Lecture 12: Modeling Enterprises

Modeling business processes
- Why business processes?
- Modelling concurrency and synchronization in business activities
- UML Activity Diagrams

Modelling organisational intent
- * modelling language
- Modelling agents and the strategic dependencies between them
- Explaining these dependencies in terms of agents' goals

Business Processes

Business Process Automation
- Leave existing business processes as they are
- Can make an organisation more efficient; has least impact on the business

Business Process Improvement
- Make moderate changes to the way the organisation operates
- E.g. improve efficiency and/or effectiveness of existing process
- Techniques: Duration analysis; activity-based costing; benchmarking

Business Process Reengineering
- Fundamental change to the way the organisation operates
- Techniques:
  - Outcome analysis - focus on the real outcome from the customer's perspective
  - Technology analysis - look for opportunities to exploit new technology
  - Activity elimination - consider each activity in turn as a candidate for elimination

Modelling Business Processes

Business processes involve:
- Multiple actors (people, business units, ...)
- Concurrent activities
- Explicit synchronization points
  - E.g. some task cannot start until several other concurrent tasks are complete
- End-to-end flow of activities

Choice of modelling language:
- UML Activity diagrams
  - Based on flowcharts and petri nets
  - Not really object oriented (poor fit with the rest of UML)
- Business Process Modelling Notation (BPMN)
  - New (emerging) standard, loosely based on pi calculus

Refresher: Petri Nets

Petri net syntax:
- Places and transitions
- Tokens (possibly coloured)

Before:

After:
### Example Activity Diagram

**Receive Order**
- [for each line item on order]

**Authorize Payment**
- [for each line item on order]

**Check Line Item**
- [in stock]

**Cancel Order**
- [succeeded]

**Assign to Order**
- [need to reorder]

**Dispatch Order**
- [in stock]

**Reorder Item**
- [need to reorder]

### Activity Diagram with Swimlanes

- **Finance**
  - Receive Order
  - Authorize Payment
  - Cancel Order
  - Dispatch Order
  - Add Remainder to Stock

- **Order Processing**
  - Receive Supply
  - Check Line Item
  - Choose Outstanding Order Items
  - Assign Goods to Order
  - Assign to Order
  - [for each chosen order item]

- **Stock Manager**
  - Receive Order
  - [for each line item on order]

### i*

- **Background**
  - Developed in the early 90's
  - Provides a structure for asking 'why' questions in RE
  - Models the organisational context for information systems
  - Based on the notion of an "intentional actor"

- **Two parts to the model**
  - Strategic dependency model - models relationships between the actors
  - Strategic rationale model - models concerns and interests of the actors

- **Approach**
  - SD model shows dependencies between actors:
    - Goal/softgoal dependency - an actor depends on another actor to attain a goal
    - Resource dependency - an actor needs a resource from another actor
    - Task dependency - an actor needs another actor to carry out a task
  - SR model shows interactions between goals within each actor
    - Shows task decompositions
    - Shows means-ends links between tasks and goals
Summary

- Need to understand business processes
  - Existing business process
    - to understand the problem
  - Potential changes to the business process
    - To investigate alternative solutions

- Need to understand organisational interdependencies
  - How people depend on one another to achieve their goals
  - How goals relate to tasks