

Tutorial 10: Workflow Modelling

Semester 1, 2004

Question 1: Using the constructs of the introduced workflow modelling language, draw a workflow model to represent the following processes.

a) Car Rental

The car rental process begins with a request by the customer for a particular vehicle, location and duration. If the customer's request cannot be fully met, alternative arrangements are offered, which the customer may reject and go elsewhere, or decide to accept. When the customer's requests can be met, the vehicle is booked for the customer. At that time, or a later time, the customer will take possession of the booked vehicle and the status of the vehicle thus changes from available, to booked, to rented. The rental period may end in one of two ways, when a problem occurs, or when the customer returns the vehicle and makes the payment. In case of a problem, a report is made regarding the nature of the problem. There are further two cases in this regard, breakdown or accident. In case of an accident, the customer may be charged, depending upon the insurance taken, and the bill would be adjusted accordingly. The rental company may send an alternative vehicle and start a new transaction with the customer, if requested.

b) Funds Approval

The employees of a company are entitled to attend certain business conferences on company expense. The request for travel and expenses is made by the employees to the division heads. Each employee holds some entitlement depending upon his/her position and years of service. The division head will approve the funds only if the employee is eligible. Approved request forms are then sent to the director, who makes the final decision to accept or reject the request. Copies of the accepted requests are then sent to the accounts officer, and the administration officer. The accounts officer makes the required payments to the conference and the administration officer makes the required hotel, airline, and other bookings, and passes the data to the accounts officer, who then makes the remaining necessary payments. The employee then collects all tickets, vouchers etc. from the accounts officer. On return from travel, the employee reimburses other expenses giving the receipts to the accounts officer. The transaction is closed, however, a record of all payments is retained.

Overview of Workflow Modelling Language

Modelling Objects

The workflow models in this graphical language are modelled using two types of objects: node and transition. Node is classified into two subclasses: task and coordinator. Node objects are connected together through transition objects to build process models.

Task

A task, graphically represented by a rectangle, represents the work to be done to achieve some objectives. It is also used to implicitly build sequence structures. It is the primary object in workflow specifications and could represent both automated and manual activities. Tasks are performed by assigned performers. The workflow specifications place less emphasis on the internal workings of tasks. Their aim is to capture the coordination requirements for performing a set of tasks for a given business process. They do, however, capture some information about the execution of tasks that are needed for coordination.

Tasks are further classified into three types: activity, sub process, and block. An activity is an atomic piece of work coordinated by the workflow management system.

Coordinator

A coordinator, graphically represented by an ellipse, is used to build workflow structures and define how tasks would be scheduled. In principle, a workflow task instantiates when one or more tasks in the workflow finish their execution. Similarly, after a task finishes, it can instantiate one or more tasks in the workflow. To represent such inter dependencies between workflow tasks we make use of coordinator objects. All modelling structures except sequential require the use of a coordinator object to model the inter-dependencies between workflow tasks. The sequential structure is represented implicitly by connecting tasks through transitions.

To simplify the structural modelling, each coordinator object only captures single coordination semantics. All modelling structures except sequence structure are explicitly modelled through coordinator nodes.

Transition

A transition links two nodes in the graph and is graphically represented by a directed edge. It shows the execution order and flow between its head and tail nodes.

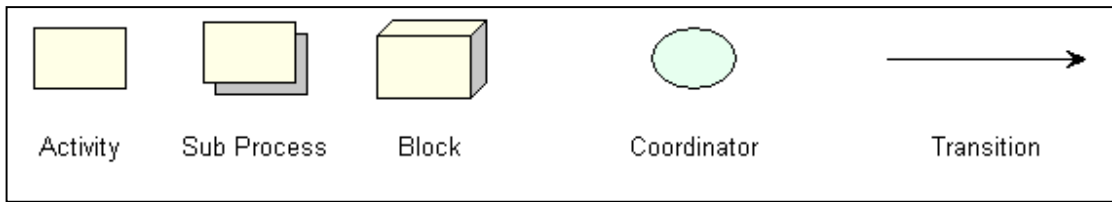


Figure 1. Modelling Objects

Figure 1 shows graphical representation of activity, sub process, block, coordinator, and transition.

Modelling Structures

By connecting nodes with transitions through modelling structures, as shown in Figure 2, we build workflow graphs where vertices represent nodes and directed edges represent transitions.

