Lecture 12: Modelling Enterprises

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

- **Modelling organisational intent**
  - i* 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
  - Look for opportunities to automate parts of the process
  - 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]

[failed] Authorize Payment

Cancel Order

[failed] Check Line Item

[succeeded] in stock

Assign to Order

[need to reorder]

Dispatch Order

Reorder Item
**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
E.g. Strategic Dependency Model

LEGEND
- D: Dependable
- o: Dependent
- : Resource Dependency
- : Task Dependency
- : Goal Dependency
- : Softgoal Dependency
- : Open (experimenter) X Critical

This diagram ©2001, Eric Yu

E.g. Strategic Rationale Model

"Functional" Alternatives

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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