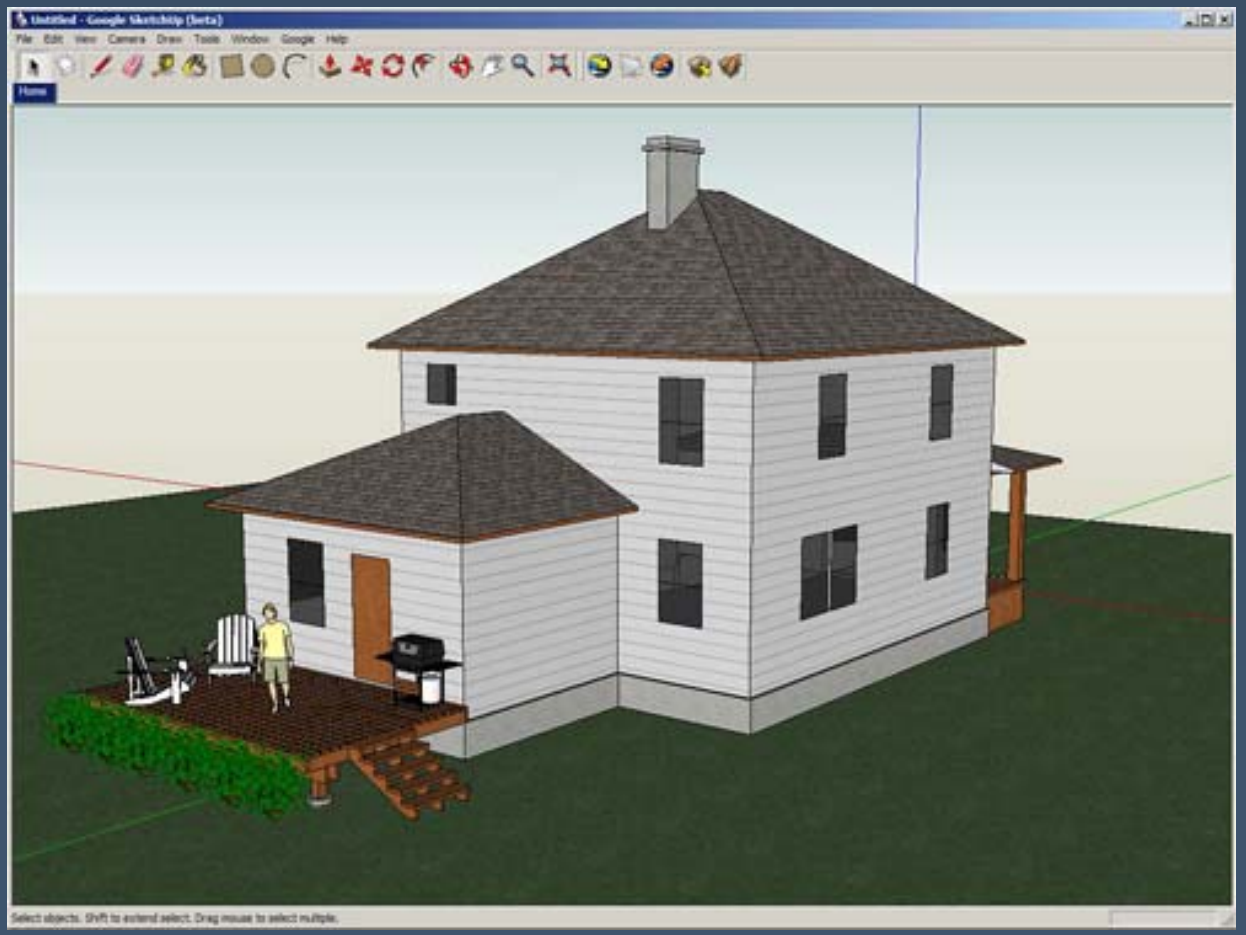
Identifying Critical Incidents for Large Scale Usability Analysis

David Akers
dakers@stanford.edu

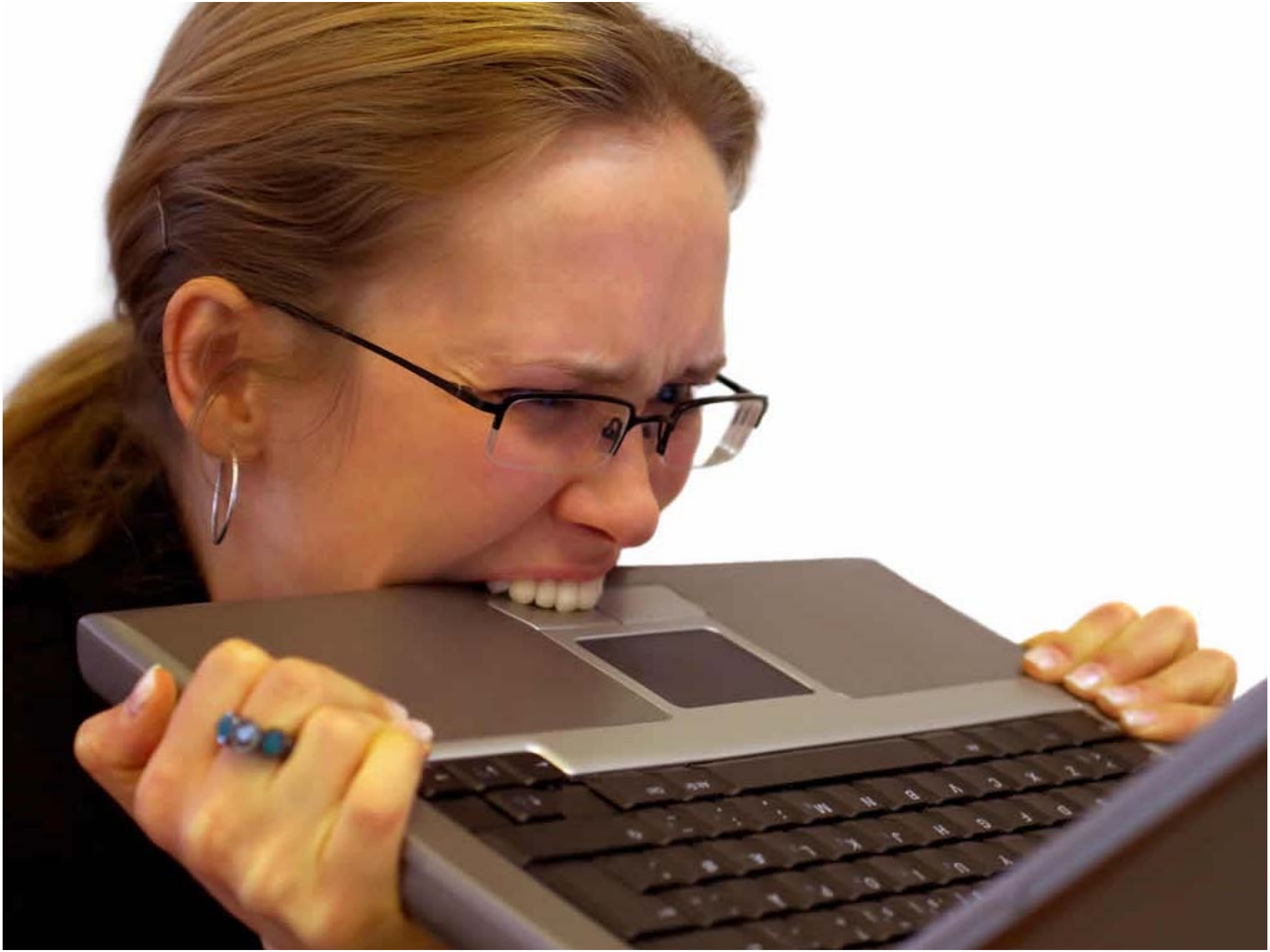
Google SketchUp... Before

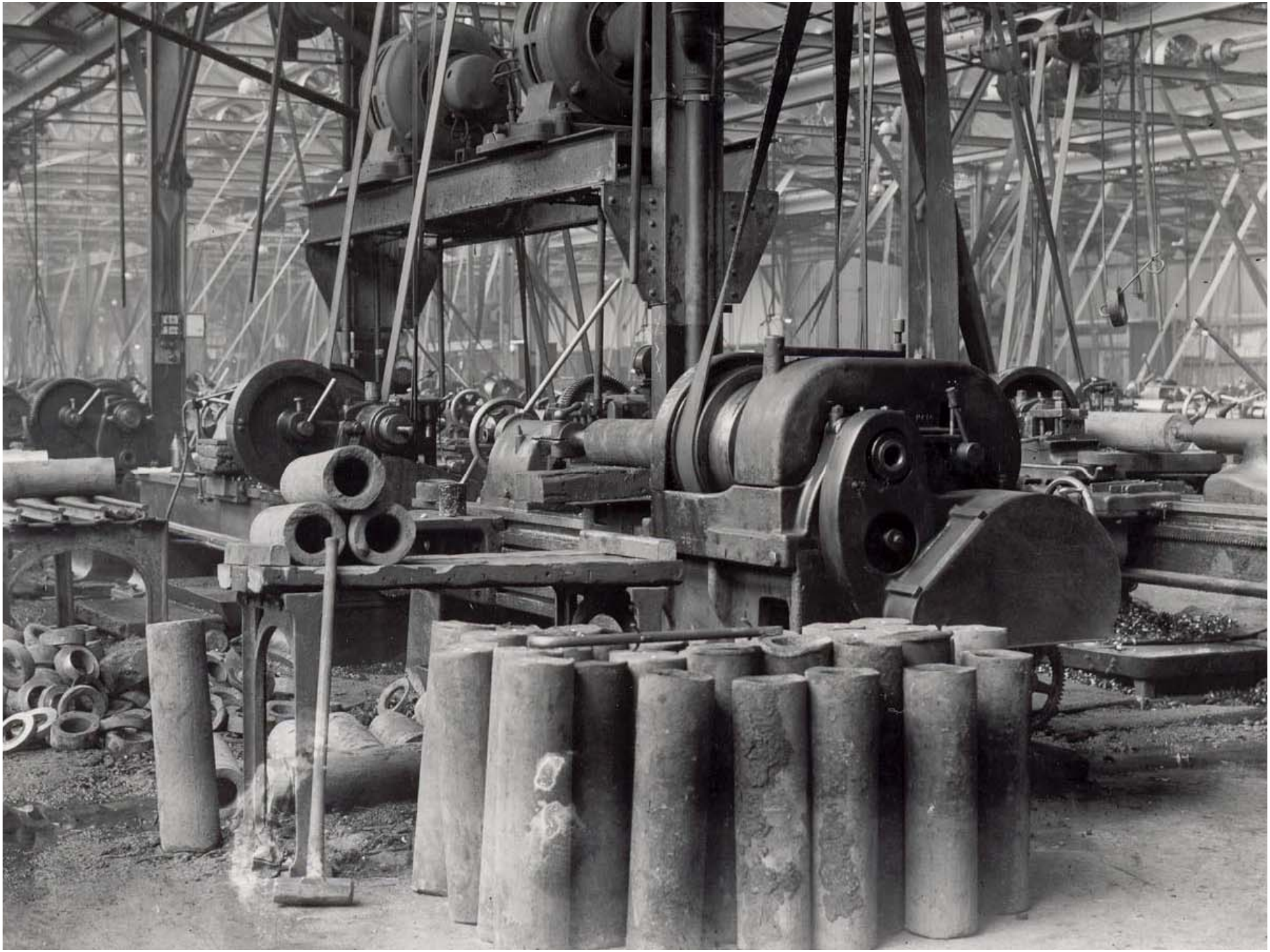
Google SketchUp... Now

Software Demo




Questionnaire





Critical Incidents in HCI

"A negative critical incident is any event that causes errors, dissatisfaction, or negatively impacts effort or task performance."

[Castillo 1997]

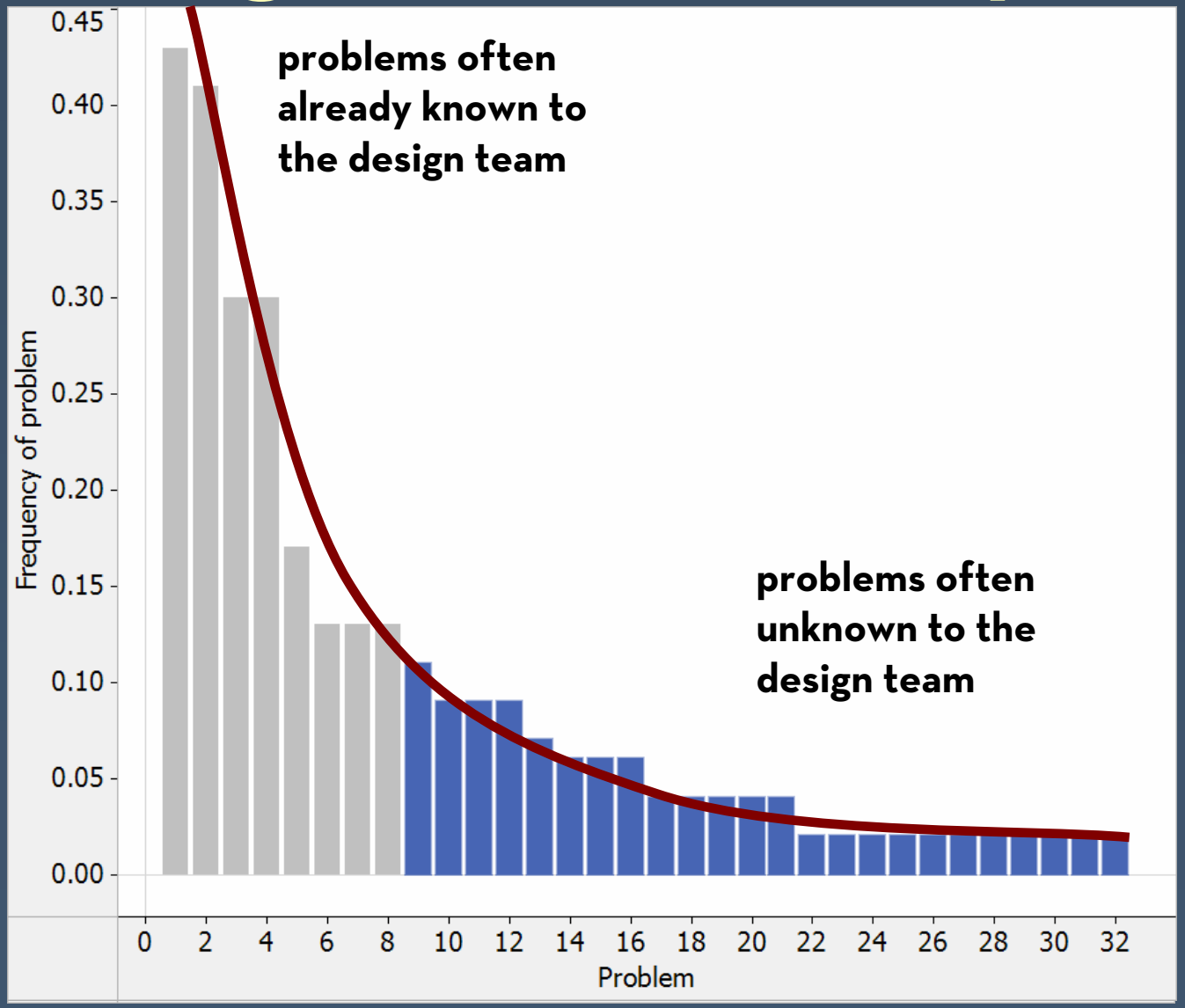
Traditional Usability Testing

Identifying critical incidents

Collecting additional detail on symptoms

Reasoning from symptoms to causes

The Long Tail of Usability



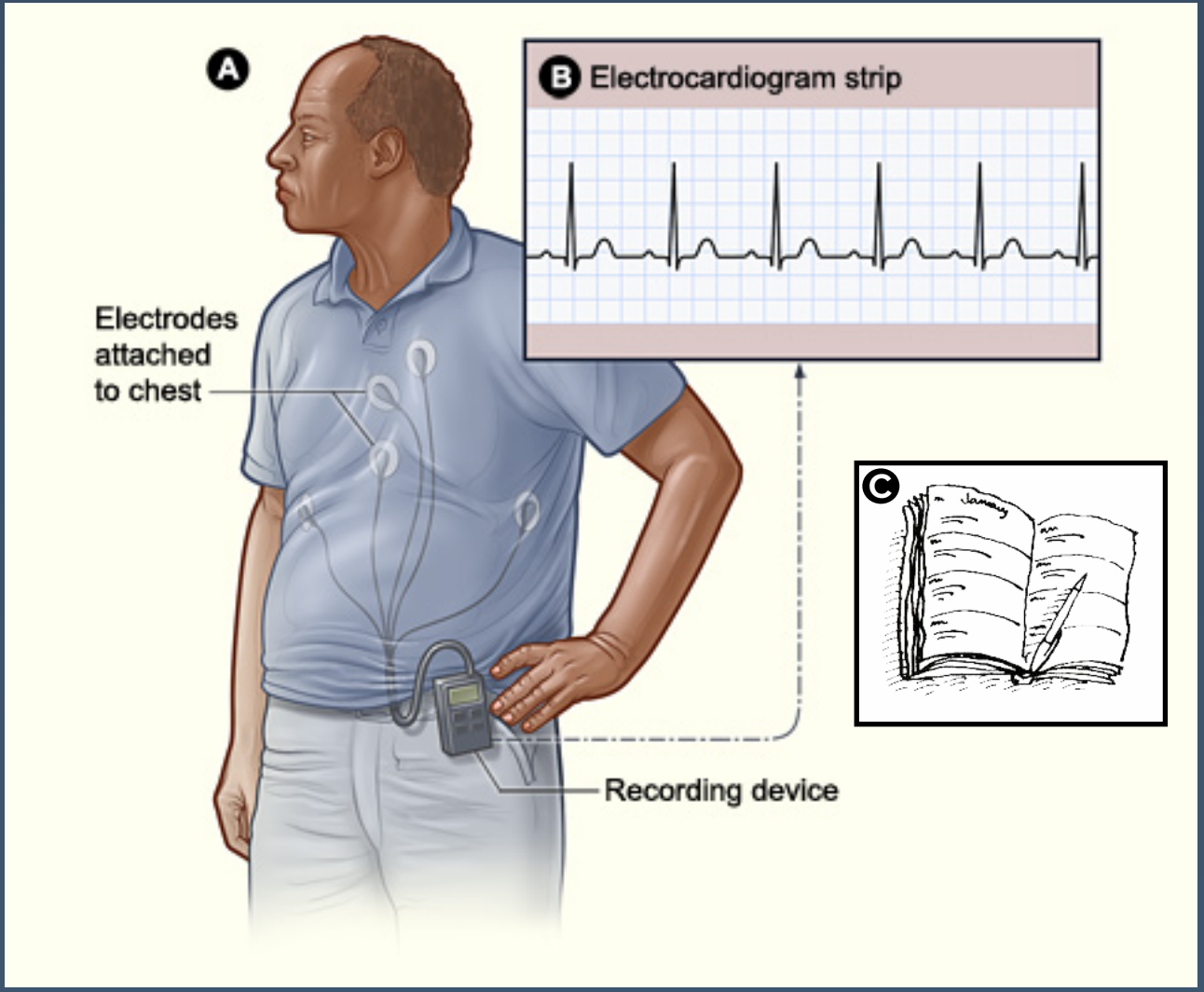
Broad Research Questions

How can we detect and characterize critical incidents in applications like SketchUp without requiring a usability expert's attention?

... and ...

How would this compare to traditional usability testing?

Detecting Critical Incidents



Obvious Tradeoffs

Self reporting	Event-based reporting
+ Don't need hypotheses or software instrumentation + Very few "false positives"	+ Does not interfere with work + Relies on objective judgments + Requires no training + Can identify problems unrecognized by the user

Environments for Usability Testing

Event-based reporting

Self-reporting

Field or lab study

Small scale
High compensation
Short duration
Privacy not an issue
Tasks usually provided

Instrumented panel

Medium scale
Some compensation
Variable duration
Privacy a minor issue
Tasks sometimes provided

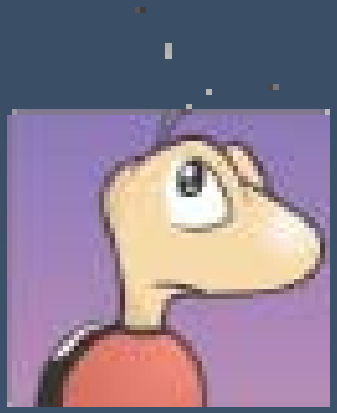
Real-world use

Large scale
No compensation
Long duration
Privacy a major issue
Tasks not provided

Self Reporting

Self Reporting Implementations

Safari



Bugzilla

Others?

Self Reporting

"You can recognize that you are experiencing a negative critical incident when you are feeling confused, annoyed, fatigued, or frustrated."

[Castillo 1997]

Report Incident

Report a Negative Critical Incident

Instructions

- Answer each of the following questions
- When you have completed the report, press the SUBMIT button
- Use this form to report ONE critical incident
  - If you experience multiple critical incidents for a task, please file a separate report for each one
- If you decide not to submit the report you can return to the main reporting page

TASK DESCRIPTION

What was your overall objective?
What was the purpose of your task? What generally were you trying to do?
For example: add a footnote, insert a page number

What part of the interface were you using?
What menu, or window, or dialog box were you using?
For example: the main window, the reminder window, the file dialog box

How were you carrying out your task?
Please give a concise description of what you were doing, but complete enough that someone else could recreate the task context.

- What was the sequence of actions you performed?
- What equipment did you use? (keyboard, mouse)
- What buttons, menus, pull-down lists, etc did you use?

CRITICAL INCIDENT DESCRIPTION

Describe what happened
What was the critical incident?
What was the feature or aspect of the interface that caused the critical incident?
During what part of the task did the critical incident occur?

How was your performance affected?
Some suggestions for information you might want to provide in this box:
What aspect(s) of were affected? (ex. speed, accuracy, ease, comprehension)
How were these aspects affected?
Why did this feature fail to meet your expectation *or*
Why do you consider it a poorly designed part the program?

How did this make you feel?
Frustrated, confused, irritated, limited in productivity, physically fatigued, or any other adjectives or phrases that describe your reaction to the incident.

How did you recover from this critical incident?
Were you able to recover and complete your task?
What actions did you take to resolve or compensate for the problem?
Why did you choose these actions?

Rate the severity of the critical incident

- ○ Unusable - can't or don't want to use this feature because of the way the software has been designed and implemented
- ○ Severe - will probably continue to use this feature, but will be severely limited in my ability to do so. Will have great difficulty in circumventing the problem.
- ○ Moderate - Will be able to use the program in most cases, but will have to undertake some moderate effort in getting around the problem.
- ○ Irritant - The problem occurs only intermittently, can be circumvented easily, or is dependent on a problem that is outside the product's boundaries. Could also be a cosmetic problem.

Submit

Pilot Study

Embarrassed (12/15): “I felt self conscious about admitting my mistakes.”

Polite (8/15): “It felt kind of like pressing a flight attendant call button.”

Unaware (7/15): “When I was busy, I forgot about the button.”

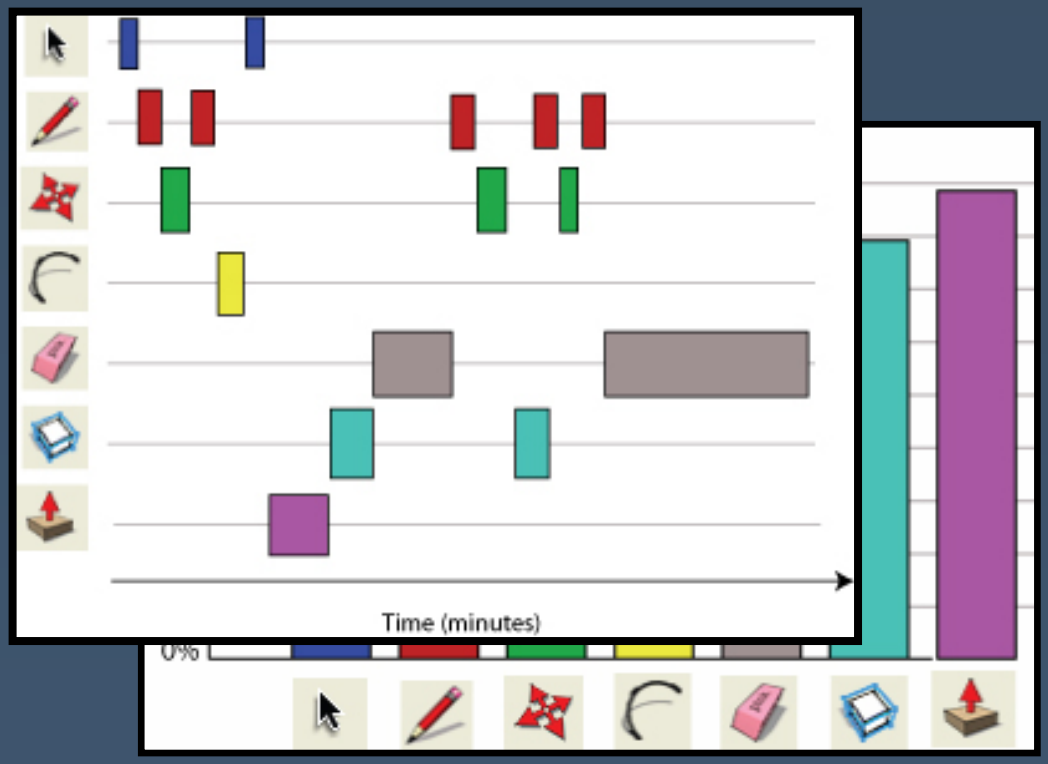
Unmotivated (6/15): “I was more interested in completing the task.”

Unqualified (4/15): “I didn’t report problems unless I understood the cause.”

Calm (4/15): “I just didn’t get frustrated enough to press the button.”

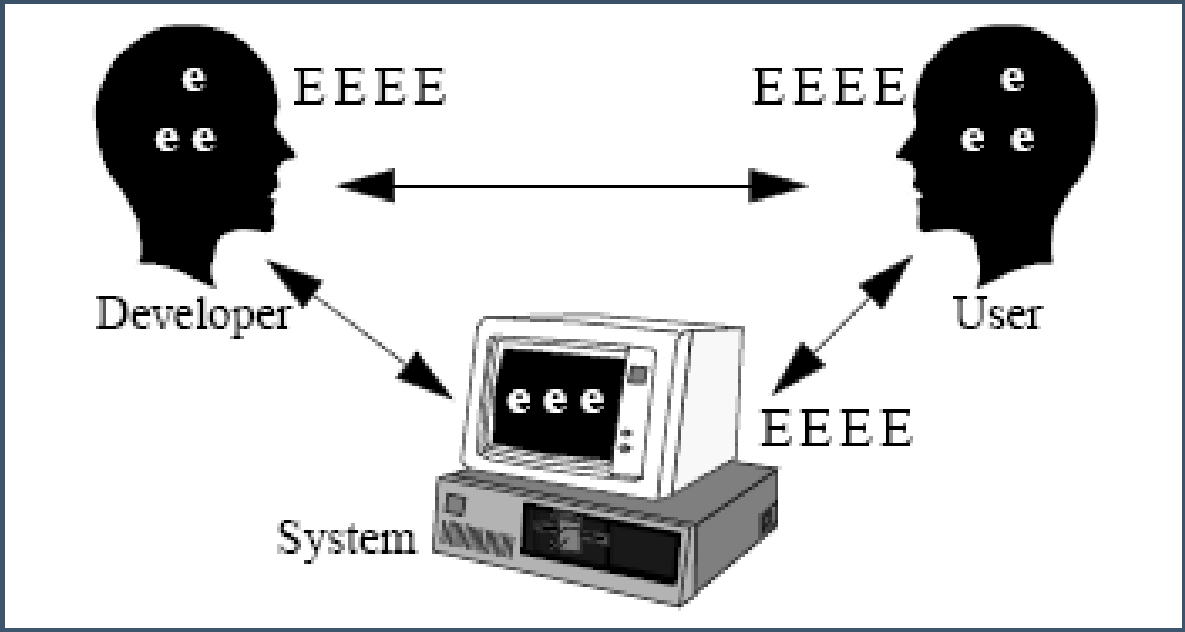
Event-Based Reporting

Approach 1: Capture Everything



Approach 2: Hypothesize Behavior

Goal: Detect cases when developers' expectations do not match users' expectations.



Hilbert *et al.* 1997

But… Many Uses

And... Many Ways To Use

Approach 3: Look for Symptoms

On-line help is invoked

UNDO action invoked

Error message triggered

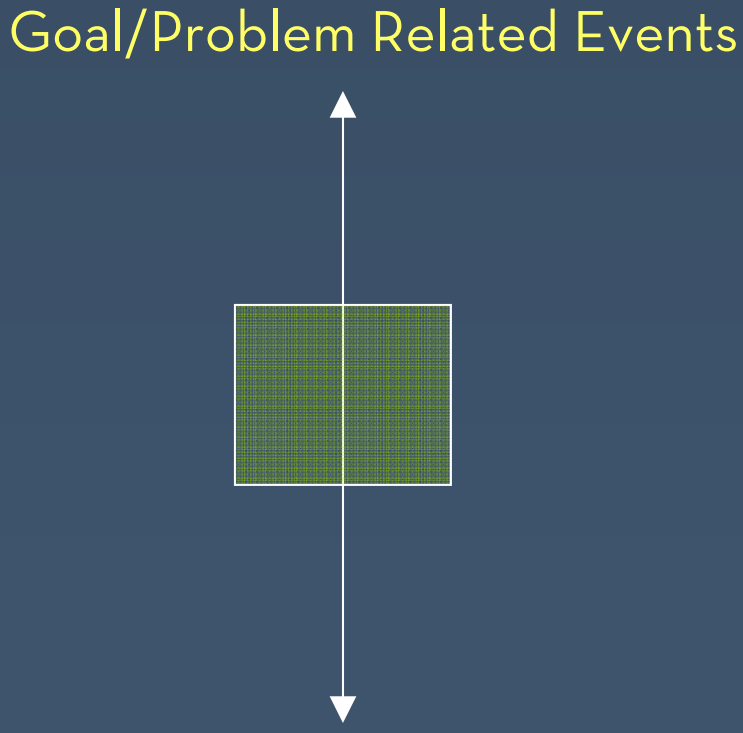
Warning message triggered

An action has no effect

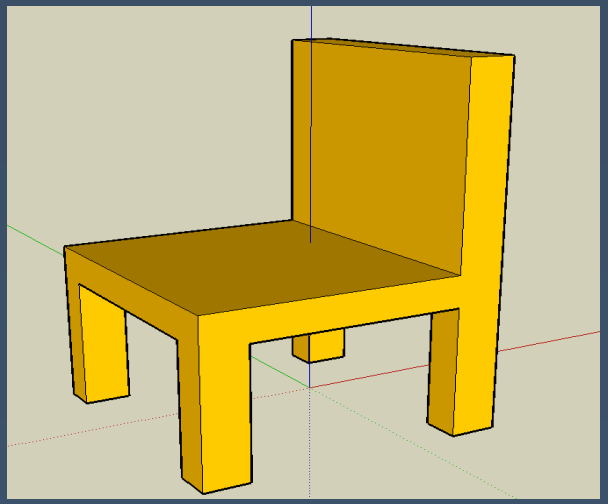
DELETE invoked

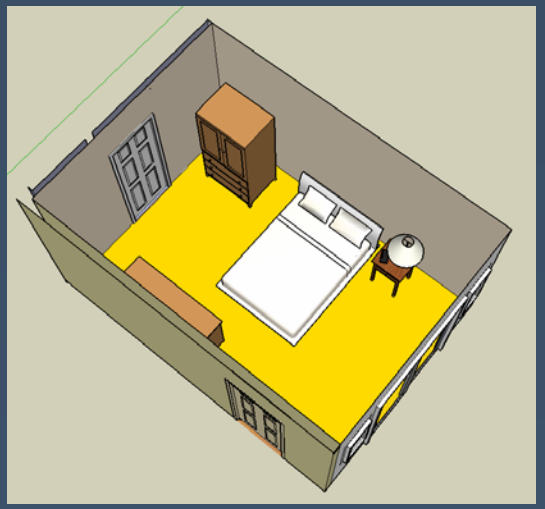
Cancel button

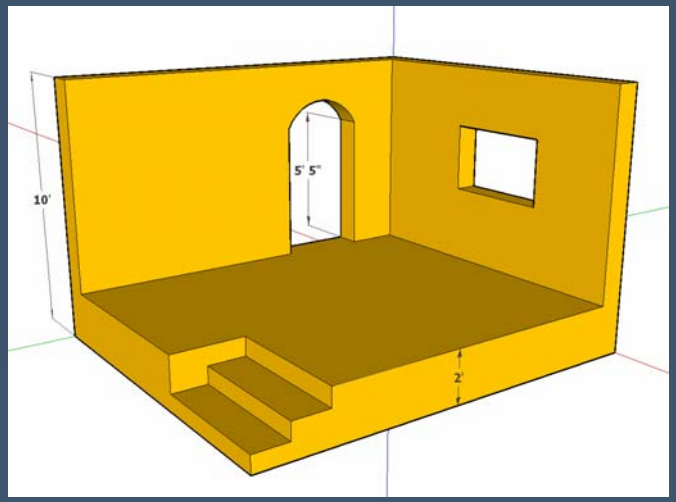
Swallow *et al.* 1997



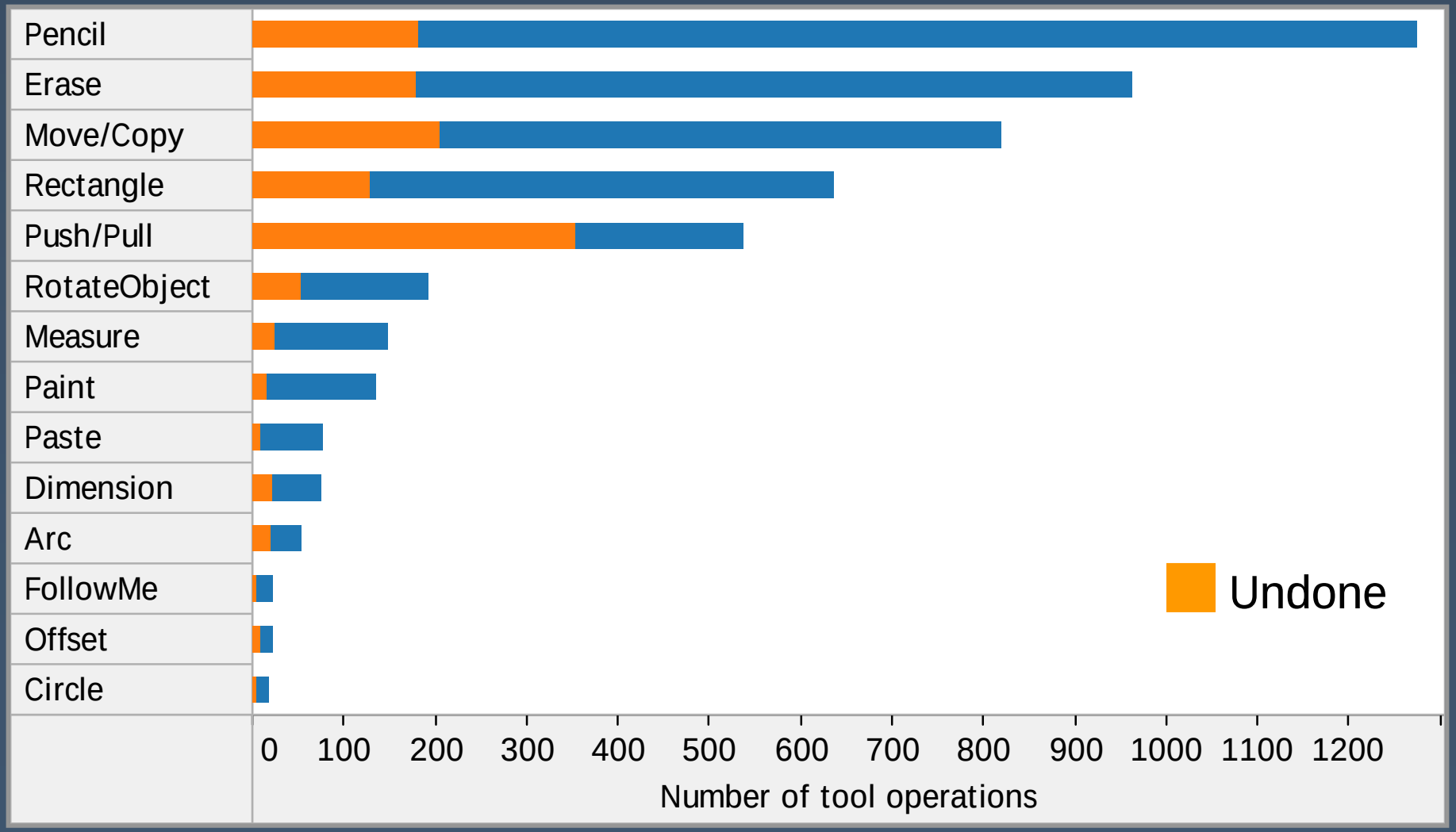
SketchUp Tasks







Tool Use Counts

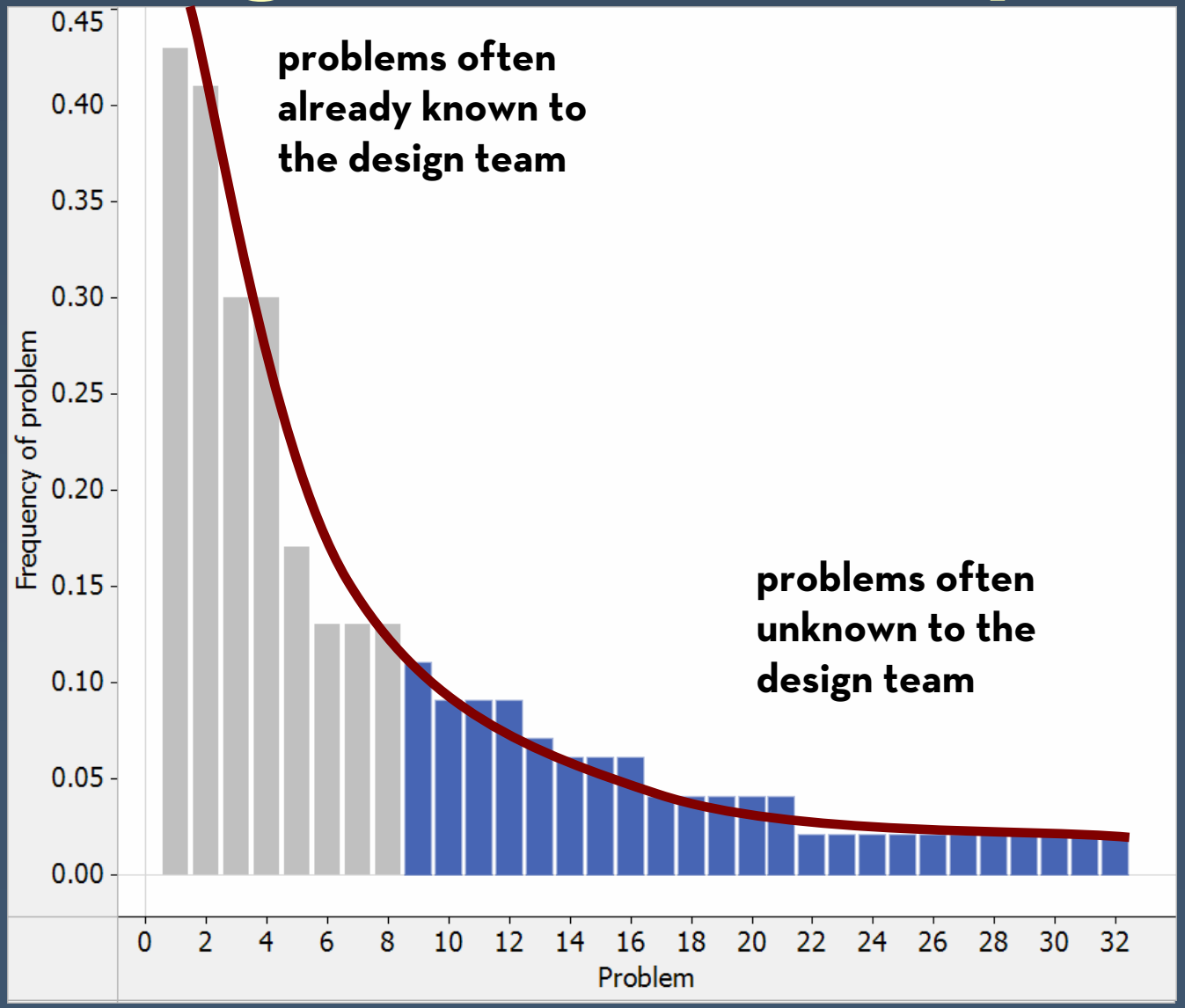


Results (Push/Pull)

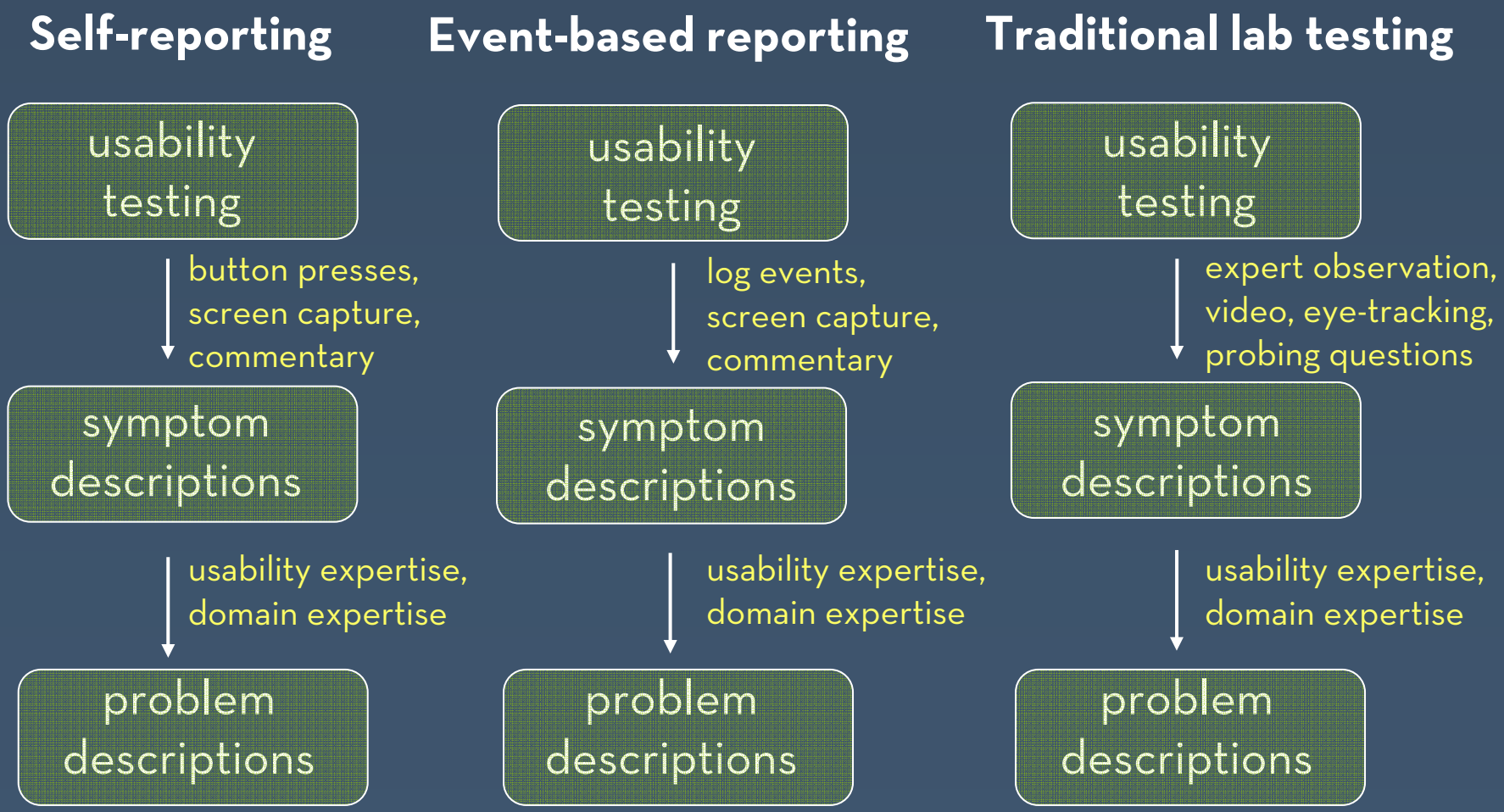
Undos of Push/Pull are caused by:

- 2% exploration in SketchUp
- 20% known problems in SketchUp
- 67% previously unknown problems in SketchUp
- 11% we'll never know!

The Long Tail of Usability

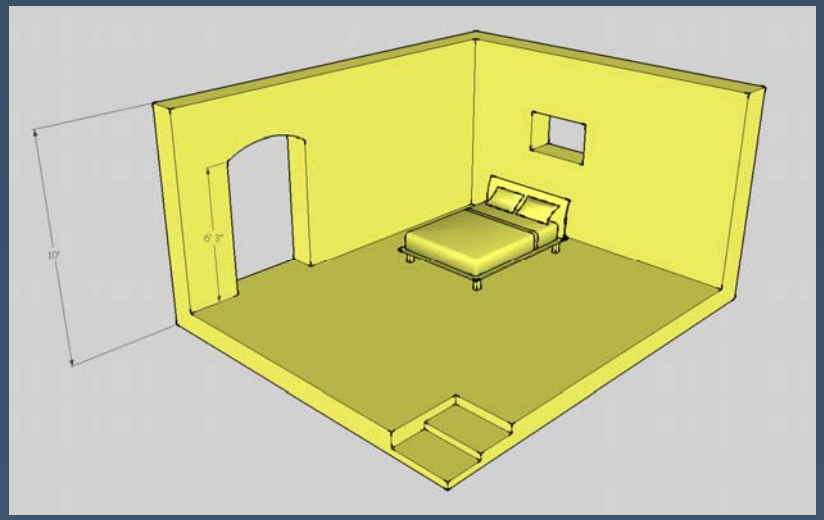


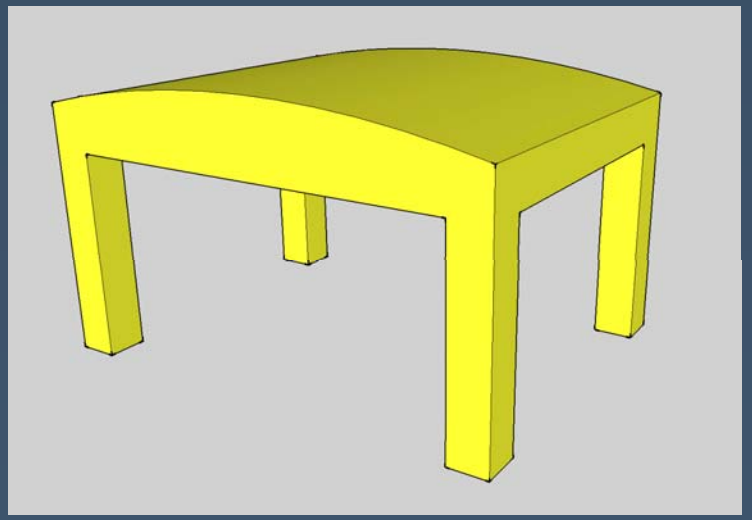
Research Question



What types of usability problems does each technique reveal?

Tasks





User Commentary

1. Please describe the events that led you to [undo/erase/self-report]. Focus your answer on recounting a “play-by-play” of what you were thinking and doing at the time. If you can’t remember, just say so and move on to the next episode.

2. During the episode, did the behavior of SketchUp surprise you? If yes, explain the difference between your expectations and what actually happened.

3. Did you find a way around the issue? If so, what did you do to get around it?

User Commentary (Erase/Undo)

4. Did you report this as an issue?
5. If you did not report this as an issue, why do you think that you didn't?

Problem Typologies

Problem severity is a combination of three factors:

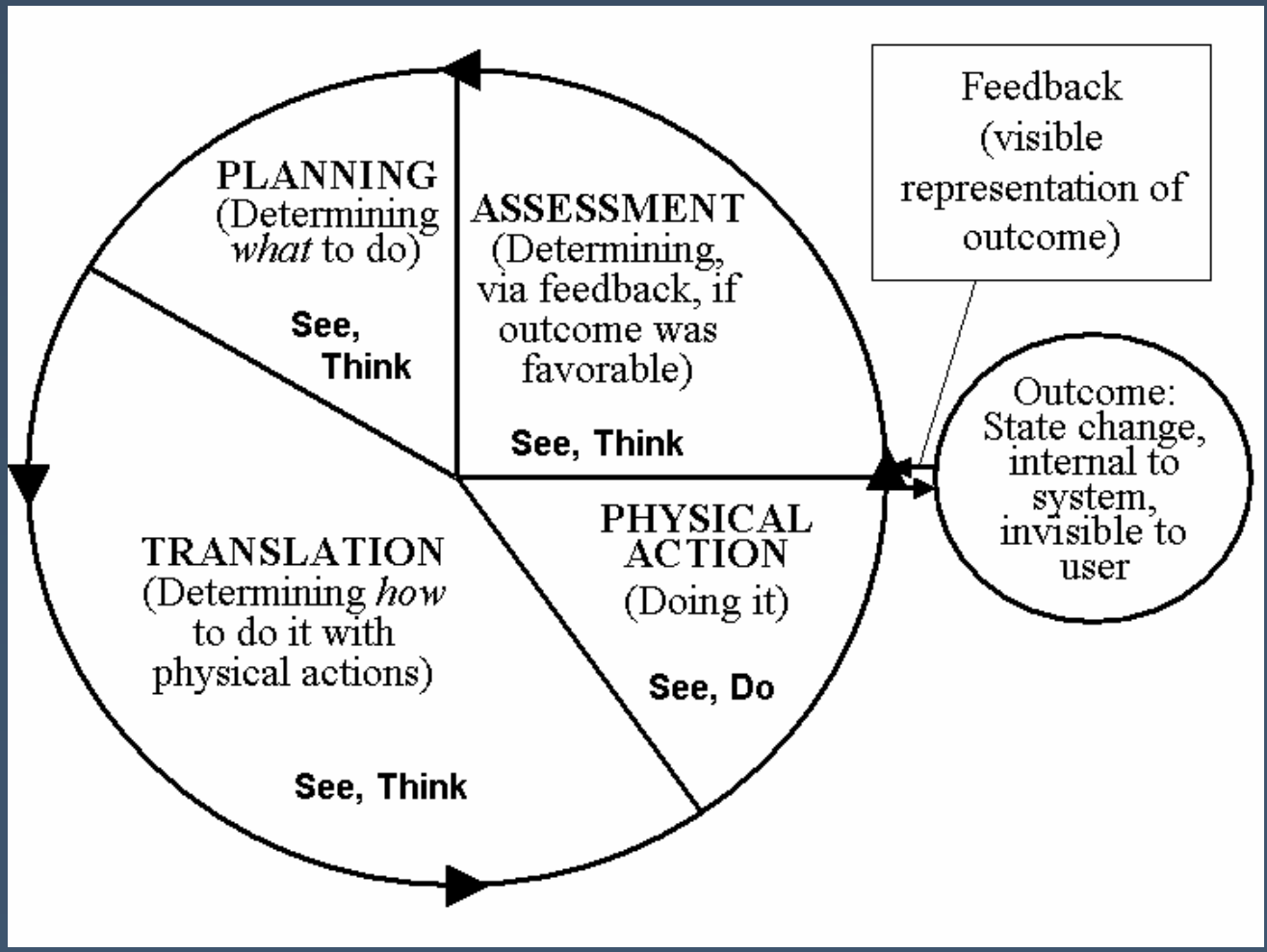
The **frequency** with which the problem occurs

The **impact** of the problem if it occurs

The **persistence** of the problem

Nielsen 1994

User Interaction Cycle



Andre *et al.* 2001

Discussion

Other problem typologies that might be useful?

How to encourage better retrospective think-aloud commentary?

CU Boulder

August 6, 2008