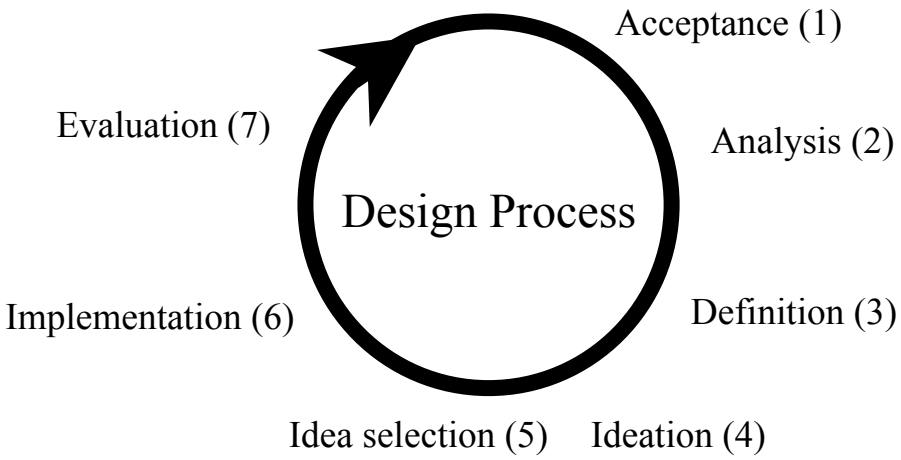
Questions?

- Project #1
  - You need to help users figuring what they want
    - *Example: keyboard in the living room*
    - *But avoid Stockholm syndrome*
  - You need to prioritize their request
    - *Too many features might be confusing*
    - *You cannot always serve all masters*
  - You need to protect users anonymity
    - *Use of persona will help*
  - Grading requests
    - *Please be courteous*
- Project #2
  - This Thursday

User evaluation

- The design cycle



- Different style of user testing
  - Matching the need of different design phase
  - Qualitative or Quantitative

Evaluation criteria

- Learning time and Retention
- Speed
- Error rate
- Subjective satisfaction
- …

- Tradeoffs are often needed

Qualitative approach

- Gather users perception of the interaction

- Methods
  - Interviews, questionnaires and surveys
  - Introspection
    - *Walkthroughs*
  - Direct observation
    - *Direct observation*
    - *Thinking aloud*
    - *Constructive interaction*

Qualitative approaches outcome

- High level effects
  - Task flow problems
  - Task description problems
  - Contextual findings
    - *Conflict with social pattern,…*
    - *Two hands needed but only one available*
- Pros and Cons
  - Apply to a real situation
    - *Good external validity*
  - Difficult to generalize
    - *Poor control of independent variables*
  - Often subjective data

Quantitative approach

- Gather (performance) measurements

- Methods
  - User events collection
    - *Mouse clicks, keys pressed,…*
    - *Data collected during system use*
      - Google, Amazon
  - Controlled experiments
    - *Set forth a testable hypothesis*
    - *Manipulate one or more* independent *variable*
    - *Observe effect on one or more* dependent *variable*
    - *Can be reproduced by others*

Quantitative approach outcome

- Low level effects
  - Patterns of use
  - Menu selection method A faster than method B
- Pros and cons
  - Objective measurements
    - *Good internal validity*
  - Real world implications sometime difficult to foresee
  - Effects might be dwarfed in real world settings
    - *3.05s versus 3.00s?*

Questioning measurements

- Are they reliable?
  - Will repeating the experiment deliver the same result?
  - Does the experiment take into account variations between subjects?
    - *Need for testing a sample of subjects*

- Are they valid?
  - Does the experiment reflects target use?
    - *Were users typical?*
    - *Were tasks typical?*
    - *Was the setting realistic?*
    - *Was the experience biased?*

Are results significant?

- Statistical significance
  - Comparing to the null hypothesis: "There is no effect"
  - Type I errors are the most disruptive

Researcher's Decision	Actual Situation: Null Hypothesis is True	Actual Situation: Null Hypothesis is False
Accept the null hypothesis	Correct decision	**Type II error**
Reject the null hypothesis	**Type I error**	Correct decision

- Design significance?
  - 3.00s versus 3.05s?

Treating subjects with respect

- Testing is a distressing experience
  - Pressure to perform
  - Feeling of inadequacy
  - Looking like a fool in front of your peers, your boss,…
- Follow human subject protocols
  - Individual test results will be kept confidential
  - Users can stop the test at any time
  - Users are aware (and understand) the monitoring technique
  - Their performance will have not direct implication on their life
  - Records will be made anonymous
    - *Videos*
- Use standard informed consent form
  - Especially for quantitative tests
  - Be aware of legal requirements

Conducting the experiment

- Before the experiment
  - Have them read and sign the consent form
  - Explain the goal of the experiment
    - *In a way accessible to users*
    - *Be careful about the demand characteristic*
    - *Answer questions*
- During the experiment
  - Stay neutral
    - *Never indicate displeasure with users performance*
- After the experiment
  - Debrief users
    - *Inform users about the goal of the experiment*
  - Answer any questions they have

Managing subjects

- Don’t waste users time
  - Use pilot tests to debug experiments, questionnaires, etc…
  - Have everything ready before users show up
- Make users comfortable
  - Keep a relaxed atmosphere
  - Allow for breaks
  - Pace tasks correctly
  - Stop the test if it becomes too unpleasant