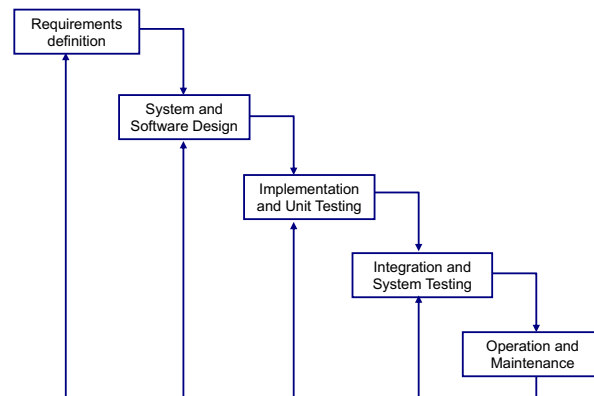


UI Design Processes

Outline

- UI Design processes
 - Waterfall model
 - Iterative design
 - Spiral model
 - User-centered design
- UI Design principles and rules
- UI Hall of Fame or Shame

Waterfall Model



💡 Disadvantage: difficult to handle changes

Waterfall Model Problems

- Users are not involved in evaluation until acceptance testing
- UI problems result in changes in requirements and design
 - Waste of effort spent earlier
- Inflexible partitioning of the project into distinct stages
 - it is difficult to respond to changing customer requirements
- It is only appropriate when the requirements are well-understood
 - Few business systems have stable requirements

Shneiderman's Interactive Systems Lifecycle

Software development lifecycle for interactive systems:

1. Collect Information
2. Define Requirements and Semantics
3. Design Syntax and Support Facilities
4. Specify Physical Devices
5. Develop Software
6. Integrate System and Disseminate to Users
7. Nurture the User Community
8. Prepare Evolutionary Plan



Shneiderman's Interactive Systems Lifecycle

1. Collect Information

- ❑ Organize the design team
- ❑ Obtain management and customer participation
- ❑ Conduct interviews with users
- ❑ Submit written questionnaires to users
- ❑ Estimate development, training, usage, maintenance costs
- ❑ Prepare a schedule with observable milestones and reviews

2. Define requirements and semantics

- ❑ Define high-level goals and middle-level requirements
- ❑ Consider task flow sequencing alternatives
- ❑ Create task objects and actions
- ❑ Obtain management and customer agreement on goals, requirements, and semantic design



Shneiderman's Interactive Systems Lifecycle

3. Design syntax and support facilities

- ❑ Compare alternative display formats
- ❑ Design informative feedback for each operation
- ❑ Review, evaluate, and revise design specifications
- ❑ Carry out paper-and-pencil pilot tests or field studies with an online mock-up or prototype

4. Specify physical devices

- ❑ Choose hard- or softcopy devices
- ❑ Select audio, graphics, or peripheral devices
- ❑ Consider work environment noise, lighting, table space, etc.
- ❑ Carry out further pilot tests and revise design



Shneiderman's Interactive Systems Lifecycle

5. Develop software

- ❑ Use appropriate development tools
- ❑ Develop code
- ❑ Perform unit test

6. Integrate system and disseminate to users

- ❑ Assure user involvement at every stage
- ❑ Conduct acceptance tests and fine tune the system
- ❑ User documentation and training

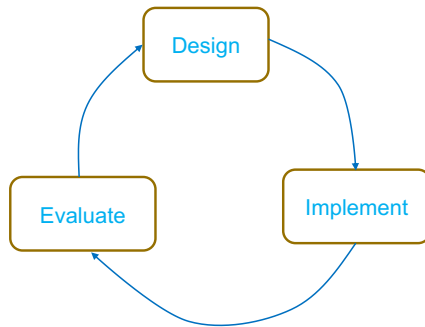
7. Nurture the user community

- ❑ User support
- ❑ Monitor usage and measurement

8. Prepare evolutionary plan



Iterative Design



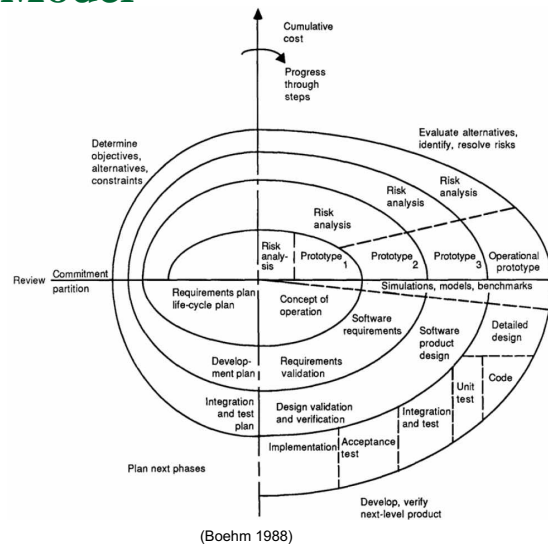
Interactive Design (cont'd)

- Each cycle is one iteration
- Release is produced at the end of each iteration
- Customer's feedback and evaluations can be incorporated into next release

- Problems
 - It's expensive to use customer's time to test
 - Customers may not be available
 - Customers don't like → they don't buy



Spiral Model



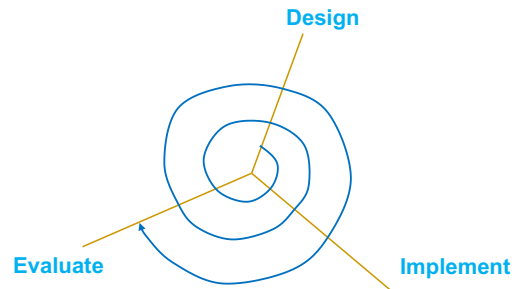
Spiral Model (cont'd)

- Process is represented as a spiral rather than as a sequence of activities with backtracking
- Each loop in the spiral represents a phase in the process
- No fixed phases such as specification or design - loops in the spiral are chosen depending on what is required
- Risks are explicitly assessed and resolved throughout the process



Spiral Model for UI Design

- An improvement of iterative design



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Spiral Model for UI Design (cont'd)

- Early cycles use cheap prototypes
 - Paper prototypes
 - Sketches on computer
 - Quick prototyping tools
- Providing multiple prototype alternatives
 - Parallel prototyping
- Later cycles should be better than early ones
- Only mature releases of later cycles can be distributed to users

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User-Centered Design

- Also known as Participatory Design
- A type of iterative design with Spiral
- Focusing on users and tasks
 - User analysis: who uses the system
 - Task analysis: what users need to do
- Getting users involved in the process
 - Users as evaluators, consultants and designers (sometimes)
- Constant evaluation
 - Users evaluate prototypes and releases

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User-Centered Design (cont'd)

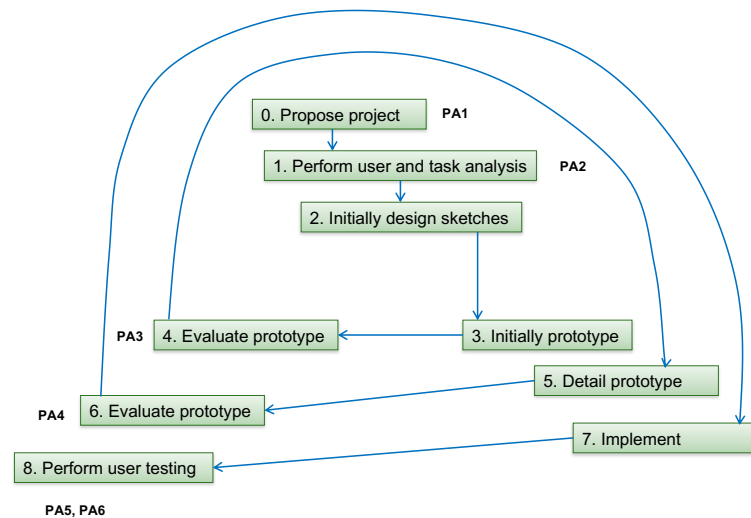
- Advantages
 - Accurate information and useful suggestions
 - Opportunity to argue over design decisions
 - Increased ego involvement in system success
- Potential problems
 - Users are not always available to participate
 - Their time maybe expensive
 - Users are not UI designers
 - Users have strong ego and preferences
 - UI designers overly obey users' preferences

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Process for Projects in This Class



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Applying User-centered Design

- You are all potential users of proposed apps
 - Users help identify problems
 - Members of other groups review a group's proposal
 - Collect feedback from potential users
 - Observe existing users' actions
- Users review and provide feedback
 - In each milestones, members of other groups provide feedback on design of a group
- User evaluation
 - By the end of the project: everyone will review the design of another group

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How to be successful in teamwork?

- Define clear goals and expectations
- Assign clear responsibilities and tasks for everyone
- Talk about accountability
 - Who is responsible when things go wrong
- Meet weekly to review status, even if no assignment is due that week
 - Record meeting minutes
- Work early than late
- Understand your teammates
 - Motivation, commitment, capability

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"I haven't read it yet, but I've downloaded it from the Internet."

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From The New Yorker Book of Technology Cartoons.

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Outline

- UI Design processes
 - Waterfall model
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 - Spiral model
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Principles

- Determine users' skill levels
 - Novice/first-time users
 - Knowledgeable intermittent users
 - Experts and frequent users
- Identify the tasks
 - Frequent actions
 - Less frequent actions
 - Infrequent actions
- Choose appropriate interaction styles
 - Direct manipulation
 - Menu selection
 - Form fillin
 - Command language
 - Natural language



Principles

- Use Shneiderman's eight golden rules of interface design
 - To be discussed in the next slide
- Prevent errors
 - Constructive and informative error messages
 - Organizing screens and menus functionally
 - Providing feedback about the state of the interface
 - Correct actions
 - E.g., grayed menu items
 - Complete sequences
 - E.g., wizard windows often have both Next and Finish buttons
- Increase automation while preserving human control
 - Auto suggestion
 - Auto completion
 - Allowing users to change



Shneiderman's Eight Golden Rules

- Strive for consistency
- Cater to universal usability
- Offer informative feedback
- Design dialogs to yield closure
- Prevent errors, rapid recovery
- Permit easy reversal of actions
- Support user control
- Reduce memory load



Summary

- User-centered design is a preferable process in UI design
- Groups in this class follow this process
- UI design principles and rules
 - Discussed across the lectures including this one

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Let Your Ideas Flow

- Chindogu, Japan



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UI Hall of Fame or Shame

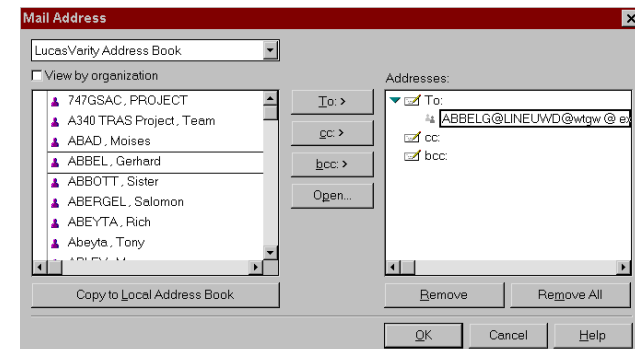


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UI Hall of Fame or Shame



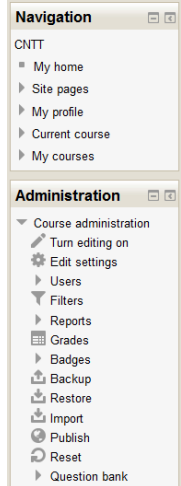
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Moodle

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Problems with the order of items?

Problems with icons?

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■ Lê Minh Quân



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BKAV

■ Lê Thành Quang

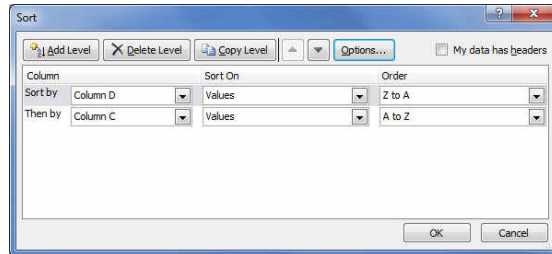


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Sort dialog in Excel



Vexere.com

