Activity Theory

Fundamentals of Human-Centered Computing

Activity Theory

Blah

Blah

Today we will cover:

- What problems does Activity Theory try to solve?
- How does Activity Theory solve these problems
- How can we apply Activity Theory?
- What are good and bad aspects of Activity Theory?

The problems

What problems does Activity Theory try to solve?

The problem

Cognitive approaches (including DCog):

Plans are generative concepts, HCI starts with a plan

Situated Action:

Plans are mere rationalizations, HCI starts with a situation

The problem

Realization: neither of these views is entirely accurate

- Plans are not fully generative (because of contingencies)
- Plans are not mere descriptions (because they provide structure)

Instead, plans are **anticipatory reflections** of recurring activity

Anticipation

The motive of activity

e.g. Why do I want to be in grad school? I anticipate a higher salary

The goal of actions

e.g. Why do I take this class? I anticipate it progresses my thinking

The orienting basis of the operations

cf. Cognitive Walkthrough: what is my current state and where do I want to be?

Plans

Plans shape activity, and are in turn shaped by it

> This is in line with Cultural-Historical Psychology (CHP), which views our mind and consciousness as a product of our activities, as reinterpreted by our brains

Whenever a plan fails, this is a learning opportunity

Plans and activities start out as **external** (e.g. using a textbook) and **collective** (e.g. getting help from others)

> They become internal and individual over time

The problem

A new goal for HCI: See plans themselves as situated actions

Design for plans, but allow them to be flexible

Study computers as mediators between subject and activity

The solution

How does Activity Theory solve these problems?

The solution

Activity Theory studies how people perform activities by interacting on several **different levels**:

Activity: “Going home”

Action: “Riding my bike” (a step towards the activity)

Operation: “Pushing my pedals” (an almost automatic process that implements the action)

These levels are **transient**

e.g. I am going uphill: biking moves from an operation to an action, or even an activity in itself

Artifacts

We employ internal and external **resources** to perform our activities

- Artifacts such as computers are external resources

We can use artifacts to:

- perform the operation
- control the task at hand
- coordinate the activity

Artifacts

In social settings, we can also use them to:

- manage our community
- adhere and implement rules
- divide labor

Artifacts

Important: We need to control the artifacts, as well!

Good tools are transparent; you forget that they are there

Good systems support **full activities** rather than just actions or operations

How? By implementing (rather than ignoring) the plans

But it has to be done flexibly!

Plans

Because plans and activities start out as external and collective, **culture** and **society** transform all our activities, and in turn, our minds

> Hence, plans and activities are socially constructed, and may evolve in the course of action (short term) and over time (long term)

Generalization

Activity Theory provides a **formal analysis** of artifacts and how they are used, and produces **comparative** data across settings

Generalizations occur by looking at the historical **development of activities** and the **artifacts** that exist as **mediators** between subject and activity

The method

How can we apply Activity Theory?

The method

The field of HCI can study the cultural practice of learning to use and using artifacts for operations, actions, and activities

- Social context gives meaning to this practice

Focus on the development, culture, and history surrounding the activities, and any tensions that arise

- Use culture and social context to interpret the activity and how it changes over time

Example

Patient Scheduler: develop a flexible system to track three kinds of plans:

- Protocols of treatment (standardized plans)
- Unraveling programs (first steps towards diagnosing and curing the disease)
- 24-hour care plan (a daily plan based on the protocols of treatment)

Also includes a patient's examination card (the instantiation of the plans for each patient)

Example

Goal: Increase direct collaboration by providing a means for communication, planning ahead, and sharing of patient files

Plans are a vital component, but:

- They are socially constructed
- They evolve
- The actual activity may deviate from the regular plan

Design implications

The system should record the construction, evolution and any deviations from the plans

- Reduces the need for communication
- Allows for changes at execution-time
- Enables the inspection of possible outcomes beforehand
- Monitors progress against the original plan

Plans implement a common culture

- System allows for the necessary flexibility

Design implications

The system supports the **activity** of patient care rather than just actions or operations of treatment!

Reflection

What are good and bad aspects of Activity Theory?

Reflection

Criticism: sometimes hard to detect what is object and subject, whether something is an action or activity

Response: If anything, just discuss strings of actions, motivated by “engagements” (requests, projects, problems, events, recurrent things) that accomplish a certain higher-level purpose

Reflection

Criticism: HCI only benefits from this approach for work that is coordinated, structured and/or flexible

Overkill for work that is barely flexible; or for work that has no structure or coordination (e.g. an artist's work)

Response: Many real-life work situations are flexible, structured, and require coordination

Activity Theory

What is the role of culture in Activity Theory?

What is the role of the situation?

How does Activity Theory see the relationship between culture and situation? How does cognition reconcile the two?

How can HCI support this process?

Activity Theory

Where do consciousness and intentionality reside in Activity Theory?

- The system?
- The situation?
- The individual?