HCI and Design
Today’s Reading

The Design of Everyday Things

Don Norman
What I learned from Assignment 0

This is the first HCI course for most of you. 😊
You need practice with core HCI and Design concepts.
Today: Understanding Users

Why do we need to understand users?

What do we need to know?

Why do people find it difficult to understand and use so many everyday objects?

What are Don Norman’s principles and how do they apply to the design of everyday things?

How can we apply Norman’s principles to the design of computer interfaces?
We need to understand users

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

Safely
Effectively
Efficiently
Enjoyably
We need to understand users

Bad design results in
anger and frustration
decreased productivity in the workplace
higher error rates
physical and emotional injury
equipment damage
loss of customer loyalty
costs money
Why does good design matter?

Bad artifact design

Bad product design

Bad communication

Dangerous design
Psychopathology of Everyday Things

We are surrounded by many everyday things that have poor usability
  Door knobs, stoves, showers, taps, ...
  hardware, software

Many of these things can be difficult to interpret and frustrating to use if they provide no clues or false clues as to how they operate
What do we need to know about users?

Physical & cognitive abilities (including 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!

Seems obvious, but...
- You have different experiences
- You have different terminology
- You have different ways of looking at the world

Easy to think of yourself as typical customer
Easy to make wrong assumptions
Norman’s Principles of Design

Make things visible

Provide a good conceptual model
  Affordances and Signifiers
  Mapping
  Constraints
  Feedback
Visibility

The correct parts must be visible and they must convey the correct message.

Natural signals are naturally interpreted.

Visibility problems occur when clues are lacking or exist in excess.

Just by looking the user should know:
  - State of the system
  - Possible actions
Bad Visibility:
How do you use this plug?
Please Push Slowly!

Wonder why doors are made out of glass?

Evidently someone was smacked...
Good Conceptual Model

A good conceptual model allows us to predict the effects of our actions.

Without a good model we operate blindly:
- No understanding of cause or effect
- No recourse when something breaks
Bad Conceptual Model: The Case of the Mistaken Urinal
Affordances and Signifiers

Affordances define what actions are possible

- Button affords pushing
- Handle affords grasping
- Knob affords turning

Signifiers specify how people discover these possibilities

- Signifiers are signs, perceptible signals of what can be done
Affordances and Signifiers
Example
Bad Signifier:
How do you open this drawer?
Mapping

Controls and displays should exploit natural mapping

Natural mapping takes advantage of physical analogies and cultural standards
  Physical: Steering wheel
  Cultural: red means stop, green means go

Transfer Effects: People transfer their expectations from familiar objects to similar new ones
  Positive transfer: previous experience applies to new situation
  Negative transfer: previous experience conflicts with new situation
What Knob Goes Where?
Exploit Natural Mapping
Constraints

Constraints limit the ways in which something can be used

Constraints can be

- Physical
- Semantic
- Cultural
- Logical
Feedback

Feedback is sending back to the user information about what action has actually been done.

Visibility of the effects of the operation tell you if something worked correctly.

Systems should be designed to provide adequate feedback to the users to ensure they know what to do next in their tasks.
Feedback Examples

Phone button press tones
Rice cooker goes “bing!”
Clicker on your turn signal
Animated icon while waiting for a web page to load
Norman’s Principles of Design

Make things visible

Provide a good conceptual model
  Affordances
  Mapping
  Constraints
  Feedback

What about software??
What about Software?

Visibility
  Visibility of the tasks the interface supports
  Communication of system state / mode

Affordance
  If it looks like a button it can be pressed, if it is underlined it can be clicked (web)

Mapping
  Clicking on a particular interface element produces expected effect (e.g., Open should be under File)
What about Software?

Constraints
  Constraining search criteria, graying out menu items that don’t apply in a particular context

Feedback
  Providing clear and immediate feedback for each action
  Animated icons for any waiting

Many more examples of these that we will see during the semester...
Larson’s dog effect
Thank you for registering! We appreciate your business. To activate your software, you will be sent an email key. After you have received the key by email you will be able to click here and proceed with the activation.
How do we learn about users?

If there are usability problems in everyday “simple” things, the challenge is much greater for complex software.

Problems can be overcome through HCI methods that collect and analyze data to better understand your users.

There are many methods, we will learn and practice a few....

- Contextual enquiry
- Surveys
- Interviews
- Usage Analysis
Activity: Hall of Fame and Shame

**Goal:** Find and critique well and badly designed objects, products, or interfaces.

1. Find a partner.
2. Go explore the building/campus and find examples of 2-3 well-designed and 2-3 badly designed objects/products/interfaces. **Be creative.**
3. Create a document that, for each example, provides:
   
   A. A screenshot or photo
   B. A short description of the object or interface and where it comes from.
   C. A short justification (i.e., three bullet points) for why it belongs in the “Hall of Shame” or “Hall of Fame”.

Post your document (pdf) to the “Fame and Shame” channel on the class Slack. **MAKE SURE TO INCLUDE THE NAMES AND NETIDs OF BOTH PARTNERS!**