

Session 9, 3/8/07

### **Confidentiality**

- Proposals are posted online on the course MIT Server
- We should respect the confidentiality of proposals
- We will obtain a copy of the MIT Confidentiality Agreement and go over it
- We will bring in a guest lecturer from MIT's Technology Licensing Office to inform us about patents, copyright, confidentiality issues and the subject of technology transfer

### **Chapters 4 and 5 of *Diffusion of Innovations* (ppt slideshow)**

- Innovation Development Process Definition
- 6 main stages of innovation process: (ordered by time) 1. Needs/problems, 2. Research, 3. Development, 4. Commercialization, 5. Diffusion and Adoption, 6. Consequences
- Commercialization, Diffusion, Adoption, and Consequences all occur after innovation is already out there.
- Who develops innovations?
  - Users, government-sponsored research (policy makers), companies, skunk works (rogue groups within companies), university researchers
- Technology has two basic components: hardware and software
- Technology transfer = one way process
  - Role of technology transfer?
  - In Xerox PARC case, failed transfer from lab to society, from lab to company decision-makers
  - What makes a successful transfer?

- corporate advertising
  - affordability
  - ease of use, trialability
  - complexity/simplicity
  - compatibility -> Xerox PARC case was not
  - also need individual personalities, not just “computer nerds”
- Is there a mini diffusion process within companies?
  - Toshiba case (Laptops vs. PC's)
  - Xerox
- Linear design process? Not the case. It’s more of a dynamic, iterative process – what I call “Co-evolutionary Design for Development”
- 3 Levels of Technology Transfer
  - knowledge
  - use – trials
  - commercialization – adopting and spreading
    - personal experiences: Google Calendar, Gmail (need invitation to join)
- Technical Determinism – technology causes changes in society
- Social Determinism – technology shaped by social factors
- Which determinism is correct? Was the capacity to undergo the Industrial Revolution either innate or acquired. Did the Protestant work ethic drive it?
- Example: In a recent issue of *Science*, Clovis points are described as the first widely diffused innovation of a hunting tool in North America. This tool spread across America in a very short

time, but how?

- This tool proved very effective at hunting large animals.
  - What was its technological innovation?
  - What was the source of raw material?
  - Why was it effective?
  - What was hunted?
  - What were the environmental constraints that enabled this innovation to develop?
  - What were the variables of its social acceptance?

### Six Stages of Innovation Development Process

- Needs/Problems
  - Knowledge in US: Is it persuasion or deciding on one's own? i.e. does strong advertising force our decisions?
    - Cell phones: are they a necessity? What do they enable? People are practically forced to adopt them. Similar to Daylight Savings, which was initiated by farmers and those concerned about children returning in dark from school.
    - Preventative Innovations: Harder to sell because end user can't see anything happening, (e.g. smoking, dieting, maintenance of daily TB drug intake, vaccines, insurance, actions to advert Global Climate Change). Observability is difficult, diffusion is slower.
    -
- Research (basic and applied)
  - Susan describes experience with a wastewater treatment innovation, Chemically Enhanced Primary Treatment (CEPT)
    - Boston Harbor clean-up technology choice at Deer Island was highly controversial. Susan and her professor/mentor, Donald Harleman were advocating for the CEPT innovation for Boston Harbor

clean-up

- But this was politically unacceptable, so taken next they took the innovation to developing countries

- Development

- Commercialization

- Diffusion and Adoption

- Cape Cod windmills
- Big Dig (\$14billion project)

- Consequences

- Confirmation Stage: Examples:

- Cape Cod windmills
- Big Dig

- Adoptability affected by scale of project

- 3 Types of Innovations

### 3 Types of Innovations

Awareness exists

“How to”, i.e. how do you use it

Principles – how/why it works (e.g. Germ theory, washing your hands)

- Preventative Innovations – climate change
- Preventative innovations are harder to sell because can't see anything happening, only stuff not happening (e.g. Smoking, dieting, TB drug adherence, Global Warming, vaccines, insurance)  
Because observability is difficult, diffusion is slower.
- Generalizations about Early Knowers vs. Later Knowers
  - Gap has narrowed (due to internet)

- societal status
- sometimes opposite: Grameen Bank example
- depends on situation, type of innovation
- Who does one target for diffusion?

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EC.715 D-Lab: Disseminating Innovations for the Common Good  
Spring 2007

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