Value Stream Map

Production Control
Coffee Bean Roasters

Required Raw material order

Shipping Manifest

Supplier

Customer

One shipment of 2000 units per week

Daily order release

With Support

5 days

Huling	800 units	Cleaning	600 units	Grading	400 units	Roasting	400 units	Packaging
1		1		1		1		1
Throughput: 0.33		Throughput:0.66		Throughput :1		Throughput :0.45		Throughput :1.5
Cycle Time:180 sec		Cycle time:90 seconds		Cycle time:60 seconds		Cycle time:133 seconds		Cycle time:40 seconds
Setup time: 90 min		Setup time:12 seconds		Setup time:8 seconds		Setup time:17 seconds		Setup time:2.3 seconds
Uptime: 100%		Uptime:80%		Uptime:33%		Uptime:75%		Uptime:100%

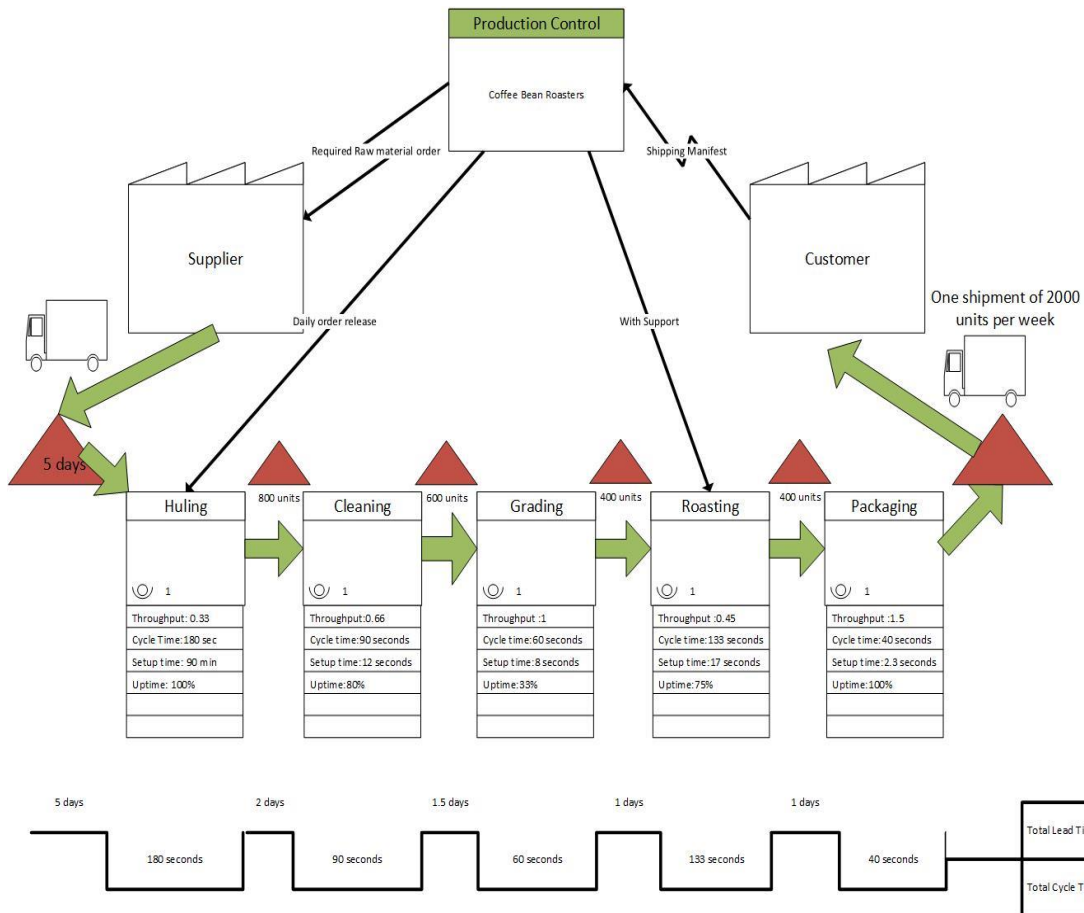| 5 days	2 days	1.5 days	1 days	1 days	
180 seconds	90 seconds	60 seconds	133 seconds	40 seconds	

Total Lead Time : 10.5 days

Total Cycle Time : 503 seconds

Value stream map calculations for coffee Bean Roasters

Known Values
Flow unit= 20KG
Number of shift per day: 3
Availability: 8 hours per shift(30 min break per shift)
Average Demand: 400/day
Weekly demand: 2000
Batch size:244

Total availability per day = 7.5+7.5+7.5 = 22.5hrs
In seconds = 22.5*60*60 = 81000 seconds

Station 1: Hulling
Cycle Time = 20 units per hr = 180 sec per unit
Set up Time = 90 mins = 3600 sec
Up Time = 100%
Operator = 1
Throughput Time = 60/180 = 0.333 seconds

Station 2: Cleaning
Cycle Time = 40 units per hr = 90 sec per unit
Set up Time = 12 sec per unit
Up Time = 80%
Operator = 1
Throughput Time = 60/90 = 0.666

Station 3: Grading
Cycle Time = 1 min per unit = 60 sec per unit
Set up Time = 8 sec per unit
Up Time = 33%
Operator = 1
Throughput Time = 60/60 = 1

Station 4 : Roasting
Cycle Time = 133 secs per unit
Set up Time = 17 secs per unit
Up Time = 75%
Operator = 1
Throughput Time = 60/133 = 0.45

Station 5: Packaging
Cycle Time = 40 seconds per unit (20*2)
Set up Time = 46 seconds per unit (20*2.3)
Up Time = 100%
Operator = 1
Throughput Time = 60/40 = 1.5

1. What is the TAKT time for this manufacturing cell?

Daily Demand = 400 units/day
Daily availability = 81000 secs/day
Takt Time = Daily availability/daily demand = 81000/400 = 202.5 secs/unit

2. What is the total production Lead Time?

Add all lead times
5+2+1.5+1+1 = 10.5 days

3. What is the total throughput and cycle times for this manufacturing cell?

Total Cycle time = 180+90+60+133+40 = 503 seconds
Total throughput time = 0.33+0.66+1+0.45+1.5 = 3.94

4. What is the maximum manufacturing capacity per week? Are we able to meet customer requirements? If we are unable to meet demand, which process failed to meet requirements?

Total available time in a day = 22.5*60*60 = 81000
Throughput time in seconds = 3.94 * 60 = 236.4
Maximum manufacturing capacity = Total available time in a day/ Throughput time =81000/236.4 = 342.63 per day
Maximum manufacturing capacity per week = 342.63*7 = 2398.41 units per week

The units that customer required for a week are 2000 units, as our maximum manufacturing capacity per week is 2398.41 units , so by this we can say that we are meeting customer requirements.

5. What is the process cycle efficiency (PCE)?

Total lead time in seconds = 10.5 * 22.5 * 60 *60 = 850500
PCE = (Total cycle time / total lead time) * 100
     = (503/850500)*100 = 0.06%

6. In under 250 words, clearly describe the purpose of VSM mapping and provide a brief explanation as to how it would help an organization control processes and capacity manufacturing.

There are several benefits to an organization for using a value stream map. Some benefits are, It is extremely efficient method for communicating the high-key features of a complicated system. The value stream map is a key early step in identifying where process improvement efforts should be focused. The map highlights issues with availability, yields, resource constraints, and other factors that delay the completion of the product or service. VSM helps us to reduce waste from the project. The current state value stream map gives the details of current processes involved in the process. After the current state map we can get the details of the waste and we will try to decrease the waste. The future state VSM is drawn with the updated or corrected stages in order to get greater efficiency than current state. When working on reaching an improved future state, the unification of many different departments is required. A value stream map is a powerful tool that can help make complicated systems easier for all

departments to understand. This understanding can lead to better levels of cooperation between these departments.