

## Activity Design

Lecture 4  
Chapter 3 Rosson & Carroll

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## Activity Design

- Transforms problems and opportunities of current practice (Problem Scenarios & Claims) into new system
- First stage in Design of proposed system
  - Followed by information and interaction design
- Part of Requirements Specification
  - Note: Problem scenarios are not specification

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## Activity Design

- Definition
  - Functionality
    - Often called “System Functionality” or “Functional Specifications”
  - Usefulness
  - Specification of *what* the proposed system will do, not *how*

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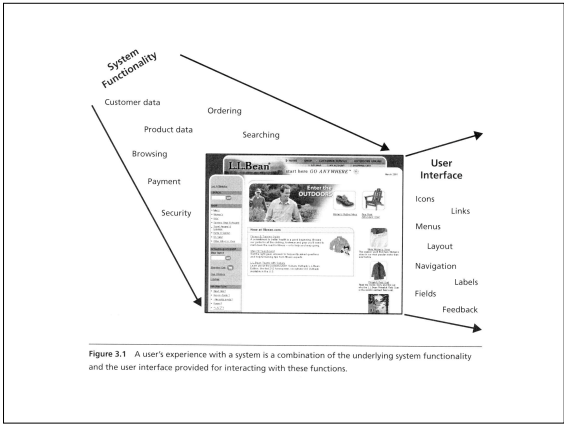
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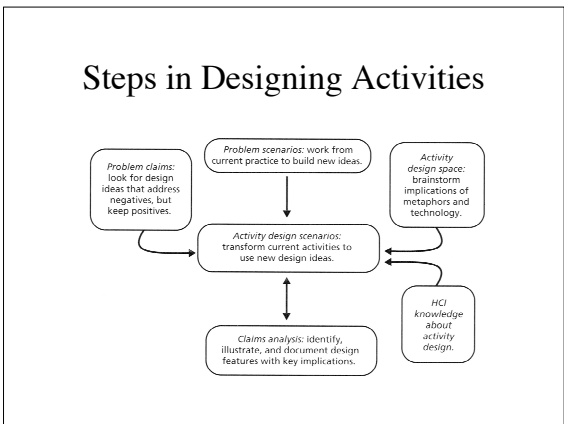
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- ### Successful Activity Design
- Effective activities
  - Comprehensible activities
  - Satisfying activities

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## Designing Effective Activities

- Human-centered design
  - not technology or designer centered
- Collaboration with users
  - Constant focus on stakeholders in all phases
  - Participatory design
- Generality of design creates consistency
  - Tradeoff: may not handle special cases well

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## Designing Comprehensible Activities

- Use the user's mental model, not the designer's
  - Metaphors and analogies (prior experience)
  - Tradeoff: Prior experience may conflict with what is required in new system

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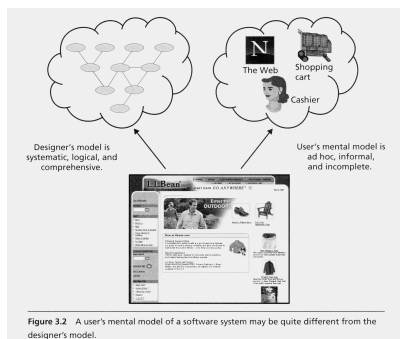


Figure 3.2 A user's mental model of a software system may be quite different from the designer's model.

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## Designing Satisfying Activities

- Automate tedious or error-prone tasks
  - Tradeoff: Automating some activities may undermine human motivation and self-esteem
  - Tradeoff: Benefits to group may be experienced as frustrating or tedious for some individuals

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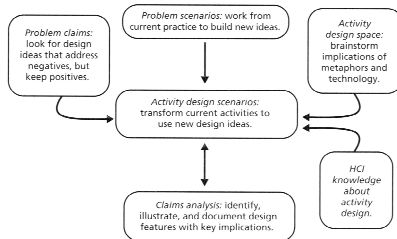
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## How to do an activity design



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## Summary of Steps

- Begin with complete set of Problem Scenarios & Claims Analysis
- For each problem scenario, brainstorm about possible ways of doing the activity
  - Note: There may be many alternative scenarios for the same activity! Choose a consistent and general design for activities
  - Pay attention to prior user knowledge and technology options
- Write *activity scenarios* for the proposed system
- Write a claims analysis for activities

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## Again, what is a Problem Scenario?

- Definition (R&C page 64)
  - A problem scenario tells a story of current practice.
    - Reveal aspects of the stakeholders and activities that have implications for design
  - Called “problem scenarios” because they describe activities in the problem domain
    - NOT because they illustrate problems in current practice
- Problem Scenarios describe
  - All major tasks by all stakeholders
  - Can include unusual or problematic events

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## For the Virtual Science Fair example

- Stakeholders and tasks
  - Exhibitors (students)
    - Review how to participate, propose a project, carry out project, construct an exhibit, demonstrate project
  - Coaches (teachers)
  - Visitors (community)
    - Find out about fair, travel to fair, browse projects, interact with students and others at exhibits
  - Judges (community)
  - Administrators (principals)

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## Problem Scenario VSF Example (p. 69)

- 3) Alicia and Delia go to the science fair
  - Background on Alicia and Delia (mother & daughter)
  - When Alicia and Delia walk into the gym...She and Delia join Marge at Sally Harris’s exhibit on black holes, and Sally showing her a flip-card animation of black hole formation. Alicia and Delia pause to listen, and Alicia is happy to see Delia try out the animation. As they move on, Alicia is surprised to realize how much she has learned about black holes, a topic she’s heard mentioned many times. Delia seems interested too; she tracks down one of her own friends and brings her back to meet Sally. As Alicia and Delia leave, they are talking about how they might get involved in next year’s fair.

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## Claims Analysis for Problem Scenarios

**Table 2.7** Claims analyzed while developing the problem scenarios. The consequences preceded with plus signs are referred to as "pros" or "upsides" of a feature; those with minus signs are the "cons" or "downsides" of a feature. As a group they illustrate the tradeoffs associated with the feature.

Situation Feature	Possible Pros (+) or Cons (-) of the Feature
Exhibits composed of physical elements	<ul style="list-style-type: none"><li>+ leverages existing skills at grasping, moving, and constructing things in the world</li><li>+ encourages direct engagement and involvement by visitors</li><li>- but each element consumes a fixed amount of physical space</li><li>- but some pieces may be expensive or difficult to produce or copy</li></ul>

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## Metaphors for Objects and Activities at Virtual Science Fair

VSF Activity	Real-World Metaphor	Implications for VSF Activities
Constructing an exhibit is like writing a . . .	Lab journal	Informal and personal notes, raw data, work in progress
	Documentary	Carefully constructed "story" of how the project happened
Coaching a student is like being a . . .	Peer (colleague)	Social support, reactions to ideas, suggestions
	Director	Specific directions about exhibit content or layout
Visiting the fair is like going to a . . .	Study room	Quiet and focused attention to pieces of information
	Public lecture	Receiving preorganized information as part of a group
	Cocktail party	Informal discussions, moving from one group to another

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## Technology Options for VSF

- Internet
  - Website (HTML)
  - Bulletin Board/Newsgroup
  - Message board
  - Email
  - On-line chat
  - Electronic whiteboard
  - Simulations
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### Derived Activity Scenario VSF Example (p. 97)

- 3) Alicia and Delia go to the science fair
  - When Alicia’s daughter Delia shows her an email invitation to a virtual science fair, the two of them decide to follow the link right then and there. They are curious about how this will be different from a regular fair.
  - On arrival, they see an overview of the virtual science fair. They notice that some exhibits are still “under construction,” so they figure that one difference may be that this fair is ongoing. The welcome note confirms this, indicating that all virtual exhibits will be complete by next Thursday, when the judging will take place.

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### Derived Activity Scenario continued

- They decide to look around anyway since they have time. Alice notices that her friend Marge is also here, so they join her. She is talking to Sally Harris about her exhibit on black holes.
- Sally and Marge see them arrive, and pause briefly to say hi. But Alicia and Delia don’t want to interrupt, so they look around at other parts of the exhibit. Delia finds a stored discussion about red dwarfs and she and her mom browse it. Delia adds a comment to this discussion and is pleased when Sally notices and elaborates on her point.

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### Derived Activity Scenario continued

- Alicia asks Sally about an unfamiliar object, a simulation. Sally shows her how it demonstrates her current theory of black hole formation, and asks them whether they want to try out some variations. Alicia is surprised and pleased at how quickly Delia understands how to change the model and get new results.

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## Refining Activities

- System object’s point of view (page 102)
- Participatory design
- Coherence
  - Do the scenarios integrate with each other?
- Completeness
  - Do the scenarios cover the major functions and possible difficulties?

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## Claims Analysis for Activity Scenarios

Table 3.3 Claims analyzing the key features of the activity design.

Proposed Activity Design Feature	Hypothesized Pros (+) or Cons (-) of the Feature
Putting exhibits online	+ remove many constraints regarding space and diversity in layout + facilitates an iterative process of design, construction, and editing + simplifies access to the exhibits by people separated in space and time – but may lead to a decreased emphasis or interest in physical components – but exhibitors may try to include too much, making exhibits complex

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## Review of Activity Design

- Activity design = Specification of functionality
  - Specification of *what* the proposed system will do, not *how*
    - *How* is the proposed user interface
  - Usefulness for the stakeholders
- Transforms each current system Problem Scenario into a new system by specifying Activity Scenarios and Activity Claims
- Stage 1 in actual design of new system
  - Followed by information and interaction design

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## Review of Activity Design continued

- Successful designs have
  - Effective activities
  - Comprehensible activities
  - Satisfying activities
- Also note there are many possible designs for activities: Which one should you choose?
  - Note tradeoffs in design
  - Very creative phase: brainstorming, collaborating with stakeholders
  - May involve repeating aspects of Requirements Analysis and changing problem scenarios

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