

University of Pisa

MSc in Computer Engineering

# Systems for Strategic Management and Support

## LECTURE 14

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

Mario G.C.A. Cimino

Department of Information Engineering

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

S320 Question to solve, how to show: (REMEMBER JUST SOME OF THEM)

- Branching?
- Optional steps?
- The role played by systems or mechanisms such as the IVR: when we hand off control of the system, when the system is used to support an activity, but is not given control?
- Interaction with other processes?
- The appropriate level of detail?
- Activities spanning multiple swimlanes (e.g.conversation)?
- Steps that do not happen in a particular order but must all be completed before a subsequent step can begin?
- Steps that interact continuously, or iterate?
- Steps triggered by the clock?
- Steps carried out by an actor with a very small role in the workflow?

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

(Some advices for who already knows the BPMN)

S321

- **Actor** can appear from top to bottom in an order that makes sense: order of appearance (default), starting from the busier actor (to highlight the points of the flow with main participants), according to their physical position (in *Lean* practice, to limit “up-and-down”)

S322

A default order related to the type:

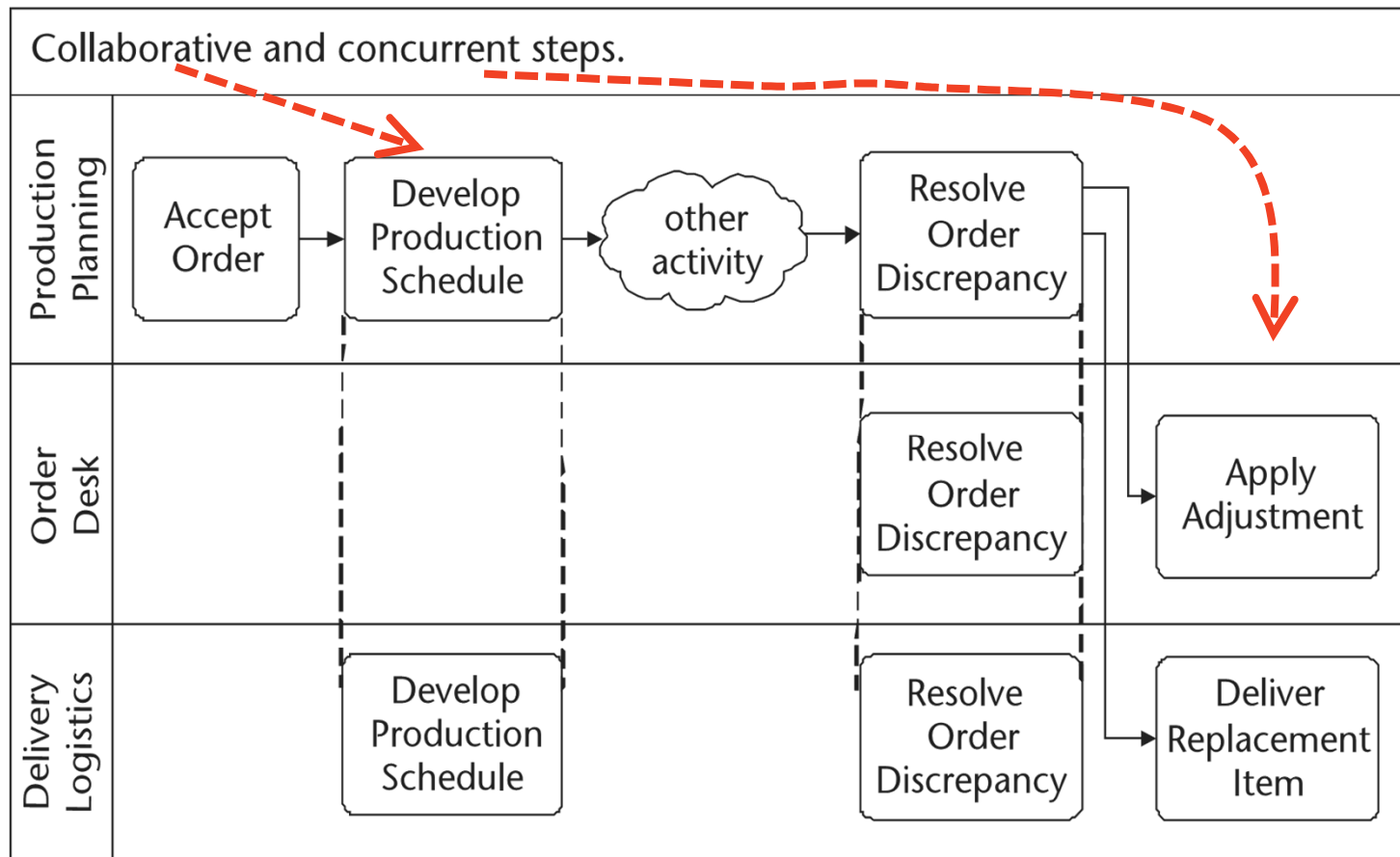
1. Customers
2. Core Actors,
3. Supporting Actors,
4. Other Processes,
5. Holding areas,
6. Systems and mechanisms (machinery, equipment,...)

Default sequence of different types of actors.	
Customer(s)	
Core actors	
Supporting actors	
Other processes	
Holding areas	
Systems & mechanisms	

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

- S323 • Do not confuse collaborative work with concurrent (parallel) work: in a collaborative step, the actors are working together on the same step, while in concurrent work they are working independently on separate tasks.

(REMEMBER JUST THE LAYOUT)

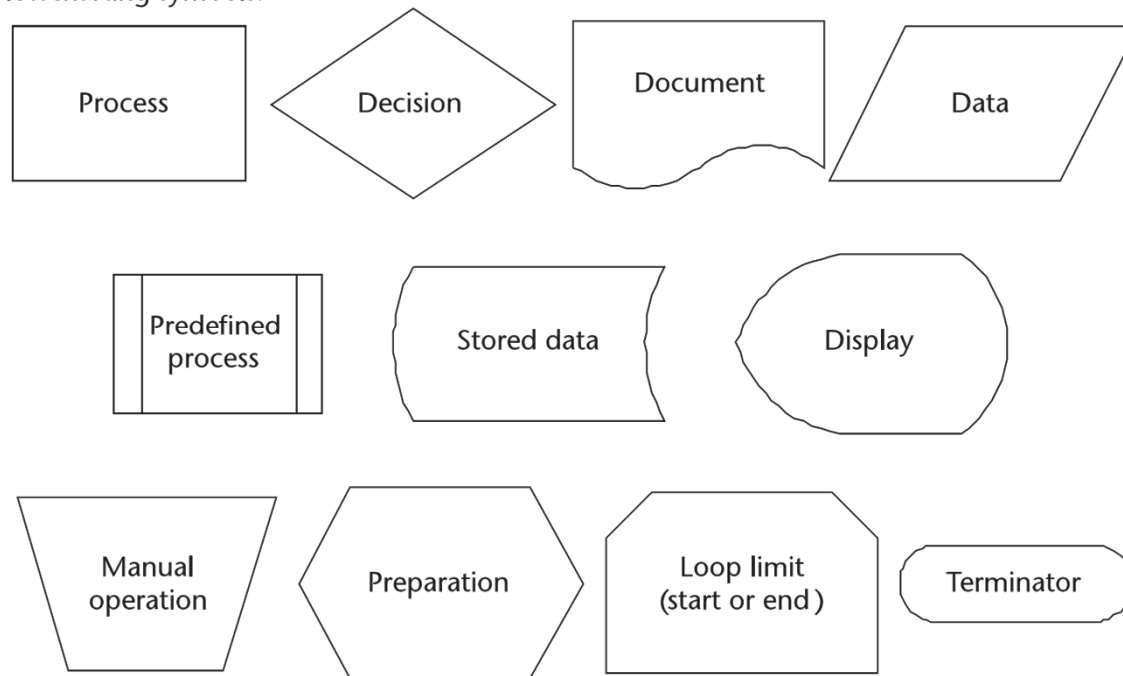


### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

- S324 • Avoid notations used for modeling specialized processes (e.g. software engineering, industrial engineering).
- S325 • Swimlane diagram aims at the key aspect of the process (the flow of work): anything else distract attention, add noise, not information.
- S326 • Workflow modeling needs the participation of a large range of people: avoid overformalization with IT flowcharts.

Flowcharting symbols.



### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

#### S327 Which steps to include?

- S328 • An actor might tell you about many activities is responsible for, but you are modeling a specific process, from trigger to result
- S329 • The process usually traces a single work item or “package” of work items, such as a service problem, an order, an engineering upgrade, a building permit request, an item being manufactured, a material requisition, a replacement part.
- S330 • Any activity that “holds” one of these work items should be part of the process, whether it adds value or not to the process. It may introduce delay, move the work along, subtract value.

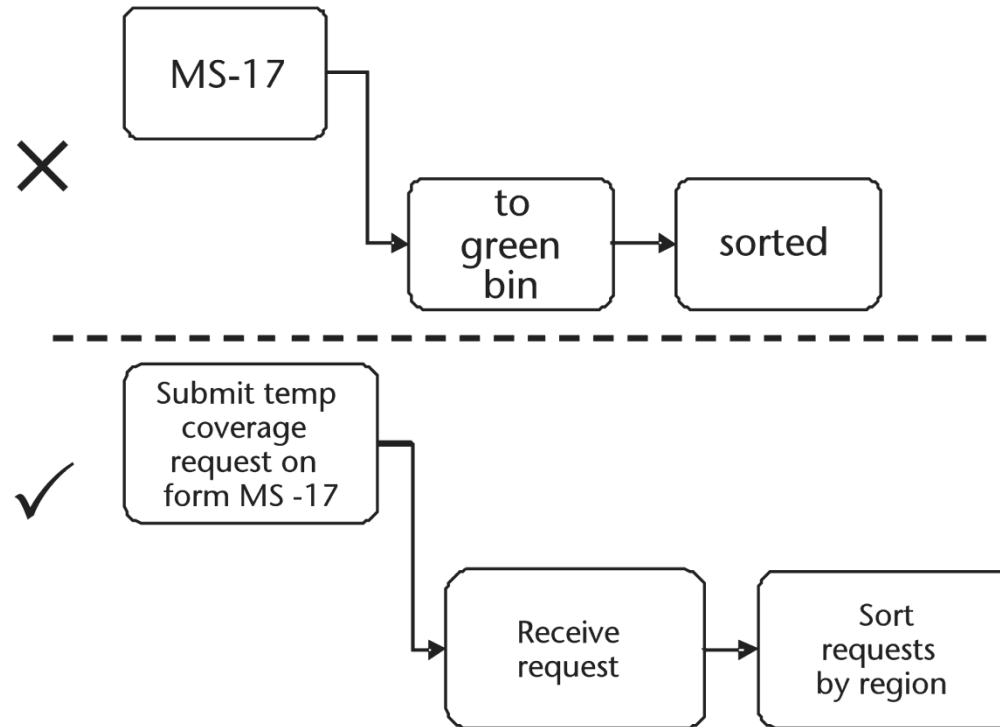
#### S331 Guidelines for naming process steps

- S332 • Avoid cryptic step names. Follow the same guidelines for naming a process (*verb-noun* or *verb-object* format) with additional detail.
- S333 • The step name should convey the result achieved by the step, if flip the verb-noun format.

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

S334



S335 • Basic structure:

- + Action verb (assign, validate, sort,...)
- + Optional qualifier (initial, replacement,...)
- + Noun(s) (service request, payment,...)
- + Optionally, information on how (by form, by fax,...)

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

- S336 • Remind, the name is not:
  - an area or function such as *titling, accounting, inventory*
  - an event or result such as *claim arrives, claim is registered*
  - a state such as *sorted*
  - based on mushy verbs or jargon

#### S337 **Flow**

- S338 • Is the passing of work from one step to another. The next step cannot start until the previous step has been completed.
- S339 • A handoff is a special kind of flow where the work passes from one actor to another. It is often a place of delay, errors, expenses.



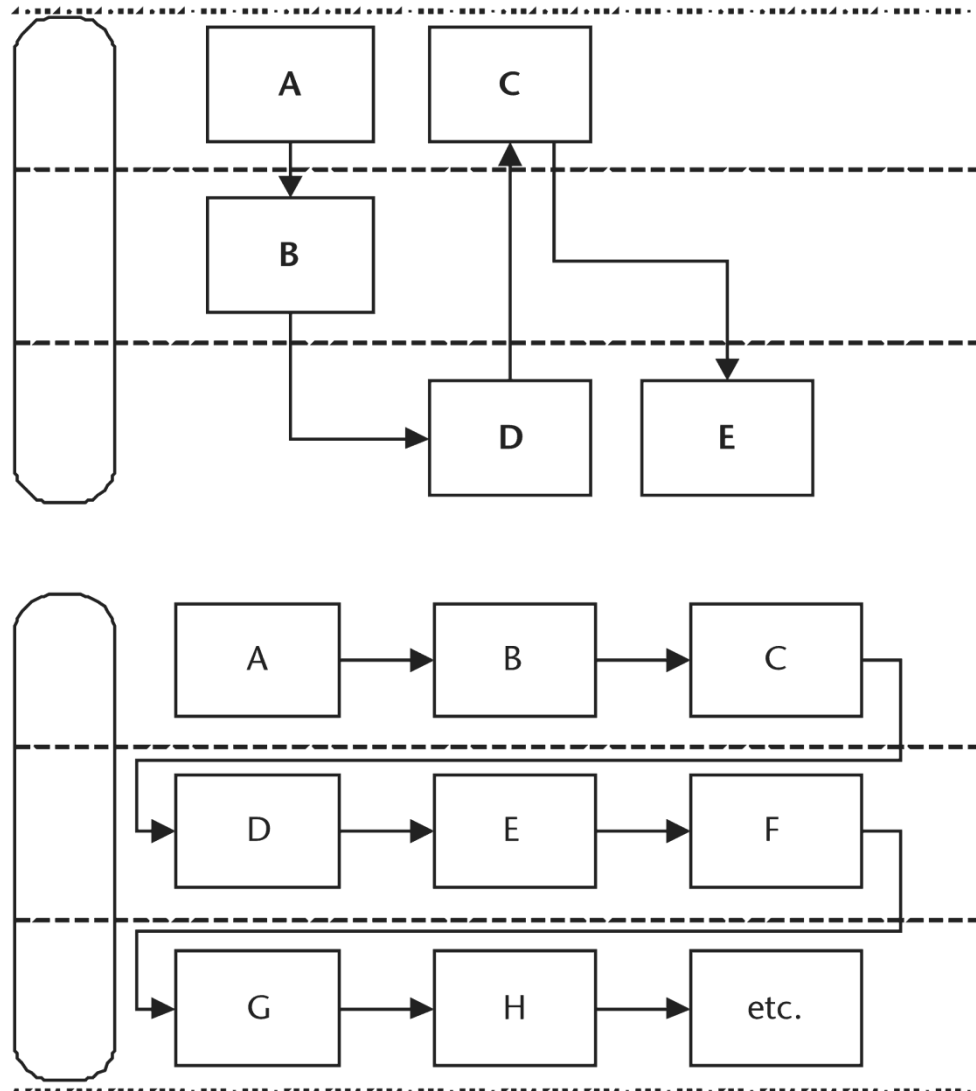
### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

S340 • Avoid the layouts represented Figure:

S341 The objective of a workflow diagram is to graphically show sequence, dependency, time.

S342 The objective is **not** to save paper



### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

- S342
- Distinguish the concepts of *data flow* and *work flow*.
  - When data flow is superimposed on a workflow model, the latter is not so evident any more

S343

*Data Flow* -

data from Provide Quote is used by Issue Invoice



*Work Flow* -

various steps between Provide Quote and Issue Invoice

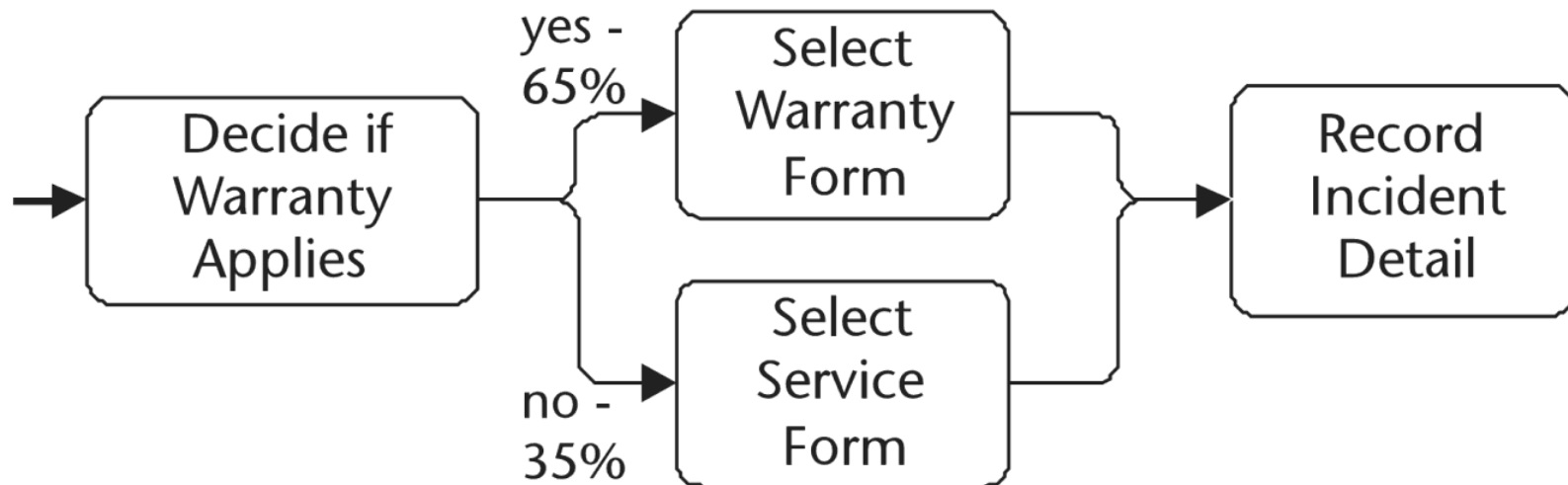


### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

S344 *Exclusive flows*, key points:

- S345 • the decision is computed before the diamond, use a dedicated step for this: *decide/determine if...*
- S346 • label each branch to indicate which decision outcome will follow that path, along with statistics if appropriate

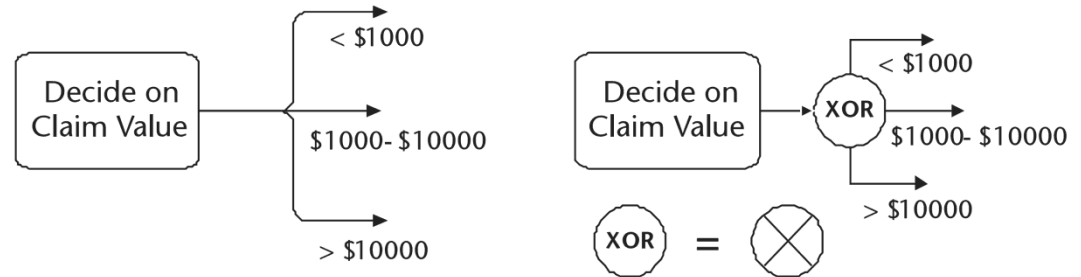


Showing decisions (conditional flows).

# III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

- S347 • Parallel and conditional outgoing flows: an example of notation

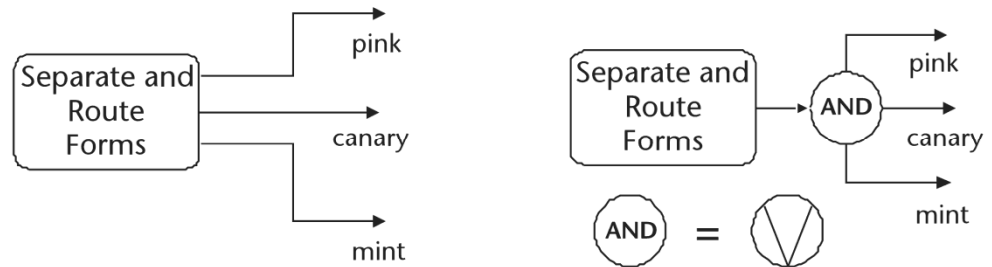
Exactly one flow path



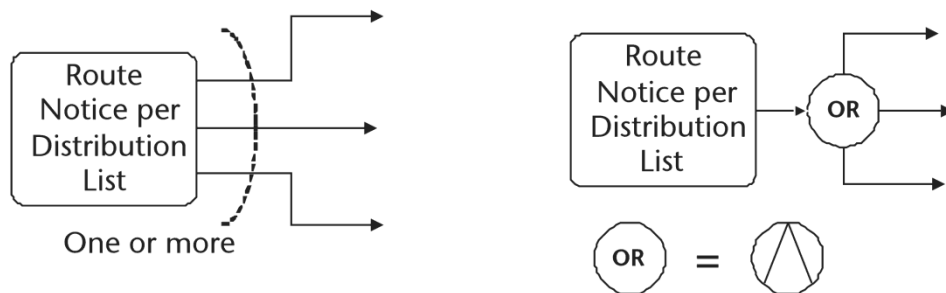
(REMEMBER THE BPMN VERSION)

- S348 • This notation is used to show the same concept in a different shape. However, use BPMN!

All flow paths



One or more flow paths



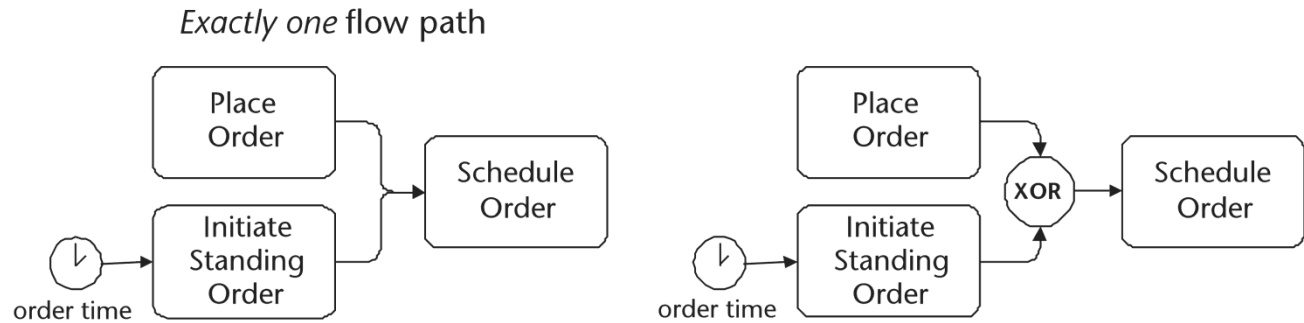
(REMEMBER THE BPMN VERSION)

An alternative for illustrating different types of branching.

# III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

- Parallel and conditional ingoing flows: an example of notation

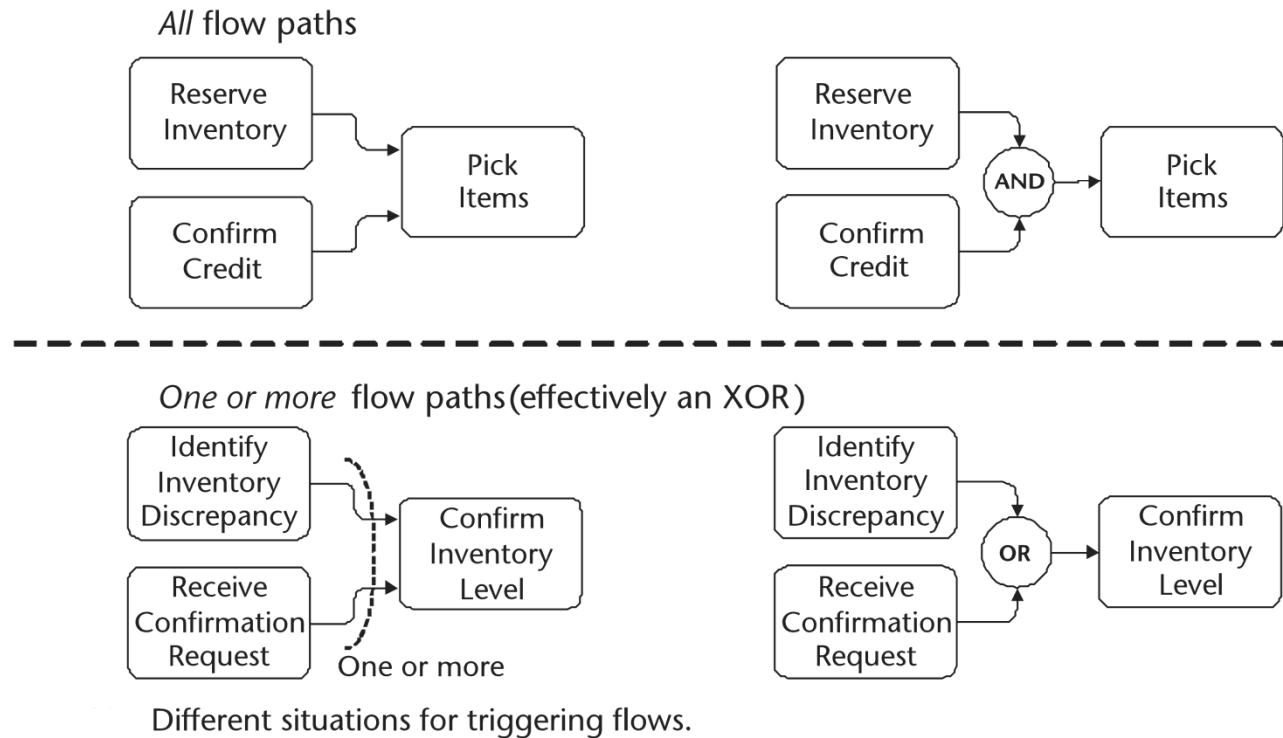
S349



(REMEMBER THE BPMN VERSION)

S350

- This notation is used to show the same concept in a different shape. However, use BPMN!



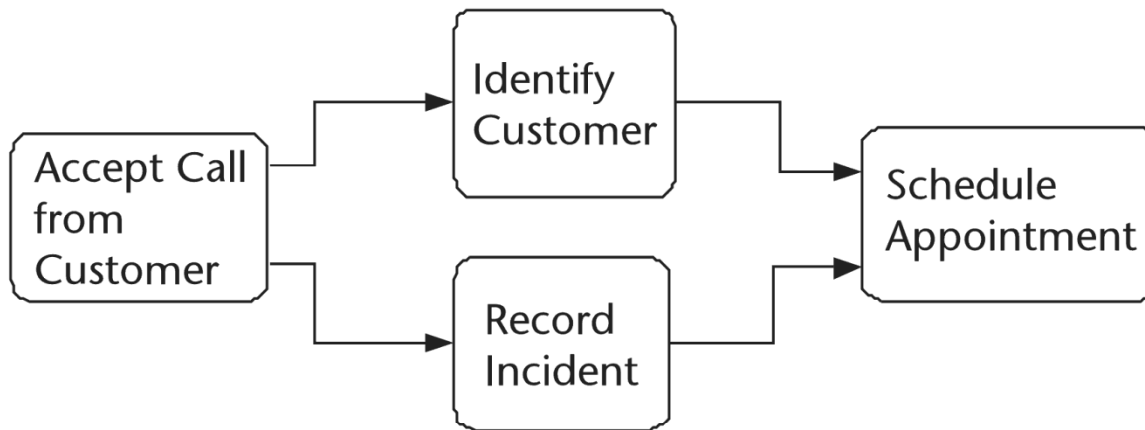
(REMEMBER THE BPMN VERSION)

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

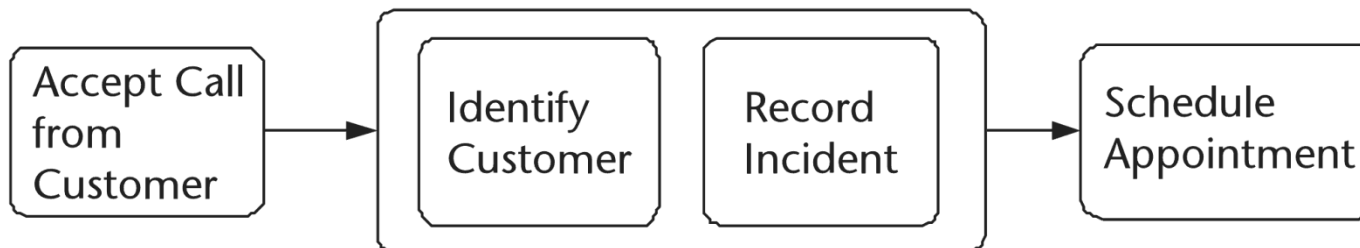
---

S351

- Some steps do not happen in any prefixed sequence



*Or...*



(REMEMBER THE BPMN VERSION)

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

#### S352 Managing progressive details:

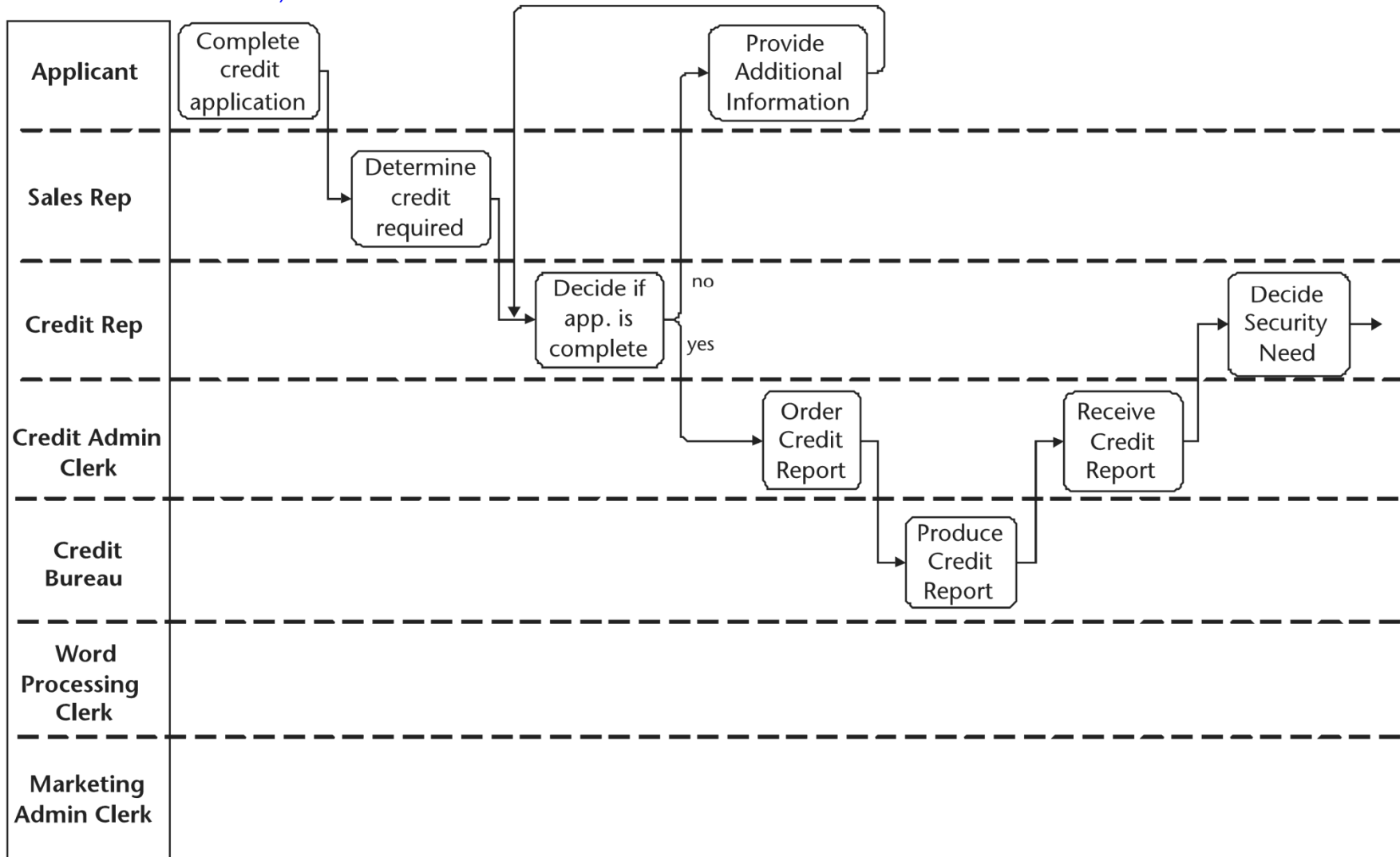
- S353 • To avoid facing with unmanageable complexity, do not jump immediately into modeling minute details instead of building layers of progressively detailed models: overall process map → business processes → sub-processes → process step.
- S354 • Save your energy by avoiding **the curse of detail**: if you add more and more detail, seemingly unable to stop, your project will be canceled and you will never get to work on the *to-be* process!
- S355 • There are three levels of a workflow diagram:
  - Level 1 or *handoff-level* diagram (i.e., the flow of work)
  - Level 2 or *service-level* diagram (related to SOA and BPM)
  - Level 3 or *task-level* diagram (rarely used)

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

S356

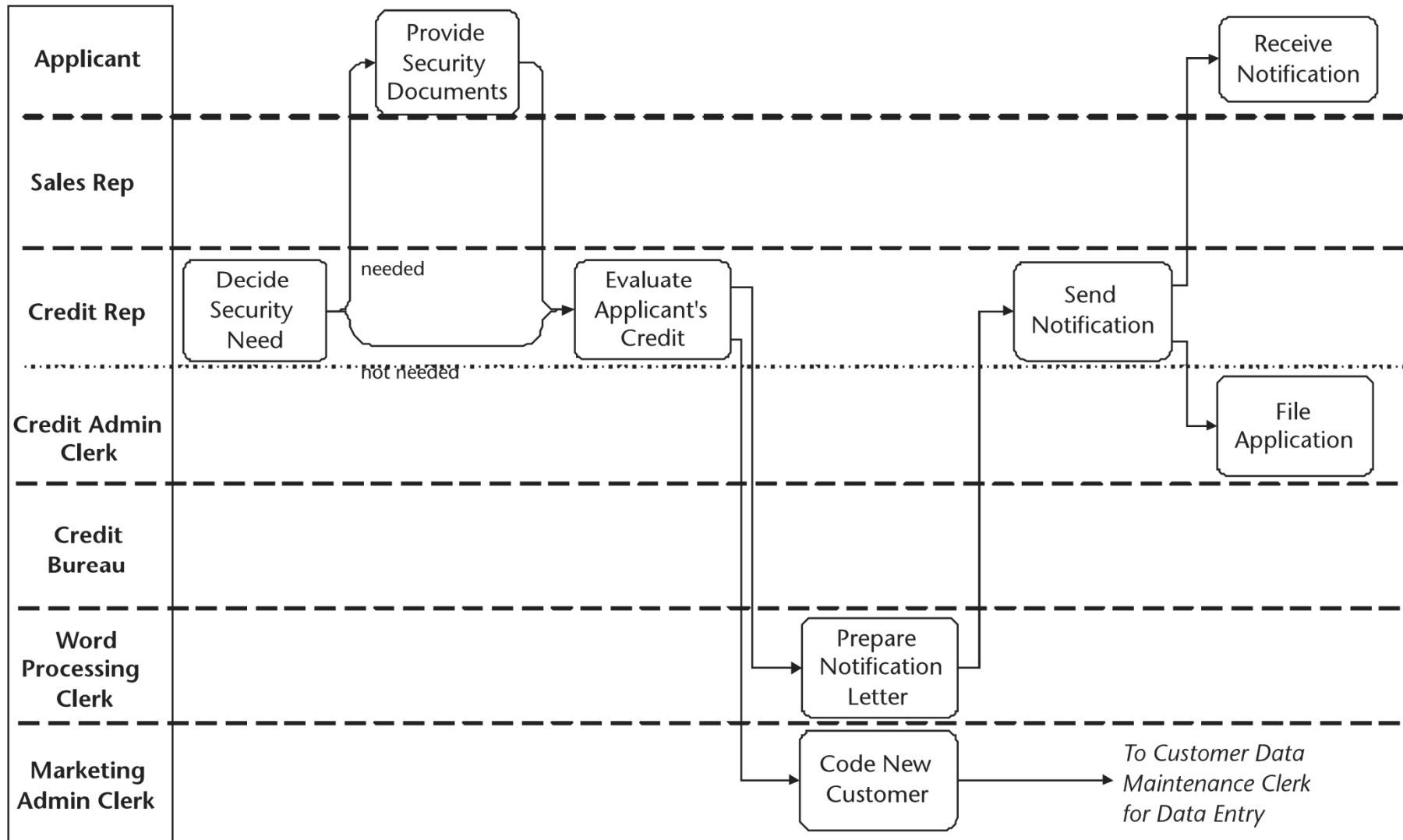
- An example of workflow model segmented into two sub-diagrams

(REMEMBER JUST THE LAYOUT)





### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS



### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

S357 **Handoff diagram:**

- S358 • It makes the overall structure in which each step summarizes the actor's involvement at a specific time in a process: whenever an actor does a lot or a little of work, draw *one* box and *move on*.
- S359 • The visual distinction in terms of relative amount of work becomes apparent with the service diagram
- S360 • Simplify steps, not actors. Handoff diagram is important to highlight “delay, errors and expenses”. It makes “yo-yoing” immediately evident, in contrast with a detailed diagram.

### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

“I’m Too Important to Be Just One Box!”

Consider a real example. The manager of a retail store had many responsibilities at the end of the day, including balancing the day’s receipts against the records in the system and then preparing the bank deposit. This was a considerable amount of work, comprising many individual steps, and was often stressful as well. However, it showed up as just a single box on the handoff level swimlane diagram. Adjacent to it was a box of the same size that represented just a few moments of work for the sales assistant who signed a form witnessing that the deposit bag had been placed in the safe. Understandably, the store manager was a little miffed by this apparent trivializing of their contribution, so we had to explain (again) carefully that this part of the workflow model would soon be expanded, while the adjacent step would stay the same.

- S361 • We can deal with this situation during the introduction of a modeling session.
- S362 • Show a service-level diagram to introduce swimlane diagram, and then show a handoff-level diagram to explain that onw of this will be built first, to establish the overall flow

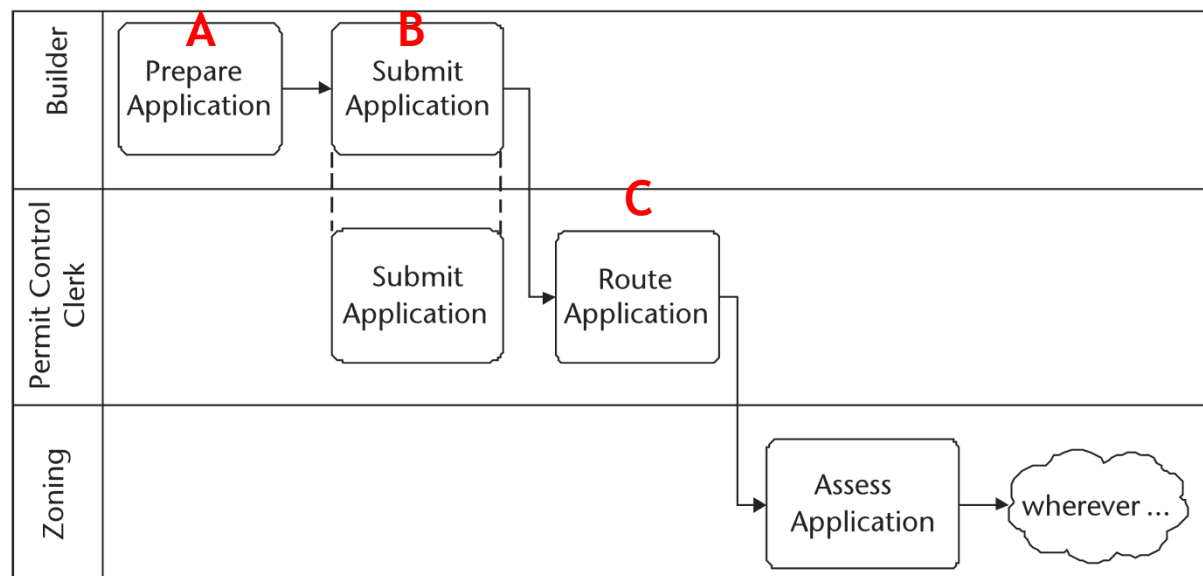
### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

- S363 • The example below appears to violate the rule about reducing all contiguous work by an actor to a single box
- S364 • It is right, because A and B (or, A and C) is not *contiguous* work done by *one* actor: it is non-contiguous work done by separate actors.
- S365 • Non contiguous because there could be other work between Prepare Application and go to City Hall to Submit it

S366

(REMEMBER JUST THE LAYOUT)



### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

S366

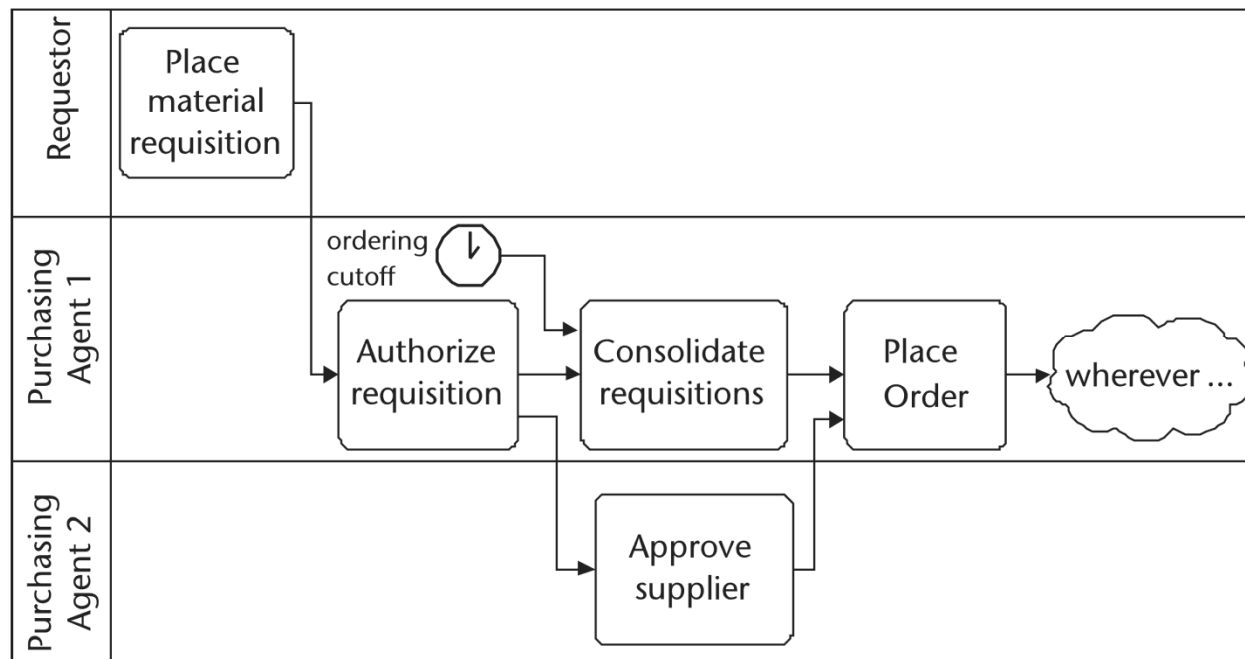
- In the example below, we have three adjacent steps performed by the same actor.

S367

- Again, it is right because the work is not contiguous: the second step is a separate activity that is not started until some temporal event happens; the third activity is also waiting for the “Approve Supplier “ step to complete.

S368

(REMEMBER JUST THE LAYOUT)



### III) PROCESS WORKFLOW MODELS: THE ESSENTIALS

---

S369

#### When to stop modeling

- S370 • You can stop modeling the *as-is* process as soon as you are able to understand why the process behaves the way it does
- S371 • This can happen at the handoff level, if something like a timing issue, convoluted workflow, or bottleneck is identified as the root cause of performance problem
- S372 • Usually we have to proceed to a second-level diagram.