Chapter 6:

Evaluation: Heuristic Evaluation

Overview

https://xd.adobe.com/ideas/process/user-testing/how-to-heuristic-evaluation-analysis-ux-design/

Discount Usability Engineering

Discount usability engineering is a low-cost approach with a small number of subjects. The goal is to get indications and hints, find major problems, and discover issues (minor problems) in your system.

There are two different approaches:

Qualitative approach

- Observe user interactions
- User explanations and opinions
- Anecdotes, transcripts, problem areas, ...

Quantitative approach

- Count, log and measure something of interest in user actions
- Speed, error rate, counts of activities

Inspections & Expert Review

Throughout the whole development process, you should do inspections and expert reviews. For this, you typically use external experts. If they are internal to the company or even to the team, they should be involved in the project as little as possible. This prevents, that the experts think the same way as the rest of the team.

Inspections and expert reviews are good tools for finding problems. Even though you won't find as many problems as in other methods, you will find the ones that are significant and most important to address. Therefore, it is a good idea to use a structured approach.

The whole inspection and expert review process is a time intensive thing to do. Including the whole preparation and conducting the expert interview and review, it might take between hours and weeks to receive the results.

While you have the experts on board you might come up with solutions to solve the problems. You can use these ideas, but the decision on how to address the issues should always be discussed within the development team.

The reviewers should be able to **communicate** the issues without hurting the team. It is really important to give **critical feedback**. That's why it's a good idea to use external experts that were not involved in the project before.

Expert Review Methods:

Guideline review/ User Interface Checklist	Check that the UI is according to a given set of guidelines/ a checklist.
Consistency Inspection	Check that the UI is consistent (in itself, within a set of related applications, with the OS). Often it is essential to get a different perspective. Therefore, a Bird's eye view can help (e.g. printout of a website and put it up on the wall). Consistency can be design-enforced (e.g. web: css). However, consistency is not always easy to obtain.
Walkthrough	During a walkthrough, people perform specific tasks as the user would do them. This shows the developer, whether the design is easy to use. If you need a lot of explanation during the walkthrough, there is probably some innovation potential.
Heuristic Evaluation	Check whether the UI violates a set of very important, but still reduced number of rules (usually less than 10 points).

User Interface Guideline - Example

There are resources available that provide guidelines and checklists for developers. In the user interface guideline of Gnome Developer, especially accessibility, simplicity, and user-friendliness are enforced. The guideline covers aspects of graphical elements, fonts, text, audio, colours, contrast, and many more. As this is often too much to address in an expert-guided interview, it is a good idea to choose 10 items that your team identifies as the most important ones.

User Interface Guidelines:
https://developer.gnome.org/hig/guidelines.html

Heuristic Evaluation

Heuristic evaluation is a widely used usability inspection method. It provides a systematic inspection of a user interface design for usability. The goal of the heuristic evaluation is to find as many usability problems as possible in the design as early as possible. It should be part of an iterative design process.

> *'A small set of evaluators examine the interface and judge its compliance with recognized usability principles (the "heuristics")'*

There are many suggestions on how to do a heuristic evaluation. One example are the 10 heuristic principles for user interface design by Nielsen:

https://www.nngroup.com/articles/ten-usability-heuristics/

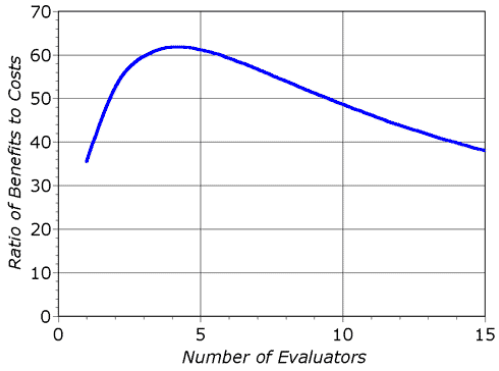
Depending on the product and the defined goals, a different set may be appropriate.

If you want to design a kitchen clock you have a totally different set of goals than when you design a new FAU website. The goals, the settings and how you do the evaluation changes.

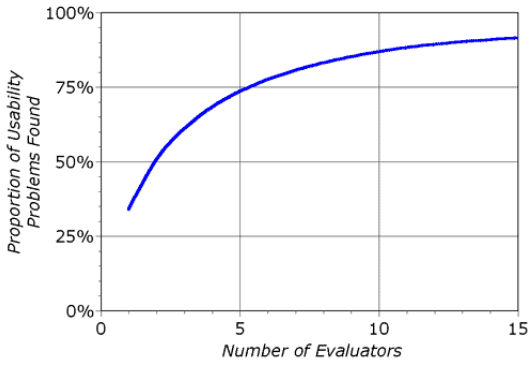
Not every heuristic evaluation is like the other.
It depends on what you want to assess!

How many evaluators should you use?

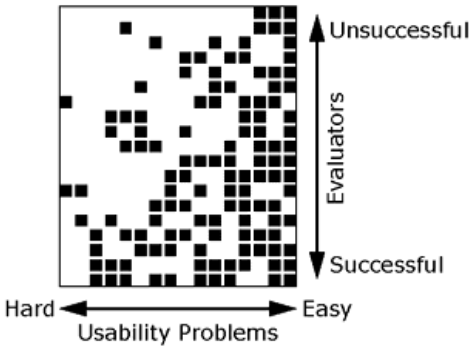
https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/
https://www.nngroup.com/articles/guerrilla-hci/



In this graph, you can see the number of evaluators from 1 to 15 on the x-axis and a ratio of benefits to cost on the y-axis. The curve shows a max peak at 5 evaluators. This indicates that it would be a good idea to use 5 evaluators for this evaluation.



In this graph, you can see the proportion of usability problems that can be found on the y-axis. With 5 evaluators you would only find 75% of the usability problems. However, even with 15 evaluators, you would not find 100% of the usability problems.



The reason, why you won't find all usability problems even with lots of evaluators can be seen in this graph. Some usability problems are hard to find and have not been addressed successfully yet. The easier the usability problem is to find, the more successful the evaluators are.

You need to find a **trade-off** between how much **time and money** you want to spend on the evaluation (how many evaluators you want) and **how many usability problems** you want to detect.

Steps of heuristic evaluation:

Preparation

- Assessing appropriate ways to use heuristic evaluation
- Define heuristics
- Having outside evaluation experts learn about the domain and scenario
- Finding and scheduling evaluators
- Preparing the briefing
- Preparing scenario for the evaluators
- Briefing (system expert, evaluation expert, evaluators)
- Preparing the prototype (software/hardware platform) for the evaluation

Evaluation

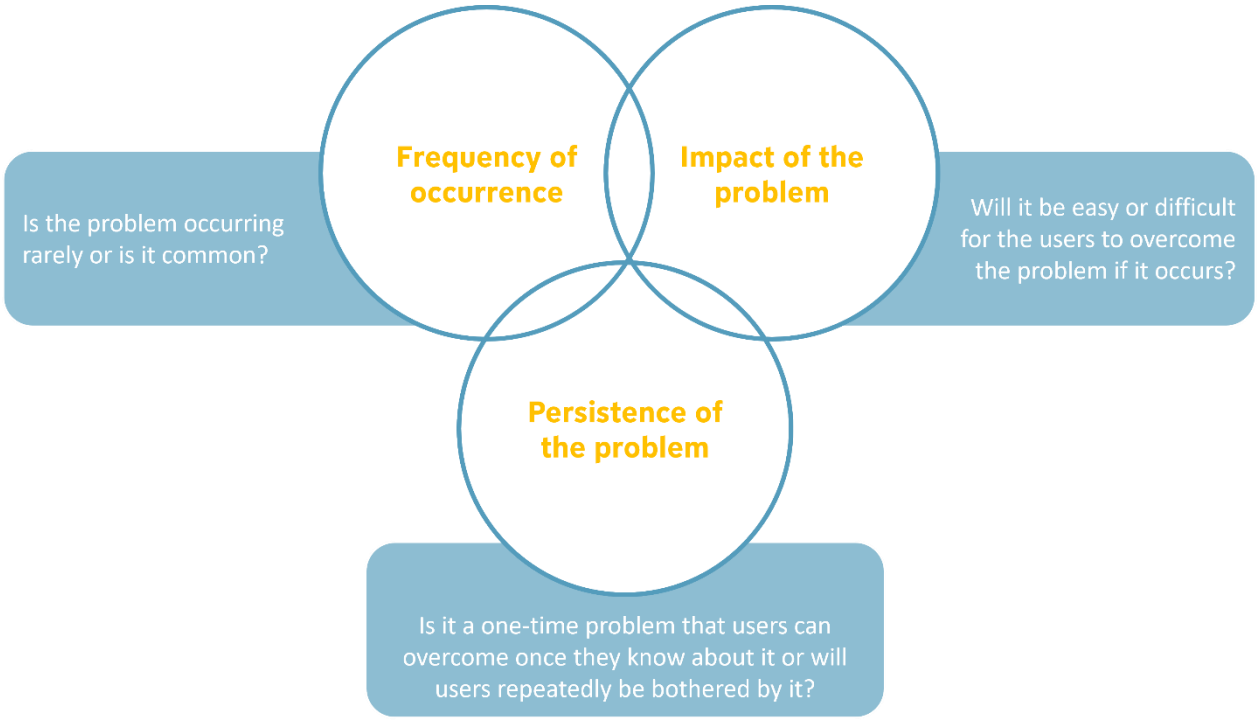
- Evaluation of the system by all evaluators
- Observing the evaluation sessions

Analysis

- Debriefing (evaluators, developers, evaluation experts)
- Compiling a list of usability problems (using notes from evaluation sessions)
- Writing problem descriptions for use in severity-rating questionnaire
- Severity rating

Severity rating during heuristic evaluation:

The **severity rating** is the heart of the whole analysis process. It is used to prioritize problems. Typically, in a usability evaluation, you generate so many issues and possible points to work on, that the team cannot answer them in the defined time. Therefore, you need to prioritize. Also, the decision on whether to release a system or to do further iterations is done in this step. The severity of a usability problem is a combination of three factors:



There are different recommendations on how to rate the severity of usability problems. One is to use a 0 to 4 rating scale:

0	I don't agree that this is a usability problem at all
1	Cosmetic problem only: need not be fixed unless extra time is available on the project
2	Minor usability problem: fixing this should be given low priority
3	Major usability problem: important to fix, so should be given high priority
4	Usability catastrophe: imperative to fix this before product can be released

References

1 Title image: https://xd.adobe.com/ideas/process/user-testing/how-to-heuristic-evaluation-analysis-ux-design/
2 https://www.nngroup.com/articles/ten-usability-heuristics/
3 https://www.nngroup.com/articles/ux-expert-reviews/
4 https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/
5 Alan Dix, Janet Finlay, Gregory Abowd and Russell Beale. (1998) Human Computer, Interaction (second edition), Prentice Hall, ISBN 0132398648 (new Edition announced for October 2003)
6 Molich, R., and Nielsen, J. (1990). Improving a human-computer dialogue, Communications of the ACM 33, 3 (March), 338-348.
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8 Nielsen, J. (1994a). Enhancing the explanatory power of usability heuristics. Proc. ACM CHI'94 Conf. (Boston, MA, April 24-28), 152-158.
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