Übung zur Vorlesung Mensch-Maschine-Interaktion

e4: High and Low Fidelity Prototyping

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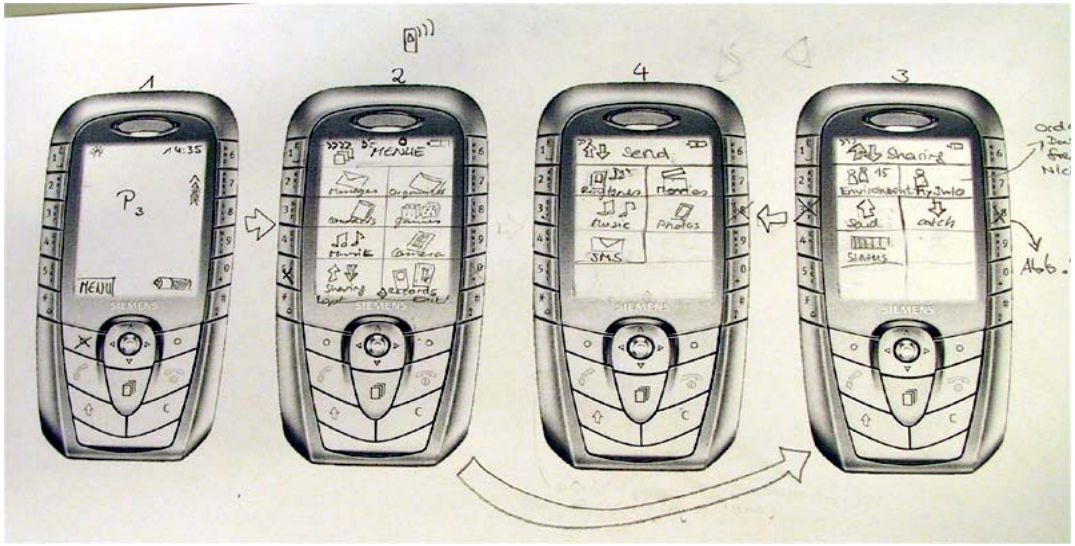
Design Cycles & Prototyping

- 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
  - ...



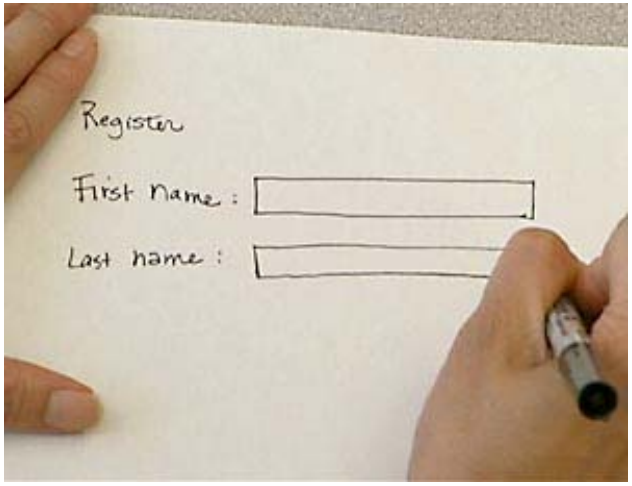
Paper Prototyping

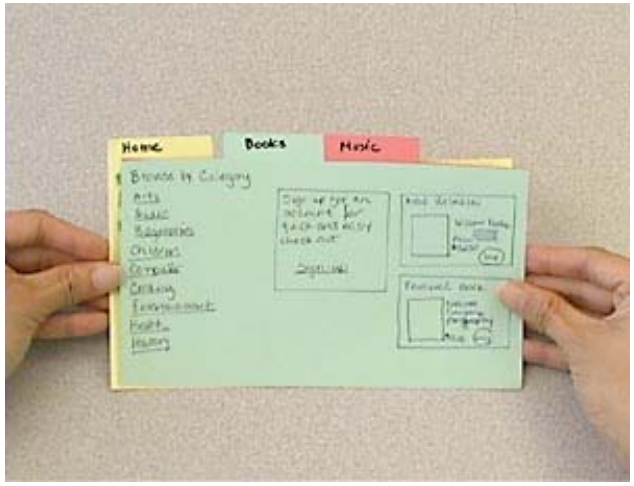
- Based on office stationery (paper and pen)
  - Paint screens, dialogs, menus, forms, ...
  - Specify the interactive behaviour
- Using the prototype
  - Give users a specific task
  - Observe how they use the paper prototype
  - Think aloud protocol: ask users to comment on what they are doing
  - 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)

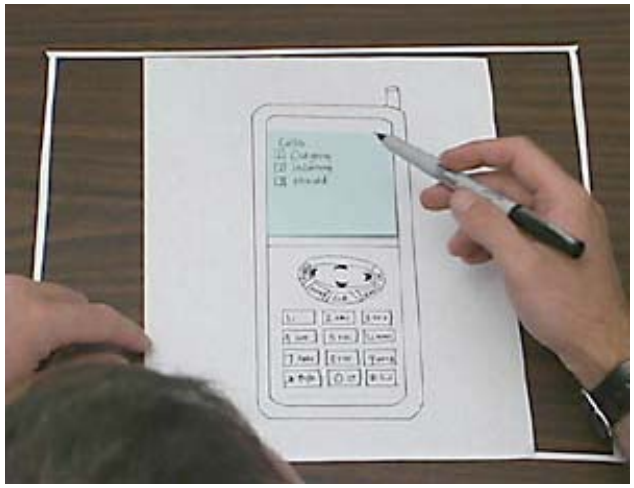
Paper prototype of typical form-filling screen





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

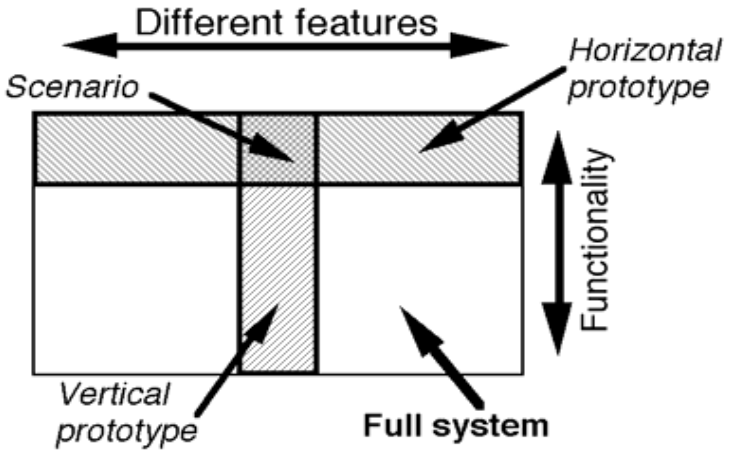
Slow Iteration

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



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

- 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

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