

Business Process Modelling

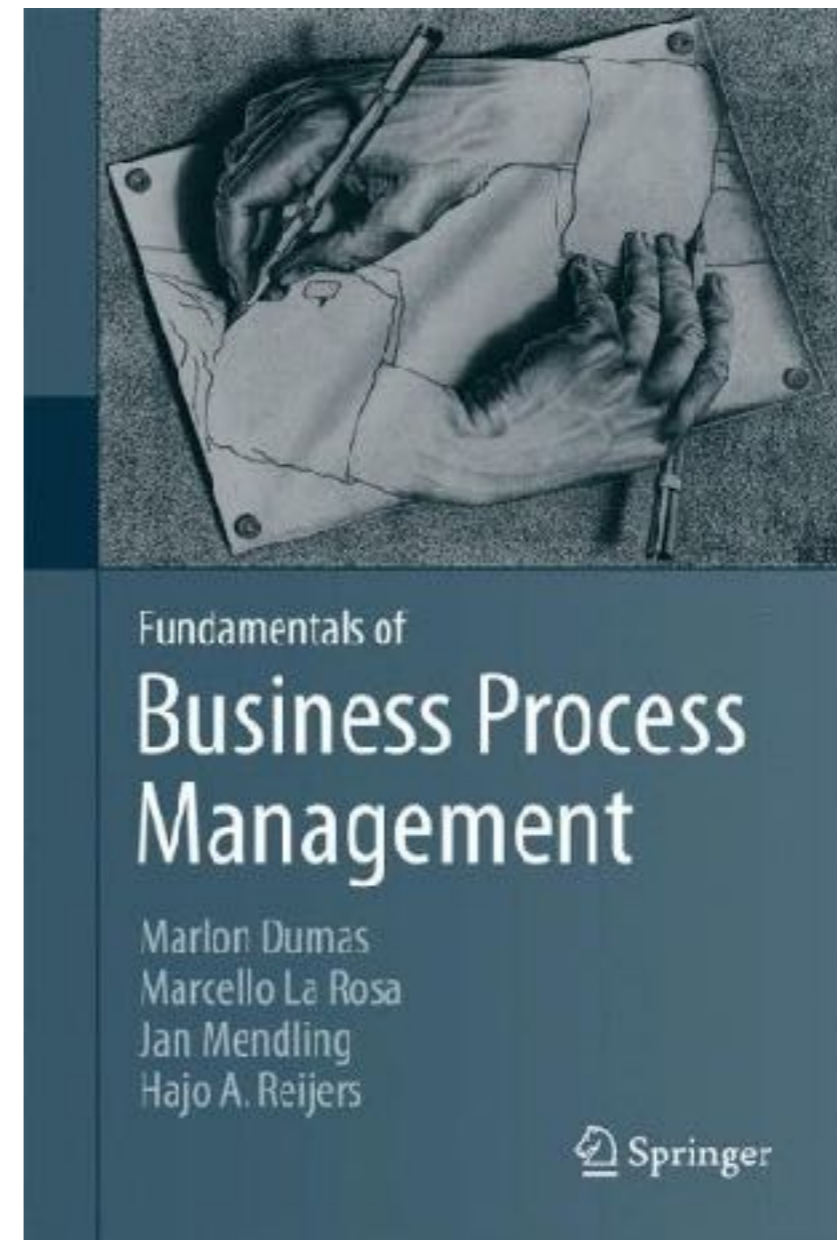
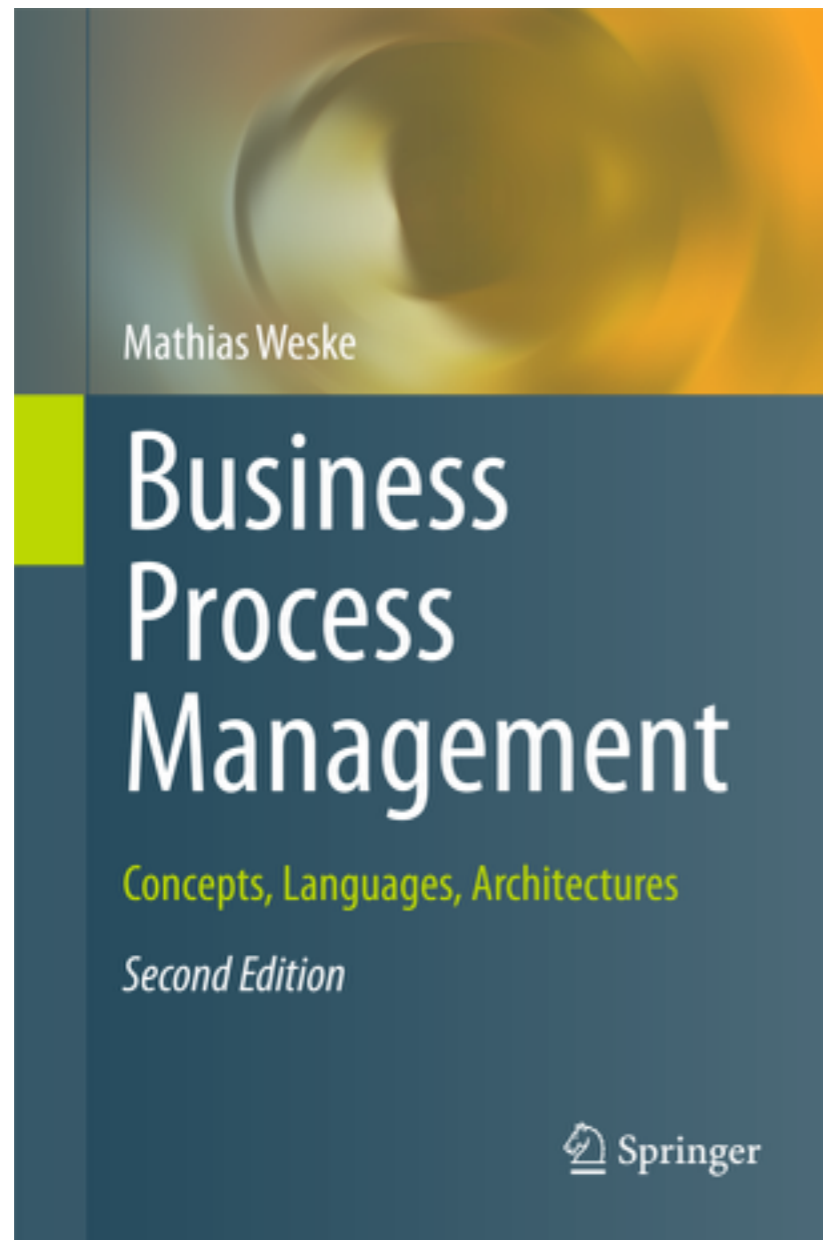
UNIVERSITÉ
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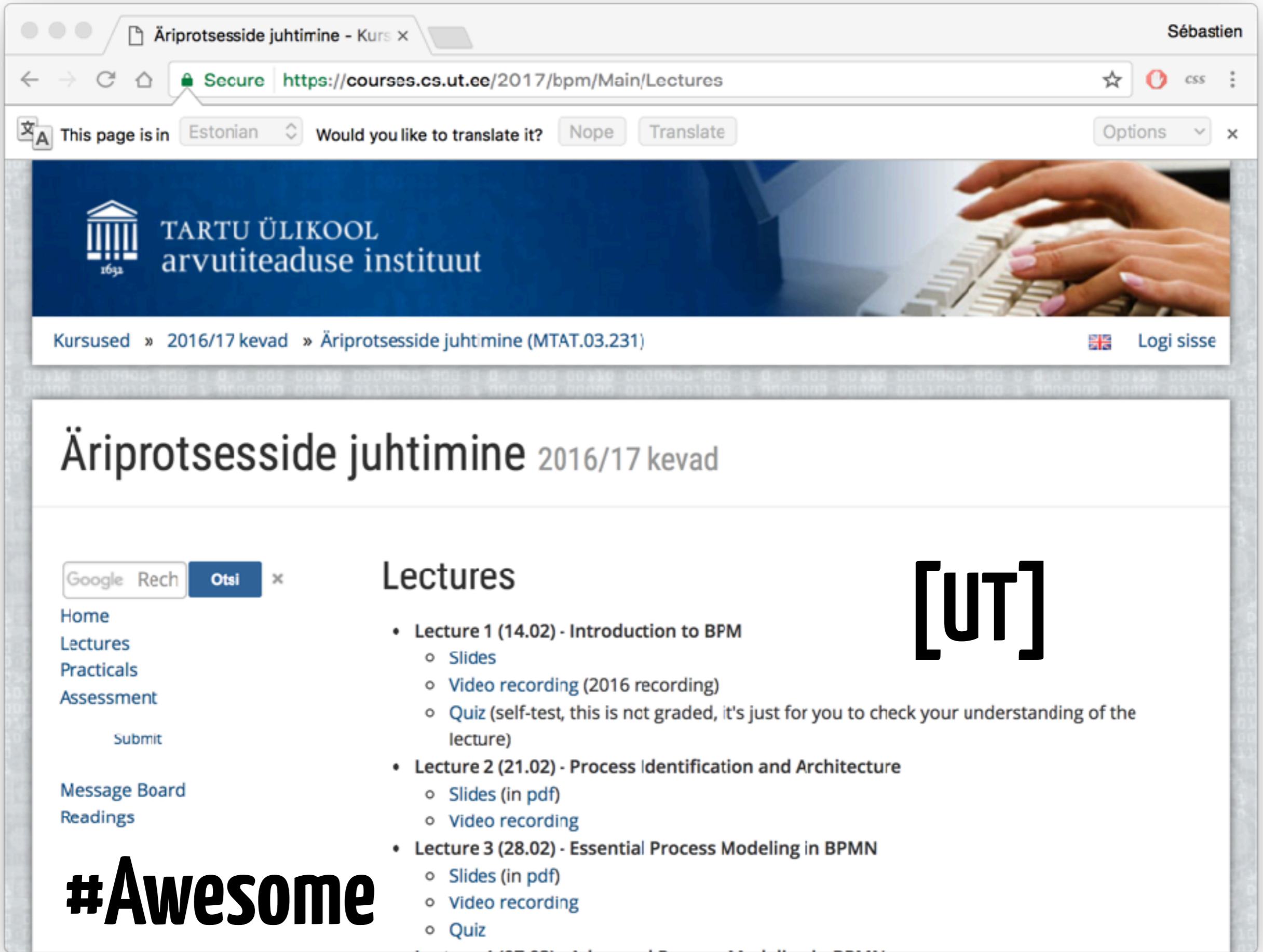
Sébastien Mosser

JDEV / T06.P / 05.07.2017



Bibliography





Äriprotsesside juhtimine 2016/17 kevad

Google Rech Otsi x

- Home
- Lectures
- Practicals
- Assessment
- Submit

- Message Board
- Readings

Lectures

- Lecture 1 (14.02) - Introduction to BPM
 - Slides
 - Video recording (2016 recording)
 - Quiz (self-test, this is not graded, it's just for you to check your understanding of the lecture)
- Lecture 2 (21.02) - Process Identification and Architecture
 - Slides (in pdf)
 - Video recording
- Lecture 3 (28.02) - Essential Process Modeling in BPMN
 - Slides (in pdf)
 - Video recording
 - Quiz

[UT]

#Awesome

Blatant Advertisement

T6
GT02

2PM-3:30PM



Business Process Modelling:
Hands-on session

Sébastien Mosser
JDEV / T06.GT02 / 06.07.2017

pictures: sac.hu



Business ?



STEP 1



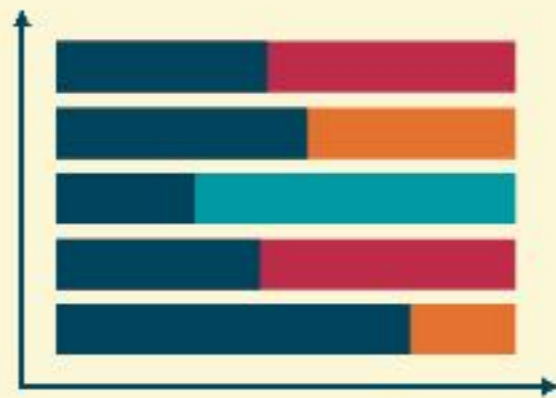
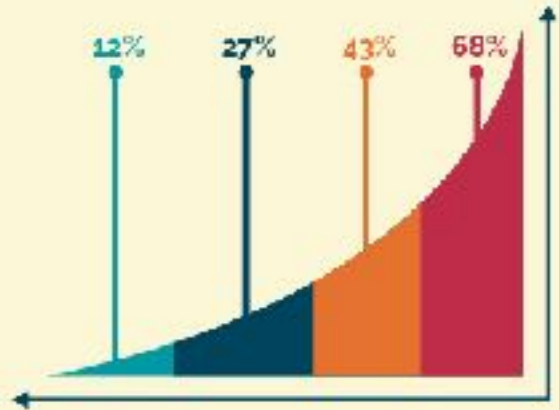
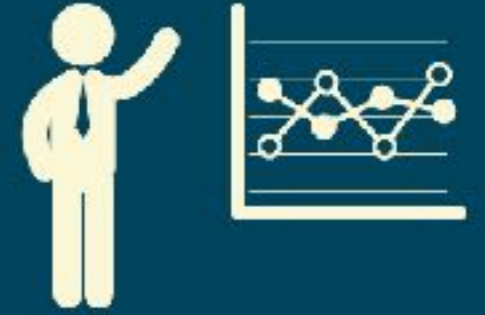
STEP 2



STEP 3



STEP 4



Process ?

Modeling ?



1

From **Architecture** to **Urbanism**

BPM for **dummies** (BPMN101)

2

3

Modelling vs **Executing**

Simulating Business Processes

4

From
Architecture
to **Urbanism**

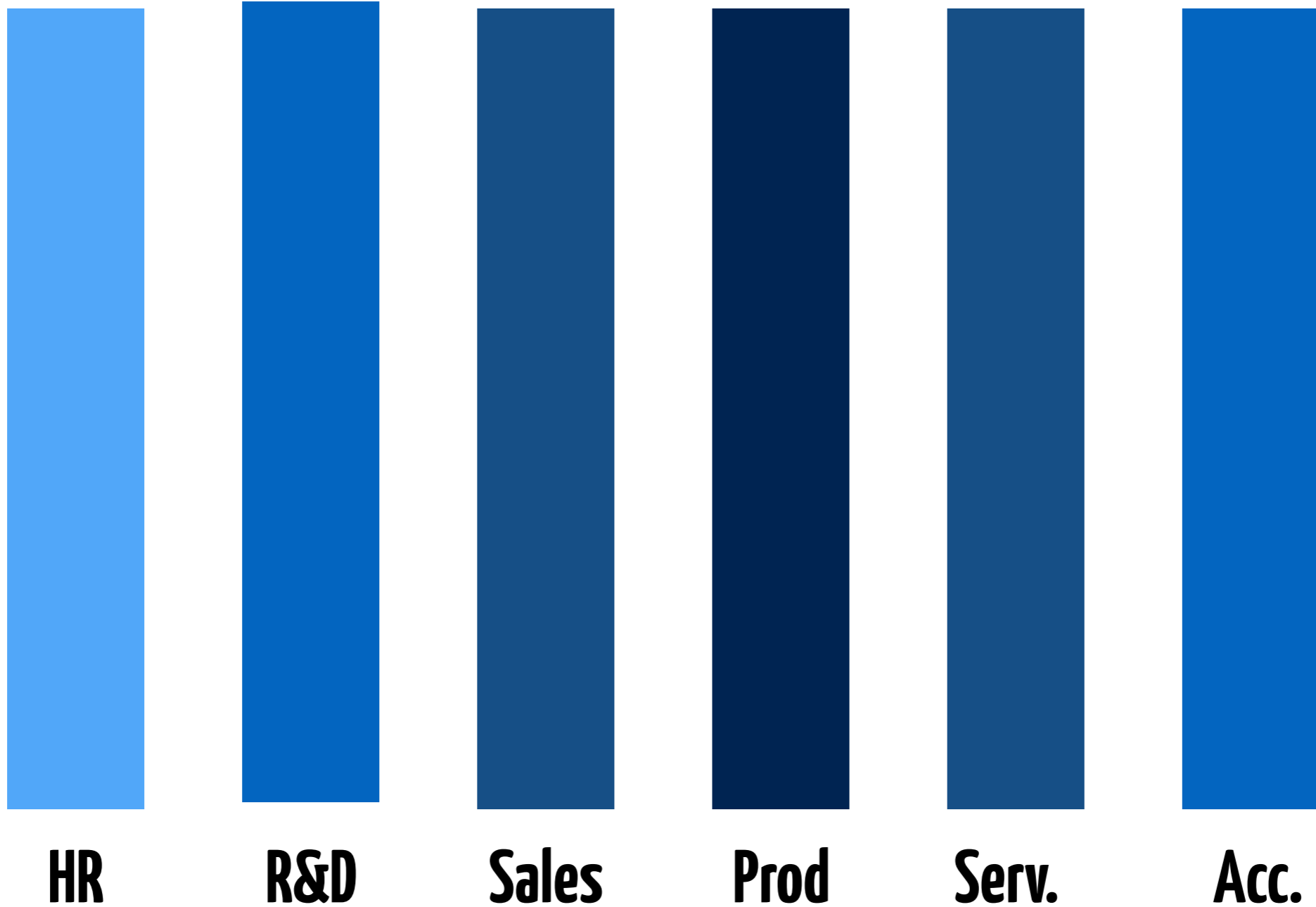


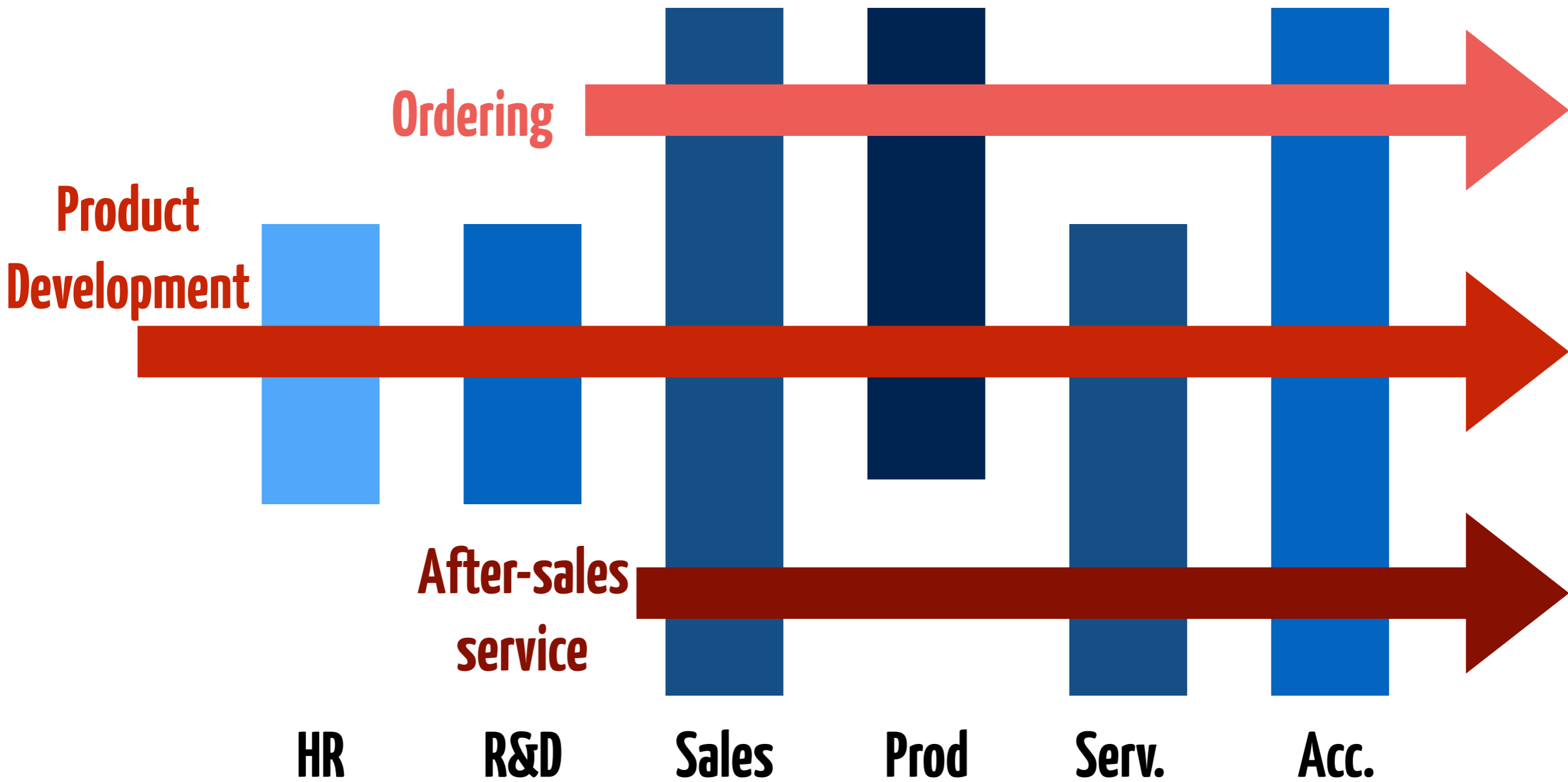
Activity must pilot **Technology**

versus

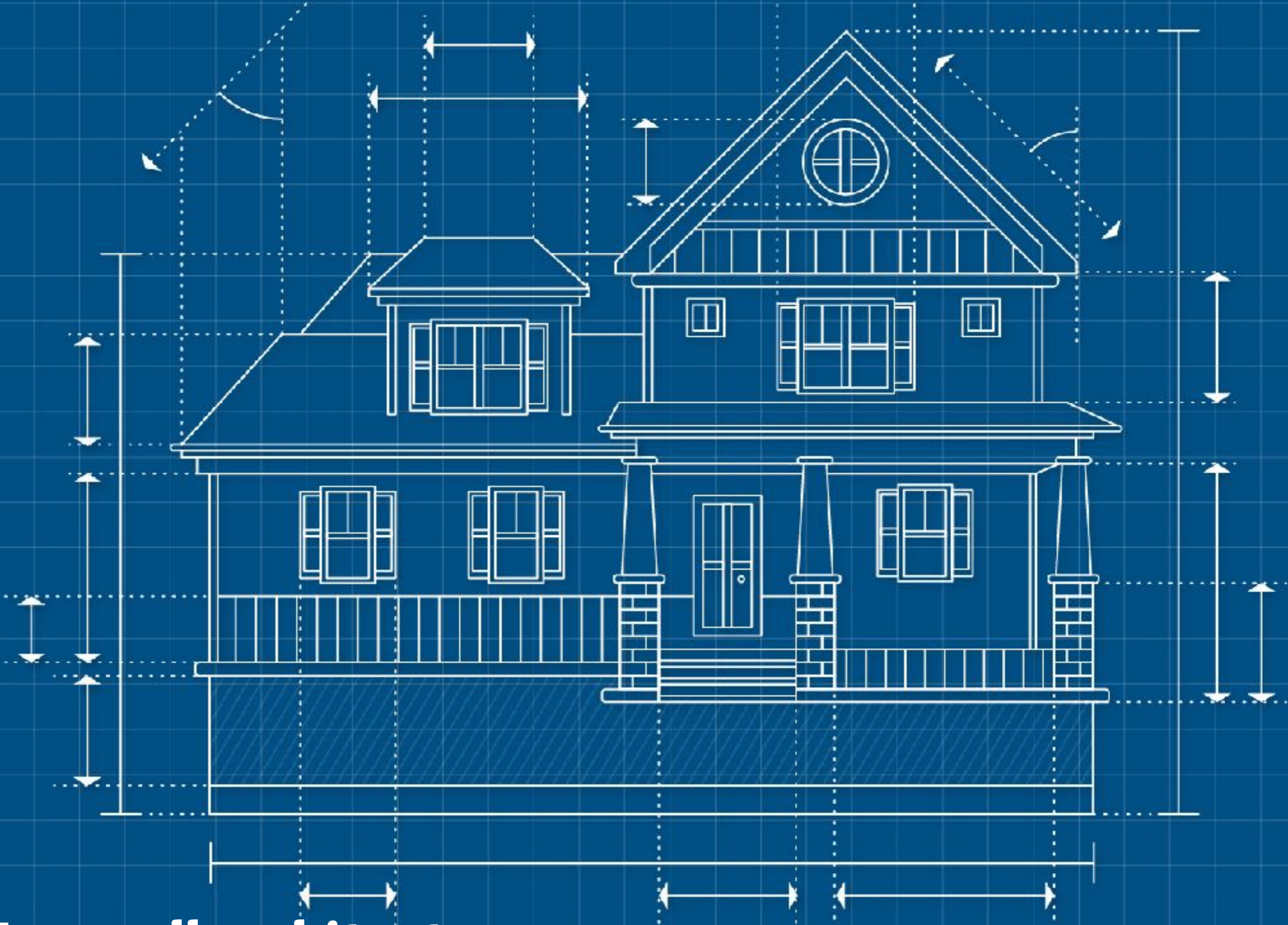
Technology must pilot **Activity**

Silos





Crosscutting **Business**



Farewell architecture, ...

Welcome, Urbanism!

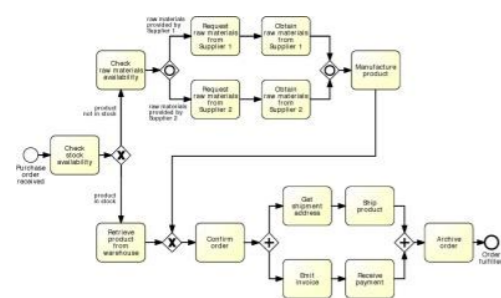


Purposes of process modeling

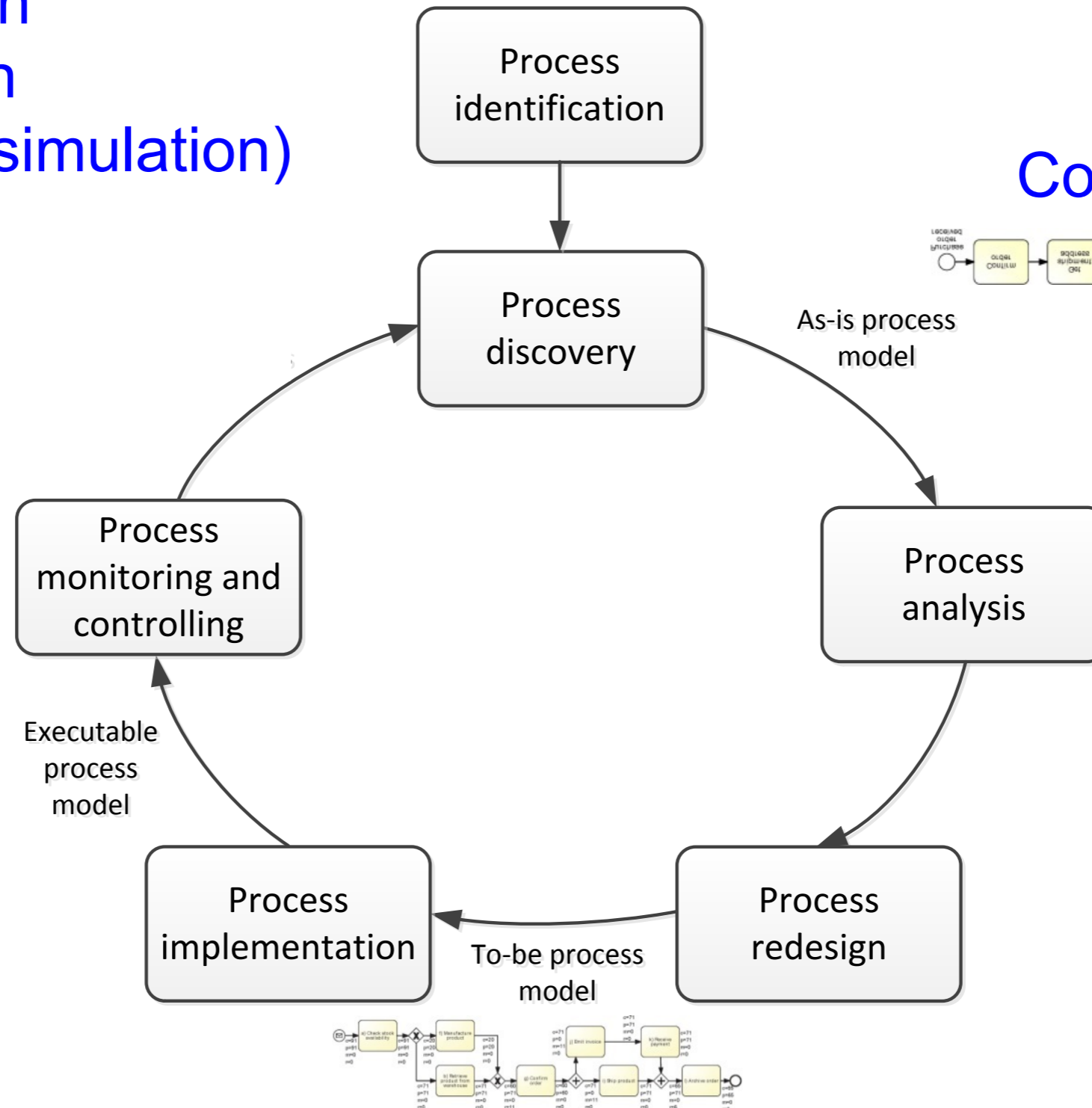
- Communication
- Documentation
- Analysis (e.g. simulation)

- Automation
- Testing

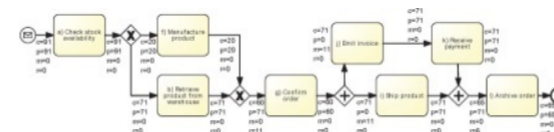
Executable



Conceptual

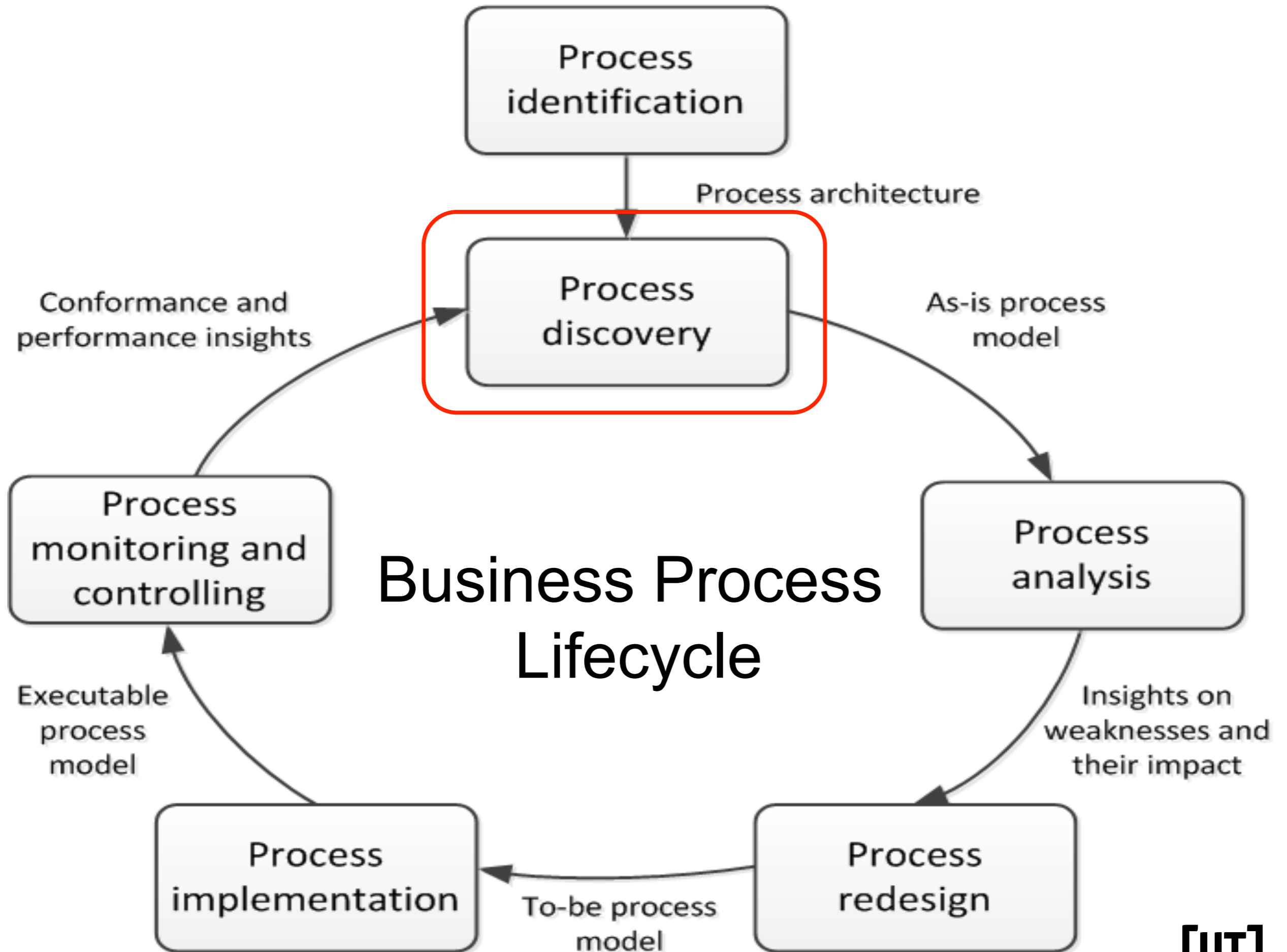


Conceptual



BPM for
Dummies
(BPMN101)





Let's start modeling

Order-to-cash

A typical order-to-cash process is triggered by the receipt of a purchase order from a customer. The purchase order has to be checked against the stock regarding the availability of the item(s) requested. Depending on stock availability the purchase order may be confirmed or rejected.

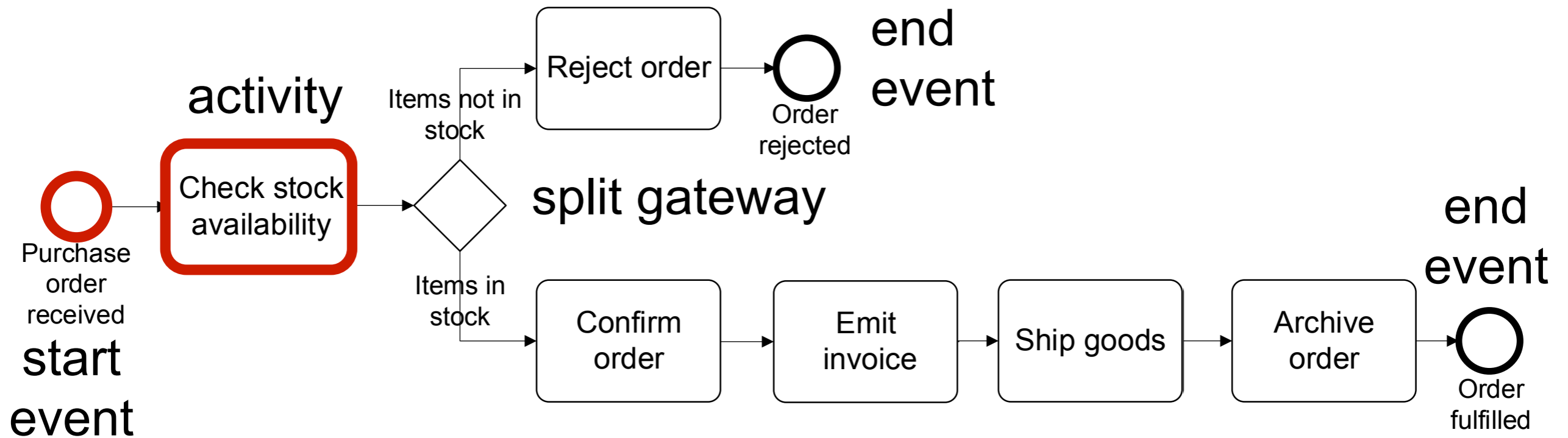
If the purchase order is confirmed, an invoice is emitted and the goods requested are shipped. The process completes by archiving the order or if the order is rejected.

Is this a process?

Is this a model? [UT]

BPMN Model

Order-to-cash



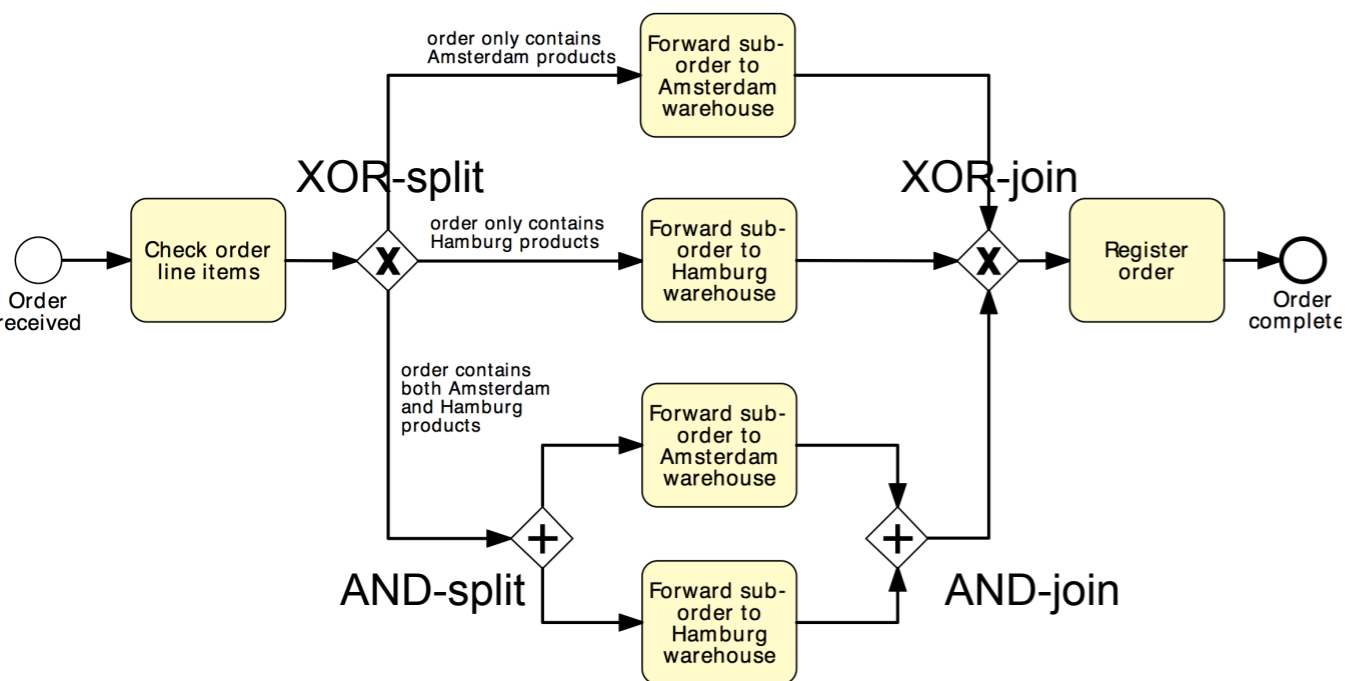
Naming conventions

- Event: noun + past-participle verb (e.g. insurance claim lodged)
- Activity: verb + noun (e.g. assess credit risk)

Alternative models for the very same process

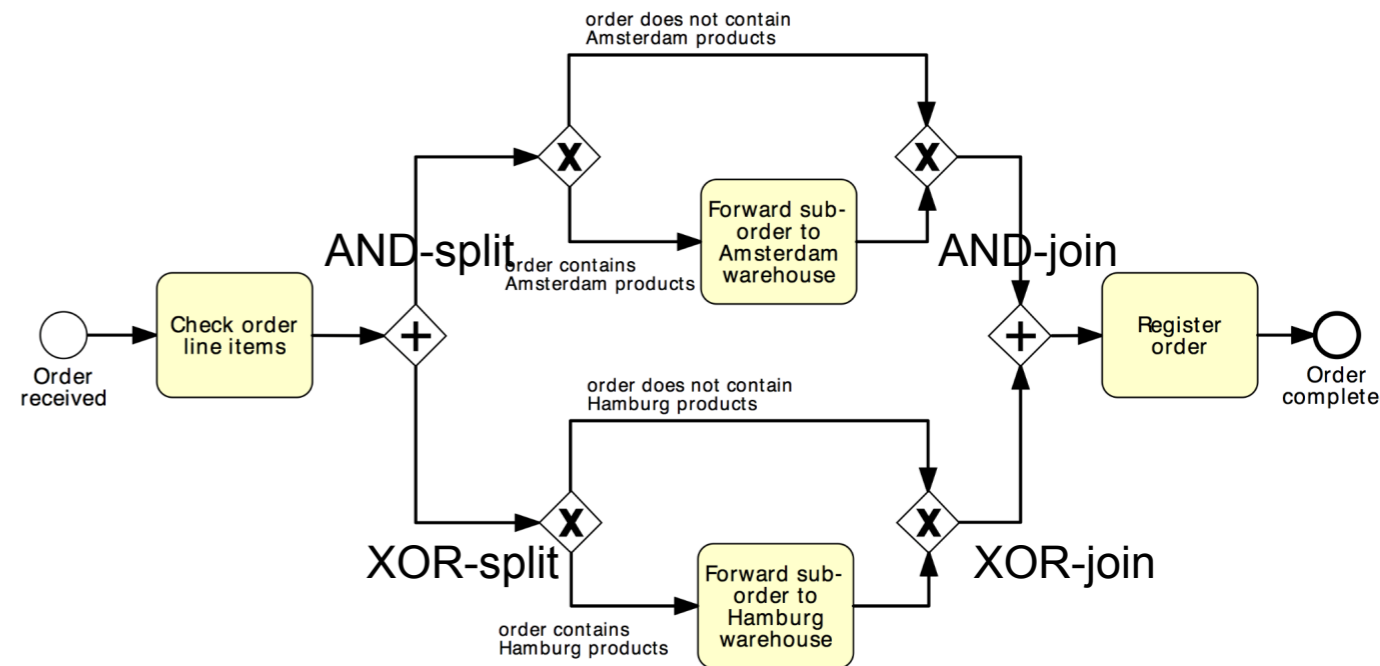
Solution 1

Order distribution process



Solution 2

Order distribution process



Activities

- Task**: A Task is a unit of work, the job to be performed. When marked with a symbol it indicates a Sub-Process, an activity that can be refined.
- Transaction**: A Transaction is a set of activities that logically belong together: it might follow a specific transaction protocol.
- Event Sub-Process**: An Event Sub-Process is placed into a Process or Sub-Process. It is activated when its start event gets triggered and can interrupt the higher-level process context or run in parallel (non-interrupting) depending on the start event.
- Call Activity**: A Call Activity is a wrapper for a globally defined Task or Process reused in the current Process. A call to a Process is marked with a symbol.

Activity Markers

Markers indicate execution behavior of activities:

- Sub-Process Marker
- Loop Marker
- Parallel MI Marker
- Sequential MI Marker
- Ad Hoc Marker
- Compensation Marker

Task Types

Types specify the nature of the action to be performed:

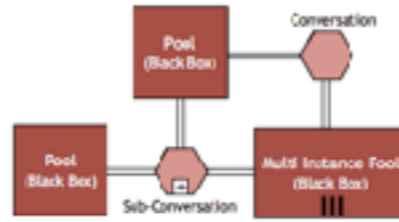
- Send Task
- Receive Task
- User Task
- Manual Task
- Business Rule Task
- Service Task
- Script Task

- Sequence Flow**: defines the execution order of activities.
- Default Flow**: is the default branch to be chosen if all other conditions evaluate to false.
- Conditional Flow**: has a condition assigned that defines whether or not the flow is used.

Conversations

- A Conversation defines a set of logically related message exchanges. When marked with a symbol it indicates a Sub-Conversation, a composite conversation element.
- A Call Conversation is a wrapper for a globally defined Conversation or Sub-Conversation. A call to a Sub-conversation is marked with a symbol.
- A Conversation Link connects Conversations and Participants.

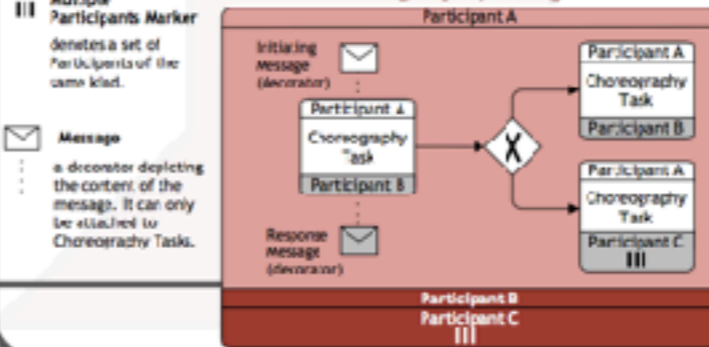
Conversation Diagram



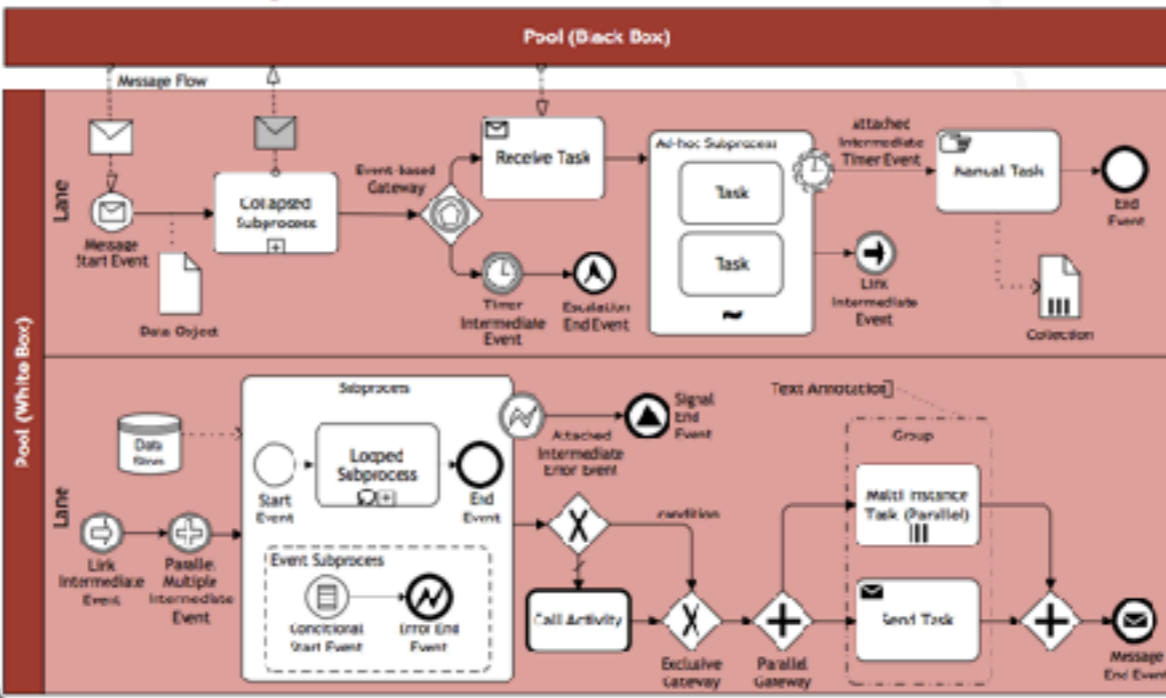
Choreographies

- Participant A**: Choreography Task
 - Participant B**: Call Choreography
 - Participant A**: Sub-Choreography
 - Participant A**: Call Choreography
- A Choreography Task represents an interaction (Message Exchange) between two Participants.
- A Sub-Choreography contains a refined choreography with several interactions.
- A Call Choreography is a wrapper for a globally defined Choreography Task or Sub-Choreography. A call to a Sub-Choreography is marked with a symbol.

Choreography Diagram



Collaboration Diagram



Events

	Standard	Start	Intermediate	End
None: Untyped events, indicate start point, state changes or final states.				
Message: Receiving and sending messages.				
Timer: Clock, timer events, points in time, time spans or timeouts.				
Escalation: Escalating to a higher level of responsibility.				
Conditional: Reacting to changed business conditions or integrating business rules.				
Link: Off-page connectors. Two corresponding link events equal a sequence flow.				
Error: Catching or throwing named errors.				
Cancel: Reacting to cancelled transactions or triggering cancellation.				
Compensation: Handling or triggering compensator.				
Signal: Signaling across different processes. A signal thrown can be caught multiple times.				
Multiple: Catching one out of a set of events. Throwing all events defined.				
Parallel Multiple: Catching all out of a set of parallel events.				
Terminate: Triggering the immediate termination of a process.				

Data

- A Data Object represents information flowing through the process, such as business documents, e-mails, or letters.
- A Collection Data Object represents a collection of information, e.g., a list of order items.
- A Data Input is an external input for the entire process. A kind of input parameter.
- A Data Output is data result of the entire process. A kind of output parameter.
- A Data Association is used to associate data elements to Activities, Processes and Global Tasks.
- A Data Store is a place where the process can read or write data, e.g., a database or a filing cabinet. It persists beyond the lifetime of the process instance.

Swimlanes

- Pools (Participants) and Lanes represent responsibilities for activities in a process. A pool or a lane can be an organization, a role, or a system. Lanes subdivide pools or other lanes hierarchically.
- Message Flow symbolizes information flow across organizational boundaries. Message flow can be attached to pools, activities, or message events. The Message Flow can be decorated with an envelope depicting the content of the message.
- The order of message exchanges can be specified by combining message flow and sequence flow.



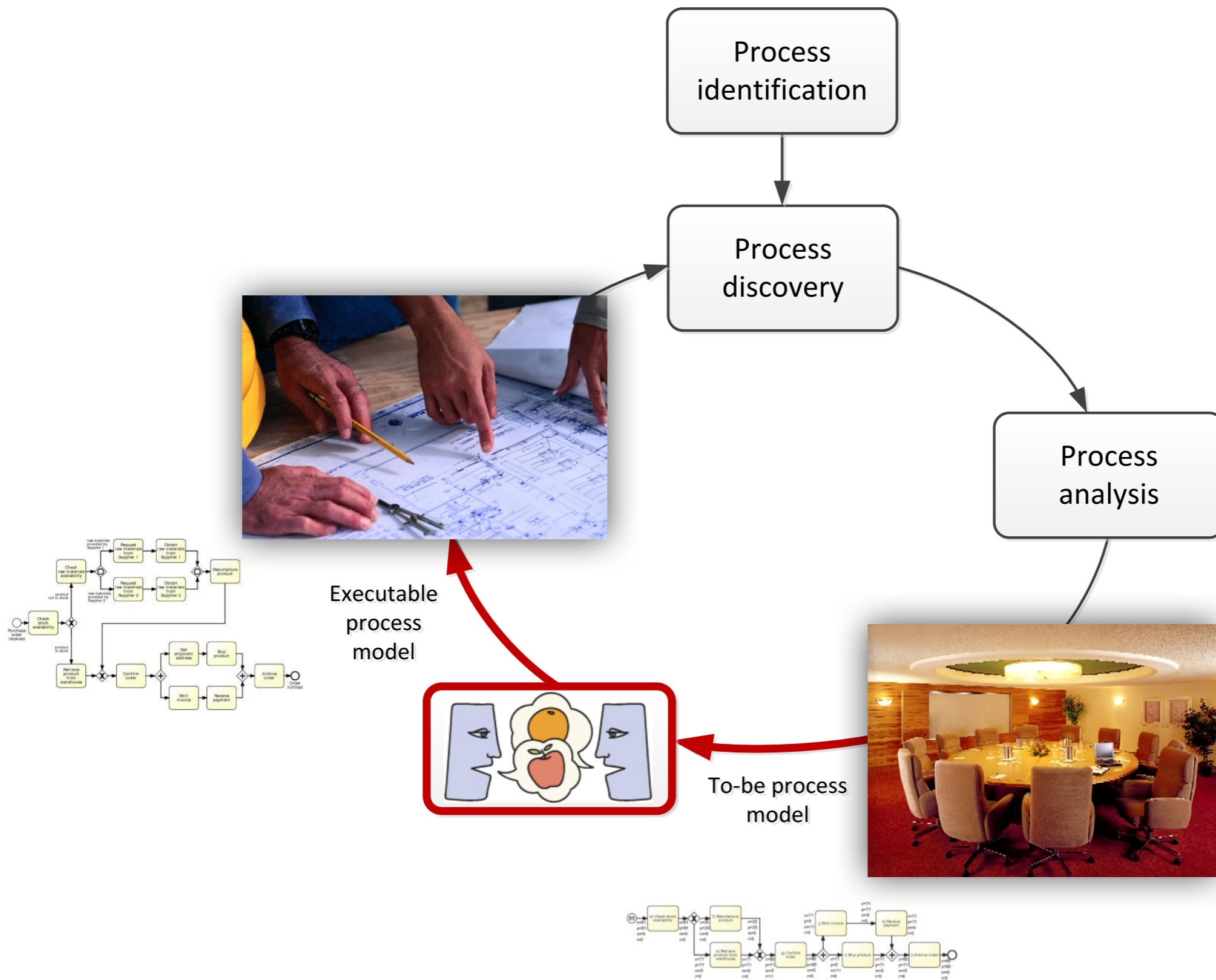
Modelling

VS

Executing



The well-known gap...



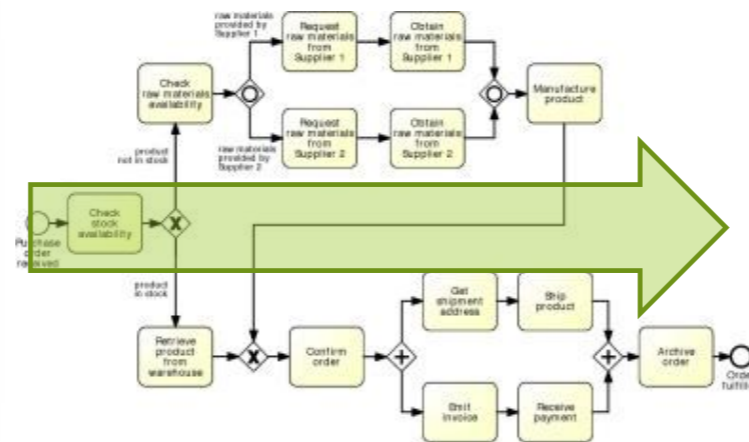
The result: two sides of the story

Conceptual “to-be” process models

- are made by domain experts
- provide a basis for communication amongst relevant stakeholders
- must be understandable
- must be intuitive and may leave room for interpretation
- contain purely a relevant set of process information

Executable process models

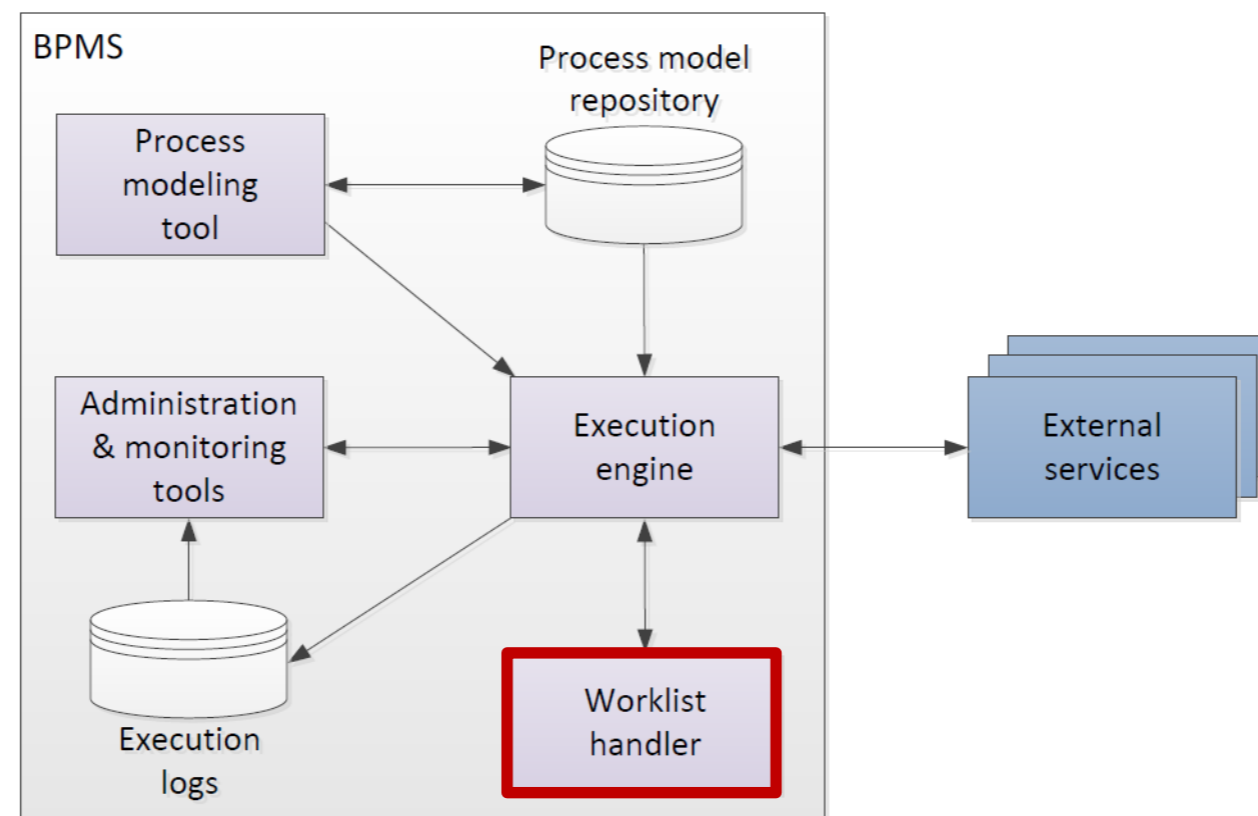
- are made by IT experts
- provide input to a process enactment system - BPMS
- must be machine readable
- must be unambiguous and should not contain any uncertainties
- contain further details that are only relevant to implementation



“to-be executed”
process model

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



Example worklist handlers

The screenshot displays the Bonita Portal interface. At the top, the browser address bar shows the URL: localhost:8080/bonita/console/homepage?tenant=1#?_p=tasklistinguser&_pf=1&_id=8&_f=available. The Bonitasoft logo is in the top left, and the user 'William Jobs' is logged in. The main navigation bar includes 'Tasks', 'Cases', and 'Apps'. A sidebar on the left shows task categories: 'To do', 'My tasks', 'Available tasks', 'Hidden', 'Done', and 'Apps'. The 'Apps' section is expanded, showing 'Help Desk' and 'Travel Request'. The main content area shows a task list with columns for 'Name' and 'Due date'. The selected task is 'Validate Travel Request' with a due date of 'In 51 min'. The detailed view of this task shows 'No description', 'Apps: Travel Request', and 'Due date: In 51 min'. It also displays 'Subtasks' and 'Done subtasks' sections, both with 'No data'. A 'Comments' section at the bottom has a text input field and an 'ADD COMMENT' button.

Bonita Soft Bonita Open Solution

[UT]

Example monitoring & administration tools

The screenshot displays the IBM BPM Process Portal interface. The top navigation bar includes the user name 'Lombardi', the title 'Process Portal', and user options like 'Welcome, kolban', 'Help', 'Preferences', and 'Log Off'. The left sidebar contains a navigation menu with sections like 'My Tasks' (Inbox, History, Help Requests, Alerts, All Tasks) and 'My ScoreBoards' (My Performance, My Team Performance, Process Performance, SLA Overview, Ad-Hoc Reports). The main content area is titled 'PM Process Analysis : My Performance' and includes filters for 'Team Filter' (All the Teams I belong to) and 'Process Filter' (All). It features two charts: 'Task Status' showing 100.00% overdue tasks, and 'When will Tasks go Overdue' showing a timeline from 9/23 to 9/30 with 'No Data'. Below the charts is a table of tasks with columns for Status, Id, Subject, Priority, Due Date, Current User, Team, and Run. The table lists three overdue tasks. At the bottom, there are two more charts: 'Your Performance vs Team Average' comparing 'kolban' and 'Team Average' on 'Completed' and 'Active' task counts, and 'Your Performance Trend' showing a performance trend from 9/8 to 9/22.

Task Status

100.00% overdue

When will Tasks go Overdue

Axis Label

100
50
0

9/23 9/24 9/25 9/26 9/27 9/28 9/29 9/30

No Data

Click Pie Slice to see the tasks in that status. Or click All.

Showing all tasks for AdHoc1 process, Alert BPD process, Fulfillment Process process, P1 process, Qucik Success Process process, Service Request process

Status	Id	Subject	Priority	Due Date	Current User	Team	Run
Overdue	67	Task: Submit Request	Normal	09/14/2010		All Users	▶
Overdue	120	Task: Escalation	Normal	09/14/2010		All Users	▶
Overdue	285	Step: Untitled1	Normal	09/21/2010		All Users	▶

Your Performance

Performance over the last 7 days vs average performance of the other members.

Your Performance vs Team Average

Task Count

2.0
1.5
1.0
0.5
0.0

Completed
Active

kolban Team Average

Your Performance Trend

Task Count

2.0
1.5
1.0
0.5
0.0

Completed
Active

9/8 9/9 9/10 9/11 9/12 9/13 9/14 9/15 9/16 9/17 9/18 9/19 9/20 9/21 9/22

Perspective
IBM BPM Pro

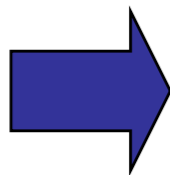
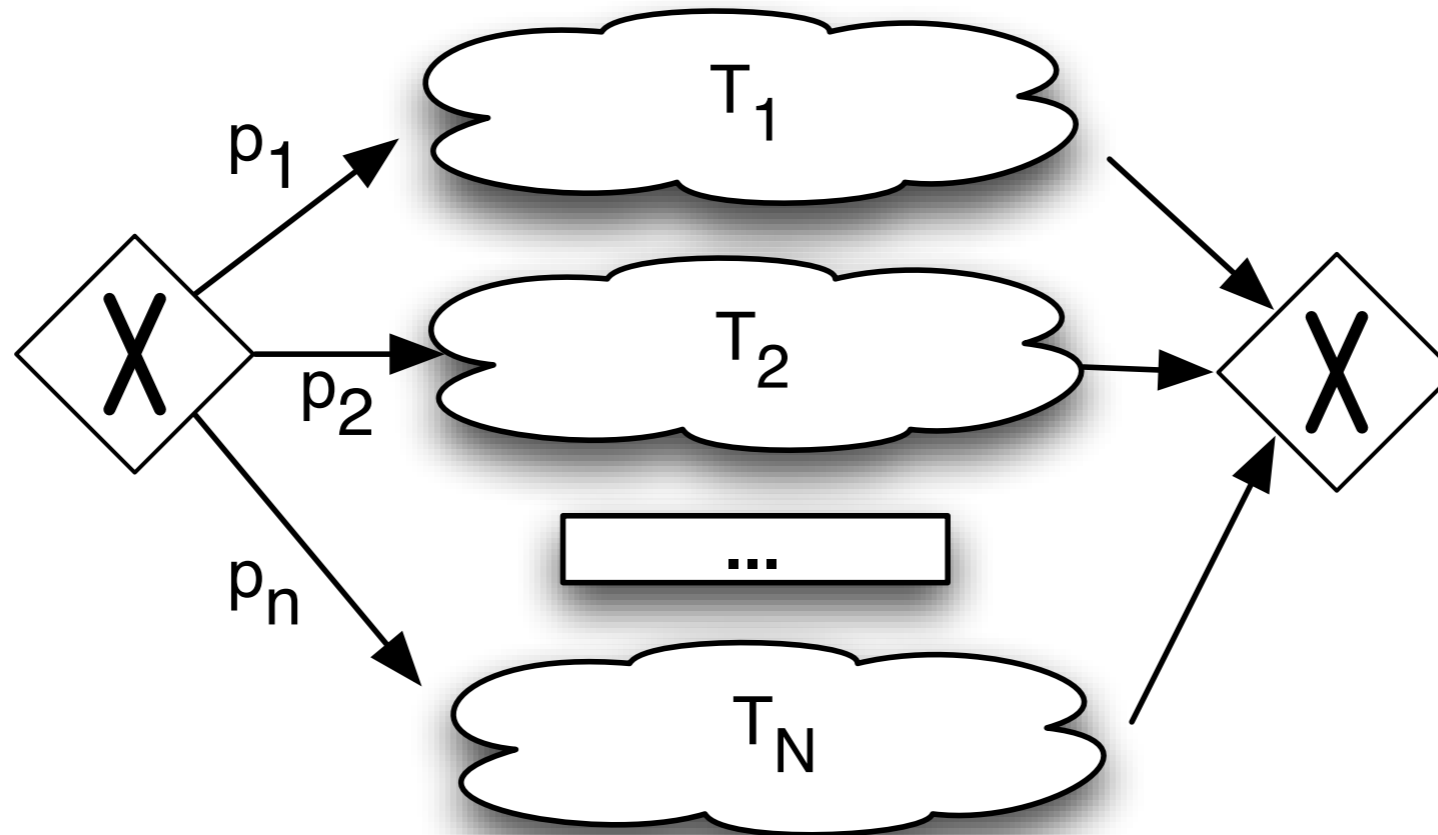
Simulating

Business

Processes



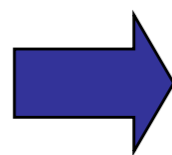
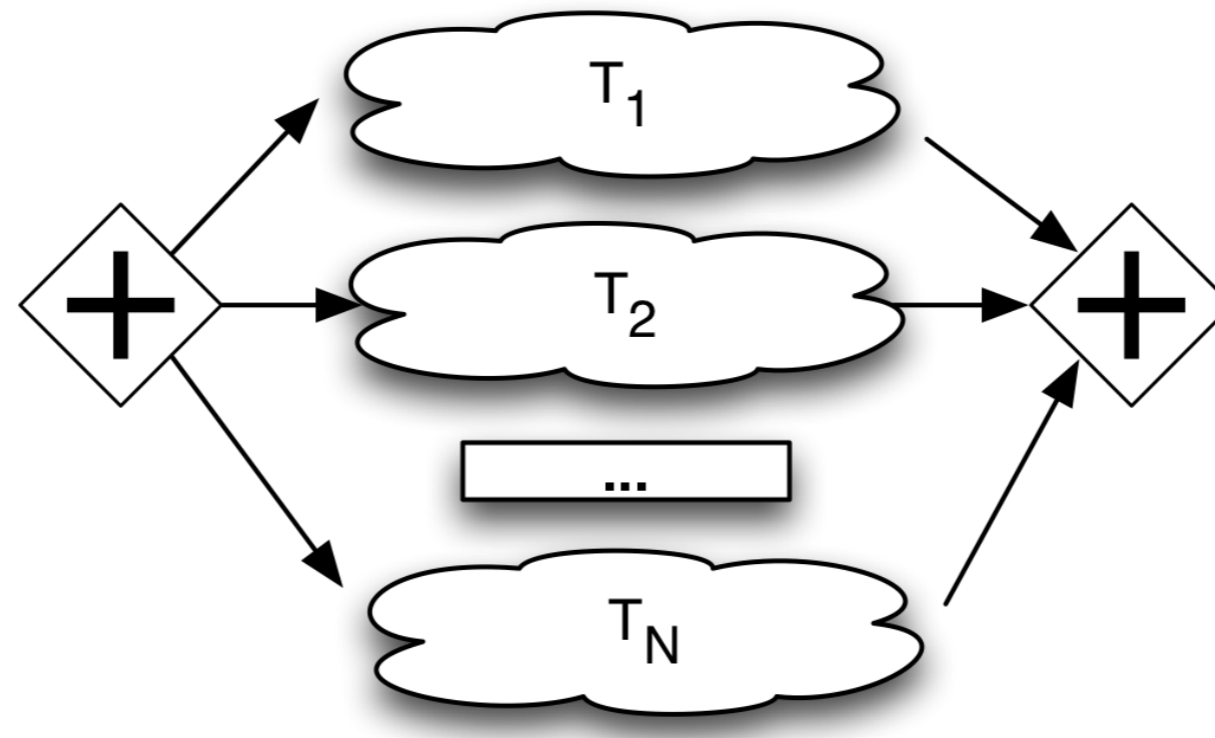
Alternative Paths



$$CT = p_1 T_1 + p_2 T_2 + \dots + p_n T_n = \sum_{i=1}^n p_i T_i$$

Parallel Paths

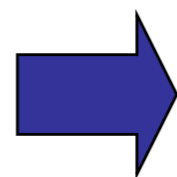
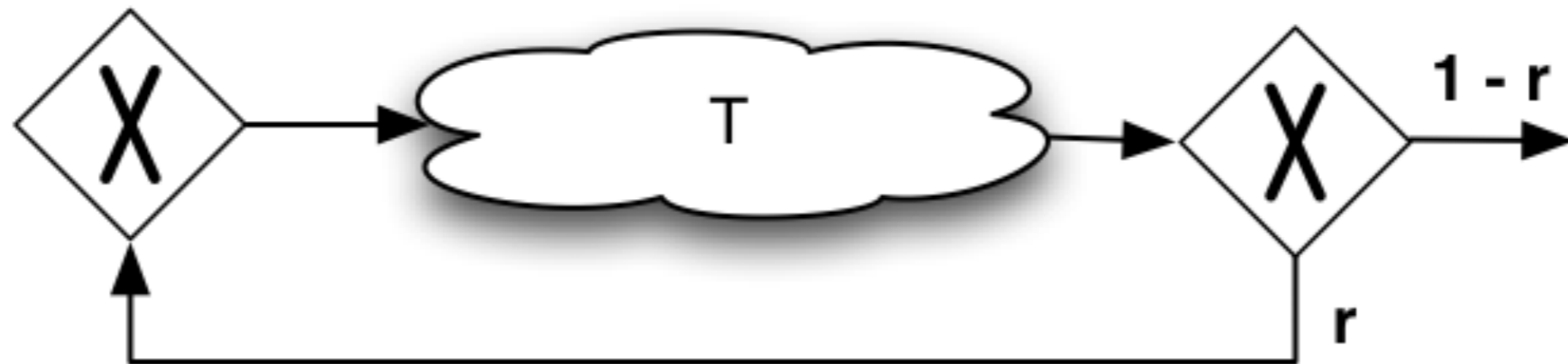
- If two activities related to the same job are done in parallel the contribution to the cycle time for the job is the maximum of the two activity times.



$$CT_{\text{parallel}} = \text{Max}\{T_1, T_2, \dots, T_M\}$$

Rework

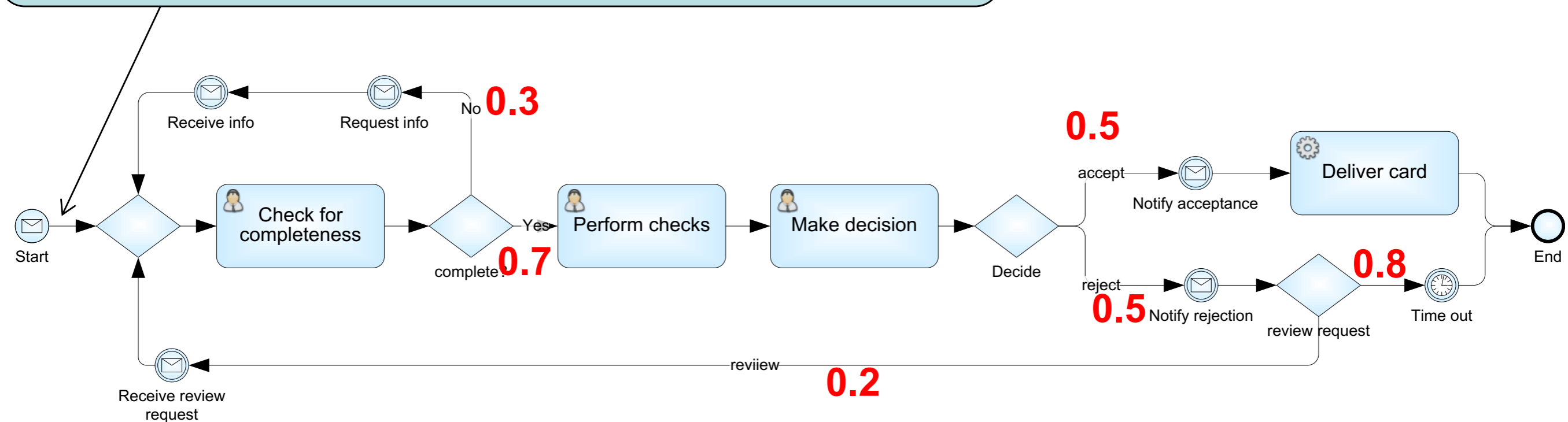
- Many processes include control or inspection points where if the job does not meet certain standard, it is sent back for rework



$$CT = T/(1-r)$$

Arrival rate and branching probabilities

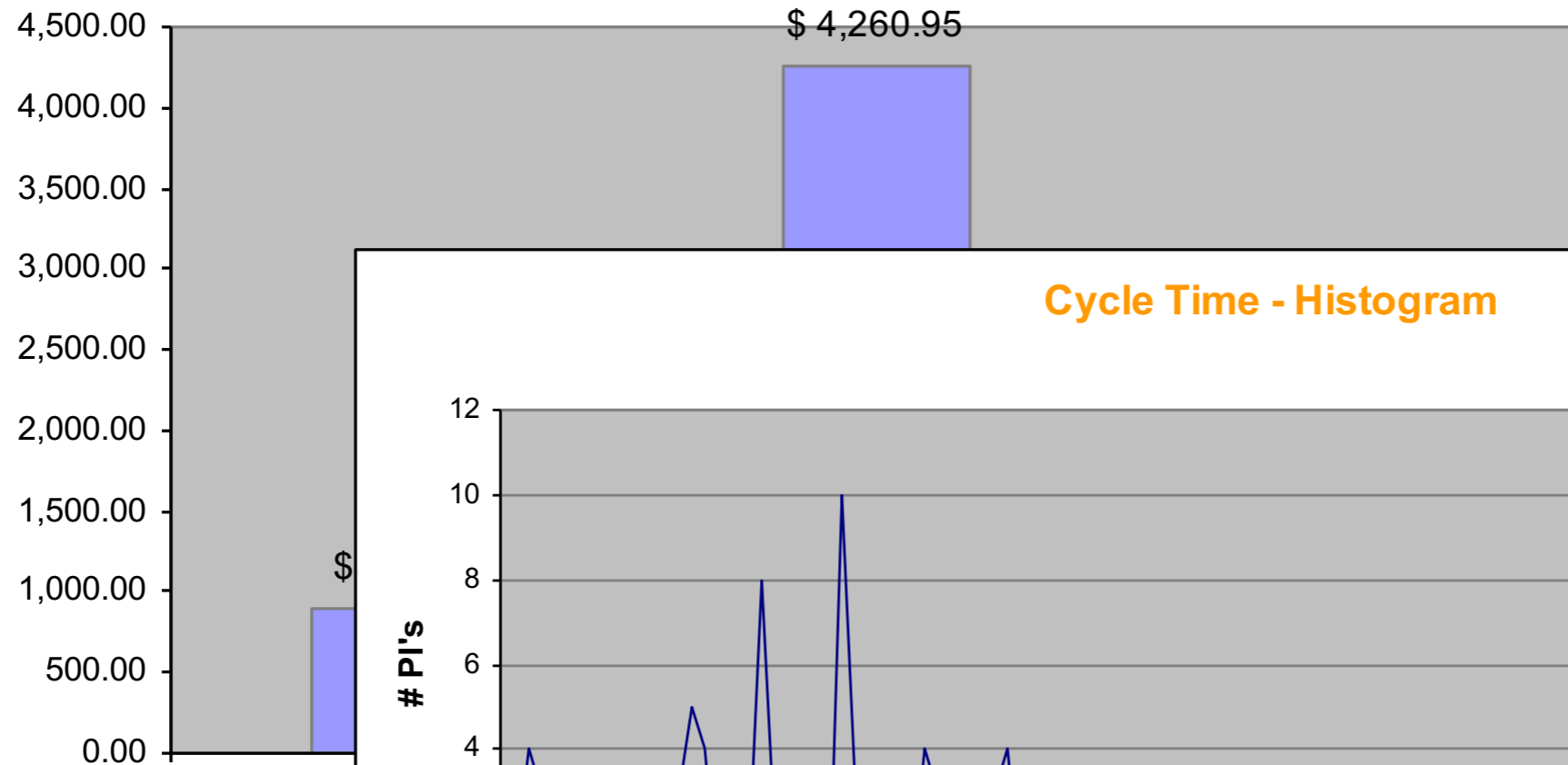
10 applications per hour (one at a time)
Poisson arrival process (negative exponential)



Alternative: instead of branching probabilities one can assign “conditional expressions” to the branches based on input data

Simulation output: KPIs

Resource Cost



Cycle Time - Histogram

