Role: Supplier
Domain: Car Manufacturing

Producing Material: purify aluminum for car body manufacturer and engine block manufacturer

Global Goals:

- Shorter delivery time in Supply Chain 5%
- Reduce global cost of our processes 4%
- Enter in new markets for example Asia

Private Goals:

- Improve productivity 10%
- Reduce administration 20%

Short Private/ Public Process Description:

My process starts with an incoming message. A computer receives the order with a request to confirm a completion date. An employee verifies the data from the order and checks if enough resources are available and verifies special customer needs. (Assumption: supplier can every time fix the desired date)
After that computer machines confirm the date. The customer needs were verified and so an employee knows if finished goods are in the warehouse or new goods have to be produced. Furthermore, an employee knows from the order how much and which kind of prune aluminum have to produce for one customer.
XOR branch if goods are available:
An employee takes the goods from the warehouse and gets them ready for a special customer and goes on with the task “get ready for shipping”.
No goods are available and customer wants car bodies:
Worker takes the blank aluminum from the warehouse and a pressing machine creates Coils. Moreover, the Coils get a special alloy against rust.
No goods are available and customer wants motor blocks:
First, the blank aluminum is send to the burner. There the blanks are burn another time, because the aluminum gets more stability.
Second, the cool adapted aluminum is pressed into motor blocks.

After the materials are produced an employee checks the quality. If the quality is ok the goods get ready for the shipment. Otherwise the goods have to produce again.
Before the goods are shipped, the partners verify the payment details. After that, the supplier sends a material notification and a shipment schedule.
At least, the supplier receives a report from a manufacturer and put it into a database if the delivered goods are bed.
Otherwise the process ends.

Estimated costs:

Assumption:

- ~40000t used blank aluminum per year → 250 working days → 10h per day → possible to transform 16t per hour
- alloy cost for 16t blank aluminum 100

	Type of resource	number of resource	cost per hour	time to finish/h	reliability	activity cost	time to finish/ min
get Msg to confirm order & completion date	computer	1	5	0,05	0,99	0,25	3
verify customer inquiry	worker	1	12	0,1	1	1,2	6
send confirmation for date	computer	1	5	0,05	0,99	0,25	3
take blank aluminium from warehouse	transport machine, worker	2	17	0,7	0,85	28	42
press aluminium into Coils	machine, 2 workers	3	30	3	0,75	360	180
put extra alloy on it for carbody	machine, worker	2	10	2,5	0,8	62,5	150
put blanks to the burner	machine, worker	2	17	0,3	0,85	12	18
burn it another time	machine, worker	2	20	4	0,75	213,33	240
press it to block	machine, 2 workers	3	30	3	0,85	317,65	180
check quality	worker	1	12	0,8	0,7	13,71	48
get ready for shipping	machine, worker	2	17	1	0,65	52,31	60
verify payment details	worker	1	12	0,4	0,7	6,86	24
send payment details	computer	1	5	0,05	0,99	0,25	3
check received money	computer	1	5	0,05	0,99	0,25	3
send material notification	computer	1	5	0,05	0,99	0,25	3
send shipment schedule	computer	1	5	0,05	0,98	0,26	3
enter it to database	computer, worker	2	17	0,3	0,8	12,75	18
take finsih goods from warehouse	machine, worker	2	17	1	0,85	40	60
16 t Aluminim = 1000							
+ Material cost - alloy cost, current cost							
Resources: Transport machine, computer, worker, producing machine							
		Private Process			Public Process		
		f_time	7,36915		f_time	0,665	
		f_cost	427,5984068		f_cost	8,759845908	
		f_reliability	0,264499841		f_reliability	0,652379174	

Calculate f_{time} , f_{cost} ,$f_{reliability}$:

	sequence	parallel	XOR
f_{time}	$\sum_a t_a$	$\max_a(t_a)$	$\sum_a p(a) \times t_a$
f_{cost}	$\sum_a c_a$	$\sum_a c_a$	$\sum_a p(a) \times c_a$
$f_{reliability}$	$\prod_a r_a$	$\prod_a r_a$	$\sum_a p(a) \times r_a$

Private Process:

f_{time} = 7,309h

f_{cost} = 427,6€

$f_{reliability}$ = 0,2645

Public Process:

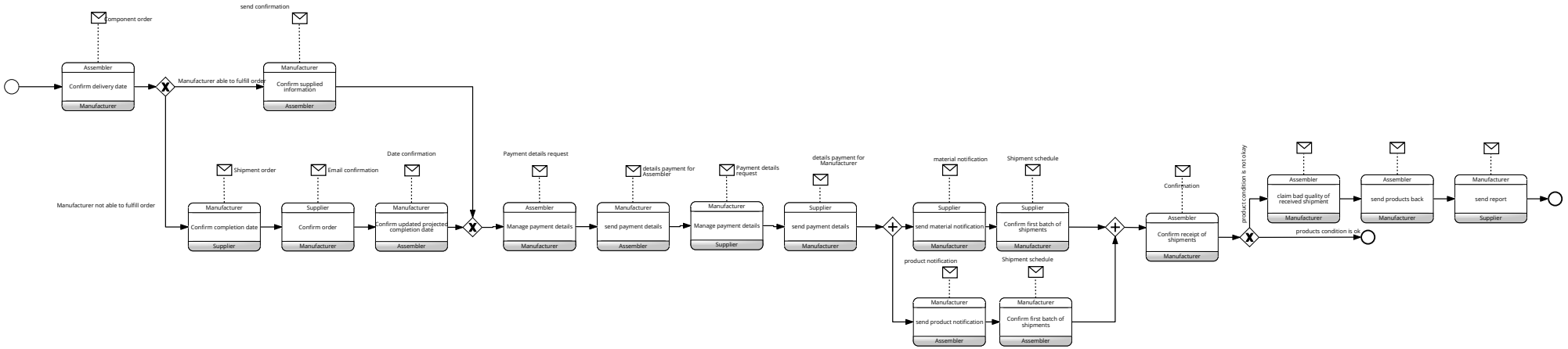
f_{time} = 0,665h

f_{cost} = 8,76€

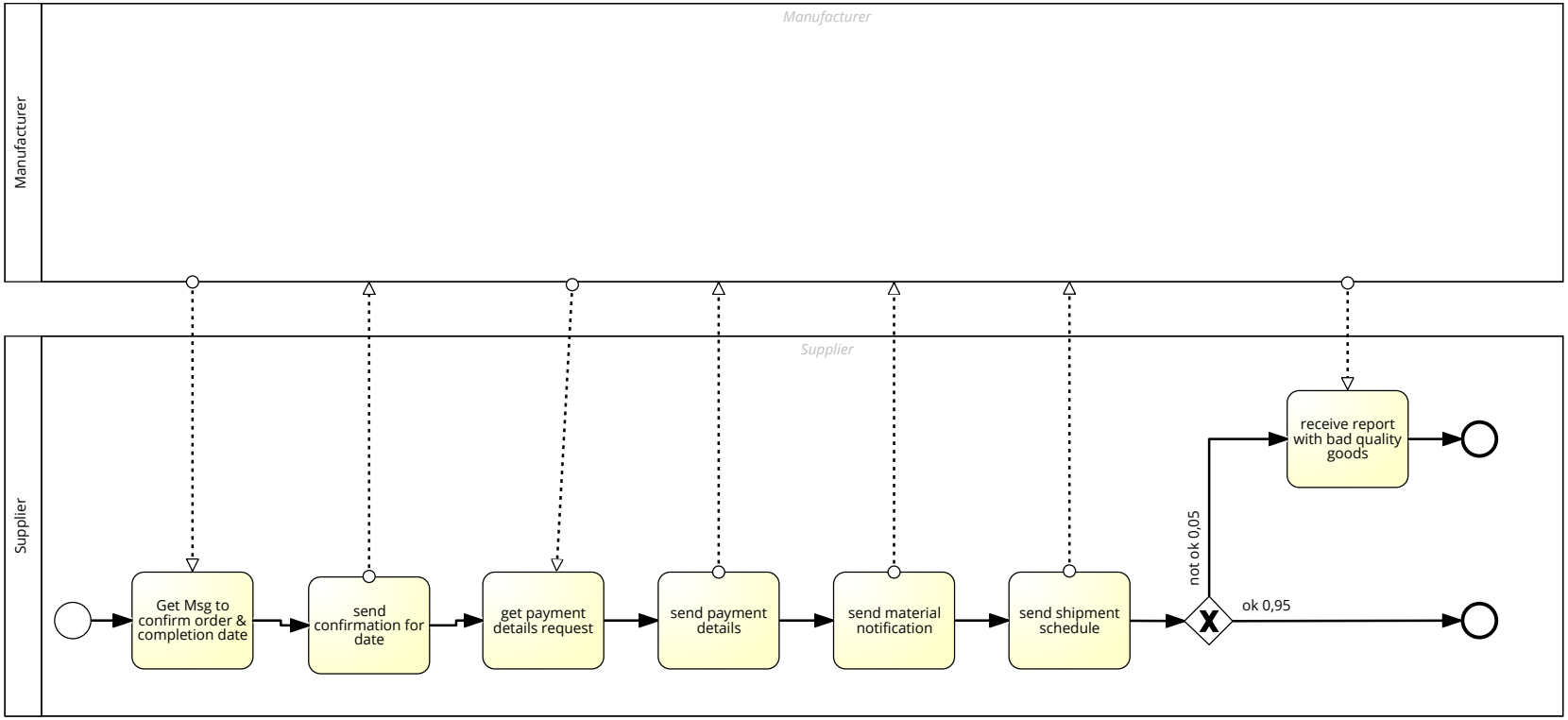
$f_{reliability}$ = 0,65

The values for the choreography model results from the sum of all participants of public models.

Interoperabilität_Choreographien



PublicProcess



PrivateProcess