IPM 11/12 – T1.6
Discount Evaluation Methods

Licenciatura em Ciência de Computadores

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Summary

- Discount Evaluation Methods
- Cognitive Walkthrough
- Heuristic Evaluation

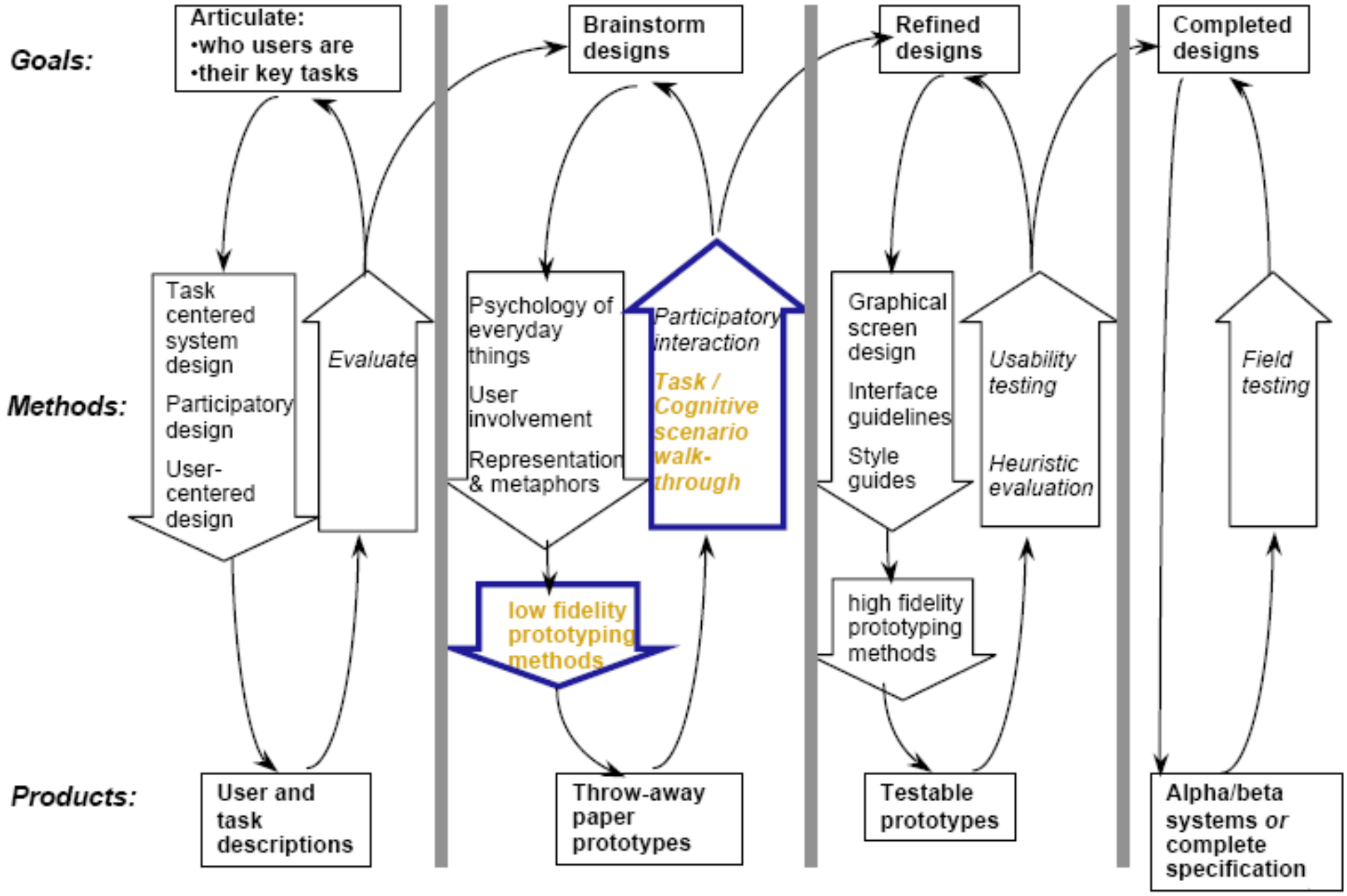
Discount usability engineering

- 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



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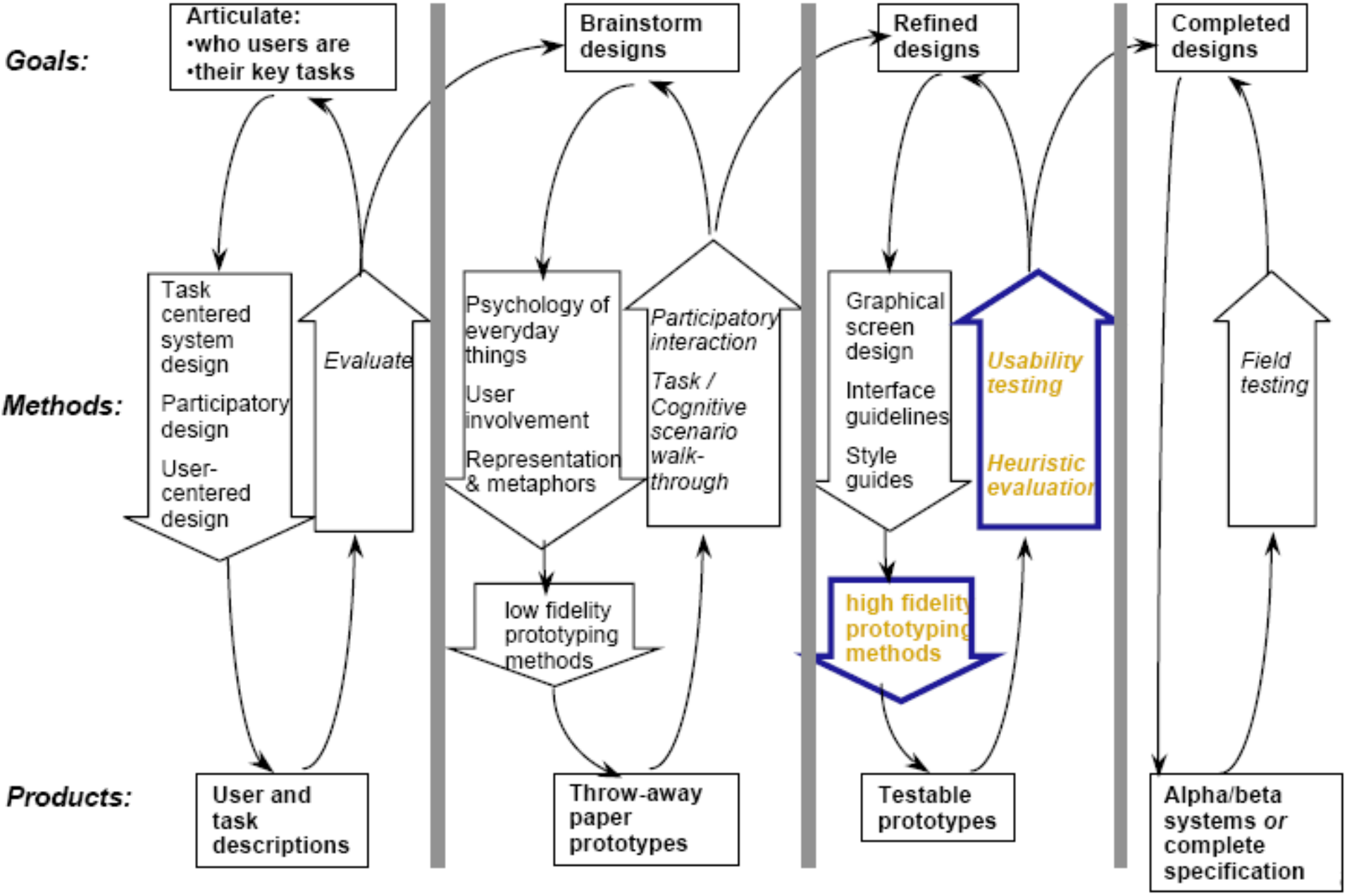


Cognitive walkthrough
Exploratory learning

- **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

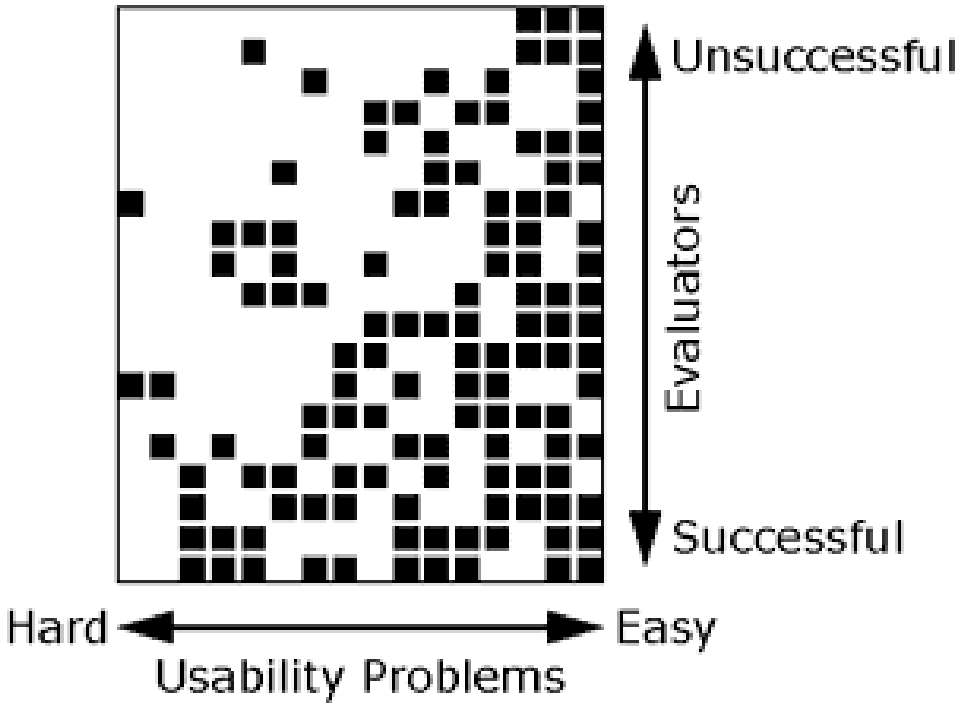
- What's required:
  - A good model of the proposed interface (e.g., at least a paper prototype)
  - A list of design heuristics to be applied
  - A scenario (task example + design prototype)
- Who does it:
  - Team of 3 to 5 experienced, objective people ("**experts")** who **aren't on the design team.**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