Stakeholders and Goals

• Stakeholders
  – Identifying the problem owners

• Goals
  – Identifying the success criteria
Lecture 6:

Stakeholders and Goals

- **Stakeholders**
  - Identifying the problem owners

- **Goals**
  - Identifying the success criteria
Stakeholders

• 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
    • wants to complete the project on time, within budget, with all objectives met.
  – “The customer”
    • Wants to get best value for money invested!

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Financial interest
• Development interest
• Usage interest
Finding stakeholders: The Org Chart

- Organization charts show
  - Areas of responsibility (flows upwards)
  - Lines of authority (delegated downwards)
- A useful tool for figuring out where the stakeholders are
  - ...but remember that most activities involve connections that cross the org chart

Levels of authority

- **Top management**
  - establishes goals
  - does long-range planning
  - determines new market & product developments
  - decides on mergers & acquisitions.
- **Middle management**
  - sets objectives
  - allocates & 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
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Goals

• Approach
  – Focus on why a system is required
  – Use goal refinement to arrive at specific requirements
  – Goal analysis
    • document, organize and classify 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

• Goals:
  – Describe functions that must be carried out

• Actors:
  – Owners of goals

• Tips:
  – Multiple sources - better goals
  – Associate stakeholders with each goal
  – Use scenarios to explore how goals can be met
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/Cease 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

Goal analysis

• Relationships between goals:
  – One goal helps achieve another (+)
  – One goal hurts achievement of another (-)
  – One goal makes another (++)
    • Achievement of goal A guarantees achievement of goal B
  – One goal breaks another (--)
    • Achievement of goal A prevents achievement of goal B

• Goal Elaboration:
  – “Why” questions explore higher goals (context)
  – “How” questions explore lower goals (operations)
  – “How else” questions explore alternatives
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 **satisficing** the softgoals
  - E.g. for a train system:

  ![Diagram of softgoals]

  - serve more passengers
  - minimize costs
  - improve safety
  - add new tracks
  - increase train speed
  - more frequent trains
  - reduce staffing
  - maintain safe distance
  - clearer signalling

Softgoals as selection criteria

![Diagram of softgoals as selection criteria]
• **Strategic dependency model**
  – used to express the network of intentional, strategic relationships among actors

• **Strategic rationale model**
  – used to express the rationales behind dependencies
Strategic dependency model (1)

- **Actor**
  - carries out actions to achieve goals

- **Role**
  - characterization of the behavior of a social actor within some context
  - a set of roles typically played by one agent

- **Agent**
  - actor with concrete, physical manifestations, such as a human individual
  - an agent occupies a position

- **Position**
  - used between a role and an agent
  - a position is said to cover a role

Strategic dependency model (2)

- **Dependee**
  - Actor who is depended upon on a dependency relationship.

- **Depender**
  - The depending actor on a dependency relationship.

- **Dependum**
  - Element around which a dependency relationship centers.
Strategic dependency model (3)

- **Goal dependency**
  - the depender depends on the dependee to bring about a certain state of affairs in the world

- **Task dependency**
  - the depender depends on the dependee to carry out an activity

- **Resource dependency**
  - the depender depends on the dependee for the availability of an entity

- **Softgoal dependency**
  - a depender depends on the dependee to perform some task that meets a softgoal

Strategic dependency model (4)
Strategic rationale model (1)

- Actor boundaries
  - all of the elements within a boundary for an actor are explicitly desired by that actor
  - to achieve these elements, an actor must depend on the intentions of other actors
- Goal (hardgoal)
  - intentional desire of an actor
- Softgoal
  - criteria for the goal's satisfaction are not clear-cut
  - judged to be sufficiently satisfied from the point of view of the actor
- Task
  - actor wants to accomplish some specific task, performed in a particular way
- Resource
  - actor desires the provision of some entity, physical or informational

Strategic rationale model (2)

- Means-ends
  - a relationship between an end, and a means for attaining it
  - "means" is expressed in the form of a task
  - "end" is expressed as a goal
- Decomposition
  - task can be decomposed into four types of elements: a subgoal, a subtask, a resource, and/or a softgoal
Strategic rationale model (3)

• Contribution
  – Make: strong enough to satisfice a softgoal
  – Some+: positive with unknown strength
  – Help: not sufficient by itself to satisfice the softgoal
  – Unknown: polarity is unknown
  – Break: sufficient enough to deny a softgoal
  – Some-: negative with unknown strength
  – Hurt: not sufficient by itself to deny the softgoal
  – Or: satisfied if any of the offspring are satisfied
  – And: satisfied if all of the offspring are satisfied

Strategic rationale model (4)
Constructs of Goal and Agent models

- **Goal**
  - Prescriptive assertion that captures an objective which the system-to-be should meet
    - **Achieve/Cease goals**
      - Reach some desired state eventually
    - **Maintain/Avoid goals**
      - Keep some property invariant

- **Softgoals**
  - Cannot really be fully satisfied
    - Accuracy, Performance, Security

- **G-refinement**
  - Relates a set of subgoals whose conjunctions possibly together with *domain properties* contribute to the satisfaction of the goal

- **Domain property**
  - Descriptive assertion about object in the environment which holds independently of the system-to-be
Constructs of Goal and Agent models

- **Agent**
  - Active object which plays a specific role towards goal achievement by monitoring or controlling specific object behavior
- **Assignment**
  - A possible assignment of a goal to an agent
  - **Responsibility** – an actual assignment of a goal to an agent
- A goal effectively assigned to
  - A *software agent* is called **requirement**
  - An *environment agent* is called **expectation**
Explore Context

• “Why” questions explore higher goals
  – Rationale for the initial goals
  – Companion subgoals that were overlooked in the first place
Look for Alternatives

- “**How else**” questions explore alternatives
  - Better solutions to the higher level goals
  - Different design of the system-to-be

Elicit Operations

- “**How**” questions explore lower goals
  - Refine goals until reaching subgoals that can be assigned to individual agents
Elicit Operations

When the refinement should stop?

- Decision be made by email discussion
- Decision be made face-to-face
- Minutes be circulated
- Agenda be defined
- Meeting be scheduled
- Meeting be held
- Attendees know details
- Changes be handled
- Attendees list obtained
- AV & other needs defined
- Room availability determined
- Facilities booked
- Change requests accepted
- Participants notified
- Changes are handled
Responsibility assignment

- **Refine goals into subgoals**
  - Latter require the cooperation of fewer agents

- **Stop refining a goal**
  - Goal is assigned as the responsibility of a single agent

- **Alternative goal responsibility assignments**
  - Different design of system-to-be

KAOS Constructs of Operation model

- **Operation**
  - An input/output relation over objects
  - Define state transition

- **Operationalisation**
  - Relationship between goal and operation

- **Performs**
  - Agent performs operations
KAOS
Operation model

Take Home!

• Stakeholders
  – Identifying the problem owners

• Goals
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• Social Modelling
  – Early requirements
  – Late requirements
  – Architecture design
  – Detailed design
Example Goal Elaboration

Crucial planning decision be made

- Decision be made by email discussion
- Decision be made face-to-face

- Agenda be defined
- Meeting be scheduled
- Meeting be held
- Minutes be circulated

- Date and location set
- Attendees know details
- Facilities booked
- Attendance confirmed
- Changes be handled

- Meeting be requested
- Attendee list obtained
- AV & other needs defined
- Attendees' preferences known
- Room availability determined

- Meeting announced
- Attendee list obtained
- AV & other needs defined
- Attendees' preferences known
- Room availability determined

- Participants notified
- Change requests accepted