

# Modeling Users 2



Predicting thoughts and  
actions in context



# Agenda

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- Other cognitive theories
  - ❖ Situated action
  - ❖ Activity theory
  - ❖ Distributed cognition
- User profiles/models -> implications
- Project Part 2 - Design Alternatives



# Cognitive/User Modeling

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## ➤ Remember the Idea:

. . . If we can build a model of how a user works, then we can **predict** how s/he will interact with the interface (before it is even built)



# Last Time

- MHP, GOMS, CCT, KLM technique
- All model human as an information processing “machine”
  
- What’s missing?



# (Social) Context

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- Human information processor models all involve unaided individual
- In reality, people work with other people and other artifacts
- Other models of human cognition
  - ❖ Situation action
  - ❖ Activity theory
  - ❖ Distributed cognition



# Situated Action

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- Studies situated activity or practice
  - ❖ Activity grows out of the particulars of a situation
  - ❖ Improvisation is important
  
- Basic unit of analysis is “the **activity** of persons acting in a **setting**”



# Example

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- Need  $\frac{3}{4}$  of  $\frac{2}{3}$  of cup of cottage cheese
  - ❖ Just has a simple measuring cup available
- Person solves problem by
  - ❖ Measuring  $\frac{2}{3}$  cup
  - ❖ Pouring out into a circle
  - ❖ Divide into quadrants
  - ❖ Take away one
- One time solution to one time problem



# Situated Action Principles

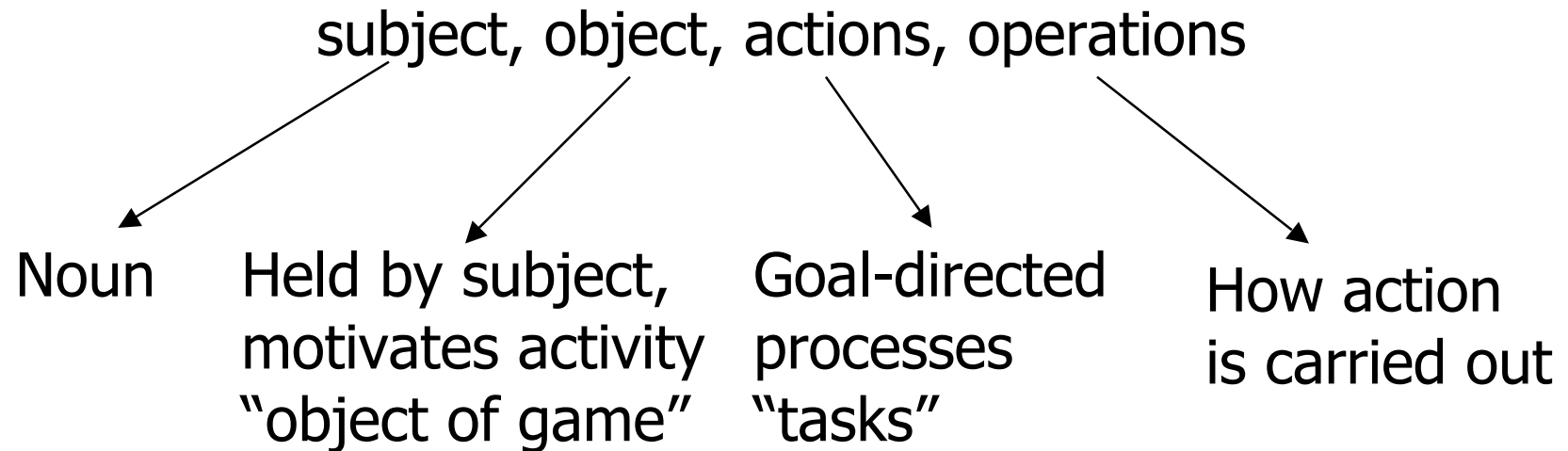
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- Structuring of an activity grows out of immediacy of the situation
- People engage in opportunistic, flexible ways to solve problems
  
- NOT Formulaic plans
- NOT Rational problem solving



# Activity Theory

- Unit of analysis is an activity
- Components:





# Activity Theory Principles

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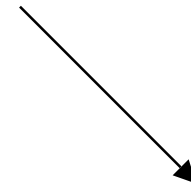
- Key idea: Notion of *mediation* by artifacts (objects)
- Our work is a computer-mediated activity
  - ❖ Starring role goes to activity
  - ❖ In “regular” HCI, stars are person and machine
- Context is not “out there”. It is generated by people in activities



# Distributed Cognition

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- Unit of analysis is cognitive system composed of individuals and the artifacts they use



like activity

- Studies the coordination and cooperation between people and artifacts in a distributed process



# Distributed Cog. Principles

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- NOT Individual agents
- Distributed collection of interacting people and artifacts
- Functional system is what matters, not individual thoughts in people's heads



# Simpler User Modeling

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- How do attributes of users (in their context) influence the design of user interfaces?
- Are there some design guidelines that we can derive from different attributes?



# User Profiles

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## ➤ Attributes:

- ❖ attitude, motivation, reading level, typing skill, education, system experience, task experience, computer literacy, frequency of use, training, color-blindness, handedness, gender,...

## ➤ Novice, intermediate, expert



# Motivation

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## ➤ User

- ❖ Low motivation, discretionary use
- ❖ Low motivation, mandatory
- ❖ High motivation, due to fear
- ❖ High motivation, due to interest

## ➤ Design goal

- ➔ ❖ Ease of learning
- ➔ ❖ Control, power
- ➔ ❖ Ease of learning, robustness, control
- ➔ ❖ Power, ease of use



# Knowledge & Experience

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## ➤ Experience

### ➤ task      system

- ❖ low      low
- ❖ high     high
- ❖ low      high
- ❖ high     low

### ➤ Design goals

- ❖ Many syntactic and semantic prompts
- ❖ Efficient commands, concise syntax
- ❖ Semantic help facilities
- ❖ Lots of syntactic prompting



# Job & Task Implications

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- Frequency of use
  - ❖ High - Ease of use
  - ❖ Low - Ease of learning & remembering
- Task implications
  - ❖ High - Ease of use
  - ❖ Low - Ease of learning
- System use
  - ❖ Mandatory - Ease of using
  - ❖ Discretionary - Ease of learning



## Project Part 2

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- Explore the DESIGN SPACE
- Three vastly different designs
- “Informed Brainstorming”
- Resulting in Poster Session
  - ❖ Purpose is to get feedback