INTRODUCTION TO HCI DESIGN PROCESS

CPSC 544 FUNDAMENTALS IN DESIGNING INTERACTIVE COMPUTATIONAL TECHNOLOGY FOR PEOPLE (HUMAN COMPUTER INTERACTION)

WEEK 2

© Joanna McGrenere
Includes slides from Leila Aflatoony, Karon MacLean and Jessica Dawson
TODAY

• Administrivia – 5 min
• Researcher journal - 5 min
• Introduction to Human-Computer Interaction - 30 min
• Discussion on design thinking activity and Norman’s reading - 20 min
• Ethics of working with participants - 5 min
• Discussion on ethics and readings and TCPS2 - 10 min

Registration issues?
  Please stay around at the end.

Namecards
  Please leave behind at end of class.
DUE BY NOW...

TCPS2

• XXX certificates are missing!
• Others, need to be done by the end of the day

Design Thinking exercise

• Prototypes: Uploaded to Canvas
• Will discuss briefly later in today’s class
DUE BY NOW...

Researcher journals

• You should see Sally‘s comments for Reading #1, #2, and #3
• Feel free to comment/reply to others’ posts to use as a learning resource – which comments do you find effective?
• Our comments:
  • Overall, average for Reading #1, 2, 3 are 1.8, 2, 2.5
  • Many have too much summary of reading
    • Summarize just enough to contextualize comment
  • Some are too long
  • Some pose questions that are too simple
• Example on next slide
• Questions? [5 min]
This reading discusses, in large, how perspectives play a big role in designing. This seems to imply that there can be no designs with universal discoverability because every individual has different background knowledge and experience. However, I find that the example of scissors’ discoverability to be quite universal. Therefore, I think it would be interesting to discuss 1) whether scissors actually have universal discoverability, 2) whether there exist any fundamental assumptions (when trying to use a product) that humans universally share, and 3) if there is, what are the products that are designed based on those assumptions.
LEARNING GOALS

• Describe the Human-centered design approach and how the approach is different from Technology-centered design

• Describe Human Computer Interaction (HCI) as a multidisciplinary field

• Understand (high-level) HCI and the user interface design process and stages

• Understand the ethics of working with human participants at UBC
DESIGN THINKING (RE-CAP)

Empathize
Define
Ideate
Prototype
Test

d.school, stanford
AN ITERATIVE PROCESS

1. Empathize
2. Define
3. Ideate
4. Prototype
5. Test
HUMAN-CENTERED DESIGN (HCD)
‘DESIGNING FOR PEOPLE’

Is a design framework that develops solutions to problems by involving the human perspective in all steps of the problem-solving process.

(Wikipedia)

Is the process of ensuring that people’s needs are met, that the resulting product is understandable and usable, that it accomplishes the desired tasks, and that the experience of use is positive and enjoyable.

(Norman, The design of everyday things)
DESIGN THINKING VS. HCD?

• Differences are not clear cut
• Conceptually very similar
• Design Thinking comes from a design tradition and can apply to any design (not specific to interactive technologies)
• HCD comes out of a more technology-centered tradition (first user-centered design)
• Design Thinking has a stronger emphasis on solving the right problem and ideating than HCD
• Can be confusing: Norman calls Design Thinking to be a Human-Centered Design Process
THE DOUBLE-DIAMOND MODEL OF DESIGN
DISCUSSION ON DESIGN THINKING ACTIVITY AND NORMAN READINGS [20 MIN]

What the heck did we actually do last class?? How did the rest of the exercise go??

**Sketches:** Wave them in the air!

**If time:** show a couple examples on Canvas

Get into pairs and take turns (2 min each) answering:
- What surprised you? or
- What you disagreed with?
WHAT IS HCI?

A discipline that applies Human-Centered Design methods to the design of interactive technologies… and increasingly, uses the Design Thinking framework.
ACTIVITY: WHAT’S A HUMAN? ....A COMPUTER? ... AN INTERACTION?
WHAT’S A COMPUTER?

... that is, what does it look like to a user?

- monitor & keyboard
- mobile phone
- tablet
- inside of your car
- the fridge
- your dog’s collar
- your child’s bracelet
- jewelry and clothing
- your home’s brain
- the Internet
WHO DOES HCI?
IT'S A MULTIDISCIPLINARY AREA...

on the purely machine side:
• computer graphics
• operating systems
• programming languages
• development environments
• networking
• software engineering
• usability and user experience engineers

and increasingly…
• industrial & product design
• digital media processing
• information science
• robotics
WHO DOES HCI?

on the human side:

psychology and kinesiology
  • cognitive, perceptual and motor behavior
  • human capabilities to use and learn machines

sociology and anthropology
  • group and cultural behavior

art and graphic + tactile design
  • visual design principles and aesthetics
WHAT MAKES IT HCI?

where they come together, e.g.,:

- the **joint performance** of tasks by humans and machines
- the **structure of communication** between human / computer, and human/human mediated by computers
HCI DESIGN PROCESS
HCI PROCESS

stages of design

design stages have different goals

evaluation tools to support those goals

identifying stakeholders
WHERE DOES THE HCI PROCESS START?

HCI starts with understanding the problems that users are having

→ identifying human activities needing better support

then designing a system that provides what they really need

→ specifying usability; utility; user experience

and deploying it for usefulness
WHY DO WE NEED A PROCESS?

human activity needing better support

How do you get from problem to solution?

A map would help.

usable and useful interactive system that addresses this
PROCESS STAGES AND THEIR GOALS

pre design: understand the problem
early design: explore design space
mid design: develop the chosen approach
late design: integrate and start to deploy
throughout: evaluate and prototype

To ponder: Can you map these on to Design Thinking stages?
Understand USERS:
• who they are
• their key tasks

Understand DESIGN:
• design space and risks
• choose design approach

REFINE Design:
• by element
• considering task
• varied contexts

CONFIRM & debug:
• performance in real use

Examine existing:
• user tasks & objectives
• contexts
• interfaces

Make use of:
• requirements
• task analysis
• real & virtualized users
• technology options
• company IP

Make use of:
• graphical design
• interface guidelines
• style guides
• real & virtualized users

Methods:
• observation
• observation – many kinds
• ethnography
• interviews, questionnaires
• task analysis

Methods:
• observation
• interview/quest
• participatory interaction
• task walk-throughs

Methods:
• usability testing – controlled, uncontrolled
• heuristic evaluation

Make use of:
• low fidelity prototyping methods

Make use of:
• testable medium-fidelity prototypes

• throw-away prototypes
• design direction
• risk analysis

• med/ high fidelity prototyping methods

Products:
• user and task descriptions
• design requirements

• testable medium-fidelity prototypes

• alpha/beta systems or complete specification

K Maclean - Derived from version by Saul Greenberg (U Calgary)
ITERATION: THE MOST KEY FEATURE

Why do we have to iterate so much in HCI design?

Because – it’s hard to predict or perfectly model:

• people – diversity in abilities, needs, motivations …
• contexts of use
• how they want to do their task/activity
• how they will view your interface

→ the designer’s own progressive understanding of issues

Designing for people is not the same as building a bridge!
ROADMAP TO METHODS

pre-design
ethnography
observation, interviews, focus groups
questionnaires, surveys

early design
interviews, focus groups, observation
questionnaires, surveys
contextual inquiry & work modeling
task analysis, task / cognitive walkthroughs
participatory design
heuristic evaluation

mid-late design
observation, interviews, questionnaires
using advanced protototypes
heuristic evaluation
formal performance / usability testing
SOME TECHNIQUES ARE UBIQUITOUS...

interviews, observation, questionnaires:
  • valuable throughout design process

BUT – they may be executed differently.
  • early: interview/observe for understanding
  • later: input on your design approach and details

what’s the difference? what’s the same?
WHO ARE THE STAKEHOLDERS?

**stakeholder** = anyone who has some reason to care about the interface

- can be lots of them!
- needs may conflict

**user**: convenience, functionality, …

**boss**: price, worker efficiency

**developer**: ease of development - deadlines, budget

**manufacturer**: cost of production

**advertiser**: visibility

… more
HOW TO FIGURE OUT WHO YOUR STAKEHOLDERS ARE:

• who will ask for it?
• who will use it?
• who will decide whether to use it (or if someone else will use it?)
• who will pay for it?
• who has to make (design / build) it?
• who has to make a profit from it?
• who will otherwise make your life miserable if they don’t like it?
• ???

On your own
Technology-centered vs. user-centered design

DIFFERENT ATTITUDES TOWARD DESIGN
ATTITUDES TOWARDS DESIGN

natural to design for all kinds of reasons …

technology-centered design

• design decisions are guided by technology

prevalent attitude in real world because . . .

• technology is fun!

• making novel things is engaging – for the designer

• If it seems like it should work well – or looks cool – people often buy it, too.
ATTITUDES TOWARDS DESIGN

Technology- (or curiosity-driven) design:

• can be the basis of radical innovation that eventually will change peoples’ lives.
• Not necessarily a bad thing.

The problem?

• risk of leaving out real people, who have real problems right now.
TRY: GOOGLE “WEARABLE PHONE”

cool!
but - what would it actually be like to use these?
SEGWAY: what is it for?
ETHICS – WORKING WITH HUMAN PARTICIPANTS AT UBC

• Doing research with humans involves a review process.
• HCI research falls (mostly) under the Behavioural Ethics Research Board at UBC.
• We have a protocol approved for all the HCI courses in CS.
• You will need to read it and follow it before you start working with participants (although participant observation in public places does not require use of consent forms)
• https://www.ugrad.cs.ubc.ca/~cs444/resources.html#ethics
HCI COURSE ETHICS - VIDEO

Videos that identify participants cannot be shown outside of class (and definitely cannot be posted on your blog).
ETHICS – DISCUSSION [10 MIN]

In terms of the Mackay reading and the TCPS2 tutorial…

• What surprised you? or
• What did you disagree with?
• Other?
ON DECK...

Thursday’s class...

1. Readings (as posted) and researcher journals
2. Review the project description on the course website.
3. Fill out skill inventory (Google Sheet) before the next class.
   • Link available on Canvas (under project)

Next Tuesday’s class:

1. Review HCI course ethics materials
   • link available in course schedule page (class 4)