Lecture 8: Stakeholder Goals

→ Boundaries
  % Scoping the problem
→ Stakeholders
  % Identifying the problem owners
→ Goals
  % Identifying the success criteria
→ Scenarios
  % Using concrete examples to understand the problem

Where do we start?

→ Identify the problem
  % What is the objective of the project?
  % The “vision” of those who are pushing for it?
    > e.g. “Meeting scheduling is too costly right now”
→ Scope the problem
  % Given the vision, how much do we tackle?
    > e.g. “Build a system that schedules meetings”, or...
    > e.g. “Build a system that maintains people’s calendars” ... or...
→ Choose a business process?
  % Given the problem, what is the appropriate business process for solving it?
    > e.g. “Anyone who wants to schedule a meeting goes to the secretary, gives
details and the secretary handles the rest”, or...
    > e.g. “Anyone can submit a meeting request, participants are informed and a
negotiation settles meeting details” ... or...
→ Choose among alternatives?
  % Given a business process, what parts should be automated, and how?
    > e.g. “Computer takes in scheduling request details, outputs a solution” ... or...
    > e.g. “Solution arrived at interactively by secretary and computer” ... or...

Requirements Elicitation

→ Starting point
  % Some notion that there is a “problem” that needs solving
    > e.g. dissatisfaction with the current state of affairs
    > e.g. a new business opportunity
    > e.g. a potential saving of cost, time, resource usage, etc.
→ Collect enough information to:
  % Identify the problem/”opportunity”
    > Which problem needs to be solved? (identify problem boundaries)
    > Where is the problem? (understand the Context/Problem Domain)
    > Whose problem is it? (identify stakeholders)
    > Why does it need solving? (identify stakeholders’ goals)
    > How does the problem manifest itself? (collect some scenarios)
    > When does it need solving? (identify development constraints)
    > What might prevent us solving it? (identify feasibility and risk)
  % Become an expert in the problem domain
    > Learn how to find your way round a new problem area quickly
    > Use your (initial) ignorance as an excuse to ask questions
    > Recognise the domain expertise of the people you talk to

Identifying the Problem

→ Vague problem stated by the customer:
  % E.g. university textbook store:
    > Manager wants to computerize the book order forms filled out by instructors;
  % E.g. A large insurance company:
    > Claims manager wants to cut down the average time it takes to process an
insurance claim from 2 months to 2 weeks
  % E.g. A telecommunications company:
    > CEO wants to integrate the billing system with customer record systems of
several affiliates, so there is only one billing system...
  % E.g. Large Government Aerospace Agency:
    > The president wants to send a manned mission to Mars by the year 2020
→ Often you only see symptoms rather than causes:
  % E.g. “Ontario patients needing X-ray scans have to wait for months”
  % The long wait is the symptom, not the problem. The problem may be:
    > Shortage of X-ray machines;
    > Shortage of trained staff;
    > Shortage of doctors to process the data
    > Inefficient scheduling procedures
Stakeholder analysis:
- Identify all the people who must be consulted during information acquisition.

Example stakeholders:
- Users: concerned with the features and functionality of the new system.
- Designers: want to build a perfect system, or reuse existing code.
- Systems analysts: want to "get the requirements right." 
- Training and user support staff: want to make sure the new system is usable and manageable.
- Business analysts: want to make sure "we are doing better than the competition." 
- Technical authors: will prepare user manuals and other documentation for the new system.
- The project manager: want to complete the project on time, within budget, with all objectives met.
- "The customer": Wants to get best value for money invested!

Organization charts show:
- Areas of responsibility (flows upwards)
- Lines of authority (delegated downwards)

A useful tool for figuring out where the stakeholders are.

Finding Stakeholders: Levels of authority
- Top management: 
  - Establishes goals
  - Does long-range planning
  - Determines new market and product developments
  - Decides on mergers and acquisitions.
- Middle management: 
  - Sets objectives
  - Allocates and controls resources
  - Does planning
  - Measures performance
- Lower management: 
  - Supervises day-to-day operations
  - Takes corrective action when necessary.
- Operational level: 
  - Performs day-to-day operations.

Identifying Stakeholders' Goals
- Approach: 
  - Focus on why systems are constructed
  - Express the 'why' as a set of stakeholder goals
  - Use goal refinement to arrive at specific requirements
  - Goal analysis: 
    - Document, organize, and classify goals
    - Goal evolution: 
      - Refine, elaborate, and operationalize goals
  - Goal hierarchies show refinements and alternatives.
- Advantages: 
  - Reasonably intuitive
  - Explicit declaration of goals provides sound basis for conflict resolution.
- Disadvantages: 
  - Captures a static picture - what if goals change over time?
  - Can regress forever up (or down) the goal hierarchy.

Source: Adapted from Anton, 1996.
Goal Modeling

→ (Hard) Goals:
  %- Describe functions that must be carried out. E.g.
    > Satisfaction goals
    > Information goals
→ Softgoals:
  %- Cannot really be fully satisfied. E.g.
    > Accuracy
    > Performance
    > Security
→ Also classified temporally:
  %- Achieve/Avoid goals
    > Reach some desired state eventually
  %- Maintain/Avoid goals
    > Keep some property invariant
  %- Optimize
    > A criterion for selecting behaviours

Agents:
  %- Owners of goals
  %- Choice of when to ascribe goals to agents:
    > Identify agents first, and then their goals
    > Identify goals first, and then allocate them to agents during operationalization

Modelling Tips:
  %- Multiple sources yield better goals
  %- Associate stakeholders with each goal
    > reveals viewpoints and conflict
  %- Use scenarios to explore how goals can be met
  %- Explicit consideration of obstacles helps to elicit exceptions

Example Goal Elaboration

→ Goal Elaboration:
  %- "Why" questions explore higher goals (context)
  %- "How" questions explore lower goals (operations)
  %- "How else" questions explore alternatives

Relationships between goals:
  %- One goal helps achieve another (+)
  %- One goal hurts achievement of another (−)
  %- One goal makes another (++)
    > Achievement of one goal guarantees achievement of another
  %- One goal breaks another (−−)
    > Achievement of one goal prevents achievement of another
  %- Precedence ordering – must achieve goals in a particular order

Obstacle Analysis:
  %- Can this goal be obstructed, if so how?
  %- What are the consequences of obliterating it?

Softgoals

→ Some goals can never be fully satisfied
  %- Treat these as softgoals
    > E.g. "system be easy to use"; "access be secure"
    > Also known as 'non-functional requirements'; 'quality requirements'
  %- Will look for things that contribute to satisfying the softgoals
  %- E.g. for a train system:
    > serve more passengers
    > reduce staffing
    > improve safety
    > maintain safe distance
    > clearer signalling
    > minimize operation costs
    > minimize development costs
    > add new tracks
    > increase train speed
    > more frequent trains
    > minimize costs
    > room availability
    > preferred preferences
    > homes booked
    > meeting announced
    > attendance confirmed
    > participants notified

Goal Analysis
Softgoals as selection criteria

- minimize costs
- improve safety
- serve more passengers
- maintain passenger comfort
- reduce staffing
- more frequent trains
- automate braking
- automate collision avoidance
- reduce waiting
- add new tracks
- increase train speed
- improve signaling
- buy new rolling stock
- hire more operators
- maintain safe distance
- minimize development costs
- minimize operation costs
- maintain passenger comfort

Scenarios

- Specific sequence of interaction between actor and system
- Tend to be short (e.g. between 3 and 7 steps)
- May be:
  - positive (i.e. required behavior)
  - negative (i.e. an undesirable interaction)
- May be indicative (describe current system) or optative (how it should be)

Advantages

- Very natural: stakeholders tend to use them spontaneously
  - E.g. "Suppose I'm admitted to hospital - what happens during my admission?"
  - Typical answer: "You, or the person accompanying you would talk to the person at the admissions desk. You have to show your OHIP card and explain who referred you to the hospital. Then you..."
- Short scenarios very good for quickly illustrating specific interactions

Disadvantages

- Lack of structure:

Example Scenario

Title: Successful meeting scheduled using messaging option
Participants: Alice (initiator, not attending); Bob, Carlo, Daphne (attendees)

<table>
<thead>
<tr>
<th>Action</th>
<th>Goals satisfied</th>
<th>Obstacles / Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice requests meeting, specifying participants, timeframe</td>
<td>Meeting requested; Attendance list obtained</td>
<td>What if selected timeframe is infeasible?</td>
</tr>
<tr>
<td>AS sends participant requests to Bob, Carlo and Daphne</td>
<td>?</td>
<td>Did we miss a goal?</td>
</tr>
<tr>
<td>Bob reads message</td>
<td>Participants informed</td>
<td>Can't detect when messages are read; what happens if Bob reads the message but doesn't reply?</td>
</tr>
<tr>
<td>Carlo reads message</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daphne reads message</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bob replies with preferences</td>
<td>Attendees preferences known</td>
<td>What if the preferences are mutually exclusive? Should we allow some to be higher priority?</td>
</tr>
<tr>
<td>Carlo replies with preferences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daphne replies with preferences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS schedules meeting</td>
<td>Room availability determined; room booked</td>
<td></td>
</tr>
<tr>
<td>AS notifies Alice, Bob, Carlo, Daphne of time and location</td>
<td>Meeting announced; Attendance Confirmed (?)</td>
<td>How do we know if they've all read the announcement? What if the schedule is no longer convenient for one of them?</td>
</tr>
</tbody>
</table>