Lecture 12: Modelling 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

Refresher: Petri Nets

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

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 calculas
Activity Diagram with Swimlanes

**Finance**
- Receive Order
  - (for each line item on order)
- Authorize Payment
  - Failed
  - Succeeded
  - (in stock)
- Cancel Order
  - (need to reorder)
- Reorder Item
- Add Remainder to Stock

**Order Processing**
- Choose Outstanding Order Items
  - (for each chosen order item)
- Assign Goods to Order
- Dispatch Order
- [stock assigned to all line items and payment authorized]

**Stock Manager**
- Receive Supply
- Assign to Order
- [all outstanding order items filled]

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Example Activity Diagram

- Receive Order
  - [for each line item on order]
- Authorize Payment
  - Failed
  - Succeeded
- Check Line Item
  - (in stock)
- Assign to Order
  - [need to reorder]
- Dispatch Order
- Reorder Item

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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