BPMN 2.0 Training exercises

Contents

1. Dispatch of goods

Please model the following process

A computer hardware company would like to model its shipping process to make it visible and clear to everybody at the firm. Here is a description of the process as described by the office manager:

When shipping orders I first determine the physical size of the order. If I determine the size to be larger than a regular shipping box (aka a ‘special delivery’), I reach out to three shipping companies and ask each one for a bid. I then select the best offer and inform the vendor of the pending shipment.

If, on the other hand, I determine the order can use a regular shipping box, I print out a label and check to see if insurance is necessary. If insurance is necessary, the folks from Logistics will handle procurement of shipment insurance.

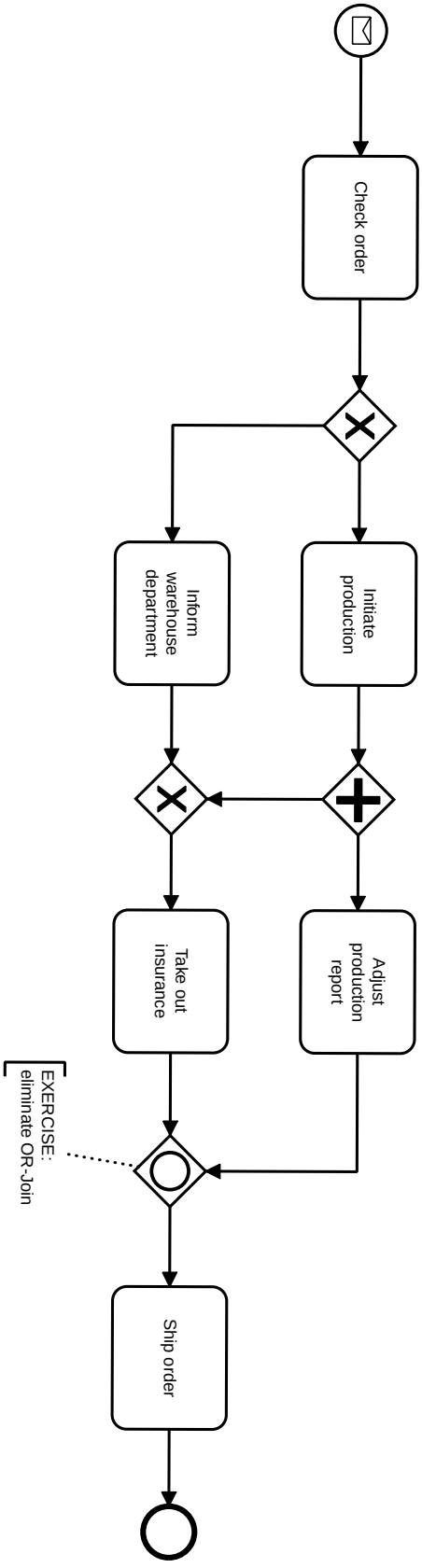
While that is happening, the folks in the Warehouse are gathering and packing the required items. Once the shipment method has been determined and set up, the folks in the Warehouse prepare the goods to be picked up by the selected shipment method vendor.

Hints

- The process scope is only to prepare the shipping, not the shipping itself.
- The process should be for the internal organisation. The shipping companies are not part of it!

2. Eliminate the OR join

Please eliminate the OR-join from the following process model



3. Recourse

Please model the following process

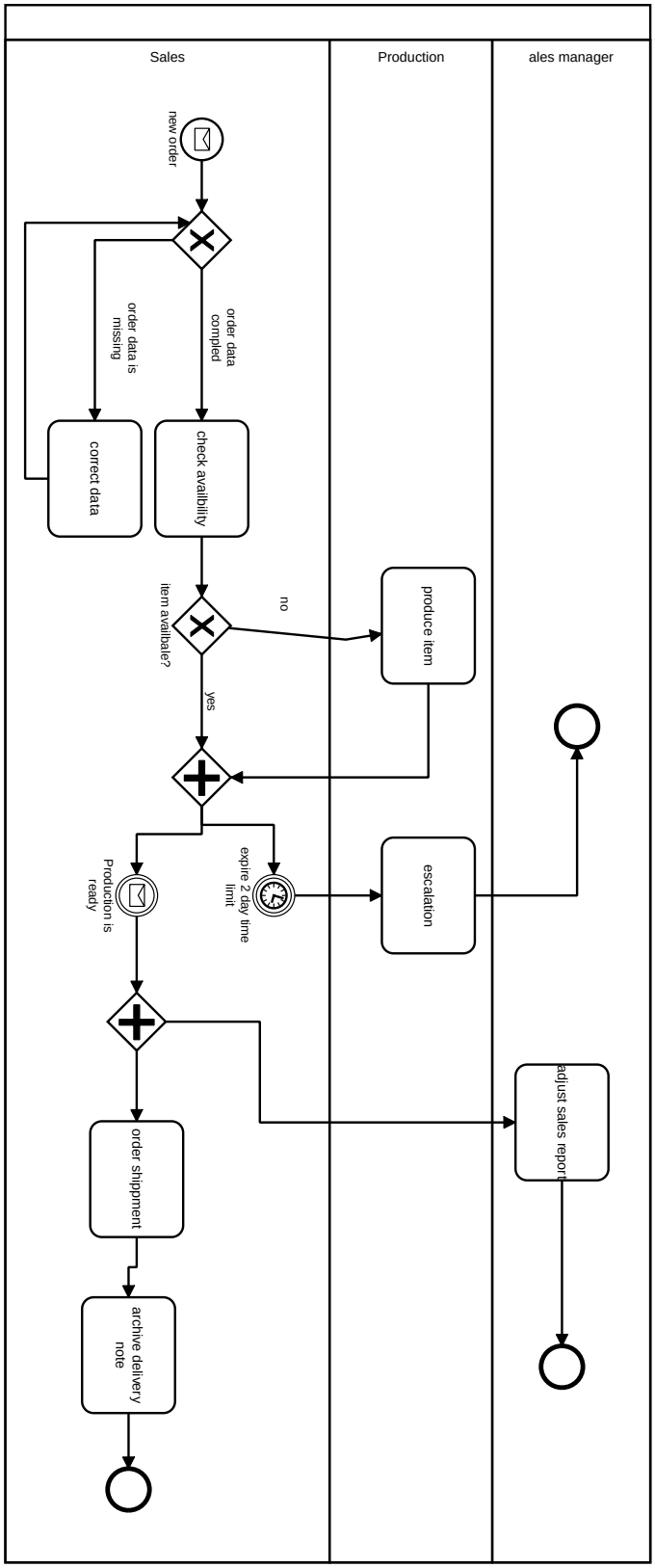
Insurance policyholders can be forced to pay back the money they have received from the insurance company for various reasons. This procedure is called recourse and in the following paragraphs, a clerk describes how this process works:

I receive a message regarding a potential recourse case. I'll investigate it and if I conclude recourse isn't possible, I will just close the case. If I determine recourse is indeed possible, I will send out a request for re-payment and then I will set a due date for the payment.

Next, one of three events will occur. * If we receive the money, I will process the payment and close the case. * If the due date is reached without a payment received, I'll hand the case over to a collection agency. * If I receive a response back from the policyholder appealing the repayment, I will research the reason for the appeal. If I conclude the policyholder was correct, I will close the case. Otherwise I will forward the case to a collection agency.

4. Unfortunate modeling style

Task 1: Check the process model below and try to align it to the modelling best practices that we defined during the training.



Task 2: Correct the given process model semantically. Make sure it fits to the following description

from the CEO:

"When we receive an order, the sales department will first check if the data is complete. If not, they ask the customer to send the missing information and wait for them. If the order data is complete, the process can continue and the Sales department checks the availability of the products. If we have everything on stock, the sales manager can start to adjust the reports while the other sales people handle the shipment and archive the delivery note. If the ordered item is not on stock, the production department will produce the item before we go on in the process. If the production takes longer than 2 days, they inform the customer about the delay."

5. Cooking with BPMN

How to cook "fish fingers with french fries"

image::e05.en.svg

Fried potatoes a la BPMN

Ingredients:

- potatoes
- onions
- bacon
- pepper
- salt
- oil

Equipment:

- 1 frying pan
- 1 knife

Peel and dice the potatoes. Then, cook them to almost well-done. Preheat the frying pan with oil in it. Add the bacon, which has been diced beforehand. After 2 minutes add the sliced onions. Once the onions are glazed, add the diced and cooked potatoes and fry everything until it is golden-brown. Season with salt and pepper.

Exercise

1. Model the process that is described above.
2. Model the ingredients by using data objects.
3. Analyze the use of data objects and parallelize the steps as much as possible.
4. Model the equipment as data objects, too. What do you realize?

6. Credit scoring

Please model the following process

A bank employee uses the bank's web site to determine the credit worthiness of a customer. That web site communicates with the back-end credit rating system of the bank which in turn communicates with a third party credit protection agency to provide credit scores of the customer.

The process sends a scoring request to the agency right after the start.

The agency first performs a quick scoring (level 1). This often leads to an immediate result which is then returned directly to the banking back-end system within seconds. The banking process presents the result to the clerk working in the bank's web site.

Sometimes the scoring cannot be determined immediately and takes longer. In this case, the third party agency informs the banking process of the delay and then starts the level 2 scoring (which can take up to a couple of minutes). After the scoring result is determined, the information is sent back to the banking process. The banking process sends a message to the bank's web site informing the clerk about the delay and to check again later. As soon as a result arrives, it can be viewed in the front end.

Hints
Please use 3 pools for your model:

- Front end (Bank): collapsed pool (do not model details)
- Scoring (Back end bank): expanded pool (model all details)
- Scoring (Credit protection agency): expanded pool (model all details)

7. Self-service restaurant

Background

A self-service restaurant is under chaotic conditions. Guests place their order at the cashier and receive their meals on call from the kitchen. As the restaurant is very popular, the processes need to be adapted to the increasing demand. In the future, guests should only interact with one member of the staff when placing their order. The chef should purely be concentrating on preparing the meals. Buzzers will be introduced to signal to customers when their order is ready.

Create a model of the following optimized process

A guest enters the restaurant when feeling hungry. The guest chooses a dish from the changing menu and waits until it is their turn. The guest then places the order with an employee. The employee enters the order into the Point of Sale (POS) system and collects the money from the guest. After payment, the employee sets up a buzzer and passes it on to the guest saying "When the buzzer rings, your dinner is ready.”

Then the employee informs the chef of the order. The chef prepares the meal and places it on the serving shelf. The chef then informs the employee the meal is ready.

The employee then triggers the guest’s buzzer. The employee hands over the tray with the meal when the guest approaches the employee at the counter. If the guest does not respond in 5 minutes, the employee will call the guest over the PA system. And if the guest does not respond again, the employee will wait another 5 minutes before calling the guest’s name again and will repeat this cycle (potentially) indefinitely.a row.

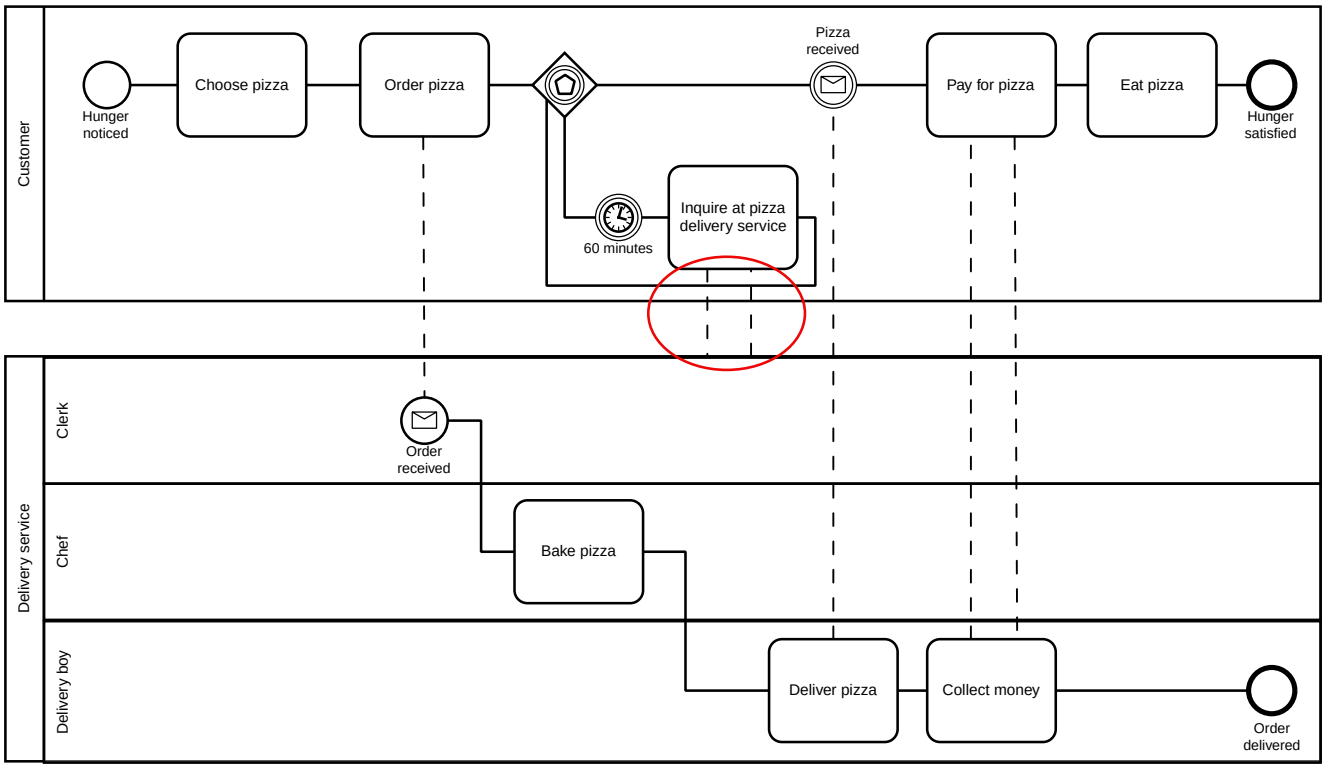
Hints
Use 3 different pools for the model:

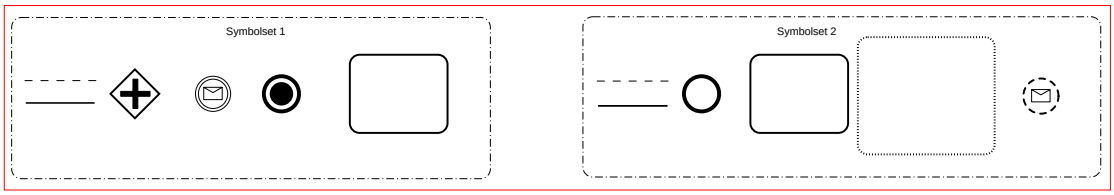
- Guest (food consumption)
- Employee (order processing)
- Chef (meal preparation)

8. Pizza order - calm down the customer

Please model the following process

If the customer calls because of the delayed pizza, the clerk should calm him down.





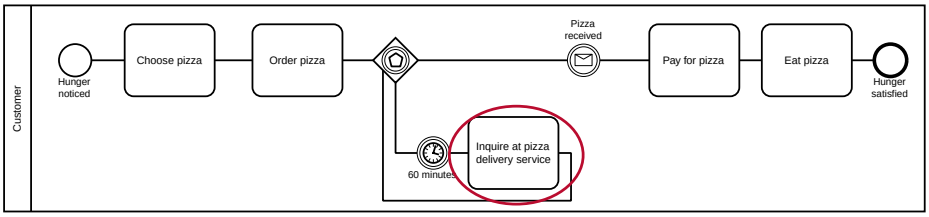
Hints

- For the solution, it is sufficient if the pool of the customer is collapsed
- You do not have to create a new model. It is enough to modify the existing one.
- Each subtask (symbol set 1 or symbol set2) should be worked out in a separate BPMN model.

9. Pizza order - interrupting the inquiry

Please model the following situation

If the customer receives the pizza during the inquiry, he ends the telephone conversation and pays for the pizza.

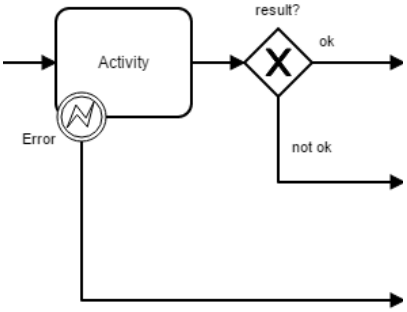


10. Handling problems

Process with Happy Path

Add the handling of the following problems to the same model that shows the happy path

1. The order data is incomplete
2. The order data is unreadable
3. The customer number within the order is wrong
4. The credit rating of the customer is insufficient
5. The ordered item is not available
6. Sending the order confirmation fails



Hints

- For each problem use either an error event attached to the activity or a XOR-gateway after the activity
- Except for problem 6, all of the above situations lead to the rejection of the order!
- Use the same model for the whole assignment.
- You do not have to model error throw events. Suppose the errors were created within the activities. You only need to model error handlers where applicable.

11. Invoice receipt

Background

This process description explains how a company deals with incoming invoices. They are evaluating if this procedure can be automated for future invoices.

Modeling objective

- Please model the following overall process as described
- Use the Camunda BPMN Framework (Camunda House / strategic vs. operational models)
- Consider the interactions between the different participants carefully. Display those interactions in the process model explicitly.
- Extract the part of the process that can be automated by a process engine

11.1. Strategic model

Process description Invoices are sent to the company by post. The team assistant receives the invoice and scans it. Then, the approver gets the invoice and checks it. The approver decides whether the invoice is approved or not. If the invoice is approved, the manager settles the invoice. If the invoice is rejected, the team assistant clarifies the case with the invoicing party. If the clarification is successful, the approver gets the corrected invoice and rechecks. If the clarification was not successful, the team assistant cancels the processing of the invoice.

Exercise:

- Please model the strategic process model of the description above
- Check if the strategic process model only shows the happy path.

11.2. Operational model (human process flow)

Process description The strategic model was discussed with the management and the involved employees. Now the process needs to be documented in more detail. Therefore, more information about the process has been collected. The following information result from a process discovery workshop:

Team assistant: „The existing model shows the process pretty well, though some proceeding steps are missing. The first thing I recognize is the handling of the invoice. By the way, I get the invoice from our postal department. Before I scan the invoice, I must check if the invoice content-wise for plausibility. The invoice may be issued incorrectly. I am only allowed to scan plausible invoices. For false invoices, I need to get a new one from the invoicing party. In this case, I stop the process at this point and wait for the new invoice. After scanning the invoice, I hand it over to the approver. If everything is OK, I don't need to do anything else. If the invoice is not approved, I need to clarify with the invoicing party. At this point the model is correct: If I couldn't clear the case, I stop the process. Otherwise, I hand over the updated invoice to the approver again." Approver: „I don't have anything to add. The model outlines my activities well."

Manager: „The model represents the process well, I agree with the previous speakers. The mentioned activities must be shown in the model. That is important. I don't want to pay any incorrect invoices. Everyone should know that and be aware of it. That means that I only want to get approved and correct invoices. I don't want to see any incorrect invoices. If I only get correct invoices, I know I can settle them directly. After the payment, from my point of view, the invoice is processed completely. However, one crucial step is missing: the hard copy of the invoice needs to be archived. The digital version of the invoice (a PDF file) should be archived in our Document Management System (DMS) in the future. This step should be automated. The hard copy of the invoice is supposed to be archived by the team assistant right after scanning it.“

The manager adds one more thing: „ The described process is correct. Nevertheless, you should consider that I settle open invoices "in one swoop". I do that when I have some spare time. I don't want to process every single invoice. That would take too much time."

Exercise:

- Model the operational process model including the human process flows.
- The interfaces between the processes (communication between participants) need to be modeled explicitly because your model will provide the basis for automation.

11.3. Operational model (human and technical process flows)

Exercise:

Use the operational model with the human process flows as a starting point. The executable process needs to be modeled in a separate pool. The resulting collaboration diagram should result in simplified pools for the task workers. Make sure that all requirements are still satisfied.

Hints

- No new business requirements are added.
- The human workflows need to be adjusted.

12. The job announcement

Background

Imagine you are a consultant and you are asked to redesign the job announcement process of a large organization. At the moment, there is no defined process for announcing job positions. Announcements are currently made available in an ad-hoc manner, meaning that the business department directly asks the HR department to publish the job ad. However, the HR department suffers from high workload and unclear input given by other departments. Ongoing questions are being sent back and forth resulting in unnecessarily long waiting times, or essential issues remaining unresolved at all. You as an experienced consultant for business processes are hired to design a process that will be implemented by IT to enhance the experience for managers having to announce jobs significantly.

As an experienced consultant, you choose a top-down approach.

12.1. Strategic model

Design a strategic model according to the Camunda House BPMN-framework. All necessary tasks should be presented in a logically abstract manner. Please note that not all details need to be shown in this diagram.

Description

The process starts in the business departments as they know first whenever they need to announce a new position. This is not dependent on whether an employee retires or an entirely new job is created. An employee notifies the HR department that an announcement must be made. Therefore, a form is to be filed and sent via email to HR. HR works on the announcement. As soon as the job is announced on the company's website, applicants can apply for it. Applications can be made via post or email. The HR department checks each incoming application. A selection process is part of the recruiting process. As soon as an applicant is selected, the interview is set up. The recruiting process is finished if the position is closed and the applicant signed the contract.

Hints

- Use a single pool with multiple lanes on the strategic level. Please further note that not more than ten flow objects are allowed.

12.2. Operational model (human process flow)

Now you have an overview of the recruiting process, and you are ready for the remaining details. First model the job announcement process. Please start by modeling the process as the process participants see it. Use two separate pools: one for the HR employee and one for the head of the business department. Model the communication between both stakeholders with message flows. Do not model IT systems.

Description

The job announcement process starts when new positions are required. The head of a business department informs the HR employee and provides the necessary information. The employee checks the information regarding the job description and its requirements. If necessary, he or she asks the department head to provide more information. If all information is available, the announcement is prepared. The department head is informed to double-check the prepared announcement. He or she then checks the prepared statement and requests correction if necessary. If no correction is required, the head approves the announcement and that part of the process finishes. The HR employee waits until the approval is made or corrections are requested. If corrections are needed, the announcement must be approved again. Otherwise, the job is announced.

12.3. Operational model (human and technical process flows)

Now that the processes for all roles is set up, your task is to investigate how it can be supported by IT. This model aims at providing a technical view on the workflow. It shows how the process can be executed automatically. Therefore, you have to model an additional pool for the process engine and investigate how all parties communicate. As starting point, reuse the human flows of the operational model from part two and only adapt it where necessary.

Hint

Add the mentioned pool for the engine. This pool controls all processes by integrating the processes with human workflow. The humans perform work which is orchestrated by the engine. Within the engine pool, please use lanes to indicate the role that is performing the human task. You might also have to change the existing pools for the human flows.

For the moment, please only consider the workflow for the job announcement. All other parts are out of scope.

Description

The business department requests announcements via the HR-portal. The submission of the form starts the process in the engine. The engine assigns the department head a task to provide information on the announcement. Once finished, the HR employee checks the job ad. If necessary, information requests are still handled face to face or by telephone. No human task management should be used. In case of corrections, a task is assigned to the business department head, and rework is requested. Then, a new check is performed. In case of approval, the announcement is being progressed. The process engine now publishes the job announcement on internal and external channels (e.g., social media platforms). For the moment, please only consider the workflow for the job announcement. All other parts are out of scope.

13. Bank robbery

Background

You are a member of a robbery gang that is planning to rob a bank. There are three members in your group. The characters and their duties are described below. Your trainer will tell you for which member you are assigned to model the process.

HINT: Communication between gang members is key to a successful robbery. Ensure you model signals and messages correctly.

13.1. Big Boss (Leader)

You are the big boss. You recognize your gang is broke. Therefore, you are planning a bank robbery.

First, you case a bank. You base your decision on the number of security guards. If a bank has more than five security guards, you case another bank. If the bank has five or fewer security guards, you continue to plan the robbery. You are a superstitious person, so you read your horoscope every day. If the horoscope for a given day is positive, you feel ready to commit the robbery. That is the day when you tell all of your gang members that the theft is on and you wait for two messages. One from Pia Pyro (the safecracker) and one from Burke Burger (the driver) telling you that they are ready. When both messages have arrived, you go on and enter the bank. After entering the bank, you point your gun and shout at the people to get down. If anyone doesn't follow your orders, you repeat this action till everyone lies on the ground. When everyone is down, you call Pia Pyro and phone your mom (the real leader of the crime gang). Then you wait until one of the following happens:

- The police arrive! In that case, you would inform the gang that the robbery is called off.
- 20 Minutes have passed. In this case, you call the robbery off, too.
- Pia Pyro is successful. In this case, you get into the car, which means that you robbed the bank successfully. Still, it could happen that Burke Burger (your driver) has disappeared with the car. Then you are in big trouble!

13.1.1. Optional subprocess:

```
If you've managed to model the above process, convert the "phone mom" task to a call
activity and model the following situation: Dial your mom's number and wait until she
answers the phone. Tell your mom you're robbing a bank – if she likes the idea, take
all the credit. Otherwise, blame your gang members. Also if at any point she puts your
dad on the phone – hang up!
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Assignment:

- Model the process of your character in one pool
- Later, you will meet up with other attendees who have modeled the same character
- After that, you will be part of a group to form a gang. All three models will be put into the same file with a pool for each character. Discuss your model and try to come up with the message flows between the pools. Your models will likely need adjustment to take the other gang member's activities into account.

13.2. Pia Pyro (Safe cracker)

You are the safecracker. You will get a signal from your boss if the robbery is on. Then you start packing your tools. After that, you need to wait for your companion Burke Burger (the driver) to pick you up with a stolen car. He will let you know when he arrives at your house. After you got the message, you load your tools into the trunk, get into the car and when you arrive at the bank, tell your boss that you are ready.

Then you wait till your boss tells you to enter the bank. You make your way to the safe. Now the tricky part starts. You need to bypass the alarm and work on opening the lock. If the alarm is triggered during one of those two activities, you need to be very fast. You will take out your TNT and blow up the safe. When the safe is open, you get the money and inform your boss. Together, you get into the car and celebrate the coup.

It could happen that during the safecracking part your boss calls the robbery off. In that case, you need to run out of the bank and escape.

13.2.1. Optional subprocess:

```
If you've managed to model the above process, convert the "Bypass Alarm" task to a call
activity and model the following situation: Disconnect the blue wire, then the yellow
wire – if a red light flashes while doing this, quickly reconnect the cables and try
again. Otherwise, you have successfully disabled the alarm.
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Assignment:

- Model the process of your character in one pool
- Later, you will meet up with other attendees who have modeled the same character
- After that, you will be part of a group to form a gang. All three models will be put into the same file with a pool for each character. Discuss your model and try to come up with the message flows between the pools. Your models will likely need adjustment to take the other gang member's activities into account.

13.3. Burke Burger (The driver)

Your job is to drive the car. You will get a signal from your boss as soon as the robbery is on. That means you have to steal a car. After you have stolen a car, you pick up your chum Pia Pyro (the safecracker). Let her know when you arrive at her house (blow the horn), wait until she has entered the vehicle and drive to the bank. If she didn't show up after five minutes, toot the horn again and keep doing so every five minutes until she eventually recognizes you. Then you tell your boss that you are ready. Your work is almost done. In fact, for you, the most anxious moment is to steal the car.

Now you just need to wait till for one of the following events to happen:

- If your boss and the safecracker jump into your car, you need to drive to the hideout.
- If your boss calls the robbery off, you drive off, burn the car and hide.
- You are a very foody person, so if you feel hungry, you would leave the bank and go with the car to the nearest burger place. After eating your hamburger, you will realize that you have left your gang in trouble. If that happens, you got kicked out of the group.

13.3.1. Optional subprocess:

```
If you've managed to model the above process, convert the "Steal a car" task to a call
activity and model the following situation: If it comes to food you might be not the
most reliable person, but you are inalienable for stealing a car. For stealing a car,
you do the following: You go to a big parking area and case a car. If a car has just
two doors, it is not suitable for a robbery. Only if a car has four doors and a trunk,
you go on with committing the theft. Then you need to unlock the car and turn off the
alarm. If you succeed, you go on and hot-wire the vehicle. You will hear the motor,
and you know your thievery has been successful. If someone noticed that you are
stealing a car after you broke into it, run off and start over by making your way to
another big parking area.
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Assignment:

- Model the process of your character in one pool
- Later, you will meet up with other attendees who have modeled the same character
- After that, you will be part of a group to form a gang. All three models will be put into the same file with a pool for each character. Discuss your model and try to come up with the message flows between the pools. Your models will likely need adjustment to take the other gang member's activities into account.

14. Reservation system

Task 1: Model the following process

Seat reservations for our workshops are made through our reservation system. When a customer makes a reservation request, a message is sent to the system. There it is first checked whether there is still a space available. Only then is the space automatically blocked in the database. If there is no more space, an information is sent to the customer and the process is ended.

After the blocking, the customer will be sent a payment request with a notice period of 5 days. If the customer confirms the reservation by paying within this period, this is stored in the database and the reservation is completed. Otherwise, the customer receives a message that his reservation has expired and the space is released again in the database at the same time.

The customer can of course cancel the booking at any time up to the beginning of the workshop. If the payment has already been made, the money will be paid back.

Hints

- Please use 2 pools: customer (closed) and the reservation system
- The process instance should remain open until the workshop starts

Exercise 2:

It has been noticed in the past that many customers did not pay within the deadline. The places were then released again, but not yet booked by others. If the customers still wanted their tickets, they had to restart the whole process. In order to make this easier for the customer, the space should first be released again in the event that the deadline has expired, but the customer should still retain the option of confirming the reservation by making a payment. The customer should only be informed and the reservation canceled if all places have been booked in the meantime.

Make these changes in the model. A signal event should be used in the event that all places have been booked.