



ETPN Project

Group 13

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Assumptions:

1. The tech tries to contact the doctors whose patients have scripts that exceeded the max number of refills every day at 3pm.
2. Stock resupply occurs every day at 8am before the pharmacy opens. Ordering a product will have it delivered on the next day with the daily resupply.
3. If the client hasn't request for the bag in 5 days we contact the client and we assume that he will respond in 48 hours. If not we cancel the process.
4. Stock transfers between pharmacies are performed within 2 hours after the request.
5. The DUR safety rule of the 12 month window for drug-to-drug interactions safety check can be optimized and reduced to a 6 month window without compromising customer safety.
6. 50% of customers that experienced issues with the pharmacy service have abandoned the latter.
7. If the process is delayed by 5 days due to out of stock of drugs the process is terminated.

Opportunity Assessment

Q1- What revenue improvement could be obtained by reducing the defection rate due to poor customer service by 60% ?

$0.925 \times 0.13 \times 0.6 = 0.07215$, $7.215\% \times 50.875 \text{ million} = 3.670 \text{ million light customers}$,
 $3.670 \text{ million clients} \times 5 \text{ scripts} = 18.353 \text{ million scripts}$
 $18.353 \times 45.45 \text{ dollars} = 834.150 \text{ million dollars (light customers)}$
 $0.075 \times 0.44 \times 0.6 = 0.0198$, $1.98\% \times 4.125 \text{ million} = 0.082 \text{ million heavy customers}$
 $0.082 \times 40 = 3.28 \text{ million scripts}$
 $3.28 \times 45.45 \text{ dollars} = 149.076 \text{ million dollars}$
 $834.150 + 149.076 = 983.226 \text{ million dollars of improvement revenue.}$

R.: 983.226 million dollars of improvement revenue from by reducing the defection rate due to poor customer service by 60%.

Q1.1- What percentage of defecting customers in 2000 are light users? Same question for heavy users.

R.: light: 92.5%, heavy: 7.5%

Q1.2- What is the volume of scripts lost annually to light defectors? Same question for heavy defectors?

R.: light: 50.875 million, heavy: 4.125 million

Q1.3- How many scripts are filled annually by CVS pharmacies?

$20087.5 / 45.45 = 441.969 \text{ million scripts}$

R.: 441.969 million scripts?

Q1.4- What is the average revenue per script?

R.: 45.45 dollars per prescription.

Side Notes: approximately 7.2 million regular pharmacy customers left CVS during the year.

55 million annual prescriptions, \$2.5 billion of revenue lost.

$7.2 = (x) + (y)$,

$55 = (x \times 5) + (y \times 40)$;

$x = 6.65714 \text{ million (light)}$, 0.925 ; $y = 0.542857 \text{ million (heavy)}$, 0.075

$2.5 \text{ billions} / 55 \text{ million} = 45.45 \text{ dollars per prescription.}$

Net Operating Revenues: 20087.5 million (ano 2000)

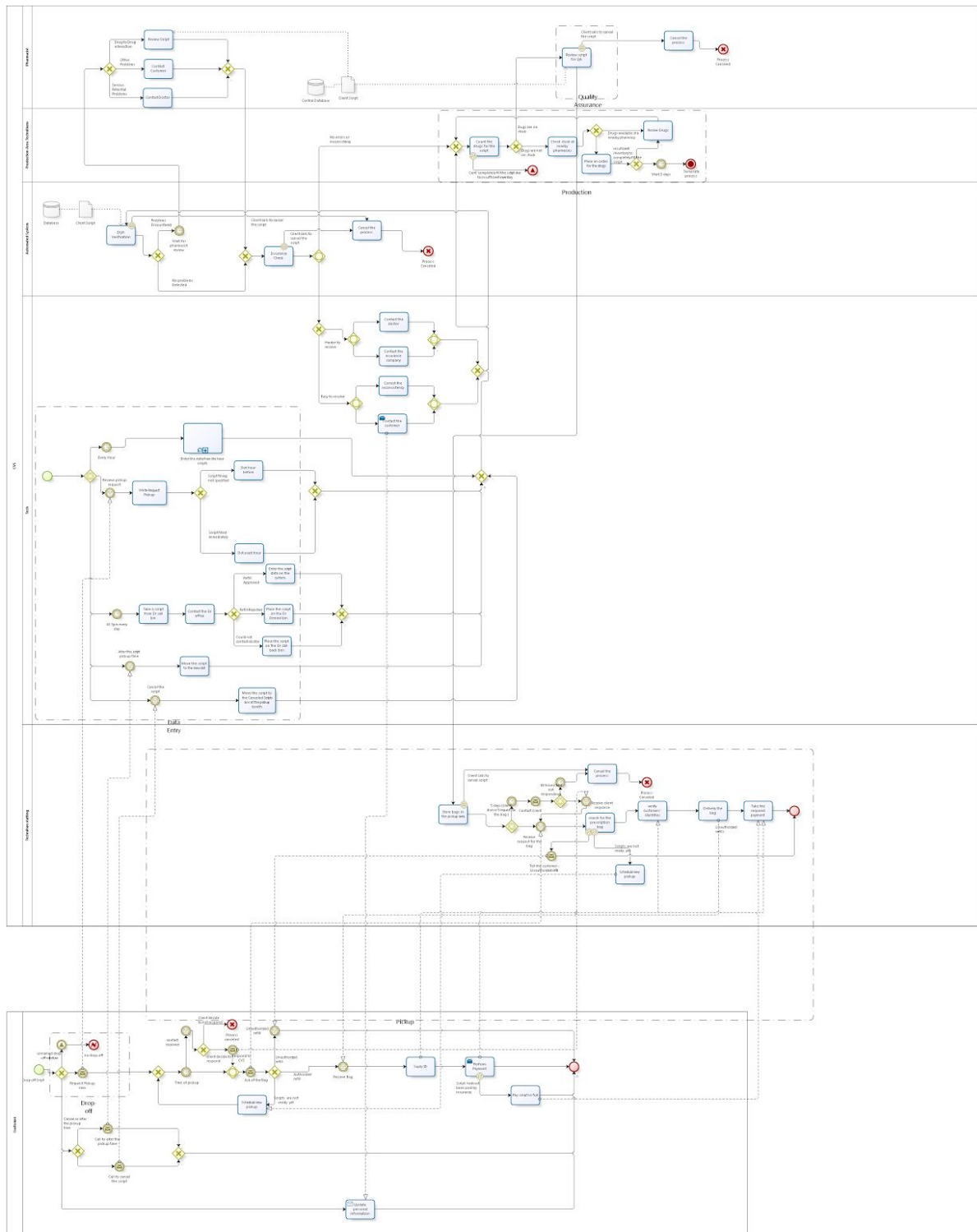
$((0.925 \times 0.13) + (0.075 \times 0.44)) \times 0.6 = 0.15325$, 15.325% de clientes perdidos por mau serviço ao cliente.

Legend:

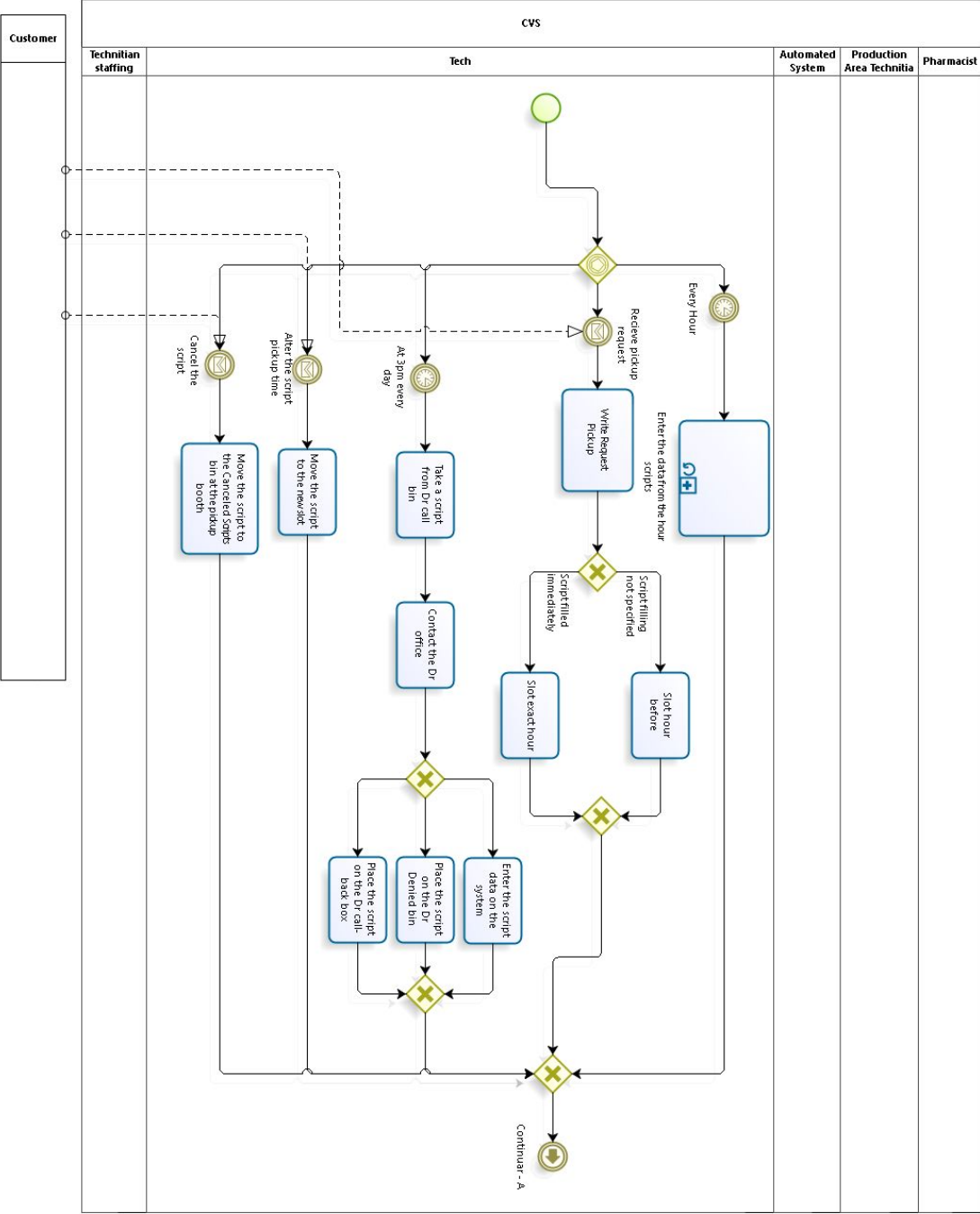
x -> light users

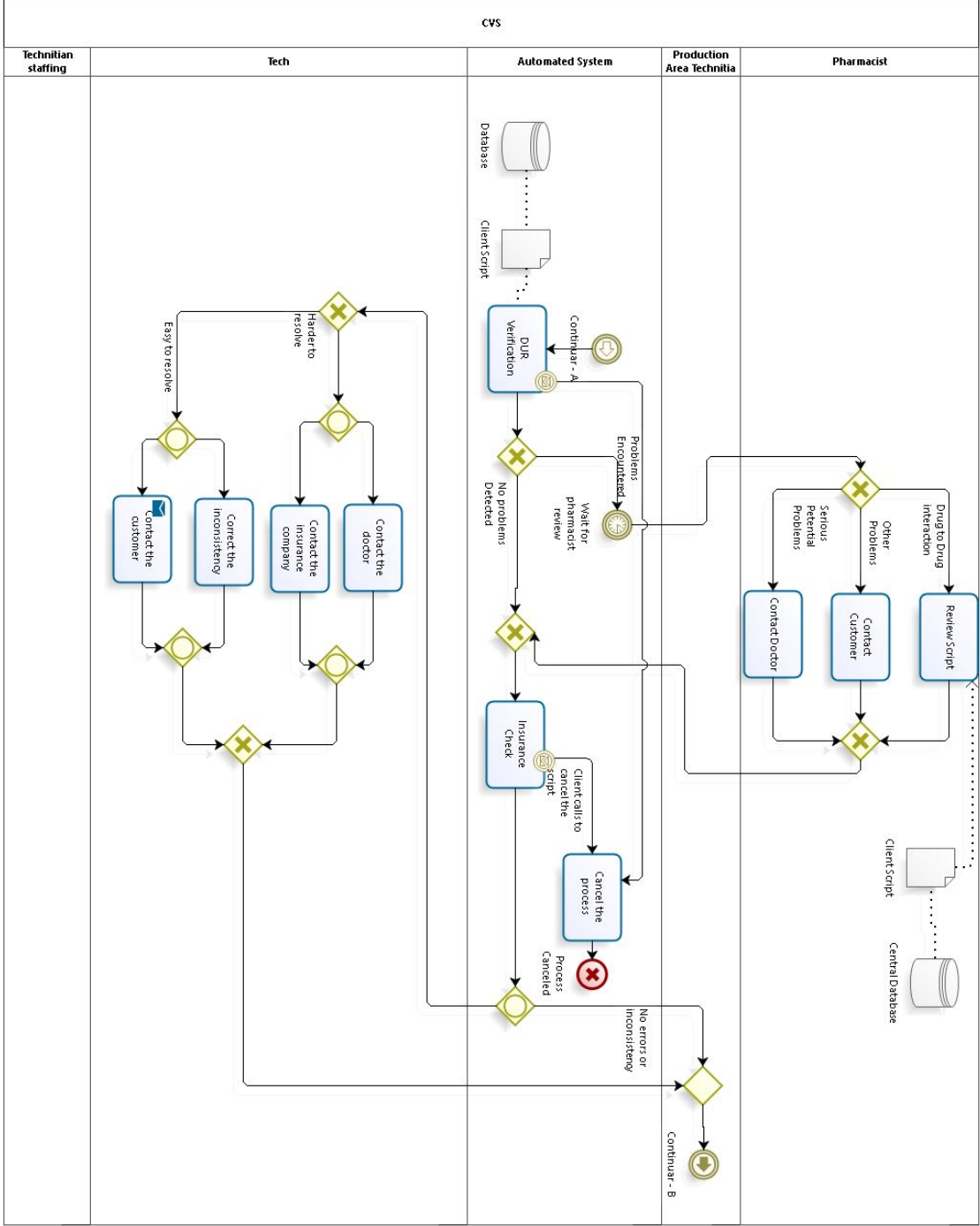
y -> heavy users

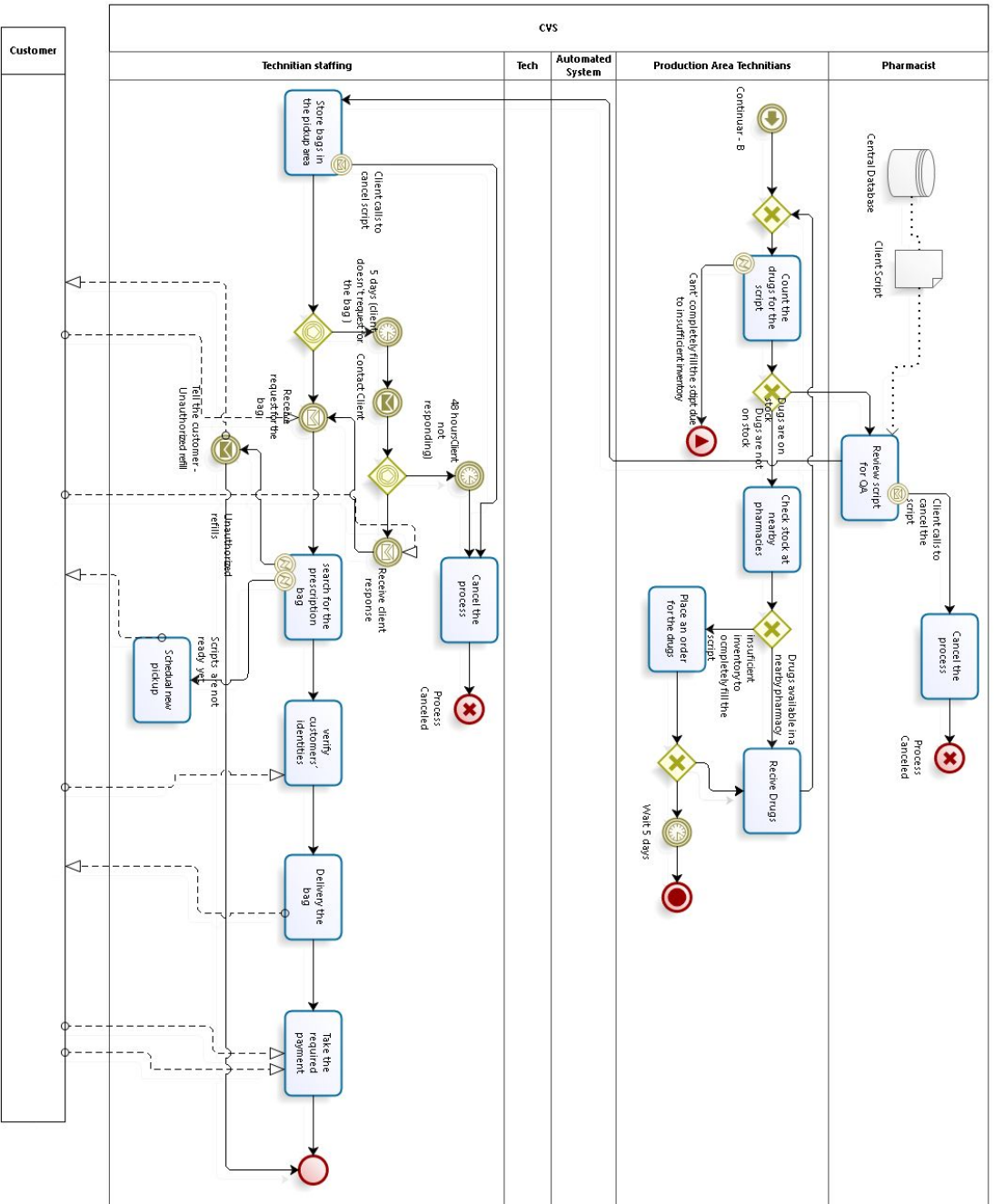
As-Is Process Model

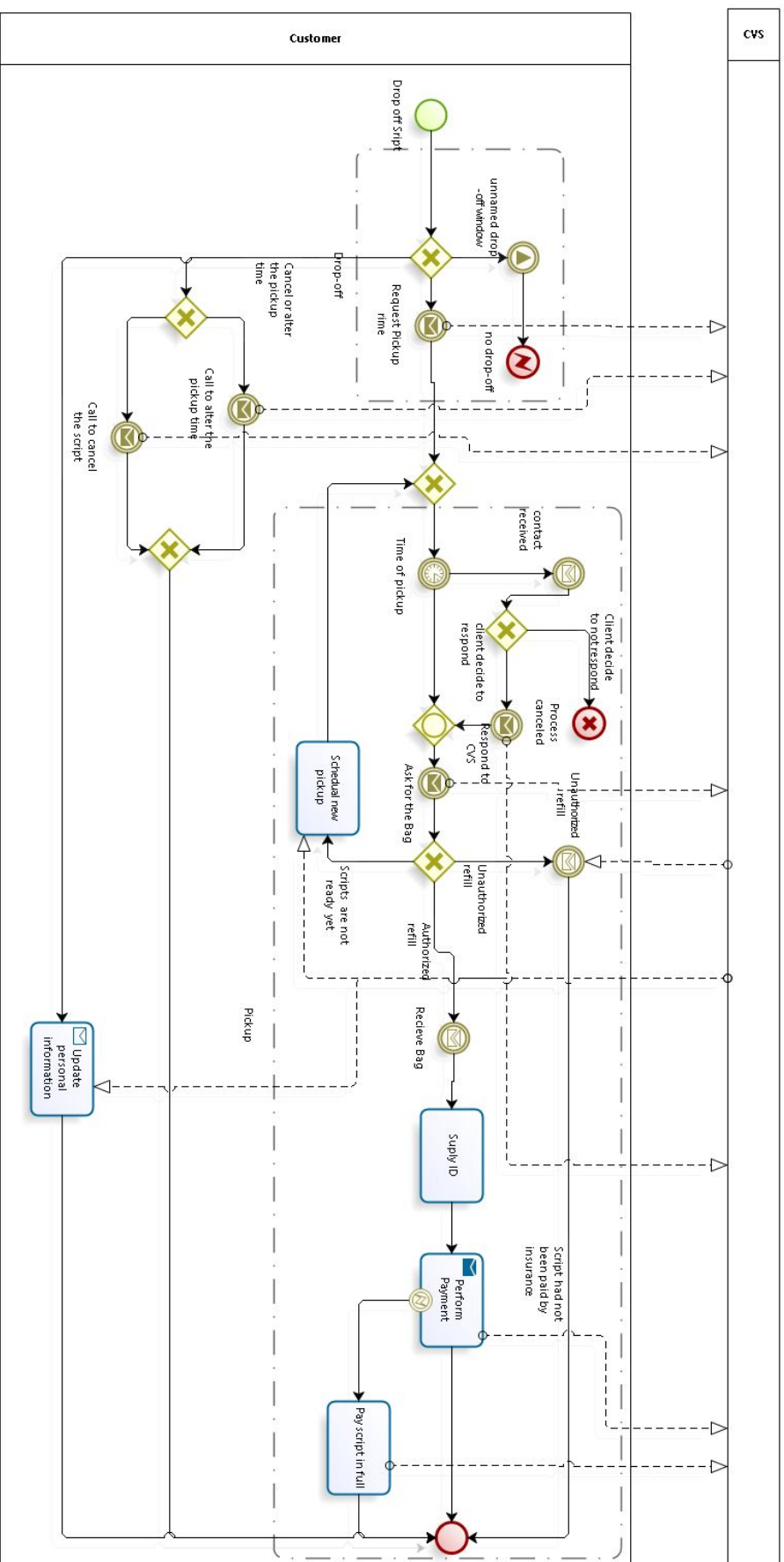


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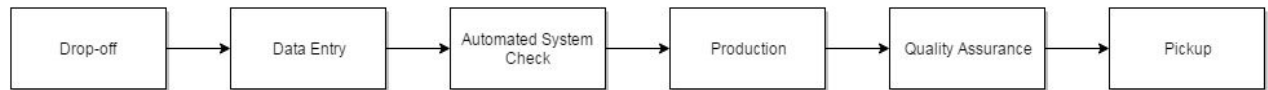








High Level Value-Chain:



As-Is Process Analysis

Here we analyze the AS-IS model. Below is the issue register that documents the issues that we considered the most important. To each issue we provide: a description explaining it's meaning; a priority number that consists on a scale that states how important an issue is relative to others(1 is the most priority and 5 is the least priority); the assumptions that we assumed; a quantitative impact analysis in terms of cost and time; a qualitative impact such as impact of the issue on customer satisfaction, employee satisfaction, company's reputation, etc.

Issue Register

Issue Name	Description	Priority Number	Assumptions	Quantitative Impact	Qualitative Impact
Tech is overloaded	Tech has too much workload and can't do some activities on the process	1	We assume the tech is overloaded because he must choose between serving customer in store or serving drive-thru. Besides there are other possible problems that could indicate that the tech is overloaded such as : <ul style="list-style-type: none">• Extended wait before initial greeting in store• Nobody responds to		The tech will not do parts of his work or will make mistakes, which causes wasted time and possibly lost revenue, like if he does not respond to drive-thru and the customer goes to another pharmacy.

			drive-thru		
Customers did not get what they expected	Technicians dealt with customers who did not get what they were expecting and 16% of customers fell into this category	1	Customers whose scripts were filled incorrectly or canceled the script	67,1 Million scripts were filled incorrectly, causing a loss of 3049,7 Million \$	Slow down pickup for other customers. Clients lose confidence in the pharmacy and take their prescriptions to other pharmacies.
Clients submitted invalid scripts	6% of submitted scripts had their refills expired or the doctor rejected the refill or if the tech could not reach the doctor immediately	2	Scripts have a maximum number of authorized refills. After they exceed that number they expire, being considered as invalid if used for a new pickup	Expired refill scripts took an average of 1 day extra to resolve	
DUR hard stop	The DUR generated a hard stop for 20% of all scripts. Could be because of the possibility of drug-drug interaction or because of a serious potential problem with the script as written	5	DUR hard stops are always checked due to safety concerns and never skipped.	<p>DUR hard stops cause an average delay of 1 min and 54 seconds</p> <p>60 seconds when the pharmacist can resolve it</p> <p>600 seconds when involvement from the doctor is needed.</p> <p>$0.9 * 60 + 0.1 * 600 = 114$ seconds = 1 min and 54 seconds</p>	If there is too much delay due to DUR hard stop it can cause frustration to the customer
Insurance error	17% of all scripts	4		Insurance errors caused an	If not resolved the customer

	encountered a problem during the automated insurance check			average delay of 20,4 seconds on the process with 120 being the average time that took to resolve an insurance issue.	is asked to pay the full amount of the prescription at pickup, creating frustration at the moment of pickup.
Problems with stock availability	7% of scripts encountered partial or complete stock shortages of the required medicine	2	Stock is replenished every day and it takes one day from requesting a product to delivery	Stock availability causes an average delay of 1,68 hours per script	
Customers waiting time	Customers waited longer than they thought they should have	1	26.25% of customers affected Half of customers affected abandoned the pharmacy service	Number of deserters: $(0.2625/2) * 55M = 7.21M$ Light deserters: 6.67M Heavy deserters: 540 Thousand Revenue Loss: $(6.67M * 5 + 0.54M * 40) * 45.45\$ = 2497.47M \$$	Creates frustration at the moment of pickup. Clients lose confidence in the pharmacy and take their prescriptions to other pharmacies.
Store-related issues	Customers complained about Store-related issues (i.e., coupons, sales, stock)	4	5% of customers affected Half of customers affected abandoned the pharmacy service	Number of deserters: $(0.05/2) * 55M = 1.375M$ Light deserters: 1.27M Heavy deserters: 103 Thousand Revenue Loss: $(1.27 * 5 + 0.103 * 40) * 45.45\$ = 475.8M \$$	Creates frustration at the moment of pickup. Clients lose confidence in the pharmacy and take their prescriptions to other pharmacies.

Tech is not qualified to answer questions	Tech is not qualified to answer questions from customers and can not solve the customer's problems.	2	<p>12.5% of customers affected</p> <p>Half of customers affected abandoned the pharmacy service</p>	<p>Number of deserters: $(0.125/2) * 55M = 3.44M$</p> <p>Light deserters: 3.18M</p> <p>Heavy deserters: 260 Thousand</p> <p>Revenue Loss: $(3.18 * 5 + 0.260 * 40) * 45.45\\$ = 1195.3M \\$</p>	Creates frustration at the moment of pickup. Clients lose confidence in the pharmacy and take their prescriptions to other pharmacies.

Process Redesign

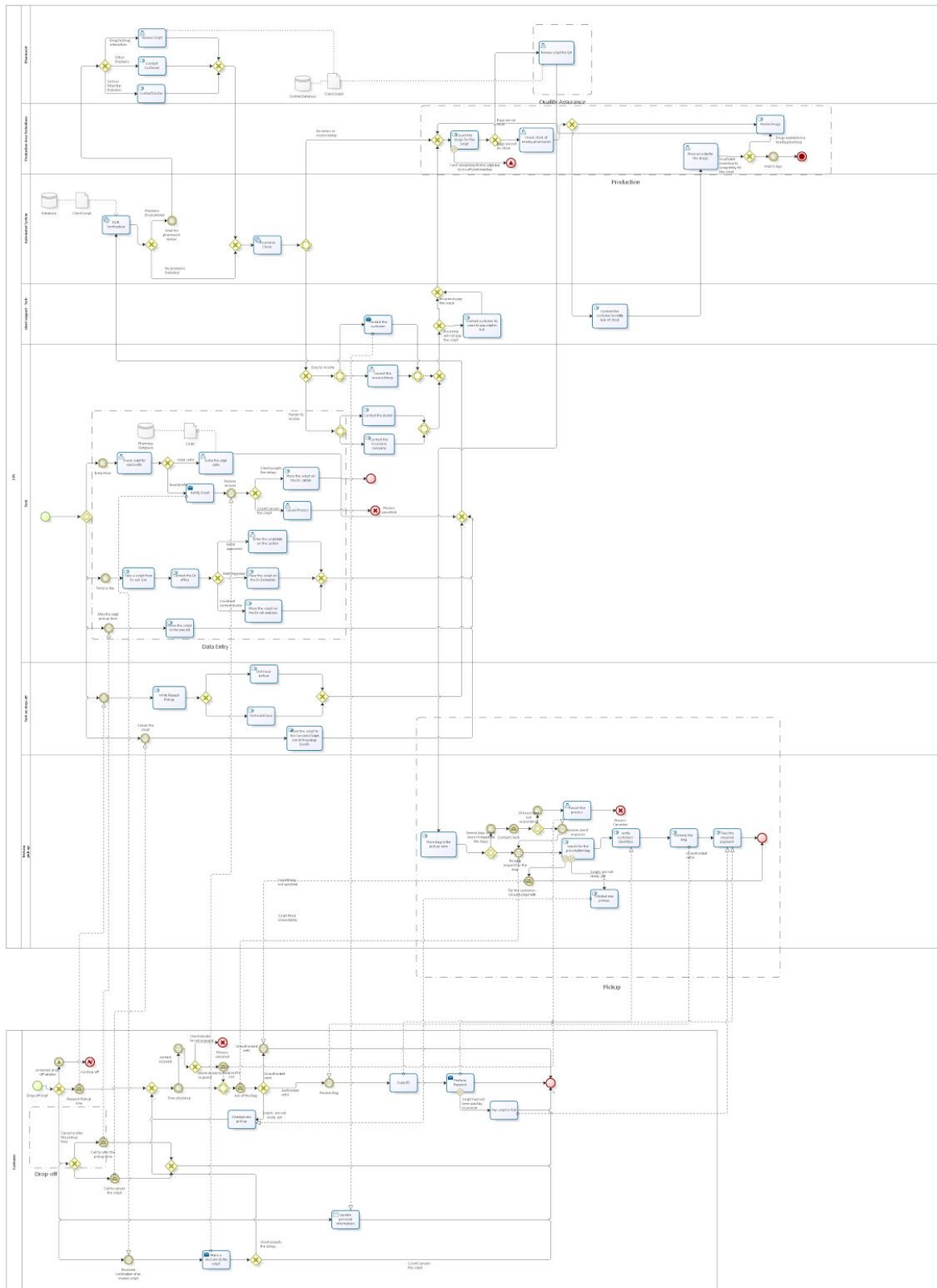
In the Process Redesign section we propose some changes to the As-Is model to be implemented on the To-Be model.

Process Changes	ID	Description
New tech at data entry	1	In order to cope with the high number of tasks at data entry, a new tech will be added full time to split the workload. One tech is now dedicated to data entry and other to the Drop-off area so that issues like an empty drop-off booth are eliminated.
New tech dedicated to customer support	2	A new technician was added so all interactions with the purpose of keeping the customer up-to-date should any nonconformities arise.
Invalid script notification	3	When a client submits a script that has exceeded the max number of refills, the customer is now contacted so he can be notified about the situation and decide whether the script proceeds or is cancelled.
Insurance Errors	4	The customer is notified when there is an insurance error by the customer support technician as well as when he need to pay the full price of the script in order to keep him updated throughout the process.

		A reprogramming of the insurance algorithm reduced the easy to resolve errors in 40%
Stock Management	5	When a script is out of stock the pharmacy will try to get it from nearby pharmacies. If the required items are also out of stock on the nearby pharmacies, an order is placed and the customer is informed.
DUR reprogramming	6	Potential drug-to-drug interactions where the time between the drugs is over 6 months are ignored and the system resolves the issue. Hard stops generated due to weight / height / age are resolved without involving the customer by checking the database for the required information. Assumption: The reprogramming reduces in 60% the easy to resolve hard stops.
Insurance Check reprogramming	7	A reprogramming of the insurance check reduced now allows the system to correct minor issues on the scripts by comparing them to previous scripts of the same customer, reducing the “easy to fix” errors by 40%

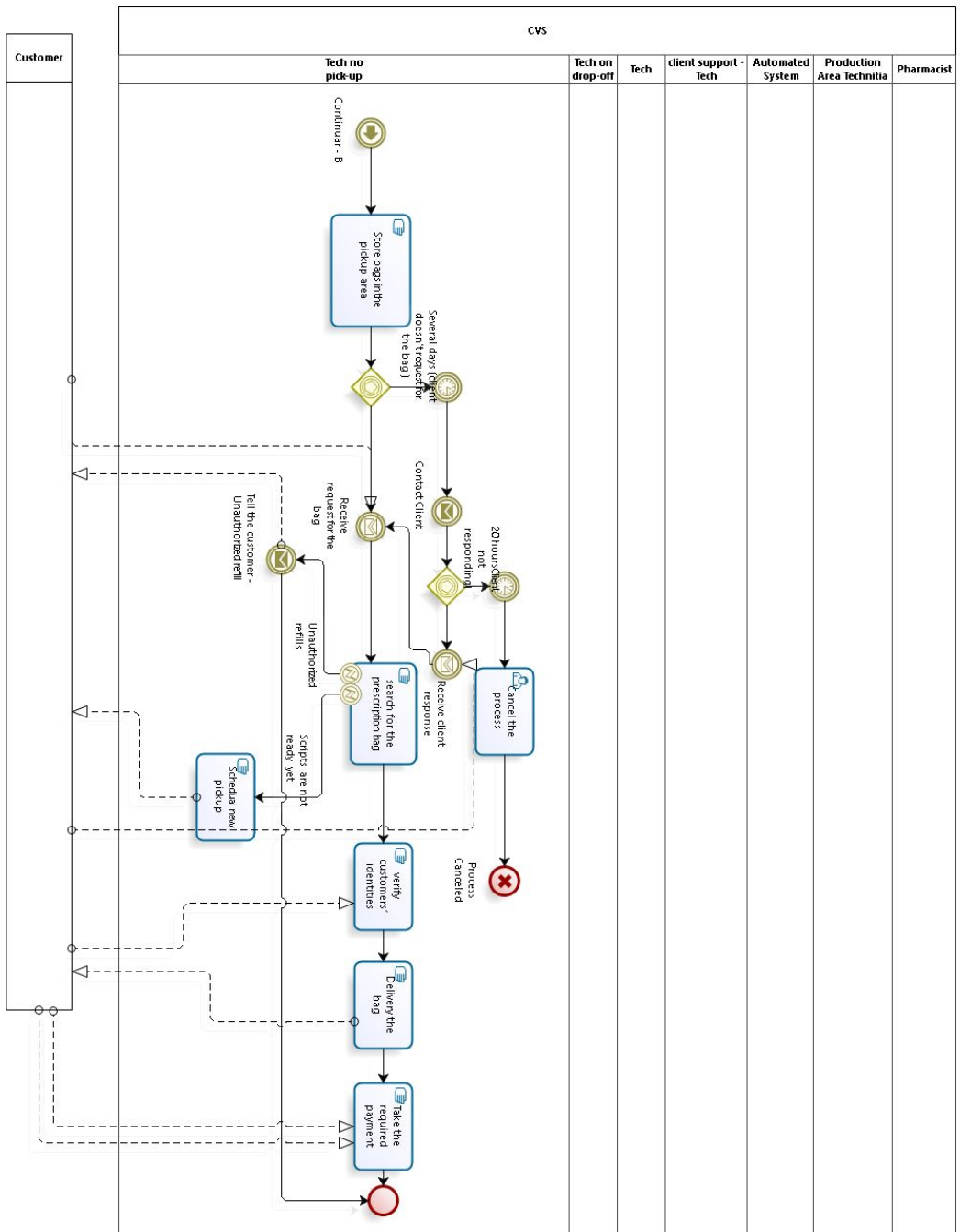
Most of the changes made for the process redesign focus on customer satisfaction and therefore cannot be measured quantitatively. These changes aim to reduce the number of customers that abandon de service and therefore provide an increase in revenue. Process changes 6 and 7 aim to reduce the average cycle time of the scrip fulfillment process, making it more efficient. In order to support the claims, a simulation was ran for each process change, having obtained the results present on the tables below.

To-Be Process Model



*In order to increase readability, a bizagi file is provided together with this report.





Process Simulation

The tables below show the results of the simulations executed to process changed 6 and 7.

Process change 6: DUR reprogramming:

As-Is results:

Name	Type	Instances completed	Instances started	Min. time (m)	Max. time (m)	Avg. time (m)	Total time (m)
Dur Hard Stop	Process	200	200	0	10	0,26	52
NoneStart	Start event	200					
DUR check	Task	200	200	0	0	0	0
ExclusiveGateway	Gateway	200	200				
NoneEnd	End event	200					
ExclusiveGateway	Gateway	25	25				
ExclusiveGateway	Gateway	22	22				
Manual check	Task	9	9	1	1	1	9
Contact Client	Task	13	13	1	1	1	13
Contact Doctor	Task	3	3	10	10	10	30
ExclusiveGateway	Gateway	22	22				

To-Be results:

Name	Type	Instances completed	Instances started	Min. time (m)	Max. time (m)	Avg. time (m)	Total time (m)
Dur Hard Stop	Process	200	200	0	10	0,185	37
NoneStart	Start event	200					
DUR check	Task	200	200	0	0	0	0
ExclusiveGateway	Gateway	200	200				
NoneEnd	End event	200					
ExclusiveGateway	Gateway	10	10				
ExclusiveGateway	Gateway	7	7				
Manual check	Task	1	1	1	1	1	1
Contact Client	Task	6	6	1	1	1	6
Contact Doctor	Task	3	3	10	10	10	30
ExclusiveGateway	Gateway	7	7				

Process change 7: Insurance check reprogramming:

As-Is results:

Name	Type	Instances completed	Instances started	Min. time (m)	Max. time (m)	Avg. time (m)	Total time (m)
Insuranne check AS-IS	Process	200	200	0	6	0,375	117,55
ExclusiveGateway	Gateway	40	40				
InclusiveGateway	Gateway	7	7				
InclusiveGateway	Gateway	33	33				
Insurance Check	Task	200	200	0	0	0	0
Contact the customer	Task	33	33	0,016666667	0,016666667	0,016666667	0,55
Correct the inconsistency	Task	33	33	1	1	1	33
Contact the insurance company	Task	7	7	6	6	6	42
InclusiveGateway	Gateway	7	7				
Contact the doctor	Task	7	7	6	6	6	42
InclusiveGateway	Gateway	33	33				
NoneStart	Start event	200					
NoneEnd	End event	200					
ExclusiveGateway	Gateway	200	200				

To-Be results:

Name	Type	Instances completed	Instances started	Min. time (m)	Max. time (m)	Avg. time (m)	Total time (m)
Insurance check AS-IS	Process	200	200	0	6	0,17125	64,25
ExclusiveGateway	Gateway	24	24				
InclusiveGateway	Gateway	5	5				
InclusiveGateway	Gateway	19	19				
Insurance Check	Task	200	200	0	0	0	0
Contact the customer	Task	15	15	0,016666667	0,016666667	0,016666667	0,25
Correct the inconsistency	Task	4	4	1	1	1	4
Contact the insurance company	Task	5	5	6	6	6	30
InclusiveGateway	Gateway	5	5				
Contact the doctor	Task	5	5	6	6	6	30
InclusiveGateway	Gateway	19	19				
NoneStart	Start event	200					
NoneEnd	End event	200					
ExclusiveGateway	Gateway	200	200				

Process Automation:

In this section of process automation is represented a table that represents the relations between the process activities, the entities and the attributes that are affected by the activities. This table has the data fields per task type and data model. The enriched process model is present on the To-Be model.

Activity	Entities	
	Customer Script	Customer DataSheet
DUR Check	Drug and/or Drug Dosage changed	
Insurance Check “easy to resolve” corrections		Date of birth and/or Insurer changed
Script Review	Drug Dosage changed	
Insurance Check “hard to resolve” corrections	Number of refills changed	Payment method changed
DUR Check - contact customer	Drug dosage changed	