
IPM 12/13 – T1.6

Discount Evaluation Methods

Licenciatura em Ciência de Computadores

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Summary

- Discount Evaluation Methods
- Cognitive Walkthrough
- Heuristic Evaluation

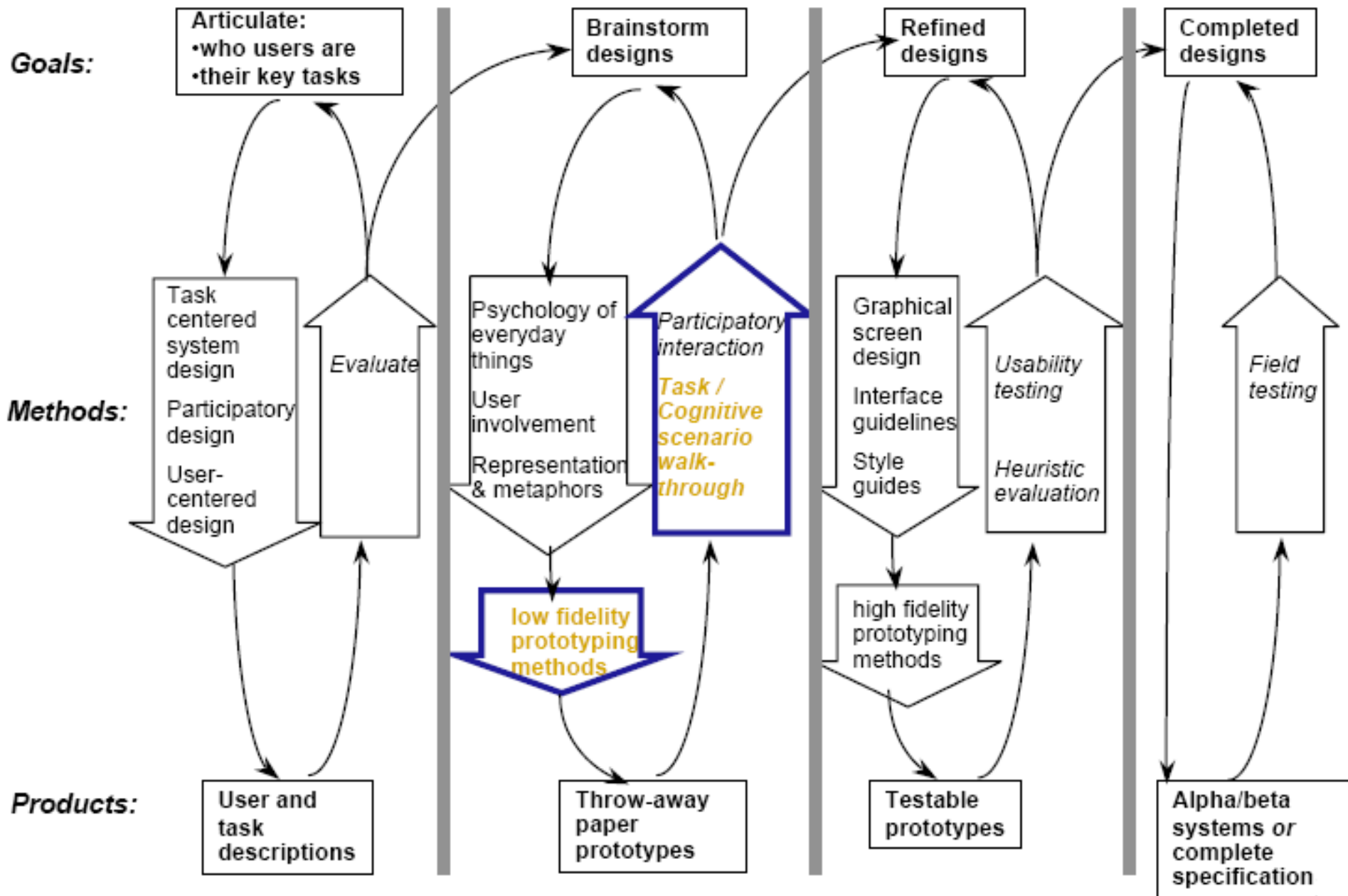
Discount usability engineering

- **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

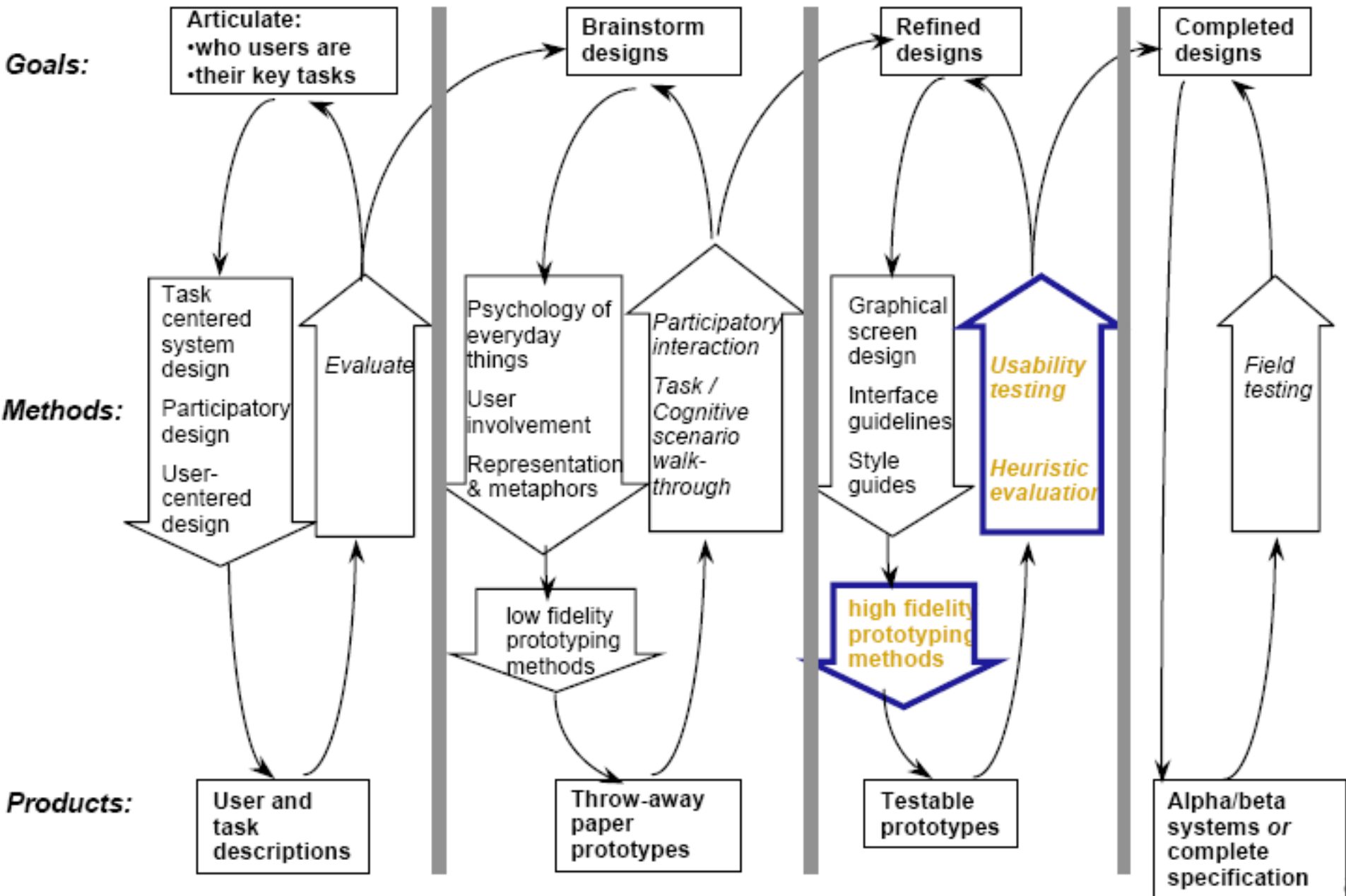
Types of discount methods

- **Cognitive walkthrough: “mental model”**
 - Assesses “exploratory learning stage” (new users)
 - *What mental model does the system image facilitate?*
 - Done by non-experts and/or domain experts
- **Heuristic evaluation: “fine tune”**
 - Targets broader use range (including expert)
 - Fine-tunes the interface
 - HCI professionals apply a list of heuristics while simulating task execution

Interface Design and Usability Engineering



Interface Design and Usability Engineering



Cognitive walkthrough

Exploratory learning

- **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
 - (e.g., a paper prototype)
- Who does it:
 - anyone – different benefits will accrue from using design team members, naïve users or expert outside analysts. **More distance = better!**
- *Alternate spec for paper prototype:*
 - Must accommodate a cognitive walkthrough

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?

discount method #2: 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

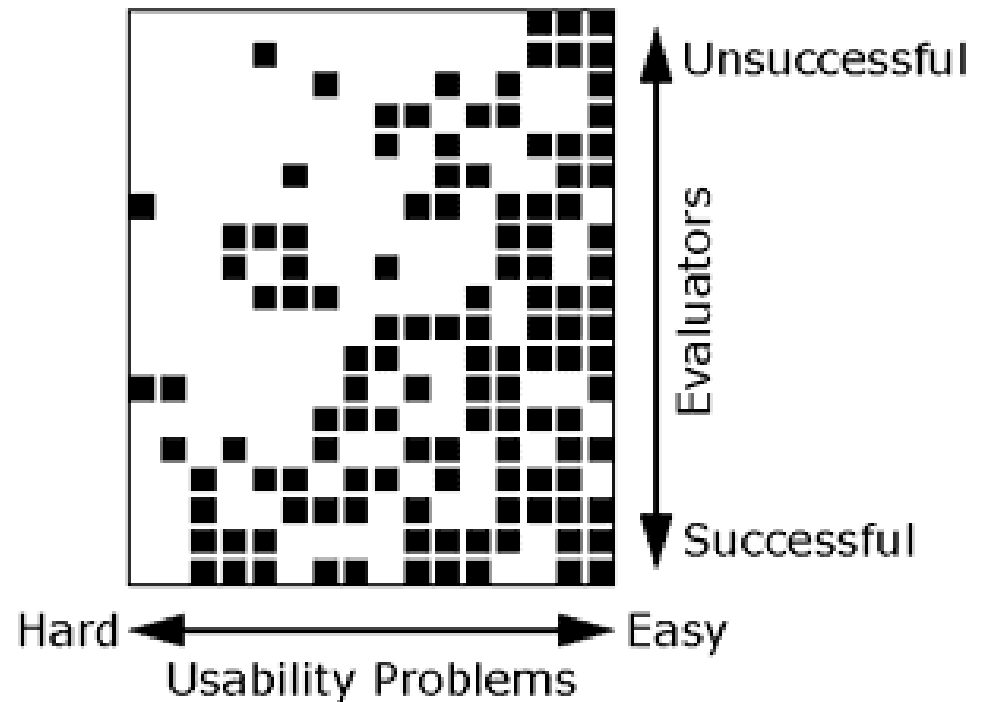
- **What's required:**
 - A good model of the proposed interface (e.g., at least a paper prototype)
 - A list of design heuristics to be applied
 - A scenario (task example + design prototype)
- **Who does it:**
 - Team of 3 to 5 experienced, objective people (“**experts**”) who **aren't on the design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

Why multiple evaluators?

- Every evaluator doesn't find every problem
- Proficient evaluators find both easy & hard (subtle) ones



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
- **Tips:**
 - Be respectful but critical
 - Let your client decide whether to ignore a problem
 - Look especially for what's *not there*

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**
note: in SJWM, severity is set later in process; extent not used

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.**

Summary: how to perform Heuristic Evaluation

1. Design team supplies scenarios, prototype; need 3-5 evaluators
2. Each evaluator **independently** produces list of justified, rated problems by stepping through interface and applying heuristics at each point
... use heuristics list & severity rating convention
3. Team meets and compiles report that organizes and categorizes problems

Summary: 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

Summary: heuristic eval, cont.

- **Research result:**
 - 4-5 evaluators usually able to identify 75% of usability problems
 - User testing and usability inspection have a large degree of non-overlap in the usability problems they find (i.e., it pays to do both)
- **Cost-benefit:**
 - Usability engineering activities often expensive / slow; but some can be quick / cheap, and still produce useful results
 - Usability inspection turns less on what is “correct” than on what can be done within development constraints
 - Ultimate trade-off may be between doing *no usability assessment* and doing *some kind*

Resources

1. Kellogg S. Booth, Introduction to HCI Methods, University of British Columbia, Canada

<http://www.ugrad.cs.ubc.ca/~cs344/current-term/>