Sun 19 Apr

Lecture 13: Evaluation (part 3)

Recap

- Usability testing
  - direct observation of users

- Basic experimental design

Overview

- Introduction
- Inspections
- Heuristic evaluation
- Cognitive walkthroughs

Based on material from:
Sharp, H., Preece, J. and Rogers, Y. (2019). *Interaction Design Beyond Human-Computer Interaction*. 5th Ed. Sussex: John Wiley & Sons Ltd.

Learning Outcomes

- Describe the key concepts associated with inspection methods
- Explain how to do heuristic evaluation and walkthroughs

Introduction

- Learn methods that are based on understanding users through knowledge codified in heuristics, or models that predict users' performance

- Not requires users to be present during the evaluation

- Inspection methods - typically involved an expert role playing the users for whom the product is designed, and identifying any potential usability problems by using a set of guidelines

Inspections

In our case, formal
we're adopting in our hi-fi
(we'll go through each of guidlines)

- Several kind
- Experts use their knowledge of users & technology to review software usability
- Expert critiques can be formal or informal
- Can be used at any stage of a design, also to complement user testing

expert testing w/ experts

- Heuristics evaluation is a review guided by a set of heuristics
- Walkthroughs involve stepping through a pre-planned scenario noting potential problems

adapt pre-planned scenario to identify problems

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Heuristic evaluation

- A usability inspection method developed by Jacob Nielsen in the early 1990s

- Derived empirically from an analysis of 249 usability problems

- These heuristics have been revised for current technology by Nielsen and others for:
  - mobile devices
  - wearables
  - virtual worlds, etc

Revised version (2014) of Nielsen's original heuristics

1. Visibility of system status
2. Match between system and real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, recover from errors
10. Help and documentation

Revised version (2014) of Nielsen's original heuristics

PSU:

1. <u>Visibility of system status</u>
   - The system should always keep users informs what is going on

loading before opening, welcoming users

2. <u>Match between system and real world</u>
   - The system should follow real-world conventions, making information appear in natural & logical order

calender icon to show academic calender

3. <u>User control and freedom</u>
   - Support undo and redo

going between main page to undergrad admission

Revised version (2014) of Nielsen's original heuristics

4. <u>Consistency and standards</u>
   - Follow platform conventions

Clear menu bar distribution at the top with meaningful labels

5. <u>Error prevention</u>

If I try registering as new student, it wouldn't work

   - Present users with a confirmation option before they commit to the action

course name + course description

6. <u>Recognition rather than recall</u>
   - Minimize the user's memory load – making objects, actions and options visible

Revised version (2014) of Nielsen's original heuristics

7. <u>Flexibility and efficiency of use</u>
   - The system can cater to both inexperienced and experience users

   bold structure labels and

8. <u>Aesthetic and minimalist design</u>
   - Avoid information that is irrelevant

9. Help users recognize, diagnose, recover from errors
   - Error messages precisely indicate the problem

10. Help and documentation Help page
    - It may necessary to provide help and documentation

No. of evaluators & problems

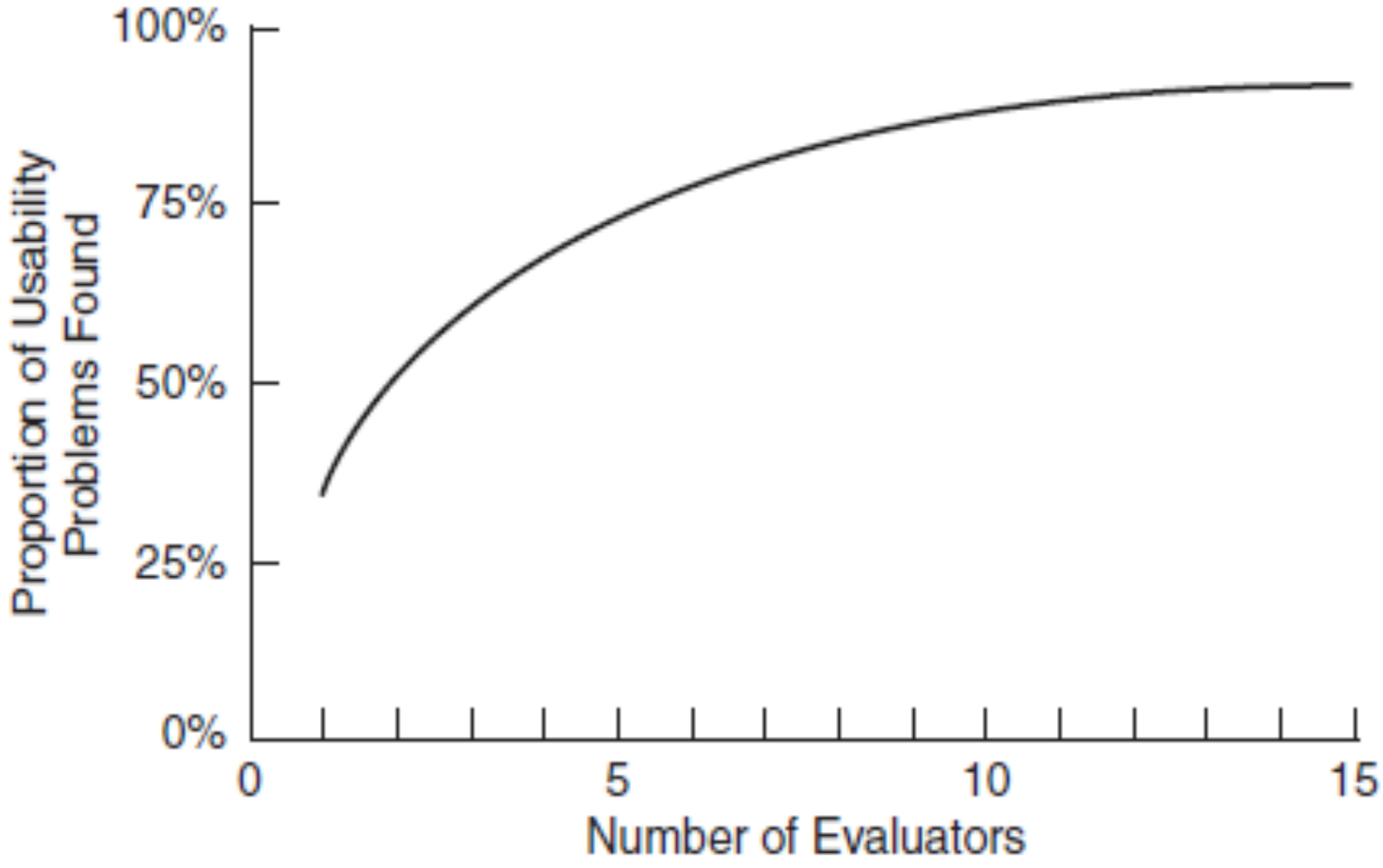

Figure 15.1 Curve showing the proportion of usability problems in an interface found by heuristic evaluation using various numbers of evaluators. The curve represents the average of six case studies of heuristic evaluation

Source: Usability Inspection Methods, J. Nielson & R.L. Mack ©1994. Reproduced with permission of John Wiley & Sons Inc.

Heuristics for websites focus on key criteria (Budd, 2007)

- Clarity
- Minimize unnecessary complexity & cognitive load
- Provide users with context
- Promote positive & pleasurable user experience

3 stages for doing heuristic evaluation

- Briefing session to tell experts what to do

- Evaluation period of 1-2 hours in which:
  - each expert works separately
  - take one pass to get a feel for the product
  - take a second pass to focus on specific features

- Debriefing session in which experts work together to prioritize problems

Activity

- Look at the Nielsen heuristics and consider how you would use them to evaluate a website

Discussion

- Do the heuristics help you to focus on the website more intently than if you were not using them?
- If you did this activity using smartphone, were all the heuristics relevant & useful?

Advantages and problems

- Few ethical & practical issues to consider because users not involved

- Can be difficult & expensive to find experts

- Best experts have knowledge of application domain & users

- Biggest problems:
  - It requires knowledge & experience to apply heuristics
  - Sometimes hard to find trained usability experts & can be expensive
  - Should use multiple experts & aggregate their results

Turning design guidelines and golden rules into heuristics

Ask questions like the following:

“Does the application include a visible title page, section or site? Does the user always know where they are located? Does the user always know what the system or application is doing? Are the links clearly defined? Can all actions be visualized directly (i.e., no other actions are required)?”

Granollers, 2018, p. 62

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Cognitive walkthroughs

can have 1 or more experts

- Focus on ease of leaning
- Designer presents an aspect of the design & usage scenarios
- Expert is told the assumptions about user population, context of use, task details
- One or more experts walk through the design prototype with the scenario
- Experts are guided by 3 questions

The 3 questions

user performance
carry out tasks
no error, time to complete
(covered last week)

- Goals & questions focus on how well users perform tasks with the product
- Comparison of products or prototypes common
- Focus is on time to complete task & number & type of errors
- Data collected by video & interaction logging
- Testing is central
- User satisfaction questionnaires & interviews provide data about users' opinions

followed by survey & interview

The 3 questions

- Will the correct action be sufficiently evident to the user? user performing step, will users know they are on right path
- Will the user notice that the correct action is available?
- Will the user associate and interpret the response from the action correctly?

  As the experts work through the scenario they note problems.

paricipantary

Pluralistic walkthrough

more than 1, multiple experts

work seperate → come together

- Variation on the cognitive walkthrough theme
- Performed by a carefully managed team
- The panel of experts begins by working separately
- Then there is managed discussion that leads to agreed decisions
- The approach lends itself well to participatory design
- Also other adaptations of basic cognitive walkthroughs

create 1 case-study → multiple questions

Final

A/B Testing

- A large-scale experiment.
- Offers another way to evaluate a website, application of app running on a mobile device.
- Often used for evaluating changes in design on social media applications.
- Compares how two groups of users perform on two versions of a design.
- Can involve thousands of users.
- May create ethical dilemmas if users don't know they are part of the test.
- Care is needed to ensure that other issues are not affecting users' behavior.

Make sure users are comfortable

color coding doesn't work for colorblind

Key points

- Inspections can be used to evaluate requirements, mockups, functional prototypes, or systems
- User testing & heuristic evaluation may reveal different usability problems
- Design guidelines can be used to develop heuristics
- Walkthroughs are focused so are suitable for evaluating small parts of a product
- A/B testing a form of large-scale experiment.