LV 706.046 3SE AK Mensch-Maschine Kommunikation

Usability Engineering for Software Developers

Applying User Centered Design

Welcome

Schönen Nachmittag!
Our Learning Objectives

- Hints for Paper and Presentation
- Repetition: TA versus CW
- UE for mobile applications
Revised schedule

- Work on the project together (today, 6.6.)
- Write a paper together (max. 3 authors)
- Submit to Committee Chair (Extended Deadline: 6.6.2005)
  - via e-mail: andreas.holzinger@meduni-graz.at
- Peer review due to 15.6.2005
- Written Final exam (30 %) 13.6.
- Presenting the paper in plenum 20.6.

Students Material on
www.uni-graz.at/~holzinge/holzinger/usability.html
- How to write a good research paper and
- How to give a good research talk
- Checklist for Reviewers
- Common errors in English
- All lecture slides
- Videos
Remember: Nielsen's famous findings

Where does the ‘3 - 5 users’ rule come from?

Discovery likelihood = 1 - (1 - p)**n
- Think of as % of problems found as function of # of users (n)
- Each curve is for a given individual detection rate (p)
The ‘3 – 5 users’ rule \((1 - (1 - p)^n)\)

Then look at the expected number of new problems found for each added participant.

Cost is linear per added participant used.

Total # problems found / cost peaks out around 3-5 users:
- Based on lots of assumptions, such as average detection rate
- Your smileage can vary
Causes for Bad Interfaces

- Viewed as an “add-on” at the end of the project
  - But user interfaces account for about 60% of effort in the design process and program code
- Ego centric intuition fallacy
  - Engineers believe they know how to design good interfaces because they use interfaces
- Design team employs poor design practice
- Complexity of the task domain and users
  - Tasks can be difficult to perform regardless
  - Humans are complex, diverse, and imperfect

Develop Better Interfaces Because

- Want to help users be more productive
- Want to help decrease user frustration, annoyance, and anxiety when interacting with computers
- Want to help businesses save money
- Want to help prevent loss of life
- Want to improve quality of life for people
Understand Humans

- Understand perceptual system to understand how we perceive information and response times
- Understand cognitive system to understand how we learn, remember, and make decisions
- Understand motor system to understand limits of human task performance
- Use knowledge to inform the design of interfaces

Challenges of Mobile HCI

1) Displays are tiny ...
Interaction is limited …


Context of use is highly dynamic …

Example from a Project

- Randomization and trial data collection via the Web
- advantages over traditional telephone-based services, particularly in multi-center trials
- provides several benefits for the medical people

... but medical people are highly mobile workers
- consequently we considered early to make "The Randomizer" mobile ...
... but this was definitely not our goal ...

Landay & Hong (2002)

consequently we carefully developed a mobile version ...
who are the end-users?
what are the tasks?
iterative design
mock-ups, prototypes
develop and test designs with end-users!

During our experiments we concentrated especially on ...

• number and type of errors per task
• number of errors per unit of time
• number of navigations necessary and most of all on
• time to complete a task ...
Expert end-users versus Novices

- Example: A Task performed with $N = 12$ people
  <$4$ end-users from each user-group>:
  - novices (who never used handhelds before),
  - intermediates (who have some experience)
  - expert users (who regularly use handhelds)

<table>
<thead>
<tr>
<th>End-user group</th>
<th>Desktop (mean tpt)</th>
<th>Handheld (mean tpt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>novices</td>
<td>1:05:53</td>
<td>1:53:21</td>
</tr>
<tr>
<td>intermediate</td>
<td>0:44:41</td>
<td>1:15:54</td>
</tr>
<tr>
<td>expert users</td>
<td>0:38:28</td>
<td>1:12:72</td>
</tr>
</tbody>
</table>

Task A: Desktop versus Handheld

- Fig. showing time to perform task [s] for:
  - Handheld (mean tpt)
  - Desktop (mean tpt)

- Data points for:
  - novices (n = 4)
  - intermediates (n = 4)
  - expert users (n = 4)

- Time to perform task [s]:
  - 0 to 200
  - 200 to 0

- End-user experience:
  - novices
  - intermediates
  - expert users

andreas.holzinger@meduni-graz.at
Lessons Learned

- There was a strong correlation between time to complete the task and problems in locating functions and navigation
- Pages that need horizontal scrolling should be avoided. Most of the users overlook that there is more to view in horizontal direction.
- Scrolling can simplest be reduced by strictly focusing on the content task!

Holzinger & Errath (2004)

Highly-mobile computers are highly personal
Physical usability is vital to that vision
Hardware companies are making tremendous progress
Now is the time to combine all aspects both of Hard- and Software
You can keep your whole digital world on-hand

Und nun zu Ihrer Aufgabe ...

- Meistens hat eine Applikation einen Mehrwert der erst durch den Einsatz eines mobilen Endgerätes zum Tragen kommt
- Heute: Schwierige Aufgabe:
- Entwickeln Sie einen mobile part Ihrer Application – im User-Centered Design, d.h. unter Einbeziehung eines "fremden" End-Benutzers
Los gehts!