



# HCI and Design

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SPRING 2016

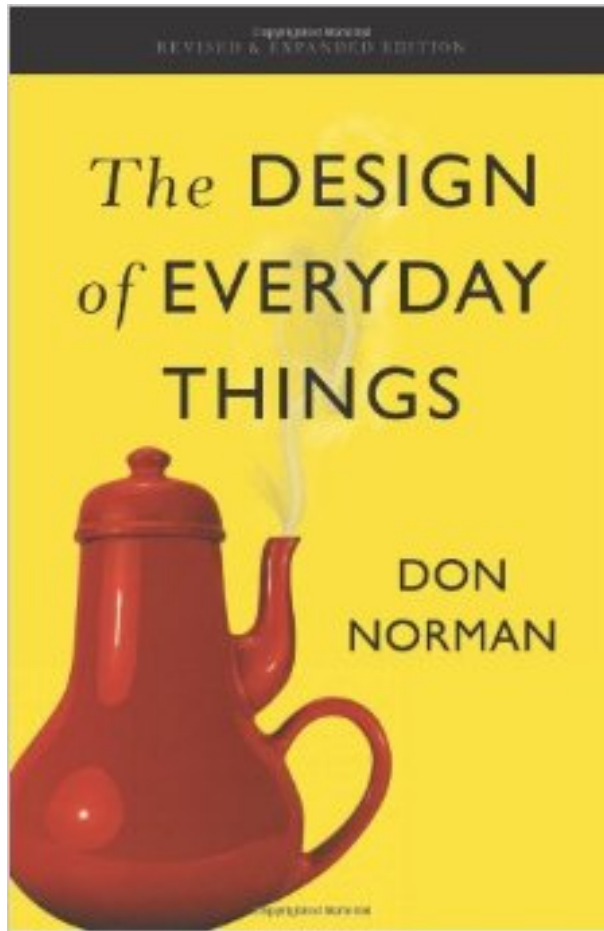
# Topics for today

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- Discuss “The Design of Everyday Things”
  - Bonnie, Derek, Fabian
- Understanding Users
  - Surveys
  - Interviews
  - Contextual Design

# Discussion (Chapters 1-3)

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# Before we start...

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- Join the class slack channel NOW
  - [tech-hci-2016.slack.com](https://tech-hci-2016.slack.com)
  - Sign up using your Cornell ID
- Assignment 1 is posted, due a week from today (2/9)
  - Written exercise based on “The Design of Everyday Things”
- Keep thinking about project teams and ideas
  - Office hours today: project questions and ideas

# IRB approval for your projects

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- IRB (Institutional Review Board)
  - Permission from Cornell to conduct research with human subjects
  - Not necessary if your project is only going to be for class
  - Necessary if you plan to publish your work in any way

(We will cover ethical considerations of working with human subjects more thoroughly later in the course)

# Things I learned from Assignment 0

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- You have diverse backgrounds and goals

... but ...

- This is the first HCI course for most of you. 😊

... also ...

- Many of you have experience / interests / connections to Africa.
- You're really good at telling funny stories.

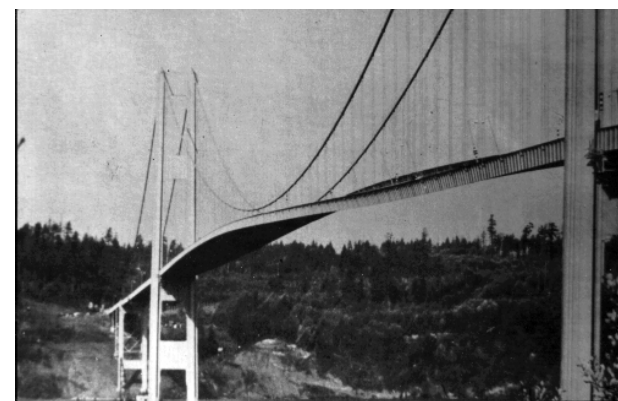
# Why do we need to understand users?

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Bad artifact design



Bad product design



Bad communication

Dangerous design

# Why do we need to understand users?

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Product success depends on designing systems/tools that can be used

- Safely
- Effectively
- Efficiently
- Enjoyably



“The Design of Everyday Things” has lots of examples



# What do we need to know?

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- Physical & cognitive abilities (& special needs)
- Personality & culture
- Knowledge & skills
- Motivation

## Fatal Mistakes:

- Assume all users are alike
- Assume all users are like the designer

# You Are Not the Customer!

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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 customer

Easy to make mistaken assumptions

# Some Basic Guidelines

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Focus on identifying the stakeholders' needs

Involve all the stakeholder groups

Involve more than one representative from each group

Use a combination of data gathering techniques

Support the process with props such as (paper) prototypes

Run a pilot session

Consider carefully how to record the data

Do interpretation/analysis soon after data collection

# User, Subject, or Participant?

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“User” and “subject” connote a more passive role

One perspective: “subjects” are “subjected to” experiments as a designer develops understanding

Another: “participants” instead “participate” in helping the designer develop understanding

“Participant” is the more common term in HCI – but also it’s a mindset that matters



# How can we learn about users?

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Collect and analyze data.

We will discuss three common techniques:

- Surveys
- Interviews
- Contextual inquiry

There are many more...

- Experience sampling, secondary research, diary studies, ethnography, etc.

# Surveys / Questionnaires

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A series of questions designed to elicit specific information

Questions may require different kinds of answers

Yes/No, choice of pre-supplied answers, open-ended

Good for:

- Answering **specific questions** from a large, dispersed group
- Gathering objective, unambiguous data (e.g., how old are you?)

Bad for:

- Subjective data (e.g., how much did you like my product?)
- Gathering detailed, nuanced, non-specific data

Survey Design/Methodology is it's own entire field!

# Interviews

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Structured, unstructured or semi-structured

Semi-structured is often a good balance

Use props, e.g. sample scenarios, prototypes

Pros: Good for exploring issues,  
can get rich data

Cons: Time consuming, infeasible  
to interview everyone, need to  
take what people say at face value



# Interviews

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Be careful! In an interviewer/interviewee relationship:

- The interviewer asks a question, the interviewee responds
- At a pause, the interviewer asks another question from a list
- When all the questions are answered, the interview is over
- Traditionally, interviewer has too much power
- May not know what will turn out to be important
- Need to make sure you ask the “right” questions



# Activity

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You're doing a study to understand the quality of the Cornell Tech MS program.

Write down five interview questions to help you explore this topic (3 mins).

Try your questions on the person sitting next to you and write down their answers (3 mins each).

What were questions that worked? Why?

What were questions that didn't work? Why?

# Contextual Inquiry

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A design-oriented, ethnographically inspired technique for finding out what users currently do and problems they encounter.



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, "Contextual Design"

# What is the relationship?

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The “master/apprentice” relationship is at the heart of contextual inquiry

In a master/apprentice relationship:

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



Obviously, the participant is the master and you are the apprentice 😊

# Unique or One of Many?

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“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)

# It's Not Quite Master/Apprentice

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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

# Principles of Contextual Inquiry

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## 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

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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

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Avoid  
summary data  
by watching  
work unfold

Have them  
think aloud..

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. . . .”



# Partnership

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Designer should create a partnership

Alternate between watching and probing

Withdrawal and return

- Designer observes action that indicates something meaningful
- The designer 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

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Avoid Other Relationship Models

Interviewer / Interviewee

- You aren't there to get a list of questions answered

Expert / Novice

- You aren't there to answer questions

Guest / Host

- Move closer, ask questions, be nosy, fill in holes

# Interpretation

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## 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

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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, don't make assumptions

# Interpretation

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Non-verbal cues can confirm or negate

Yes and Nos

- “Huh?” – way off
- “Umm, could be” – usually means no
- “Yes, but...” or “Yes, and”

Commit to hearing what people actually say

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

# Focus

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Focus defines the point of view

- Clear focus steers the conversation
- Everyone in the team should have 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

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Surprises, contradictions, idiosyncrasies

- Nothing any person does is for no reason

Nods

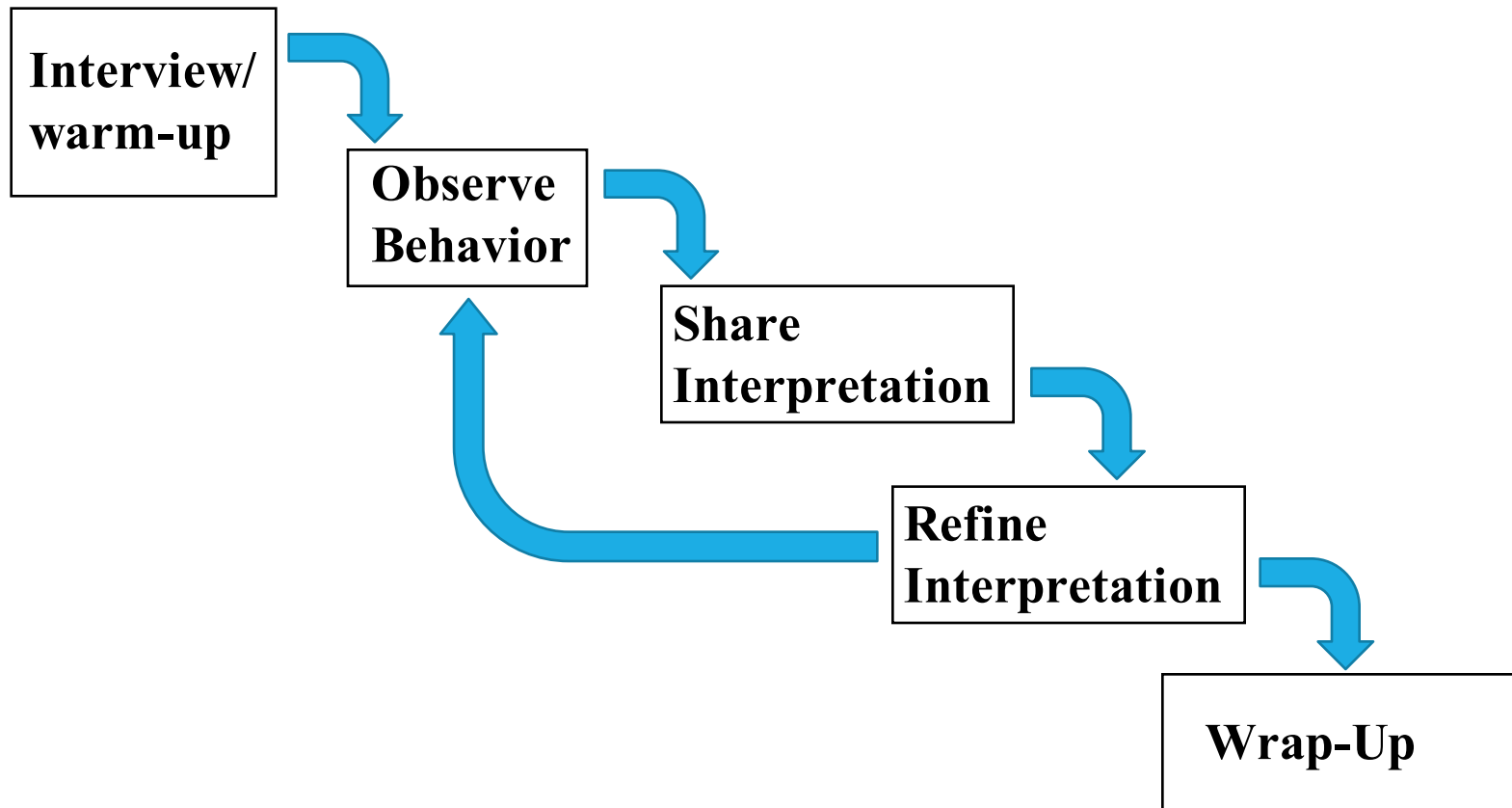
- Question assumptions even if they match  
“Do they really do that? Why would they do that?”

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

# Stages of Contextual Inquiry

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# How To Mess It Up

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Be sure you explain “the rules” of how you’ll be interacting

- If this isn’t clear, may devolve into a traditional interview (since this relationship is more familiar to people)
- If you could have done it in a coffee shop, then you didn’t do a contextual inquiry

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

Overly disrupting the task

- Don’t ask so many questions that participants stop doing their tasks

# Data interpretation and analysis

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Start interpretation/analysis soon after data gathering

Contextual inquiry yields a lot of data

- Does not reduce to a statistical test

Use data to distill models

- Help to understand the workflow
- Highlights gaps in understanding
- Identify breakdowns and workarounds
- Different approaches emphasize different elements
- Many types of models (e.g., flow, sequence, artifact, cultural, physical)

*More on data analysis techniques later in the course...*

# Summary

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- Product success depends on designing systems/tools that can be used effectively, efficiently, enjoyably, safely.
- Understanding users is critical
- There are many techniques you can use:
  - Surveys
  - Interviews
  - Contextual design
  - More...

# Next time...

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- Usability and prototyping
- Reading: “Design of Everyday Things”, chapters 4-5
- Video posted on the class website
- Discussion leaders: Karan, Harrison, Greg