Littlefield Simulation

three3

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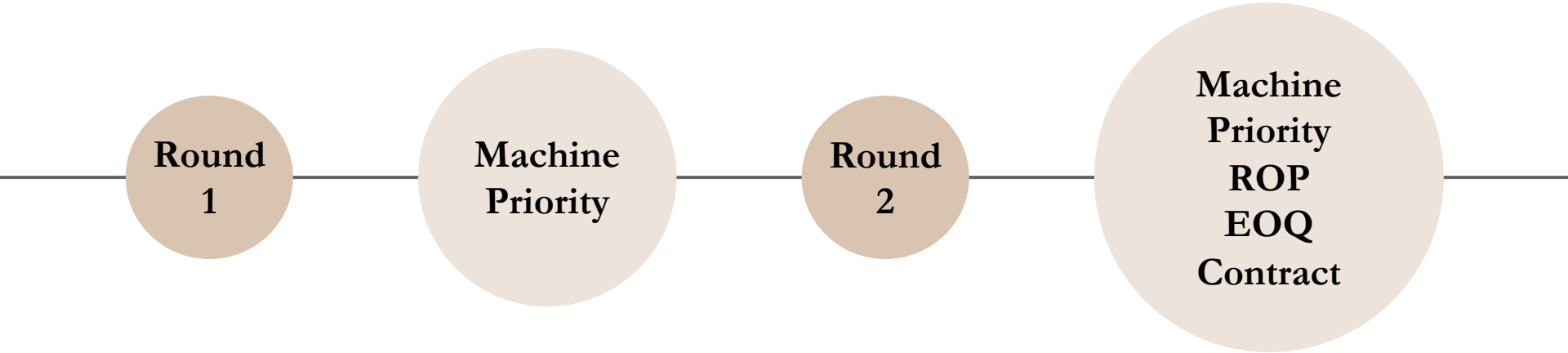
CONTENT

LITTLEFIELD

I. INTRODUCTION



II. PLAN & ACTION

1. **Flow Rate and Capacity**

Machine 1

Machine 2

Machine 3

Priority of Tester

2. Inventory and Contract

Economic Order Quantity

Reorder Point

Contract Number

1. Flow Rate and Capacity

Step 1: Created an ***Excel*** to store all the data

Step 2: Analyze the situation on Day 50

Average Demand of ***12.24***

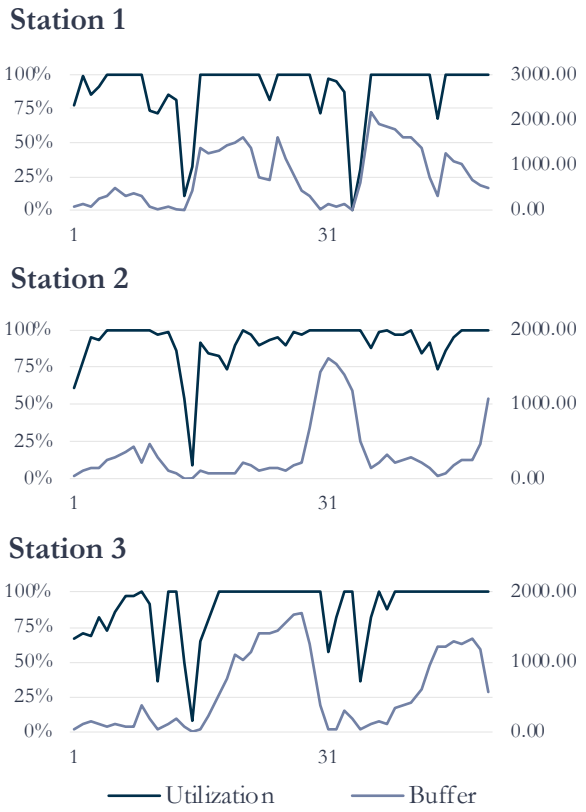
Step 3: Predict future demand

Stable in the long-term

Step 4: Calculate the capacity of machine

$$\textbf{Capacity} = \frac{\sum Jobs\ completed\ in\ the\ first\ 50\ days}{\sum Machine's\ utilization\ in\ the\ first\ 50\ days}$$

	Machine 1	*Machine 2*	*Machine 3*
Total Job Completed	*573*	*573*	*573*
Total Utilization	*44.43*	*45.75*	*44.16*
Capacity	*12.90*	*12.52*	*12.98*
Unit Capacity	**4.30**	**12.52**	**12.98**



Capacity Analysis

Step 5: Make decisions on machine

Decision: Buy one of each machine

Theoretically

capacity of machine can cover the demand

Real World

Not Enough Capacity

randomly high demand

→ buffer

→ longer lead time

→ lower revenue

Step 6: Change the priority of the testers

Decision: Provide priority to step 4

Important Factor

Previous Buffer

Lead Time

Especially under Contract 3 ($1250)

Difference when Demand is High

Priority to step 2: All the jobs are delayed

Priority to step 4: Part of the jobs survived

Capacity Analysis

2. Inventory and Contract

Two Decisions to Make

1. EOQ

$$Economic\ Order\ Quantity = \sqrt{\frac{2 * Fixed\ cost\ per\ order * Annual\ demand}{Unit\ holding\ cost\ per\ year}}$$

2. ROP

$$Reorder\ Point = Lead\ Time * Average\ Daily\ Demand + Safety\ Inventory$$

Three Stages

Changed to Contract 3

Last 50 days without access

	Day 50	*Day 71*	*Day 211*
Cost per Order ($)	1000	1000	1000
Average Daily Demand (jobs)	12.24	12.50	11.50
Unit Holding Cost ($)	60	60	60
Lead Time (day)	4	4	4
Service Level	90%	99%	99%
Std. of Demand	3.35	4.11	4.11
***EOQ** (kits)*	**23160**	**23400**	**20100** (57*60*11.8/2)
***ROP** (kits)*	**3480** (4*12.24 + 1.28*2*3.35)	**4140** (4*12.5 + 2.33*2*4.11)	**4140**

Inventory Analysis

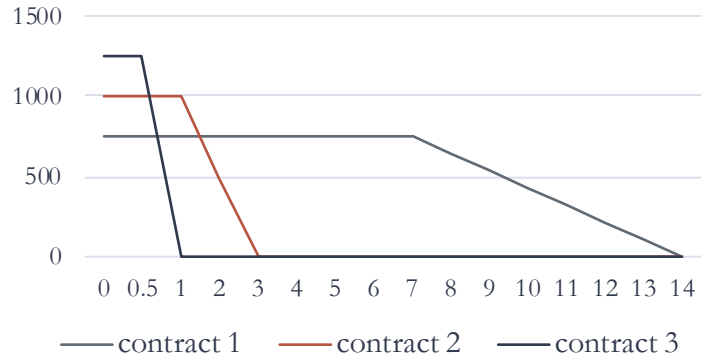
Contract Analysis

	Price/order	*Quoted lead time*	*Max lead time*
Contract 1	$750	7 d	14d
Contract 2	$1000	1d	3d
Contract 3	$1250	0.5d	1d

Strategy:

- Earn more each order
- Change the contract when lead time achieve break-even point

Revenue on Lead Time



III. ANALYSIS & RETROSPECT

First Round: 8th

- ➔ Timid actions of following peers
- ➔ Rule of thumb instead of planning ahead
- ➔ Revenue deteriorated around Day 180
- ➔ Bought machine in an unfavorable condition to eliminate the buffer

Second Round: 1st!!!

- ➔ A thorough analysis of demand, capacity, inventory and break-even point of contract
- ➔ Planned ahead: enhance the system capacity to shorten the lead time and achieve high revenue
- ➔ Changed the EOP around Day 200 to avoid inventory over-purchasing and save interest

Plan ahead!

Do something when others do nothing!

IV. CONCLUSION

ROP

Balanced Costs

Adjusting Contracts

Competitors

Thank You ! –three3

Q & A

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