

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 03:
Contextual Inquiry &
Design Research

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Tuesday / Thursday
10:30 to 11:50

Project Status and Assignments

Proposals to be “Funded” and Posted for Bidding
Bidding Tomorrow, Team Formation Thursday

Looking Forward

Ideation on Friday in Section

2b: Design Research Plan due Tuesday 1/17

2c: Design Research Check-In due Friday 1/20

2d: Design Research Review due Tuesday 1/24

Other Assignments

Assignment 0 Due Today

Reading 1 Posted, Due Friday

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

Ethnography

Contextual Inquiry

Additional Methods

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



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

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

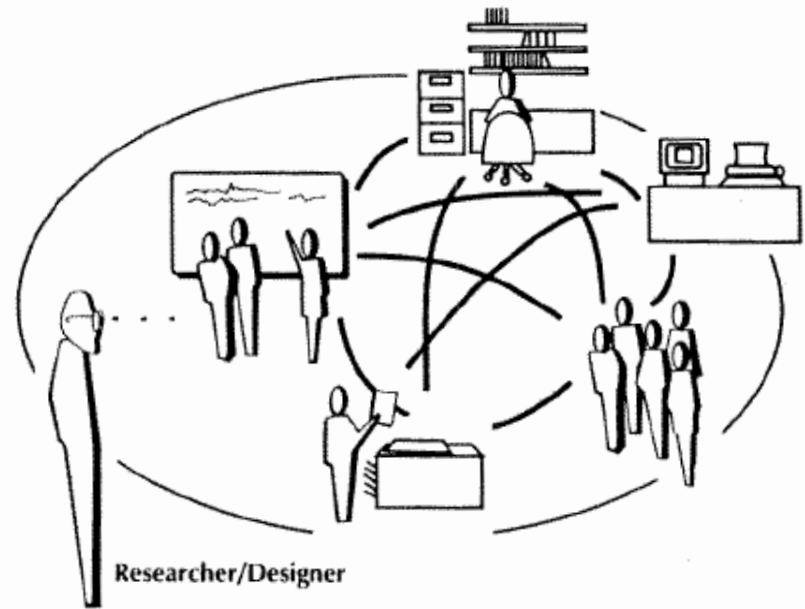
Holism

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

HOLISTIC

Particular behaviors understood in relation to how they are embedded in the social and historical fabric of everyday life.

Focus on relationship between the parts



Four Ethnographic Principles

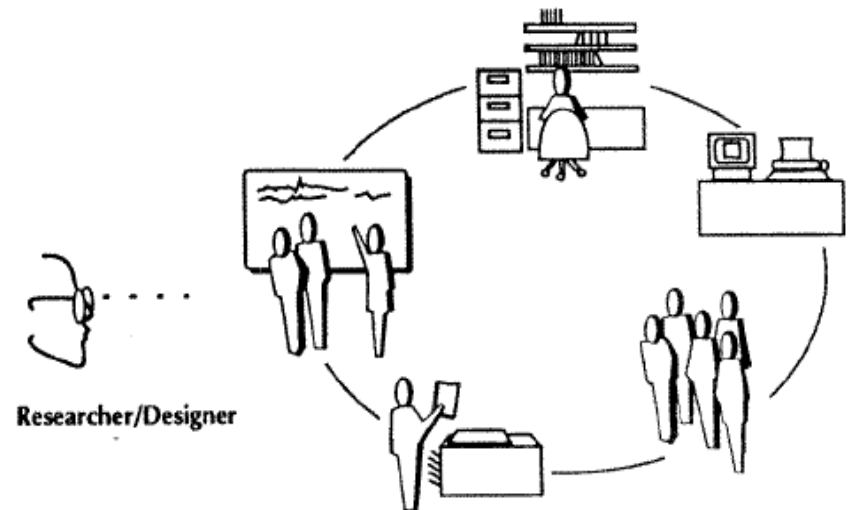
Descriptive

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

Defer judgment.

DESCRIPTIVE

Judgements of the efficacy of behaviors observed are withheld



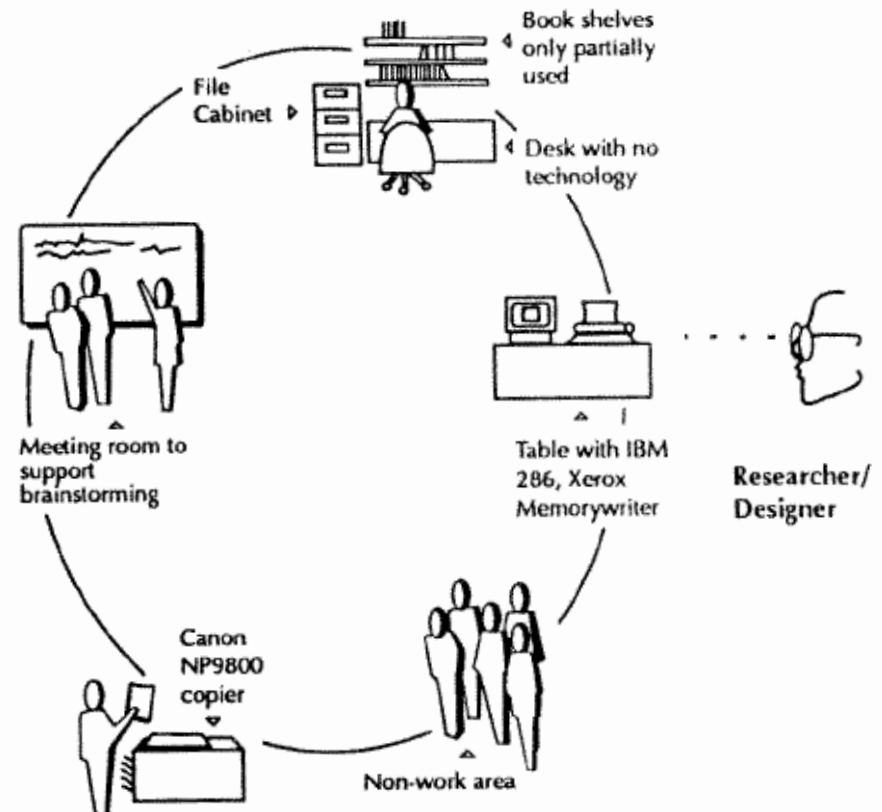
Four Ethnographic Principles

Contrasted With _____

Member
Point-of-View

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

Descriptive categories are
those of the researcher



Four Ethnographic Principles

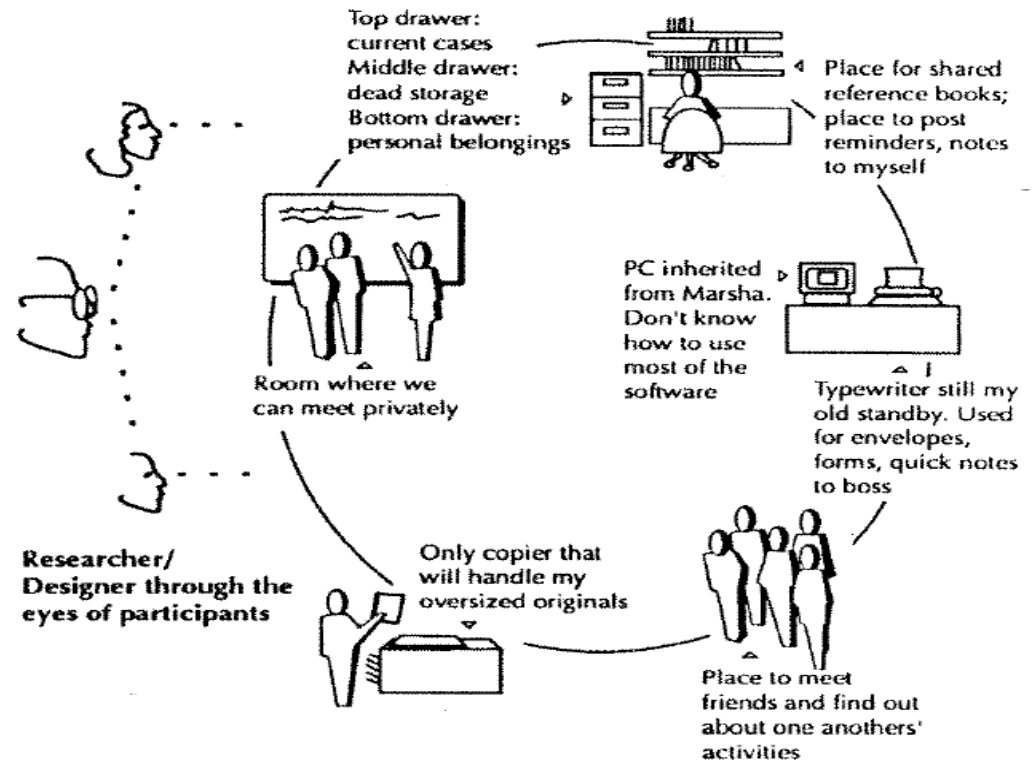
Member Point-of-View

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

MEMBERS' POINT OF VIEW

Understand other peoples' behavior from their point of view

Descriptive categories are those of the community of practice



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 “ethnographically inspired methods”

Translating from raw field observation
to design ideas can be a difficult process

Today

Ethnography

Contextual Inquiry

Additional Methods

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

User, Subject, or Participant?

Only two groups refer to their customers as users

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

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

This is not simple correctness, nor only about respect, it is a mindset that matters for being open

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



What is your relationship?

In an interviewer/interviewee relationship:

The interviewer asks a question

The interviewee responds immediately

At a pause, the interviewer asks
the next question from their list

When all the questions are answered,
the interview is complete

This would support gaining phenomenological
understanding if you knew what questions to ask

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 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

Context

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.”

Context

“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

If cannot observe,
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

Customer: *When I got this problem report I gave it to Word Processing to enter online—*

(Why did she decide to give it to Word Processing? Did she do anything first?)

Interviewer: *So you just handed it on automatically as soon as you got it?*

C: *No, it was high priority, so I read it and decided to send a copy to the Claims department.*

(How did she decide it was high priority? Is it her decision?)

I: *How did you know it was high priority?*

C: *It has this green sticker on it.*

(Someone else made the decision before the report ever got here. Who and when?)

I: *Who put on the green sticker?*

C: *That's put on by the reporting agency. They make the decision about whether it's high priority and mark the report.*

(We can better pursue how the reporting agency makes the decision with them; we'll only get secondhand information from this user. Instead of trying to go further backward, look for the next missing step forward: doesn't Claims get a more personal communication than just the report?)

I: *Did you just send it on to Claims, or did you write them a note about why they needed to see it?*

C: *Oh, I always call Claims whenever I send them one of these reports.*

Partnership

Traditionally, interviewer has too much power

You do not know what will turn out to be important

Apprenticeship model tilts power back too far

You are not there to learn the skill

Interviewer should create a partnership

Alternate between watching and probing

Partnership

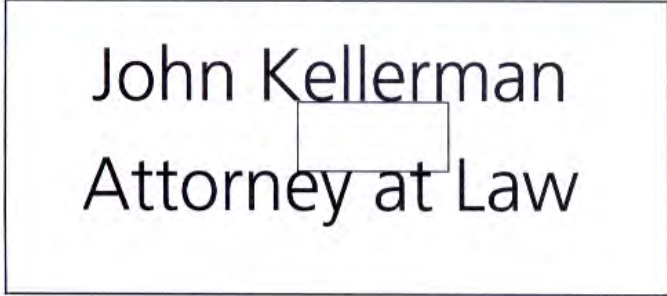
Withdrawal and return

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



John Kellerman
Attorney at Law

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

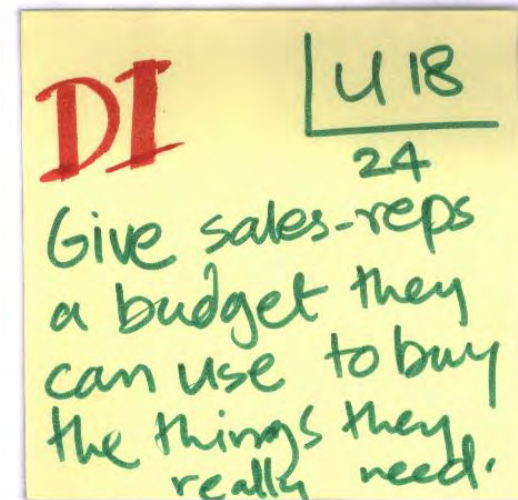
Do not squash design ideas if they arise
This is design, not dispassionate science

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” – probably no, just being polite

“Yes, but...” or “Yes, and” – depends 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 has an entering focus

Focus lets the interviewer see 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

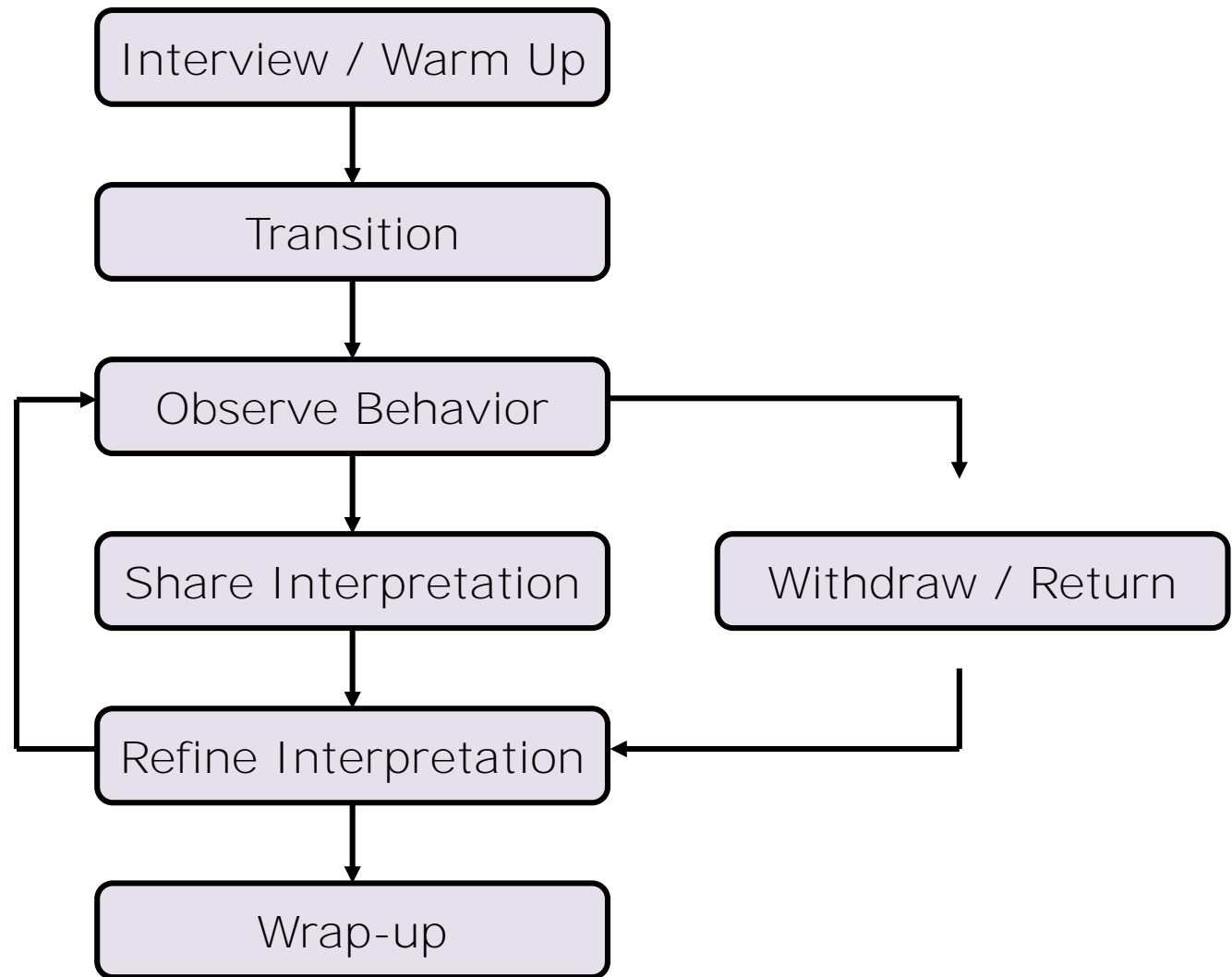
“Do they really do that? Why would they do that?”

What you do not know

Treat interview as an opportunity to learn new stuff

Even if the participant is not knowledgeable, extent of their knowledge / misinformation can be useful

The Stages of a Contextual Inquiry



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

How to Screw it Up

With the wrong person

They need to be willing to partner with you

Turning it into a regular interview

If you could have done it in a coffee shop,
then you did not 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

Withdrawal and return, maybe on a 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

But you learn by attending to misconceptions

When All Else Fails

Remember Master/Apprentice

Remember Context

Remember Withdraw & Return

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

Ethnography

Contextual Inquiry

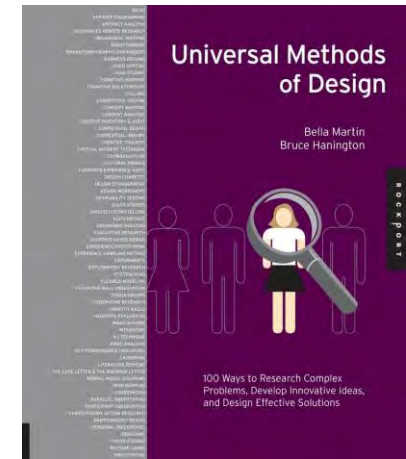
Additional Methods

Many Design Research Methods

Many other design research methods are available, with different strengths

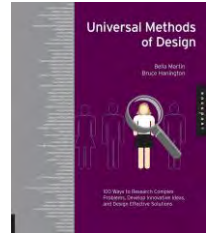
Often apply multiple methods for complementary perspectives

Fundamental goal remains to gain design insight through improved understanding of problems



Interviews

Method 48



Similar to contextual inquiry,
but lacking context of direct observation

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

Can be Structured / Semi-Structured

Avoid leading questions

Interpret responses

Repeat and rephrase, probe terms and concepts

“can you give an example”, “tell me more”,

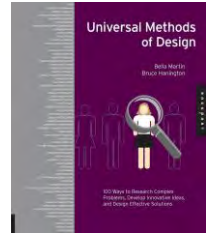
“what do you mean”, “why was that important”

Ask when it did not happen as expected

Pair with questionnaires for depth / to humanize

Focus Groups

Method 43



Moderated conversation among peers

Moderator helps establish this,
participants share experiences, wants/needs

Researcher benefits from their conversations

Prompts discussion topics

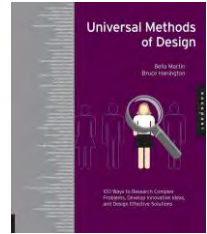
Explanations of problems in status quo

Underlying emotions in a process

Desires / disagreements for new designs

Diary Study

Method 30



Participants keep a diary

Possibly as primary data

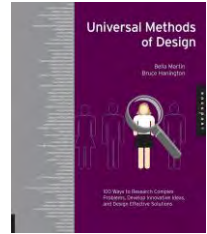
Possibly to create mindfulness before interview



Need						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
12am-3am	3am-6am	6am-12pm	12pm-3pm	3pm-6pm	6pm-9pm	9pm-12am
You needed: <input checked="" type="checkbox"/> Info. <input checked="" type="checkbox"/> Assist. <input type="checkbox"/> Other						
What did you need? <i>to know if stroller could be used on Dix Valley trail</i>						
Why did you need it? <i>wanted to take baby for walk in park but it must be ice-free</i>						
Where were you? <i>at home</i>						
What were you doing? <i>planning outing</i>						
When did you need it? <i>5-10 mins</i>						
What I needed was very important.						
<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Neutral	<input checked="" type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree		

Diary Study

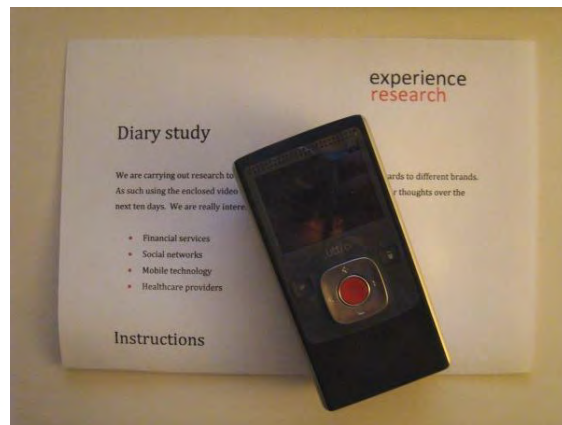
Method 30



Participants keep a diary

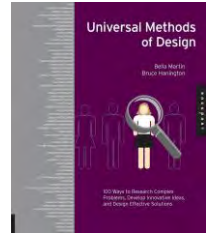
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Diary Study

Method 30



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Experience Sampling

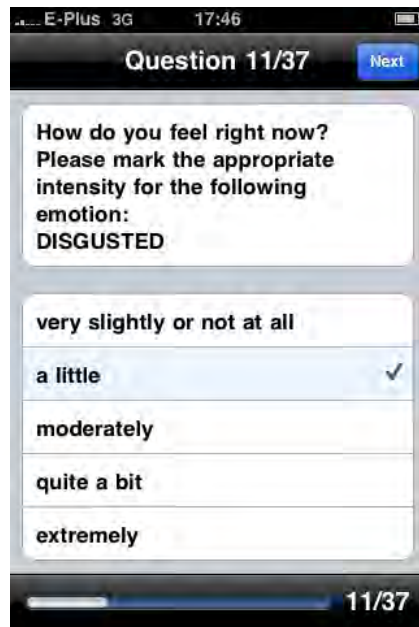
Method 37



Emerges from “beeper study” method

Can be random, can be context-aware

Can gather self-report, photos, sensor data

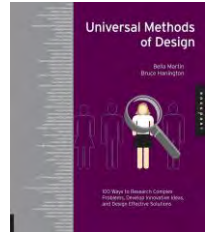


Many Design Research Methods

Personal Inventories

“collections of artifacts selected by the participant”

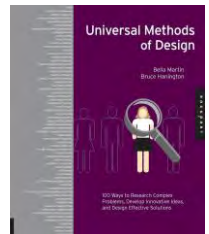
Method 62



Cultural Probes

“materials designed to inspire people to thoughtfully consider personal context and circumstance”

Method 24



“maps ... asked the elderly to mark zones for meeting others, being alone, dreaming...”

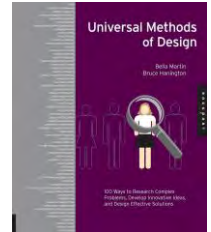
Many Design Research Methods

Behavior Mapping

Method 06

“place-centered mapping”

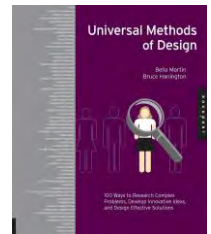
“individual-centered mapping / traces”



Graffiti Wall

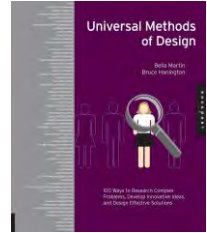
Method 45

“candid feedback on behaviors and perceptions of current spaces”



Shadowing

Method 76



“observational method that involves tracking somebody in their role”

“not intended to be covert ... however subtle instances might be completed in public spaces ...”

Useful reminder to be thoughtful and safe

multiple groups have been asked to leave
be safe, be mindful of people

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?

Independence

Privacy

Trust

Accountability

Ownership and Property

Fairness

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

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 03:
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Elisabeth Chin
Ravi Karkar



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