Activity diagrams

Larman Chapter 28

UML Activity diagrams

Make a quick research:

How can we use them?

What is the most common usage of activity diagrams?

Drawing Activity Diagrams

Purpose:

– to model a business process

– to describe a function of a system represented by a use case
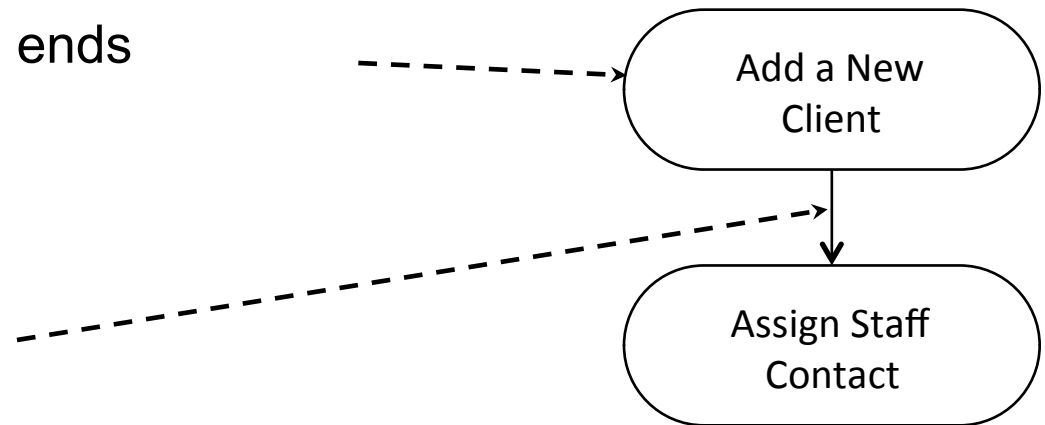
– to describe the logic of an operation

Notation of Activity Diagrams

- **Activities**
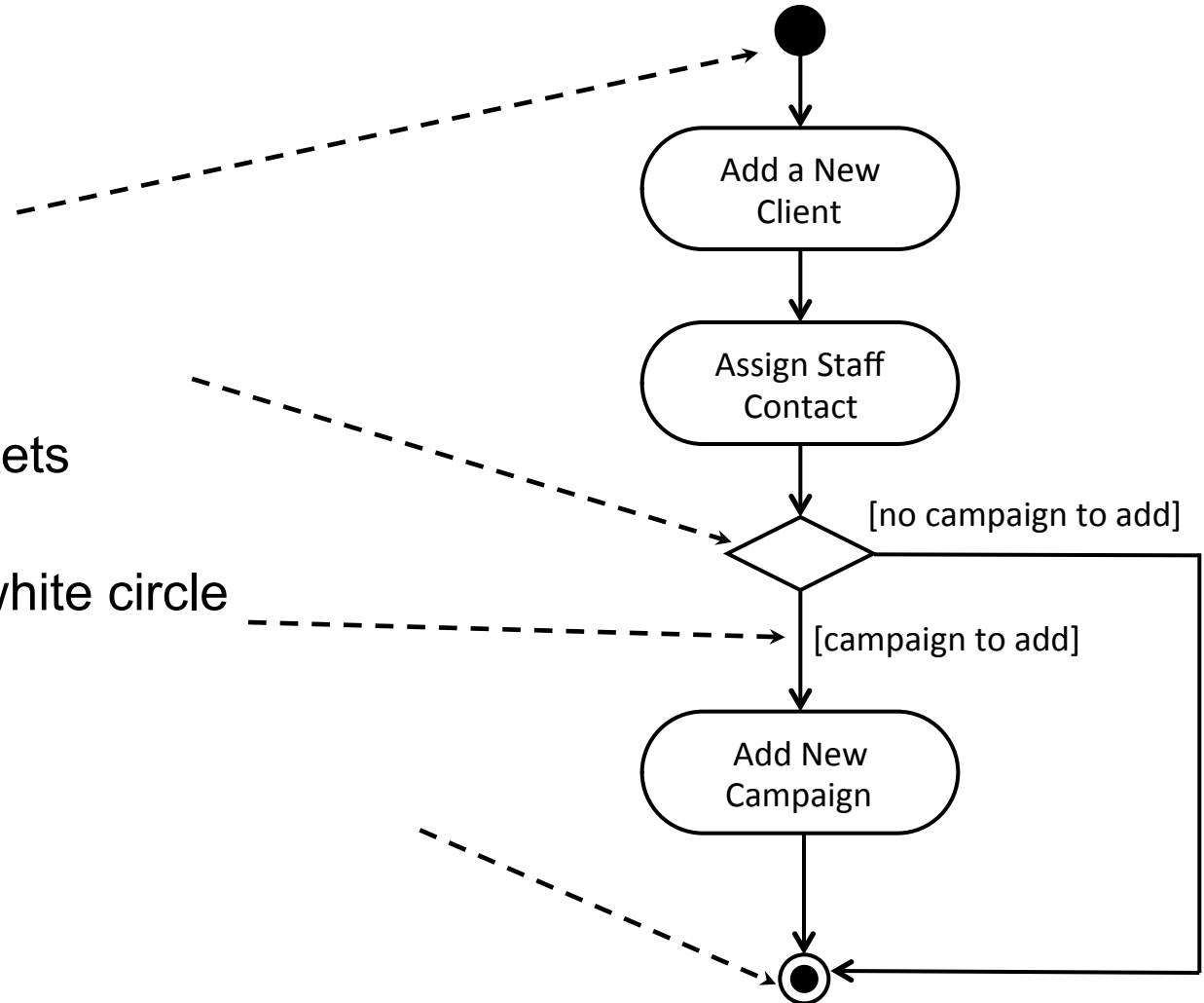 - rectangle with rounded ends
  - meaningful name

- **Transitions**
  - arrows with open arrowheads

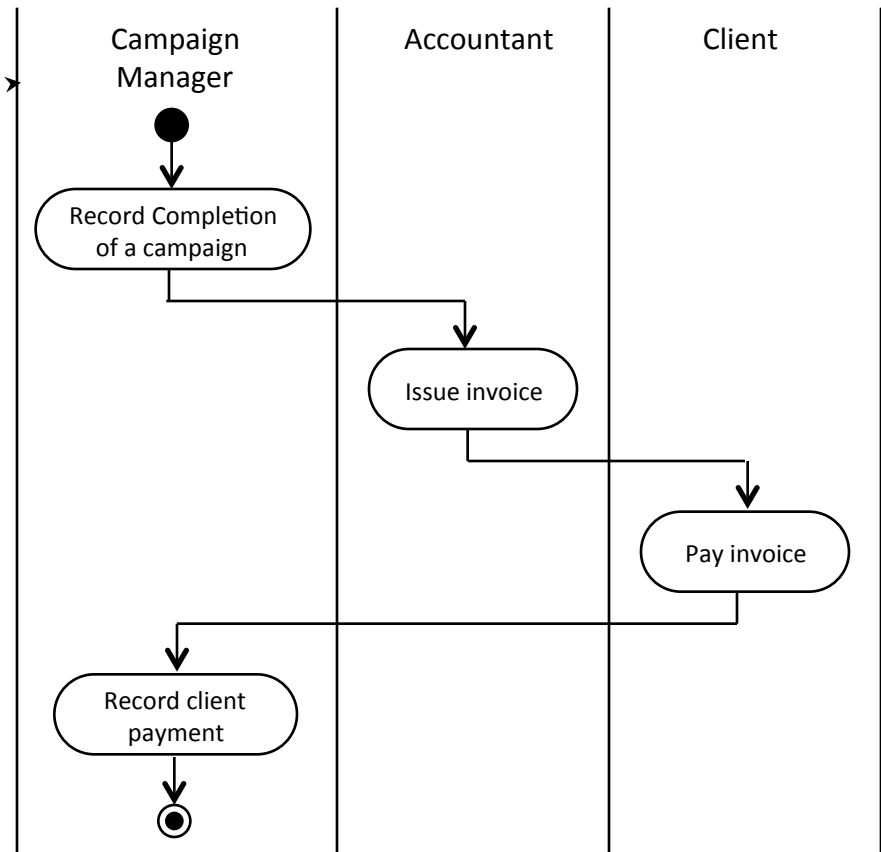Add a New Client

Assign Staff Contact

Notation of Activity Diagrams

- **Start state**
  - black circle
- **Decision points**
  - diamond
- **Guard conditions**
  - in square brackets
- **Final state**
  - black circle in white circle

Add a New Client

Assign Staff Contact

[no campaign to add]

[campaign to add]

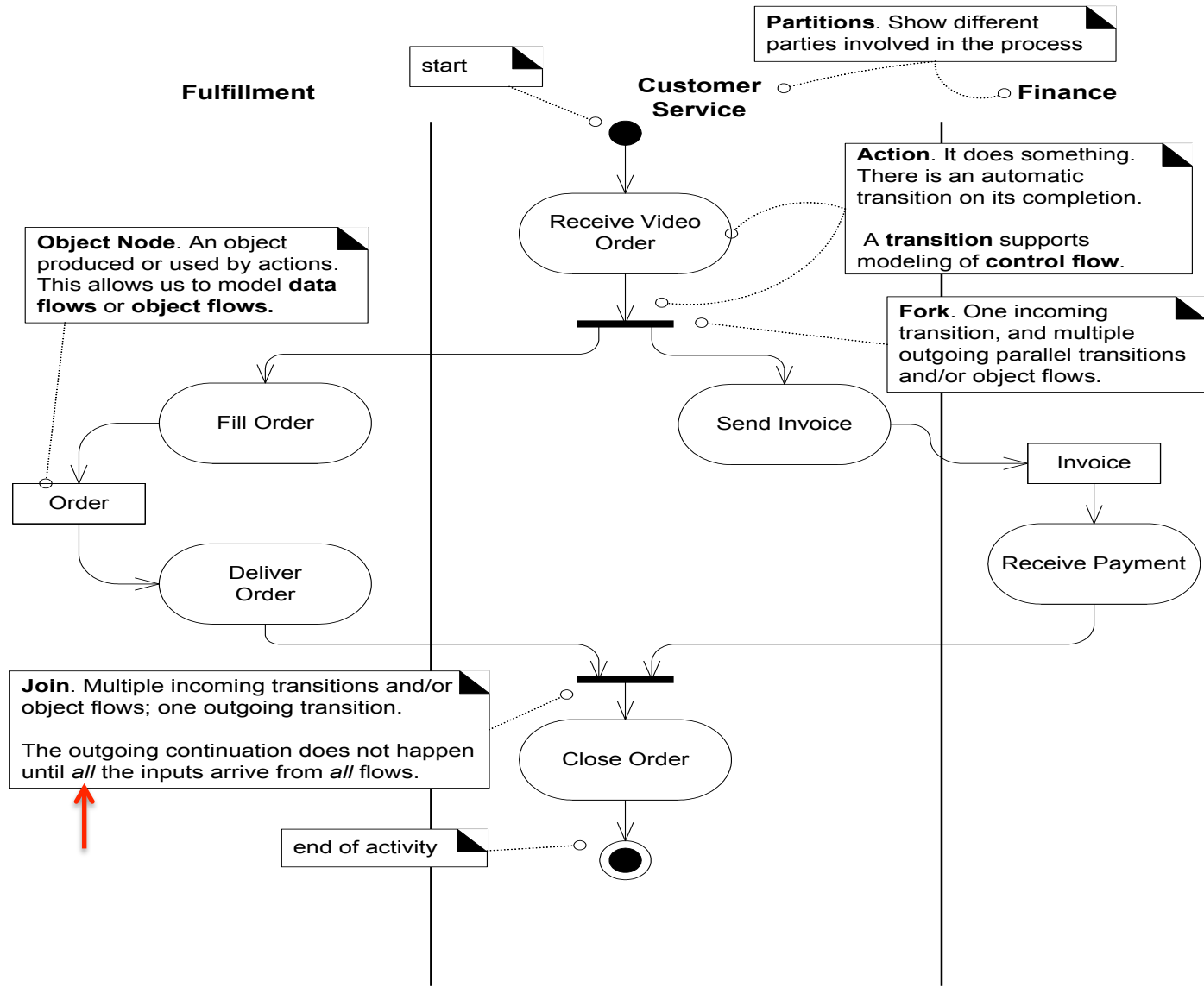Add New Campaign

Notation of Activity Diagrams

- **Swim lanes**
  - vertical columns
  - labelled with the person, organisation or department responsible for the activities in that column

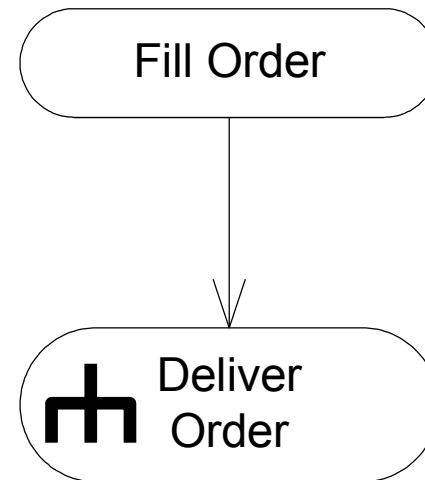# Drawing Activity Diagrams

- Are all the activities carried out by the same person, organisation or department?

- If not, then add swim lanes to show the responsibilities

- Name the swim lanes

- Show each activity in the appropriate swim lane
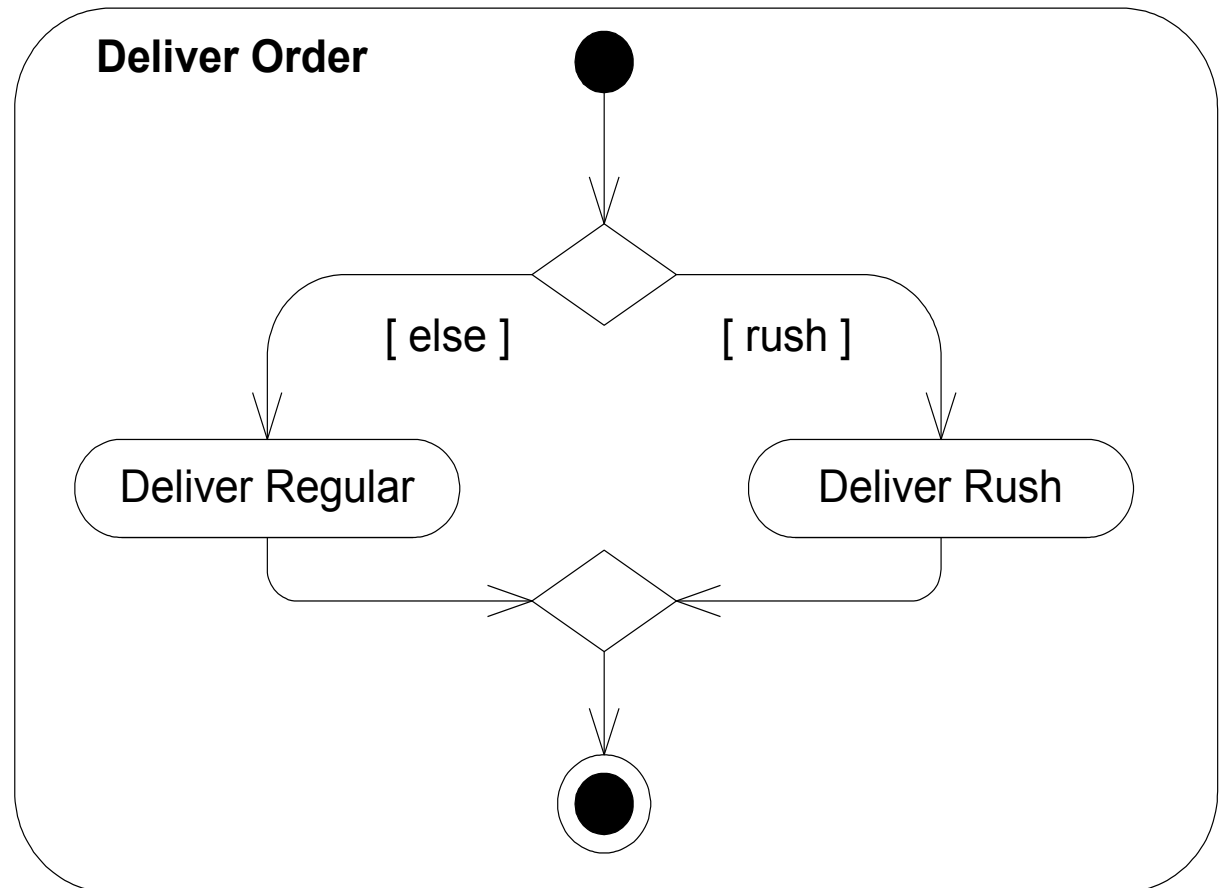
Activity diagrams with forks and object Nodes

start

Fulfillment

Customer Service

Finance

Partitions. Show different parties involved in the process

Action. It does something. There is an automatic transition on its completion.

A **transition** supports modeling of **control flow**.

Receive Video Order

Object Node. An object produced or used by actions. This allows us to model **data flows** or **object flows.**

Fork. One incoming transition, and multiple outgoing parallel transitions and/or object flows.

Fill Order

Send Invoice

Invoice

Order

Deliver Order

Receive Payment

Join. Multiple incoming transitions and/or object flows; one outgoing transition.

The outgoing continuation does not happen until *all* the inputs arrive from *all* flows.

Close Order

end of activity

Sub-activity diagrams

the "rake" symbol (which represents a hierarchy) indicates this activity is expanded in a sub-activity diagram
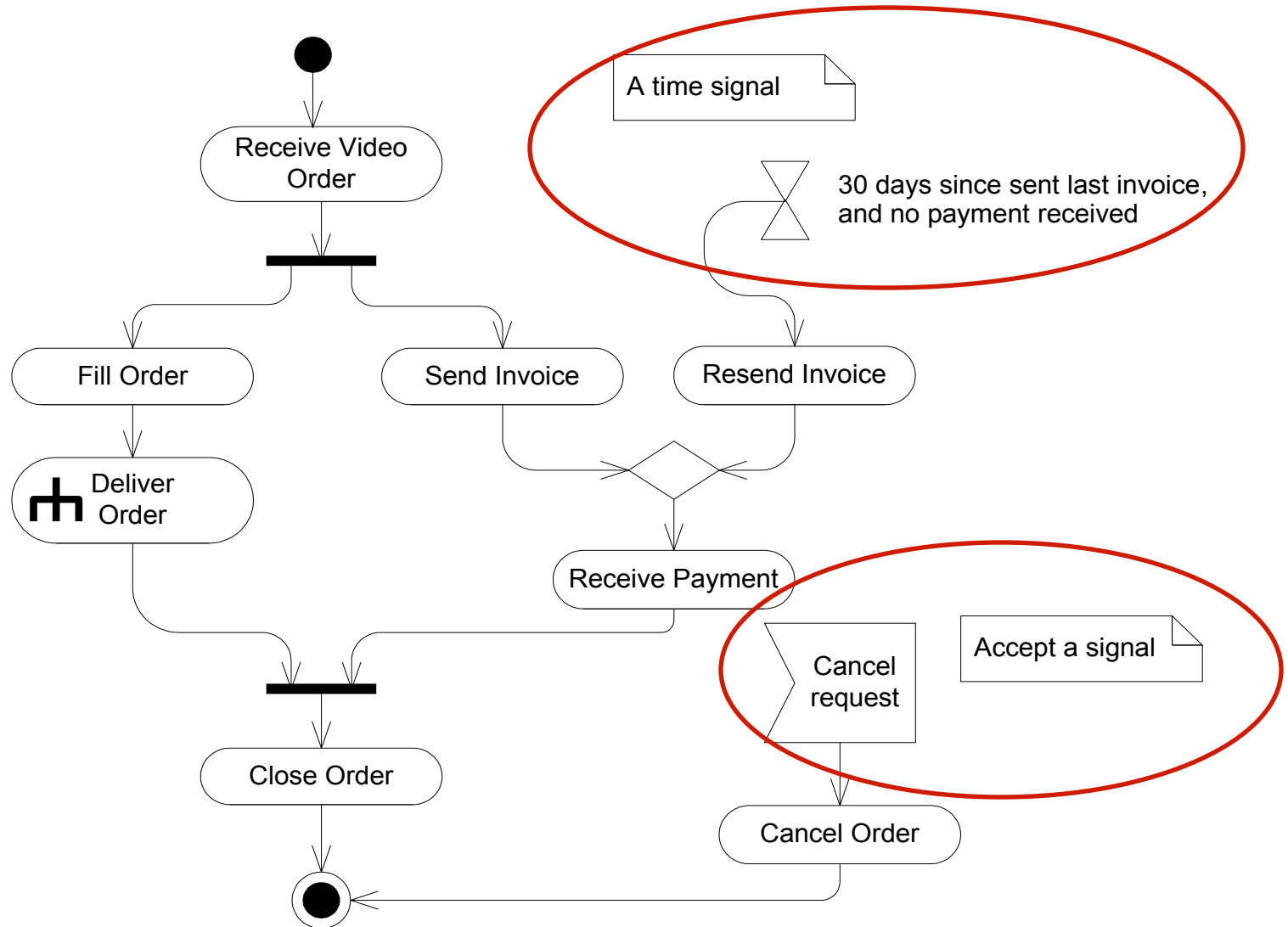
Fill Order

Deliver Order

Sub-activity diagrams

Decision: Any branch happens. Mutual exclusion

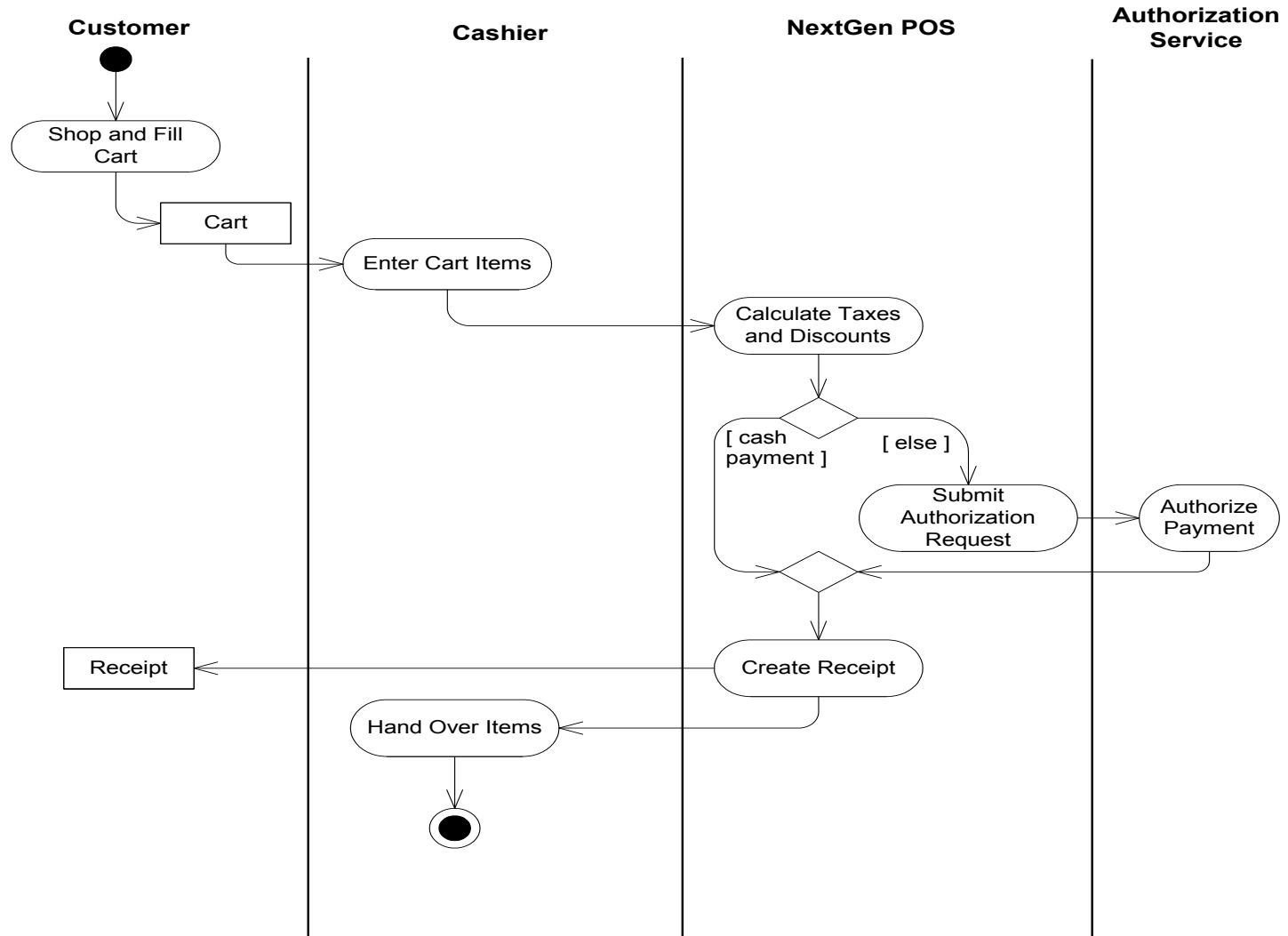**Merge**: *Any* input leads to continuation. This is in contrast to a *join*, in which case *all* the inputs have to arrive before it continues.

Deliver Order

[else]   [rush]

Deliver Regular   Deliver Rush

More UML Activity Diagram notation

Receive Video Order

A time signal

30 days since sent last invoice, and no payment received

Fill Order

Send Invoice

Resend Invoice

Deliver Order

Receive Payment

Cancel request

Accept a signal

Close Order

Cancel Order

Process sale use case

Activity Diagrams in UP

- Activity diagrams are especially valuable in the UP **Business Modeling** discipline

- Activity diagrams can help to understand and communicate the structure and the dynamics of the organization

Guidelines:

- *Activity diagrams are best suited for **complex processes**. Use case text suffices for simple processes*

- *Take advantage of the possibility to make sub-activity diagrams*

- *Strive to make the level of abstraction of action nodes roughly equal within a diagram*

Øvelse
Aktivitetsdiagrammer

1. Vælg en opgave, som du kender godt fx. en opgave, som du udfører på dit arbejde eller i din fritid. Tegn et aktivitetsdiagram, der beskriver aktiviteterne, der udgør denne opgave.

2. Brug svømmebaner hvis opgaven involverer aktiviteter, der udføres af flere personer.

3. Vælg nogle aktiviteter i dit aktivitetsdiagram og nedbryd disse til mere detaljerede aktivitetsdiagrammer (sub-activity diagrams).

Exercise

1. Choose a workflow/task that you know well. It can be a workflow/task you do at work or in your spare time.
    Draw an activity diagram that describes the activities of this workflow/task.

2. Make use of swim lanes if the workflow/task involves activities performed by more than one person/department.

3. Select some activities in your diagram and describe these in more detailed activity diagrams (sub-activity diagrams).