# Object Oriented Systems Analysis and Design Using UML Simon Bennett, Steve McRobb and Ray Farmer

# **Activity Diagrams**

Based on Chapter 5
Bennett, McRobb and Farmer

Object Oriented Systems Analysis
and Design Using UML

4th Edition, McGraw Hill, 2010



#### In This Lecture You Will Learn:

- The purpose of activity diagrams
- The notation of activity diagrams
- How to draw activity diagrams

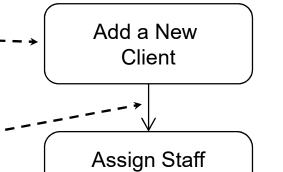


#### Purpose

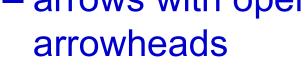
- to model a task (for example in business modelling)
- to describe a function of a system represented by a use case
- to describe the logic of an operation
- to model the activities that make up the life cycle in the Unified Process



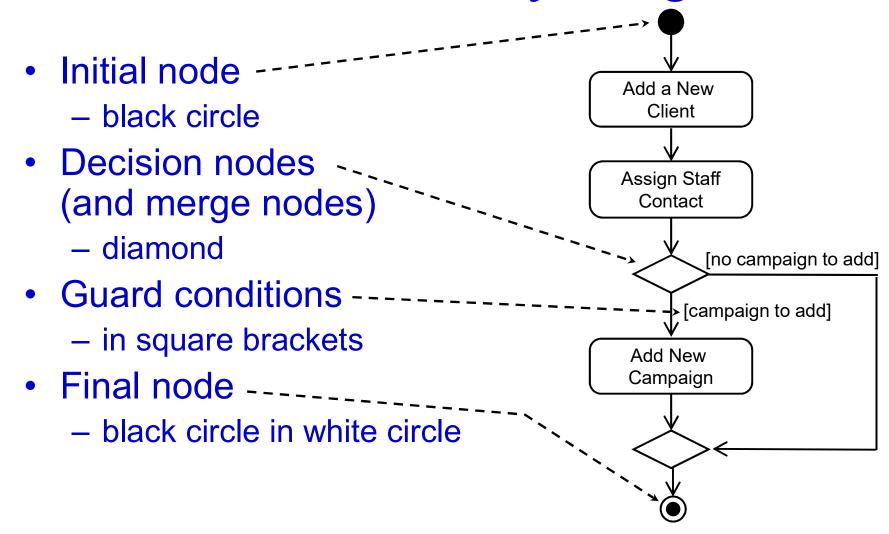
- Actions -----
  - rectangle with rounded corners
  - meaningful name
- Control flows
  - arrows with open arrowheads



Contact





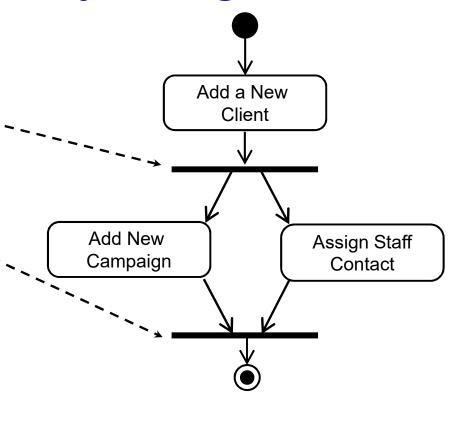




Fork nodes --- and join nodes

- thick bar

 Actions carried out in parallel





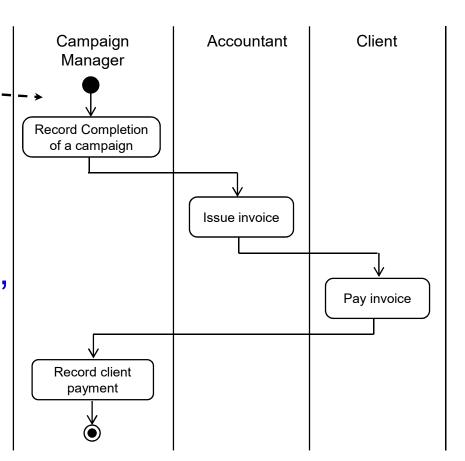
- In UML 1.X multiple flows from an action were implicitly ORed
- In UML 2.0 they are implicitly ANDed
- Guard conditions do not have to be mutually exclusive, but it is advisable that they should be
- Decisions should be strictly nested, but...
- ... a merge point can be combined with a following decision point





Activity Partitions --- (Swimlanes)

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



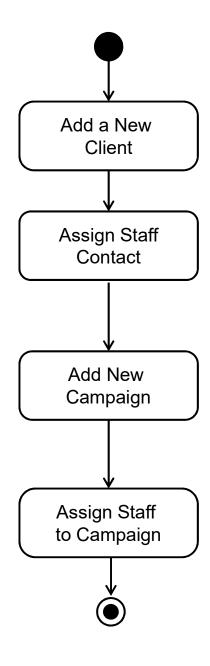


- What is the purpose?
  - This will influence the kind of activities that are shown
- What is being shown in the diagram?
  - What is the name of the business process, use case or operation?
- What level of detail is required?
  - Is it high level or more detailed?



- Identify actions
  - What happens when a new client is added in the Agate system?
    - Add a New Client
    - Assign Staff Contact
    - Add New Campaign
    - Assign Staff to Campaign
- Organise the actions in order with flows

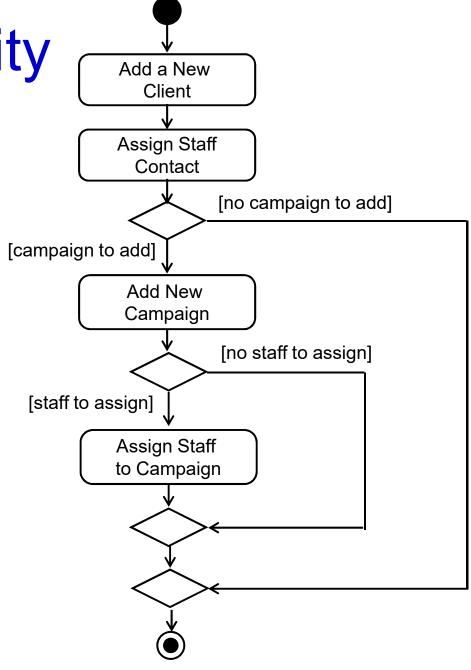






- Identify any alternative flows and the conditions on them
  - sometimes there is a new campaign to add for a new client, sometimes not
  - sometimes they will want to assign staff to the campaign, sometimes not
- Add decision and merge nodes, flows and guard conditions to the diagram





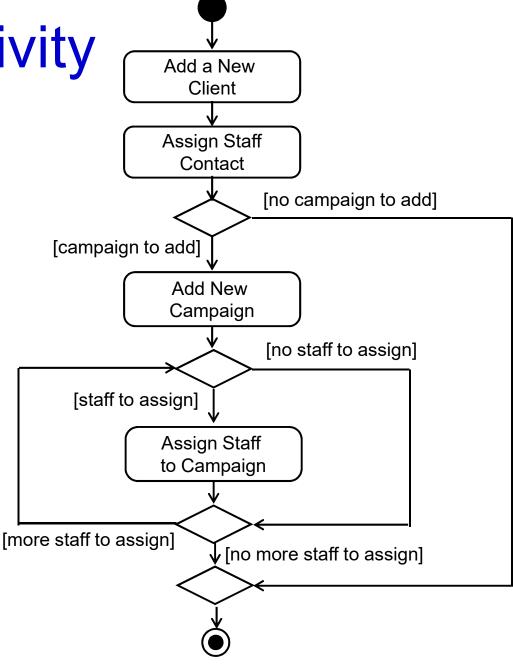


- Identify any actions that are carried out in parallel
  - there are none in this example
- Add fork and join nodes and flows to the diagram



- Identify any processes that are repeated
  - they will want to assign staff to the campaign until there are no more staff to add
- Add decision and merge nodes, flows and guard conditions to the diagram

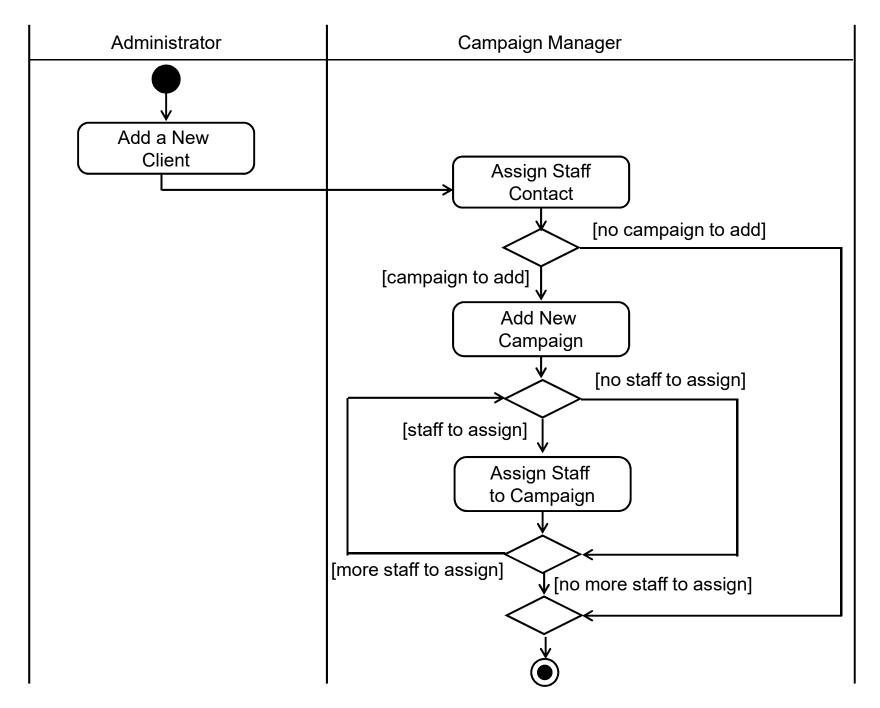






- Are all the activities carried out by the same person, organisation or department?
- If not, then add swimlanes to show the responsibilities
- Name the swimlanes
- Show each activity in the appropriate swimlane

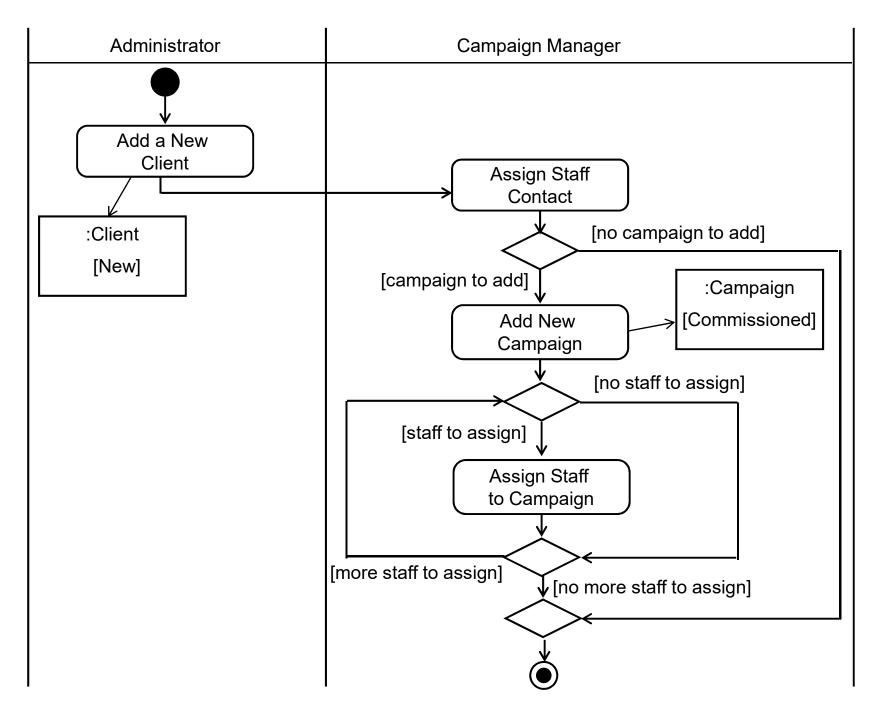






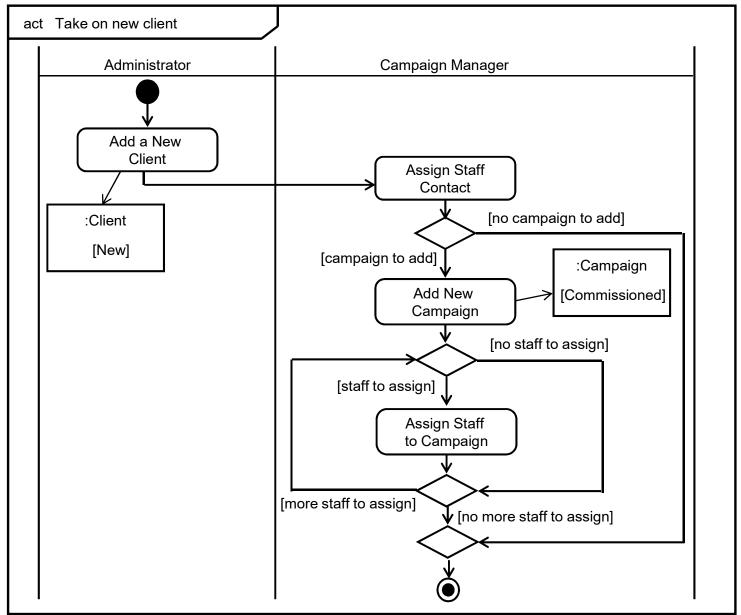
- Are there any object flows and objects to show?
  - these can be documents that are created or updated in a business activity diagram
  - these can be object instances that change state in an operation or a use case
- Add the object flows and objects







#### When printed or copied a frame is used





#### Summary

In this lecture you have learned about:

- The purpose of activity diagrams
- The notation of activity diagrams
- How to draw activity diagrams



#### References

- The notation and semantics of activity diagrams have changed significantly since UML was first released. The original UML books by Rumbaugh, Booch and Jacobson are now out of date on the subject.
- Bennett, Skelton and Lunn (2005)
   (For full bibliographic details, see Bennett, McRobb and Farmer)

