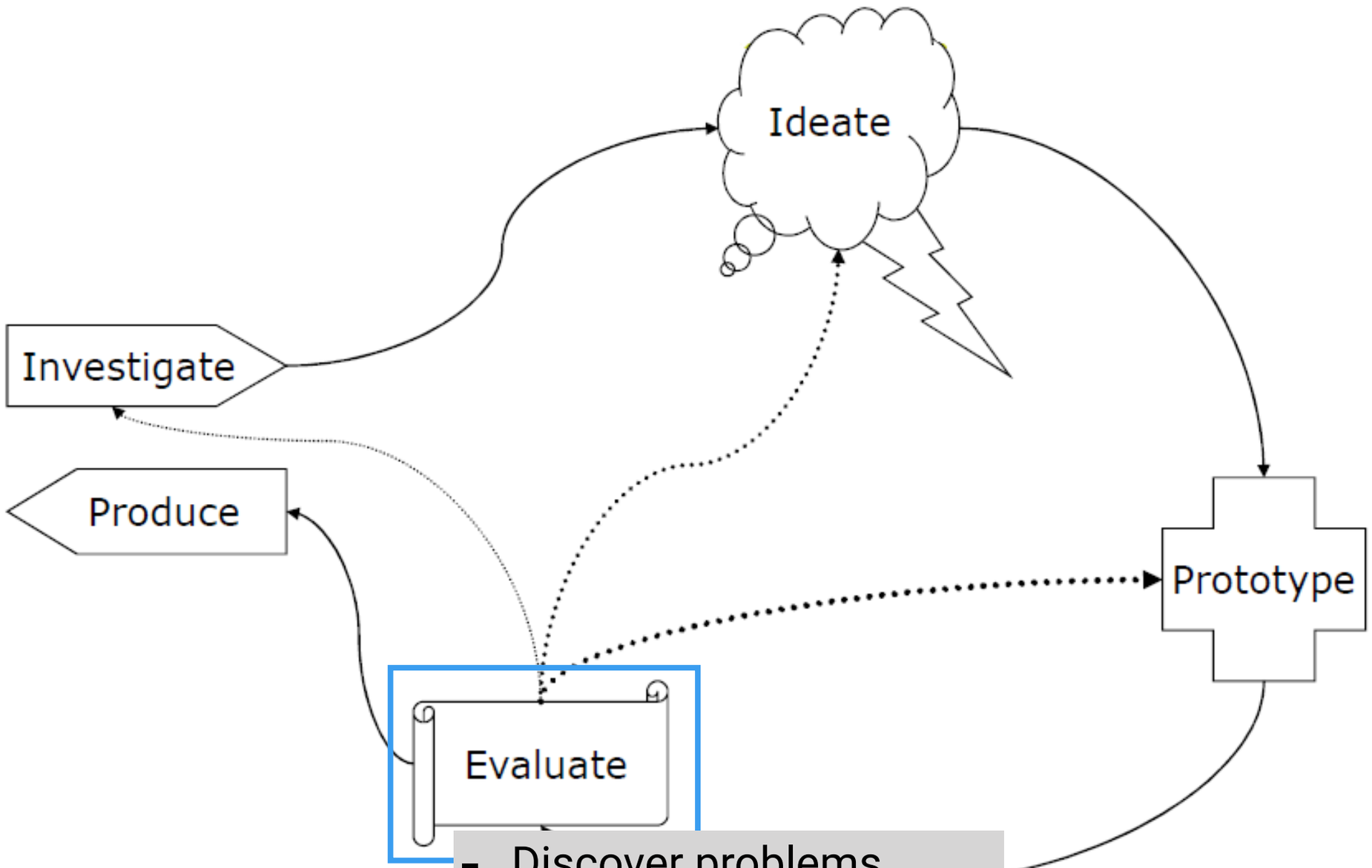
Human-Computer Interaction

CPSC 481 - Winter 2019

Usability Evaluation

With acknowledgements to Tony Tang

Evaluate



- Discover problems
- Assess progress
- Determine next steps

Why evaluation?

- Automated processes can find bugs, but not usability issues
- Evaluation gives you a way to move forward
  - What needs to be fixed, added, removed?
- Answers to two questions:
  - Did we build the right thing?
  - Did we build the thing right?

Which evaluation method to choose?

- Time
- Cost
- Required number of specialists
- Required number of users
- Physical environment configuration
- Equipments

In most organizations, you have three major options

- **“Inspection (Expert) Evaluations”**
  - Task Centered System Evaluation; Heuristic Evaluation; Guideline Review
- **Usability Test**
  - Formal method of evaluation that asks (potential) users to complete tasks
- **Field Deployment**
  - Give a prototype to users in the field, and watch their usage/ask for feedback

Within an organizational context

- **Reviews with stakeholders**
  - Usually, fairly cursory as a presentation / part of a meeting
  - General flow, look/layout/feel
  - Useful for: getting people on board
- **Test with users**
  - See whether it actually works with real people
  - Looking for the problems that people encounter
  - In organizations with poor design culture: part of “quality assurance” (aka “testing”)

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Inspection Evaluation

- Who evaluates?
  - Usability specialist
  - Software development consultants specialized in a particular interface style
- Inspection methods
  - Heuristic Evaluation
  - Guideline Review
  - Cognitive Walkthrough

“User” Testing

~~“User”~~ Testing
Usability Test

- A usability test is a “formal” method for evaluating whether a design is learnable, efficient, memorable, can reduce errors, and meets users’ expectations.

- **Users are not being evaluated**

- The design is being evaluated

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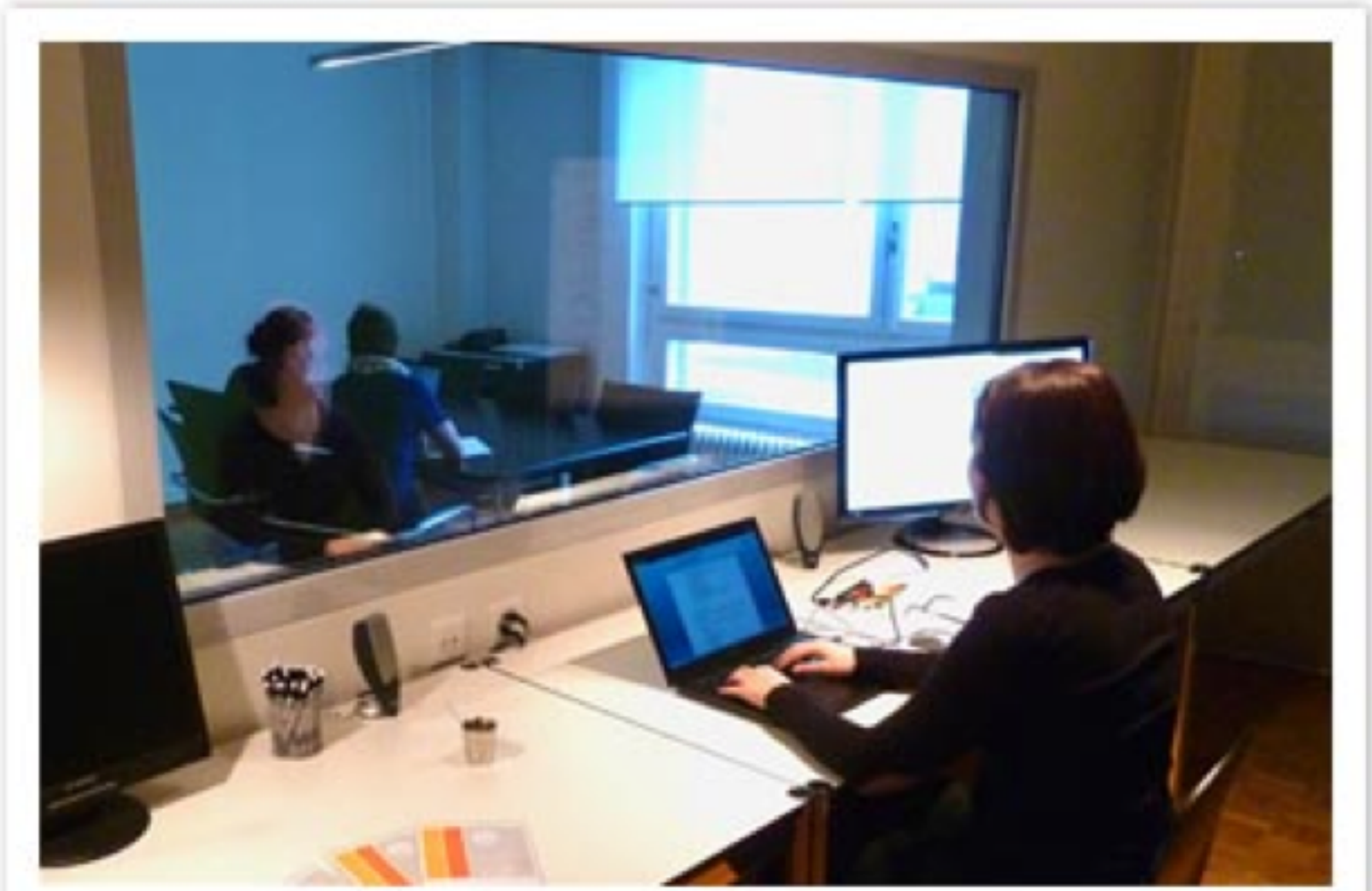
- Iterate on the design, repeat

Usability Test: Environments



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  - Do you want your whole team to be able to view?
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  - Are interruptions important?
  - Repeat use systems, or one-time use systems?

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- **Satisfaction:** How pleasant is it to use?

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Corel Paper Prototype Test

- http://www.youtube.com/watch?v=ppnRQD06ggY

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- Keywords to good task selection: specific, concrete user goals that describe a complete job (or interaction)

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- Consider "the context of use"
  - What would someone need to to with your tool?
  - Under what circumstances would they be in?
    - (relaxed *vs*. under pressure; non-interrupted *vs.* interrupted constantly)

Usability Tasks
Netflix

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- “What do you think about the site?”

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- **Self-reported**
  - Ease, satisfaction, clarity, comprehension, etc.

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- **How many?**
  - Considerable debate in the community
    - Rule of thumb: ~5

Usability Tests: How many users?

Number of usability problems found with **n** users is described by

$$N(1-(1-L)^n)$$

Where:

- N = total number of usability problems
- L = proportion of problems discovered on 1 user
- Typically, L = 31%

Usability Tests: How many users?

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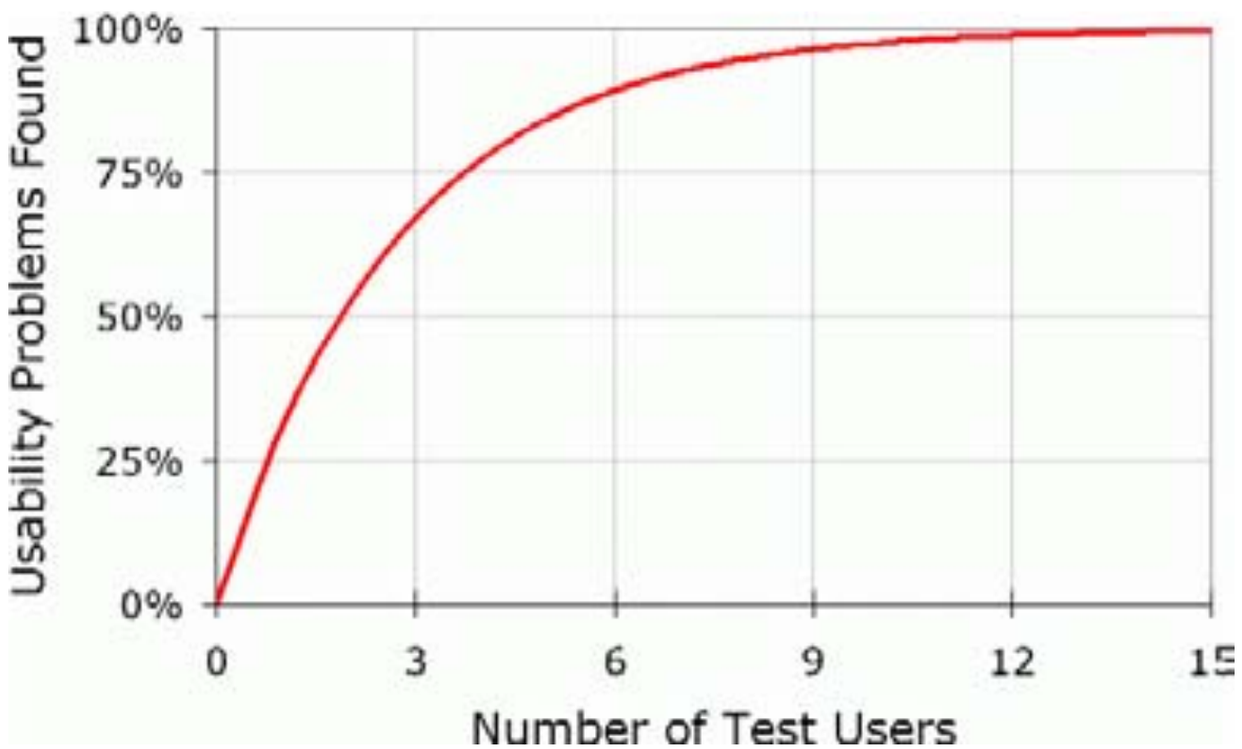
Nielsen & Landauer (1993)



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  - Big obvious problems
  - Error trends
  - Trends in comments
- Group issues in terms of severity/priority
  - 1: must fix/brick wall
  - 2: should fix/okay to wait
  - 3: okay as is/could be improved

Making sense of your data

- Affinity diagraming

Making sense of your data

- Discussion with others who watched with you

Usability Testing: Providing Feedback

- Based on your list of issues, provide a small handful of suggestions on how to address the issue

- Depending on the part of the design cycle you are in (early, middle, late), these should be bigger or smaller suggestions

- Provide video “**proof**” of people encountering issues

Three Basic Usability Test Protocols

- Think-Aloud Protocol

- Co-Discovery Protocol

- Conceptual Model Extraction

Think-aloud protocol

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- As participants complete a task, you ask them to report
  - what they are thinking
  - what they are feeling
  - rationale for their actions and decisions
- **Idea:** rather than interpret their actions/lack of action, you can actually understand why they are doing what they are doing

Think-aloud protocol

- *What's weird*:

- People are not normally used to saying things out loud as they work.

- They may also be embarrassed to say things out loud.

Co-discovery Learning protocol

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- **Main idea**: remove the awkwardness of think-aloud

- Two people sit down to complete tasks
- Only one person is allowed to touch the interface
- Monitor their conversation

- **Variation**: use a semi-knowledgable “coach” and a novice (only the novice gets to touch the design)

Conceptual Model Extraction

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- Show the design, but don’t say how it works

- Ask the user to explain
  - function of each element
  - how they would perform a particular task

Conceptual Model Extraction

- Initial conceptual model (before they use it)
- Formative conceptual model (after they've used it)
- *Good for*: eliciting a user's understanding before and after use
- *Bad for*: understanding exploration and learning

Acknowledgements

- Tony Tang
- Lora Oehlberg
- Ehud Sharlin
- Frank Maurer
- Saul Greenberg

Course information

- Website
  - GitHub Pages https://silvadasilva.github.io/CPSC481-2019W/en/#!index.md
- Communications
  - Slack https://cpsc481-2019w.slack.com/
- Readings and Slides
  - Posted online at the main website