Homework Set 2

A brief discussion

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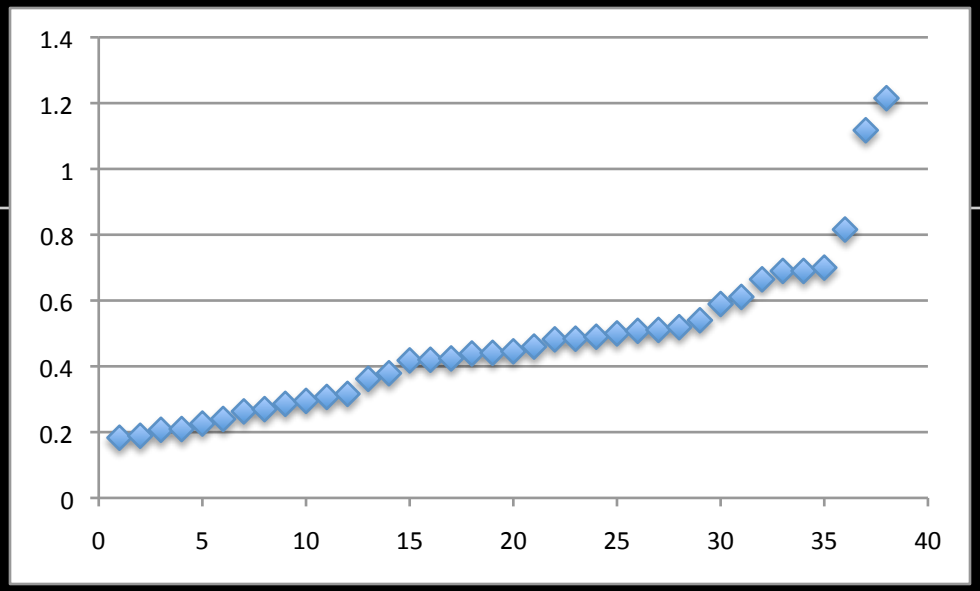

Problem 4

Hick's Law or Fitt's Law?

$$MT = a + b \cdot ID$$

$$ID = log_2(\frac{A}{W} + 1)$$

Dyn 1
Dyn 2
Dyn 3
Dyn 4
Static 1
Static 2
Static 3
Static 4
Static 5
Static 6
Static 7
Static 8

$$MT = a + b \cdot ID$$

$$ID = log_2(\frac{A}{W} + 1)$$

$$a = 548$$

$$b = 420$$

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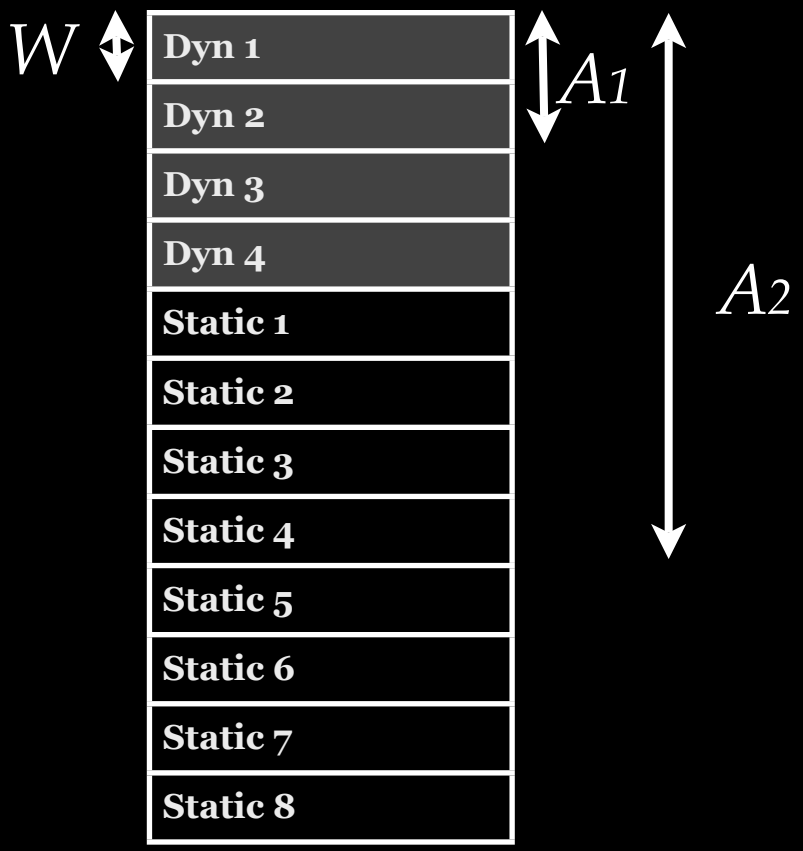

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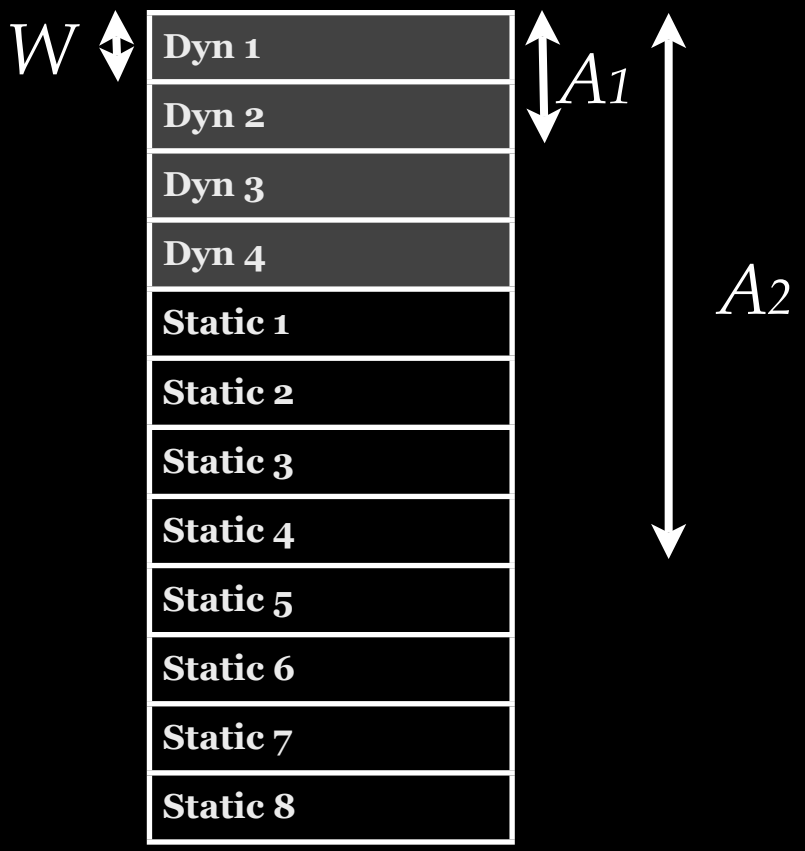


$$.5(548 + 420 \cdot log_2(\frac{A_1}{W} + 1)) +$$

$$.5(548 + 420 \cdot log_2(\frac{A_2}{W} + 1))$$

$$n \cdot log(m) \quad \neq log(n \cdot m)$$
$$= log(m^n)$$

Cognitive Walkthrough and Heuristic Evaluation

Tuesday

original slides by brian bailey

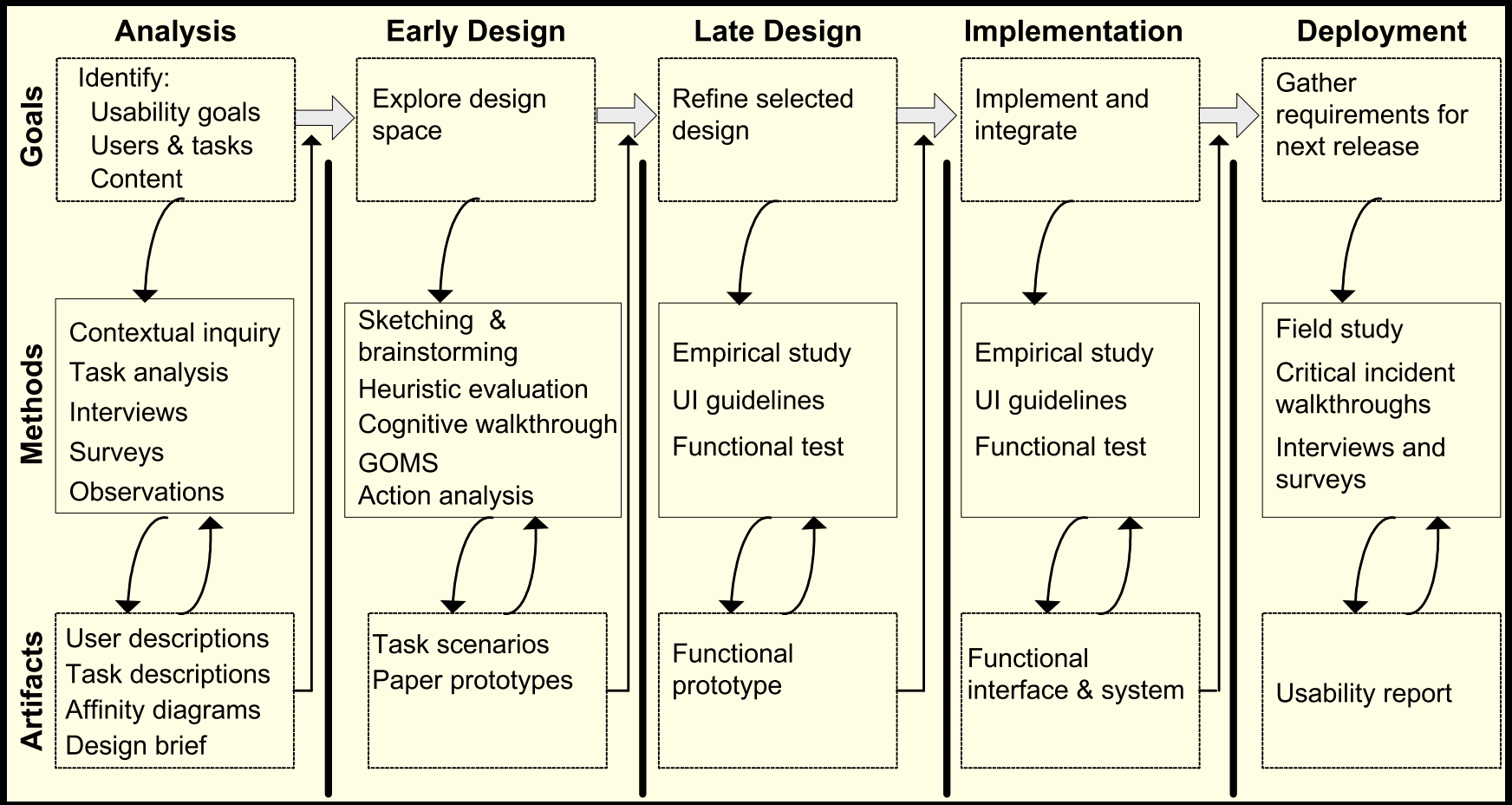
low-fi prototyping

(or - how to get paid for playing with construction paper and crayons)

Messages

- **Low fidelity prototypes allow rapid exploration with minimal investment**
- **Get your design down quickly, evaluate it, and iterate based on lessons learned**
- **Improves creativity and resulting design**

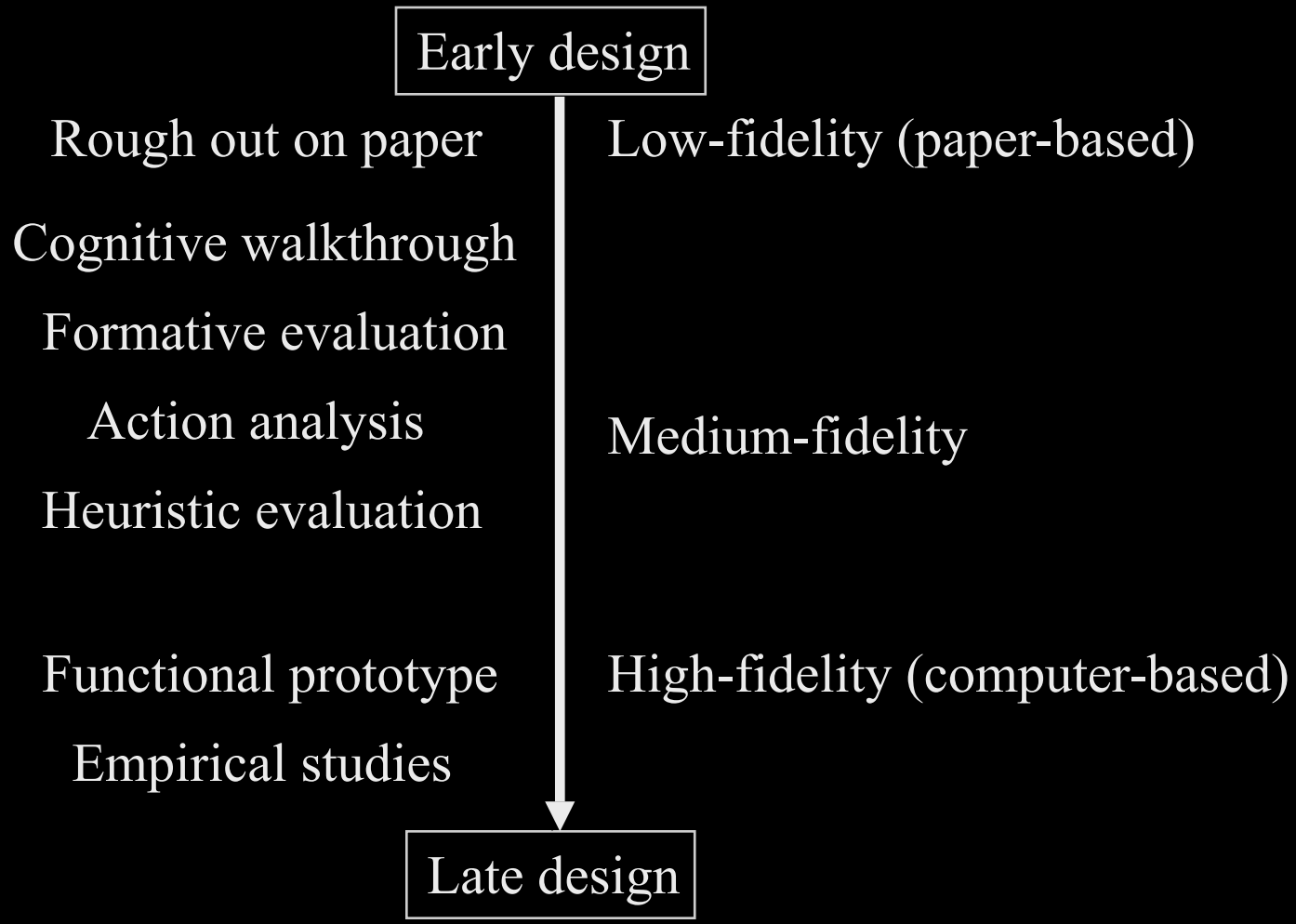
In Context of TCUID



Prototyping in HCI

- **Build a scaled model of an interactive system**
  - externalize your design thinking
  - enables communication
- **Evaluate the model against some criteria**
  - measure how "good" the model is
  - compare against other models
  - learn how to improve it
- **Iterate as necessary**
  - integrate lessons, increase fidelity and detail
  - iterate rapidly at first, then slow as design solidifies

Prototype and Evaluation Stages



Iterative Design

- **Build, evaluate, iterate, …**
  - iterate rapidly at first, slow as design solidifies
- **Increase fidelity and add detail**
  - change from paper to computer medium
- **Evaluate different aspects of the design at different stages of the design process**
  - **early**: metaphor, structure, usefulness
  - **late**: performance, learnability, satisfaction

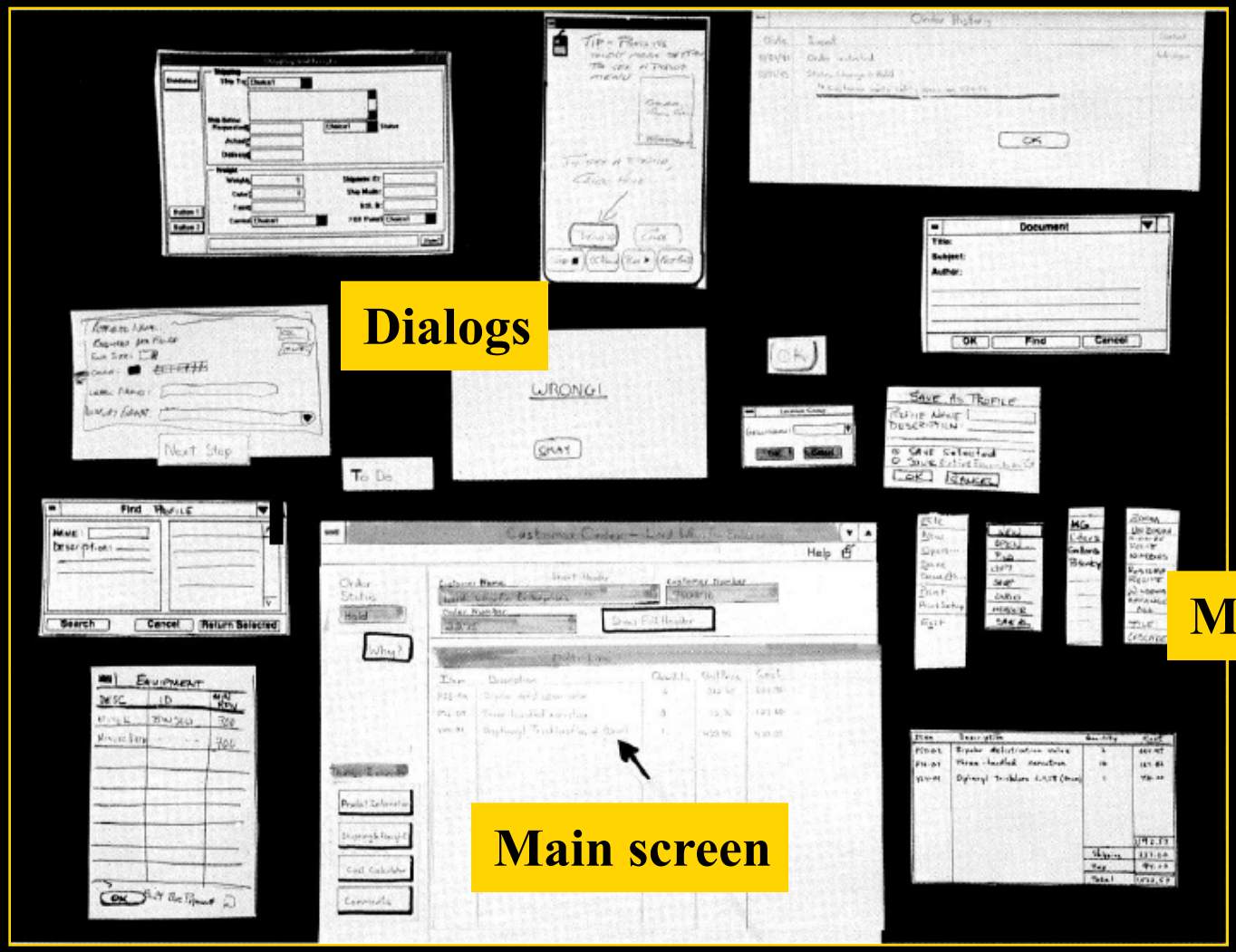
Prototyping Tools

- **Use tools to construct models**
  - paper, informal tools, development tools
- **In choosing a tool, consider:**
  - requirements of the project
  - expertise of design team
  - access to relevant libraries
  - *balance investment with effectiveness*

Low-fidelity Prototype

- Rough cut of your interface design created with paper, post-it notes, overlays, correction tape, etc.
- Sketch storyboards to show overall design concept and interface structure
- Use post-its and overlays to simulate critical interactions
- Build the prototype to support your tasks

Low-fidelity Tools



Example

Benefits of Low-fidelity

- Quick and cheap to build prototype
- Communicates design concept and structure, can demonstrate interactions
- Facilitates brainstorming and invites discussion
- Enables early evaluation
- Maximizes number of design refinements before you commit to code
- Enables rapid and extensive exploration of the design space

Materials

- **Paper: heavy paper for base interface screens**
- **Overlays: show changes in content**
- **Post-it notes: show changes in content**
- **Adhesives: glue sticks, correction tape**
- **Colored markers and pencils: enable highlighting, drawing in color**
- **Scissors: cut content to size**
- **Library: Pre-fabricate menus, buttons, tabbed panes, dialogs, etc.**

Build the Prototype

- **Sketch interface screens on heavy paper**
  - called *storyboards*
- **Build interactions using "library"**
  - menus, dialogs, tabbed panes, buttons, etc.
- **Assemble components to enable users to perform each task from your analysis**
- **Do not debate the design too much, get your ideas down and ready for evaluation**
  - quality will improve with iteration

Evaluate Low-Fi Prototype

- **Identify “big” problems**
- **Perform rapid iteration**
- **May catch problems that empirical tests could miss (e.g., consistency issues)**
- **Evaluations are only effective if your team**
  - has the right skill set
  - wants to improve the design, not defend it

Evaluation Techniques

- Formative evaluations
- Wizard of Oz studies
- GOMS and action analysis

- Cognitive walkthroughs
- Heuristic evaluations

Evaluating the Techniques

- **Does the technique identify usability issues that users will encounter in practice?**
- **Can the technique help you identify design solutions? Does implementing these solutions actually fix the usability issue?**
- **When can you use the technique?**
- **What are the costs of learning and applying the technique? What types of usability issues does it discover?**

Formative Evaluation

- **Evaluate how well users can perform tasks with your low-fidelity prototype**
  - have a user perform a task with prototype
  - manipulate prototype to make it interactive
  - identify trouble points and solutions
  - revise prototype and perform again

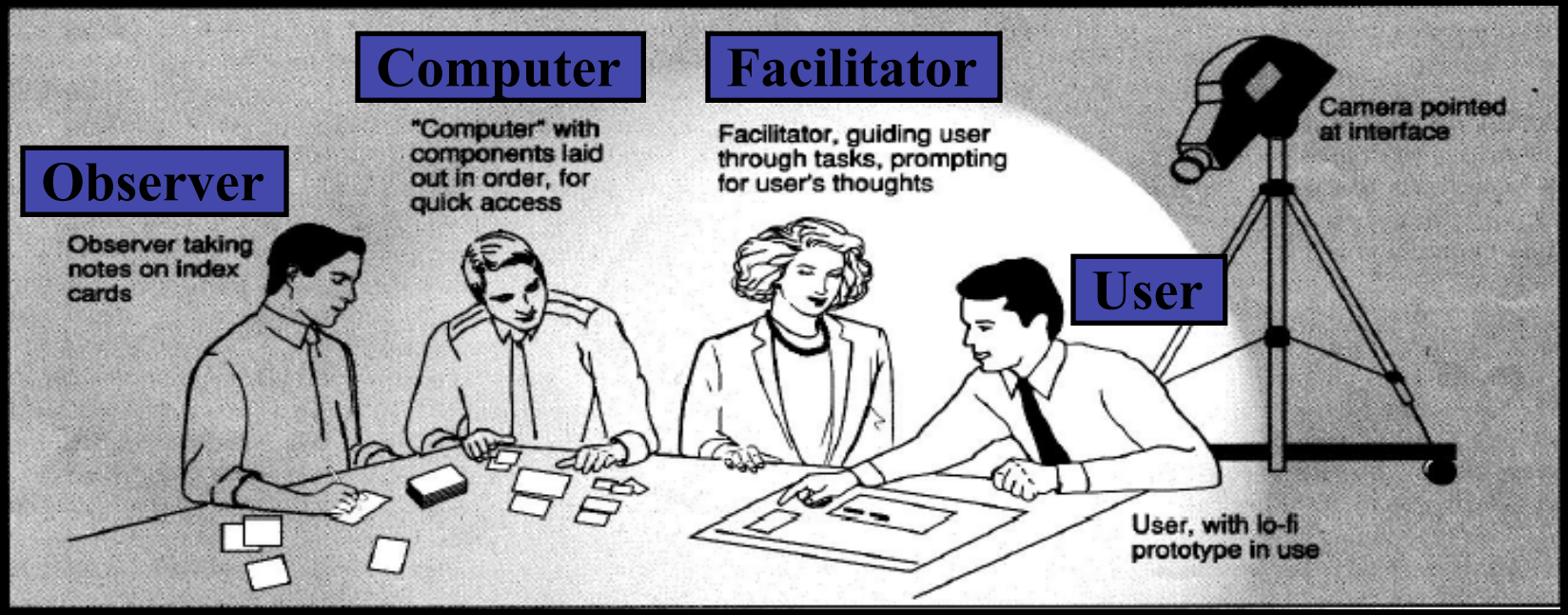
What You Need

- **User and task descriptions**
- **Low-fidelity prototype with enough "functionality" for several tasks**
- **An evaluation team that consists of a**
  - "computer"
  - facilitator
  - note taker

What To Do

- Ask the user to perform a task
- Manipulate prototype to reflect actions
- Ask the user to think aloud
- Identify trouble points with the interface
- Write down each usability issue

Formative Evaluation



After the Evaluation

- **Reflect on the results**
  - write each usability issue on a post-it note
  - identify severity and frequency
  - use affinity diagram techniques
- **Explore larger design changes to address multiple usability issues**
  - small variations may not be enough, this is the best time for “big” changes
- **Change your prototype and re-evaluate**