Change Scenarios

The trigger for this business change is the unsatisfactory quality of materials from the supplier and significant costs and time needed for quality check of materials. For one batch, the step takes 4 hours and costs 360 EUR. If we assume as in the example an order with 3 batches and take into account the probability at the relevant XOR gateway of 0.82, then the total time for this step would be 9.84 hours and total costs would be 885.60 EUR.

In brief, the major two scenarios for this business change would be to either shift the material quality check to supplier but to pay more for the materials (scenario 1) or to keep doing the quality check but then to pay less for materials (scenario 2 and 3).

The following text describes all 3 scenarios in more details.

Scenario 1

Summary

- Deleting material quality check
- Deleting replacements of defect materials in the loop
- Adding replacement of defect CPUs after the loop
- Supplier has to perform material quality check
- Increasing the price for materials

This scenario includes eliminating material quality check (saving 9.84 hours and 885.60 EUR for an order with 3 batches) and due to higher expected material quality from supplier who would have to implement material quality check on his end (and incur additional costs) also to eliminate the activity of replacing defect materials (saving 0.74 hours and 21.00 EUR for an order with 3 batches).

As the supplier has to implement the material quality check process on his end, we would pay him more for the materials, 6.100 EUR instead of 6.000 EUR.

As we might expect that the quality of produced CPUs might decrease due to the new settings, activity for replacement of defect CPUs was incorporated after the batch loop with an XOR gateway having probabilities of 0.10/0.90. This step then takes 0.6 hours and costs 17.89 EUR. The reliability of this step is 95% which leads to a decrease of the overall reliability.

Overall, these changes would save 9.98 hours and 587.54 EUR. On the other hand the average reliability would decrease to 83.88 % from 84.24%.

Scenario 2

Summary

- Deleting replacements of defect materials in the loop
- Adding replacement of defect materials after the loop
- Adding replacement of defect CPUs after the loop
- Decreasing the price for materials

In this scenario, we would keep the material quality check step, but decrease the material price from 6.000 EUR to 5.700 EUR per batch.

On the other hand, the replacement of defect materials would be moved out of the batch loop and executed only once per order which would save time and costs especially for orders with high number of batches, even though the difference is marginal.

Finally, activity for replacement of defect CPUs was incorporated after the batch loop with an XOR gateway having probabilities of 0.10/0.90. This step then takes 0.6 hours and costs 17.89 EUR. The reliability of this step is 95% which leads to a decrease of the overall reliability.

Overall, these changes would save 889.65 EUR. On the other hand the average reliability would decrease to 83.83 % from 84.24% and the average process time would increase by 0.46 hours

Scenario 3

Summary

- Deleting replacements of defect materials in the loop
- Adding replacement of defect materials after the loop
- Adding replacement of defect CPUs after the loop
- Deleting recycling – this must be done separately by assembler
- Decreasing the price for materials

This scenario is the same as the scenario 2 with one additional change and this is removal of the recycling step. The assembler would have to implement his own recycling step with third party which would create additional costs for him as he would have to pay for this service. So far manufacturer was performing this step for assembler for free.

Removing this activity will save additional 1.2 hours and 34.34 EUR.

Overall, these changes would save 0.74 hours and 924.00 EUR. On the other hand the average reliability would decrease to 84.00 % from 84.24%.

Responses to the business change made by the supplier

Scenario 1

In the first scenario of the business change made by supplier, supplier stopped receiving materials for recycling from us (manufacturer). Our response was then to stop providing recycling services to the assembler at all.

Summary of changes in the private model

- Deleting ***Recycling of unused CPUs***
- Deleting ***Recycling of unused materials***

Overall, these changes would save 34.34 EUR and 1.20 hours. Average reliability would increase to 84.41 % from 84.24%.

Scenario 2

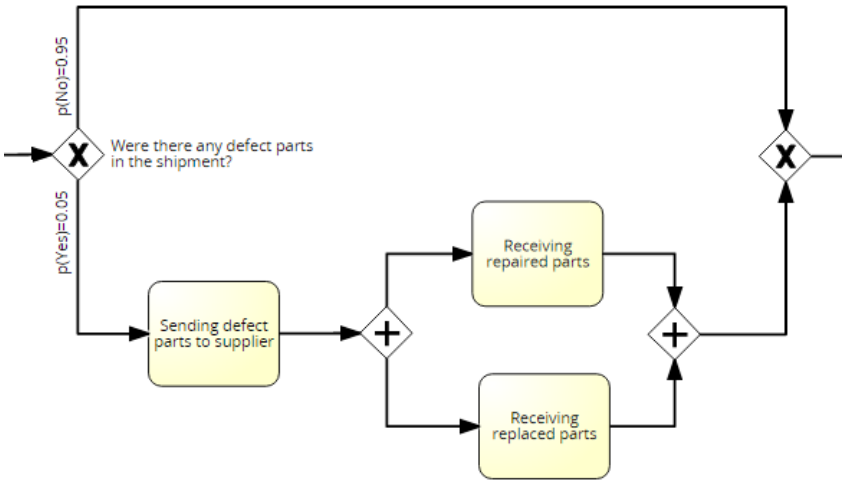
In this scenario, supplier decided to handle defect materials we are sending back to him in a more differentiated way. Part of the defect materials will be repaired instead of replaced directly. This will increase the time supplier needs to replace completely all defect parts.
Our response is to rebuild the process of replacing defect materials with the supplier. This will include two main changes in this area. On one hand splitting the original replacement activity into sending defect materials to supplier and receiving materials back and on the other hand to create parallel steps of receiving replaced and/or repaired materials back
Summary of changes in the private model

- Replacing ***Replacement of defect parts*** with the activities listed below
- adding ***Sending defect parts to supplier***
- adding parallel gateway with ***Receiving repaired parts*** and/or ***Receiving replaced parts***

To run through the old replacement process took 6 hours. To complete the new replacement process with the repair option (see the screen shot below) takes 5 hours longer on the supplier´s end and thus also 5 hours longer on our end, i.e. 11 hours. This has been reflected in the private model where the sending step takes 5 hours. Receiving replaced parts takes 1 hour (this step with the sending step reconstitute the old 6 hour step) and receiving repaired parts takes 1+5 additional hours, i.e. 6 hours. As both receiving steps are parallel steps, then the entire receiving

step takes maximum of 1 and 6 hours, i.e. 6 hours. Then the sending and receiving step make 11 hours in total.

As the probability that the replacement would be needed is low (5%) with another preceding XOR gateway with the probability of 82%, this change does not change the average process time and costs too much. Overall, these changes would increase the average process time by 0.61 hours (0.82*0.05*5 additional hours* 3 batches =0.61 hours). The additional average costs amount to 14.85 EUR and the average reliability decreased to 84.12 % from 84.24%.

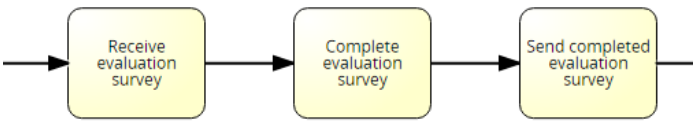


Scenario 3

In this scenario, supplier decided to introduce evaluation survey. This will lead to addition of three new steps in our private model to receive, complete and send back the survey.

Summary of changes in the private model

- adding ***Receive evaluation survey***
- adding ***Complete evaluation survey***
- adding ***Send completed evaluation survey***



These additional steps will increase the average process time and average process costs of the private model by 3 hours and 150 Euro, respectively. The average reliability will not change as the reliability of the added steps is 100%.

Responses to the business change made by the assembler

Scenario 1

In the first scenario of the business change made by assembler, assembler changed his payment process of payment from being executed sequentially in his process to being executed in parallel with his assembling process in his model. We would adjust to this change by changing our public and private model by parallelizing the payment process with the batch production and delivery process as well. This would save time. The activity ***Making payment to assembler*** takes 1 hour and by this amount the average process time would decrease. Average process costs would stay the same as this activity would take place as before. As the reliability for this activity is 100%, the average process reliability will not change as well.

Summary of changes in the private model

- Parallelizing ***Making payment to assembler***

Scenario 2

In the second scenario, the assembler requires payment for each batch separately, whereas the payment procedure including clarification of payment details is parallelized with the coordination of batch shipment and batch shipment. Because coordination of batch shipment and batch shipment take in total 10 hours and clarification of payment details and payment together 3 hours only, this change would decrease the average process time by 3 hours, even if the payment is performed for each batch. On the other hand, the costs would increase with the number of batches to be delivered for an order. In our calculation example with 3 batches, the average costs of the private (also public process) would increase by 200 EUR (clarifying payment and making payment costs in total 100 EUR, now instead performing this action only once we have to perform it three times). The average process reliability would stay the same for the private and public process as both parallelized steps display reliability of 100%.

Summary of changes in the private model

- Parallelizing ***Clarifying payment details with assembler*** and ***Making payment to assembler*** and placing both steps into the batch loop

Scenario 3

In the third scenario, the assembler requires that the entire payment for the order is made at once after the last batch of CPUs has been delivered. This requires that the activities ***Clarifying payment details with assembler*** and ***Making payment to assembler*** are shifted after the batch production and delivery loop in our private and also public model. As this modification only changes when we are being paid by the assembler, no change in average process time, costs or reliability has been introduced du to this modification.

Summary of changes in the private model

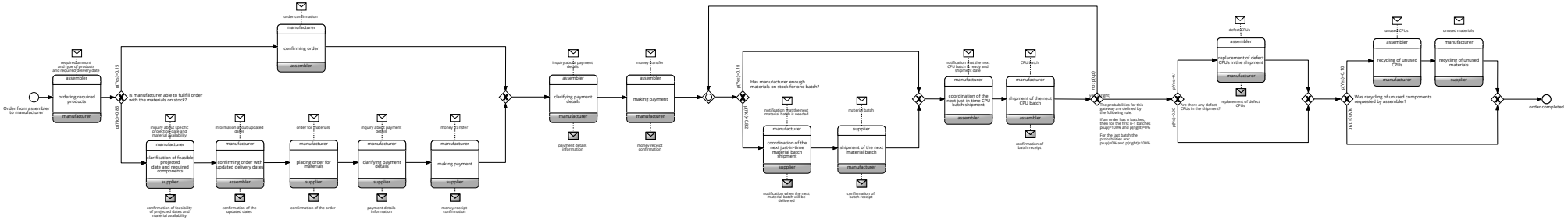
- Moving the position of the activities ***Clarifying payment details with assembler*** and ***Making payment to assembler*** after the batch loop

On the next pages following models are presented:

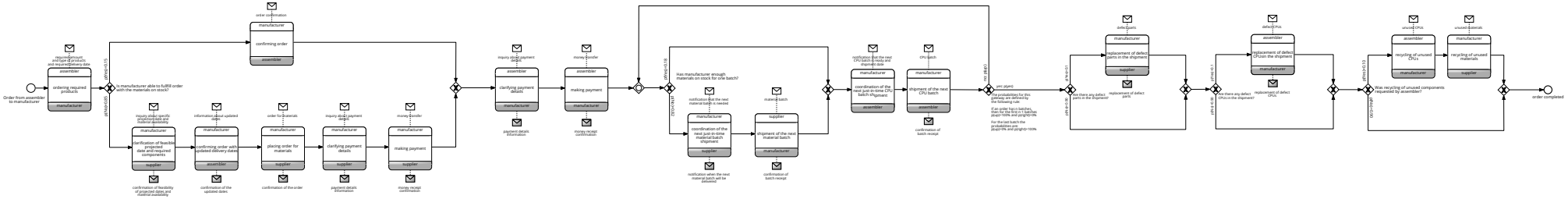
- Choreography for my business change scenario 1
- Choreography for my business change scenario 2
- Choreography for my business change scenario 3
- Private model for my business change scenario 1
- Private model for my business change scenario 2
- Private model for my business change scenario 3
- Private model for my response to business change from Assembler scenario 1
- Private model for my response to business change from Assembler scenario 2
- Private model for my response to business change from Assembler scenario 3
- Private model for my response to business change from Supplier scenario 1
- Private model for my response to business change from Supplier scenario 2
- Private model for my response to business change from Supplier scenario 3

Remaining public models and choreographies will be uploaded by my colleagues, whoever makes the last changes to them. My changes have been already in those models incorporated.

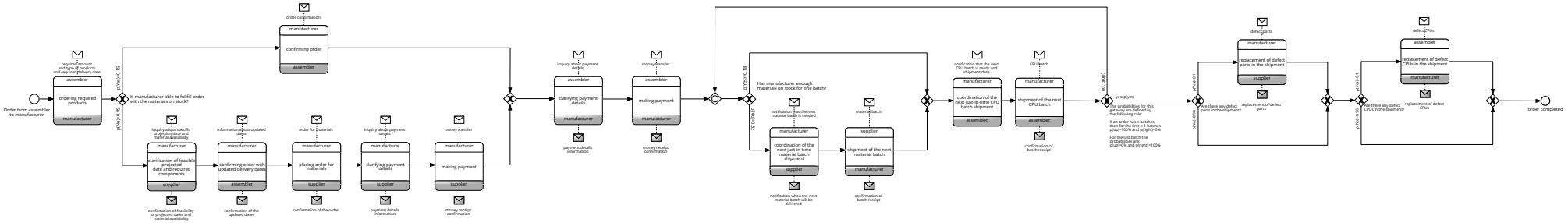
Choreographie_Manufacturer_Szenario1



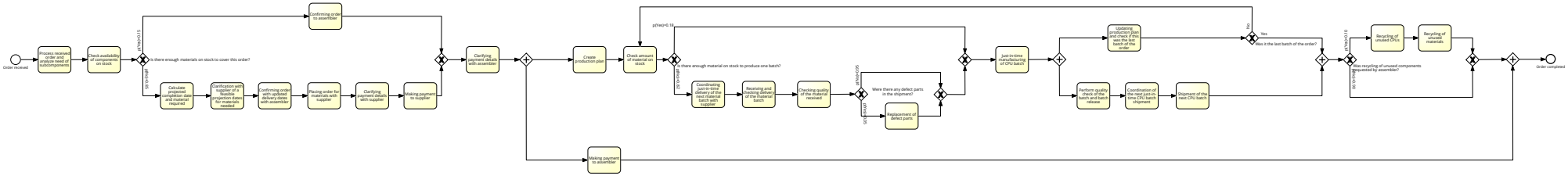
Choreographie_Manufacturer_Szenario2



Choreographie_Manufacturer_Szenario3



Private_Model_Manufacturer_to_Assembler_scenario1_Ehrlich_Martin_9350580



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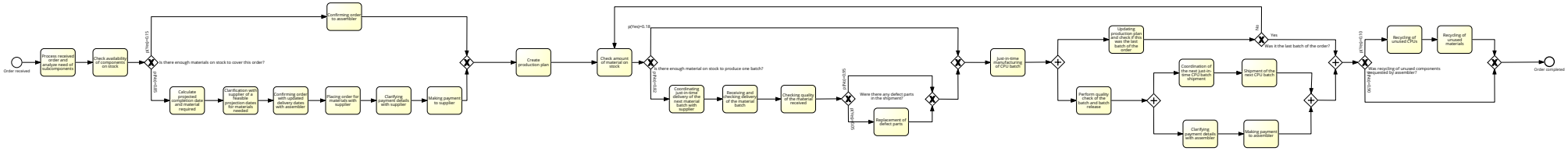

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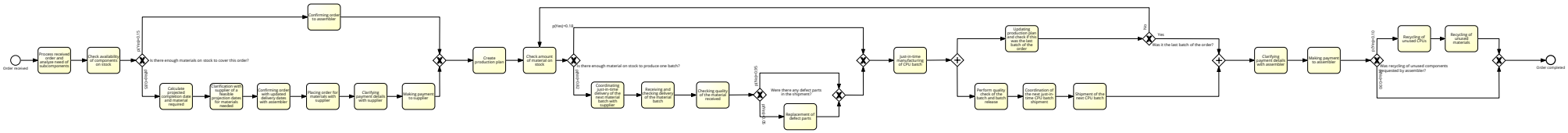

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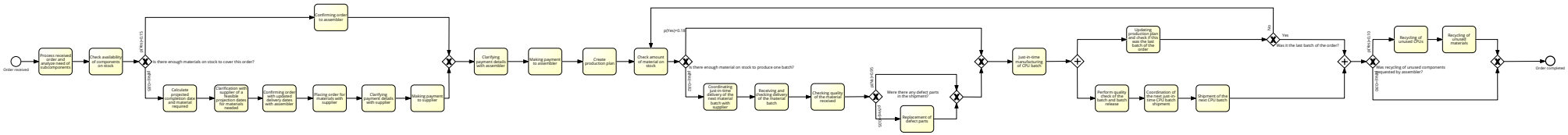

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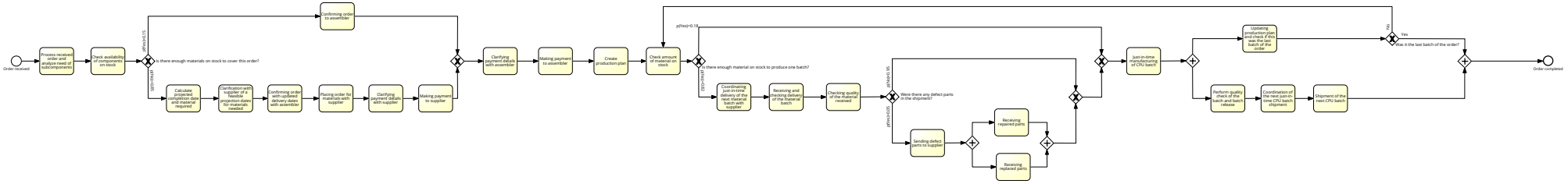

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