CMT308:
Business Continuity & Transformation

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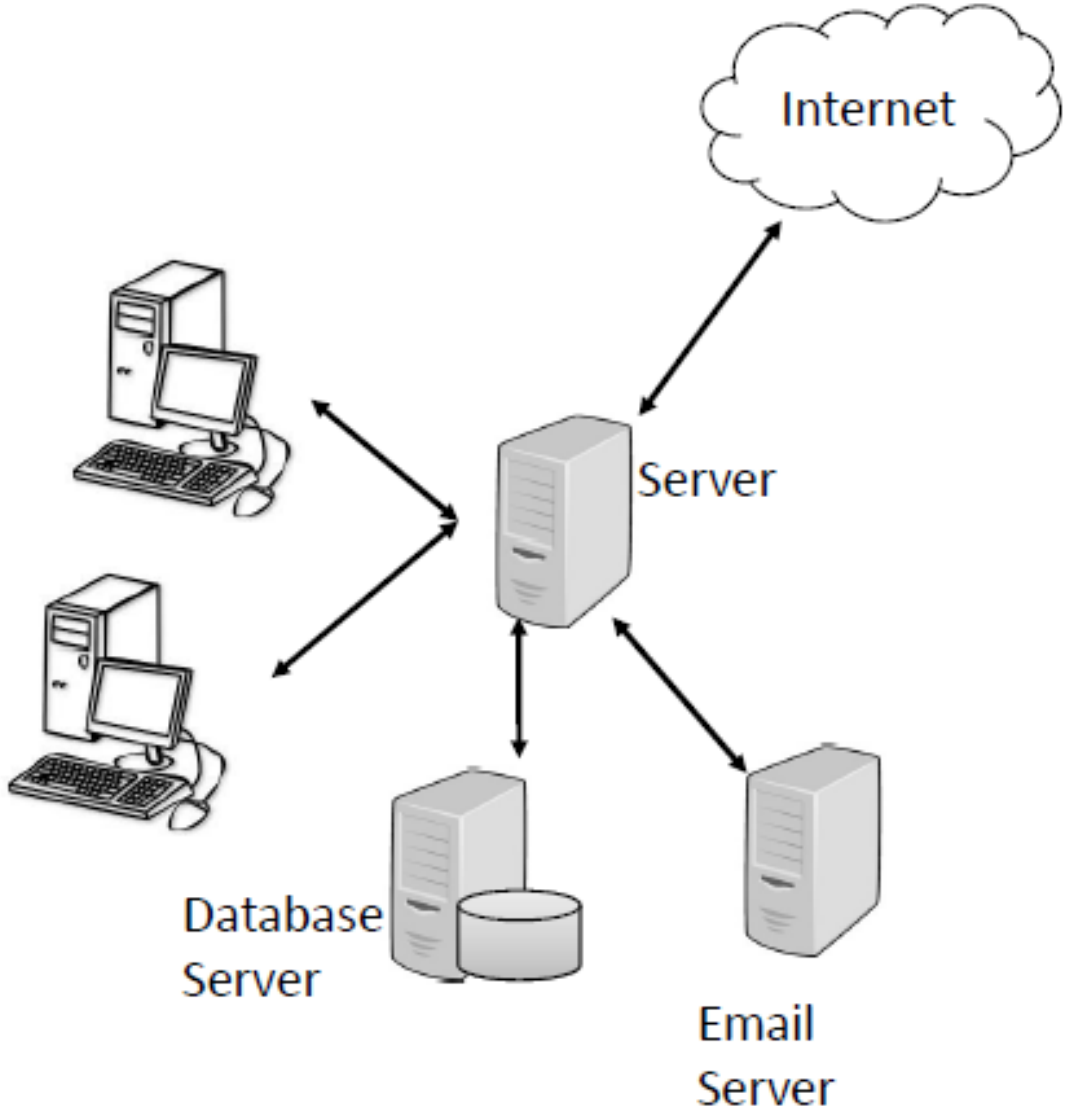
Threats (from Amir Javed: CMT116)



- Employee are more like to be hit by Email Threat
  - Phishing (1 in 3,207)
  - Spamming (55% of email analysed by Symantec in 2018 as spam)
  - Email – can be of two type, as attachment or as link. Microsoft Office users are the most at risk of falling victim to email-based malware, with Office files accounting for 48 percent of malicious email attachments.
- Malware Threat
  - Self propagating financial trojans (Emotet and Qakbot)
  - Execution of Powershell Script such as VBS.Downloader and JS.Downloader
- Cryptojacking – Ransomware.

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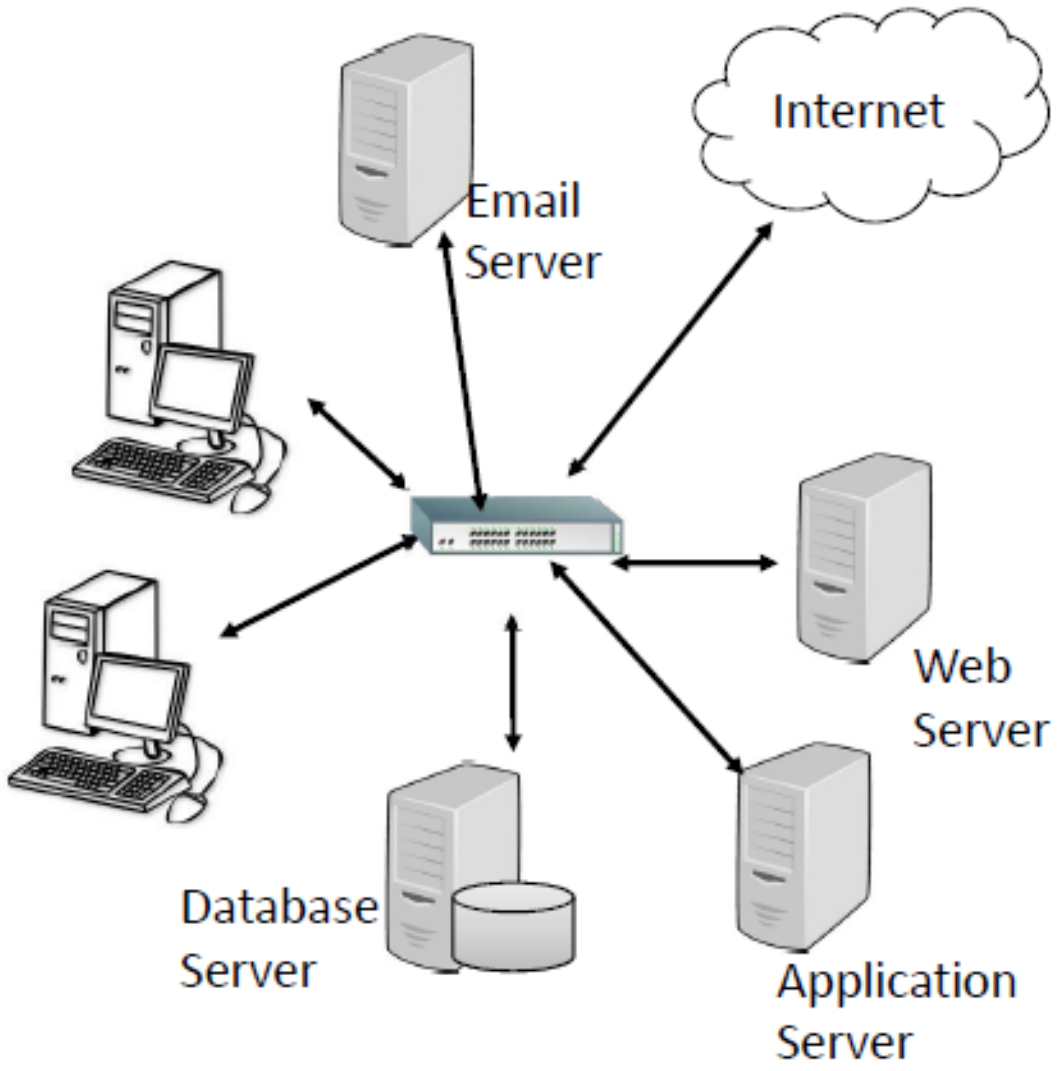

- **Web attacks**
  - 1 in 10 URL pointing to malicious web server
  - 1.3 million unique web attacks reported by Symantec in 2018
  - Exploit Kits to carry out web attacks
  - On average 4,800 website compromised by Formjacking.

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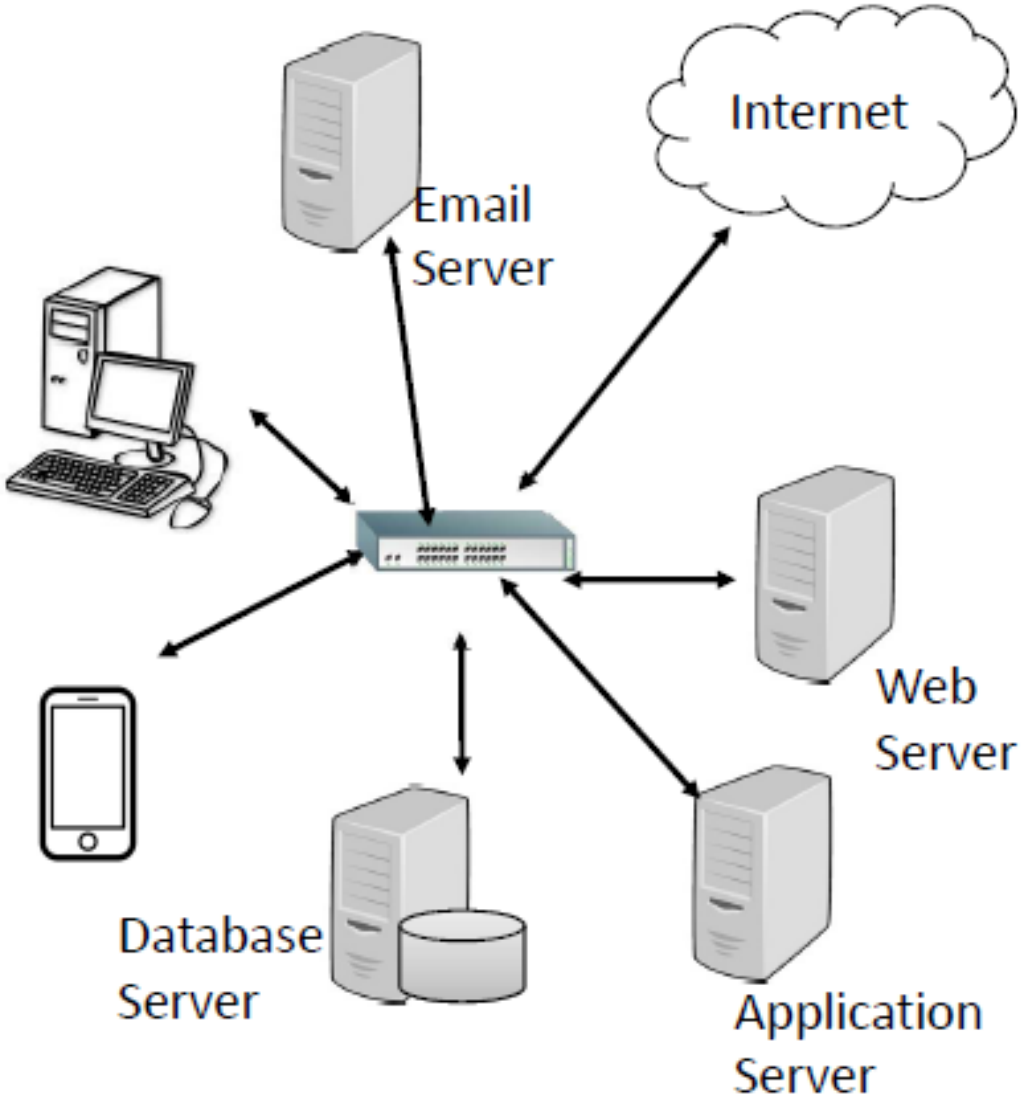

- Mobile malware
  - Ransomware for mobile. (63% of companies in US got affected by ransomware malware)
  - 1 in 36 devices in organisation were considered as high risk. Why ?
  - Devices that were rooted or jailbroken, along with devices that had a high degree of certainty that malware had been installed.

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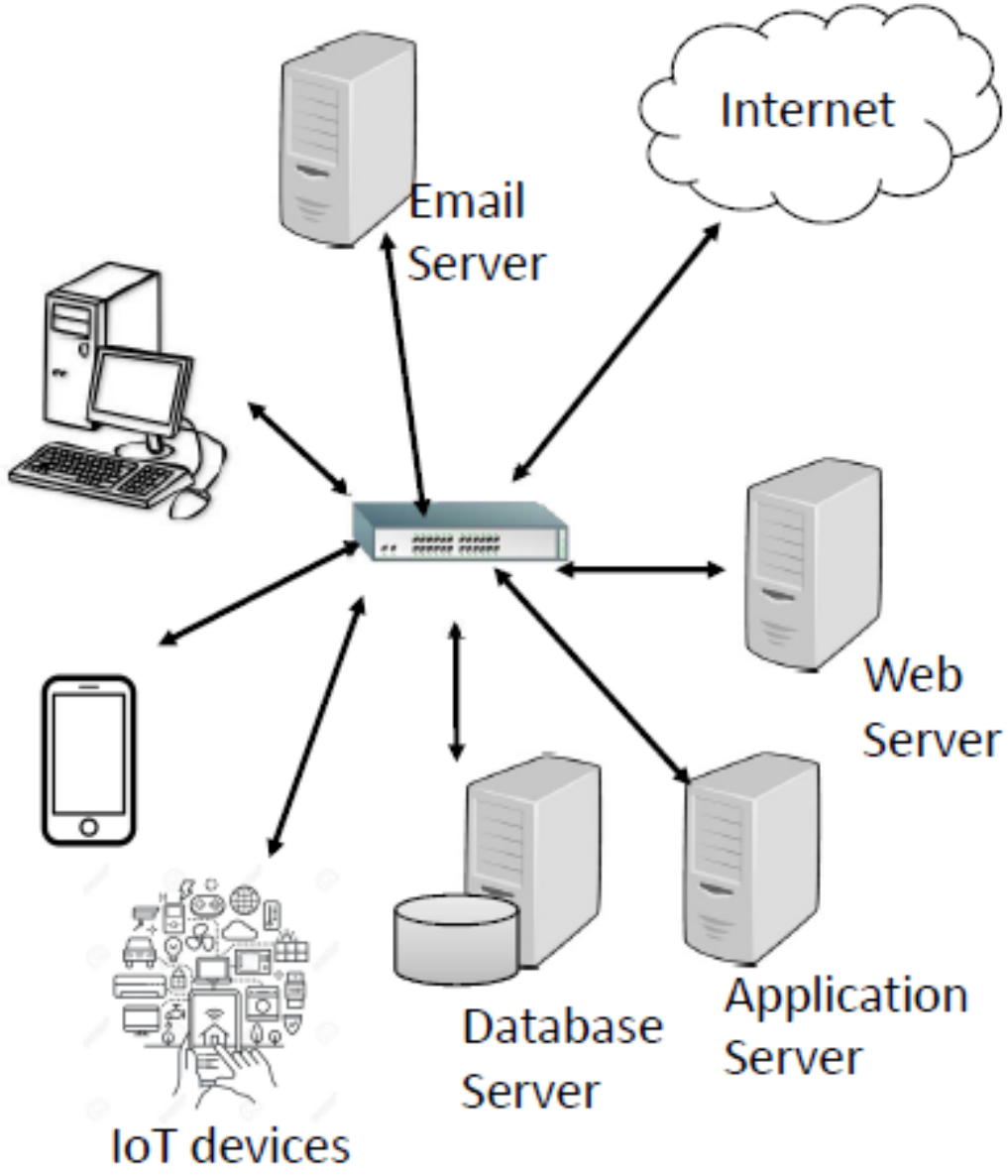


- IoT
  - On average 5,200 IoT based attacked reported by Symantec in 2018.
  - Routers and connected cameras were by far the main source of IoT attacks.
  - Attackers were also increasingly focused on Telnet as an avenue for attack and accounted for over 90 percent of attempted attacks.

Business Processes

- Process Documentation
  - Understanding and formalizing the process
- Process Design and Analysis
  - Analysis of process properties (i.e. time taken to complete the process)
  - This step is useful when understand the critical path
  - Understand impact on Business Continuity
- Process Automation / Workflow
  - Enacting/executing the process in an automated manner
- Process Re-engineering / Optimisation
  - Re-engineering using new services (e.g. use of Service Oriented Architectures, Cloud Computing)

What is a Business Process?

- Generally no agreement on what constitutes a Business Process – but a lot of common themes around definitions and tools

A sequence of activities performed by one or more participants in order to deliver value to the business

A process: consists of a sequence of simpler activities

Activities performed by a human participant or an automated system

Activities are coordinated through intermediate validation gateways or events

Examples:

Ordering a pizza

Approval of a finance form

Checking patient consent

Processes can be:

- Management Process
  - General management of a business or organization
  - May have a strategic focus
- Operational Process
  - Set of activities that create the “primary value stream”
- Supporting Process
  - Supports the core operation processes

Understand (measure, cost)

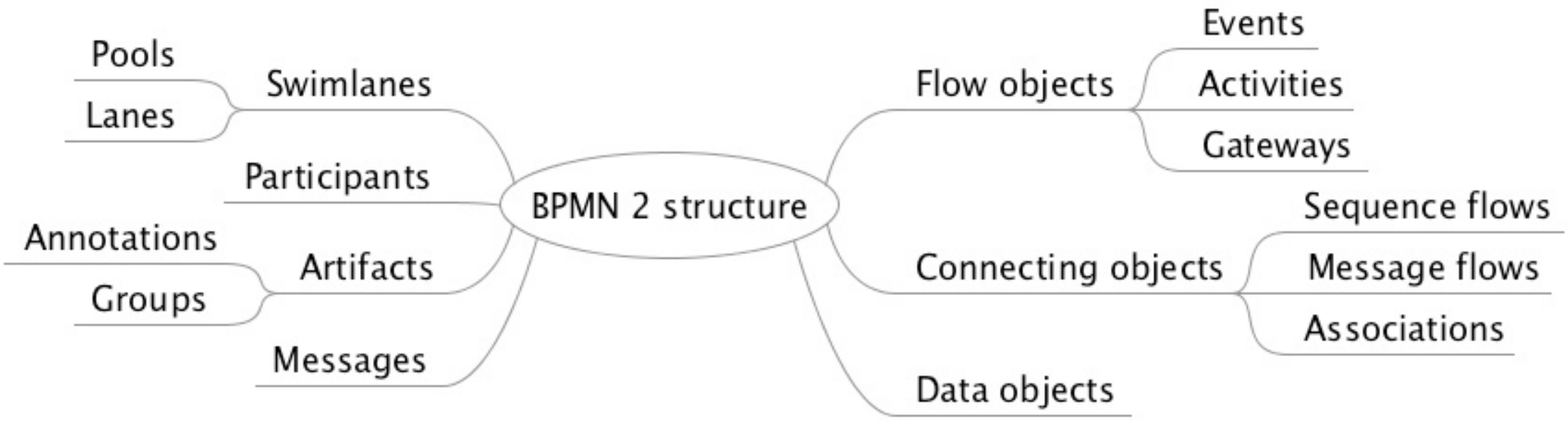
Improve (Streamline, rationalize)

Design new (Additional capability)

Automate

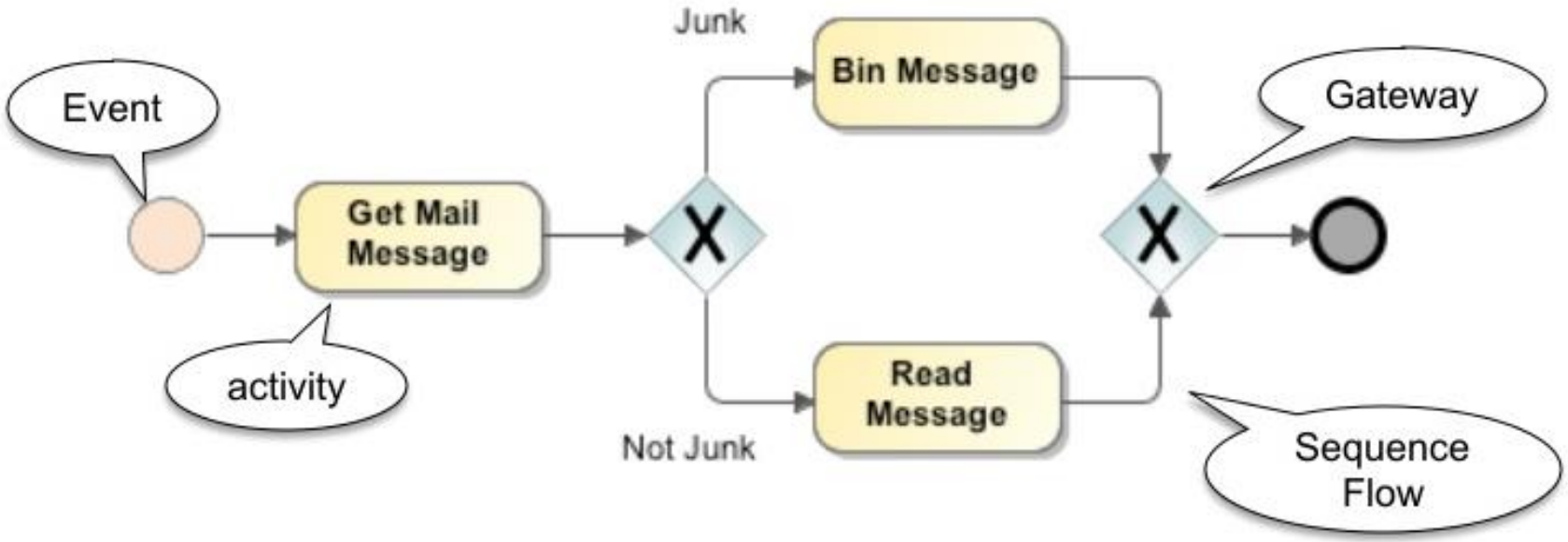
BPMN notation … summary (Dr Jim Arlow)

BPMN ISO Standard –
ISO 19510:2013



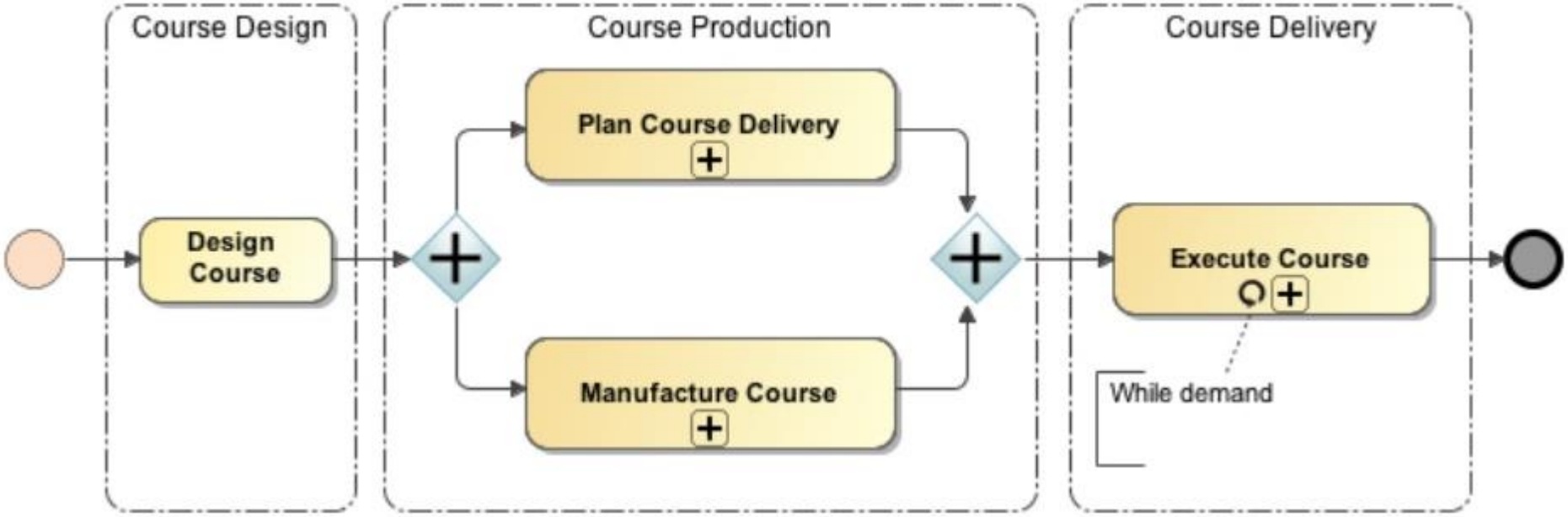
BPMN: Process diagram

- BPMN – defines a process as a set of flow elements the compise different types of flow nodes – connected into a seqence
- Flow nodes:
  - Events: something that happened during the process
  - Activities: work performed in the process
  - Gateways: control flow through the process



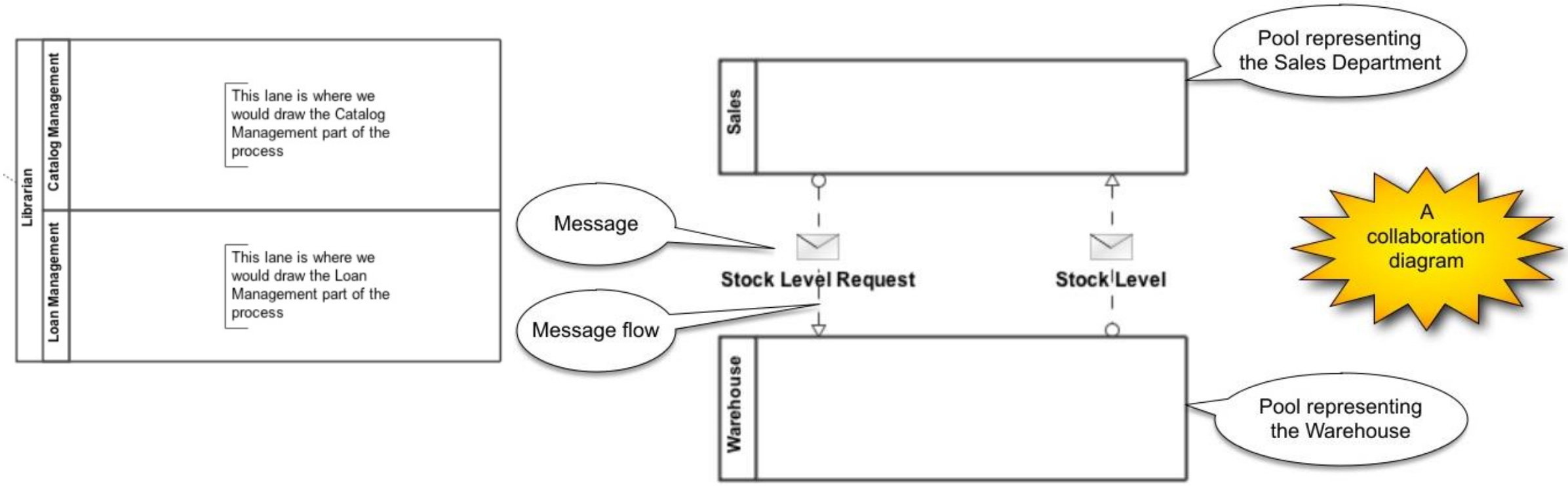
Groups

- Use of groups to organize and highlight parts of the model in order to improve comprehensibility + also manage hierarchy
- Groups can contain a collection of processes



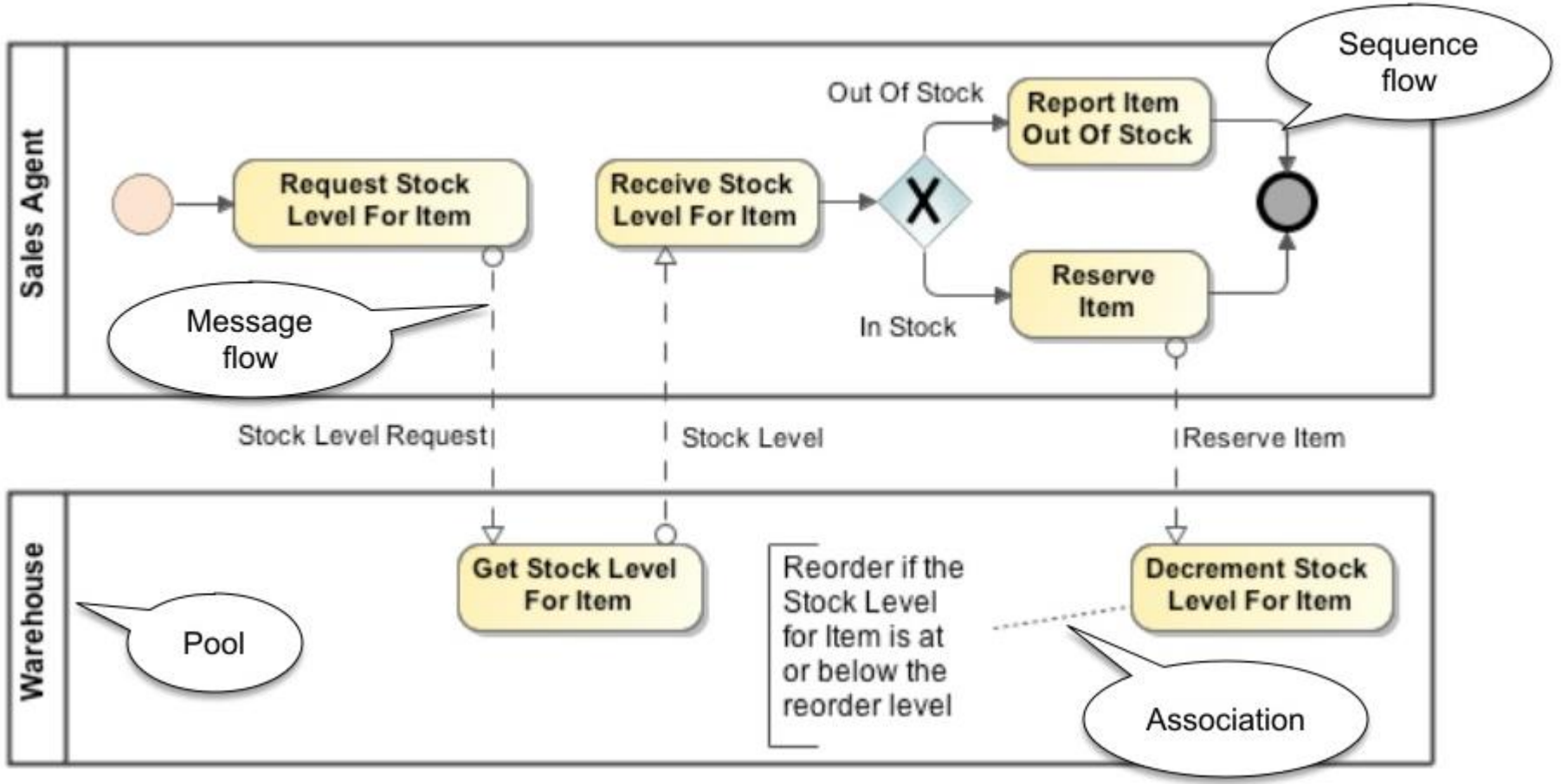
Collaboration Diagram: Polls, message flows & messages

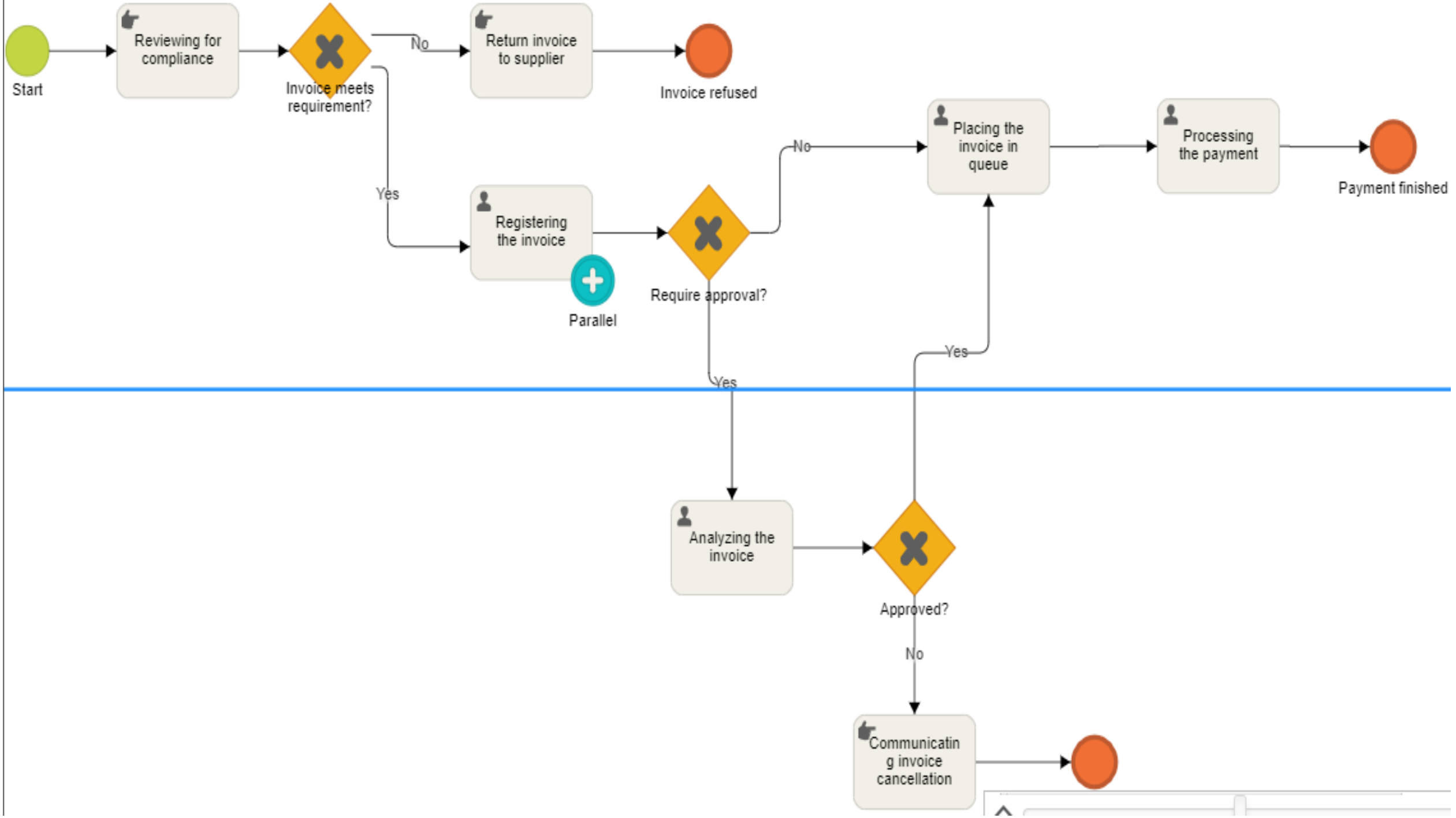
- Interaction between multiple participants
- Pools: participant in a process; Lanes: grouping related activities
- Explicit messages – showing communication between participants

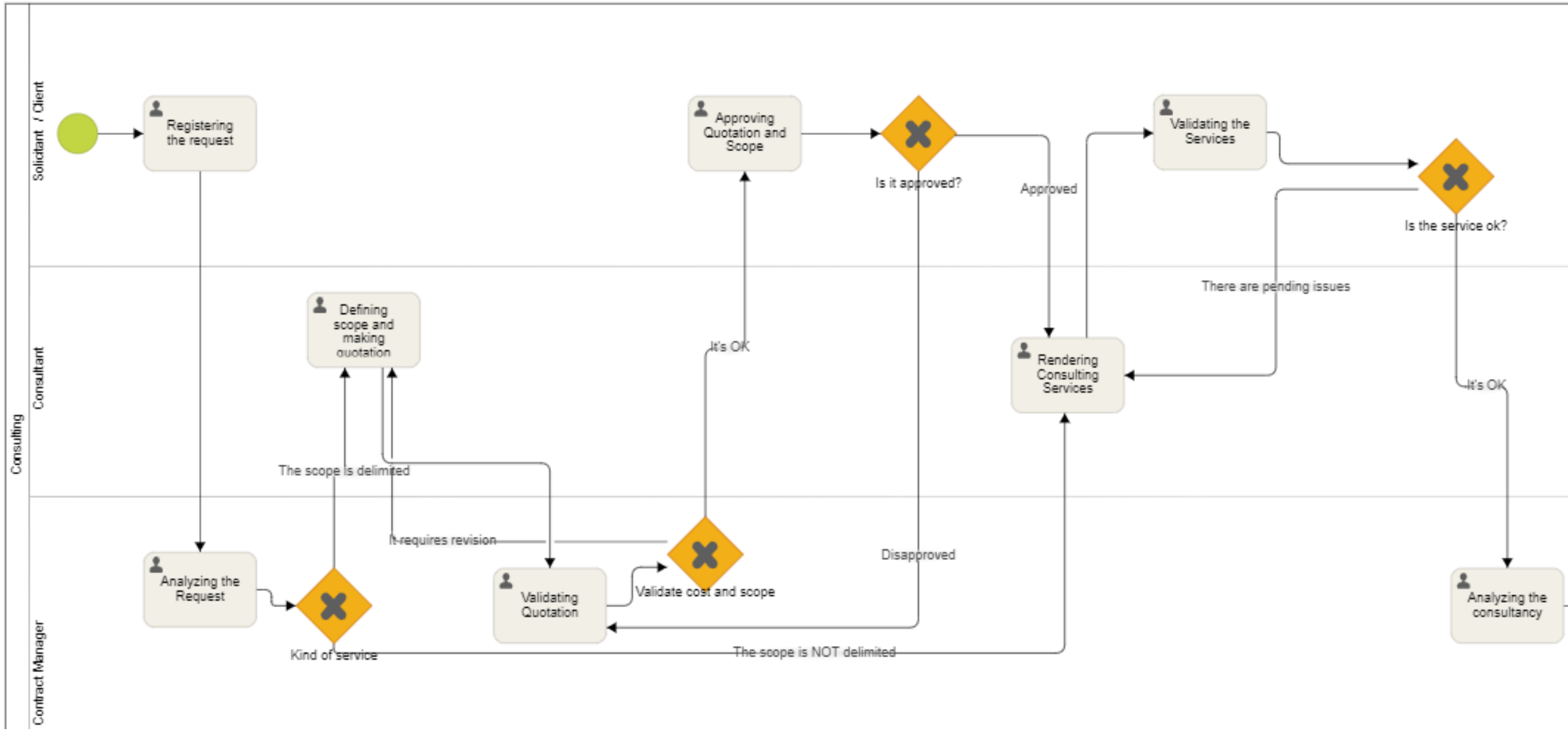


Interactions/Connections

- Sequence flows – determines the sequence of activities
- Message flows – messages between process participants
- Associations – associate text or data with modelling elements




Start
Reviewing for compliance
Invoice meets requirement?
No
Return invoice to supplier
Invoice refused
Yes
Registering the invoice
Parallel
Require approval?
No
Placing the invoice in queue
Processing the payment
Payment finished
Yes
Yes
Analyzing the invoice
Approved?
Yes
No
Communicating invoice cancellation



Consulting Request Validation

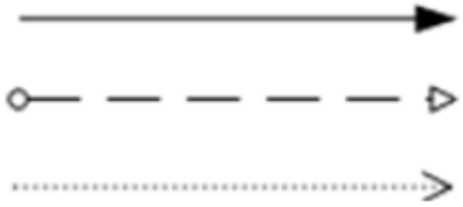
Summary of Notations (so far)

3 kinds of flow objects

- Activity
- Gateway
- Event

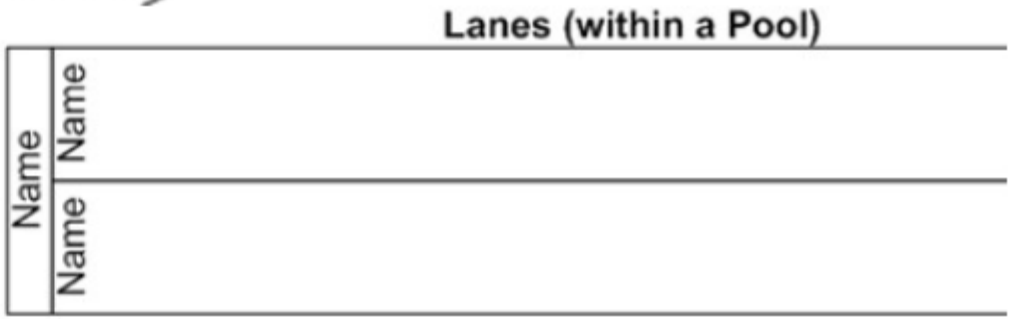
3 ways of connecting

- Sequence flow
- Message flow
- Association



Two types of container

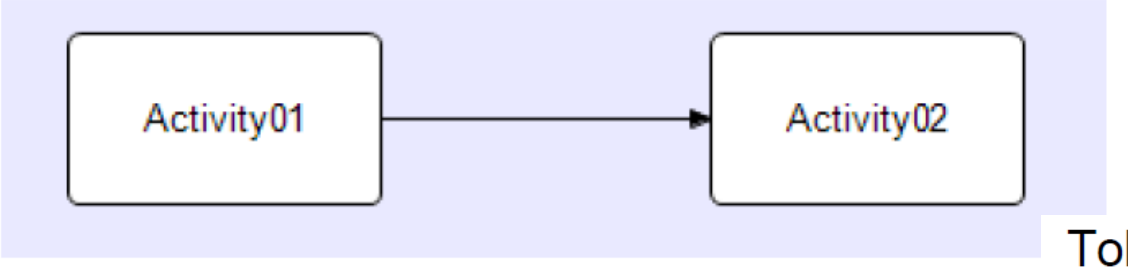
- Pools
- Lanes (swimlanes)



Coordination Logic

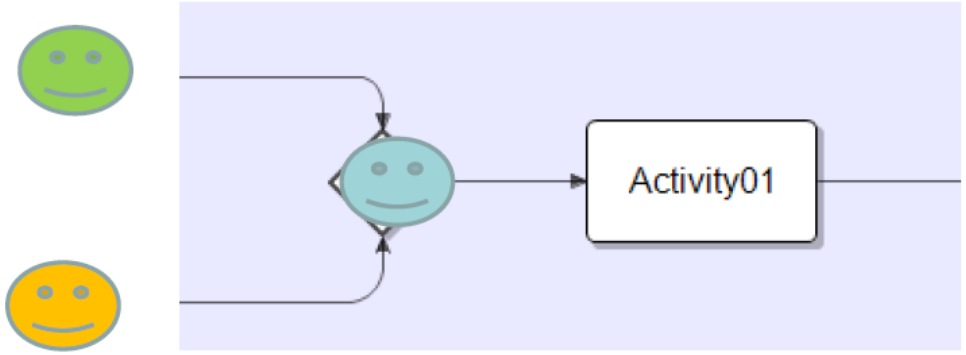
Template-based

- static connection of “flow objects” or sequence relationship (predecessor and successor)
- similar to a river (upstream and downstream)
- process template is an abstract description of a process



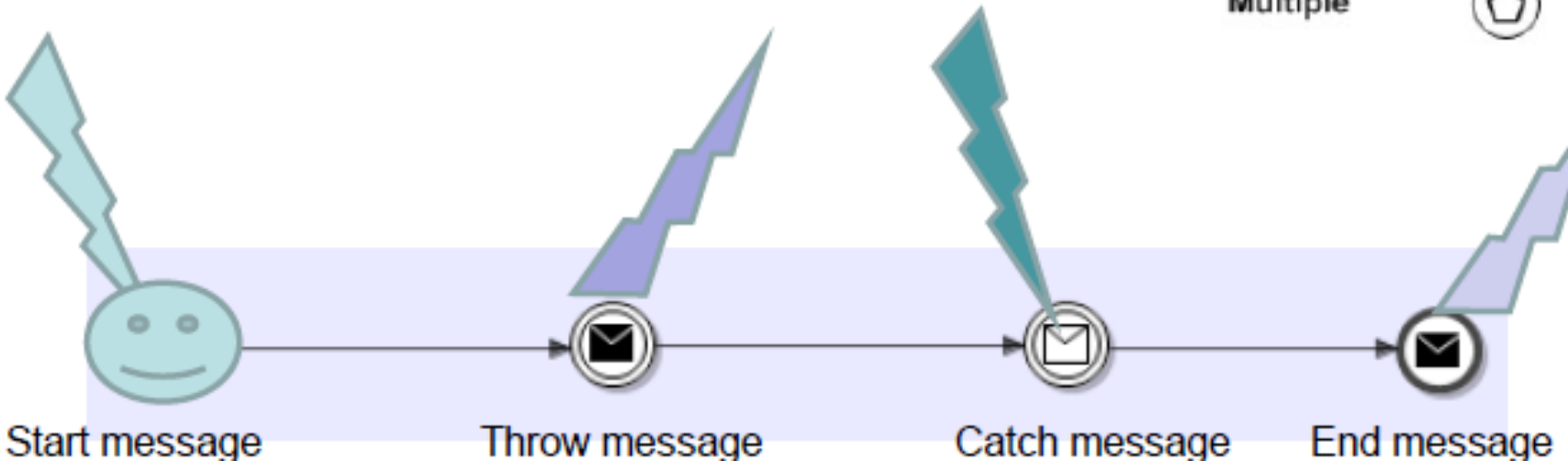
Token-based

- token marks elements which active at a particular time
- dynamic connection of “flow objects” or synchronisation (wait for) / chronologic relationship
- similar to a “flock” of ducks (split and join)
- several tokens may co-exist



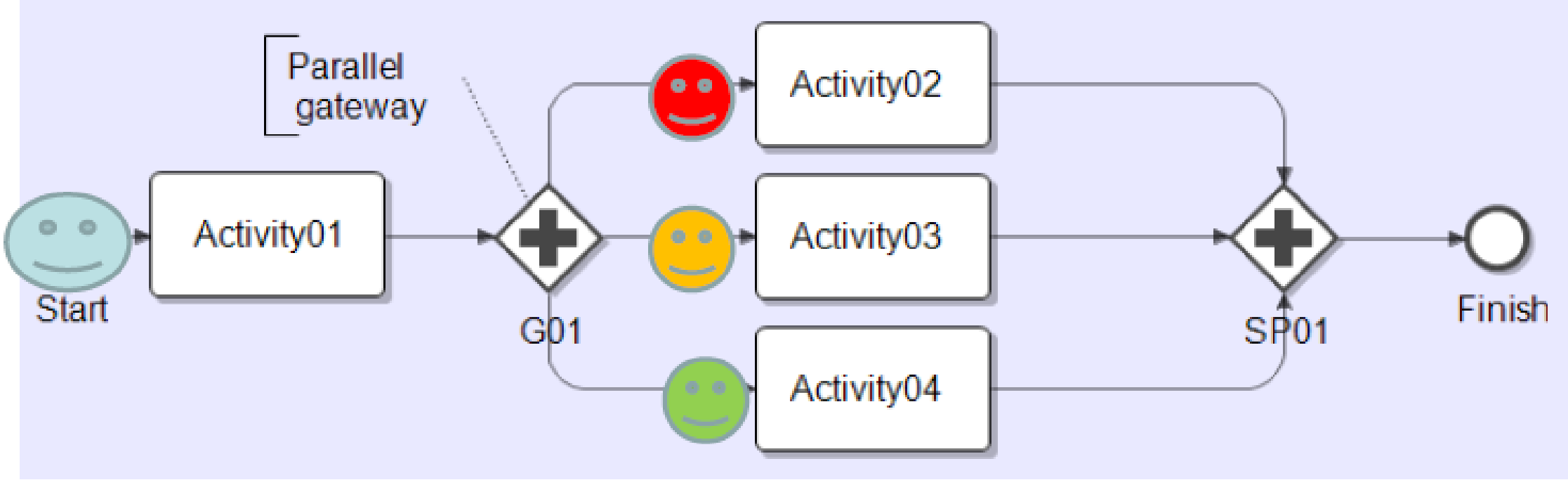
Event details

- Too many events details
- Recommendations to use:
  - Mainly “message”
  - Sometimes “empty”, “error” and “timer”



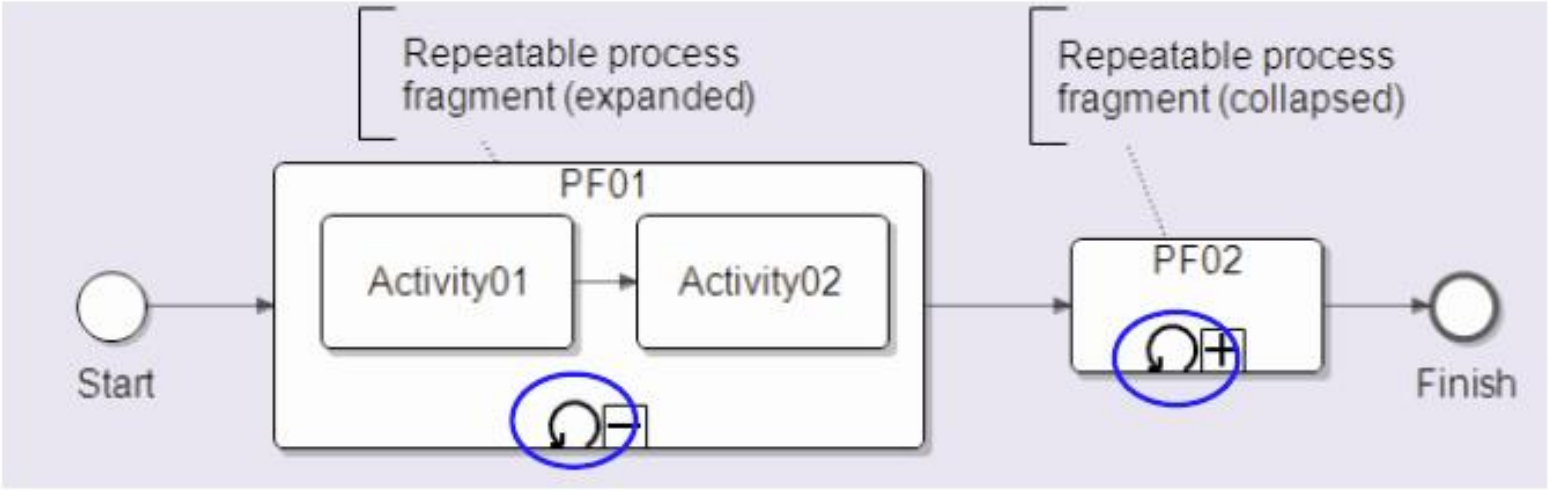
Gateway

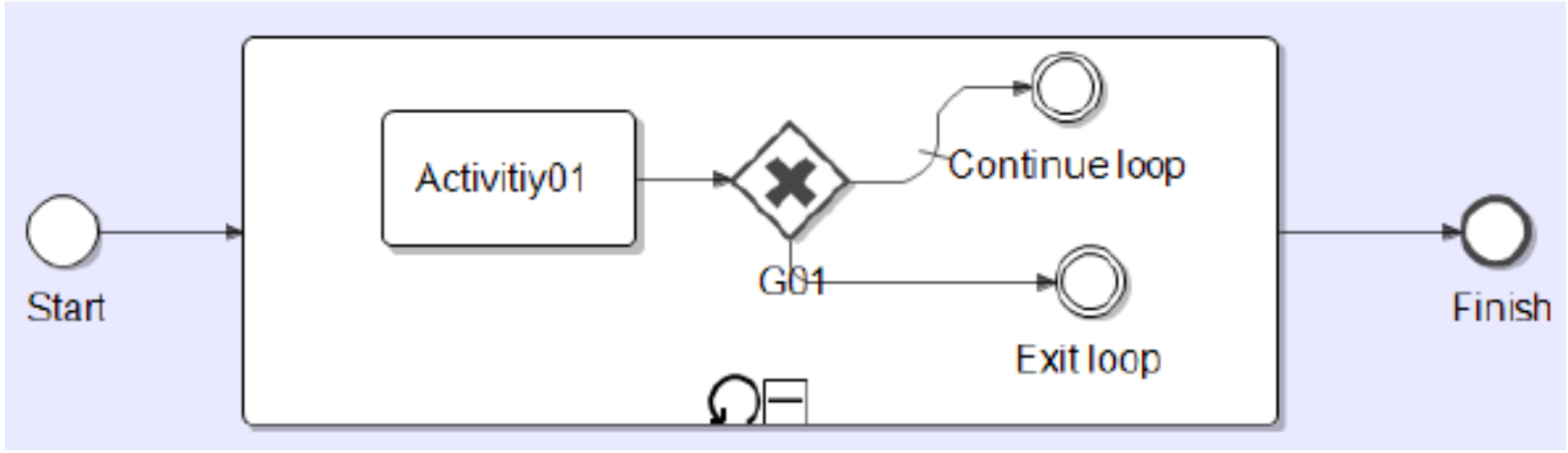
- Gateway enables choice of a path – multiple parallel paths based on a conditional
- Activity choice influenced by check undertaken at the Gateway
- Gateway may be parallel: +; exclusive: x;



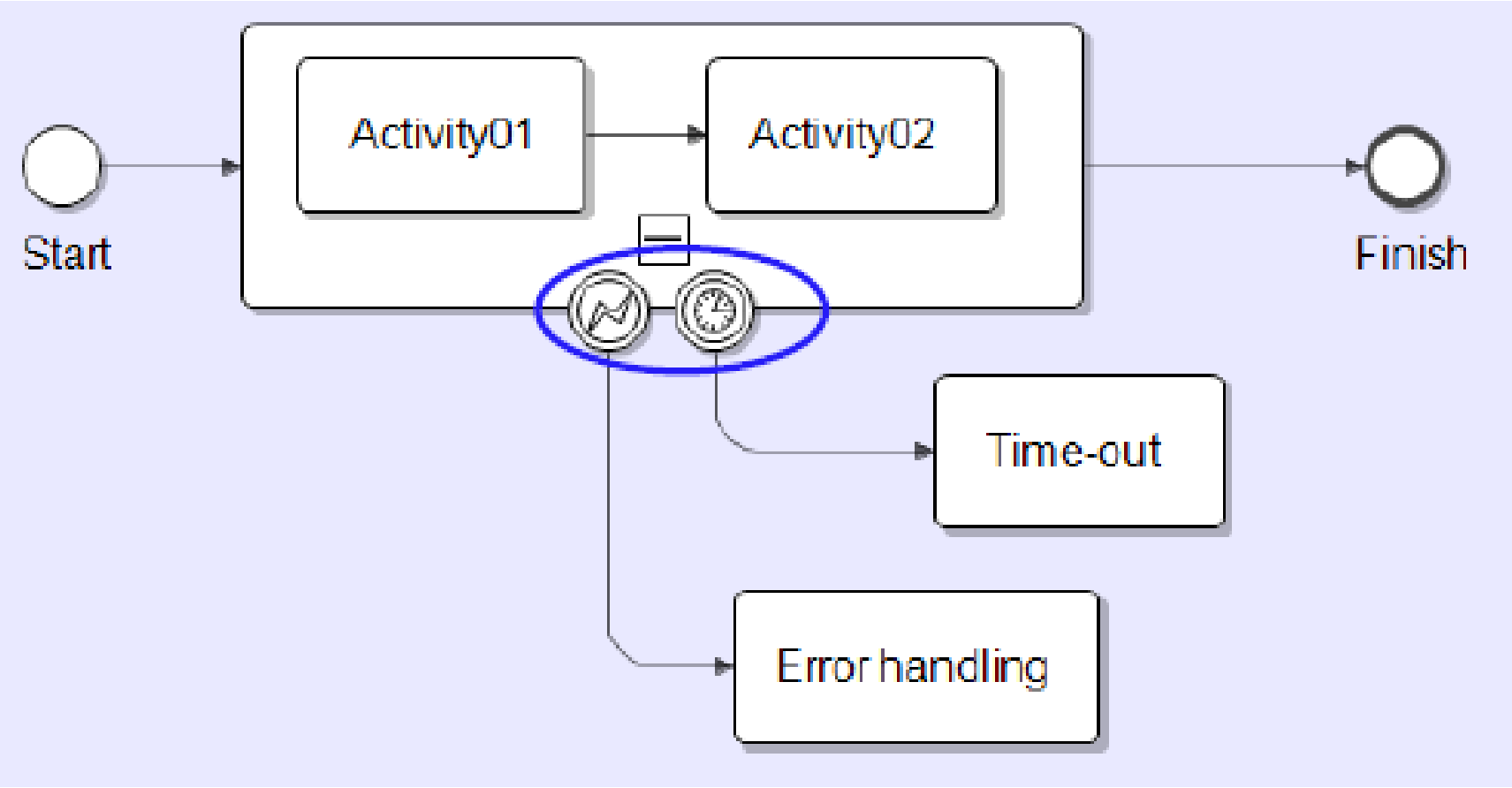
Process hierarchy + repeats

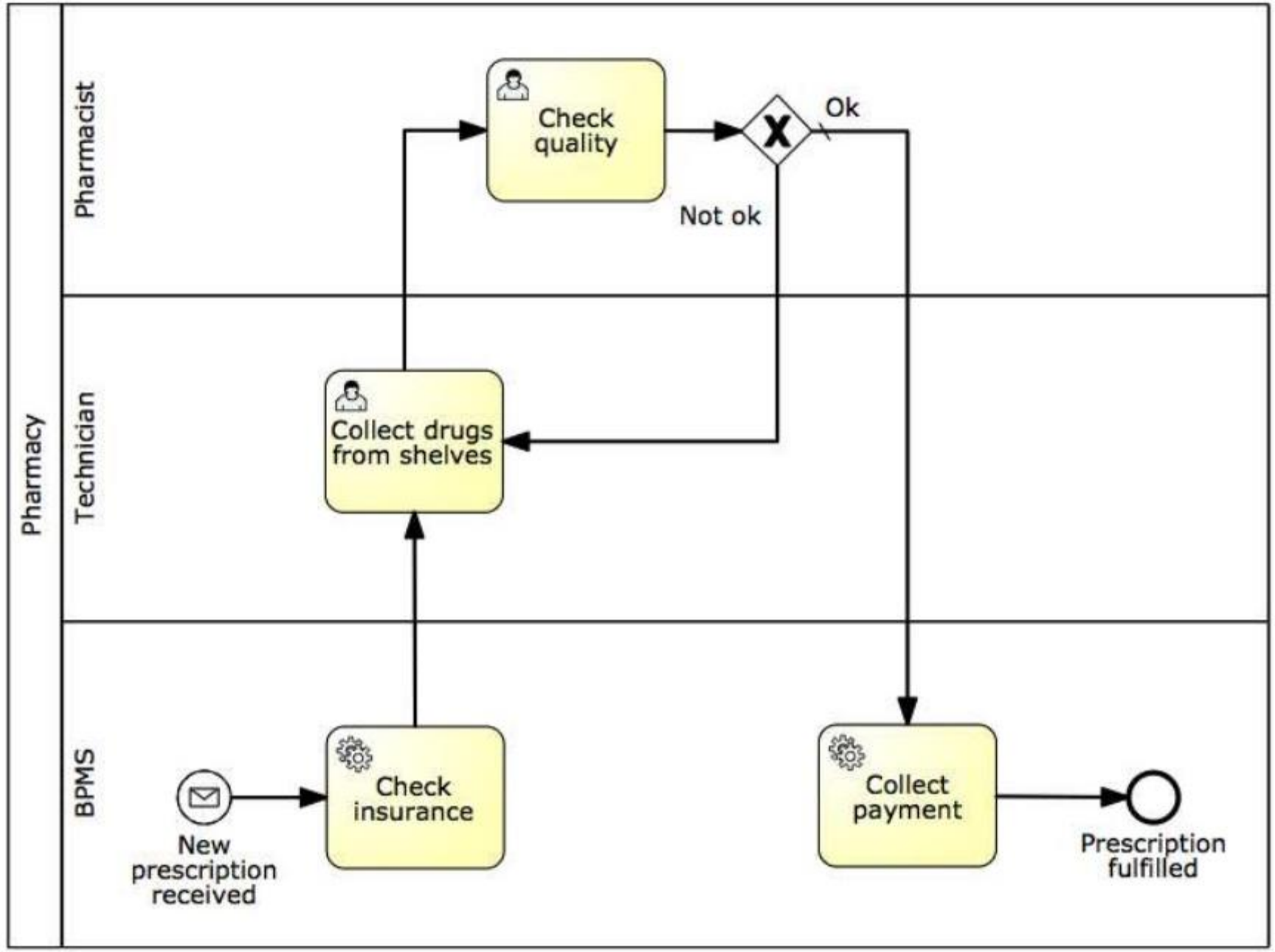
- Process fragments can be expanded or collapsed
- One fragment can be repeated



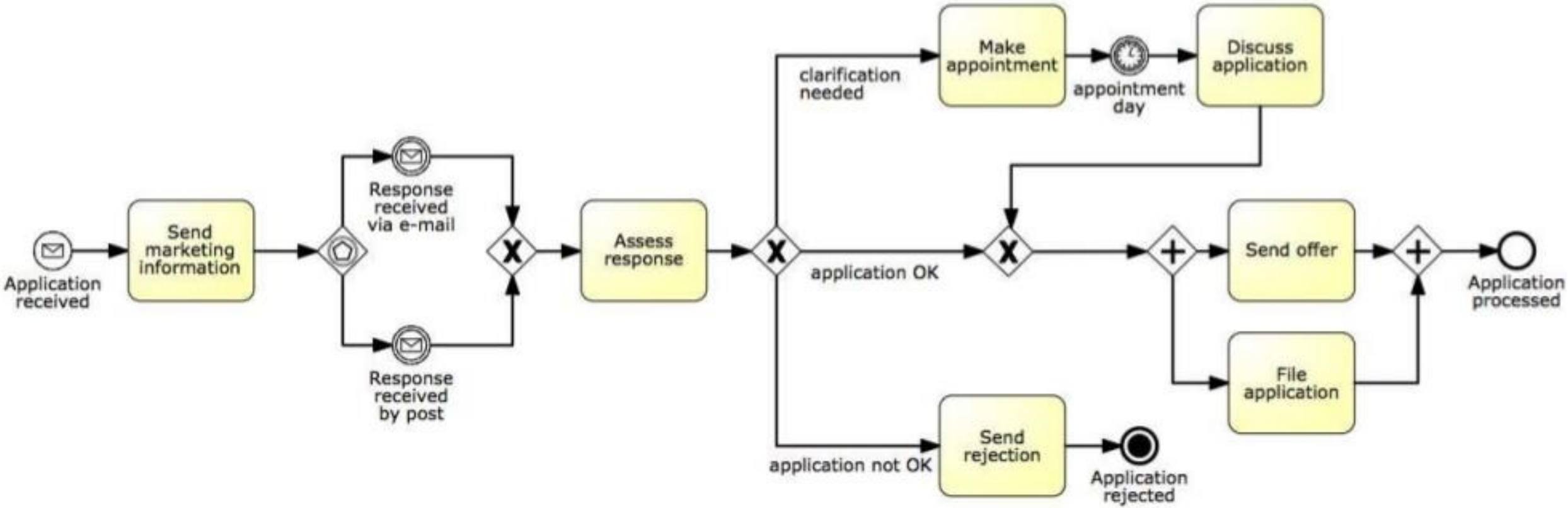


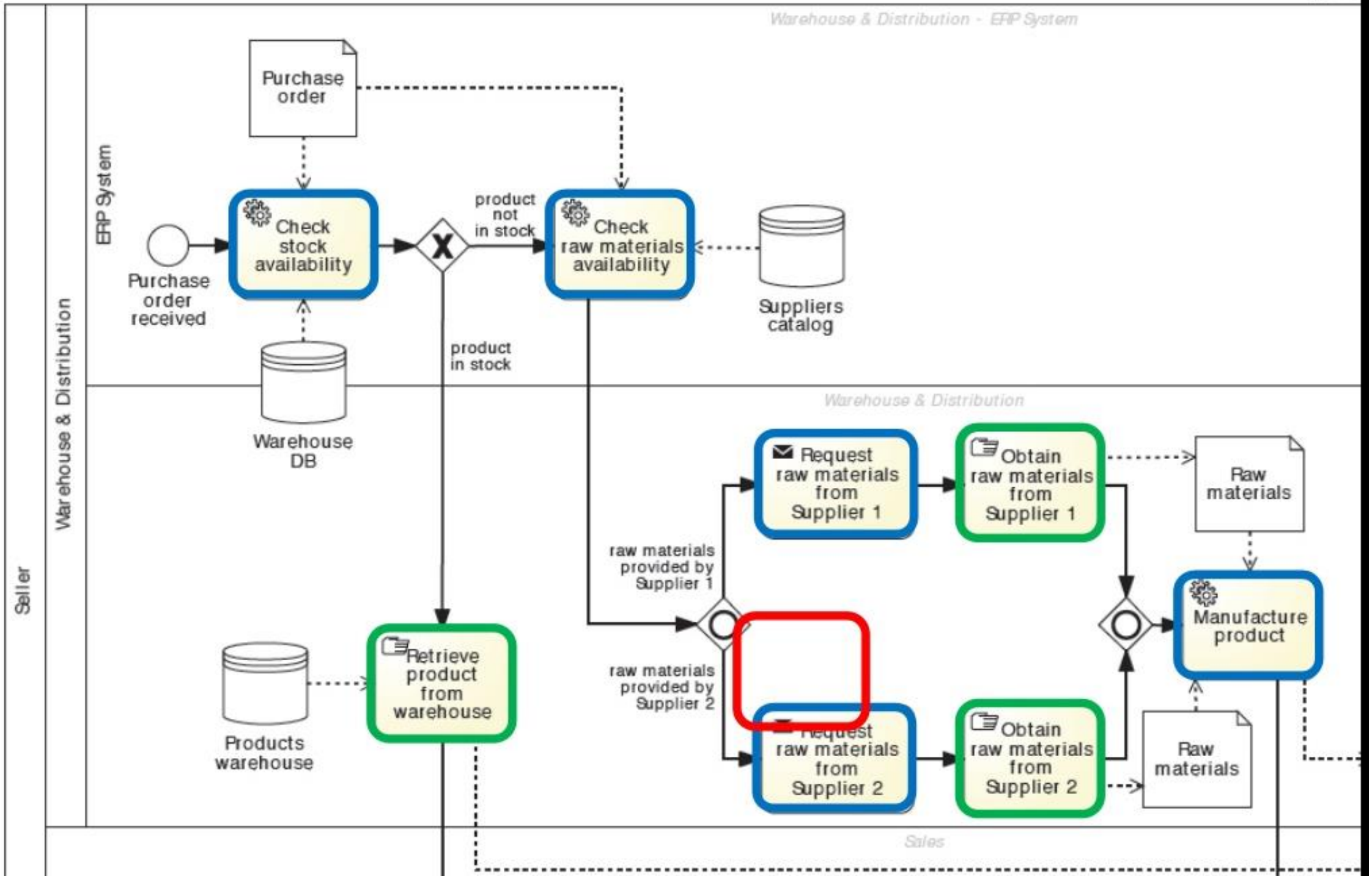
Errors & Time outs




Pharmacy
Pharmacist
Technician
BPMS
Check quality
Ok
Not ok
Collect drugs from shelves
Check insurance
New prescription received
Collect payment
Prescription fulfilled

Sales process for a B2B service




Seller
Warehouse & Distribution
ERP System
Warehouse & Distribution - ERP System
Purchase order
Purchase order received
Check stock availability
product not in stock
Check raw materials availability
Suppliers catalog
Warehouse DB
product in stock
Warehouse & Distribution
Request raw materials from Supplier 1
Obtain raw materials from Supplier 1
Raw materials
raw materials provided by Supplier 1
raw materials provided by Supplier 2
Manufacture product
Products warehouse
Retrieve product from warehouse
Request raw materials from Supplier 2
Obtain raw materials from Supplier 2
Raw materials
Sales

Business Process Modelling

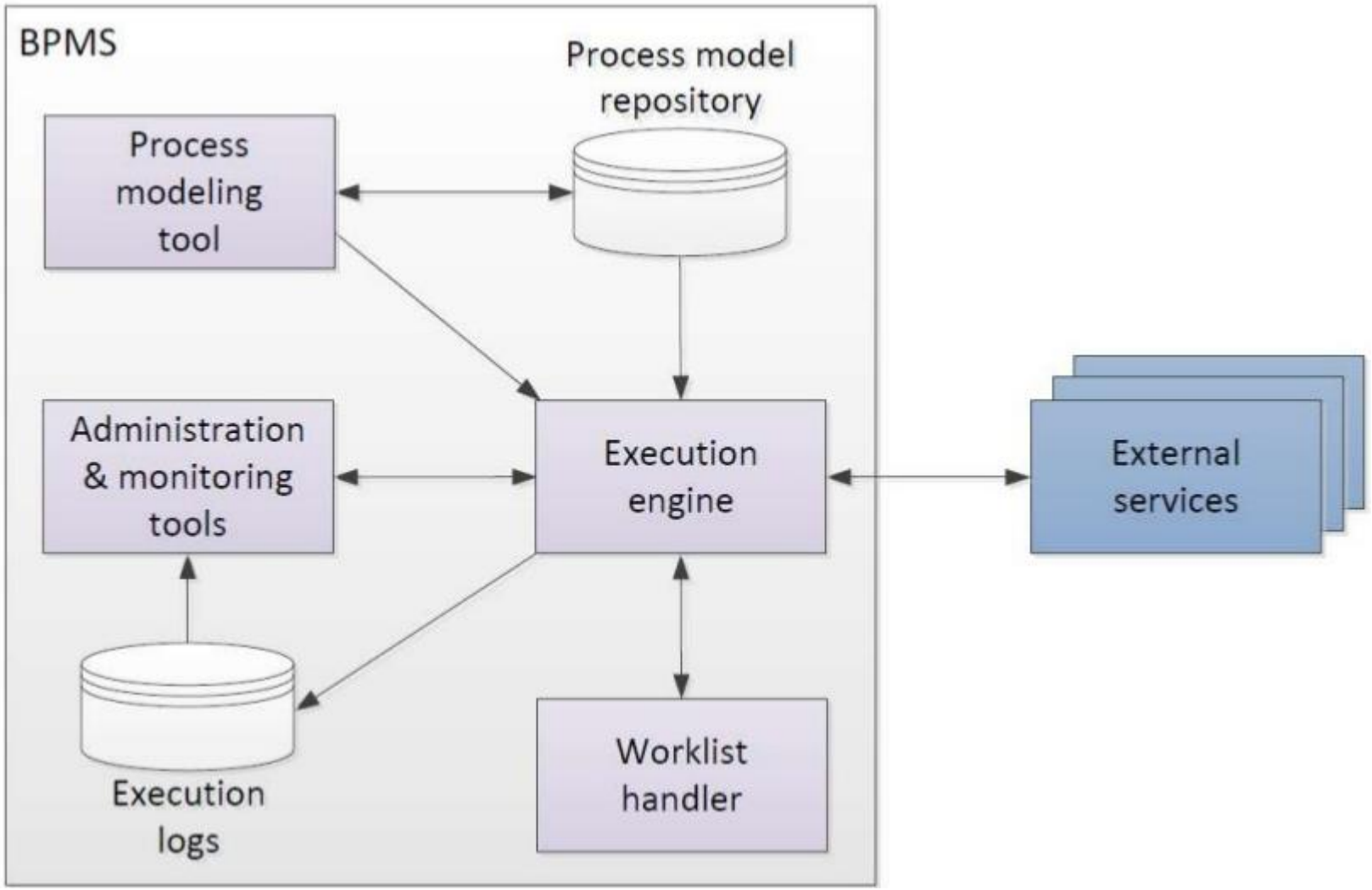
- A number of tools available:
  - https://www.bizagi.com/uk
  - https://www.bonitasoft.com
  - https://www.nomagic.com/products/magicdraw
  - https://bpmn.io/
  - https://www.heflo.com/tour-heflo-bpm/

- Use a simple tool to get some experience/understanding:
  - https://www.heflo.com/blog/process-modeling/bpmn-notation/
  - YouTube Videos: https://www.youtube.com/channel/UCSPgupeNPl-HGCKGGISip8w

- Can be used via a Web browser – no download needed

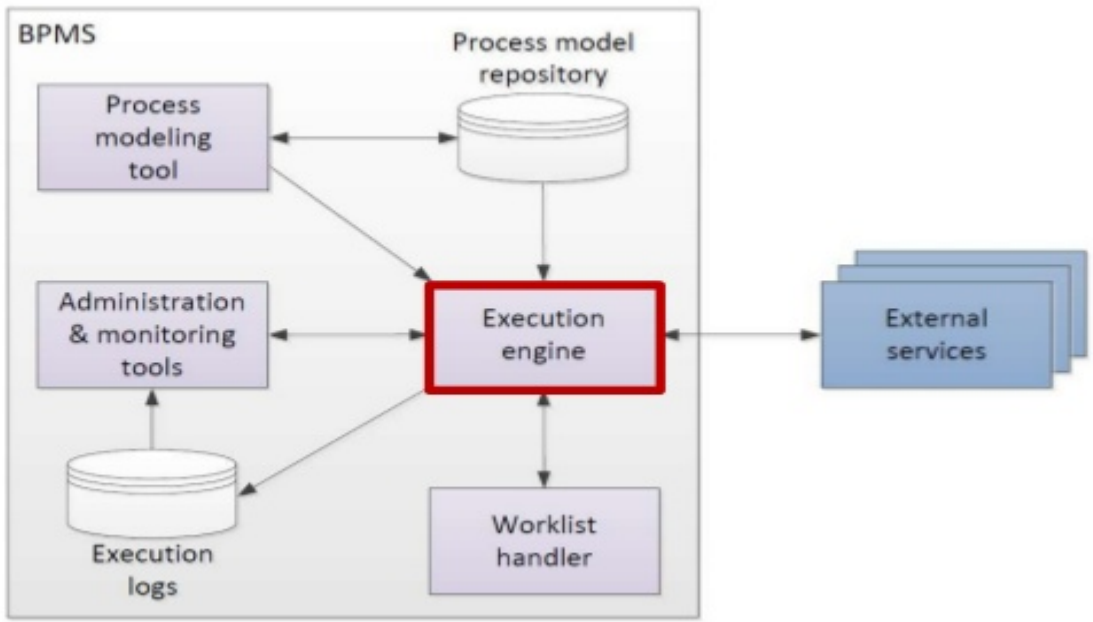
Business Process Management System

(Marcello La Rose & Marlon Dumas (QUT & UT))



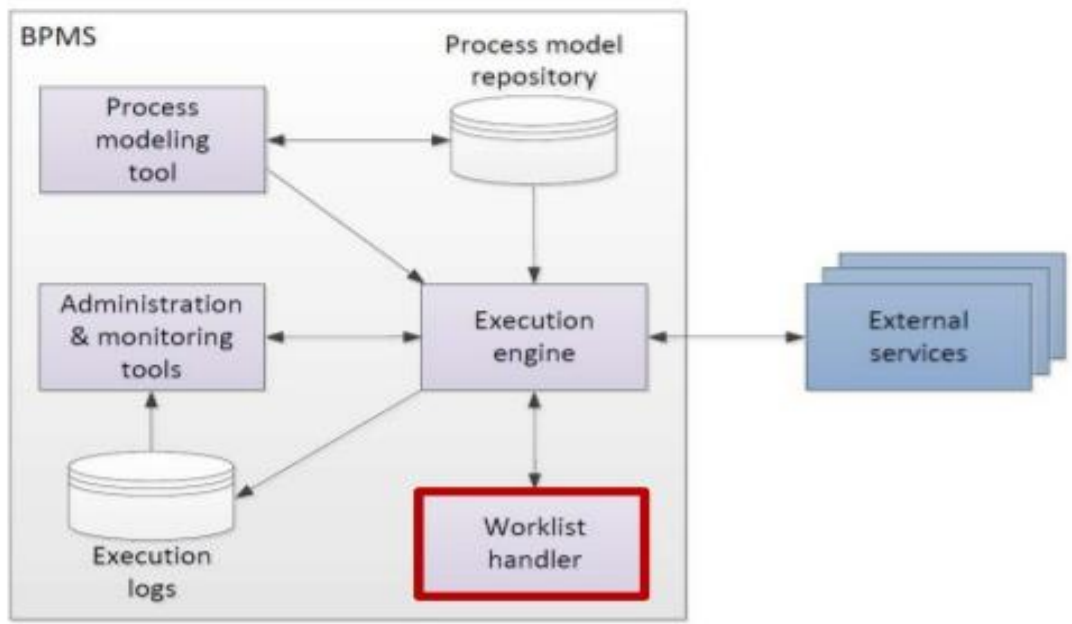
Execution Engine

- Instantiates executable process models (also called “cases”)
- Orchestrates distribution of work items to process participants and software services in order to execute a business process from start to end
- Logs execution data



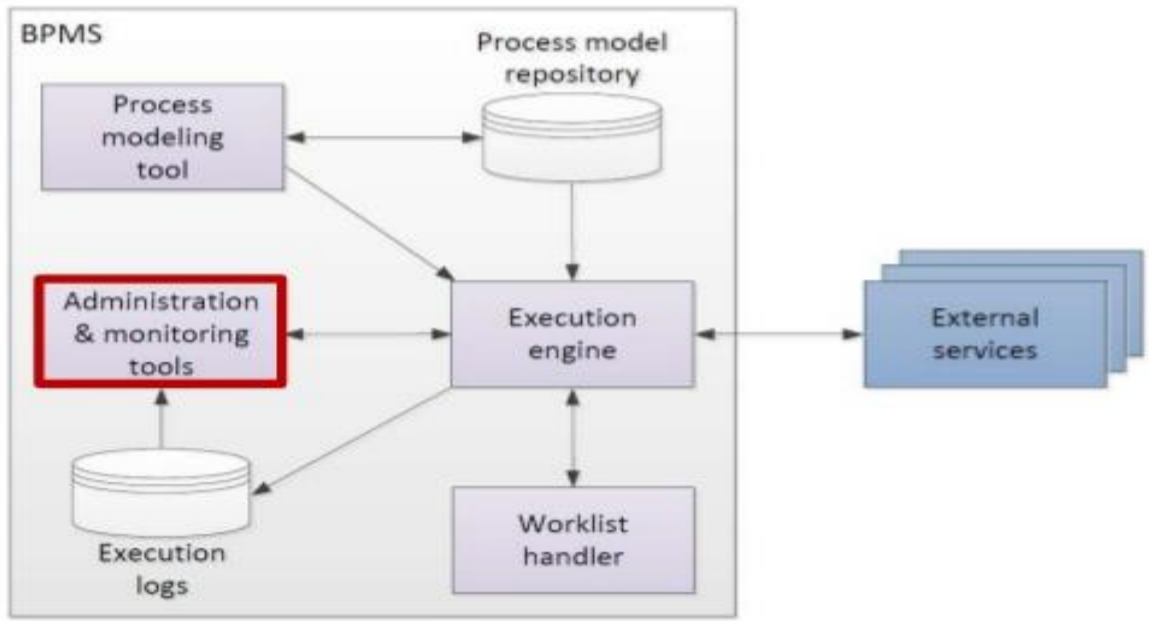
Worklist Handler

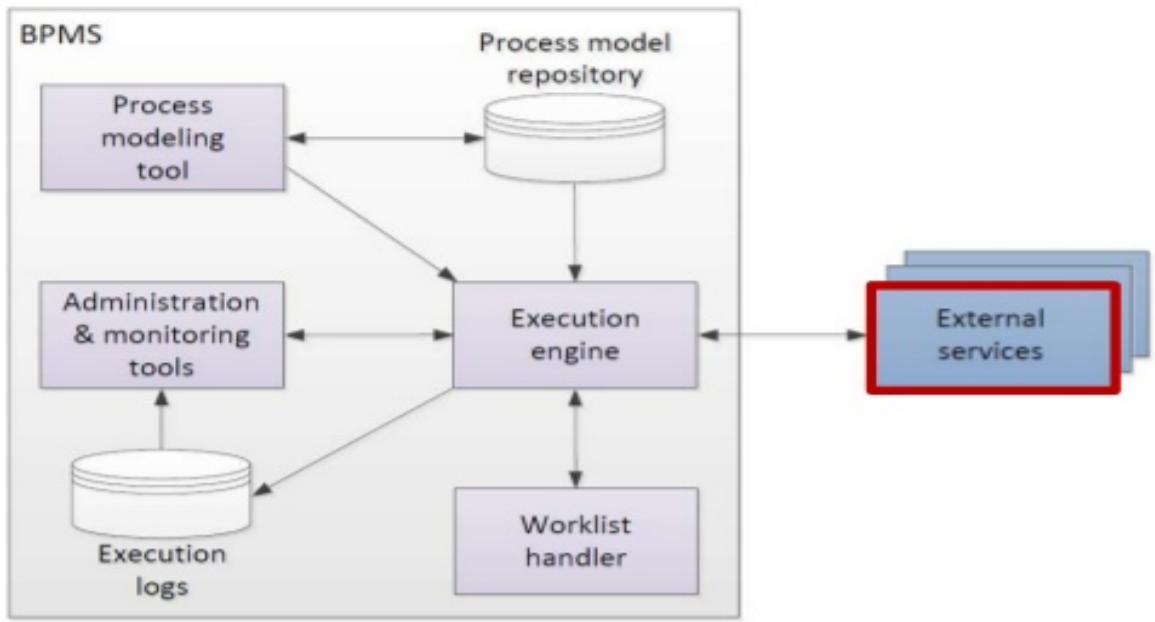
- Imagine it as an “inbox”
- Offers work items to process participants and allows participants to commit to these work items
- Handles participants’ work queues and work item priorities
- May provide social network capabilities



Administration & Monitoring Tools

- To manage automation solutions
- To configure access to system components
- To monitor participants availability and performance of process cases



External Services

- Expose a service interface with which the engine can interact
- The engine provides the invoked service with the necessary data it will need to perform the activity for a specific case
- Examples: rules engine, email or Twitter notification, DB connector, CRM connector…