Chapter 6:

Evaluation: Tools for Usability Evaluation

Overview

AttrakDiff

The AttrakDiff score was developed by Marc Hassenzahl. It measures the user experience by evaluating how attractive products and systems are regarding usability and design. The questions are a pair-wise set of words that represent opposites. It is employed in a wide variety of settings.

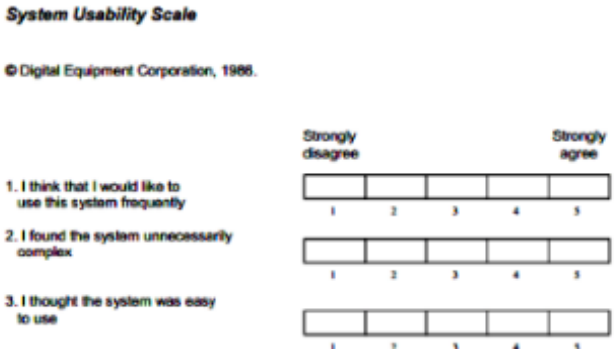
http://www.attrakdiff.de/index-en.html

SUS – System usability score

Another widely adopted tool is the system usability score (SUS). It was developed as a quick and dirty usability scale in 1986 by John Brooke.

Although it is quite an old test, it still works in our digitized and modern world and can be applied in lots of settings.

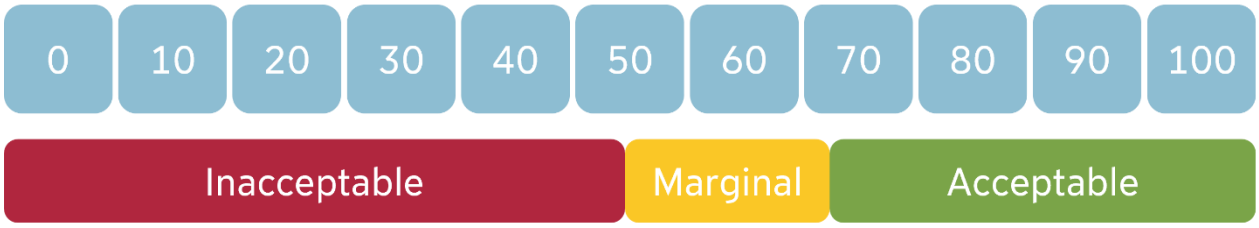
The system usability score is a 10-item questionnaire with 5 response options for each item.



Questionnaire Items:

1. I think that I would like to use this system frequently
2. I found the system unnecessarily complex
3. I thought the system was easy to use
4. I think that I would need the support of a technical person to be able to use this system
5. I found the various functions in this system were well-integrated
6. I thought there was too much inconsistency in this system
7. I would imagine that most people would learn to use this system very quickly
8. I found the system very cumbersome to use
9. I felt very confident using the system
10. I needed to learn a lot of things before I could get going with this system

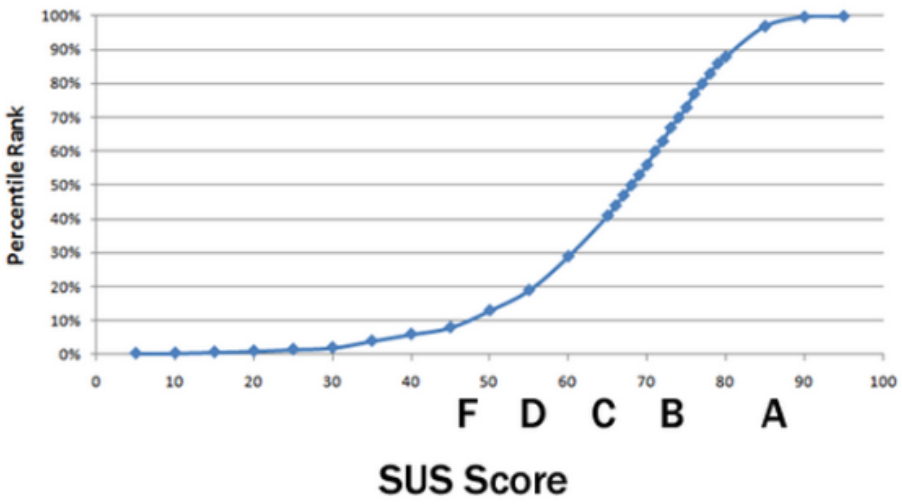
SUS scores have a range of 0 to 100



The SUS yields a single number representing a composite measure of all the different questions and rates the overall usability of the system being studied. The score can range from 0 to 100, with 100 being a system, which people strongly agree that they want to use.

The scores for individual items are not meaningful on their own. You cannot compare the SUS of Item 1 of a setting with the SUS of Item 1 of a different setting. You need to compare the overall numbers.

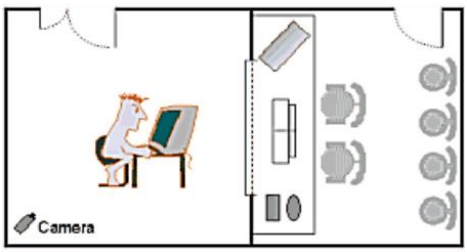
To calculate the SUS score, first sum up the score contributions of each item. For each item's score, the contribution will range from 0 to 4. For items 1, 3, 5, 7 and 9, the score contribution is the scale position minus 1. For items 2, 4, 6, 8 and 10, the contribution is 5 minus the scale position. Multiply the sum of the scores with 2.5 to obtain the overall value of SUS.



Typically, you get a SUS score greater than 60 because the system is designed so that only the worst systems end up below 60. Often the SUS score is summarized with grades from F to A, where A is 85 or better which means that the system is almost free from usability problems. F describes a system that receives a value below 50. It fails the user's expectations, and the design should be considered again.

The average score that is reported from SUS analysis is 68.

Usability Lab



http://www.usabilitypartners.se/

http://www.rerc-ami.org/

http://www.uqul.uq.edu.au

Another possibility to do a usability evaluation is to set up a usability lab. Some interesting usability labs can often be found in gaming development. In the pictures above you can see some example settings and equipment, you could use for the lab. Often a certain scenario is observed by multiple observers. This can be done with cameras, remote viewing possibilities, or by using a semi-transparent mirror.

Think about a concrete usability problem that you want to address:

- How would you set up the usability Lab?
- What do you need for it?

During a usability observation, you should have a protocol to demonstrate that a product improves productivity. The protocol also provides the basis for qualitative and quantitative findings, which might lead to subsequence improvement of certain aspects of the product.

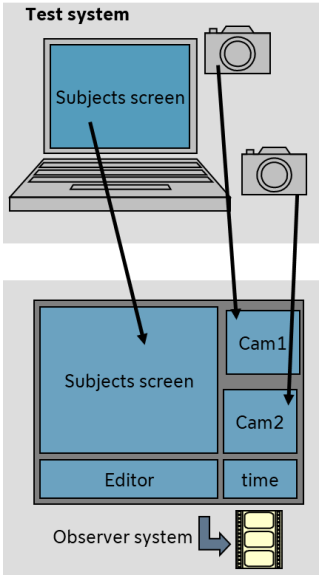
Minimize the chance for human errors in observation and protocols. Most people are pretty bad at doing manual protocols. It is a good idea to always combine manual protocols with computer logging:

- Log what you get from the system
- Observers make a protocol on external events

One possibility to do an external observation is to use video protocol. An example setting is shown in the picture on the right. Here, multiple views are integrated:

- screen capture with pointer
- view of the person interacting with the system
- view of the environment

An external view of the environment can be helpful to observe events that distract the user (e.g. Ringing smartwatch). This cannot be reproduced in the manually written protocol. Complete screen capture and an environmental view provide a good opportunity to check afterward what had happened.



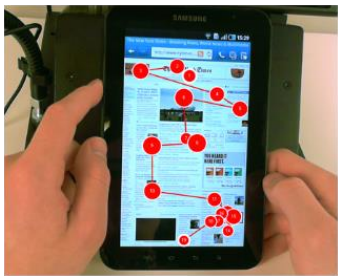
Example Usability Lab setting:

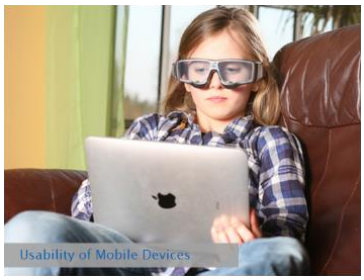
- Computer for the test user
  - Run application to test
  - Export the screen (e.g. VNC)
- Computer for the observer
  - See the screen from the subject
  - Attach 2 webcams and display them on the screen
  - Have an editor for observer notes
  - Capture this screen (e.g. Camtasia)

➔ Discuss with the user afterwards:
  - Why did you do this?
  - What did you try here?

Mobile Usability

An observation method that is becoming more and more important is the visualization of what people are looking at on a computer screen or a mobile application.





https://www.tobiipro.com

A base method to observe this is Eye-Gaze Tracking. Using this method, you can record what the user is looking at and where the user's attention is on the screen. This will give you a lot of valuable information about what needs to be changed to make an app more successful.

Nowadays, Eye-Gaze Tracking is used for example in:

- **Psychology**, e.g. Where do people look at? How long do they look at an item?
- **Usability testing**, e.g. Where do users look first?
- **Users with severe disabilities**, e.g. Eye movement as the only input

References

1. 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)
2. Brooke, John. (1995). SUS: A quick and dirty usability scale. Usability Eval. Ind.. 189.
3. www.attrakdiff.de
4. https://www.tobiipro.com