Choreography model

ID level 1	p of XOR	ID level 2	p of XOR	ID level 3	initiator	receiver	activity	time (hours)	human resource (in persons)	human resource (EUR/hour)	technical recources costs total (EUR)	reliabilty	total costs (EUR)	avg time	avg costs	avg reliability	
1					assembler	manufacturer	ordering required products	4,00	2	25	20	100,00%	220,00	4	220,00	100,00%	
	0,15	U1			manufacturer	assembler	confirming order	1,00	1	25	0	99,00%	25,25				
	0,85	D1			manufacturer	supplier	clarification of feasible projected date and required components	2,00	2	25	10	95,00%	115,79				
		D2			manufacturer	assembler	confirming order with updated delivery dates	1,00	2	25	0	99,00%	50,51				
		D3			manufacturer	supplier	placing order for materials	4,00	2	25	20	100,00%	220,00				
		D4			manufacturer	supplier	clarifying payment details	2,00	2	30	10	95,00%	136,84				
		D5			manufacturer	supplier	making payment	1,00	2	30	0	100,00%	60,00	8,65	499,45	90,80%	
2					assembler	manufacturer	clarifying payment details	2,00	2	30	10	100,00%	130,00	2	130,00	100,00%	
3					assembler	manufacturer	making payment	1,00	2	30	0	100,00%	60,00	1	60,00	100,00%	
	0,82	D1			manufacturer	supplier	coordination of the next just-in-time material batch shipment	2,00	2	20	10	99,00%	90,91				
		D2			supplier	manufacturer	shipment of the next material batch	8,00	2	20	200	99,80%	521,04				
			0,05	U1	manufacturer	supplier	replacement of defect parts in the shipment	6,00	2	20	50	99,40%	291,75	25,338	1 541,29	98,99%	0,9997
4					manufacturer	assembler	coordination of the next just-in-time CPU batch shipment	2,00	2	20	10	99,60%	90,36	6	271,08	99,60%	
5					manufacturer	assembler	shipment of the next CPU batch	8,00	2	20	200	99,50%	522,61	24	1 567,84	94,42%	99,50%
	0,10	U1			assembler	manufacturer	recycling of unused CPUs	6,00	2	20	50	99,00%	292,93				
		U2			manufacturer	supplier	recycling of unused materials	6,00	2	20	50	99,00%	292,93	1,2	58,59	99,80%	
													average values ->	72,188	4 348,25	85,56%	

U = up (uppper path)
D = down (bottom path)

Average number of batches/order   3

Order from assembler to manufacturer

ordering required products
manufacturer

requires amount and type of products and required delivery date
assembler

order confirmation
confirming order
manufacturer
assembler

p(Yes)=0.15

Is manufacturer able to fulfill order with the materials on stock?

p(No)=0.85

inquiry about specific projected date and material availability
clarification of feasible projected date and required components
manufacturer
supplier

confirmation of feasibility of projected dates and material availability

information about updated dates
confirming order with updated delivery dates
manufacturer
assembler

confirmation of the updated dates

order for materials
placing order for materials
manufacturer
supplier

confirmation of the order

inquiry about payment details
clarifying payment details
manufacturer
supplier

payment details information

money transfer
making payment
manufacturer
supplier

money receipt confirmation

inquiry about payment details
clarifying payment details
assembler
manufacturer

payment details information

money transfer
making payment
assembler
manufacturer

money receipt confirmation

p(Yes)=0.1

Has manufacturer enough materials on stock for one batch?

p(No)=0.9

notification that the next material batch is needed
coordination of the next just-in-time material batch shipment
manufacturer
supplier

notification when the next material batch will be delivered

material batch
shipment of the next material batch
supplier
manufacturer

confirmation of batch receipt

p(Yes)=0.05

Are there any defect parts in the shipment?

p(No)=0.95

defect parts
replacement of defect parts in the shipment
manufacturer
supplier

replacement of defect parts

notification that the next CPU batch is ready and shipment date
coordination of the next just-in-time CPU batch shipment
manufacturer
assembler

CPU batch
shipment of the next CPU batch
manufacturer
assembler

confirmation of batch receipt

no, p(r,gl=n)

yes, p(r,gl=y)

The probabilities for this gateway are defined by the following rule:

If an order has n batches, then for the first n-1 batches p(up)=100% and p(right)=0%

For the last batch the probabilities are: p(up)=0% and p(right)=100%

p(Yes)=0.3

Was recycling of unused components requested by assembler?

p(No)=0.7

unused CPUs
recycling of unused CPUs
assembler
manufacturer

unused materials
recycling of unused materials
manufacturer
supplier

order completed

The probabilities for this gateway are defined by the following rule:

If an order has n batches, then for the first n-1 batches p(up)=100% and p(right)=0%

For the last batch the probabilities are: p(up)=0% and p(right)=100%

supplier

receive inquiry about feasible projected completion date — sends confirmation of feasible projected completion date — confirmation of feasibility of projected dates and material availability — order received — receive order — send confirmation of order — receive inquiry of payment details — send payment details — get payment — send confirmation of payment — receive that needed — send confirmation of sending the next batch — send next batch of materials — receive confirmation of batch receipt

p(left) — Was it the last batch of the order? — are there defect parts? — p(yes)=0.05 — receive defect parts — send new parts — p(no)=0.90 — are there parts for recycling? — receive parts for recycling — unused materials — next batch of materials

inquiry about specific projection date and material availability
order for materials
inquiry of payment details
confirmation of the order
notification that next batch is needed
money receipt information
money transfer
defect parts

Manufacturer

order received — p(No)=0.85 / p(Yes)=0.15 — Is there enough material on hand to fulfill order?

Clarification with supplier of a feasible projection dates for materials needed — Confirming order with updated delivery dates with assembler — Placing order for materials with supplier — Clarifying payment details with supplier — Making payment to supplier

Confirming order to assembler

Clarifying payment details with assembler — Making payment to assembler — money receipt confirmation

p(Yes)=0.1s — notification when the next material batch will be delivered — Is there enough material on stock to produce one batch?

Coordinating just-in-time delivery of the next material batch with supplier — Receiving and checking delivery of the material batch — confirmation of batch receipt — Were there any defect parts in the shipment? — Replacement of defect parts

Coordination of the next just-in-time CPU batch shipment — Shipment of the next CPU batch — Was this the last batch of the order? — For probabilities, see the text. — No / Yes

p(Yes)=0.10 — Recycling of unused CPUs — Recycling of unused materials — Was recycling of unused components requested by assembler? — p(no)=0.90 — Order completed

payment details information
payment details information
unused CPUs

Assembler

order required products — P(yes)=0.15 / P(no)=0.85 — Is manufacturer able to fulfill order with the materials on stock? — receive confirmation

receive confirmation of the order with updated delivery dates — send confirmation of the updated delivery dates

receive payment details information — send inquiry about payment details — do money transfer — receive money receipt confirmation — notification of the next CPU batch shipment — receive shipment of the next CPU batch — send confirmation of batch receipt — Was this the last batch of the order? — For probabilities, see the text.

P(yes)=0.10 — recycling of unused CPUs — Was recycling of unused components requested by assembler? — P(no)=0.90 — order completed

order confirmation
confirmation of the updated dates
money transfer
confirmation of batch receipt
CPU batch
confirmation of batch receipt