



Lecture 12: Modelling Enterprises

→ Modeling 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

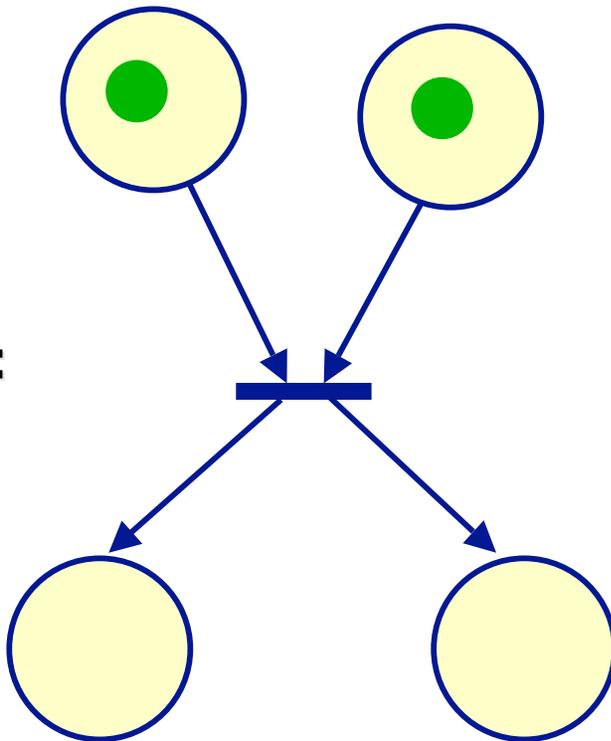


Refresher: Petri Nets

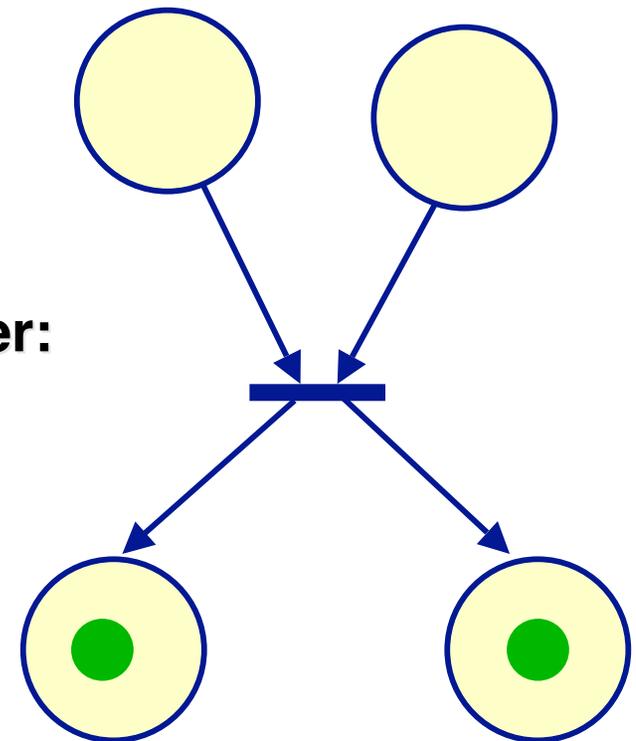
→ Petri net syntax:

- ↪ Places and transitions
- ↪ Tokens (possibly coloured)

Before:

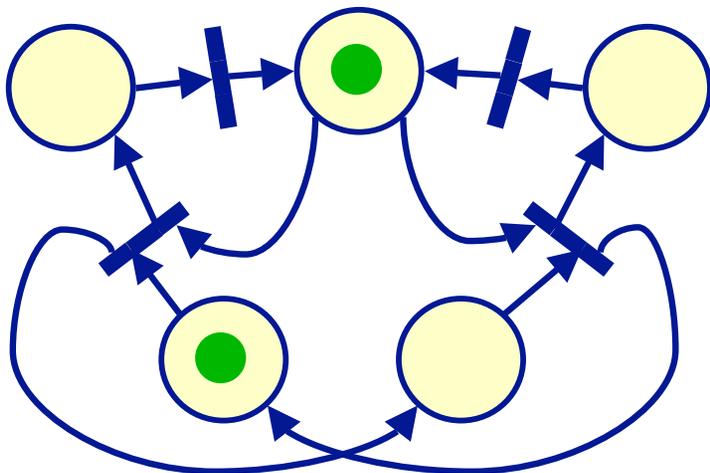
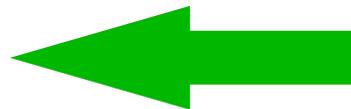
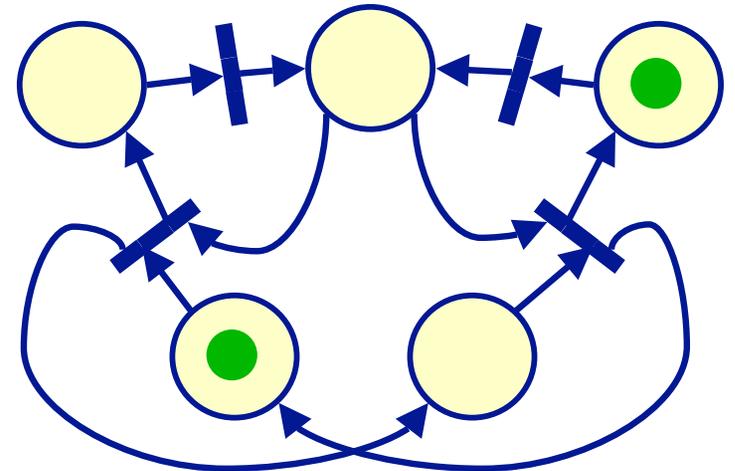
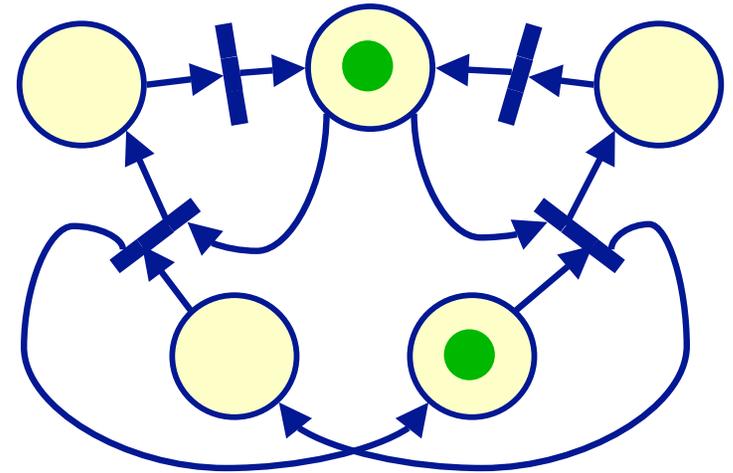
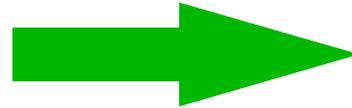
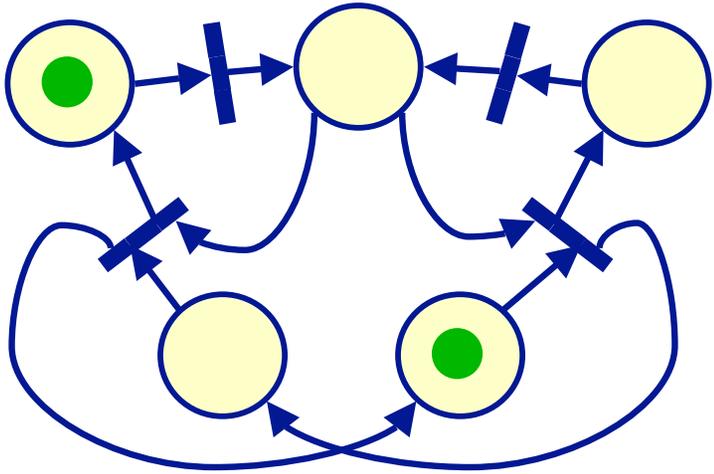


After:



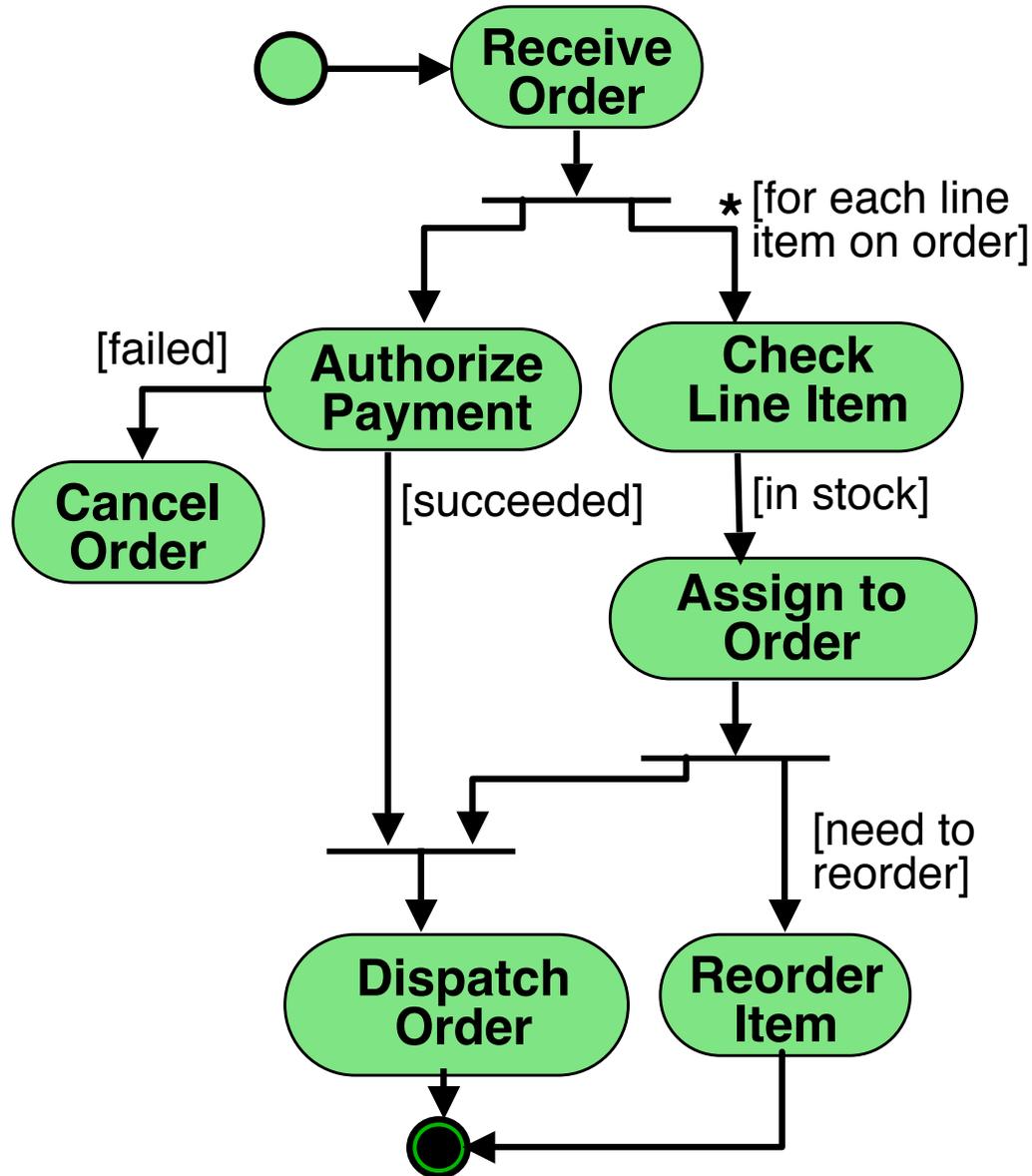


Example



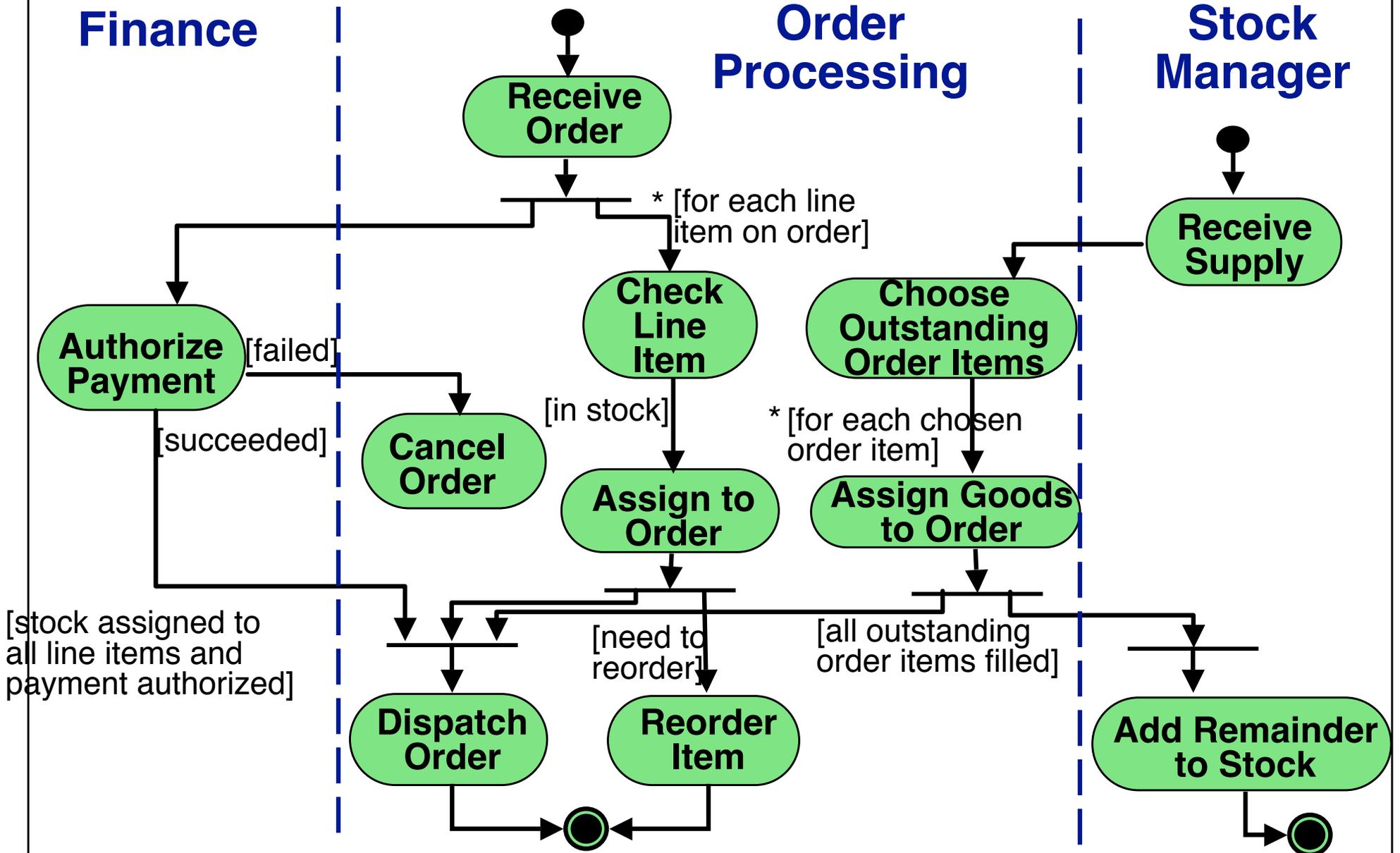


Example Activity Diagram





Activity Diagram with Swimlanes



[stock assigned to all line items and payment authorized]



Business process modeling - BPMN

Source: adapted from White, 2005

- New standard released in 2004
- Adds many detailed modeling elements to basic activity diagrams

Flow Objects

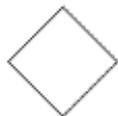
Events



Activities



Gateways



Connecting Object

Sequence Flow



Message Flow



Association

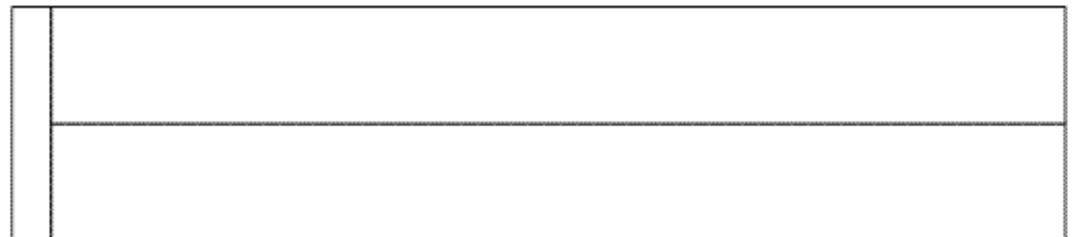


Swimlanes

Pool



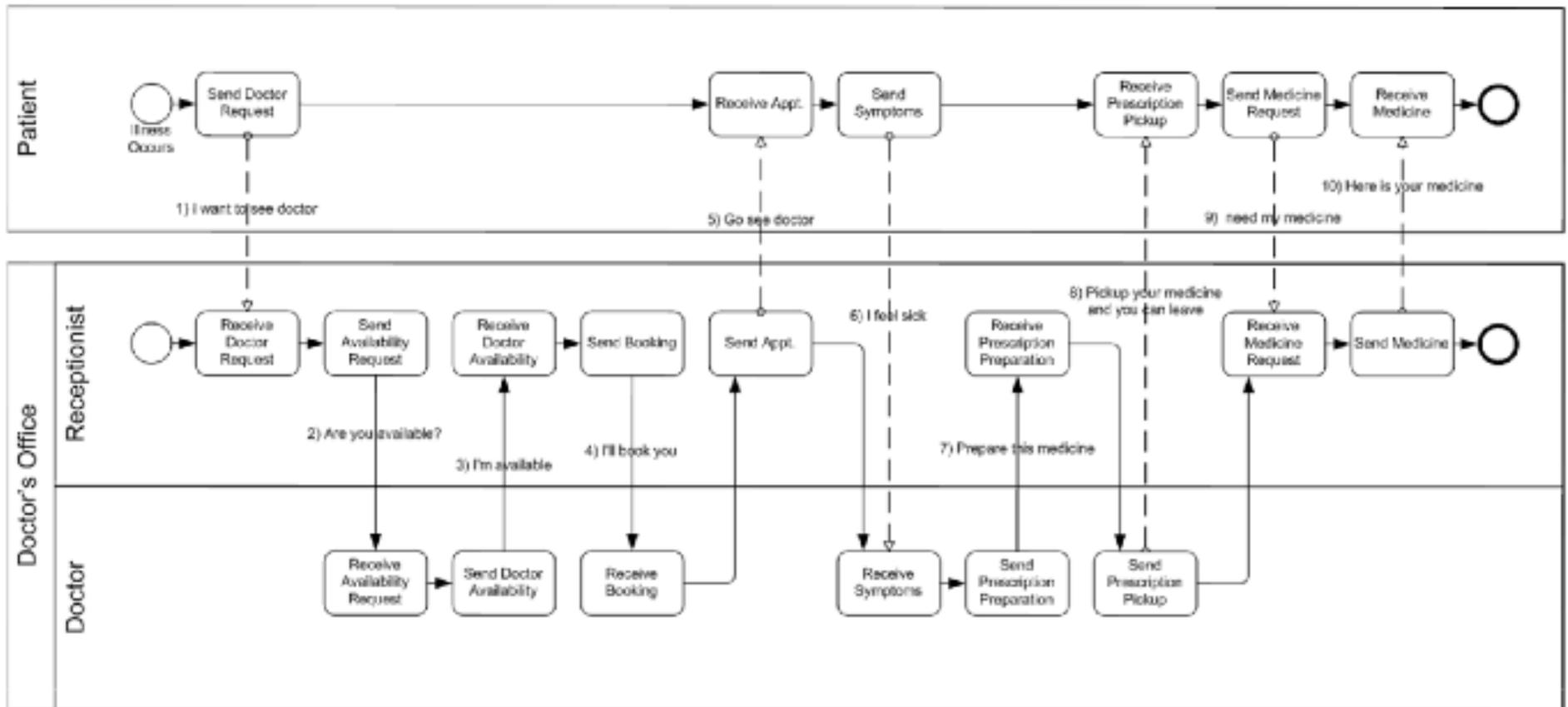
Lanes (within a Pool)





Simple Example

Source: adapted from White, 2005

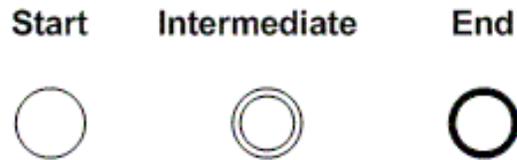




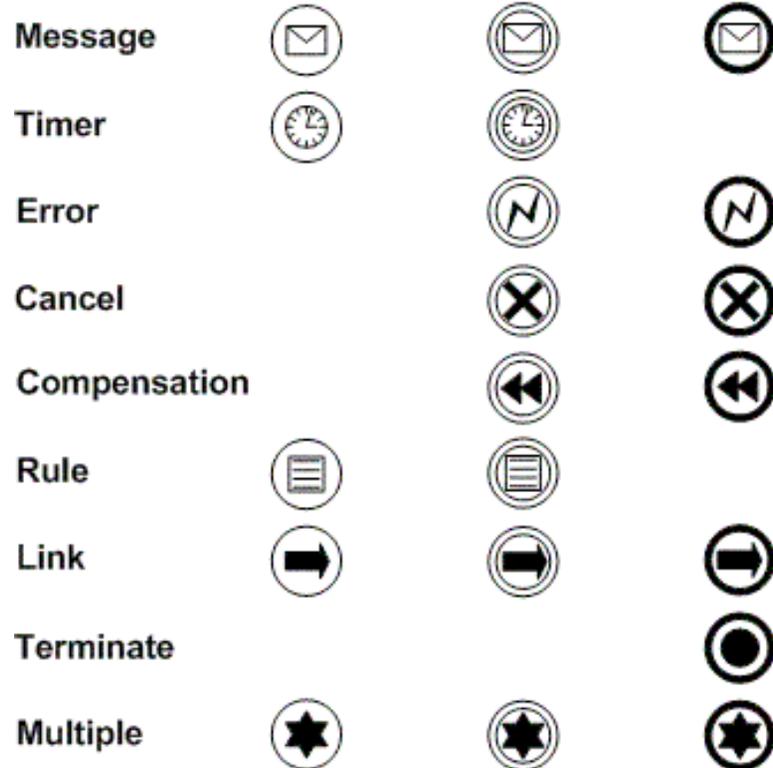
Elaborating BPMN models...

Source: adapted from White, 2005

Events

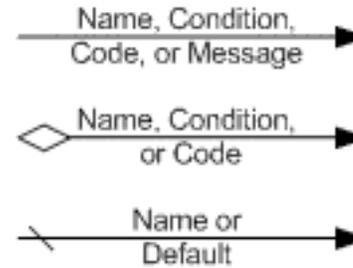


Event Types



Connections

Sequence Flow



Association



Message Flow





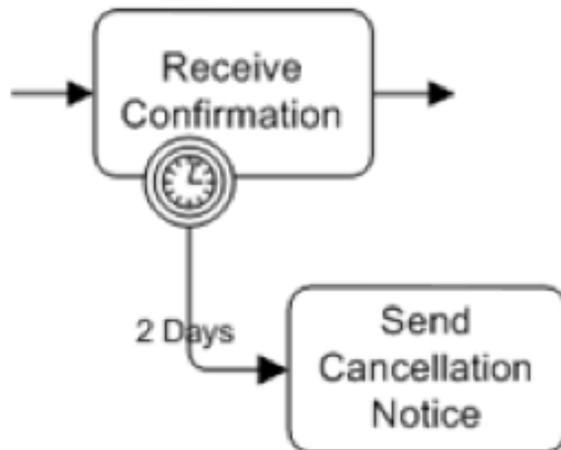
Events may change the flow

Source: adapted from White, 2005

→ Events can interrupt activities

- ↪ Activity stops
- ↪ Flow proceeds from the event

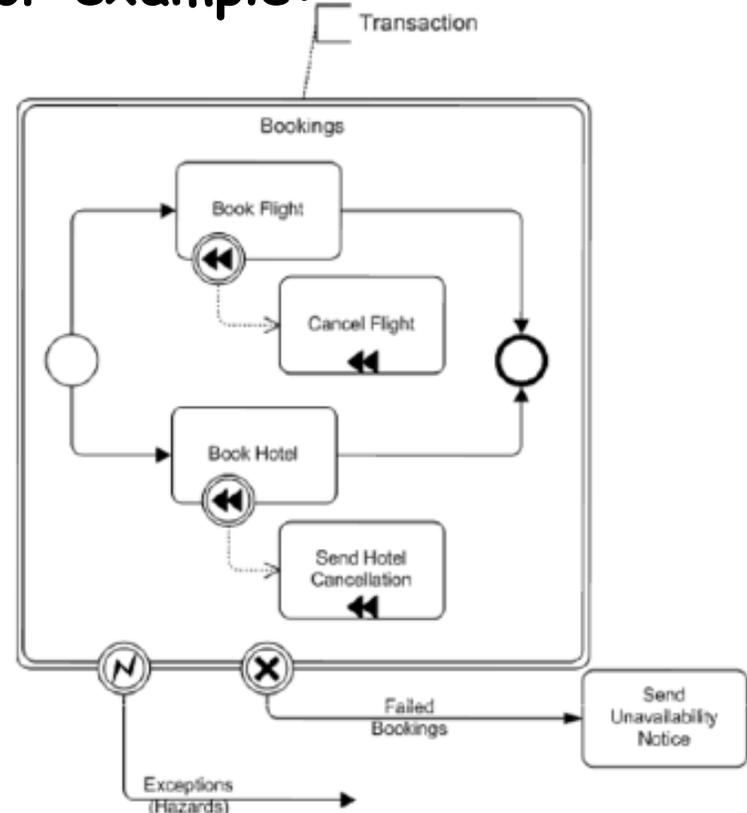
→ For example:



→ Activities can be transactions

- ↪ Transactions have double borders
- ↪ Compensation events occur when the transaction doesn't complete

→ For example:





*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:

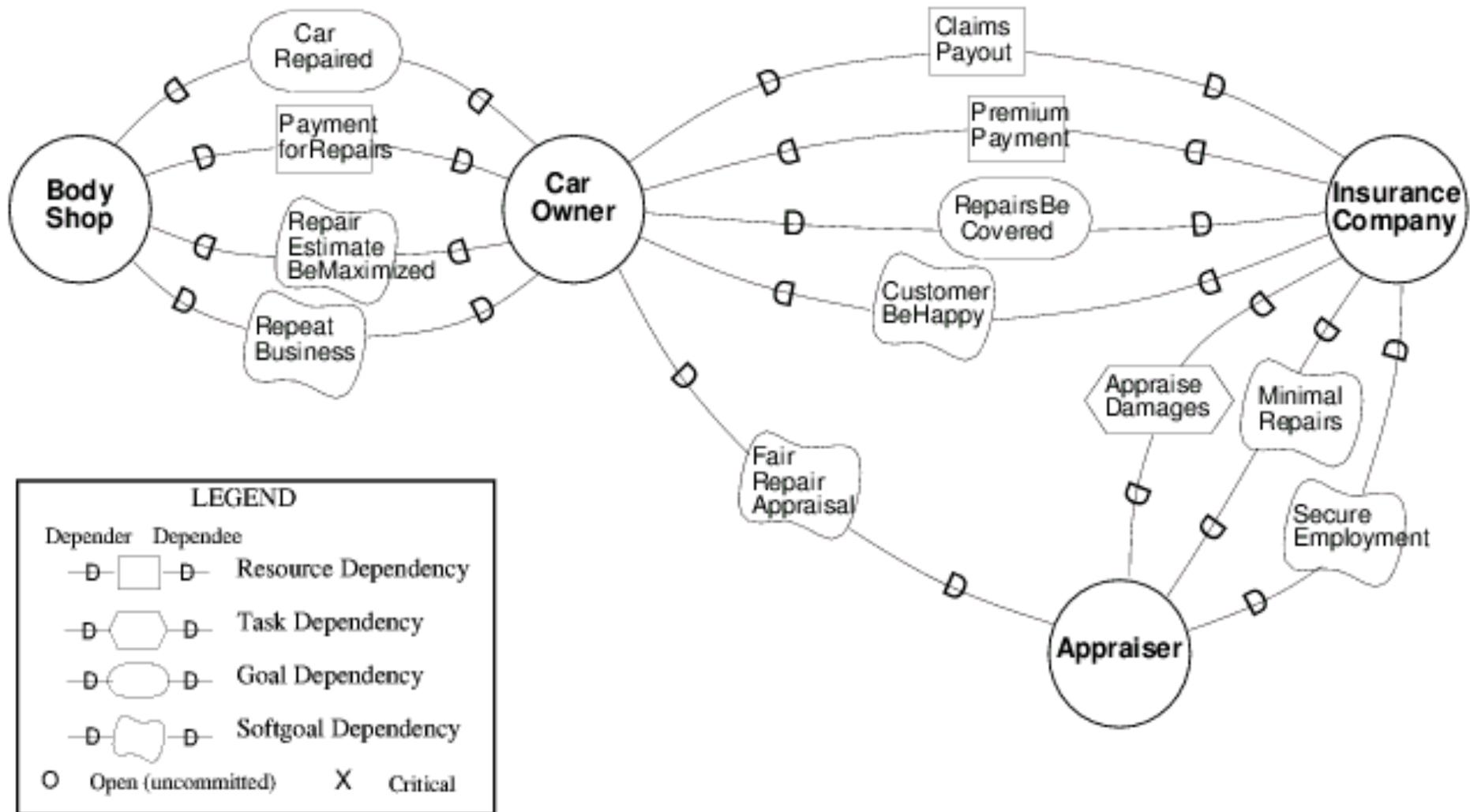
- goal/softgoal dependency - an actor depends on another actor to attain a goal
- resource dependency - an actor needs a resource from another actor
- task dependency - an actor needs another actor to carry out a task

↳ SR model shows interactions between goals within each actor

- Shows task decompositions
- Shows means-ends links between tasks and goals



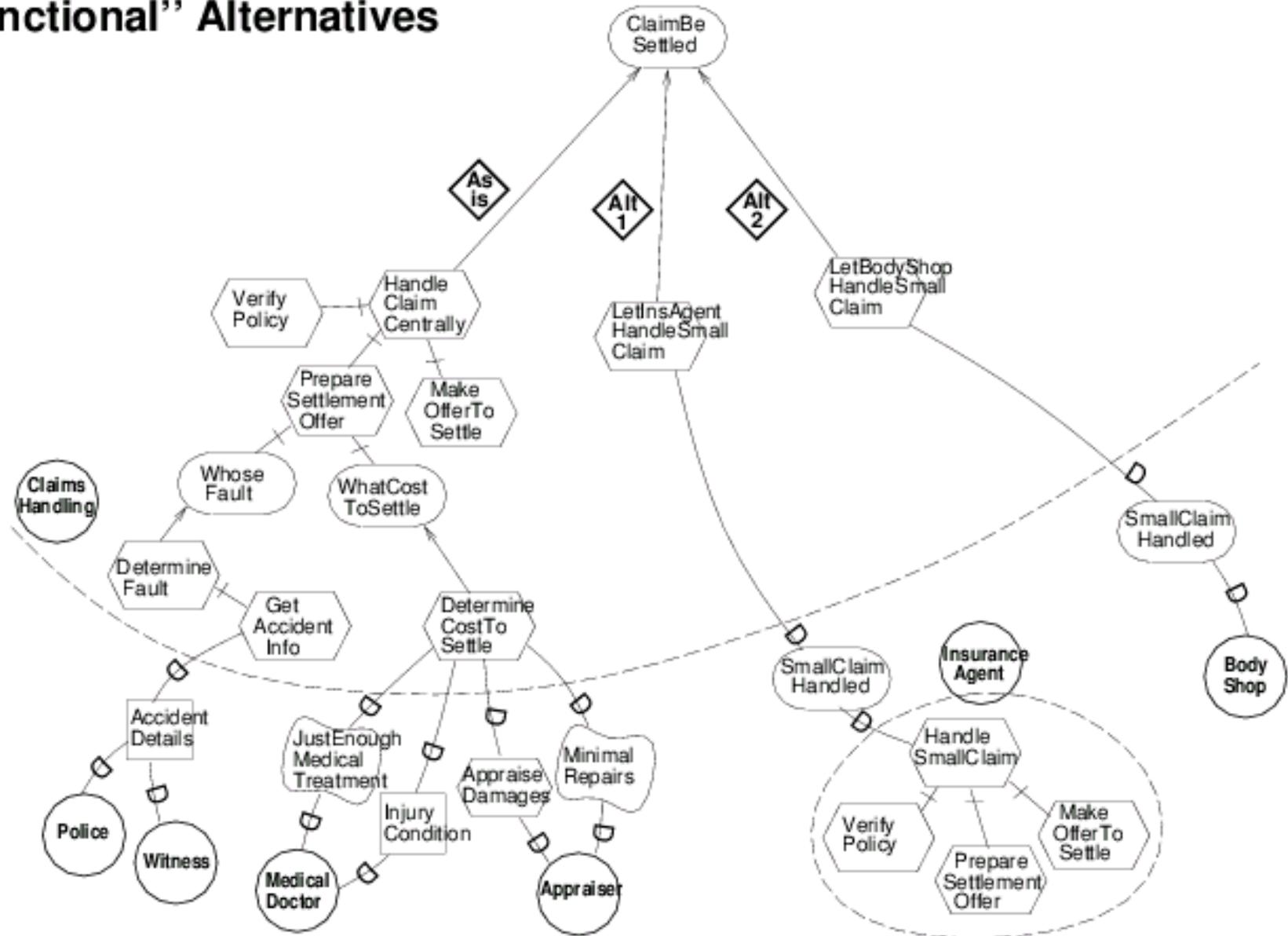
E.g. Strategic Dependency Model





E.g. Strategic Rationale Model

“Functional” Alternatives





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