

SIM 18/19 – T5.2

Discount Evaluation Methods

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Summary

- Discount Evaluation Methods
- Cognitive Walkthrough
- Heuristic Evaluation

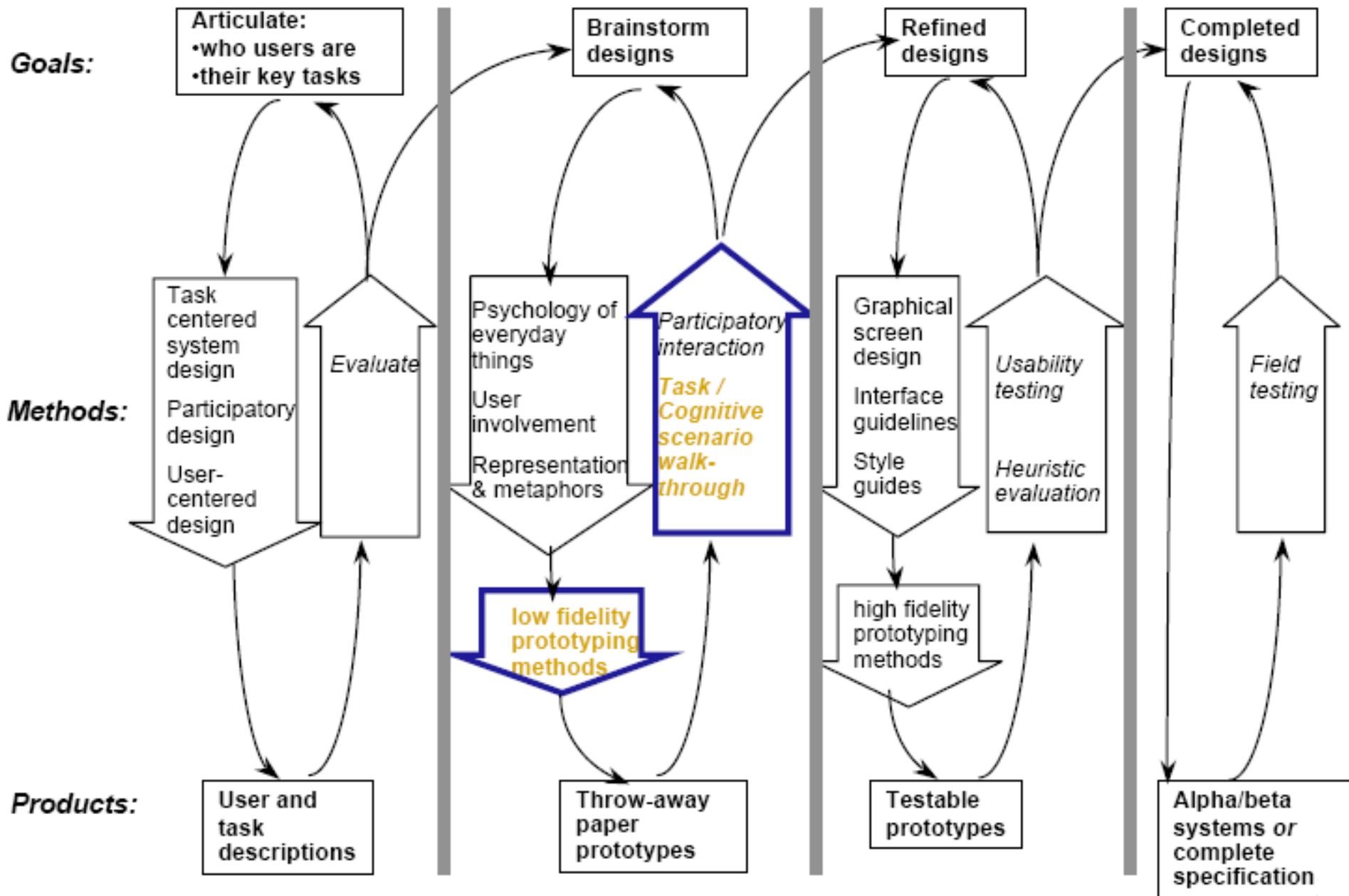
Discount usability engineering

- **Cheap (thus 'discount')**
 - No special labs or equipment needed
 - Doesn't need to involve users *directly*
 - the more careful (and informed by users) you are, the better it gets
- **Fast**
 - On order of 1 day to apply
 - Standard usability testing may take a week
- **Easy to use**
 - Can be taught in 2-4 hours

Cognitive walkthrough

- Evaluate “**mental model**”
 - Assesses “exploratory learning stage”
 - New users, occasional users
 - *What mental model does the system image facilitate?*
 - Done by non-experts and/or domain experts

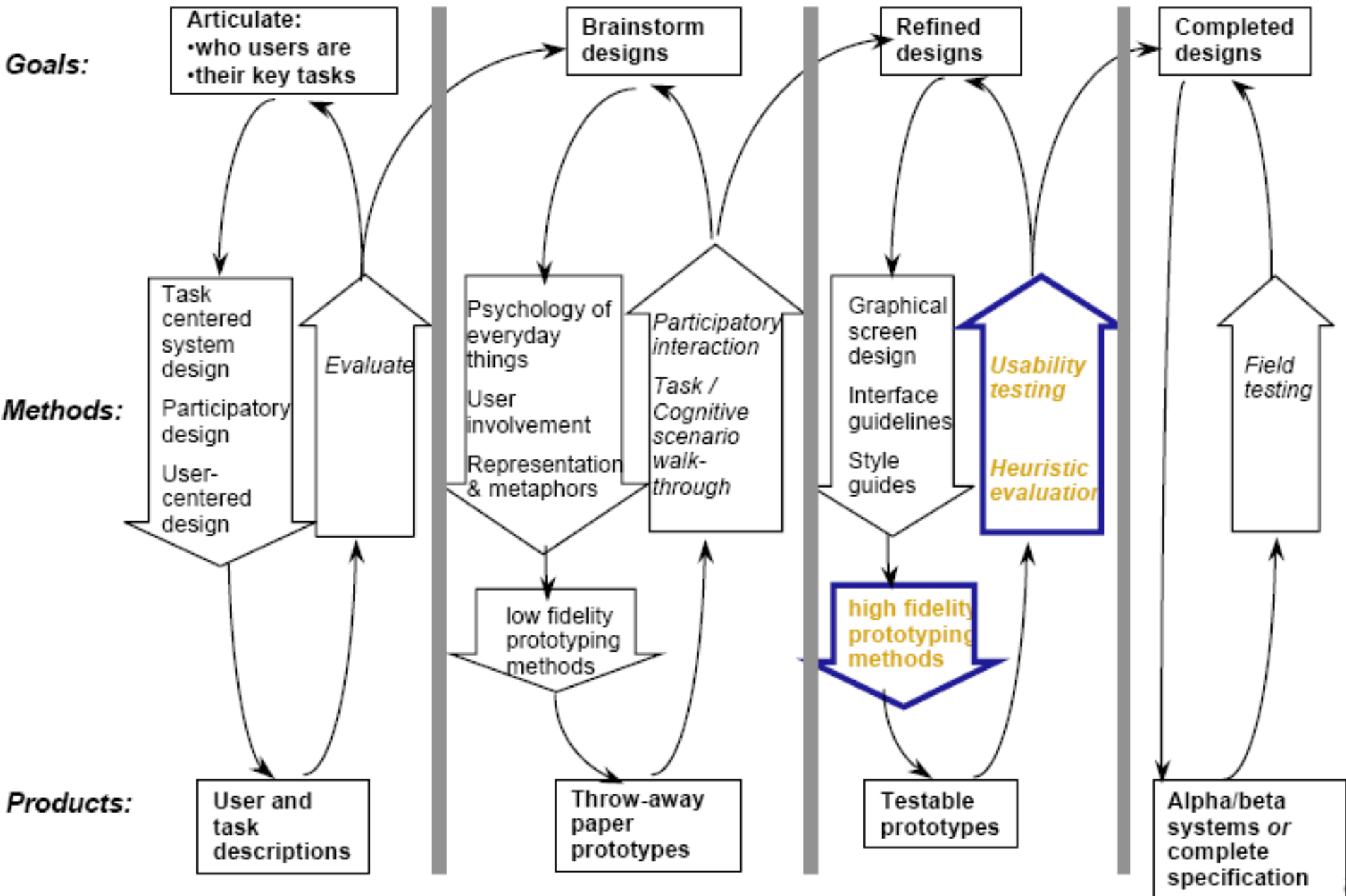
Interface Design and Usability Engineering



Heuristic Evaluation

- **“Fine tune” system image**
 - Targets broader use range
 - New, occasional and expert users
 - Fine-tunes the interface
 - HCI professionals apply a list of heuristics while simulating task execution

Interface Design and Usability Engineering



Cognitive Walkthrough

Cognitive walkthrough

- **What for:** assessing how well a **new user** will be able to figure out the interface
- **Not for:** assessing performance at highly skilled, frequently performed tasks; or finding radically new approaches
- **Additional advantages:** helps work out task sequence models through observation
- **Disadvantages:** limited utility for frequent-use interfaces, narrow focus, relatively time consuming & laborious (compared to HE)

Cognitive walkthrough

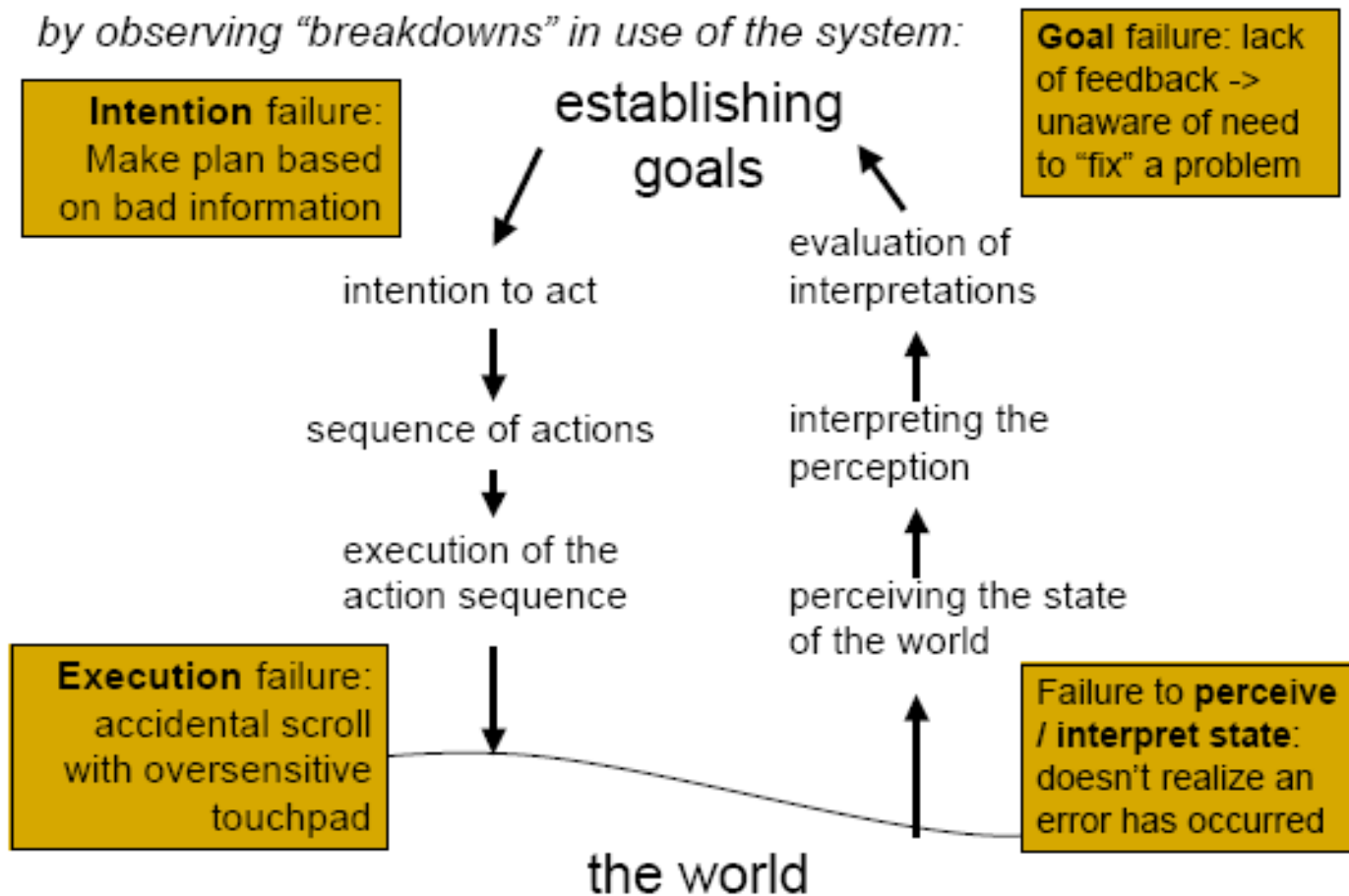
- **Possible outputs:**
 - Loci & sources of confusion, errors, dead ends
 - Estimates of success rates, error recovery; performance speed less evident
 - Helps to figure out what activity sequences could or should be
- **What's required: complete interface description**
 - Horizontal prototype (paper prototype, Balsamiq, etc)
- **Who does it:**
 - anyone – different benefits will accrue from using design team members, naïve users or expert outside analysts. **More distance = better!**

How? Roughly:

- Start with a scenario (a **design-specific task**)
- Ask these questions at each step as relevant:
 - Q1: Will the correct action be evident?
 - Q2: Will the user recognize the correct action?
 - Q3: Will the user interpret the result correctly?
 - Q4: Will the user be able to progress towards goal?

Suggestion: Follow Norman's diagram for each task

by observing "breakdowns" in use of the system:



Simpler approach

	User 1	User 2	User 3
Task 1	Green	Green	Green
Task 2	Yellow	Yellow	Green
Task 3	Red	Red	Red

- 1 – User completed the task successfully
- 2 – User completed the task with difficulty
- 3 – User did not complete the task

Heuristic Evaluation

Heuristic evaluation

- **What for:** identifying (listing & describing) problems with existing prototypes (any kind of interface)
- **Not for:** coming up with radically new solutions
- **Additional advantages:** contributes valuable insights from objective observers
- **Disadvantages:**
 - Reinforces existing design - better solutions might exist
 - Not very repeatable

Heuristic evaluation

- **What's required:**
 - A good model of the proposed interface (e.g., at least a paper prototype)
 - A list of design heuristics to be applied
 - A scenario (task example + design prototype)
- **Who does it:**
 - Team of 3 to 5 experienced, objective people (“**experts**”) who **aren't on the design team.**
- **General idea:**
 - Independently check compliance with usability principles (“heuristics”)

step 1: each evaluator works with interface *alone*
(different evaluators will find different problems)

step 2: evaluators aggregate findings afterwards

One list of heuristics (Nielsen, '93)

- H2-1: visibility of system status
- H2-2: match between system & the real world
- H2-3: user control & freedom
- H2-4: consistency and standards
- H2-5: error prevention
- H2-6: recognition rather than recall
- H2-7: flexibility and efficiency of use
- H2-8: aesthetic and minimalist design
- H2-9: help users recognize, diagnose & recover f/ errors
- H2-10: help and documentation

Step 1: Individual evaluation

- **At least two passes for each evaluator**
 - First to get feel for flow and scope of system
 - Second to focus on specific elements
- **Each evaluator produces list of problems**
 - Explain problem w/reference to heuristic or other info
 - Be specific and **list each problem separately**
 - Assign rating of **severity** to each violation

Severity ratings

- Each violation is assigned a **severity rating**
- **Combination of:**
 - Frequency
 - Impact
 - Persistence (one time or repeating)
- **Used to:**
 - Allocate resources to fix problems
 - Estimate need for more usability efforts
- **Done independently by all evaluators**

Severity & extent scales

- **One severity scale (others possible):**
 - 0 - don't agree that this is a usability problem
 - 1 - cosmetic problem
 - 2 - minor usability problem
 - 3 - major usability problem; important to fix
 - 4 - usability catastrophe; imperative to fix
- **One extent scale:**
 - 1 = single case
 - 2 = several places
 - 3 = widespread

Step 2: aggregating results & making recommendations

- **Evaluation team** meets and compares results
- Through discussion and consensus, each violation is documented and categorized in terms of severity, extent
- Violations are ordered in terms of severity
→ **combined report goes back to design team.**

Heuristic evaluation

- **Advantages**
 - The “minimalist” approach
 - General guidelines can correct for majority of usability problems
 - Easily remembered, easily applied with modest effort
 - **“black box”**: **systematic technique that is reproducible with care.**
 - *Discount usability engineering*
 - Cheap and fast way to inspect a system
 - Can be done by usability experts and end users
- **Problems:**
 - Principles must be applied intuitively and carefully
 - Can't be treated as a simple checklist
 - Subtleties involved in their use
 - Doesn't necessarily predict users/customers' overall satisfaction
 - May not have same “credibility” as user test data
 - A solution: include design team & developers in usability evaluation

Resources

1. Kellogg S. Booth, Introduction to HCI Methods, University of British Columbia, Canada
<http://www.ugrad.cs.ubc.ca/~cs344/current-term/>