Human-Computer Interaction IS4300

T4 – Design Sketches

due now

- Brainstorm a variety of different interface designs, taking into account your interaction metaphors from T3, and sketch them by hand on paper or a whiteboard. Then choose one that seems the most promising.
- **Design alternatives.** Provide at least 3 rough sketches of design alternatives you considered, and describe how you settled on your final design.
- **Preliminary interface design**. A preliminary design consists of one or more sketched windows or dialog boxes, along with the menus and controls that the user manipulates.
- **Storyboards**. For each of your Concrete Use Cases, describe how your preliminary interface would be used to perform the task. Use rough sketches to illustrate how the interface would look at important points in the task.
- ***Hand-drawn sketches are encouraged***.

I6 – Swing Layout Managers *due in 1 week*

- **You have two choices for requirements**:

1) try to duplicate the functionality of an existing applet; or,

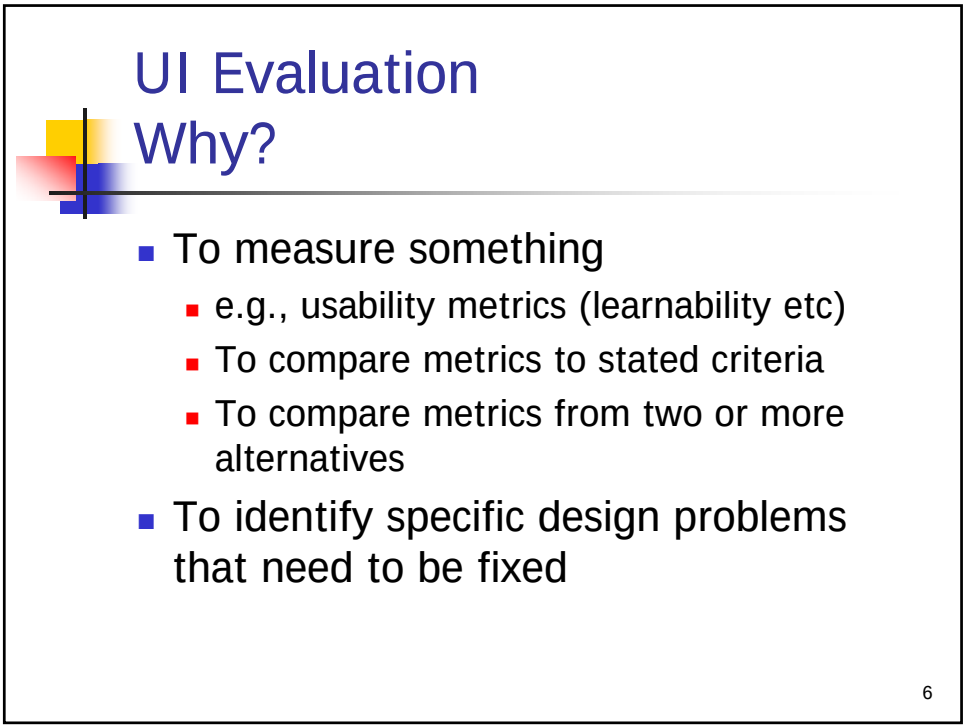
2) create your own (ideally project-related) applet with the following minimum requirements:

  - A JFrame and a modal JDialog.
  - A JTabbedPane and JScrollPane.
  - Nested JPanels including the following layout managers: GridLayout, FlowLayout, BorderLayout
  - Some interaction widgets (JButton, etc.) on every JPanel and tab.
  - Reasonable behavior when the JFrame is resized.

- You may not use GridBagLayout, FreeLayou, Null layout, or absolute layout anywhere in the project.

Stone Chapter 20

Why evaluate the usability of user interface designs?


UI Evaluation
Why?
To measure something
e.g., usability metrics (learnability etc)
To compare metrics to stated criteria
To compare metrics from two or more alternatives
To identify specific design problems that need to be fixed
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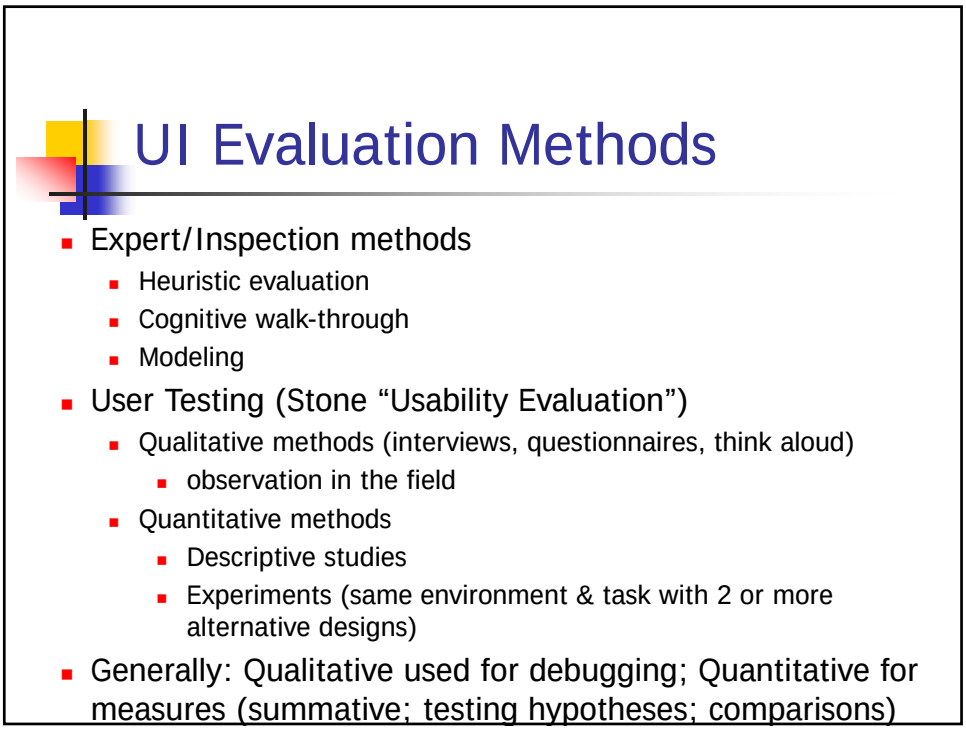
UI Evaluation Methods
Expert/Inspection methods
Heuristic evaluation
Cognitive walk-through
Modeling
User Testing (Stone "Usability Evaluation")
Qualitative methods (interviews, questionnaires, think aloud)
observation in the field
Quantitative methods
Descriptive studies
Experiments (same environment & task with 2 or more alternative designs)
Generally: Qualitative used for debugging; Quantitative for measures (summative; testing hypotheses; comparisons)

Problem

- Mary has just designed a web site for her daughter's girl scout troup, allowing the public order cookies. She'd like the site to be as usable as possible. She has no budget, but does have a copy of Nielsen's usability book. What is the most appropriate evaluation method for her situation? Why?

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Problem

- Megabuck Inc's R&D department has just designed a new replacement for the desktop mouse that they say will revolutionize computing by cutting time-to-target in half. "Prove it" says the CEO. What is the most appropriate evaluation method? Why?

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Problem

- Startup Industries is thinking of developing a new web portal linking office gossip blogs, and have developed an early prototype, but they're not sure if anyone will want to use it. What kind of evaluation method should they use? Why?

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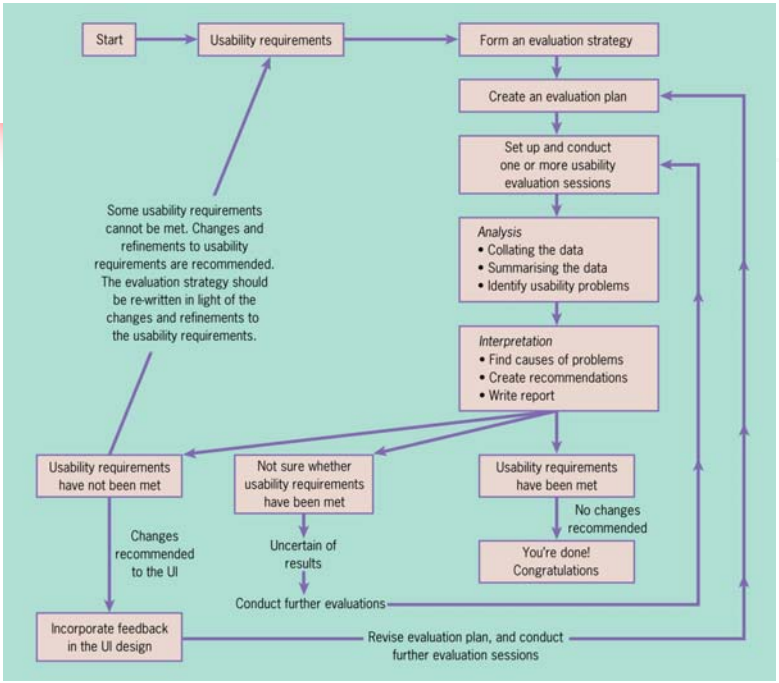
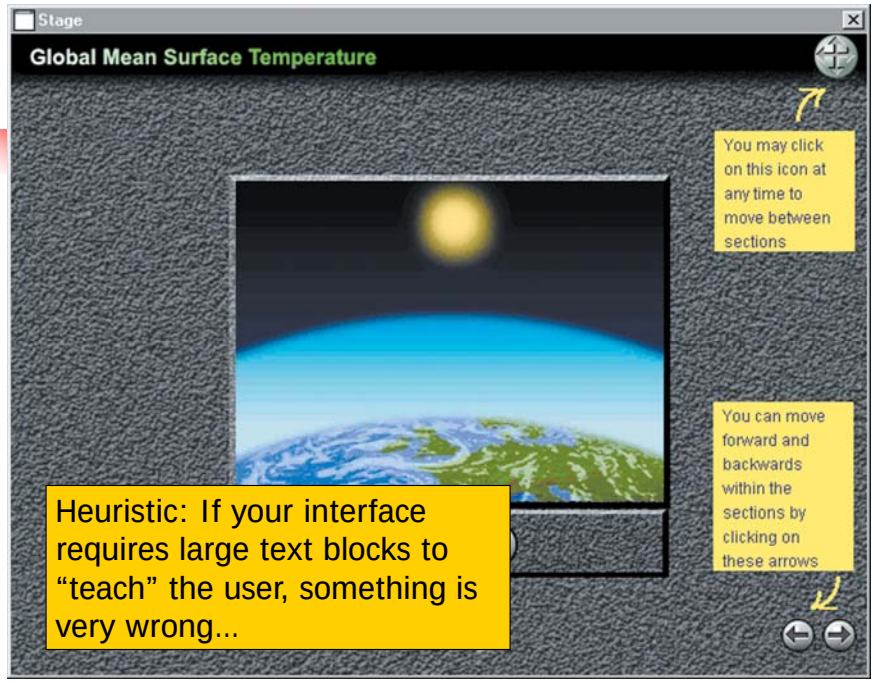
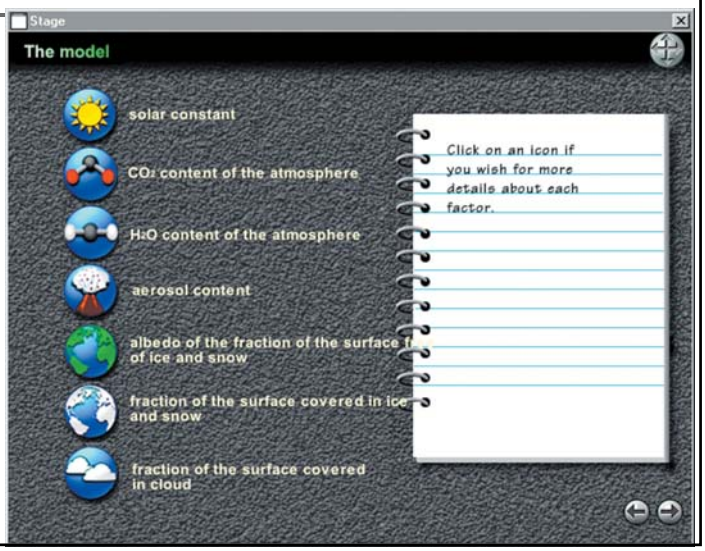


Users, Tasks, Environment, and Domain

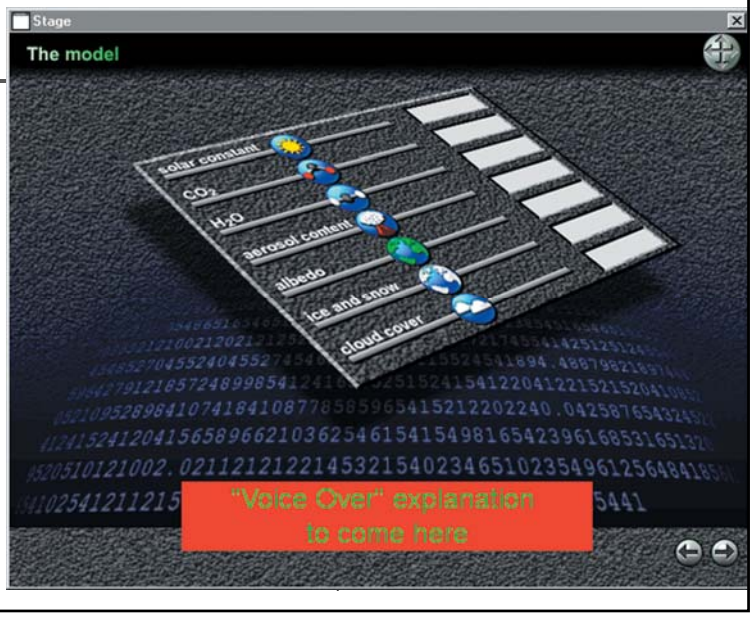
- Our Running Example: Global Warming
  - The Users for S103
  - Users' Tasks and the Global Warming UI
    - CD-ROM based
  - The Domain for the Global Warming UI
    - Paper-based and CD-ROM materials
  - The Environment for the Global Warming UI
    - Home-study, or work

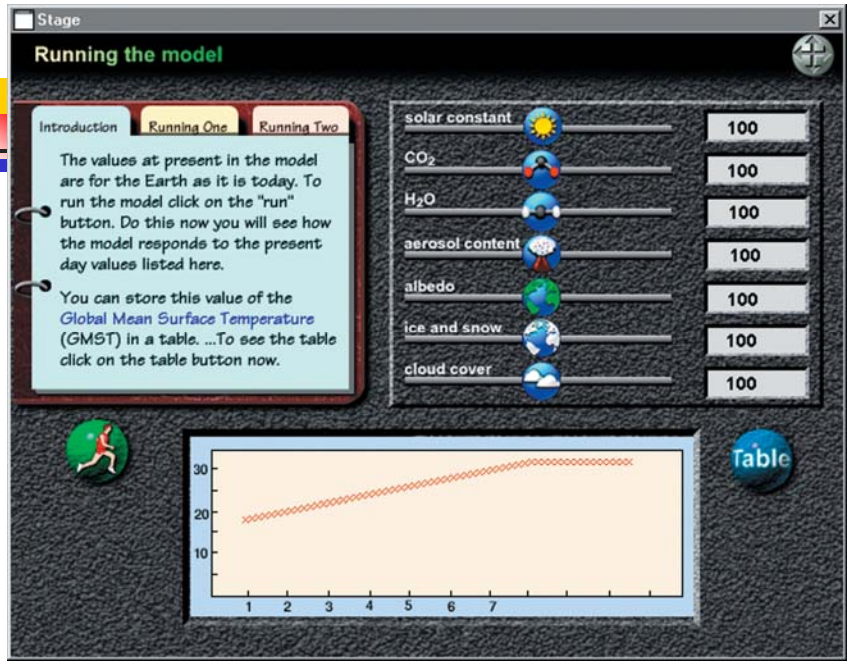


Critique?
Metaphors?



Common prototyping technique





Stone Chapter 21

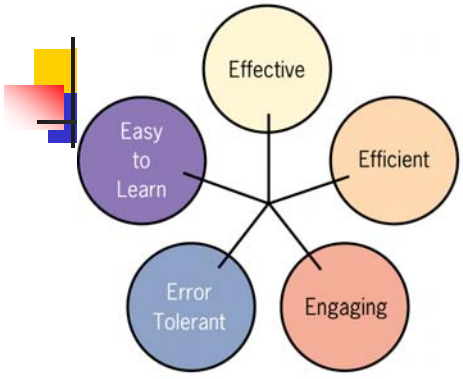
Deciding on what you need to evaluate: the strategy

Creating an Evaluation Strategy

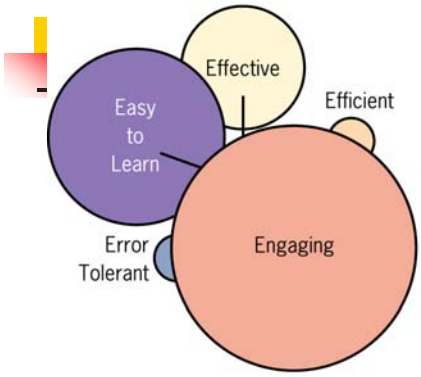
- What Is the Purpose of This Evaluation?
  - Does system meet usability requirements/concerns
    - "Railway clerks work in extremely noisy environments, so any warning messages to them should be visually distinct and highlighted on the screens."

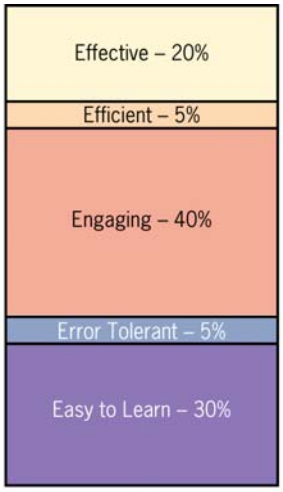
Creating an Evaluation Strategy

- What is the purpose of the evaluation?
- Usability Requirements & Metrics
  - Quantitative (per Nielsen)
  - Qualitative Usability Requirements
    - "The users on an e-shopping site should be able to order an item easily and without assistance."
- Prioritizing requirements

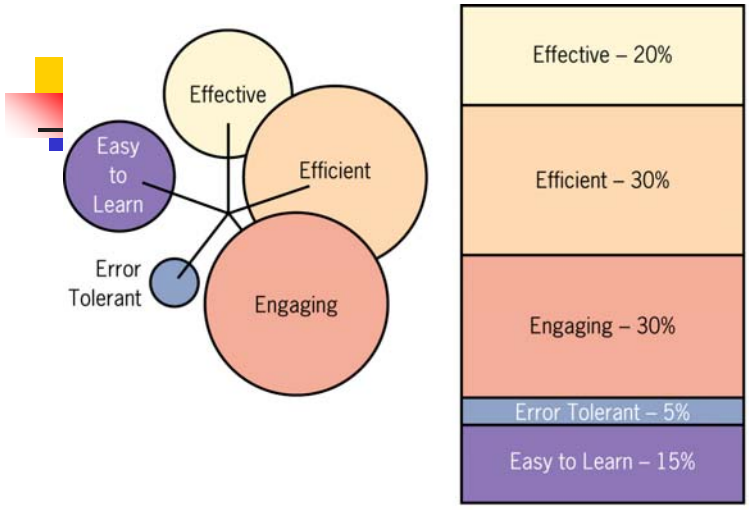


Online Museum Exhibition





- General Museum Site



Evaluation Strategy

- What Am I Evaluating? (prototype or ?)
- What Constraints Do I Have?
  - Money
  - Timescales
  - Availability of usability equipment
  - Availability of participants and the costs of recruiting them
  - Availability of evaluators
- Documenting the Evaluation Strategy

Team project evaluation strategy

- Usability Requirements: specified per team
- Constraints:
  - Fixed time, zero money, limited resources
- Evaluation Plan
  - Formative qualitative user test of paper prototype (wk7)
  - Formative heuristic evaluation of software prototype (wk10)
  - Formative qualitative & quantitative user test of software product (wk13)

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Usability Test Research Plan

- Experiments can take a huge amount of time to plan and prepare.
- Extreme example: medical clinical trials

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Sample Research Plan

Embodied Conversational Agents to Promote Health Literacy for Older Adults

Sample Research Plan

A. SPECIFIC AIMS
B. BACKGROUND AND SIGNIFICANCE
C. PRELIMINARY STUDIES
D. RESEARCH DESIGN AND METHODS
E. HUMAN SUBJECTS

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Sample Research Plan

Hypotheses

- H1. Immediate and distal knowledge gains and glycemic control will be significantly improved when the current standard of care is augmented with a brief "virtual consultation" with an embodied conversational agent, compared to the current standard of care alone.
- H2. Patient satisfaction will be greater when the current standard of care is augmented with an embodied conversational agent, compared to the current standard of care alone.

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Sample Plan
Research Model

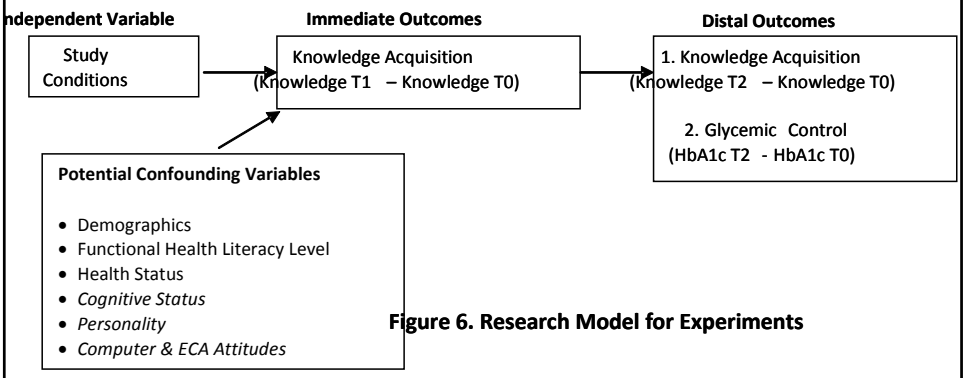

Figure 6. Research Model for Experiments

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Measures

- D.3.1.1 Independent Variables
  - Agent vs. Standard of Care
- D.3.1.2 Primary Dependent Variables
  - Diabetes Knowledge
  - HA1c
  - Satisfaction
- D.3.1.3 Potential Confounding Variables
  - Sociodemographics
  - Health literacy
  - Cognitive status
  - Etc.

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Sample Measure

- Diabetes Knowledge.
  - Diabetes knowledge will be assessed using the Diabetes Knowledge (DKN) Scales, three separate 15-item multiple choice questionnaires that measure general diabetes knowledge. Reliability for the items in the scales (Cronbach's alpha) was 0.92, indicating high internal consistency. Validity was assessed by determining that 219 participants who participated in a 1-1/2 day class on diabetes scored significantly higher posttest on the measures compared to pretest (11.27 vs. 7.61, $p<.001$).
  - We will administer the DKN immediately before the educational intervention (T0), immediately following the intervention (T1), and at three months follow up (T2).

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Study Population

- D.3.2 Study Population
- D.3.2.1 Study Setting: The Geriatric Ambulatory Practice
- D.3.2.3 Eligibility and Exclusion Criteria
  - Eligibility criteria include:
    - Age 60 years or greater,
    - Have Type 2 diabetes mellitus, with or without complications (ICD-9 codes 250.00-250.90)
  - Exclusionary criteria include:
    - Patients with significant cognitive disability …

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Sample Plan

- D.3.3 Sample Size and Power Considerations

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Sample Plan

- D.3.4 Recruitment and Data Collection Procedures
  - D.3.4.1 Study Subjects
  - D.3.4.2 Recruitment and Initial Telephone Interview
  - D.3.4.3 Initial Clinic Visit (T0, T1)
  - D.3.4.4 Follow-up Clinic Visit (T2)

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Sample Plan

- D.3.5 Analysis
  - D.3.5.1 The Analysis Plan

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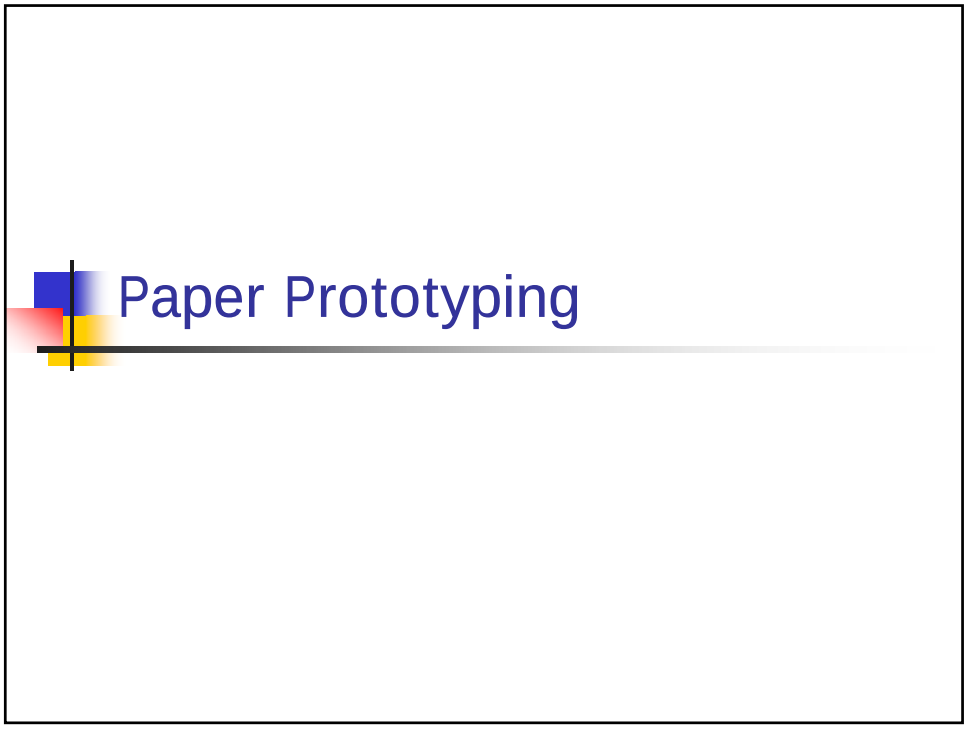
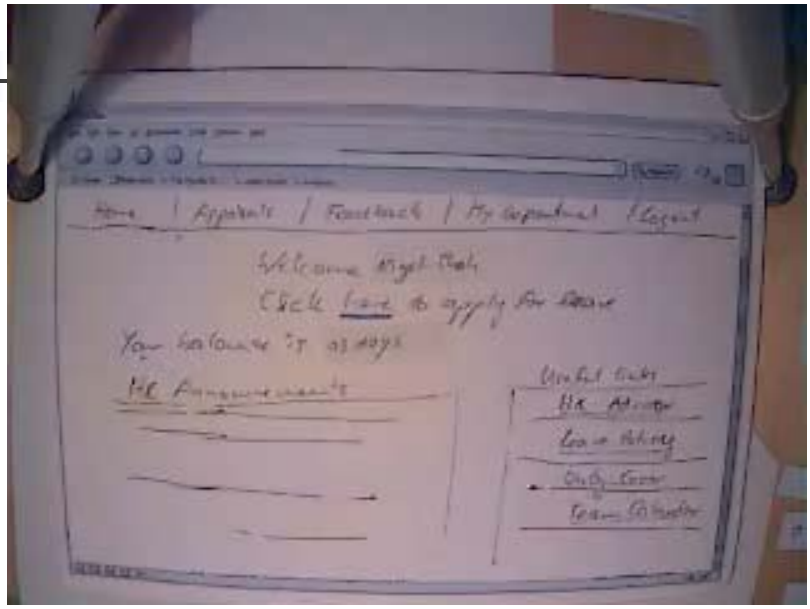


Paper Prototyping
What is it?

- Perform user testing with a paper mock up of your interface
  - One person “plays computer” updating the interface whenever the user interacts with it

Example: leave submission system



Why?

Snyder, “Paper Prototyping”

- Substantive user feedback early in development process
- Promotes rapid iterative development
- Facilitates communication within dev team and between dev team and customers
- Does not require any technical skills, so a multidisciplinary team can work together
- Encourages creativity in the product development process
- Less intimidating than a computer
- Encourages more (creative) feedback
- No nitpicky feedback

Why?

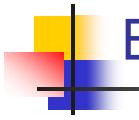
- Prevent inertia that can be caused by building “heavy” prototypes
- Try out goofy ideas without having to worry about how many hours it will take to implement

Paper Prototyping How

- Parts list
  - White poster board
  - Blank 5x8, 4x6 index cards
  - Removable tape
    - For text fields (users write on it)
    - For ‘grayed out’ (disabled) widgets
    - To stick widgets on the background
  - Markers, pens & highlither
  - Scissors
- Optional
  - Transparency & markers
  - Restickable glue
  - Correction fluid/tape (for on-the-fly changes)

Widget-by-widget suggestions

- Radio buttons & check boxes
  - Removable tape for selection
- Tabbed dialog box
  - One index card/tab
- Text field
  - User writes on removable tape
- Drop-down list
  - List on card/paper
  - When item selected, computer writes on tape



Building the Prototype

- Hand sketched, monochrome
- Enlarged UI (e.g. 11x17) easier to work with and will allow almost all testing
- Can use “greeking” for large blocks of irrelevant text
- Can use photos or printouts where especially important (e.g., photo of product on a shopping page)

Demo! Pet-O-Matic

T5a – Paper Prototyping

- Before the next class, prepare your prototype and test cases, and practice "playing computer".
- Build your prototype.
- Write your 3 test tasks on separate index cards
- Practice running your paper prototype.

- We will practice with all teams in class.

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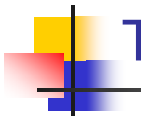

To Do

- Read
  - Stone Ch 22-24
- Finish by Thursday (next class)
  - T5a – Build your paper prototype and practice.
- Finish in one week
  - I6 – Swing Layout Managers

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