Administrative Issues

- Week 12 class will be held in week 11,
- right after our regular class
- Are there any time conflicts?

That means
- **Week 11**: 10.1.2008 13:00-14:30 and 14:30-16:00 (we will have 10mins break in between)
- **Week 12**: 17.1. 2008 no class
Overview

What do we serve today?

- Selected **Theories** of Knowledge Transfer
- Plus examples

---

Last Lectures:

- Knowledge Organization
- Broad Knowledge Bases
- Knowledge Acquisition

Today:

- **Knowledge Transfer**
Knowledge Transfer

**Knowledge Transfer**: Effective sharing of ideas, knowledge, or experience between units of a company or from a company to its customers. The knowledge can be either tangible or intangible.

(MIT, Definitions for Inventing the Organization)

What are instruments that can facilitate knowledge transfer?
Overview

• Knowledge Transfer through Organizational Knowledge Repositories or Memories
  – A different type of knowledge base
  – Many of the concepts from knowledge organization still hold (categorization, taxonomies, etc)
  – But embedded in an organizational context
  – Designed to facilitate knowledge transfer/retention in organizations
  – Often critical to organizations, less critical to employees

Knowledge Transfer
Background and State of the Art

Research on Knowledge Transfer focuses on

- Theories
  • Focus on the Nature of Knowledge Transfer
  • Example: Knowledge Flow Theory

- Modeling Languages
  • Identification, Visualization and Analysis of Knowledge Transfer Situations
  • Examples: B-KIDE, KDDA, KMOL

- Instruments
  • Improve and Facilitate Knowledge Transfer
  • Examples: Wikis, mentoring, experience factory
Knowledge Flow Theory
[Nissen 2004]

Classification of different types of knowledge flows along 3 dimensions

- **Explicitness**
  - Tacit / Explicit

- **Reach**
  - Individual, Group, Organization, Interorganization

- **Life Cycle**
  - Evolve, Apply, Distribute, Formalize, Organize, Create, ...

**Formalization:**
\[ a = a_1 e + a_2 r + a_3 l \]
Excercise:

Describe the following knowledge management instruments and techniques with Knowledge Flow Theory in a formal way:

- Folksonomies
- Ontology Engineering
- ConceptNet
- Games with a Purpose

Formalization:

\[ a = a_e + a_r + a_l \]

- Explicitness
  - Tacit / Explicit
- Reach
  - Individual, Group, Organization, Interorganization
- Life Cycle
  - Evolve, Apply, Distribute, Formalize, Organize, Create, …
Modes of Knowledge Creation
[Nonaka 1994]

Knowledge Transfer
[Alavi & Leidner 2001]
Overview

• Discretionary Databases

A shared database is discretionary if users contribute to the database voluntarily.

What are other examples of discretionary databases?

Types of Knowledge Reuse Situations [Markus 2001]

Four distinct types:

• **Shared work producers**
  – who produce knowledge they later reuse

• **Shared work practitioners**
  – who reuse each other’s knowledge contributions

• **Expertise-seeking novices**
  – who seek advise from experts

• **Secondary knowledge miners**
  – who seek to answer new questions or develop new knowledge
Types of Knowledge Reuse Situations
[Markus 2001]

Shared Work Producers:
- People working together in a team
  - e.g. a team of software developers
- Shared work producers create and document the knowledge they later reuse themselves
- Ideally, this makes it easier to reuse knowledge

Challenges:
- Filing, organizing and searching for knowledge might still pose challenges
- Example: Software Development
  (What did I want to achieve with this specific piece of code? What do my comments mean?)

Can you give other examples?
Types of Knowledge Reuse Situations [Markus 2001]

Shared work practitioners:
- People doing similar work in different settings, a Community of Practice
  - e.g. a group of software consultants
- Shared work practitioners produce and create knowledge for each other’s use

Challenges:
- quality of resources, up-to-dateness

Example: Professional Services
(What did my colleague consultant wanted to achieve with this specific piece of code? What do his/her comments mean?)

Expertise-seeking novices:
- People with an occasional need for expert knowledge
  - e.g. Secretary
- Knowledge producers differ significantly in their knowledge background from the knowledge consumers
- Expertise-Seeking Novices do not possess the required knowledge and do not need to acquire it themselves because they rarely need it

Challenges:
- Jargon, don’t know right questions, easy access, etc

Example: Secretary in need of PC administration knowledge
(How can I configure my computer to print on the network printer?)
Types of Knowledge Reuse Situations
[Markus 2001]

Secondary knowledge miners:
- People who seek to answer new questions or develop new knowledge through analysis
  - E.g. Website Analyst
- Shared work producers analyze records produced by other people for different purposes

Challenges:
- Induction

Example: Analyzing User Access Logs for Website Optimization
(What do users search for on our company website?)

The Tragedy of the Commons
[Garrett Hardin 1968]

http://www.sciencemag.org/cgi/content/full/162/3859/1243

Picture a pasture open to all, limited in space and food supply.

- Each herdsman will try to keep as many cattle as possible on the commons
- He will ask himself: What is the utility to me of adding one more animal to my herd?

  - The positive component: increment of 1 more animal to sell
  - The negative component: overgrazing – equally shared by all the herdsmen. Corresponds to only a fraction of -1
  - Conclusion: add as much animals as possible
  - Therein lies the tragedy of the commons. Each herdsman is locked into a system that compels him to increase his herd without limit – in a world that is limited.

Can you give examples of the Tragedy of the Commons in today’s world?
The Tragedy of the Commons
[Garrett Hardin 1968]
http://www.sciencemag.org/cgi/content/full/162/3859/1243

Examples of the Tragedy of the Commons

- Depletion of fish stock in international waters
- Traffic congestion on urban highways
- Pollution
- Global Warming / Climate Change

- Can you find others?

Examples of the Tragedy of the Commons

- Depletion of fish stock in international waters
- Traffic congestion on urban highways
- Pollution
- Global Warming / Climate Change

Can you find others?

Is knowledge as a form of a public good prone to the tragedy of the commons problem? If so, how?

Example: Online Forum
Knowledge sharing and social dilemmas

[Cabrera2002]

Social dilemmas describe paradoxical situations in which individual rationality – simply trying to maximize individual payoff – leads to collective irrationality.

-> The tragedy of the commons

The Free-riding / Defecting Problem:
to enjoy a resource (e.g. pasture, an information resource) without contributing to its provision

The Ramp up Problem:
Without users providing resources, no additional users will be attracted

In Knowledge Sharing contexts (as opposed to classic public goods), the cost of the contribution of knowledge does not lie in the contribution itself. The cost has to do with the process of making that idea available. [page 9]

How could we tackle this problem?
Three Potential Solutions
[Cabrera2002]

1. Restructuring the payoff function
2. Increasing perceived efficacy of individual contributions
3. Establishing group identity and promoting personal responsibility

Restructuring the Pay-Off Function
[Cabrera2002]

= Reducing the perceived costs or increasing the perceived benefits of contributing.

If the cost of contributing to a discretionary database is lower, the benefits associated with defecting are also lower

For a humorous example, see http://www.soledadpenades.com/2007/03/11/the-next-captcha-generation-for-myspace-forms/
Restructuring the Pay-Off Function

[Cabrera2002]

Two principle ways to increase individual payoffs:

- **Cooperation-contingent transformation**
  - A selective incentive or reward is offered which is contingent on an individual’s behavior
  - such as social recognition, can be extremely powerful incentives so long as they are public, infrequent, credible, and culturally meaningful

- **Public good transformation**
  - The perceived value of the collective gain is increased. If the value of the collective gain is greater for the individual than the cost, the incentive to cooperate will increase. (no direct rewards)
  - One way to increase the value of the collective gain is to combine a knowledge exchange program with a gain-sharing or profit sharing plan in which every individual receives a bonus based on the success of the knowledge-sharing program.

Examples:

- Make it easier for people to share information
- Information about the existence and rationale of systems
- Availability of training opportunities
- Assure that employees have the time and resources necessary

---

### Table 1

Examples of interventions aimed at restructuring the payoff function

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced information technology</td>
<td>• Reduce cost of contributing</td>
</tr>
<tr>
<td>Rewards or selective incentives</td>
<td>• Increase benefit of contributing</td>
</tr>
<tr>
<td>Gain-sharing programs</td>
<td>• Increase perceived value of collective gain</td>
</tr>
<tr>
<td>Align human resource policies with participation</td>
<td>• Increase benefit of contributing</td>
</tr>
<tr>
<td></td>
<td>• Send clear message about importance of knowledge exchange and creation for the organization</td>
</tr>
</tbody>
</table>

---
**Increasing efficacy**  
[Cabrera2002]

**Information self-efficacy**
- An employee’s belief that the information he or she has would be helpful to co-workers were they to receive it.

**Connective efficacy**
- is the belief that others will actually receive the information if it is contributed.

**Examples:**
- Provide feedback whenever others use their contributions

---

**Table 2**

Examples of interventions aimed at increasing the efficacy of contributions

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Objective</th>
</tr>
</thead>
</table>
| Provide feedback to contributors | • Increase information efficacy  
                                 | • Increase connective efficacy  
                                 | • Create further opportunities for knowledge combination and creation through deeper processing of others’ contributions |
| Ensure a critical mass of participants | • Make potential value of shared knowledge greater than individual cost  
                                         | • Increase information efficacy by reducing redundancies |
| Advanced technology          | • Increase connective efficacy by reducing search difficulties |
| Training                      | • Increase information efficacy  
                                 | • Increase connective efficacy |

---
Promoting group identity and personal responsibility [Cabrera2002]

A sense of group identity **influences contributions to a public good**, i.e. individuals share more information when common group identity was made salient [page 18].

**Axelrod: the probability of cooperation increases when**
- Interactions among participants are frequent and durable
- Participants are easily identifiable
- There is sufficient information available about each individual's actions

<table>
<thead>
<tr>
<th>Table 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples of interventions aimed at increasing group identity and personal responsibility</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourage communication</td>
<td>- Increase sense of group identity</td>
</tr>
<tr>
<td>Create knowledge sharing communities or communities of practice</td>
<td>- Increase frequency of interactions</td>
</tr>
<tr>
<td>Publicize information about employees' contributions</td>
<td>- Increase identifiability</td>
</tr>
</tbody>
</table>

Markus Strohmaier 2007
Example: Promoting Group Identity

Determinants of Knowledge Transfer
[Gupta 2000]

Value of Knowledge Stock $P_1(\cdot)$

Motivational Disposition to Share Knowledge $P_2(\cdot)$

Knowledge Outflows from the Subsidiary

Existence and Richness of Transmission Channels $P_3(\cdot)$

Motivational Disposition to Acquire Knowledge $P_4(\cdot)$

Knowledge Inflows into the Subsidiary

Absorptive Capacity $P_5(\cdot)$

Absorptive Capacity $P_6(\cdot)$

Figure 1. Determinants of intra-corporate knowledge outflows from and inflows to foreign subsidiaries: An overarching theoretical framework.
Motivation

Motivation to Learn

Extrinsic

Operant Conditioning

Social Cognition

Biology

Intrinsic

Cognition

Affect

Conation

Spiritual

http://chiron.valdosta.edu/whuitt/col/motivation/motivate.html
Sources of Motivational Needs

<table>
<thead>
<tr>
<th>Behavioral/external</th>
<th>social</th>
<th>biological</th>
<th>cognitive</th>
<th>affective</th>
<th>conative</th>
<th>spiritual</th>
</tr>
</thead>
<tbody>
<tr>
<td>• elicited by stimulus connected to innate stimulus</td>
<td>• imitate positive models</td>
<td>• increase/decrease stimulation (arousal)</td>
<td>• maintain attention to something interesting or threatening</td>
<td>• increase/decrease affective dissonance</td>
<td>• meet individually developed goal</td>
<td>• understand purpose of one's life</td>
</tr>
<tr>
<td>• obtain desired, pleasant consequences (rewards) or escape/avoid undesired, unpleasant consequences</td>
<td>• be a part of a group or a valued member</td>
<td>• activate senses (taste, touch, smell, etc.)</td>
<td>• develop meaning or understanding</td>
<td>• increase feeling good</td>
<td>• obtain personal dream</td>
<td>• connect self to ultimate unknowns</td>
</tr>
<tr>
<td>• eliminate threats to meeting goal, obtaining dream</td>
<td>• decrease hunger, thirst, discomfort, etc.</td>
<td>• decrease cognitive disequilibrium; uncertainty</td>
<td>• solve a problem or make a decision</td>
<td>• decrease feeling bad</td>
<td>• develop or maintain self-efficacy</td>
<td>• take control of one's life</td>
</tr>
<tr>
<td>• reduce others' control of one's life</td>
<td>• maintain homeostasis, balance</td>
<td>• figure something out</td>
<td>• eliminate threat or risk</td>
<td>• increase security of or decrease threats to self-esteem</td>
<td>• maintain levels of optimism and enthusiasm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• maintain levels of optimism and enthusiasm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Any questions?

See you next week!