Politecnico di Milano

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Workgroup and Workflow Management Systems - Written Test of Mar 06th, 2007

Family name _____ First name _____ Politecnico ID # _____

Master Course in _____

Please, fill in this sheet carefully. All answers must be provided on this sheet, which must be returned at the end of the test. No additional sheet will be considered[1].

Rules. The examination is passed if the student obtains at least 13 points out of a total of 25 points available for this test, and the grand total of obtained points, including those obtained with a presentation or a project, is greater than or equal to 18. Use of books, handbooks, lecture notes is not permitted: only the sheets provided by the teacher can be used. All the questions must be answered, at least partially: tests in which even one question has not been answered will not be evaluated. Duration of the test: 2 hours.

Exercises

(1) Describe the relevance of the *X-PDL* language from the *Workflow Management Coalition* and its impact on the interoperability among different WfMSs.

space reserved to your answer

[1] **Remark**. Complete specifications whenever needed. Clarity and order will be taken into account for the evaluation.

(2) *Lift-me-up* is a market leader in northern Italy in the area of elevators and related technologies. In order to improve their maintenance offer, *Lift-me-up* wants to automate the following process(es).

After the installation of a new elevator at the customer's site or upon request by a new customer, an operator in *Lift-me-up*'s back office starts a new maintenance contract. He/she inputs the generalities of the customer and the details (e.g. model, make, and/or project) of the elevator into the system, which starts the ordinary maintenance process that consists of three-monthly, on-site controls and a yearly billing. Hence, every three months, a technician is sent to the customer to perform the standardized control procedure and, based on the outcome of the control, either: (i) performs no further intervention on the elevator; (ii) immediately repairs small defects; or (iii) sends a list of materials to *Lift-me-up*'s central warehouse (which prepares the requested spare parts), picks up the requested materials, and finally repairs the elevator on site. In either case, after the check-up and the possible adjustment, the technician compiles a report about the intervention and sends it to the back office for the yearly billing.

Once a year (tipically on December 31^{st}), the back office prepares the yearly bill for each customer (based on all interventions during the billing period) and sends the bill out. Once the payment has arrived (via credit card, bank transfer, or cash), the operator records the respective details into the system, and the next billing period is started.

Extraordinary interventions by technicians may be explicitly requested by registered customers via phone (e.g. in case of an accident or of a blocked elevator). A technician is sent to the customer's site to perform a diagnosis of the problem and, based on the outcome of the diagnosis, either: (i) immediately repairs small defects; or (ii) notifies *Lift-me-up*'s central warehouse about the required materials, picks up the requested materials, and repairs the elevator on site. After the intervention, the technician compiles the standardized report.

Provide a reasonable schema of the outlined process(es), according to one of the following modeling formalisms: *WIDE* model, *Workflow Management Coalition* model, Petri nets.

(3) With respect to the process model of Exercise **2**, identify how many local transactions can be defined and provide one complete example of a local transaction.

space reserved to your answer - exercise 3

space reserved to your answer - exercise 2

(4) Provide a formal description of the concepts of *valid time* and *transaction time* for a temporal DBMS. Provide an example about the usage of valid time and transaction time for a WfMS.

space reserved to your answer

This part for use by the teacher, only.

Ex. 1	Ex. 2	Ex. 3	Ex. 4	**Total**