu.tw
- Web: www.nctu.edu.tw/~yml

Instructor’s Information

- Name: Yung-Ming Li
- Education
  - Ph.D., University of Washington (Information Systems)
  - M.S., University of Southern California (Computer Science)
  - B.S., National Chiao Tung University (Computer & Information Science)
- Experiences
  - TA/RA (UW Business School)
  - A start-up cofounder (KEYNet/KEYCITI)
  - A lecturer (KYU)
  - An engineer (Institute for Information Industry)

Research Interests

- Topics Problems/Modeling
  - Economics
  - Operations
  - Technologies

IS Methodologies

- Economics
- Game theory (Equilibrium of distributed individual decisions)
- Computer Science
- Algorithm (Heuristic, discrete methodologies)
- Operations Research
- Optimization (centralized optimal solution for resource allocation)
CS v.s. Econ - Examples

1. Online Auction (eBay)
   - Technology issues: networks security, database, AI, etc.
   - Economics issues: auction rule design (who will win? Intermediary, bidders, sellers, or society), reputation/trust, etc.

2. P2P Networks (Kazaa)
   - Technology issues: content search and download protocol and network topology design, etc.
   - Economics issues: Incentive to sharing (free riding), pricing P2P networks services, etc.

CS v.s. Econ – Examples (Cont’)

3. Knowledge Management
   - Technology issues: workflow design, data mining, document presentation, etc.
   - Economics issues: incentive mechanism to induce cooperative sharing behavior, stability and efficiency, etc.

4. Digital Media (content)
   - Technology issues: multimedia, compression technology, DRM technologies, etc.
   - Economics problem: versioning content, bundling content, etc.

Course Objectives

- IT economics becomes one of the IS main stream areas in US (research papers in top journals and courses offered in top business schools)
- IT changes traditional economic behavior (like Auction, P2P, Intelligent property, etc)
- Apply economics method to study the emerging Internet/digital economy

Course Objectives (Cont’)

Course Outline

- Introduction (IT Economics)
- Game theory
- Information asymmetry
- Networks externality
- Incentive mechanism
- Competition and cooperation
- Trust and reputation Mechanism
- Networks Pricing
- Digital Content Pricing
- Emerging Internet applications (P2P, DRM, electronic commerce, online community... etc)

Reference books

- Textbooks
Reference Materials

• Magazines
  – Business Week, Economist, Business 2.0 (start up)

Reference Materials (cont’)

Journals
  – Select research papers from
    • Management Science
    • Information Systems research (ISR)
    • MIS Quarterly
    • Journal of Management Information systems (JMIS)
    • Decision Support systems (DSS)

Course Activities

• Lectures (from the instructor)
• Homework practices
• General IT-Business articles and research papers reading, presentation, and discussion
• Term project

Lecture and Homework

• The instructor will provide the class notes for each lecture (Powerpoint)
• Homework will be assigned to help students practice and familiarize the methodologies
• All students are expected to try the problems by himself. However, you are highly encouraged to discuss the problems

Reading, Presentation, and Discussion

• Identify and position the research question
• Evaluate the proposed approach to the question
• Theoretical modeling issues
• Suggest a research question that would extend the work

Term Project

• Select a interesting, timely, and promising topic
• Emphasize the importance of chosen topic (technology and business opportunities)
• Utilize discussed methodologies to model the economic behaviors
• Derive managerial implications based your model
Grading

- Homework (30%)
- Presentation (30%)
- Midterm Exam (20%)
- Term Project or Final Exam (30%)

Lecture Part I-1
The Information Economy

- Information goods
- Cost structure of production
- Characteristics of consumption
- Networks effect
- Lock-in
- Compatibility and System competition