Feedback from Usability Evaluation to User Interface Design: Are Usability Reports Any Good?

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Overview

- **Motivation**
- **Experiment**
- **Results**
- **Conclusion**

Motivation (1)

- **The interplay between user interface design and usability evaluation**
- **User interface design provides design products:**
  - The system
  - An operational prototype
  - A user interface specification
  - A paper prototype
  - ...
- **Usability evaluation provides feedback to user interface design**
- **This feedback forms the basis for redesign and further development**

Design products

User Interface Design

Usability Evaluation
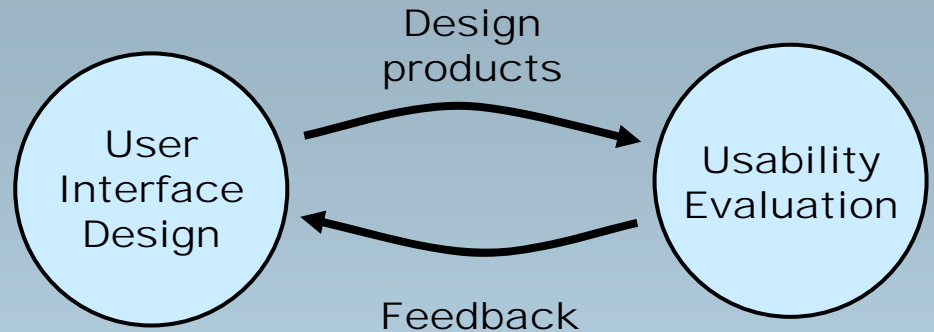
Feedback

Motivation (2)

- **Typical feedback:
  A usability report**

- **Characteristics:**

  - 40-80 pages

  - 30-80 usability problems:
    A list and a detailed description
    of each

  - Problems are identified through
    user-based tests

  - Problems are categorized
    (cosmetic, serious, critical)

  - Additional: TLX and task
    completion times

  - Log files transcribed from the
    video (15-20 pages)

1. **Executive summary**
2. **Method**
   a) **Purpose**
   b) **Procedure**
   c) **Test participants**
   d) **Test procedure**
   e) **Location & equipment**
   f) **Identification & categorization of
      problems**
3. **Results**
   a) **Workload (NASA-TLX)**
   b) **Time used**
   c) **Problem overview**
   d) **Detailed description of problems**
4. **Conclusion**
5. **Appendix**
   a) **Tasks**
   b) **Interview guide**
   c) **Questionnaires**
   d) **Video log-files**
   e) **System log-files**
   f) **Task solutions**

Motivation (3)

- **There are very different opinions about the usefulness of a usability report**

  Usability reports are boring and nobody ever reads them

- **Basic question:**
  To what extent can a usability report influence developers' opinion about strengths and weaknesses of a system

Experiment: Overview

- **A system for registering use of time and materials**
- **Used by tradesmen**
- **Running on a mobile telephone with a barcode scanner**
- **Codes for tasks and materials**

- **Two usability evaluations of the system (by two teams)**

	Field	Laboratory
Critical	15	14
Severe	16	14
Cosmetic	17	6
Total	48	34

Experiment: Steps

Step	Developer A	Developer B
#1	Outline the process for the developers, without revealing details. Understanding of usability discussed.	
#2	Semi-structured interview on initial opinions on advantages and disadvantages	Semi-structured interview on initial opinions on advantages and disadvantages
#3	Recieve and read the **laboratory** usability report. Semi-structured interview based on step #2. Interview is conducted by one of the writers of the **laboratory** report. A **field** report writer takes notes.	Recieve and read the **field** usability report. Semi-structured interview based on step #2. Interview is conducted by one of the writers of the **field** report. A **laboratory** report writer takes notes.
#4	Recieve and read the **field** report. Semi-structured interview based on step #3. The developer is asked to comment on the usefulness of the reports and the individual parts. Interview is conducted by one of the writers of the **field** report. A **laboratory** report writer takes notes.	Recieve and read the **laboratory** report. Semi-structured interview based on step #3. The developer is asked to comment on the usefulness of the reports and the individual parts. Interview is conducted by one of the writers of the **laboratory** report. A **field** report writer takes notes.
#5	Group discussion where the developers are presented with each other's list of advantages and disadvantages. The two developers are asked to agree on a joint list.	

Results: Views on Usability

- **Before reading the usability reports both developers were asked to express how they understood the term usability**

- **Developer A:**
  - 'intuitive' is the word that described it best
  - also mentioned 'easy' and 'straightforward' to use, without having to read several manuals

- **Developer B:**
  - the specific screens in the system, where the design of the screens should target the user and the information presented should be relevant
  - The user interface should be easily understood and nice to look at

Results: Developer A

Advantages (before reading reports)

1. Online: The system can provide relevant real time information.
2. Barcode scanners: All interaction begins with the user scanning.
3. No software on the mobile phone.

Advantages (after reading report 1)

1. Online / No software on mobile phone.
2. The use of barcode technology.
3. Customizable.

Advantages (after reading report 2)

1. Online / No software on mobile phone.
2. Customizable.
3. The use of barcode technology.
4. Hardware: mobile phone. Everybody knows it.

Disadvantages (before reading reports)

1. GPRS: Limited coverage.
2. Barcodes are used to interact with the system instead of the mobile phone.
3. Online: problem when no connection is available.

Disadvantages (after reading report 1)

1. No manual or documentation.
2. Error messages.
3. Handling of logical errors.
4. Input of data through the mobile phone is problematic in relation to target user group.
5. Human resistance towards the system.

Disadvantages (after reading report 2)

1. Human resistance towards the system. Employees feel that they are under surveillance.
2. No manual or documentation.
3. Many barcodes needed to navigate the system.
4. Browser technology/phone restrictions: Input of data through the mobile phone is problematic in relation to target user group.
5. Error messages and handling of logical errors.

Feedback

Results: Developer B

Advantages (before reading reports)
1. Hardware: mobile phone.
2. Few scans necessary.
3. Customizable.
4. Online – real time.
5. Simple solution with limited interaction.

Advantages (after reading report 1)
1. Hardware: mobile phone. Everybody is familiar with the technology.
2. Displays only necessary information.
3. Customizable.
4. Online all the time.
5. The system is simple and uniform.

Advantages (after reading report 2)
1. Hardware: mobile phone. Everybody knows it.
2. The system is simple and uniform.
3. Customizable.
4. Displays only necessary information.
5. Online all the time.

Disadvantages (before reading reports)
1. Screen size.
2. Problems with GPRS. Often slow.
3. No manual or documentation.
4. Only works on some types of mobile phones.

Disadvantages (after reading report 1)
1. The text describing each of the barcodes.
2. More user education in needed.
3. System reply time.
4. Screen size. Difficult to maintain an overview.
5. System is interpreted differently on different phones.

Disadvantages (after reading report 2)
1. The text describing each of the barcodes.
2. More user education in needed.
3. System reply time.
4. Screen size. Difficult to maintain an overview.
5. System is interpreted differently on different phones.

Feedback

Results: Joint List

Advantages (Developer A – originally)

1. Online: The system can provide relevant real time information.
2. Barcode scanners: All interaction begins with the user scanning.
3. No software on the mobile phone.

Advantages (Developer B – originally)

1. Hardware: mobile phone.
2. Few scans necessary.
3. Customizable.
4. Online – real time.
5. Simple solution with limited interaction.

Advantages (Joint)

1. **Online – real time.**
2. **Customizable.**
3. **Rely on commonly known technology: mobile phone.**
4. **Simple and small barcode-scanner.**
5. **The system is simple and uniform.**

Disadvantages (Developer A – originally)

1. GPRS: Limited coverage.
2. Barcodes are used to interact with the system instead of the mobile phone.
3. Online: problem when no connection is available.

Disadvantages (Developer B – originally)

1. Screen size.
2. Problems with GPRS. Often slow.
3. No manual or documentation.
4. Only works on some types of mobile phones.

Disadvantages (Joint)

1. **Online: Problems with GPRS.**
2. **No manual or documentation.**
3. **Human resistance towards the system. Employees feel that they are under surveillance.**
4. **More user education in needed.**
5. **Error messages and handling of logical errors.**

Feedback

Results: Summary

- **Difficulties in naming five advantages and five disadvantages**
- **The advantages reflect the arguments that the system is sold upon, whereas the disadvantages reflect the technical issues encountered in the development process**
- **After reading the reports:**
  - The advantages were not changed noticeable; the points were merely rephrased
  - The disadvantages were completely altered as they adopted many issues from the usability report
  - The disadvantages were also expanded with issues that concerned the interaction with the system and social implications caused by the usage of the system
- **The second usability report did not have a profound influence on his belief about strength in the system**
- **The joint list was made by both developers and gave rise to discussion between the two, where especially the ranking initiated heated discussions**

Conclusion

- **The reports were useful for the developers**
  - in understanding the usability evaluation
  - as a basis for redesign and further development
  - as a means to prioritize redesign and development
- **For the developers the usability reports**
  - did not alter their initial belief of the system's advantages to a great extent
  - did expand their list and made them consider other topics
  - did clearly influence their conception of the weaknesses of the system
- **The reports enriched the developers with insight into how users interact with their product and what the strengths and weaknesses were**
- **Information on test setup, users, tasks, and test users' subjective opinions was important to the developers, but these are also the point of critique, when developers explain, why they find problems more or less real.**

Observations

How the developers were using the reports:

- A problem list (overview + detailed descriptions) is important to have and essential for the designers when trying to understand a problem

- Results of NASA-TLX, which are not explained and put into context, are difficult for the designers to relate to

- Log-files of user interaction, based on video recordings combined with system-logs, are used and considered important by the developers to understand specific details of the usability problems

- General assessments and evaluations have limited usefulness for the developers

Questions …