CSE 440: Introduction to HCI
User Interface Design, Prototyping, and Evaluation

Lecture 03: Contextual Inquiry

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Tuesday/Thursday
12:00 to 1:20
Amazing Color Changing Card Trick

The colour changing card trick
Why did I show you that?
Why did I show you that?

If we are focusing on the wrong thing, we can completely miss other important things.

Our assumptions and pre-conceptions play a huge role in how we focus our attention.

Today is about this danger when understanding the context for which you design technology.
“You Are Not the Customer”

Seems obvious, but...

You have different experiences
You have different terminology
You have different ways of looking at the world

Easy to think of self as typical

Easy to make mistaken assumptions
Today

Project Progression

Ethnography

Contextual Inquiry

Distilling Models

Alternative Approaches to Understanding
Project Progression

Group Formation Today
   Please watch your email this afternoon
   Seating in section and in Tuesday lecture

Project Milestones
   Brainstorm in tomorrow’s section
   Contextual inquiry plan (1 page, what is your plan)
   Contextual inquiry check-in (1 page, in progress)
   Contextual inquiry review (4 pages of results and task analysis)

Reading Due Before Section
IEP Collect

Teacher Contextual Inquiry

Participants:
- Two Special Education Teachers
- One General Education Teacher

Successful IEP:
- "My experience of really strong IEP's occurs when parents feel empowered to be part of the process."

Tracking Progress:
- "I do everything from writing on sticky notes to writing on masking tape stuck to my leg to using a tablet to record daily observations."

- "A good IEP requires a lot of goals, and if you multiply that by many students it is hard to track all the students in detail."
IEP Collect

Parent Contextual Inquiry

Participants:
- Two parents whose children formerly had IEPs
- One parent with two children that currently have IEPs
- One guardian of a student with an IEP

The Process:
- “The lingo and paperwork are confusing, they come with 17 people and you are there by yourself.”

Communication:
- “right now I come in doing all the communications to get information”

Tracking
Today

Project Progression

Ethnography
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Ethnography

Traditional science attempts to understand a group or individual objectively

Understand the subject of study from the outside in a way that can be explained to “anyone”

Ethnography attempts to understand a group or individual phenomenologically

Understand the subject of study as the subject of study understands itself
Ethnography

Emerged in 1920s as a new anthropology method, exploring why groups think and act as they do

Learn local language, record myths, customs, and ceremonies in much greater detail than prior work

You will likely never perform an ethnography
Four Ethnographic Principles

Natural settings
Holism
Descriptive
Member point-of-view
Four Ethnographic Principles

Natural Settings

Conducted in the setting of the participant

Focus on naturally occurring, everyday action

Cannot use laboratory, experimental settings, or a phone call to gather this type of data

You really do have to go out there and see it
Four Ethnographic Principles

Holism

Behavior can only be understood in its larger social context; that is, holistically.
Four Ethnographic Principles

Descriptive

Study how people actually behave, not how they ought to behave.

Defer judgment.
Four Ethnographic Principles

Member Point-of-View

See through participant eyes in order to grasp how they interpret and act in their world.
Four Ethnographic Principles

Member Point-of-View

See through participant eyes in order to grasp how they interpret and act in their world.
Design Ethnography

Quicker than traditional ethnography
   Days, weeks, or months, not years
Sometimes “concurrent ethnography”
   The ethnography is being done
   at the same time that design is under way
Goal is to generate insights informing design
   Sometimes via “ethnographically inspired methods”
Translating from raw field observation
   to design ideas can be a difficult process
Today

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Contextual Inquiry

Applied design ethnography

“The core premise of Contextual Inquiry is very simple: go where the customer works, observe the customer as he or she works, and talk to the customer about the work. Do that, and you can’t help but gain a better understanding of your customer.”

Hugh Beyer and Karen Holtzblatt
What is your relationship?

In a scientist/subject relationship:
- The scientist does stuff
- The subject responds in some way
- The scientist collects data, goes back to their office, and analyzes the data to gain understanding

This is not very appropriate for gaining phenomenological understanding
User, Subject, or Participant?

Only two groups refer to their customers as users.

In traditional science, “subjects” are “subjected to” experiments as a researcher develops understanding.

In ethnographically-oriented design methods, “participants” instead “participate” in helping the researcher develop understanding.

This isn’t simple PC, it’s a mindset that matters.
What is your relationship?

In an interviewer/interviewee relationship:
- The interviewer asks a question
- The interviewee responds immediately
- At a pause, the interviewer asks another question from a list
- When all the questions are answered, the interview is over

This would only be appropriate for gaining phenomenological understanding if you knew what questions to ask in advance

Implying you have phenomenological understanding
What is your relationship?

In a master/apprentice relationship:

- The master is doing stuff
- The master explains what they are doing
- The apprentice asks clarification questions
- The master answers

This relationship is at the heart of contextual inquiry
Master/Apprentice Relationship

Seeing the work reveals structure

Many instances and many interviews reveal the picture

Every current activity recalls past instances

A customer describing how she learned a feature told us, “I looked it up in the documentation.” But when we asked her to look it up again, she was able to show us: “I looked the function up in the index and scanned the section. I saw this icon in the margin that I recognized from the screen, so I read just this paragraph next to it. It told me all I needed to know.” The documentation provided the context she needed to recover a detailed story, and the detail revealed aspects that had been overlooked—that the icon was her visual cue to the relevant part of the page.
Unique or One of Many?

“Take the attitude that nothing any person does is done for no reason; if you think it’s for no reason, you don’t yet understand the point of view from which it makes sense. Take the attitude that nothing any person does is unique to them, it always represents an important class of customers whose needs will not be met if you don’t figure out what’s going on.”

(p. 63, Contextual Design)
Not Quite Master/Apprentice

The goal is not to learn to do the task

Instead, the goal is to learn how the participant does the task in order to learn how to support it

And for the researcher to enlist the participant’s active assistance in understanding the task
Not Quite Master/Apprentice

In a contextual inquiry relationship:

The participant is doing stuff
The participant explains what they are doing
The researcher offers an interpretation
The participant agrees or corrects

Partners

Not really an interview
Not really an apprentice
Principles of Contextual Inquiry

Context
Must be done in the setting of the participant.

Partnership
Master/apprentice model; investigator is humble.

Interpretation
Observed facts must be regarded for their design implications. Raw facts without interpretation are not very useful.

Focus
Themes that emerge during the inquiry. You cannot pay attention to all facets of someone’s work at all times.
Context

Go to the workplace & see the work as it unfolds
People summarize, but we want details
Keep it concrete when people start to abstract

“Do you have one? May I see it?”
Context

Imagine studying how a student writes a paper

Why not just ask?
Context

Imagine studying how a student writes a paper

Why not just ask?

May not remember details

Getting roommate to read drafts

May skip critical difficulties

Trouble locating references on the Web
Avoid summary data by watching work unfold

We once asked a secretary how she started her day. Her answer was, “I guess I just come in and check my messages and get started.” She wasn’t able to go beyond this brief summary overview. It was the first thing in the morning and she had just arrived at the office, so we asked her to go ahead and do as she would any other morning. She unhesitatingly started her morning routine, telling us about it as she went: “First I hang up my coat, then I start my computer. Actually, even before that I’ll see if my boss has left something on my chair. If he has, that’s first priority. While the computer’s coming up, I check the answering machine for urgent messages. There aren’t any. Then I look to see if there’s a fax that has to be handled right away. Nope, none today. If there were, I’d take it right in and put it on the desk of whoever was responsible. Then I go in the back room and start coffee. Now I’ll check the counters on the copier and postage meter. I’m only doing that because today’s the first of the month. . . .”

Have them think aloud..
Context

“One customer said he would not use a manual’s index to find the solution to a problem: ‘It’s never in the index.’ He could not say what led him to this conclusion, what he had looked up and failed to find. All his bad experiences were rolled up into one simple abstraction: it’s not there. But when we watched him looking things up, we could see that he was using terms from his work domain, but the index listed parts of the system.”
“A customer was unable to describe how she made her monthly report. When asked to create it, she pulled out her last report and started filling in the parts.”
Context

Ground in an instance

Span time by replaying past events in detail

Look for holes

Ask questions to fill them

Use artifacts for context

If story has not yet ended, go back to a story that did not end.
Partnership

Traditionally, interviewer has too much power
  You don’t know what will turn out to be important
Apprenticeship model tilts power back too far
  You aren’t there to learn the skill
Interviewer should create a partnership
  Alternate between watching and probing
Partnership

Withdrawal and return

Researcher observes action that indicates something meaningful

The researcher asks about this, and the pair withdraw from the task

Discuss the question

Then return to the task

In one interview with a user of page layout software, the user was positioning text on the page, entering the text and moving it around. Then he created a box around a line of text, moved it down until the top of the box butted the bottom of the line of text, and moved another line of text up until it butted the bottom of the box. Then he deleted the box.

**Interviewer:** Could I see that again?

**Customer:** What?

I: What you just did with the box.

C: Oh, I'm just using it to position this text here. The box doesn't matter.

I: But why are you using a box?

C: See, I want the white space to be exactly the same height as a line of text. So I draw the box to get the height. (He repeats the actions to illustrate, going more slowly.) Then I drag it down, and it shows where the next line of text should go.

I: Why do you want to get the spacing exact?

C: It's to make the appearance of the page more even. You want all the lines to have some regular relationship to the other things on the page.
Partnership

Do not squash design ideas if they arise
This is design, not dispassionate science

Get instant feedback

If it works, you understand the work practice and have a solution

If it fails, you can improve your understanding of the work

Find the issues behind design ideas
Partnership

Avoiding Other Relationship Models

Interviewer / Interviewee

You are not there to get a list of questions answered

Expert / Novice

You are not there to answer questions

Guest / Host

Move closer, ask questions, be nosy
Interpretation

Chain of Reasoning

Fact, Hypothesis, Implication for Design, Design Idea

Design is built upon interpretation of facts

Design ideas are end products of a chain of reasoning

So interpretation had better be right

Share interpretations with users to validate

Will not bias the data

Teaches participant to see structure in the work
Interpretation

Instead of asking open ended questions...

“Do you have a strategy to start the day?”
“Not particularly.”

... give participants a starting point

“Do you check urgent messages first, no matter where they are from?
“Actually, things from my boss are important, because they are for me to do. Messages or faxes may be for anybody.”

Participants fine-tune interpretations

Probe contradictions until assumptions fit
Interpretation

Non-verbal cues can confirm or negate

Yes and Nos

“Huh?” – way off

“Umm, could be” – usually means no, just being polite

“Yes, but...” or “Yes, and” – depends on what follows

Commit to hearing what people actually say

Most have not ever had people actually pay careful attention to what they are doing
Focus

Everybody has a focus, you cannot prevent it

- Entering focus
- Project focus

Because you will have a focus, be mindful of that focus and use it to your advantage

Brainstorm and define your focus
Focus

Focus defines the point of view
  Clear focus steers the conversation
  Everyone in the team should have an entering focus
Focus lets the interviewer sees more
  Focus reveals detail
Focus conceals the unexpected
  Focus on one, and lose the other
Start with a focus and then expand
Focus

Opportunities to expand focus:

Surprises, contradictions, idiosyncrasies

Nothing any person does is for no reason

Nods

Question assumptions even if they match
“Do they really do that? Why would they do that?”

What you don’t know

Treat the interview as an opportunity to learn new stuff
Even if the participant is not knowledgeable, the extent of their knowledge / misinformation will be useful
The Stages of a Contextual Inquiry

1. Interview / Warm Up
2. Transition
3. Observe Behavior
4. Share Interpretation
5. Refine Interpretation
6. Wrap-up
Explain the Rules

Be sure you explain “the rules” of how you’ll be interacting during the contextual inquiry.

If this isn’t completely clear, the encounter may devolve into a traditional interview (since this relationship is more familiar to people).
How to Screw it Up

Slipping into abstraction
  Keep it concrete, in the work, in the details
Not being inquisitive or nosy enough
  If you have the impulse to ask, do it right away
Being too pushy with interpretation
  If you ignore corrections, participant will shut down
With the wrong person
  They need to be willing to partner with you
How to Screw it Up

Not being inquisitive or nosy enough

If you have the impulse to ask, do it right away

Turning it into a regular interview

If you could have done it in a coffee shop, then you didn’t do a contextual inquiry

Multiple people present

Can be good if they talk, surface their thoughts
Bad if they do not talk, are not forthright
How to Screw it Up

Overly disrupting the task

If you change the task, your data is less useful
Remember withdrawal and return, maybe schedule
Retrospective methods might be necessary
(e.g., going through artifacts, prior critical incident)

Being stuck in your focus

Important to have a focus, expectations of what you expect to be important in your inquiry
But can learn by attending to misconceptions
When All Else Fails

Remember Master/Apprentice

Remember Context

Remember Withdraw & Return
Today

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Developing Models

Contextual inquiry yields a lot of data

Does not reduce to a statistical test

Use it to distill models

Highlights gaps in understanding
Identify breakdowns and workarounds

Many types of models

e.g., Flow, Sequence, Artifact, Cultural, Physical

No model is perfect, these highlight different things
Flow Model: Secretarial Hub

**President**
- Run the business
- Keep abreast of what’s going on
- Sign checks
- Go on trips

**Worker**
- Do the work of the business
- Meet with management

**Vendor**
- Invoice for services

**Sales manager**
- Run the sales department
- Travel to sales offices

**Marketing manager**
- Run the marketing department
- Produce proposal

**U1 (Secretary)**
- Keep office organized
- Ensure bills paid on time
- Do final proof, print, and distribution of documents
- Manage and coordinate schedules
- Handle logistics of trips

**Department’s reports**
- Checks to sign

**Request to help with family vacation plans**
- Request to schedule meeting with president

**Invoices**
- Check

**Proposal to proof and mail**
- Requires lots of iterations

**Discussed travel plans**
- Requires lots of iterations

**Announcement**
- Announcement events of general interest
- Hold documents that manage shared projects
Flow Model: Creative Work

Test user
- Run software and use documentation
- Report all problems

Problem reports

Documentation

Discussion of problems

Drafts for review

Discussion of assignments

Work assignments

Writing standards

Editor
- Check drafts for accuracy, consistent layout, grammar, and terminology
- Assign writing tasks

U2 (Documentation writer)
- Create documentation from specifications and the actual product
- Validate documentation with developers and the actual product
- Test all examples

Marked-up drafts

Discussion of system problems

Product versions

Specifications

Discussion of review

Drafts for review

Developer
- Write the software
- Review documentation for accuracy and completeness
Sequence Model: Doing Email

**Intent:** Handle emergencies

- Trigger: Return to the office
- Scan message list for important message—Use sender, subject
- Choose urgent message
- Read message about unhappy user
- Decide more into needed
- Make phone call
- Had to put off issue of unhappy user

**Intent:** Get back to people easily

- Leave phone message
- File in phone folder
- See list of messages
- Choose message 9: subject indicates university news relevant to department
- Read message
- Delete message
- See message 10 automatically
- Read message 10
Sequence Model: Equipment Audit

Assigned to do equipment audit

- Retrieve required form from database
- Print form
- Collect data at site
- Record data on paper form
- Type data into form on computer

- Print completed form
- Leave hardcopy of form with customer
- Send electronic form to supervisor
- Store electronic form on form database
Cultural Model: Developer

Marketing
- Our new features are top priority
- If I say do X, you figure out what that means

Competitors
- We have 50 new features; catch up

U9 (Developer)

Base technology group
- You aren’t our primary user; we’ll fix bugs for you in our own time
- Our technology is standard; use it even if it doesn’t work

Customer support
- Our bug reports are top priority
Cultural Model: Department Store

Department store company culture

PC support management

Do everything you can for the customer

The PC user is your customer

We sell socks

Don’t enforce any standards

Standards make my life easier

Users

We are a no-risk interface

Support whatever I choose to buy

We are your one-stop shop

Customer focus

Business focus

End customers

We go out of our way for you

We help you sell socks

Use these de facto standards

We run on integrity and trust

External technology vendors

Use whatever new net HW we create

We sell socks

U1 (PC support analyst)
Artifact Model: Calendar

- Past (seldom accessed)
- Future (quick access)

- Scheduled events
- Unscheduled but associated with the day
- Reminders (storage with quick access)

- Business cards (storage for later)
- Rubber band

- Meetings
- Appointments
- Reminders
- Strike out a day
- Notes
- Never used
Physical Model: Work Site

- Maybe outside
- Large area (up to square mile)
- Tight spaces
- Climbing
- Awkward positions

Approximately a 5 minute walk. If doing an audit at a site under construction, then safe path frequently changes and may need to wait for construction equipment to pass.
Affinity Diagrams

Generated during group session

Each observation, idea, note to a post-it

Notes are hierarchically organized into themes, based on project focus
Today

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Interviews

Similar to contextual inquiry, without context

Set a focus, develop questions

Interpret responses

Repeat and rephrase
Ask for an example
Determine steps in a sequence
Probe terms and concepts
Ask when it did not happen as expected
Interviews

Similar to contextual inquiry, without context

Set a focus, record and take notes, have two people

Develop questions

Avoid leading

Interpret responses

Repeat and rephrase, probe terms and concepts
“can you give an example”, “tell me more”,
“What do you mean”, “why was that important”

Ask when it did not happen as expected
Participant Data Capture

Diaries

Experience Sampling

How do you feel right now? Please mark the appropriate intensity for the following emotion:

DISGUSTED

- very slightly or not at all
- a little
- moderately
- quite a bit
- extremely
Value Sensitive Design

To be useful or usable is not the same as supporting important human values

Examples?
Value Sensitive Design

To be useful or usable is not the same as supporting important human values

Examples?

Privacy
Trust
Accountability
Ownership and Property

Freedom from Bias
Human Safety
Universal Access
Sustainability
Value Suitabilities

Value Sensitive Design is an interactional theory

Values are not inherent in a given technology
But a technology is not value neutral

Some technologies are more suitable
than others for supporting given values

Value Sensitive Design investigates
stakeholders, values, and value suitabilities

Direct and indirect stakeholders
Tripartite Method

Conceptual Investigations
Analyses of the values involved in a system

Technical Investigations
Identify or develop technical mechanisms
Investigate suitability to support values

Empirical Investigations
Investigate who the stakeholders are, which values are important to them, and how they prioritize these values
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