INFO212 22H / System Development
Assignment 02. Submission deadline: TBA

Purpose

The purpose of this exercise is to practice process modeling with Process modeling tool Camunda.

Problem Definition

In this assignment, you will be working on the same problem domain as in oblig 01. You will be designing a process model (using BPMN) for a car rental company from the description below:

A car rental company that has branches all over the country plans to facilitate the car rental process to its customers through a website and a mobile application. For this purpose, they have asked you to help them design the system.

In each branch of this company, there are several cars available for rent. Each of the cars needs to be registered in the system with their own specific information, including a unique ID, make (ex: VW), model (ex: Golf), color, rental group (ex: A, B, C & D for small car, medium-sized car, large car and station wagon, respectively).

Customers can order to rent a car from the company using online services or in person from any of the company's branch offices. Customers need to register before they can order a rental service. When registering on the website, customers must provide a driver's license number and some personal information such as personal id (11 digit), name, surname, phone number, email and address (For simplicity, we ignore the license verification process but there exists a service in vegvesen.no https://www.vegvesen.no/om-oss/om-organisasjonen/apne-data/et-utvalg-apne-data/api-for-sjekk-forerkort/ for the verification process).

What the user can see on the first page is a search box where she/he can specify the desired rental location, return location, start time and rental duration. This way, the customer can see all the available cars and request the car of her/his choice. While a new order is placed, a few types of insurance policy and price will be offered to the customer. The customer can decide which insurance policy he would like to take for the rental. The system should in general keep a history of customers.

When the user confirms his order, it should be checked whether her/his valid driver's license is registered in the system or not. For this purpose, the user must log in to the system. Before any order can be placed into the system the credit card information needs to be stored. Customers should be able to pick up the cars from the pickup point. At the appointed time, the customer arrives at the rental location so that an executive employee at the branch hands over the car. A general agreement/contract is signed by the customers before handing over the keys to the customers. If a customer does not show up at an appointment time, a certain fee will be deducted from the credit card, or an invoice will be sent to the customer's address.

Customers can deliver the cars at the appointed time at the delivery locations. The company has a cleaning policy which says that the cost for removing cigarette smoke is 3000 Krone. The customer will get a charge in the credit card or get an invoice if evidence of smoking is found. If any damage is found in the car while returned, the insurance agreement on the rental order is checked. If the customer does not have full insurance for the damage, a damage record is created, and an invoice will be sent to the customer later. Otherwise, if the customer has full insurance coverage, the insurance company will be informed, and an insurance claim will be made. After repair, the car is transferred to the branches to be rented to the next customer.

Task 1:

A) Create a BPMN model which covers the main process flow of car rental situation. The process model should include basic tasks and flow with decision nodes.
B) Design some forms in Camunda and demonstrate process simulation using the 'Play' functionality available in Camunda Modeler.

Task 2 (Bonus: Optional)

In this part of the assignment, you will enhance the process model with a decision model and notation (DMN). The purpose of the DMN model is to support the system administration making decisions on rental for customers. The system administrator needs to check the history of customers before renting a car. Based on the history of customers, the rental decision is made. Requests from customers who do not have a good background (for example, dangerous driving etc.) are reviewed by an administrative employee in order to assess the rental risk. Let us assume that the company keeps a score for every customer. A customer with score = 0 indicates that the customer has no incident record; For every incident record, customers lose 10 points. Therefore, a customer with score = -40 indicates that the customer could be very risky to rent out a car.

When a new car rental application is received, the application gets classified. New applications have three risk groups:
- "Low-risk" group includes the applications without any risks.
- "High-risk" group includes the applications with at least one high risk factor.
- "Medium-risk" group includes the applications with a medium risk.

The specialist department "risk rating" uses documented instructions to classify the rental applications manually. The Risk rating is the fundamental for the decision on the application. Due to repeated false ratings the cases of damage are increasing and causing high costs for the insurance company. To improve the situation, the decisions for the risk rating are modelled in DMN. For this purpose, the management determine the following criteria:

- All customers under 20 years of age with score <= -30 are classified as "High-risk"; and with –30 <= score <= 0 are classified as "Medium-risk".

- All customers between 20-25 years of age with score <= -40 are classified as "High-risk"; and with –40 <= score <= -20 are classified as "Medium-risk".

- All customers between 25-35 years of age with score <= -50 are classified as "High-risk"; and with –50 <= score <= -20 are classified as "Medium-risk".

- All customers above 35 years of age with score <= -60 are classified as “High-risk”; and with –60 <= score <= -20 are classified as “Medium-risk”.

Model the decision table for rating the rental applications and include the decision table into your BPMN process model. Based on the assessment of risk group, the system administrator will either accept/reject the rental application.

Submission guideline:

A zip file containing CAMUNDA files (.bpmn, .form, .dmn) and a max 4-page pdf report containing screenshots of the process models, forms, simulations and decision tables. Include a short explanation along with the screenshots in the report. You must hand out the reports in mittUiB.