

Evaluation of groupware

CT334/434: CSCW



CSCW Basics

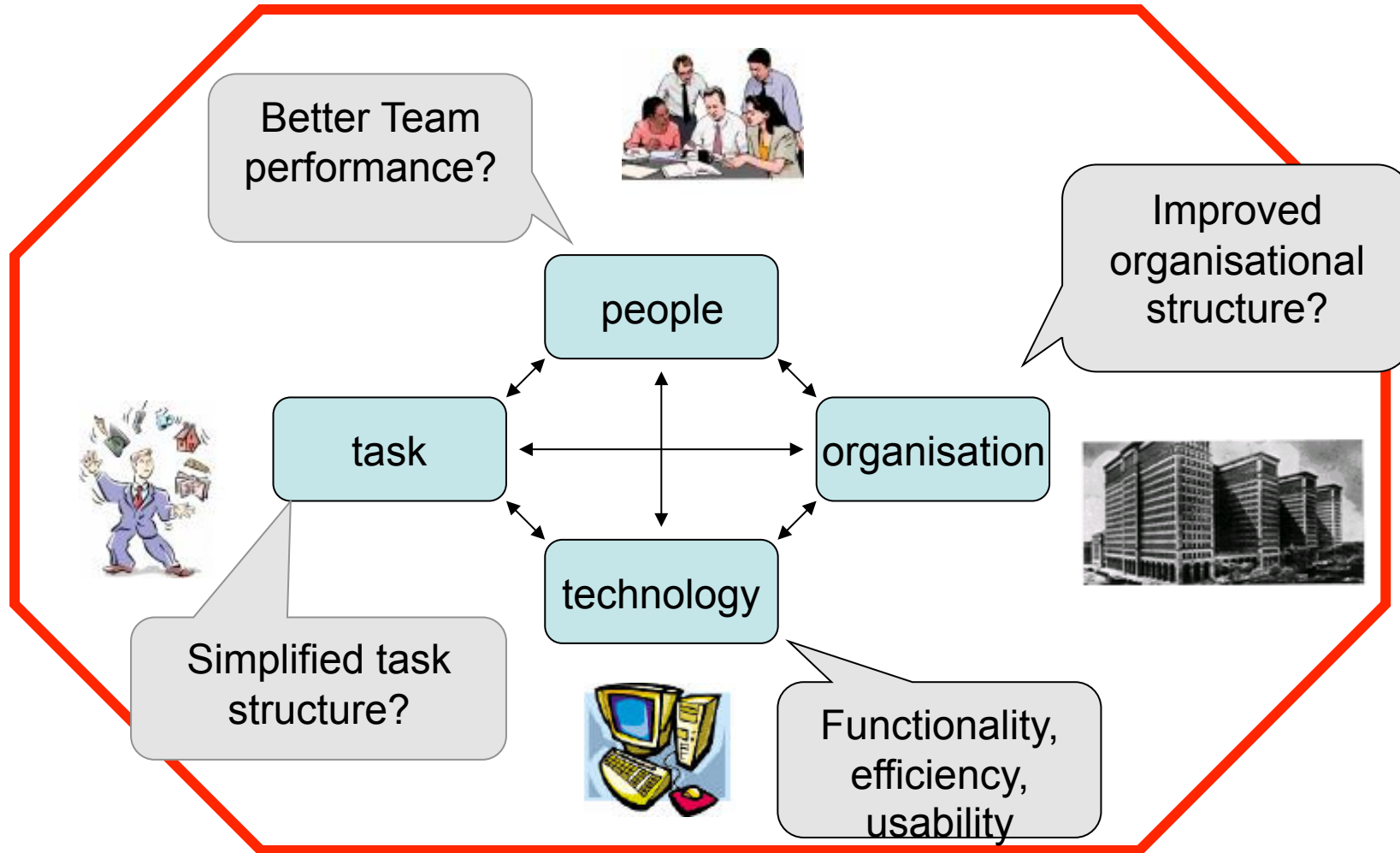
- Intro to Group Work
- Intro to Groupware
- Design of Groupware
- Evaluation of Groupware



Learning Outcomes

- After attending this lecture and reading the additional literature, you should be able to:
 - Explain what evaluation is
 - Understand what/when/how evaluation can be performed
 - Understand what type of knowledge can be derived by different evaluation methods

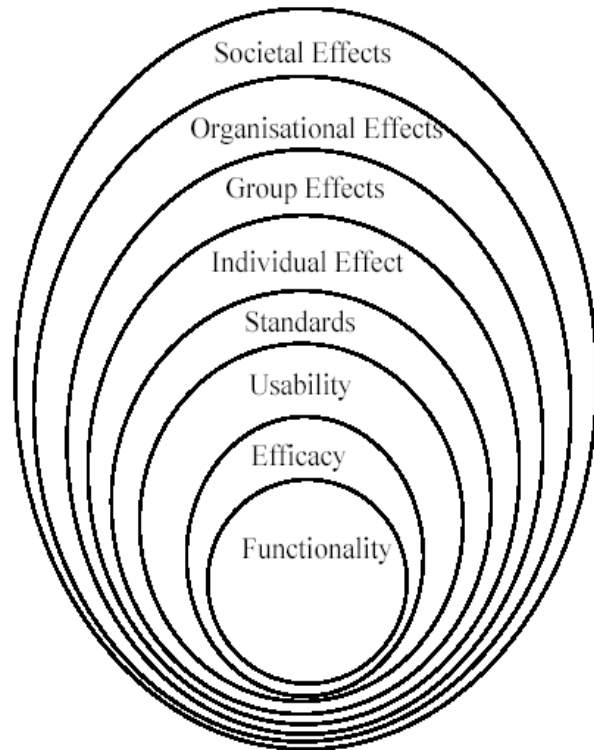
The Context



A difficult task

- The evaluation of CSCW systems is difficult, because
 - Many different factors affect their success
 - many disciplines study these factors
 - the interaction occurs over long time periods

What to evaluate?



1. Does it work? (*functionality*)
2. Does it work well enough? (*efficacy*)
3. Is it workable with? (*usability*)
4. Does it follow the *standards* laid down by various bodies? (*standards*)
5. What does it do to those who work with it? (*individual effect*)
6. What does it do to their work? (*group effects*)
7. What does it do to those they work with and for? (*organisational effects*)
8. What does it do to the world beyond work? (*societal effects*)

Evaluation criteria

- **Functionality:** reliability, robustness, efficiency, technical novelties
- **Efficacy:** does the system do what is intended/needed?
- **Usability:** interaction design issues
- **Standards:** consistency with requirements of various standards-making bodies
- **Individual effect:** psychological issues
- **Group effect:** socio-political issues
- **Organisational effect:** profit, security, changes
- **Societal effect:** cost/benefit, changes, socio-political issues

When to evaluate?

- **Concept evaluation**
 - Analyse potential impact of new socio-technical system on the basis of scenarios
 - Before implementation -> requirements (four principles of groupware design)
- **Prototype evaluation**
 - Test if the applications function as they were planned and whether user-interfaces are usable
 - During implementation -> grounded design decisions
- **Operational evaluation**
 - Evaluate impact of technology on work setting: communication, social interaction, quality of work and organisational efficiency
 - After implementation -> adoption knowledge & requirements for new technology

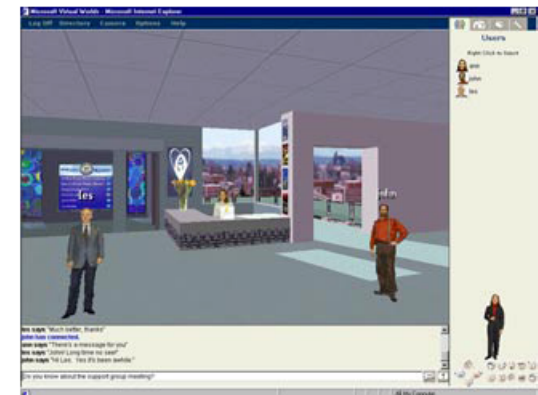
HutchWorld

- Virtual Worlds to enhance social support and information exchange among caregivers and patients
 - **Information services:** contact information, links to the institution's web site and related web sites, Seattle guides for transportation, shopping and restaurants.
 - **Social services** Bulletin Board Service, notes, gifts and email exchange, real time communication in 3D environment and text chat area.
 - **Diversiory services** users can make music together by interacting with sculptures in a 3D environment, create a personal journal, web browse and play games.
- Microsoft Research & Fred Hutchinson Cancer Research Center



HutchWorld (2)

- **Concept evaluation**
 - Meetings with patients, caregivers & medical staff early in design
 - Observations in hospitals, schools, and research facilities
 - What: functionality, usability, individual and group effects
 - Physical world metaphor, social support, restricted entry
- **Prototype evaluation**
 - Early prototype tested on site with real users
 - Organisational effect: problems with technology deployment (staff training)
 - Functionality: chat-room did not achieve critical mass, asynchronous communication was needed
 - Individual/group effect: users felt obliged to talk
 - Later prototype tested at Microsoft
 - Usability
- **Operational evaluation**
 - portal version: limited field trial



How to evaluate?

- **Inspection methods:** evaluators ‘inspect’ an interface according to a set of criteria
 - Heuristics (HCI)
- **User observations:** evaluators observe users performing tasks within a semi-controlled setting
 - User testing (HCI)
 - Laboratory experiments (cognitive/social psychology)
- **Verbal methods:** evaluators ask users their opinion
 - Interviews, Questionnaires, Focus Groups and Customer Feedback (social psychology & marketing)
- **Field studies:** evaluators study people interacting within their world
 - Ethnography (HCI)
 - Conversation Analysis and Interaction Analysis (Ethnomethodology)

Heuristic evaluation

- Evaluation by experts according to, guidelines for good design, or checklists of usability.
 - Inexpensive, fast and easy
 - Too general; tend mainly to address usability
 - Group/societal/organisational effects may be lost
 - Research on community is working on heuristics for sociability

Heuristics for CSCW

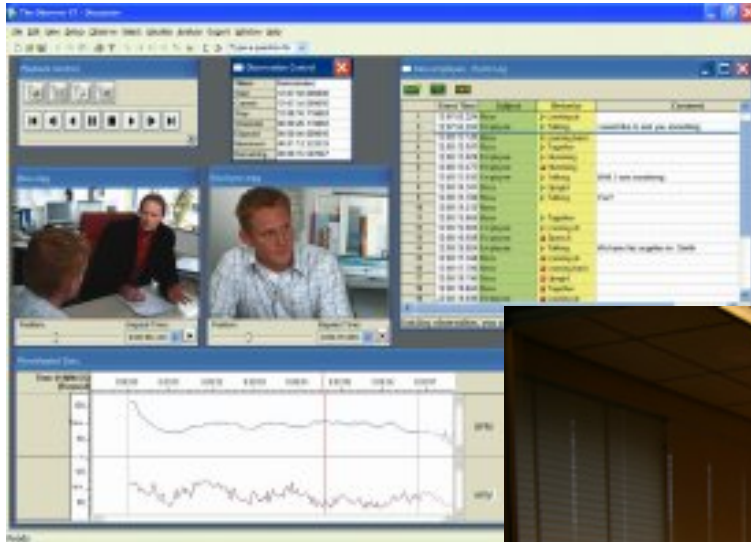
1. **Provide the means for intentional and appropriate verbal communication**
2. **Provide the means for intentional and appropriate gestural communication**
3. **Provide consequential communication of an individual's embodiment**
4. **Provide consequential communication of shared artifacts (i.e. artifact feedthrough)**
5. **Provide protection**
6. **Management of tightly and loosely-coupled collaboration**
7. **Allow people to coordinate their actions**
8. **Facilitate finding collaborators and establishing contact**

Laboratory experiments

- Collect quantitative data about selected factors, attempting to control other influences
- Hypotheses testing
 - Compare prototypes (prototype evaluation)
 - Study social dynamics (operational evaluation)
- Decontextualised and artificial setting
 - Difficult to select a representative sample
 - Short observation



Laboratory settings



On-line experiments

- Participants are ‘observed’ while performing task on-line (e.g., community
 - Control on sample (registration, invitation by e-mail)
 - Logging behaviour
 - Hypotheses can be tested by assigning participants to different experimental conditions

Verbal methods

- Questionnaires, interviews, focus groups
- Can be used to investigate several dimensions
 - individual/social/organisational/societal effects
- Self-reports
- Useful at every stage of the evaluation cycle

Questionnaire: example

- Collaborative writing

- 41 participants

- 3 groupware

- 83% word

- Benefits

- better product

- Drawbacks

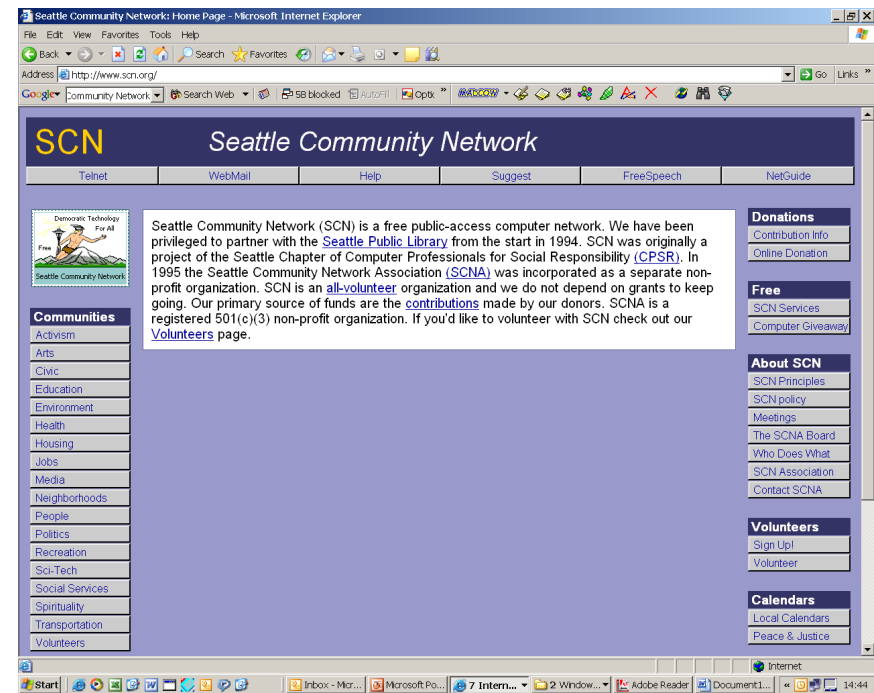
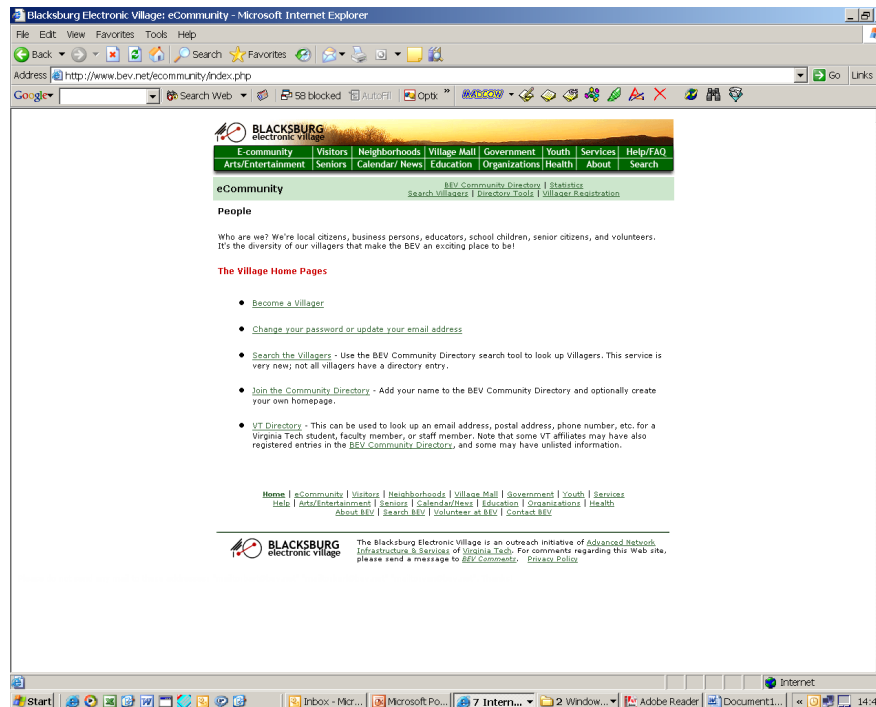
- Making the task more difficult

Reasons	N	Position		
		First	Second	Third
Discuss the document's content	38	Email (34%)	Meeting (32%)	Phone (25%)
Discuss the document's structure	35	Meeting (38%)	Email (35%)	Phone (19%)
Discuss the division of work	33	Meeting (40%)	Email (38%)	Phone (23%)
Write the text	31	Email (50%)	Meeting (21%)	Other (17%)
Edit the text	36	Email (50%)	Meeting (23%)	Other (14%)
Resolve conflicts	33	Meeting (37%)	Email (33%)	Phone (17%)

Ethnography

- Contextual approach that requires a prolonged period of immersion in the social setting being studied
- Special skills are required to the researchers
 - they should become ‘part of the team’ or
 - ‘hang around’ without interfere
- Huge amount of data is collected
 - audio and videotapes, field notes, descriptions and diagrams of the work setting, and samples of various artefacts
- Useful to investigate group/organisational/societal effects

Ethnography: example



Conversation/Interaction Analysis

- Study real group interactions as revealed by their conversation and actions
- Data driven;
- Used on video-conferencing, e-mail,
- Understand what people do, not why they do it
- Useful to investigate group/organisational/societal effects

Example



- On-line Aibo Discussion Forum
 - Technological essences + 75% -8
 - Life like essences + 48 -12
 - Mental states + 60 – 4
 - Social rapport + 59 – 8
 - Moral standing + 12 -2

WHAT!? They Actually THREW AWAY aibo, as in the GARBAGE?!! That is outrageous! That is so sick to me! Goes right up there with Putting puppies in a bag and than burying them! OHH I feel sick...

Summing up

- CSCW evaluation is complex
 - Several evaluation criteria
 - Several methods
 - Inspection
 - User observations
 - Verbal methods
 - Field study

Conclusion

- Multiple methods should be used to evaluate CSCW
- Choice depends on the questions to be addressed and the training and skills of the researchers

Additional readings

- **Preece - chapter 10 -**
- **Hutchworld: Lessons Learned.** Cheng, et. al.
<http://research.microsoft.com/scg/papers/hutchvw2000.pdf>
- **Evaluation of cooperative systems project**
<http://www.comp.lancs.ac.uk/computing/research/cseg/projects/evaluation/index.html>