Introduction to HCI

Evaluation of Prototypes
Usability Testing

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Midterm evals [5 min]

- Course seems largely on track
- **The attention to pre-readings have improved a lot**
- **Midterm results were good**
- **Working class seem to be effective**
- **In-class activities are well-received**
- Workload has gone down
- **In-class discussions/participation need improvement**
- **We will spend more time on milestone and instructions**

Today

- Mid term eval [5 min]
- Discussion of readings [5 min]
- Usability testing lecture [20 min]
- In class activity [30 min]
    - Usability study
- Discussion [15 min]

Learning Goals

- Understand the role of usability testing in HCI
- Be able to define usability testing (nelson's definition vs others)
- Understand how usability testing is different from other evaluation methods
- Explain when usability studies are typically conducted and why
  - Give examples of locations, tasks, metrics, evaluation methods that might be involved
- Explain how to plan and conduct a usability study

What is the role of usability in HCI?

- Usability: a primary focus of HCI
- **Evaluate** system usability
  - How **easy** it is for the user to *get* the system to do what s/he needs it to do
- **Design** for usability
- Establish/apply **metrics and standards** for usability

Observe, learn, iterate and learn (Don Norman)

What is the role of usability in HCI?

•HCI starts with understanding the problems that users are having

then designing a system that solves these problems
→ requirements, task examples specify what it should do
→ decide on conceptual/interface design for how system will do it

→ **usability studies:** see if we succeeded

Usability (Nielsen's definition)

- Learnability
  - easy to learn so a user can rapidly start to use it
- Efficiency
  - once the user has learned the system, a high degree of productivity is possible (better known as *performance*)
- Memorability
  - the user should be able to return to the system and not have to learn again
- Errors
  - users should make few errors and recover easily
- Satisfaction
  - the system should be pleasant to use

- → Usability study/test: evaluates an interactive system/prototype with respect to all/some of these elements, always involving real users

Elements of a usability test

1. Interactive system / prototype
2. Evaluation goals
3. Tasks
4. Measures/metrics
5. Data collection/recording methods
6. Participants

When designing a usability test:

- Choice of methods: **triangulate**
  - Typically: one instrument counts something, while another interprets what was counted
- Choice of metrics: driven by your requirements & eval goals
  - As well as basic usability principles
- How many users: should be representative of your user groups
  - E.g.: If you want to support both expert and novice users, should have good numbers of both!
  - Within a demographic, < 4-5 is dubious; often >10-12 is of marginal additional value.
  - Sometimes constraints dictate low numbers.
    - Examples?
    - If you have to generalize, consider who your test users are, and how representative they are?

Task

- Generally: user researcher specifies the task
- Can be:
- At quite low level; e.g. The subtask that will take you from one screen to the next.
- Or, at entire task level: see if someone can figure it out, start to finish, and watch /count / measure the challenges s/he has
- Not done with those task examples yet!
- ➔ Can use them as a basis for a stripped-down task description
  much as you did for cognitive walkthroughs
- (But don't usually want to include the *story*)

Methods
examples of common ones

- Observational techniques:
- silent
- think aloud
- constructive interaction
- Query techniques:
- Interview
- survey
- questionnaire

Metrics
examples of common ones

- Time:
  - To **complete** a task (entire, or a portion)
  - **Learn** a task
  - **Resume** a task after interruption
  - **Find** something on a screen
  - **Attain** specified degree of proficiency

- Errors:
  - Number per task or unit of time
    - Different types: e.G., Navigation, selection, interpretation
  - Number of users making the error
  - Alternately: number of successes

Metrics
examples of common ones

- events of interest:
  - page views or clicks
  - access of particular tools
  - timeouts
  - questions asked or help tools consulted
  - # users willing to recommend
- subjective factors:
  - task level satisfaction
  - perception of aesthetics
  - perceived ease of use
  - perceived preference
  - (all can be measured on a Likert or semantic rating scale)

Alternatives to usability testing

Usability testing requires users, relatively refined prototypes, and usually focusses on measuring something.

- "Discount" methods can also target prototypes at various stages and be done without users
  - Heuristic evaluation
  - Cognitive walkthrough

- Because you don't need users . . .
  - Can do it first (before a usability study)
  - Possible to apply these methods yourself while iterating on a design (before it's totally finished)

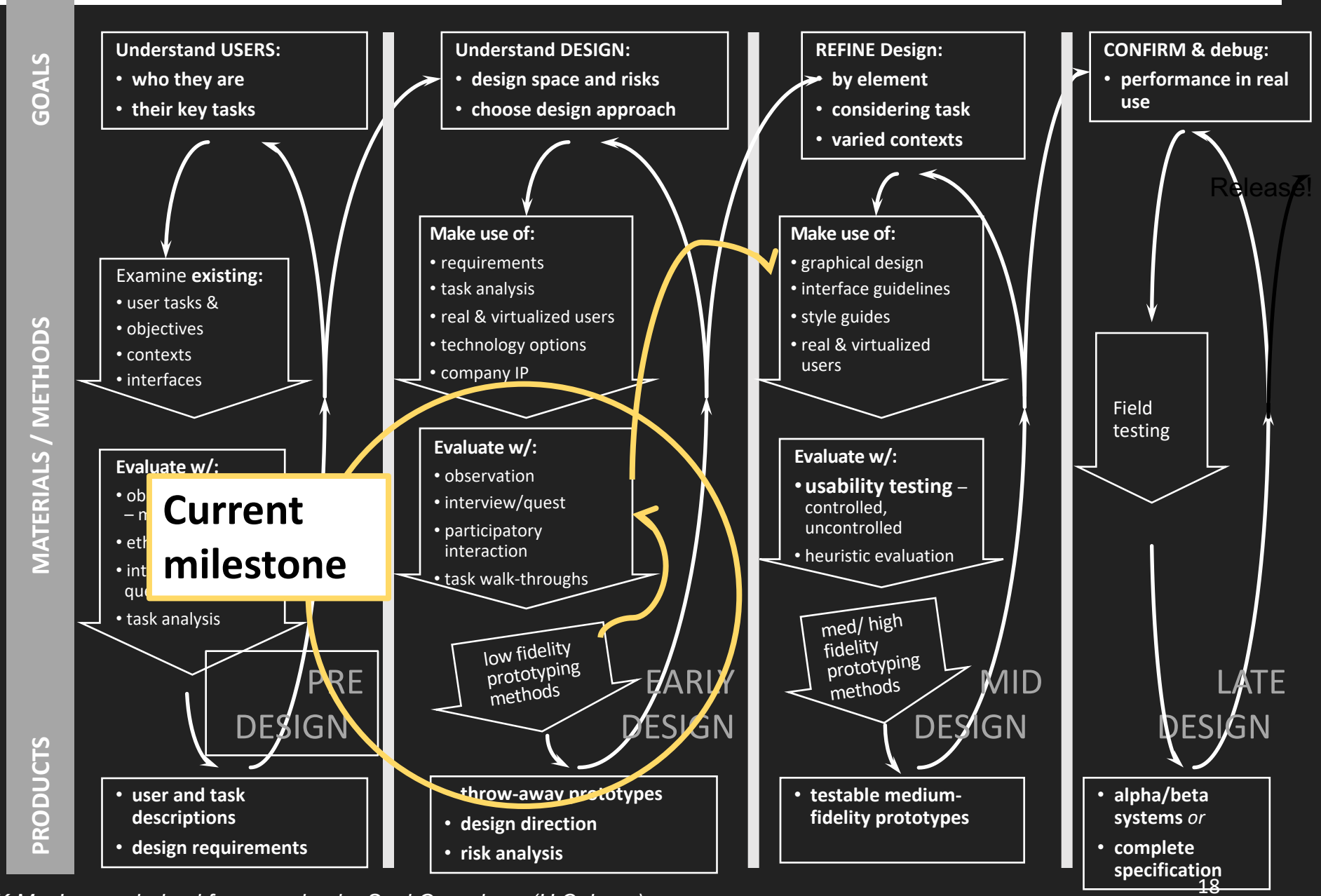
Biggest differences with alternatives

- Usability testing requires:
- *A refined interface.*
  - This could be… your new medium fidelity prototype.
  - Or it could be the bad old interface, which you plan to revise or replace
    i.e., Might be “evaluate for understanding the problem”
- *Measured outcomes.*
- *Users (participants).*

Note on terminology

- Not entirely standardized…
- User Study – very general. Any study that involves actual or prospective users. Can be anytime -- from before a system is built (Empathize / Pre-Design) right to a controlled experiment.
- Usability Study – more specific. Requires a system for which task performance can be measured (usually Mid / Late Design, but can be Pre-Desing for a system being re-designed)
- Controlled Experiment – a specifc type of usabilty study with hypotheses and statistical testing, often comparing alternate designs (more on this later). (Test / Late Design)
- Informal / Small User Study – often used before a usability study, not ready to measure things yet, interested in higher-level feedback. (Early design).

usability testing: *"count" problems in refined prototype*



K MacLean - derived from version by Saul Greenberg (U Calgary)

Usability testing
in your project – Fifth milestone: test

- Evaluation goals?
- You will likely want to draw from your requirements and task examples; may need to prioritize;
- Test *how well* your system supports what you intended it to
- Metrics, evaluation methods, etc. Should follow

- Hi fidelity prototype scope?
- Prototype should be a working system
- **It should do enough to test if your design will meet your goals** (and be acheivable in the time available)

On deck…

- Next class (Tuesday) …
- Working Class and Prototype Review

- Forth project milestone: prototyping
    - due on Thursday Nov 14th (next week)

Activity [30 min]

- Read and discuss any questions about the next milestone [5min]
- Come up with evaluation elements for your projects [10 min]
- Document your metrics, methods, task, participants, data collection, procedure [15min]
- Develop unbiased questions [5 min]