INF5200- CSCW

Refresher seminar
2016
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Outline

• Purpose and expected outcome
• Tone’s introduction: early reflections about work, some related concepts
• Theories
• Interplay between work, technology, tools, activities and design
• Reflections about socio-technical/ socio-cultural complexity of work-context in organizations
Expected outcomes

• Give an overview of the CSCW research domain that may constitute a basis for own research in the field.

• Be able to give an account of the most important research traditions and problem statements within the field,

• Get familiar with current debates about CSCW and the development of CSCW research focus

• Know some groupware examples

• Develop own positioning within the research field
Alexander Read’s lecture
complexity of CSCW

• Cooperative work in science (multidisciplinary+ distributed+ many people + various locations+ different time- zones, +++++)

• High energy particle physics

• Tools for Global Collaboration – A quick look at a CERN experiment

• Precision measurements of Higgs boson production in the decay channel to two photons in the ATLAS (A Toroidal LHC ApparatuS) experiment at the LHC (Large Hadron Collider), a particle accelerator at CERN (the European Organization for Nuclear Research) in Switzerland
CSCW

• A set of «concerns» about supporting multiple individuals working together with computer systems
• CSCW: examines cooperative work arrangements, support requirements and mechanisms, design and usability of technology in actual work settings
• CSCW as «constructive» research domain - design oriented for developing better CSCW systems (Schmidt & Bannon)
• Groupware is associated with the ”computer support” part. It supports groups of people engaged in a common task, for a goal, and provides an interface to a shared environment
• Implications for organizations: communication, coordination, collaboration, cooperation, articulation, .......
Cooperative work

Mandatory readings


Additional readings


• Cooperative work as interactional work: Polymorphous, orderly activity, has duration, involves effort, organized commitments & expectations for a shared goal (Wittgenstein)
• Articulation work as: cooperative work arrangements (who should do what, how, when and where?)
• Workflow as: structured process around actions
• Workflow systems as: technologies for organizational ordering
• Ensembles as: unstructured aggregation of people
• Group centrality, group-ware, mutual dependency, accountability, common information space
Theories in CSCW: work and work practices

Mandatory readings

Additional readings
• Work, cooperative work, complex structure of organized commitments (Schmidt, Gasser)
• Coordinative practices: Adapting, fitting, augmenting, working around - handling misfits (Gasser)
• Articulation work/ disarticulation and the need for private spaces (Clement& Wagner)
• Primary, secondary work, visible and invisible work (Gasser, Schmidt; Suchman, Strauss)
• Work lattice, arc of work/ clusters of tasks, work trajectory (Gasser, Strauss): Organization, reorganization, maintenance, disruptions
• Work- arounds
Groupware exercise

• Challenges
• Potentials
• Limitations
• ......
Cooperative work in IT

Mandatory readings

Additional readings
• Nature of software work and need for cooperation practices and division of labor
• Modular decomposition as « responsibility assignment» to reduce dependencies (Grinter)
• Recomposition, for better «fit»
• Coupling, information hiding/ black boxing in software design
• Software dependencies, local, global, trade-offs (due to hardware constraints)
• Changing dependencies amongst modules, restructuring, configuration management
• Shared understanding of dependencies requires coordination and communication- same site, cross site (Agile project)
• Configuration work (Balka & Wagner)
• Articulation work in project management: design, testing, implementation, testing,… (procter et al.,.)
Theories in CSCW
Activity Theory

Mandatory readings

Additional readings
• Kaptelinin, V.: The Object of Activity: Making Sense of the Sense-Maker 2005. Mind, Culture and ACtivity Volume 12 Issue 1, pp. 4-18. online access
AT

- Vygotsky, Leont’ev, Rubinstein, and others, started in 1920s
- Activity Theory is a framework or “descriptive tool for a system”
- Used often to support ethnographic research methods that track and analyze the history and development of a practice
- Cognitive based theory including socio-cultural aspects of actions/activities.
- People are socio-culturally embedded actors. Subjects of activities have needs, which should be met through an interaction with the world
- Dynamics of cooperative work: co-ordinated, co-operative and co-constructive activities (Bardram)
Activity triangle
• The role of group interactions in constructing and coordinating different work activities
• Actions are implemented through lower-level units of activity, called operations.
• Operations are routine processes providing an “adjustment of an action” to the ongoing situation.
• Activity occurs between a subject, an object and a community. Subject and object relate through mediation of artifacts, subject and community relate through norms and regulations, and object and community relate through different power relationships and division of labor.
• Role of artifacts as mediators of human activity, and of cooperative breakdowns (why they happen). Important to notice that breakdowns in organizations promote the development of better systems - technical, work practices, organizational structure, ..., (Halverson, Bardram and Kaptelinin)
• The unit of analysis is the motivated activity directed at an objective (goal), where activity normally features a division of labor.
Principles

• Object-orientedness

• Internalization/externalization. Internal activities cannot be understood if they are analyzed separately from external activities.

• Internalization provides means for people to try “potential interactions with reality” without performing “actual manipulation with real objects” (mental simulations, conceptual models, considering alternative plans, etc.)

• Externalization transforms internal activities into external ones.
• Mediation

• Activity Theory emphasizes that human activity is mediated by tools in a broad sense

• Tools are created and transformed during the development of the activity itself and carry with them a particular culture
AT; why activity?

- Fundamental concept in CSCW, CSCL, HCI research and practice (Moran; Halverson; Bardram; Bodker; Kaptelinin; Bannon; Nardi; Bertelsen; Carroll; .....)
- Modern work at organizations is cooperative
- People perform different tasks for specific goals
- Understanding the “meaning” of tasks and activities for designing assistive technologies
- Interactive technologies are widespread and integrated into modern work-practices
- Technology based activities better supports new task forms and developing “smart solutions”
- Developing Joyous activities offer us joyful experiences
• To streamline our common understanding of the concept of activity
• Platform to scientifically analyze complex work activities
• Differentiate between work/ non-work activities
• Differentiate between «activity analysis» and «task analysis»
• Relates human cognition to collaborative activity
• Connects human activity, motives, operations, mediating artefacts (physical or psychological), and the mediation process together
• Offer researchers a common established platform to guide their CSCW research
At demonstrates

• Activity context in CSCW, CSCL and HCI studies

• Usefullness of tools and their limitations
Some relevant literature

Theories in CSCW
Actor-Network Theory (ANT)

Mandatory readings


Additional readings


• Latour, B. Actor-network theory. A few clarifications plus more than a few complications, 1996. [online access].


Different concepts: Artefacts, actants, heterogeneous networks of human and non-human actors, alignment, inscription, translation, enrolment, delegation, displacement (Latour; Callon; Law; Berg)

Technologies-in-use (Berg; Aanestad)

Articulation work (Berg)

Mediation
Infrastructuring and eScience

Mandatory readings


Additional readings

Infrastructures

• Infrastructure as hierarchy of systems, networks, relations (Star), standards, interoperability, transparency, and sustainability

• Information space (Schmidt), cyber social communities (Ribes and Lee), participatory design (Karasti)

• Visible upon breakdown

• Infrastructuring as activity & distributed work - delegating responsibilities
• Star & Ruhleder (historic socio-technical)
• Star & Bowker (understanding of infrastructures and contextualized relations based on dimensions of embeddedness, transparency, scope, membership in a community of practice, links with conventions of practice, built on installed base, becomes visible on breakdown)
• Cyber infrastructure as a computational infrastructure supporting research activities, collaboration, data-sharing and analysis.
• Emphasis on long-term support, large scale and cross-disciplinary collaboration
• It supports relationality (themes and actors to each other)
• Heterogenous integration (human actors, technologies, processes)
• Sustainability (foundation for interoperability)
• Scalable (taking account of future increase in volumes)
• Supports automation of tasks (human-machine)
• The social involvement
• Infrastructural inversion – focusing on activities involving maintenance, upgrade, breakdown (Bowker)
• Challenges: multidisciplinary, long cycles of development, technical
• Unit of analysis is the singular project
Concepts in cscw Awareness

Mandatory readings


Additional readings

• Gross, T.: *Supporting Effortless Coordination: 25 Years of Awareness Research*, Journal of Computer Supported Cooperative Work 22 (4-6), 2013: 425-474 [online access]


• Awareness of what? Shared workspace, collaborative activities, shared agreements, critical situations, background awareness, passive awareness, reciprocal awareness, peripheral awareness

• Activities of others which provide a context for your own activity; actors taking notice of the context of joint effort/work (Dourish & Bellotti)

• Important for cooperative, coordinated and co-constructive activities

• Distributed cognition (Heath & Luff)

• Shared feedback to increase awareness

• Mechanisms supporting awareness; informational (controlled by sender than recipient), role restriction (affects awareness of progress and joint activity), role switching
• CSCW systems supporting awareness often reveal automatic information about location, activity of remote colleagues such as computational environments for:
• collecting, dissemenating and integrating information relating to cooperative activities)
Cooperative mobile work

Mandatory readings

Additional readings
• Collaborative activities: colocated, synchronous, asynchronous, dispersed: affecting the social context of work.
• Mobility of people & artefacts
• Communication (process & technology), needs configuration
• Interaction through objects leads to dependencies. What about breakdowns?
• Local mobility, walkabouts supports collaboration by maintaining awareness, passive information gathering
Pervasive technology

Mandatory readings


Additional readings


• Bardram, J.E. & Bossen, C: Interwoven Artifacts — Coordinating Distributed Collaboration in Medical Care, 2004. Technical report, Centre for Pervasive Computing. online access


• Technology entering the physical world to bridge the gap between the physical and the virtual
• Central features: application of natural, multimodal user interfaces that are robust, trustworthy, user-friendly, and flexible
• Navigational support needs interaction and appropriation
• Accuracy versus precision (fire-fighters example)
• Tacit communication
• Common information space
• Improvisation (Ley et al.)
• Relevance of pervasive technologies to CSCW
Theories in cscw
Coordination mechanisms

Mandatory readings


Additional readings


• Coordination mechanisms as conceptualization of structures in the work arrangement

• Symbolic organizational constructs: artifacts, protocols, meetings, forms, procedures, work arrangements, ... to mediate the articulation of cooperative work, align work tasks and practices, and to reduce complexity of articulation work (Carstensen & Sørensen; Schmidt & Simone)

• Boundary objects synonymous with «interpretive flexibility» (Star)

• Linkability: by aligning each mechanism with other mechanisms to facilitate seamless alignment of articulation work. This requires stability

• Malleability: possibility for changing the behaviour of a mechanism (Schmidt & Simone)
CSCW outside work: virtual worlds and social media

- **Mandatory readings**
  - Bardzell, J., Nichold, J., Pace, T., Bardzell, S.: *Come Meet Me at Ulduar: Progression Raiding in World of Warcraft*, 2012. ACM, CSCW. [Fulltekst](#).

- **Additional readings**
  - Scissors, L., Burke, M. & Wengrovitz, S.: *What’s in a Like?: Attitudes and behaviors around receiving Likes on Facebook*, 2016. CSCW’16: 1501-1510. [Online access](#).
  - Park, J., Ciampaglia, C.L. & Ferrara, E.: *Style in the Age of Instagram: Predicting Success within the Fashion Industry using Social Media*, 2016. CSCW’16: 64-73. [Online access](#).
• Sociality of activities, relations (Nardi & Harris), relations, meaning-making, values
• Ludic pursuits: socially organized (tracking, intercepting players, collaborative sweeps)
• Ludic pursuits articulation: crafting, chatting
• Space of play: Informing design for ludic pursuits,
• Organised groupings, cultures of players, game design, allowances of the internet
• Joint construction of information space (Schmidt): routines, distributed coordination, structured & unstructured cooperation, adversial cooperation, distributed awareness, interruptions, monitoring (Heath & Luff)
CSCW outside work: in the home and outdoors

Mandatory readings
- Grinter, R; Aoki, P.M; Hurst, A; Szymanski, M.H; Thornton, J. & Woodruff, A.: *Revisiting the visit: understanding how technology can shape the museum visit*, 2002. CSCW'02 :146 - 155. [online access at ACM's Digital Library].

Additional readings
• Technologies in home-care; Interconnected technologies
• Ambient assisted living
• Designing computer systems for home environments: technical, social, safety, usability challenges
• Enrollement
• Translation
• Ingrained practices (Bratteteig & Wagner)
• Articulation, coordination, primary, secondary, visible, invisible work....
Design of CSCW

Mandatory readings


Additional readings


• Design for anticipated, unanticipated use
• Design may support work procedures, activities,...
• Work articulation depends on the material and social conditions
• Common artifacts:
• Provides a design space to support cooperative work and fluid transitions
• conveys information at a glance, stimulates peripheral awareness
• Offers predictability in terms of function, consistency, compatibility and dependebility
Participatory Design & cscw

- **Mandatory readings**
  - Bratteteig, T. og Wagner, I.: *Unpacking the notion of participation in Participatory Design*, Journal of CSCW (in press)
- **Additional readings**
  - Bratteteig, T. og Wagner, I.: *Spaces for Participatory Creativity*, 2010. ACM. Participatory Design Conference: 51-60. [Fulltekst](#).
  - Bratteteig, T. & I. Wagner: *Disentangling power and decision-making in participatory design*, 2012. ACM: Proceedings of PDC. [Fulltekst](#).
- **Extra readings**
  - Suchman, L.: *Do categories have politics?*, 1993. Computer Supported Cooperative Work: Journal of Collaborative Computing, vol 2 no 3, 177-190. [online access](#).
  - Grinter, R.E.: *From workplace to development: what have we learned so far and where do we go?*, 1997. Proceedings of the international ACM SIGGROUP conference on Supporting group work : the integration challenge: the integration challenge (Group' 97), pp. 231 - 240. [online at ACM Digital Library](#).
• Participatory design as evolving practices amongst design professionals: politics of design nature of participation, methods, tools, techniques for participation (Kensing & Blomberg)
• Informed by, and responsive to people’s everyday work practices
• Distribution of power at work place
• Perspectives: pragmatic (workers know best), theoretical (designers and users have different experiences), political (people have right to influence their workplace)
• Decision linkages and empowerment (Bratteteig & Wagner)
• Cooperative design (Kyng)
• Computer based systems at work to control workers, not to improve work conditions
• Workers participation is important: analysis of needs, evaluation of technologies, design & prototyping, organizational implementation
• Participation and resistance (Bowers & Pycock)