MTAT.03.231 – Business Process Management
Regular Exam (Process Automation)

22 May 2012

Scenario

BuildIT is a construction company specialized in public works (roads, bridges, pipelines, tunnels, railroads, etc.). Within BuildIT, it often happens that engineers working at a construction site (called *site engineers*) need a piece of equipment, such as a truck, an excavator, a bulldozer, a water pump, etc. BuildIT owns very little equipment and instead it rents most of its equipment from specialized suppliers.

We consider the process for equipment rental at BuildIT. The process starts when a site engineer fills in an "Equipment Rental Request" containing the following details:

- Identifier of the site engineer who initiates the request
- Requested start date & time of the equipment rental
- Expected end date & time of the equipment rental
- Project for which the equipment is to be rented
- Construction site where the equipment will be used
- Description of the required equipment
- Expected rental cost per day (optional)
- Preferred supplier (optional)
- Supplier's equipment reference number (optional):
- Comments to the supplier (optional)

The rental request is handled by one the clerks at the company's depot. The clerk consults the catalogues of the equipment suppliers and calls or sends e-mails to one or multiple supplier(s) in order to find the most cost-effective available equipment that complies with the request. Once the clerk has found a suitable piece of equipment available for rental, she recommends that it be rented. At this stage, the clerk must add the following data to the equipment rental request:

- Selected supplier
- Reference number of the selected equipment
- Cost per day

Equipment rental requests have to be approved by a works engineer (who also works at the depot). In some cases, the works engineer rejects the rental request, meaning that no equipment will be rented. Naturally, before rejecting a request in this way, the works engineer should first discuss their decision with the site engineer and also write an explanatory note that is included in the equipment rental request. In other cases, the works engineer rejects the recommended equipment (but not the entire request) and asks the clerk to find an an alternative equipment (e.g. a cheaper equipment or a similar equipment but with different specifications). In this case the works engineer should communicate their decision to the clerk and write an explanatory note in the rental request.

Rental requests for which the rental cost per day is less than or equal to 100 are automatically approved, without going through a works engineer.

Once a request is approved, a PO is automatically generated from the data contained in the approved rental request. The PO includes the supplier's equipment identification, the cost per day, the construction site where the equipment is to be delivered, the delivery date & time and the pick-up date & time and the comments to the supplier (optional).

On the requested date, the supplier delivers the equipment to the construction site. The site engineer inspects the equipment. If everything is in order, she accepts the equipment and writes the date of delivery in the PO. Optionally, the site engineer may add a note to the PO to indicate any issues found during the inspection. Similarly, when the equipment is picked up by the supplier, another inspection is performed, and the site engineers write the pick-up date in the PO (and an optional "pick-up" note).

Sometimes, the site engineer asks for an extension of the rental period. In this case, the site engineer records the extended pick-up time into the PO, and the revised PO is automatically re-sent to the supplier. Prior to doing this change, the site engineer is expected to call the supplier in order to agree on the change of pick-up date.

A few days after the equipment is picked up, the supplier sends an invoice to the clerk by e-mail. Upon receipt of an invoice for equipment rental, the clerk records the following details:

- Supplier
- Invoice number
- PO number
- Equipment reference number
- Delivery date & time
- Pickup date & time
- Total amount to be paid

When entering these invoice details, the clerk also verifies that the entered data are in accordance with the data in the PO and marks the invoice as "accepted" or "rejected". In case of rejection, the clerk adds an explanatory note (e.g. requesting the supplier to send a revised invoice). Eventually, the supplier may send a revised invoice if needed.

Accepted invoices are forwarded to the finance department for payment, but this part of the process is outside the scope of this scenario.

Note. In the above process, the task of creating a PO is automatic. For the purpose of this exercise, you may choose to replace this automatic task with a manual task where the clerk manually enters the data required to create the PO. Also, you do not need to implement the tasks of sending or re-sending the PO to the supplier.

Task

Implement the above process using either YAWL or Bizagi. If using YAWL, submit a ".yawl" and ".ybkp" file (zipped). If using Bizagi, submit a ".bpm" file and either a virtual machine (VirtualBox), a screencast or a collection of screenshots showing three scenarios:

- Automatically approved request
- Request approved by works engineer, delivered, picked-up and invoiced correctly
- Request rejected by works engineer