DP2 – INTRODUCTION TO THE TOPIC OF THE ASSIGNMENTS – A.Y. 2015-16

The workflow concept

A workflow (see http://en.wikipedia.org/wiki/Workflow) is the representation of the flow of actions that a group of people has to play in a coordinated manner to achieve a certain goal.
A workflow management system is a software application that monitors and gives support to the execution of the workflow in several ways. For example, the application can trace the execution of the workflow. When an action of the workflow should be executed, the application can notify the people who have to execute it and allow a person to take over the action. After the completion of the action, the application can also report its completion. A particular execution of a workflow will be called a *process* and the people participating to the execution will be called *actors*.

In our exercise, a workflow is characterized by a name, which uniquely identifies it, and a set of actions. Every action has a name, which is unique within the workflow, and is associated with a role: it can be taken over and executed only by an actor belonging to that role. There are two types of actions: simple actions and process actions.

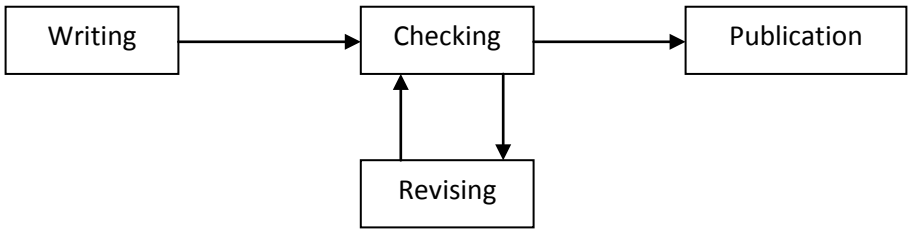
Simple actions, once completed, can enable other actions. For each simple action, the workflow specifies the possible subsequent actions. After the execution of a simple action, the actor who has taken over the action will decide which of the possible future actions must be effectively executed.

A process action, instead, corresponds to the execution of a whole process. Process actions are not followed by other actions, i.e. they do not have possible subsequent actions, but they are characterized by the name of the nested workflow that they execute.

Workflow examples

Example 1: Article Production

This is an example of workflow that contains only simple actions. The workflow can be described by the following diagram (where actions are represented by rectangles containing the action name, and a directed edge from one action to another one indicates that the latter is possible after the first one):



Action *Writing* consists in creating a first draft of the article, which is made by a journalist. After the writing, an editor must perform the *Checking* action, which consists of a check of the draft and the notification of the necessary changes. When the editor terminates the Checking action, the editor must also decide the next action to be performed. There are two possibilities: if the editor judges the article already suitable for publication, the next action will be *Publication*, performed by an editor. Otherwise, the next action will be *Revising*, performed by a journalist, and consisting of making the changes required by the editor.

The description of this workflow can be formalized by means of the following table

Action Name	Role	Autom.Inst.	Simple/Process	Next Possible Actions
Writing	Journalist	true	Simple	Checking
Chcecking	Editor	false	Simple	Revising Publication
Revising	Journalist	false	Simple	Checking
Publication	Editor	false	Simple	

where Autom.Inst indicates whether the action is enabled when the process starts (as you can see, only the Writing action is enabled at the beginning), Simple/Process indicates whether the action is simple or is the activation of a whole process, and Next Possible Actions lists the possible future actions (as you can see, action Publication has no successors).

Example 2: Sales Management

This example includes three workflows, one of which also uses process actions:

1. Workflow Sale Management, which consists of the acceptance of an order (AcceptOrder action) and the subsequent execution of one of two processes, corresponding to the workflows NormalSale and PrepaidSale.
2. NormalSale, which corresponds to a sale in which the delivery of goods (GoodsDelivery action) is done simultaneously with the issuance of an invoice (InvoiceIssuance action), which in turn is followed by the reception of the payment (PaymentRec).
3. PrepaidSale, which corresponds to a sale in which the invoice is first issued, then the payment is received, and only after that the goods are delivered.

These workflows can be formalized with the following tables:

NormalSale Workflow

Action Name	Role	Autom.Inst.	Simple/Process	Workflow	Next Possible Actions
GoodsDelivery	Warehouseman	true	Simple	-	
InvoiceIssuance	Accountingman	true	Simple	-	PaymentRec
PaymentRec	Accountingman	false	Simple	-	

PrepaidSale Workflow

Action Name	Role	Autom.Inst.	Simple/Process	Workflow	Next Possible Actions

InvoiceIssuance	Accountingman	true	Simple	-	PaymentRec
PaymentRec	Accountingman	false	Simple	-	GoodsDelivery
GoodsDelivery	Warehouseman	false	Simple	-	

SaleManagement Workflow

Action Name	Role	Autom.Inst.	Simple/Process	Workflow	Next Possible Actions
AcceptOrder	Salesman	true	Simple	-	PrepaidSale NormalSale
NormalSale	SalesManager	false	Process	NormalSale	.
PrepaidSale	SalesManager	false	Process	PrepaidSale	-