Deeper Into Requirements

CS3724
Summer II 2003
SBD and Requirements Analysis

**Root concept**: vision, rationale, assumptions, stakeholders

**Field studies**: workplace observations, recordings, interviews, artifacts

**Summaries**: stakeholder, task, and artifact analyses, general themes

**Problem scenarios**: illustrate and put into context the tasks and themes discovered in the field studies

**Claims analysis**: find and incorporate features of practice that have key implications for use

Root Concept

- **4 parts**
  - Vision statement
  - Basic rationale
  - Stakeholders
  - Starting assumptions

Subtle differences, sometimes a high level vision will include the rationale. One sentence can capture both easily.
Analyzing Current Practice

• Field study
  - Go out and observe workers in their situation
  - Interviews
• Focus groups
• Collect artifacts

Doing Field Work

• Have a plan
  - List of questions
  - Items of interest
  - Techniques and methods
• Establish a comfortable relationship with the workers
  - How do you do this?
Summarizing Data

• Who are the stakeholders
  - Can you group everyone into a few explicit types? (students, teachers)
• Stakeholder diagram
  - Show relationships

Diagram:

- Teachers
- Students
- Community members
- Administrator

Connections:
- Teachers advertise fair to Students, guide activities of Students.
- Students create projects for viewing by Community members, interact with Community members.
- Community members browse exhibits of Administrator, comment on or judge exhibits of Administrator.
- Administrator recruit volunteers from Teachers; acknowledge participation by Teachers.
- Teachers provide resources for Students; summarize results of Students; acknowledge participation by Students.
Task Analysis

• Hierarchical task analysis
  - Decomposing higher level goals into sub goals
  - Useful to determine how, why certain tasks are performed

0. Check class roll

1. Navigate to registrar.vt.edu
   Plan 1: Do 1.1, 1.2
   1.1 Open browser
   1.2 Enter URL

2. Open faculty access tool
   Plan 2: Do 2.1, then 2.2; if 2.2 fails, do again
   2.1 Select link
   2.2 Logon
   2.2.1 Enter PID
   2.2.2 Enter password

3. Display roll for CS 3724
   Plan 3: Do 3.1, 3.2 3.3
   3.1 Select ‘summary class info’
   3.2 Select semester
   3.3 Select class CRN

Plan 0: Do 1,2,3
Artifact Analysis

- Many forms
  - Data files, forms, software, brochures, etc
- Come from all stakeholder groups
- Need to relate and understand how the artifacts impact tasks

Workplace Themes

- A category made by designers that is proposed for related observation or discussion points
- Different stakeholders deal with different work activities
- Themes try to make explicit underlying patterns in work, similarities among stakeholders
How do you do it?

• Use post-it notes on artifacts that describe the behavior or purpose
• Work together as a design team to organize the post-it notes into groups
• Review, discuss, reorganize until team is satisfied
• Can involve other stakeholders (participatory design)

Participatory Design

• Getting end users (stakeholders) involved in the design process
• Mostly used in requirements gathering but also in requirements refinement
• Several methods
  – Ethnographic field studies
  – Contextual inquiry
  – Participatory analysis
Ethnographic Field Study

- Go out and observe users doing what they do
- Interview many people
- Investigator is observer, doesn’t really interfere with user, becomes part of group
  + useful, effective, lots of requirements
  - BUT it is difficult and costly to perform (time and money)

Contextual Inquiry

- Observe and record notes
- The observer can interrupt and ask questions about what is going on
- This is different from ethnography
  + more elaborate records of tasks
  + identify causes of people’s behavior
  - BUT is highly disruptive to the user
Participatory Analysis

• Make observations (ideally video or audio recordings)
• Have users review these recordings and make comments on them
  + get users to identify important features
  - BUT is costly in terms of time, equipment

Problem Scenarios

• Tells the story of current practice
• Reveal aspects of stakeholders and their activities (current)
• Describe activities in current problem domain
• New activities are grounded in current activities
Characteristics of Problem Scenarios

• Usually fictional
  - But can be based on observed behavior

• Creative activity
  - Means it is not easy, but not overly difficult if you have done good requirements gathering

• Based on artifact and task analysis

Problem Scenario

George Hadley, a recent retiree and avid rose gardener, moved to Whidbey Island a few months ago. Now that it was spring, George was looking forward to creating an even better garden than the one at his previous home. First, he roamed around the garden, taking notes and careful measurements. He then sketched out a rough plan, showing which rose bushes he wanted and where they were going to be planted. As he was finishing up, Susan - his next-door neighbor - dropped by. An avid gardener herself, Susan was interested in seeing what George had planned. George was grateful for her input, since she had lived in the area for many years. She pointed out one rose bush that did not grow well in the soil and recommended replacing it with another one. She also gave George a warning that deer were a big local problem for rose gardens in the area - they loved to eat the roses!

The next day, George decides to get started on his garden and buy some rose bushes. He opted to go to the Green Thumb nursery center. It was a further drive than the Kmart, but had a wide selection and he was familiar with the nursery staff, who were always happy to answer his questions. As he entered the nursery grounds, George couldn't help but admire the very nicely arranged display of impatiens at the nursery entrance. The main retail building was buzzing with activity. Glancing up at the overhead signs, George was able to maneuver himself quickly to the rose bush section.

Once there, George scanned the tables looking the rose bushes he wanted. Many of the bushes on the shelf looked like earlier customers had moved them around and George had to rely on the plant tags to help him find what he wanted, although even these looked like they had been switched around. After some careful investigation, George found the first bush on his list. Holding up in the light, George inspected the bush carefully, making sure there weren't any bugs or fungus lurking about. Satisfied with his selection, George went off to look for another item on his list. After almost 10 minutes of searching unsuccessfully, George was getting very frustrated. He was finally able to track down an employee, who informed him that the rose bush was out of stock and wouldn't be in for another month. If only there had been a sign, George thought, as he headed towards the cash register.
Claims From Scenarios

• Interleaved with scenario writing
• Identifying scenario features that impact design
  – Positives and negatives
• Extracting claims from scenarios is first step (saying whether it is good or bad)

Claims Analysis

• Determining the effects on the design
• Elaborate the scenarios
• Documents why scenarios are written
• Extend scenarios (without writing new ones)
• Balanced view (good and bad)
• Motivate design reasoning
Claims Features

• Anything in the situation (scenario) that has a notable effect on the actor’s experience
  - Objects
  - Procedures
  - Other people

Consequences

• Simply some impact for the actors in the scenario
• Related directly to claims features
• Positive and negative consequences
• Lead to design decisions
  - In later design stages
Creating a garden sketch...

+ provides a concrete means of communicating with nursery worker
+ helps direct customer to exactly where he or she needs to go in the nursery
+ keeps a record of what customer has already planted
+ prevents impulse buying

- but must be replaced if changes are made
- but may be easily damaged or lost
- but customer may be unable to find all the plants drawn in the diagram

Rules for Writing Scenarios

• At least 1 scenario per stakeholder group
• Analyze at least two claims from each scenario
• Write multiple scenarios for groups with many tasks or complex tasks