Activity theory

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Outline

- Introduction
- Philosophical background
- Main concepts and principles
- Implications for human-computer interaction

Now, please spend 2 min. (one pair)
(1) looking up papers on scholar.google for your project
(2) Looking up papers on reddit for your project
What did you find?

- Were you able to get through 2 minutes faster?
- Was the choice of media important?
- Was the tool important?
- Were you paying attention to each other and to others?

Task analysis breaks down here. Activity theory can help.

Information-processing approach

Cognition
Information/processing

Perception
Action

Subject
Environment
Critics (even before IP existed!)

- Martin Heidegger (1889-1976)
  - Behavior is prior to knowledge
  - Phenomenology
- Jean Piaget (1896-1980)
  - Constructivist Epistemology
  - Bottom-up-constructed patterns of behavior
- Lev Vygotsky (1896-1934)
  - Psychological tools

Activity-centered approach
Activity Theory

- The theory evolved from the work of Vygotsky (1896-1934)
- Vygotsky was contemporary of Pavlov, the father of reflexology and then behaviorism
- Vygotsky criticized the mentalist tradition
  - Individual consciousness is built from the outside through relations with others… it must be viewed as products of mediated activity

Historical background

- Influenced by the Theory of dialectic materialism developed by Marx and Engels

“For Marx and Engels, labor is the basic form of human activity … Their analysis stresses that in carrying out labor activity, humans do not simply transform nature: they themselves are also transformed in the process … The tools that are available at a particular stage in history reflect the level of labor activity. New types of instruments are needed to carry out the continually evolving new forms of labor activity” (Wertsch, 1981p. 134-135)
Philosophical background

- Vygotsky appropriated ideas about how tools or instruments mediate the labor activity and extended those ideas to include how psychological tools mediate thought.

- He plays with the similarity between Marx’s notion of how the tool mediates human labor activity and the semiotic notion of how sign systems mediate human social processes and thinking.

- His point is that instruments are not only used by humans to change the world but also they transform and regulate humans in this process.

Vygotsky’s statements

- Psychological tools—language, writing, maps etc.—are artificial formations. By their nature they are social.

- They are directed toward the control of behavioral processes… just a technical means are directed toward the control of processes of nature.

- Emphasis on the mediation by psychological tools in the study of thinking and consciousness.
Activity Theory’s Critique of HCI (and Task Analysis)

- The role of artifact between user and task is ill-understood
- Focus on one user - one computer
  - vs. collaboration, work site, team, organization
- Interaction with system seen as end in itself
  - vs. a small part of a work/activity system
- Task analysis for user interface design
  - fail to capture the complexity and contingency of real-life action

Activity Theory examines Developing situations/systems

- All the elements of the system are continuously changing.
- Subjects not only use tools, they also adapt them.
- They obey rules, and transform them.
- They divide work and innovate.
- “finger painting”
A Perspective of Human Development

• people are socio-culturally embedded actors
  - not processors, or system components
• appropriateness of tools for a collective *practice*
  - *we design new conditions for collective activity*
  - *qualifications, work environment, division of labor*
• conflicts/contradictions in human development
  - *growth of expertise as solution to conflict in use*
• hierarchical analysis of motivated human action
  - *dynamically integrating levels of activity analysis*

Activity System
(Engestrom + Webb)

- Tools & artefacts
- Activity
- Subject
- Person
- Group
- Rules
- Community
- Division of Effort
- Object
- Experiences
- Knowledge
- Products
- Outcome
- Success
- Well-being
Main concepts

- **Subject**: the individual/subgroup chosen as the point of view in the analysis.
- **Tools**: physical or psychological.
- **Community**: individuals/subgroups who share the same general object.
- **Division of labor**: division of tasks between members of the community.
- **Rules**: explicit/implicit regulations, norms, conventions that constrains action/interaction
- **Object**: “the ‘raw material’ or ‘problem space’ at which the activity is directed and which is molded or transformed into outcomes”

Vision for human computer interaction

- **Human**
  - Users are actors having intentions/motivations/needs
- **Interaction**
  - There is a psychological relation between the user and the tool
  - What develops or is important is not always time, but emotions, social connections, trust
- **Computer**
  - A technical system does not immediately constitute a tool for the user. Even explicitly constructed as a tool, it is not, as such, a tool for the user,
  - A technical system only becomes a tool through the user’s activity,
  - A tool is never given, the user contributes to its design,
  - A tool in use is not the object of the user’s activity,
  - Tools can have real and important impacts on human activity
Implications for design

- Keep other aspects in mind besides time and task, per se
- Use the previous lists to keep in mind context
- The user experience is sometimes work, and sometimes play, and sometimes something else entirely

- 1:40 to 2:12, tools to start to work back, includes model of users, tasks, and activities

https://www.youtube.com/watch?v=FF-6KL15FPE

References