

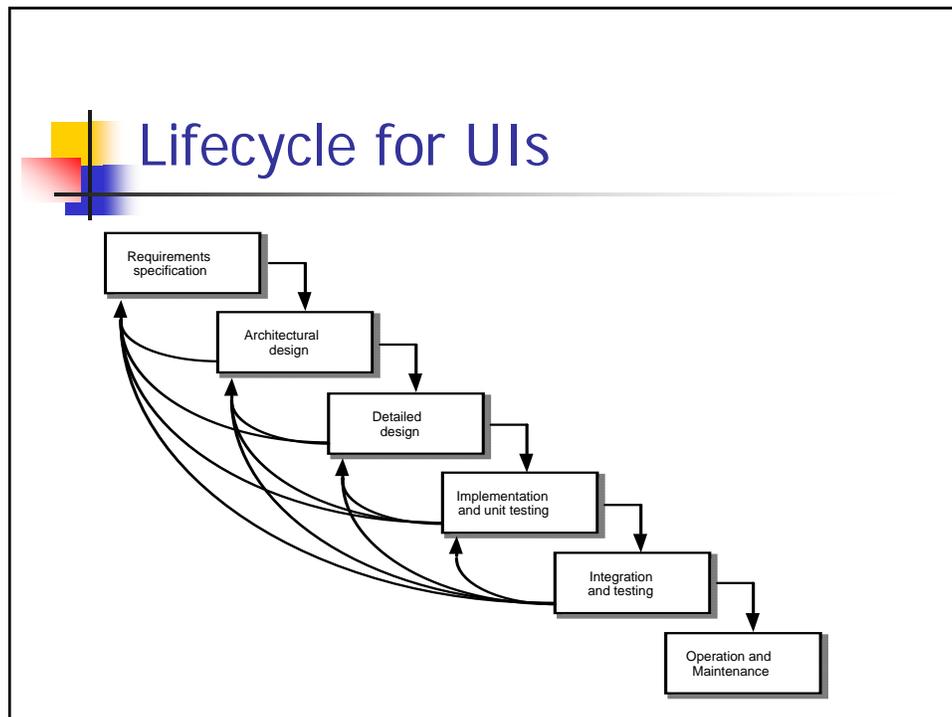


Human-Computer Interaction IS4300



Requirements Analysis

- What does the system/interface need to do?
- Who is the user?
- What does the user need to do?
- What is an example of system use?
- How well does it need to perform?



Who are the users? Stakeholders

- Be aware of lines of power and communication and be clear with everyone if you are breaking them
- Not just users, but anyone affected
- Symmetry
- Free rider problem
- Critical mass

Classes of Stakeholders

- Primary
 - End users
- Secondary
 - Receive output or provide input
- Tertiary
 - Directly affected by success or failure
- Facilitating
 - Involved with design, development, maintenance



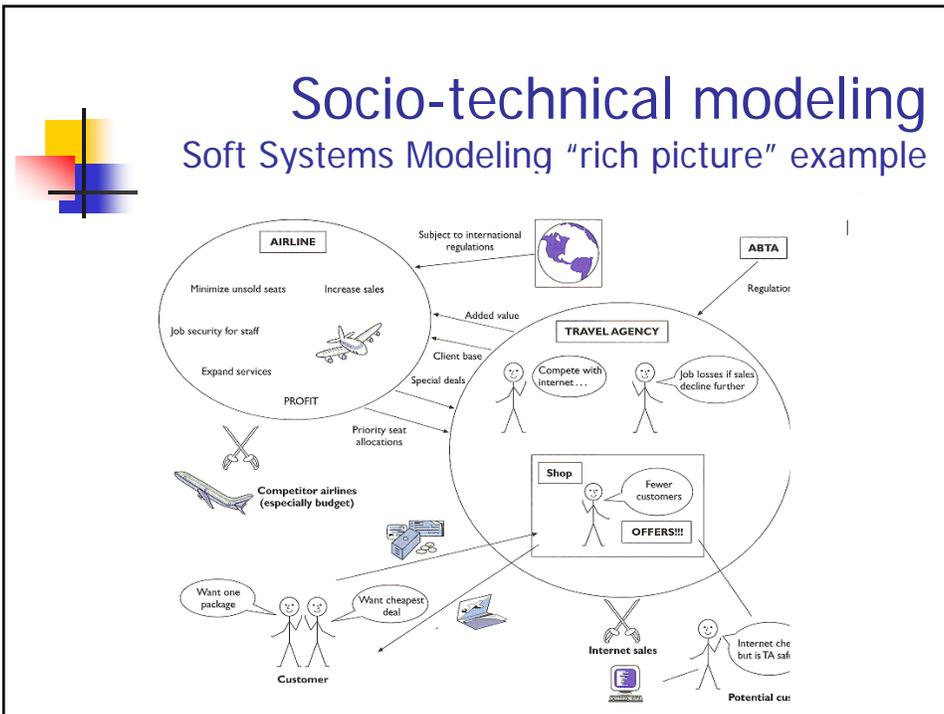
Example: EMR

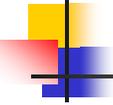
CUSTOM - Questions to Ask of each Stakeholder X

- What does X have to achieve and how is success measured?
- What are X's sources of job satisfaction?
- What knowledge and skills does X have?
- etc. (Dix pg. 461)

Socio-technical Modeling

- CUSTOM
 - Focus on stakeholders
- OSTA
 - Focus on tasks
- Soft systems methodology
 - Independent of technology





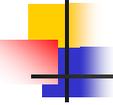
Concepts: Participatory Design

- Include users throughout design process
 - Brainstorming
 - Storyboarding
 - Pencil and Paper Exercises (paper prototyping)
- e.g. ETHICS
 - Design groups include representative stakeholders – make all design decisions.
 - Explicit list of questions to answer.



Concepts: Contextual Inquiry

- cf ethnography
 - More focused (assumes technology)
 - More brief (usually one or a few interviews)
 - Focuses on interview (vs. observation)
 - Uses specific techniques & models
 - Sequence
 - Physical
 - etc.
 - But, done in the workplace (in context)



P2-1 User Analysis

- Identify major kinds/classes of users
- Practically speaking (for the homework)
 - Age, gender, ethnicity
 - Education
 - Physical abilities
 - General computer experience
 - Skills (typing? Reading?)
 - Domain experience
 - Application experience
 - Work environment and other social context
 - Relationships and communication patterns
- Consider CUSTOM questions



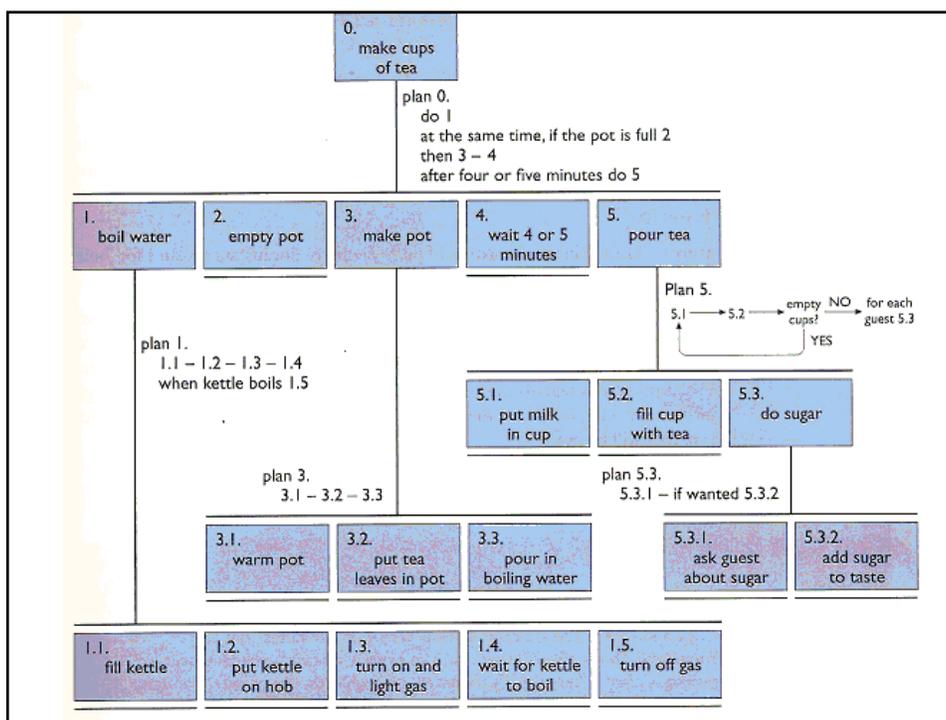
Dix CH 15 Task Analysis

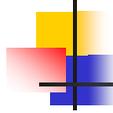
- Analysis of how people do their jobs

- Task decomposition
- Knowledge-based Techniques
- Entity-relation-based Analysis

Hierarchical Task Analysis

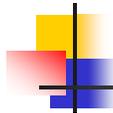
- Hierarchy of tasks & subtasks
 - +
- Plans
 - Express partial ordering on subtasks (possible parallelism)
 - Conditions on subtasks
 - Temporal constraints on subtasks
 - Cycles





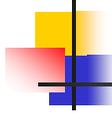
Class Exercise

- HTA for tooth brushing



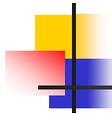
Exercise

- Teams of 2-3
- Pick a task that one of you observed in your ethnography
- Do a HTA



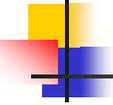
Knowledge-Based Analysis

- Goal: understand knowledge needed to perform a task
- Taxonomies
 - Ask the expert
 - Card sorting
 - Use for objects & tasks
 - Usually many different ways to do
 - Addressed by task descriptive hierarchy (AND/OR/XOR)



Entity-Relationship Analysis

- Objects
 - Concrete, Actors (roles), Composites
 - Attributes
- Actions
 - Agent, Patient (changes state), Instrument
- Events
 - Performing of an action, spontaneous
- Relationships
 - Object-object, Action-patient, Action-instrument
- Use HTA (e.g.) to describe sequencing



P2-2 Task Analysis

- For at least 3 tasks
 - Hierarchical task decomposition
 - Task = Goal (what, not how)
 - Top-level = problem you're solving
 - Decompose into subtasks/subgoals
 - For each task
 - Goal – “Why do you do this?”
 - Preconditions (other tasks, information)
 - Decompose if nontrivial – “How do you do it?”



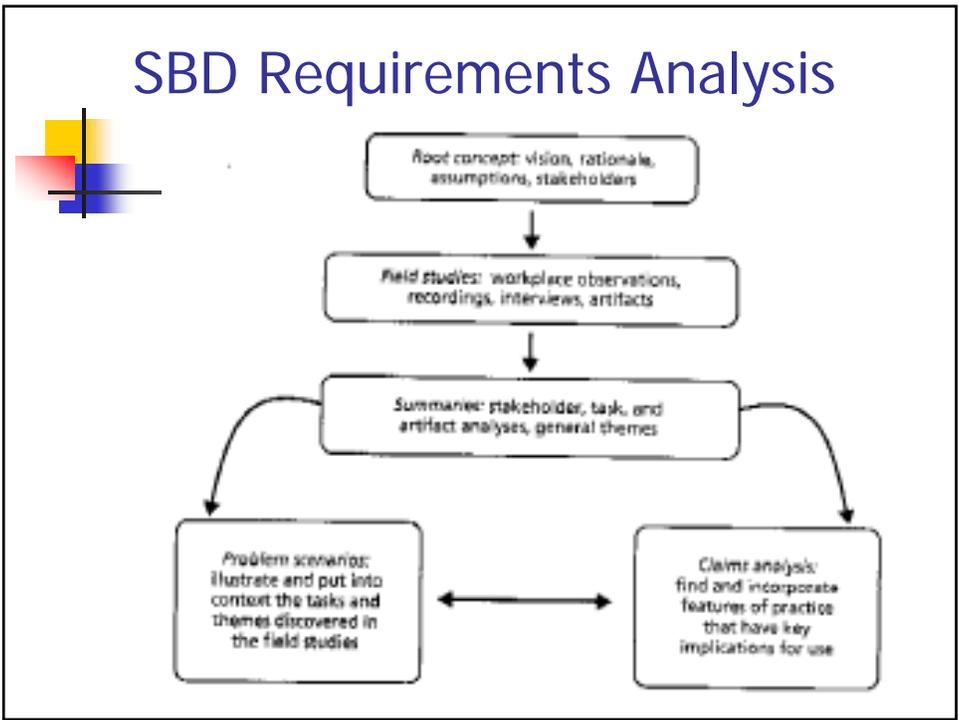
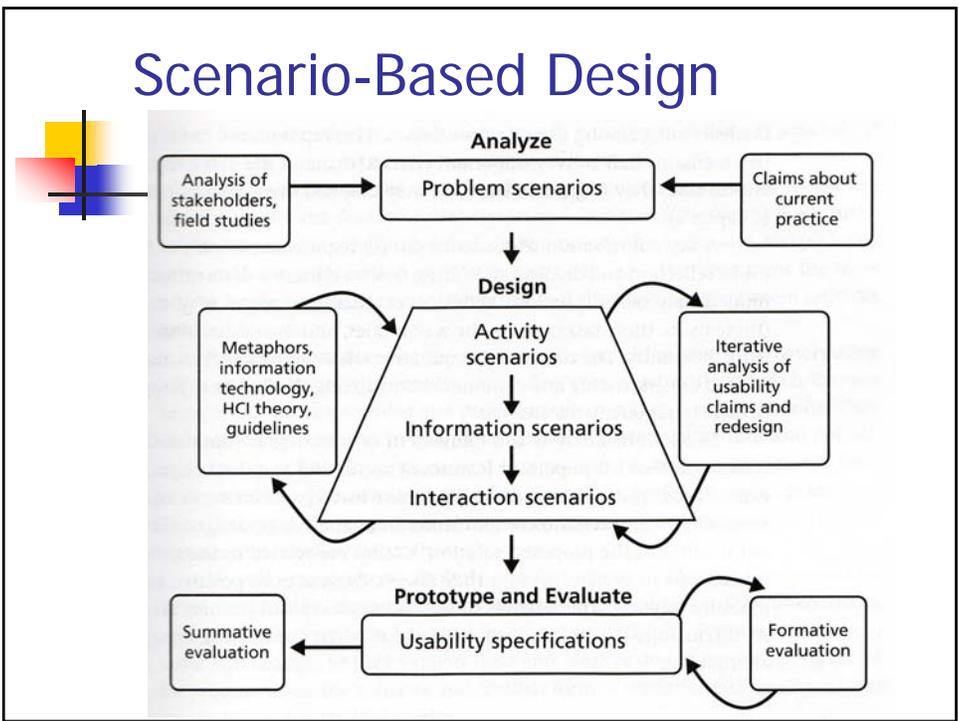
P2-2 Task Analysis

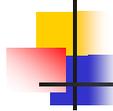
- Other information about tasks that may be useful
 - Where is the task performed?
 - How often is the task performed?
 - What are its time or resource constraints?
 - How is the task learned?
 - What can go wrong? (errors, exceptions)
 - Who else is involved in the task?



Scenario-Based Design

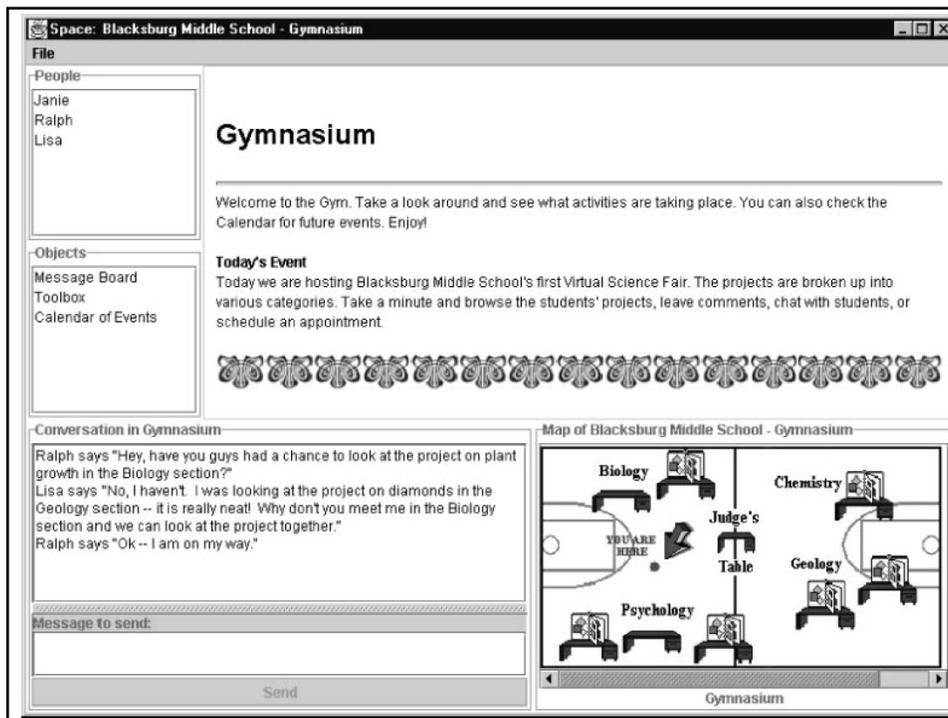
- 
- ### What is a Scenario?
-
- A concrete narrative about specific people, in specific contexts, performing very specific tasks.
 - A story.





Problem Scenarios

- Tells a story of a current practice.
- Narratives of activities in the current situation (prior to technology introduction) that reflect needs and opportunities for redesign.
- Carefully constructed to reveal aspects of the stakeholders & activities that have implications for design. (*fictional!*)
- Not requirements, per se, but captures insights about the current situation.
- Basis for our design methodology.



The screenshot shows a virtual world interface for a gymnasium. The window title is "Space: Blacksburg Middle School - Gymnasium".

File

People

- Janie
- Ralph
- Lisa

Objects

- Message Board
- Toolbox
- Calendar of Events

Gymnasium

Welcome to the Gym. Take a look around and see what activities are taking place. You can also check the Calendar for future events. Enjoy!

Today's Event

Today we are hosting Blacksburg Middle School's first Virtual Science Fair. The projects are broken up into various categories. Take a minute and browse the students' projects, leave comments, chat with students, or schedule an appointment.

Conversation in Gymnasium

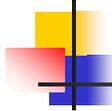
Ralph says "Hey, have you guys had a chance to look at the project on plant growth in the Biology section?"
 Lisa says "No, I haven't. I was looking at the project on diamonds in the Geology section -- it is really neat! Why don't you meet me in the Biology section and we can look at the project together."
 Ralph says "Ok -- I am on my way."

Message to send:

Send

Map of Blacksburg Middle School - Gymnasium

The map shows a layout of the gymnasium with several sections labeled: Biology, Chemistry, Geology, Psychology, Judge's Table, and YOU ARE HERE. A central area is labeled "Judge's Table".

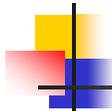


Example Problem Scenario

Sally Harris is a high school sophomore who has been researching black holes for the past 3 months... She has been in the science fair for the last 3 years, so she knows a lot about...

She is a bit worried about the space and materials provided to everyone... This year she has explored some new methods-for example, an Authorware simulation that illustrates her theory of black hole formation. ...

As she studies her simulation, Sally thinks of a way to turn the lack of computer support into a "feature": She will create a sequence of visualizations that can be flipped like a deck of cards to show the animation. ...



Why Use Scenarios?

- Concrete
- Flexible
- Supports interdisciplinary design
- Supports participatory design
- Supports & promotes reflection and discussion

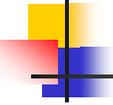
How many scenarios?

Rules of Thumb

- You should have at least one scenario for each type of primary stakeholders
- For stakeholders with many tasks, or tasks the are complex, write multiple scenarios

Exercise

- Same teams of 2-3
- Write a primary stakeholder problem scenario for the HTA task



P2-3 Problem Scenarios

as in Rosson & Carroll Fig 2.13

- Invent hypothetical stakeholders

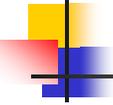
- Write problem scenarios for your 3 tasks, for one or more primary stakeholders

- Be as concrete as possible to show actors' motives



P2 - Project

- Description of users / user classes
- Task Analysis
 - Three or more tasks, including goal, preconditions, subtasks, and exceptions
- Problem Scenarios
 - For 3 most important tasks
- Specify at least two meaningful usability criteria
 - Dix Table 6.2, pg. 239



Requirements Analysis Summary

- What's missing in these methods?
 - Interface Design!
- Task Analysis & Problem Scenarios intended to capture a current problem-solving activity.
 - If you are designing something totally new, with no current analog, treat these as hypotheticals



To Do

- Read Dix Ch 8, GUI architecture
- Work through Java Swing tutorials
- Get access to NetBeans
- Finish I3, ethnography
- Start P2, requirements analysis