Conceptualizing a System’s workflows with Activity Diagrams

THE LOGICAL VIEW
Objectives

• Definition of Activity Diagrams
• Design-Level Work-flows
• Contrasting Design-level and Analysis level Work-flows
• Symbols used in Activity Diagrams
• Drawing Activity Diagrams
ACTIVITY DIAGRAMS

• An Activity Diagram is used to elaborate the workflows in a use case.
• It is basically a flow chart, showing flow of control from activity to activity
ACTIVITY DIAGRAMS

• DESIGN LEVEL workflows elaborate the details of how control is passed from one software element to the next

• THEREFORE:
  – In DESIGN, activity diagrams are used to expose the details of how the system being designed will function (flow of control or run-time sequence of activities)
  – In ANALYSIS, activity diagrams are used to model the general order of activities within a use-case

• DESIGN activity diagrams are thus MORE DETAILED, and MORE SPECIFIC than analysis level activity diagrams
ACTIVITY DIAGRAMS

• INPUTS for developing activity diagrams within the systems design effort are:
  – Sequence diagrams
  – Use-case narratives
  – State Chart Diagrams

Use-Case Specification
SYMBOLES OF ACTIVITY DIAGRAM:  
1. ACTIVITY, and 2. TRANSITION

- An activity represents the performance of a task within the workflow.
- In the UML, an activity is represented by a lozenge (horizontal top and bottom with convex sides).

- A Transition shows what activity follows after another.
- In the UML, a transition is represented by a solid line with an arrow.
SYMBOLS OF ACTIVITY DIAGRAM:
3. START STATE & 4. STOP STATE

• Every activity diagram
  – Begins with a START STATE symbol.
  – Ends at one or more STOP STATE symbols

• There can be
  – only one start state symbol on each activity diagram.
  – One or many stop state symbols

• In the UML,
  – a start state is represented by a small solid circle.
  – A stop state by a “bull’s” eye

• Start state

• Stop state

- A Swimlane is used to partition an activity diagram to help us better understand who or what is initiating the activity.

- A synchronization allows you to show concurrent threads in a workflow of a use case.

- In the UML, a synchronization bar is represented by a thick horizontal or vertical line.
NewSwimlane6 : NewEmployeeReport
NewSwimlane5 : Employee
NewSwimlane4 : EmployeeRecordsController
NewSwimlane3 : AddEmployeeForm
NewSwimlane2 : PayrollAdministrator

enter employee information

Validate employee entry

check if all required fields completed

check for duplicity

does record exist

Print Message: record exists

generate employee id

Insert Record in Database

Display Employee record
ACTIVITY DIAGRAM

• Activity diagrams provide useful information that enables the designer to:
  – Refine existing, and identify new, methods for the classes in the proposed system
  – Refine the responsibilities of the classes
  – Identify “hard to visualize” attributes needed by specific classes
  – Corroborate the methods of each class derived from the sequence diagrams