

IS-462

Simulation Project

Transport services simulation

Abstract:

One of the major factors influencing the success of organizations in today's competitive world is to increase customer satisfaction through the improvement of service speed so, the company are trying to find ways to improve their delivery speed.

Introduction:

In a company a lot of customer in different places with trucks that shipping goods to customer and so on , this process take a lot of time and that's lead to spend more money and maybe lose many customer so, we always trying to improve our company and try to be In the forefront of companies and satisfy our customer With all these aspirations we will show you how work on this.

Problem Definition and solution:

The companies nowadays looking for workflow or anything that improve the speed of shipping and dropping the goods in less time, so it makes companies gaining more time it is mean gaining more money Here we try to find the best way for goods and transport service with our source that is to add Van for small goods transportation this will make variety of delivery methods and organize transportation distribution.

Before adding the Van:

Customer #	The way of shipping	Arrival time	Serves time
1	Truck -1	0	4
2	Truck -2	1	4
3	Truck -2	1	3
4	Truck -1	2	3
5	Truck -2	6	2
6	Truck -1	6	3
7	Truck -2	7	5
8	Truck -2	7	4
9	Truck -1	7	2
10	Truck -1	8	1
11	Truck -1	8	2

			Truck1			Truck2				
Customer	Arrival time	Serves time	TSB	ST	TSE	TSB	ST	TSE	Time in queue	Time is system
1	0	4	0	4	4	-	-	-	0	2
2	1	4	-	-	-	1	4	5	0	4
3	1	3	-	-	-	5	3	8	4	7
4	2	3	4	3	7	-	-	-	2	5
5	6	2	-	-	-	8	2	10	2	4
6	6	3	7	3	10				1	4
7	7	5	-	-	-	10	5	15	3	8
8	7	4	-	-	-	15	4	19	8	12
9	7	2	10	2	12	-	-	-	3	7
10	8	1	12	1	13	-	-	-	4	5
11	8	2	13	2	15	-	-	-	5	7
Total	--	33	--	--	--	--	--	--	32	65

Average waiting time in queue: $32/11 = 2.9090$ min

Probability customer has to wait: $9/11 = 0.818$

Average time spend in system: $65/11 = 5.90$ min

After adding the Van (Part 1):

Customer #	The way of shipping	Arrival time	Serves time
1	Truck -1	0	4
2	Truck -2	1	4
3	Van	1	3
4	Truck -1	2	3
5	Truck -2	6	2
6	Van	6	3
7	Truck -2	7	5
8	Van	7	4
9	Truck -1	7	2
10	Truck -1	8	1
11	Truck -1	8	2

Customer	Arrival time	Serves time	Truck1			Truck2			Van			Time in queue	Time is system
			TSB	ST	TSE	TSB	ST	TSE	TSB	ST	TSE		
1	0	4	0	4	4	-	-	-	-	-	-	0	4
2	1	4	-	-	-	1	4	5	-	-	-	0	4
3	1	3	-	-	-	-	-	-	1	3	4	0	3
4	2	3	4	3	7	-	-	-	-	-	-	2	5
5	6	2	-	-	-	6	2	8	-	-	-	0	2
6	6	3	-	-	-	-	-	-	6	3	9	0	3
7	7	5	-	-	-	8	5	13	-	-	-	1	6
8	7	4	-	-	-	-	-	-	9	4	13	2	7
9	7	2	7	2	9	-	-	-	-	-	-	0	2
10	8	1	9	1	10	-	-	-	-	-	-	1	2
11	8	2	10	2	12	-	-	-	-	-	-	2	4
Total	--	33	--	--	--	--	--	--	--	--	--	8	42

Average waiting time in queue: $8/11 = 0.7272$ min

Probability customer has to wait: $5/11 = 0.4545$

Average time spend in system: $42/11 = 3.8181$ min

After adding the Van (Part 2):

Customer #	The way of shipping	Arrival time	Serves time
1	Truck -1	0	4
2	Van	1	4
3	Truck -2	1	3
4	Van	2	3
5	Truck -2	6	2
6	Truck -1	6	3
7	Van	7	5
8	Truck -2	7	4
9	Truck -1	7	2
10	Truck -1	8	1
11	Truck -1	8	2

			Truck1			Truck2			Van				
Customer	Arrival time	Serves time	TSB	ST	TSE	TSB	ST	TSE	TSB	ST	TSE	Time in queue	Time is system
1	0	4	0	4	4	-	-	-	-	-	-	0	4
2	1	4	-	-	-	-	-	-	1	4	5	0	4
3	1	3	-	-	-	1	3	4	-	-	-	0	3
4	2	3	-	-	-	-	-	-	5	3	8	2	5
5	6	2	-	-	-	6	2	8	-	-	-	0	2
6	6	3	6	3	9	-	-	-	-	-	-	0	3
7	7	5	-	-	-	-	-	-	8	5	13	1	6
8	7	4	-	-	-	8	4	12	-	-	-	1	5
9	7	2	9	2	11	-	-	-	-	-	-	2	4
10	8	1	11	1	12	-	-	-	-	-	-	3	4
11	8	2	12	2	14	-	-	-	-	-	-	4	6
Total	--	33	--	--	--	--	--	--	--	--	--	13	46

Average waiting time in queue: $13/11 = 1.18$ min

Probability customer has to wait: $6/11 = 0.545$

Average time spend in system: $46/11 = 4.18$ min

Conclusion:

Simulation is important in our life because it could organize, low costs, and make your business more efficient also it help you before you take the actual decision. So here we take a decision that buy a van car to transport a small peace of goods to the customer and we think that will not make that big change after apply the simulation we saw that there is change and helpful for us.