Übung zur Vorlesung
Mensch-Maschine-Interaktion

e4: High and Low Fidelity Prototyping

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Wintersemester 2007/2008
Design Cycles & Prototyping

• Creating prototypes is important to get *early* feedback
  – from the project team (prototypes help to communicate)
  – from potential users
• Different types of prototypes
  – Low-fidelity prototypes (e.g. paper prototypes, sketches)
  – High-fidelity prototypes (e.g. implemented and semi-functional UI, could look like the real product)
  – Fidelity refers to the level of detail
• Tools & Methods
  1. Sketches & Storyboards
  2. Paper prototyping
  3. Using GUI-builders to prototype
  4. Limited functionality simulations
  5. Wizard of Oz
Sketches & Storyboards

• Storyboards as in movies: one picture for each key scene
• Sketch out the application
  – Key screens
  – Main interaction
  – Important transitions
• Helps to ...
  – ... communicate and validate ideas
  – ... compare different options
• Ignore details, e.g.
  – Fonts
  – Design of icons
  – ...
Paper Prototyping

• Based on office stationery (paper and pen)
  – Paint screens, dialogs, menus, forms, ...
  – Specify the interactive behaviour

• Using the prototype
  – Give users a specific task
  – Observe how they use the paper prototype
  – Think aloud protocol: ask users to comment on what they are doing
  – At least two people
    » One is simulating the computer (e.g. change screens)
    » One is observing and recording

• Evaluate and document findings
  – What did work, what did not?
  – Where did the user get stuck or choose alternative ways?
  – Analyze comments

• Iterate the process (make new versions of the paper prototype)
Paper Prototype Examples

Pictures from the *How-To Training Video* (Nielson Norman Group)

- Paper prototype of typical form-filling screen
- Paper prototype of a tabs-based design
- Paper prototype of a device-based interaction (here: a mobile phone)
- Paper prototype of a website
Low-Fidelity Prototyping

• Advantages of paper prototypes
  – Cheap and quick – results within hours!
  – Enables non-technical people to interact easily with the design team
    → no technology barrier
  – Helps to ...
    » ... find general problems and difficult issues
    » ... get a better design (UI and system architecture)
    » ... get structured code
  – Make mistakes on paper → before you architecture design and coding
  – Save money

• Get users involved
  – To get the full potential of the prototypes they have to be tested with users
  – Specify usage scenarios
  – Prepare tasks that can be done with the prototype
Rapid Prototyping

- Idea: Minimize the time for design iterations → make errors quickly
- Enables the design team to evaluate more design options quickly
- The longer you go without evaluating a design, the more you risk.
- Sketches and paper prototypes can be seen as simulation of the real prototype.

- Without paper prototyping:
  - Idea – sketch – implementation – evaluation

  Slow Iteration

- With paper prototyping:
  - Idea – sketch/paper prototype – evaluation – implementation - evaluation

Quick Iteration
High-fidelity Prototyping

• Also called **functional** prototype
• Same look & feel as in the final product
  – Colors, screen layout, fonts, …
  – Text used
  – Response time and interactive behavior
• Restricted functionality
  – Only part of the functionality is implemented
  – Functionality is targeted towards the tasks
  – Non-visible issues (e.g. security) are not regarded
• Can be used to predict task efficiency of the product
• Feedback often centered around the look & feel
• Standard technologies for implementation
  – HTML, JavaScript
  – Flash, Director, Presentation programs
  – GUI Builder (e.g. Visual Basic, Delphi, NetBeans)
Horizontal Prototyping

- Demonstrate the feature spectrum of a product
- Allows the user to navigate the system
- The actual functions are not implemented
- Helps to evaluate / test
  - Navigation
  - Overall user interface concept
  - Feature placement
  - Accessibility
  - User preferences
- Applicable in low-fidelity prototyping and high-fidelity prototyping
- Used in early design stages
  - To determine the set of features to include
  - To decide on the user interface concept
- Example: overall usage of a mobile phone

http://www.useit.com/papers/guerrilla_hci.html
Vertical Prototyping

- Demonstrate a selected feature of a product
- Only this specific function is evaluated
- Details of the feature are implemented
- Helps to evaluate
  1. The best design
  2. The user performance
     for this particular function → Optimize the usability
- Mainly used in high-fidelity prototyping but can be applicable to low-fidelity prototyping
- Used in early design stages
  - To compare different designs for a specific function
- Used in later design stages
  - To optimize usage of a function
- Example: a new method for writing SMS on a mobile phone
Wizard-of-Oz

• “The man behind the curtain”
• User is evaluating a system
• Wizard is controlling a missing piece of the system
• The user does not know about the wizard
• Provides the user with the experience of using a system without extensive implementation effort for the prototype
• Do not implement the hard parts in the prototype – just let a human do it.
• Typical areas
  – Speech recognition
  – Speech synthesis
  – Annotation
  – Reasoning
  – Visual Perception