



Prototyping

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Objectives

- To understand the purposes of prototyping.
- To understand the difference between low and high fidelity prototypes.
- To understand the advantages and disadvantages of low and high fidelity prototypes.

Purposes of prototyping

- A prototype is an initial version of a system which may be used for experimentation
- Prototypes are valuable for requirements elicitation because users can experiment with the system and point out its strengths and weaknesses.

Purposes of prototyping

- To check the feasibility of ideas with users.
- To check the usefulness of an application.
- To allow users to contribute to the design of an application.
- To allow users to test ideas.
- To validate and negotiate the requirements.

Prototyping benefits

- The prototype allows users to experiment and discover what they really need to support their work
- Establishes feasibility and usefulness before high development costs are incurred
- Essential for developing the 'look and feel' of a user interface
- Can be used for system testing and the development of documentation
- Forces a detailed study of the requirements which reveals inconsistencies and omissions

Prototyping costs and problems

- Training costs - prototype development may require the use of special purpose tools
- Development costs - depend on the type of prototype being developed
- Extended development schedules - developing a prototype may extend the schedule although the prototyping time may be recovered because rework is avoided

Types of prototyping

Rapid development of prototypes is essential so that they are available early in the elicitation process

- ☐ Throw-away prototyping
- ☐ Evolutionary (Executable) prototyping

Prototype fidelity

- Low-fidelity prototypes
 - Omits details
 - Based on paper prototypes
- High-fidelity prototypes
 - More like finished product
 - Based on software prototypes

Paper prototype

- Interactive paper mockup
 - Sketches of screen appearance
 - Paper pieces show windows, menus, dialog boxes
- Interaction is natural
 - Pointing with a finger = mouse click
 - Writing = typing
- A person simulates the computers operation
 - Putting down & picking up pieces
 - Writing responses on the “screen”
 - Describing effects that are hard to show on paper
- Low fidelity in look & feel
- High fidelity in depth (person simulates the backend)

What you can learn from a paper prototype

- Conceptual model
 - ☐ Do users understand it?
- Functionality
 - ☐ Does it do what is needed? Missing features?
- Navigation & task flow
 - ☐ Can users find their way around?
 - ☐ Are information preconditions met?
- Terminology
 - ☐ Do users understand labels?
- Screen contents
 - ☐ What needs to go on the screen?
- Which interaction style to use

What you can't learn from a paper prototype

- Look: color, font, whitespace, etc
- Feel
- Response time

Advantages and disadvantages of low-fidelity prototypes

Advantages

- They are cheap to produce.
- They can evaluate design ideas and design alternatives.
- They promote rapid, iterative development.

- They are useful for facilitating communication between users and stakeholders and the UI designer.

- They can show the look and feel and layout of screens.

Disadvantages

- Their ability to check errors in design is limited.
- The specification is less detailed so it may be more difficult for programmers to code.

- A human facilitator is needed to simulate how the UI will work (e.g., by manipulating how different prototypes in response to users actions).
- Paper may seem less compelling.

- They are useful for gathering requirements but are generally thrown away once the requirements have been established.

High-fidelity prototypes

- Provide a functional version of the system that users can interact with.
- Usability testing can be undertaken.

Advantages and disadvantages of high-fidelity prototypes

Advantages	Disadvantages
They can show complete functionality.	They are more time consuming to create than low-fidelity prototypes.
They can show the look and feel, layout, and behavior of the final product.	They are not as effective as low-fidelity prototypes for requirements gathering, because they cannot easily be changed during testing.
They are fully interactive, and can be useful as a marketing tool (demo).	They can look so professional and finished that users are less willing to comment. This may mean that the prototype gets built irrespective of its merits and loses its throw-away benefits.

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