Part A. Foundation Knowledge (15 points)

Distributed separately on paper

Part B. Process Modelling, Analysis, Redesign (30 points)

CusCo has been providing insurances to businesses for more than 20 years. They have been around for a long time and they really know their customers. This deep understanding of customers and ability to offer “right” products to them have resulted in increasing revenues over the past 10 years. However, with the emergence of many new digital companies, they feel it is harder to get them as customers. As part of their strategy, they acquired a digital competitor. The management is now considering the option of merging these processes.

CusCo has two processes for the same service. One is the traditional sales and the other is the process of the newly acquired digital company.

The process for traditional clients begins with a sales representative analysing and identifying potential new customers. Once they have identified them, which takes on average 2 hours, they submit a request to sales admin. The sales admin prepares a report for each of the potential clients. The report covers the information publicly available about the potential client, presents and summarizes experiences and data CusCo has about existing customers that fall within the same customer segment as the potential customers. The report is generated by using their system for contracts (CNTR). This is quite a difficult task and takes on average 4 hours. However, as they are backed up, the waiting time is about 1 week.

Once the report is sent back to the sales, they book a meeting with the potential client. Clients usually agree to have a meeting (with 90% success rate). Following this, sales prepares for the meeting and makes a visit to present their offer. At the meeting, sales get a good feeling if there is an interest or not. From the time sales get the report
about a potential customer until they meet with the customer, it takes about 2 weeks but the processing time is only 3 hours. Out of every 10 visits, 6 are interested, 3 are not interested, and 1 says they already have a contract but when it ends, they will contact CusCo. If there is an interest, the sales send the data to sales admin who prepares an offer. The offer is sent back to sales who modify it and approve it before sending it to the potential customer. If the potential customer already has a contract, the sales admin makes a note of it so they can be contacted when their contract is about to end, which when the time is right, is included in the normal flow of interested clients. This part of the process takes on average 3 days but the processing time is 4 hours for sales admin and 1 hour for sales.

Once the offer has been sent to the customer, they wait for a response. The potential customer can either accept (50%), decline (35%), or accept with modifications (15%). If they accept with modification, the offer is modified and sent back to the customer for approval until it is accepted. This takes on average 2 weeks (also for modifications).

Once accepted, the contract is sent to back office who registers the contract in CNTR. The contract is then used to register customer data, payment schedule, bank account numbers, dates and all other data required for the management of the contracts. This data is registered in a system called OPER. Once a contract data is registered in OPER, it is archived. This takes on average 3 hours to do. There is no waiting time. Back office takes out daily reports of expected payments, extract a report of payments to the bank accounts of CusCo, and reconcile the files to see which customers have paid their premium and who has not. The payment is either ok or something is missing. If it is missing, the matter is investigated and actions taken to correct it. Back office has to take out reports from the OPER system and find each customer that is to be dealt with. These activities take on average 4 hours (no waiting time) to do if there are no errors. However, if there are errors (5% of the time), it will take one additional hour in processing time but as response is needed from external parties, the waiting time is usually 2 days.

The digital process is quite different. The digital marketing team work with getting leads. It can either be earned leads such as writing white reports, case studies, guest blogs or paid such as google ads. This takes on average 6 hours (no waiting time). As leads come in, an algorithm filter irrelevant ones (such as students who register to download white papers, spam emails and so on) and assigns leads to sales representatives. Sales then looks at the data filled in (web form) and selects the best standard offer they have for the potential customer. This is quite standardized and take only 10 min per case with no waiting time. Once the offer is prepared, it is sent.

Sales (i.e. the sales rep) then awaits a response. Potential customers can respond via the email they receive. They can either decline, accept, or wish to be contacted. If they do not respond, they are automatically sent a reminder. If they wish to be contacted, a sales rep contacts them. Similar to the above process, the offer can be accepted or modified and then accepted. It can also be declined. On average, it will take about 3 weeks to get a response. If no response is received after 3 weeks, the lead is considered as dead. This happens in 70% of cases. If the offer is accepted (15% of the cases), the offer and the acceptance of the customer is automatically sent (and entered) to the digital back office. This is all done in a system called INSU. Once in INSU, back office verifies the data by for instance checking the customer data, contract data to ensure that the customer really exists, contacts them to get bank
account information. Once all is correct, the contract is generated and sent to the customer. This takes on average 3 hours per client and as response is required, the waiting time is about 4 days. Then, back office enters the data into AUIN, a system that does exactly what OPER does. The process of AUIN is the same as OPER (activities and costs but the error rate is higher as it is 15%). If the client wishes to be contacted, it means they are interested but want to have some modifications made to the standard contract. In such cases, as they are in direct contact with a sales representative, they all accept the offer. The processing time for the sales representative is on average 4 hours but the waiting time is 2 days on average.

The costs per resource (all costs including social taxes) are given in the Table below.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Traditional/Digital</th>
<th>Cost/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Representative</td>
<td>Traditional</td>
<td>40€/hour</td>
</tr>
<tr>
<td>Sales Admin</td>
<td>Traditional</td>
<td>25€/hour</td>
</tr>
<tr>
<td>Back Office</td>
<td>Traditional</td>
<td>15€/hour</td>
</tr>
<tr>
<td>Marketing</td>
<td>Digital</td>
<td>20€/hour</td>
</tr>
<tr>
<td>Sales</td>
<td>Digital</td>
<td>15€/hour</td>
</tr>
<tr>
<td>Back Office</td>
<td>Digital</td>
<td>10€/hour</td>
</tr>
</tbody>
</table>

The total benefit per contract is on average 20 000 € for traditional and 500 € for digital contracts. The traditional part prepares about 100 visits per month whereas the digital receives about 1000 leads per month. On average, 50% of the leads are filtered out by the algorithm and only 10% of the leads that sales prepare an offer for, lead to a contract.

The traditional part of the business suffers from inefficiency resulting in higher costs and longer waiting times for lead to client processes. The traditional business estimates that with faster processes, they can target more potential customers and reach 20% more customers. On the digital business side, the “waste” of “bad” leads are time and cost consuming. The current process is not efficient and CusCo feels it could improve the ratio of “good” leads by 20%. The time to validate customer data for digital clients is inefficient and could be reduced by 30%. Finally, CusCo has identified that with a same or similar business process for the two business sides, the time for back office processing should be reduced by 10 %. Having a common IT solution should also yield cost savings of estimated 20 000 € annually.

**Task 1. [12 points]** Capture the as-is processes (both of them) using BPMN. Be sure to follow the modelling guidelines introduced in the course.

**Task 2. [6 points]** Calculate the cycle time efficiency of the as-is processes (both of them). Assume a working week of 40 hours.

You can make assumptions if information is missing. For example you can use your own estimate if the processing time for a task is not stated. In this case, you have to explicitly state your assumptions. List your assumptions as bullet points.
Task 3. [6 points] Prepare an issue register and include 3 major issues you have identified in the as-is process. For this question, you might wish to include a column in which you record any assumptions you have made.

Task 4. [6 points] Propose a set of changes leading to the two as-is processes being merged into a single to-be process in such a way that efficiencies are gained as a result. Note that a “set of changes” is not a single change but a number of (minor) changes that together form a set. For each change, you should indicate:

- What will be added to or dropped from the as-is processes to make them converge to a merged to-be process?
- What will be done differently?
- Which issue(s) is/are being addressed by the proposed change?
- Which performance measure(s) do you hypothesize will be improved as a result of the proposed change?
- To which BPR principle(s) or redesign heuristics is your proposed change related (if any)?

Note: There is no need to write the to-be process. All you need is to explain each proposed change. We expect there to be between 2 to 4 changes proposed.

Part C. Process Mining (5 points)
Consider the log of the loan application handling process available here:

http://data.4tu.nl/repository/uuid:5f3067df-f10b-45da-b98b-86ae4c7a310b/DATA1

For each of the following questions, please provide the answers AND a screenshot (of Disco or ProM) showing the answer. We ask for the screenshot as a proof that you found the answer yourself. Please provide each screenshot in a separate file, with file names C1.png, C2.png … C5.png. Other common image formats accepted too (e.g. JPG). The answers themselves can be provided in the same file as Part B of the exam.

1. What is the mean cycle time (duration) of the cases that were successful (Containing activity O_Accepted)?
2. What is the mean cycle time (duration) of the cases that were unsuccessful (Containing activity O_Refused)?
3. What is the mean cycle time (duration) of the cases that were cancelled (Ending with activity O_Cancelled)?
4. Considering only cases that have a duration higher than 90 days, can you say for those cases what is the most frequent application type?
5. Considering only cases where resource User_7 is involved, how many distinct traces (variants) are there?