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Engineering Innovation & Design

Psychology

Interaction: The psychology

- People treat computers like real people
 - How do we know?
 - Experiments; Cliff Nass, Byron Reeves
 - Example 1: Politeness
 - “People are polite to computers: When they are asked to evaluate a computer's performance, they tend to assess the one they are using more positively than others -- just as people tend to praise other people more to their faces than behind their backs.”*

-Nass+Reeves

Social Psychology: The Advantage

- Establish Close Relationships
 - Between the caller and the application
 - Establish close relationships: Team Work
 - Convince users to try harder: Reciprocity
 - Create “believability”: Expert Opinion
 - Companies with their callers
 - Identity - differentiation between similar products
 - Reduction in churn

Psychology

- *What does it affect?*
 - Ability to understand the system
 - Ability to learn the system
 - Capacity to enjoy the system
- *How expressed?*
 - The form of the system
 - The functionality of the system
 - How the system perform the functionality
 - The system in context of the environment
 - The context of people using the system\

Usability

Usability – What it is

- [Wikipedia] The primary notion of usability is that an object designed with a generalized users' psychology and physiology in mind is, for example:
 - More efficient to use—it takes less time to accomplish a particular task
 - Easier to learn—operation can be learned by observing the object
 - More satisfying to use
- Blade's Definition
 - Can people use it?
 - Can the user form a correct mental model of the system?
 - Do they enjoy using it?

Usability – What it isn't

- User Acceptance Testing
- Quality Assurance

Levels of usability testing

1. Self review
2. Expert review
3. Low fidelity prototyping (For speech systems, Wizard of Oz)
4. High fidelity prototyping

Levels of usability testing – for a new dish at a restaurant?

1. Self review
2. Expert review
3. Low fidelity prototyping (For speech systems, Wizard of Oz)
4. High fidelity prototyping

3 Ideas to keep in mind

1. Intended behavior: What should the subject to do complete the task?
2. Observed behavior: What is the subject doing?
3. Rationalization: What is the difference between then mental model the subject is forming, and what the designer intended

Conducting a Usability Test

- Recruit Subjects
 - Define who to recruit
 - Define what order to test them (easiest audience, first - generally. E.g., test new technology with your friends who are tech-savvy and *then* test a grandmother/grandfather)
- Create a Pre-test questionnaire
 - What do you want to know about each person, specifically, before they've tested the system (demographic information, generally)
- Create a Post-test questionnaire
 - Subjective ratings (likability, usability, comprehension)
 - Ideas (what improvement do they suggest?)
- Produce a Task list
 - What will you test? Hard to test a full system - every case, every error
- Set up a test environment
 - The place will affect the user's mental state
- Run test and write up results

Protocol

1. Dry-run the usability test before you use real-subjects (to work out problems with the test)
2. Ensure users are comfortable (have water on hand, comfortable chair, quiet environment, etc.)
3. Tell them what you're doing (but don't prime the subjects)
4. Try to prevent yourself from being perceived as the designer of the system (which psychological phenomenon....?)
5. Ensure subjects do not feel responsible for any errors
6. Administer the pre-test questionnaire
7. Provide tasks, ask users to read aloud (this isn't a test of your usability task writing skills)
8. Ask users to talk-aloud while they perform actions if it won't affect the test (helps understand motivation)
9. Stop the test if it gets too hard for the user or if the user can't perform the task
10. Administer the post-test questionnaire, and wrap up

How to record observations

- Take notes (quickly!)
- Organize issues into categories after the test (can be hard to do)
- Produce a usability-test report

Usability Report format

Issue #	Description	UI Severity (1-5)	Tech Complexity (1-5)	Resolution

Subtleties of Usability Testing

- Make them comfortable
- Don't lead the witness
- Let them make mistakes – to a point
- Get away from them, if you can
- Interpret the results carefully – watch out for stats!

How to replace staples in a stapler?

Constructing the Stapler Usability Test

- What questions do we ask on the pre-test questionnaire?
- What task(s) do we have them perform?
- What do we ask on the post-test questionnaire?

Note

For 5 point scales, use this format (Likert Scale):

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Do Not Use This Format....why?

1. Very Good
2. Good
3. Average
4. Poor



Watch a TA perform test
Blade is the usability subject

Talk-Aloud technique

Example Test

- Challenge - Blade has to pay a City Of Cambridge parking ticket (doh!) on line
 - 1) Construct pre-test questionnaire
 - 2) Construct task
 - 3) Construct post-test questionnaire
- Time
 - 10 minutes to construct the pre-test questionnaire, task and post-test questionnaire

Questions

- What goes on the pre?
- What is the task?
- What goes on the post?

Run test

- Volunteer?
- Take notes - find all usability errors

Results

- What did you discover?
- What are the fixes?

Student test - Excel

- 1 Subject
- 40 Observers

Task

- Subject leaves the room
- Audience is briefed about the task
- Subject uses Excel

Homework

- Design a usability test forsomething
- Conduct the test
- Present results to the class

- Pre-test questionnaire
- Post-test questionnaire
- Write up of usability issues
- Executive summary of test

Usability Report format

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