

Project for Business Modeling
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Equipment rental

(adapted from Exercise 2.14 of Dumas et al., Fundamentals of Business Process Modeling)

RentIT is an equipment rental company providing a wide range of construction equipment on demand, all the way from minor equipment items such as water pumps and drillers, to major equipment such as bulldozers, crawl dozers and cranes.

RentIT receives orders mainly from construction companies, with which it maintains longterm relations. To maintain these relations, sales representatives meet periodically with existing customers to understand their upcoming demand for construction equipment, to find ways of better satisfying their needs, and to negotiate special deals and discounts.

The main process at RentIT is the order-to-cash process, which starts when a new Purchase Order (PO) is received via its information system. The PO specifies the equipment to be rented and the rental period, among other details.

When a Purchase Order (PO) is received, a sales representative at RentIT checks the PO and the availability of the equipment requested in the PO. This may lead to one of three outcomes: (i) the PO is accepted; (ii) the PO is rejected and accordingly the customer is informed and the case is closed; or (iii) a question is sent to the customer. In the latter case, the customer should provide a response within 3 days. If the customer does not respond within this time, a reminder is sent by RentIT's information system, and if the customer has not responded 3 days after the reminder, the PO is canceled. When a customer responds to a question, the sales rep can accept the PO, reject it, or ask another question to the customer; in this latter case, the above 3-day delays for sending reminders and for canceling the PO are applied again.

Once the PO has been accepted, RentIT's information system marks the corresponding equipment item(s) as busy for the duration of the rental. The system also automatically schedules the delivery and pick-up of the equipment from/to the warehouse where the equipment is located. Deliveries and pick-ups are outsourced to an external logistics company.

A customer can send a request to cancel a PO, in which case the equipment is freed up and the delivery is canceled. A cancellation request must be received before the equipment is dispatched from RentIT's warehouse. Once the equipment has been dispatched (i.e., it has left RentIT's warehouse), it is no longer possible to accept the customer's cancellation request.

On the due date, the logistics company picks up the equipment from RentIT's warehouse and delivers it to the construction site. At the site, an engineer of the construction company (called a site engineer) checks the equipment together with the logistics agent. In case the delivery is rejected by the site engineer, this may happen for two reasons: (i) because of an error of the customer or because the customer changed its mind; or (ii) because of a defect in the delivered equipment or an error attributable to RentIT. In the former case, an invoice equivalent to the cost of 1 day of rental is sent to the customer and the payment procedure described below takes place. In the latter case, the sales rep is alerted by RentIT's information system. The sales rep contacts the customer immediately to negotiate an alternative arrangement. This may lead either to cancelling the PO, or scheduling a new delivery as soon as possible.

Normally, the equipment is picked up on the end date indicated in the PO. A customer may ask for an extension to the deadline by sending an updated purchase order (also known as a PO update). When a PO update is received, the sales rep checks if it is possible to grant the extension. If so, the extension is recorded in RentIT's information system. If an extension is not possible, the deadline remains unchanged. In both cases, the customer is informed.

Once the equipment has been picked up, RentIT issues an invoice for the amount indicated in the latest version of the PO. Invoices should be paid within 14 days. If the payment has not been received within 10 days, a reminder is sent to the customer. If no payment has been received within 14 days after the invoice was sent, the invoice is put on debt collection.

It may happen that the customer disagrees with an invoice. In this case, the sales rep contacts the customer, and amends the invoice if required. This leads to an amended invoice being issued. The customer has 14 days to pay after an amended invoice is issued (after which the same process as above for payment reminder and putting into debt collection is followed).

When an invoice falls into debt collection, the sales rep tries to negotiate a special repayment agreement with the customer. Generally, this leads to a repayment within a few weeks. In very extreme cases where the debt is still outstanding after two months of the invoice due date, the invoice is sold to a debt collection agency.

The equipment RentIT holds is stored in one of several warehouses. Every piece of equipment undergoes periodic maintenance. When an equipment is due for maintenance, a repairs and maintenance supplier comes to pick it up (there are several such service suppliers for different types of equipment) and delivers the equipment back once maintenance is completed.

The same applies when a piece of equipment breaks. In some cases, the equipment breaks while located at a customer's premises. In this case, the repairs service supplier picks up the broken equipment from the customer's site, or performs an on-site repair. If the equipment becomes unavailable while it is in use by a customer, the sales rep dispatches an alternative piece of equipment to the customer site. If this is not possible, the original purchase order is updated accordingly, in such a way that the customer is only billed for the days the equipment was in use. The sales rep might apply a special discount in case an equipment breaks while in use.

RentIT needs to handle inbound invoices from repair service providers and logistics providers in addition to invoices arising from indirect procurement. RentIT also needs to make recurrent payments for equipment leasing. In order to optimize cash flow, RentIT does not actually own some of the equipment it rents out, using equipment lessors in this case. The Chief Financial Officer (CFO) and his team are responsible for strategic sourcing of equipment, which involves planning new equipment acquisitions, retirement of older or broken equipment and negotiation of terms with the lessors. The CFO and his team are also responsible for financial planning and budgeting, financial monitoring, approval of major expenses, and compilation of the quarterly and annual financial reports. On the other hand, the team of the Chief Operations Officer (COO) oversees the management of the warehouses, human resources, IT systems, office facilities, and relations with logistics service providers and repairs and maintenance service suppliers.

Finally, the Sales and Marketing Director oversees all sales representatives, and together with her team, she oversees all activities related to marketing, acquisition of new customers, and strategic development of relations with the large customers.

The project consists in the following.

Assuming a scenario where you are managing RentIT and want to assess the health of your business processes, or establish a process-oriented approach, conduct the following:

Based on the descriptions above, identify the main processes in RentIT and organise them into a process architecture (thereby classifying them as core, with identified value chains, support or management and identifying the core and support processes related to each core process).

For at least two of the identified processes perform a linguistic analysis, identifying pools, lanes, tasks, data objects, data stores, events, gateways. For at least one of them provide one model using BPMN, including all possible variants.

For the modeled process, perform a qualitative analysis, providing a breakdown into simple steps of some selected tasks, discussing which of the identified steps can be deemed as Value Adding, Non-Value Adding, or Business-Value adding. Based on such an analysis, discuss opportunities for business process re-engineering.