

Process-driven Information Systems

LECTURE 4

<http://www.iet.unipi.it/m.cimino/wdis/>

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Workflow Modeling

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B01) Especially if the distinct actors perform different steps, and the handoff will surely affect the process, show all of them.

B02) If you have different job titles, perhaps based on seniority, but all performing the same steps, you can represent just a single swimlane

B03) Do not show actors within an organization when we have no control over “who, does what, when”, for instance because they are not within an internal department

B04) Example: a Postal Service or Courier Company actor, as an external agency, is not broken in all their internal actors

B05) When the job is strictly to look at flow across organizations and not within them, the model will show the major departments involved but not the individual actors within them, because that was not part of the study

Jobs, Roles and Committees

B06) Often there is no practical reason to differentiate between actor (e.g. a job role such as customer service representative or investigating officer) and a role (a specific part played in a process).

B07) The step names make it clear what role is that each playing.

B08) *Two actors with the same job title but different roles*

E.g., two clerks, each with the same job title, handling a cash deposit. One's role is to prepare the deposit, while the other confirm the accuracy of the deposit slip. Simply retail clerk #1 and retail clerk #2.

One person performing two distinct roles

B09) Start giving a pool to the person and two internal lanes to his roles. If the work done by each is of a different nature, and id being handled by one person because of resource constraints, keep two separate swimlanes.

B10) If there are not really handoffs, or the work flows seamlessly from one role to another (they do not do role A work in the morning and role B work in the afternoon), then you do not have separate roles.

B11) However, if the handoffs prove to be a source of delay, error, or expense, then leave the swimlanes separate to highlight situation

- *Committee as an actor*

B12) An actor may perform as an individual as well as a member of a committee. In any case we model the committee as an actor, even if all of its members are already represented on the swimlane diagram because of their separate responsibilities in the process.

B13) Hence, sometimes you can explicitly show the member's participation in committee work as a collaborative activity instead of as a unique swimlane.

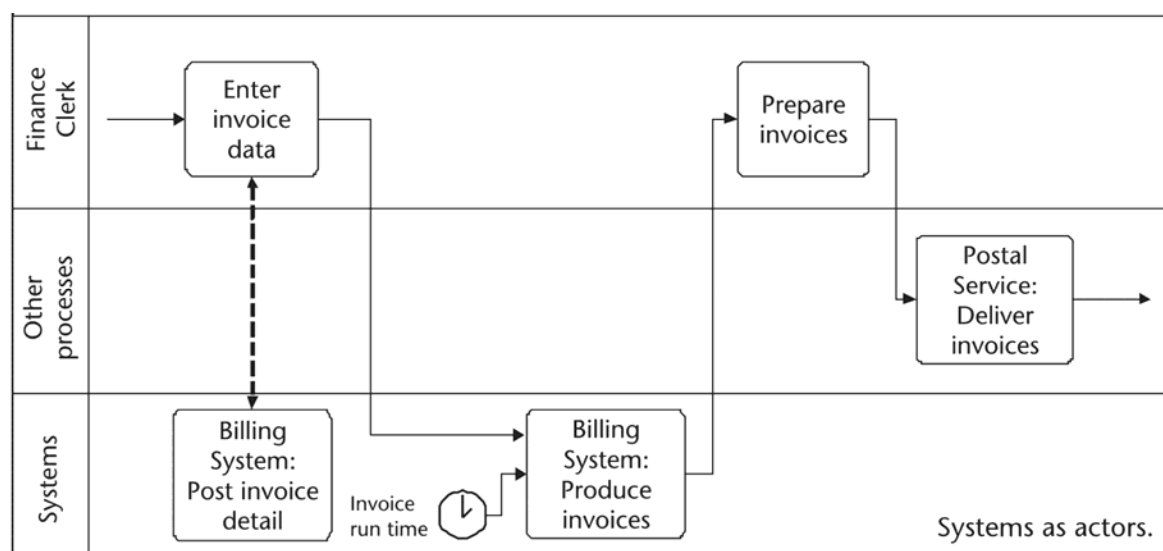
Systems as Actors

B14) If much of the process is done by the system, then delay, error and expense may be introduced by the system itself rather than by humans. The system needs to be shown, although it might be simplified and abstracted to avoid entering into IT issues

- *Systems supporting human actor*

B15) E.g., Web-based online shopping system, human resources system. The system can be simply mentioned in the step name (*create order via web, assign employee using human resources system*) or represented as a separate swimlane and interaction with it is represented by dashed lines.

B16) Even if you have many systems, generally you can use a unique swimlane labeled "systems". Preface the step description with the name of the system and, if appropriate, the system function used



- *Batch Systems*

B17) E.g., an overnight production of invoices. It takes the control of the work items, adds values, and introduces delay because subsequent steps wait its result.

B18) The main difficulty in representing systems is to find IT resources who have the technical skills to trace through the batch processes, but who can also explain in everyday language what it being accomplished without getting into the complexity of processing steps

B19) Creating swimlane diagrams where each subsystem is represented as a separate step (or even has its own swimlane) works well when the subsystems are clearly delineated

B20) Splitting work across subsystems often drives you to too low level of detail, so no business person could follow the diagram

B21) Sometimes to show each day as a separate swimlane highlights the delays and serial nature of the process. E.g.

- day 4: Transmit contract record to national clearinghouse
- days 5 and 6: no activity
- day 7: Receive activity report from national clearinghouse

B22) It is usually hard to synthesize out the main milestones without the support of experienced professionals

B23) Human actor supporting Systems

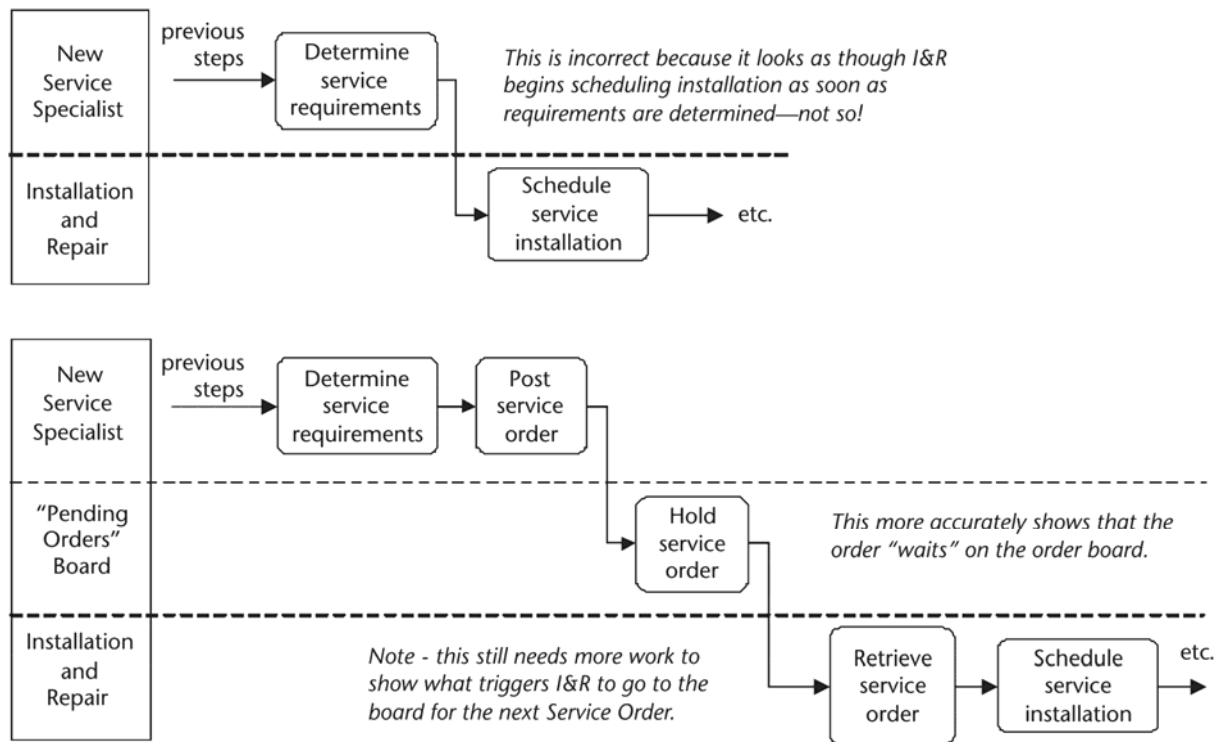
IT staff monitoring batch jobs for successful completion, recovering from failures, checking report outputs, correcting bad data “by hand” and so on, have to be shown as actors. They have a role in the process. Sometimes process steps are less automated than many people are aware. E.g. an e-commerce site where orders are captured on the Web, printed, and manually entered into the order entry system! This “human glue” must be shown.

B24) Devices and machines as actors

When they take control and add value, show them as actors.

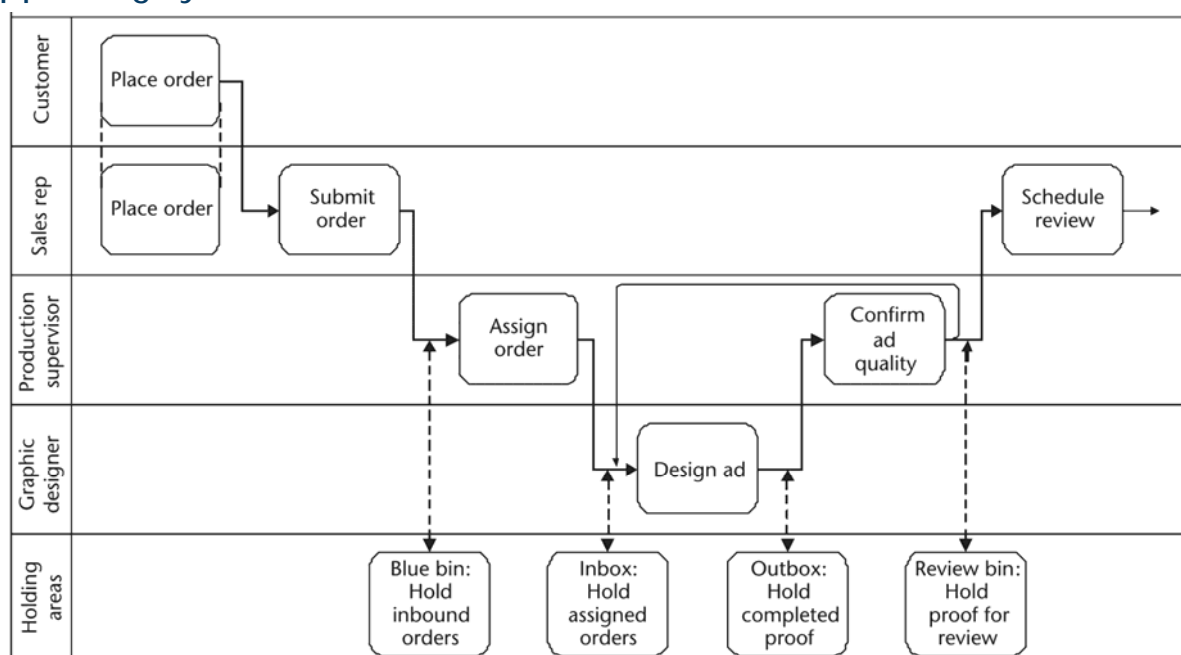
Passive Actors

B25) Sometimes, a passive storage or holding area like an inbox, outbox, or staging area at a warehouse can be shown as an actor, even if it does not do something. This way, it is easy to see all the points in the process where work is waiting.



A passive holding area as an actor.

B26) To show all the "hold work" steps may make the diagram too long. A more compact alternative is to represent an holding areas as a supporting system.



A holding area supporting a flow.

- *Transmission Mechanisms as actors.* Some example.

B27) A telephone network is not represented, because it is instantaneous, it does not hold work, it does not produce delay.

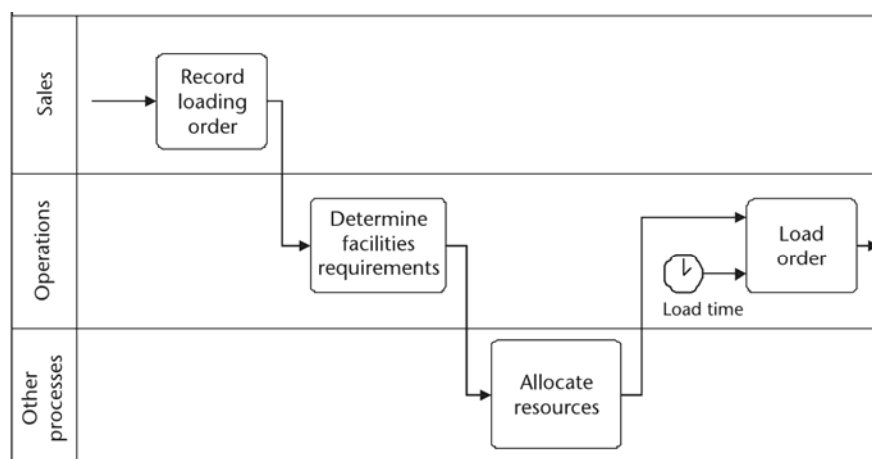
B28) An e-mail communication is asynchronous, i.e., the actor does not interact instantaneously, and then it holds the work in the meantime. An e-mail inbox is often represented as an actor.

B29) Do not show something that physically holds the work but is in turn held by, or is under the control of, another actor (truck, delivery cart, mailbag)

- *Processes as Actors*

B30) A separate process can appear as an actor if your process depends on it, i.e., there is a handoff of work to the separate process and a wait for something to come back from that process. E.g., a process providing shared services to many concurrent instances of another process.

- B31) E.g., A bulk marine shipping terminal. Every day multiple orders are pending to load ships with the commodities stored at the terminal

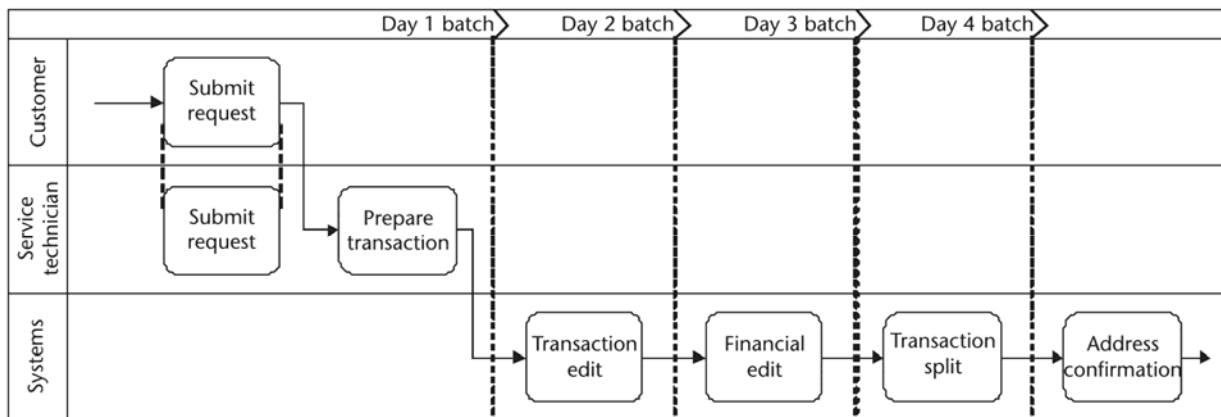


Other processes as actors.

Some types of steps

B32) *Scheduled step*: is triggered by temporal events, which are labeled so as to clearly express the temporal condition.

B33) Time on a diagram. Add vertical lines to the diagram, each indicating some labeled time boundary or milestone



Adding a time scale to a diagram.

B34) A part of the process you do not know/care about yet. Use a cloud icon, with a textual comment. The cloud can be also used to indicate collaborative, creative work in a process that cannot be reduced to a sequence of steps and decisions.

Starting from over-complex diagram

B35) Sometimes you will face with overly convoluted and detailed diagram. Cleaning up these diagrams is a good source of income.

B36) Order the diagram with the main flow going strictly from left to right (except for some looping back, of course)

B37) Ensure that the diagram contains a single process. If not, separate out different processes

B38) With separate processes, you will be able to simplify even further by separating out variations for one part of a process where alternative flows have been depicted.

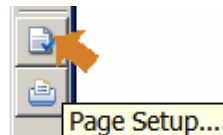
B39) Each variant should be diagrammed separately, including the most common case on the main diagram.

B40) If a diagram is still too much detailed, combine steps until you have an approximation of a service diagram.

B41) Rearrange the order of the swimlanes. Combine steps in the service diagram to produce a handoff diagram.

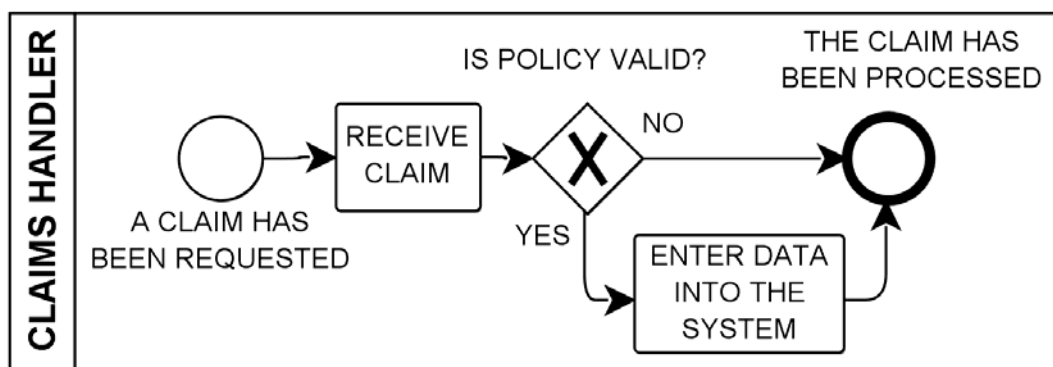
A basic example on Yaoqiang BPMN Editor (a standalone editor)

1. *File* → *New* → *BPMN File* (enter name) → *OK*
2. Drag & drop pools, lanes, events, tasks, gateways from the Palette to the Diagram
3. To wrap long labels: right button on the label → *Label Wrap*
4. To expand the drawing area: right on the page setup icon (on the right border of the area)



6. Select *A3* → *OK*
7. To use a grid placement click the grid icon (on the right), and then click the layout buttons on the left.
8. To increase/decrease the diagram view: *CTRL* + mouse scroll
9. To arrange multiple page on the same diagram: right button on a page → *Add page Horizontal/Vertical*

A basic example on Yaoqiang BPMN Editor



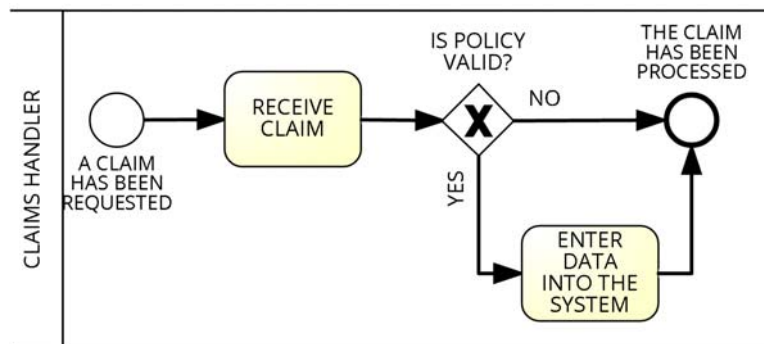
1. *File* → *Save as...* → *BPMN File (.bpmn)* → *Save*

It is an XML format for diagram interchange between software tools.

A basic example on Signavio BPM Suite
(a cloud-based solution, for team projects)

- Signavio Academic Initiative, student invitation:
<http://tinyurl.com/signavio-invitation>
- Signavio Process Editor, user manual:
<http://academic.signavio.com/help/en/>
- There is a shared folder *PDIS*

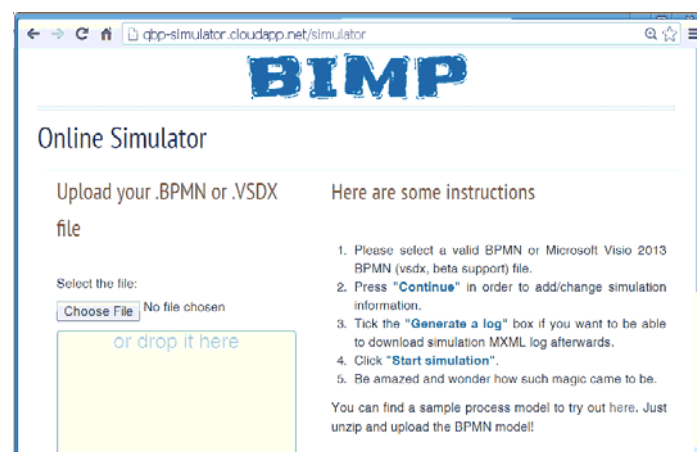
1. Select the *MyDocuments* folder, *Import* → *Import BPMN 2.0 XML*
→ (select the diagram created with Yaoqiang) → *Import*



- Click on the *Flask icon* () → *Simulate with Bimp*

<http://bimp.cs.ut.ee/uploads/signavio>

- *Bimp Simulator* is a cloud-based simulator
 - it can import the BPMN 2.0 XML format
 - <http://bimp.cs.ut.ee>
 - <http://qbp-simulator.cloudapp.net>





Online Simulator

You are editing: uploaded_1444763133.bpmn

[View BPMN 2.0 Diagram](#)

Click on *save scenario* to save a BPMN 2.0 XML format with annotation of additional simulation information

[Save scenario](#)[Upload a new model](#)[Collapse all](#)

Process simulation specification

Inter arrival time (between two instances): Fixed to: 10 Minutes

of instances: 10

Simulation start time: 2015-10-03 21:04:23

Currency: EUR

Resources

Add	Name	# of Resources	Cost per Hour	Timetable
	Claims Handler	1	EUR	Default

Timetable / Work schedule

Add	Name	Begin day	End day	Begin time	End time
	Default	Monday	Sunday	00:00:00	23:59:59

Tasks

Tasks

Name: **RECEIVE CLAIM**

Resource: Claims Handler Fixed cost: EUR

Duration: Fixed to: 5 Minutes

Name: **ENTER DATA INTO THE SYSTEM**

Resource: Claims Handler Fixed cost: EUR

Duration: Fixed to: 5 Minutes

Gateways

Exclusive (XOR) IS POLICY VALID?

THE CLAIM HAS BEEN PROCESSED 100 %

ENTER DATA INTO THE SYSTEM 0 %

Click on *Generate a MXML* to produce an XML log for ProM

☐ Generate a MXML log[Start Simulation](#)