## HCI User and Task Analysis

CS774 Human-Computer Interaction
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## Our Design Activities

- Establish process
- Task analysis

- Interface design

- Evaluation

- LUCID process model
- *Ethnographic observation*
- *Scenario development*
- Guideline development
- Prototyping
- Heuristic expert evaluation
- Usability testing
- GOMS KLM analysis

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## User and Task Analysis

- Documenting the user - the who
  - Who are your users?
  - Where do they work, what do they know, what are they trying to do, what is the organization like?
- Documenting the task - the what
  - What tasks are the user performing?
  - What is the goal, what is the action sequence, what are they thinking, what are the problems and opportunities?

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## Real Cases

- Kim Derrickson, Sam Droge - biology PDA
- Suchi Gopal, Jeff Morrisette - NASA
- Athletic department for recruitment

- Helpful to think about real people

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## User Analysis

- What do you need to know?

- Who are your users?
- Where do they work?
- What do they know?
- What do they do?

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## Who are your users?

- Demographic analysis
  - Age, income, class, country, company (hey! reg cards)
  - Who and where are they?
  - What subgroups do you have? Diversity issues?
- Organizational analysis
  - Who does the real work in the company?
  - Don't interview the manager who thinks they understand, interview the employee who does the work
  - (Talk to the manager as part of SE, not HCI)

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## Where do they work?

- Where will they use the software?
  – Home office?
  – Personal office?
  – Cubicle?
  – Busy space, like emergency room?
  – Hiking?
- What constraints does the place add to the UI?
  – Lighting, sound, attention, gloves, ...

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## Studying the space

- Photograph or videotape the space (w/ permission)
- What do you see?
  – Work products?
  – Access to manuals? Web?
  – Post-it notes? Crib sheets?
  – Awkward desks?
  – Distractions?
  – Phone? Other communication?
- Social environment. Where are any co-workers?

## What do they know?

- Know thy user

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## What do they know?

- Computer expertise
  - How comfortable/familiar are they with the system you plan to use? (Can you trust their self reports?)
- Cultural constraints
  - What background knowledge/biases may they have?
- Task knowledge and concern
  - How long have they been doing this?
  - What mental models do they have? Vocabulary?
  - Do they share your goals? Support the project?

## What do they do?

- What is their job description?
  - Are you automating a primary or secondary task?
  - What level of care/concern do they have?
- What is their day like?
  - Do they do this all day, or vary their routine?
  - How long do they have to perform the tasks you are considering automating?
  - Do they use the system infrequently, preventing habituation?

## Data Collection

- User surveys
  - Send 'em a survey
- Site visits
  - Go spy - watch them work
- Focus groups and interviews
  - Talk to them
- Exploratory prototypes
  - Show 'em what you're proposing

## Site Visits

- Advantage over surveys and off-site interviews
  - No problems with false memory or reporting
  - Can take notebook, camera, camcorder (permission!)
- Watch user perform tasks
  - Talk to them, solicit what they're thinking
  - If you can't talk to them, videotape them and review the videotape with them afterwards to find out what they were doing and thinking
  - Take notes

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## Task Analysis

- Start from your high concept
- What are the tasks involved? List them.
  - Routine, frequent tasks?
  - Infrequent tasks?
- Is the task new?
  - Can you observe the current method?
  - How does the automated task relate to existing ones?
- Who does a particular task?
  - Task matrix

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## Task Scenarios (Use case)

- Written description of task
- Different levels of formality
  - Scenario - basic script
  - Sequence - task broken into steps
  - Flowchart - task analyzed into sequences and options
- Include Norman's goal level
  - Don't focus too soon on specific intentions/actions

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## BioPDA- Scenario 1

- A field botanist goes out to survey a small flowering plant growing in the pine barrens east of Baltimore. She takes a backpack with notepad, PDA, field guide and ruler. When she gets to the field, she consults previous notes to remember the transit she took the previous trip. She then records general facts like temperature, clouds, She starts down the transit, stopping whenever she sees the plant. She notes if the plant has flowers or seeds, has any special conditions like yellow leaves, insect nibbles, insects on plant, and so on. She measures and records the plant height and width. She does this through the entire transit. She then takes the information home to analyze on a PC statistical package.

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## BioPDA - Scenario 2

- A ornithologist goes out to observe nesting bird behavior early in the morning. He drives out to a blind where he hunches down in relative dark to watch birds come and go from a nest. He uses a field scope on a tripod to watch the nest and observe when the parent birds come and go, when they feed the chicks, and what behaviors they exhibit (calls, movements) between each other and the chicks. He records the activity, the bird involved, the time and the duration for each event. The events are all categorized in advances, so he uses codes. Some days he will pick up the chicks to check for growth and signs like diseases.

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