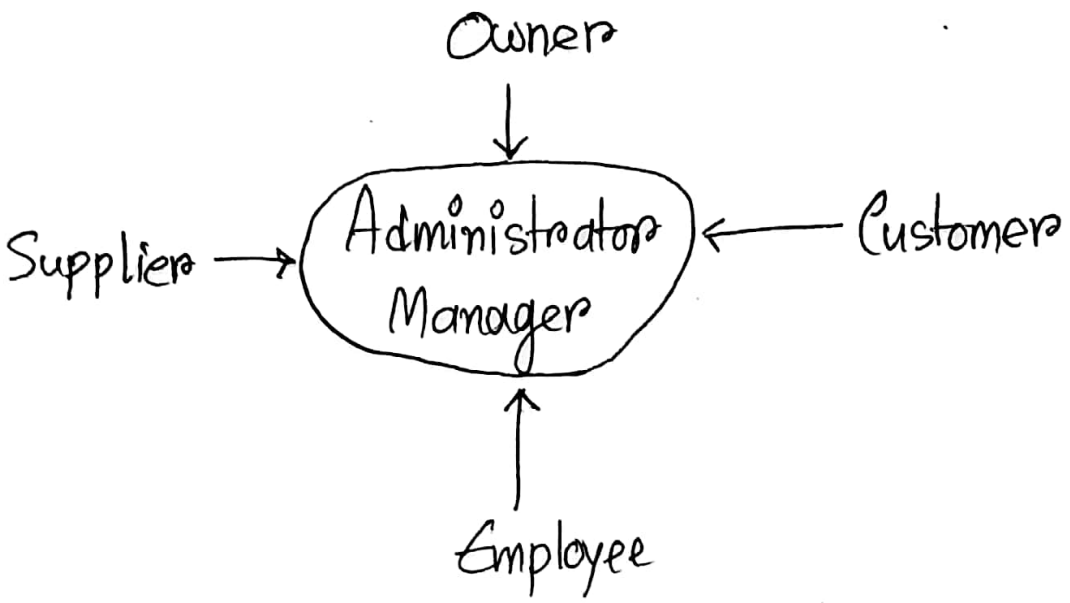
MRI

Hum 2113
Industrial Management

1/E
04.02.18



Inputs: i) Human resource
ii) Physical resource
iii) Information resource
iv) financial resource

*Profit Maximize

MRI sir

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Management

2/E
11.02.18

Management is a set of activities.

- planning
- Decision Making
- Organizing
- Leading

The ~~perform~~ person who performs the above activities is the manager.

F.W. Taylor কে Father of Scientific Management বলা হয়, for

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3/E
18.02.18

Functions of Management

- Planning

- Policy is the general guidlines for executing performance. Policy is a long term guideline.
- Budget is the numerical expression of planning.
- Budget expresses the income and expenditure.
- Budget is a short term plan.

  Short term (standard) = 1 year or less
  Mid term (standard) = 1 ~ 5 years
  long term (standard) = More than 5 years
  also known as
  "strategic plan"

- Vision is the long term direction of any company or organization.
- Mission states that what we are doing now.
- Objective To attain long term direction, we have to breakdown the vision in objectives
- Target - Individualize the objetives

Strength, weakness, opportunities, threats analyzes.

~~the~~

Decision Making

Decision making process

Recognizing Defining the Nature of Decision Situation

↓

Identifying Alternatives

↓

Evaluating Alternatives

↓

Choosing the "best" alternative

↓

Putting it to practice

↓

Follow up

#Authority is the right to give order/to influence the behaviour of others.

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8/E
04.04.18

Theory X: Assume that, employee dislikes to work.
Lack of Ambition
Avoid Responsibility
Must be directed and forced

*ডাগলাস ম্যাকগ্রেগর এই Theory এর প্রবর্তক।

Theory Y: Assume that,
- Employees likes to work
- Full of Ambition and creative
- Don't avoid responsibilities
- Need not to be directed and forced

Two-Factor Theory

*Frederick Herzberg এই Theory এর উদ্ভাবক।

- Hygiene factors (Imperative/আবশ্যিকীয় উপাদান)
  - Company Policy and administration
  - Salary
  - supervision

Hygine factors are directly related with job dissatisfaction.

- Motivations factor
  - achievement
  - Advancement
  - Recognition
  - Responsibility

Motivation factors are directly related with Satisfaction.

21.04.18

Inventory Control

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10/A

Costs of holding high Inventory

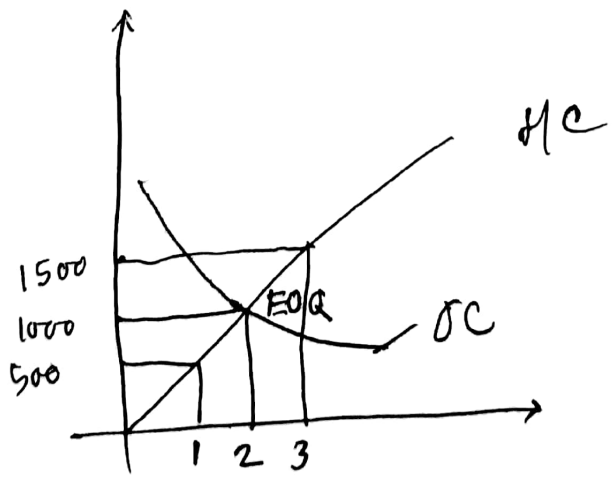
1. Interest/opportunity cost
2. Storage and Handling cost
3. Taxes, insurrance and shrinkage

Costs of holding Low inventory

1. Customer Service cost
2. Ordering "
3. Setup "
4. Labor and equipment Utilization
5. Transportation
6. Payment to suppliers.

#Economic Order Quantity (EOQ)

The lot size that minimizes total annual inventory holding and ordering/setup costs.



Operations Management
Krajewski
and
Ritzman

Hum 2113 10/E

05.05.18

1. $EOR = \sqrt{\frac{2DS}{H}}$

2. ROP = Average Demand during load time + safety stock

3. IP = OH + SR − BO

4. $TBO = \frac{EOQ}{D} \times Time$

5. Holding Cost $= \frac{EOQ}{2}(H)$

6. Ordering Cost $= \frac{D}{EOQ}(S)$

7. $ELS = \sqrt{\frac{2DS}{H}} \times \sqrt{\frac{P}{P-\alpha}}$

8. Production time of each cycle $= \frac{ELS}{\rho}$

D = Annual Demand

S = setup/ordering cost per order per year

H = Holding cost per order per unit per year

ROP = Re order point.

IP = Inventory Position

BO = Back order

SR = Scheduled Receipt

OH = On-hand Inventory

TBO = Time between order

EOQ = Economic Order Quantity

ELS = Economic production lot size

σ = Standard Deviation

p = production rate

d = demand rate

t = time

z = value of probability

Average Daily Demand = 100 units

Standard deviation of daily demand = 30 units

Lead time = 3 days

Ordering Cost = 835/order/year

Holding cost = $9.40/unit/year

Cycle service level = 92%

The company operates 5 days/week and 52 weeks/year

① EOQ

② ROP

③ If on-hand inventory is 40 units. There is a one open order to up by an EOQ and there are is no back order

① $EOQ = \sqrt{\frac{2DS}{H}} = \sqrt{\frac{2 \times 2600 \times 35}{9.40}}$

$= 440$ units

$D = 5$ days/week $\times$ 52 ~~three~~ weeks/year $\times$ 100 units/day

$= 2600$ units

$S = 35$

$H = 9.40$ \$

② ROP = ADDLT + Safety Stock

ADDLT = Lead time + Demand

$= 3 \times 100$

$= 300$ units

$\therefore$ Safety stock $= Z \sigma_L$

$= Z(\sigma_t \sqrt{L})$ $[\because \sigma_L = \sigma_t \sqrt{L}]$

$= Z \cdot (30\sqrt{3})$

$= Z \cdot (5.2)$ units

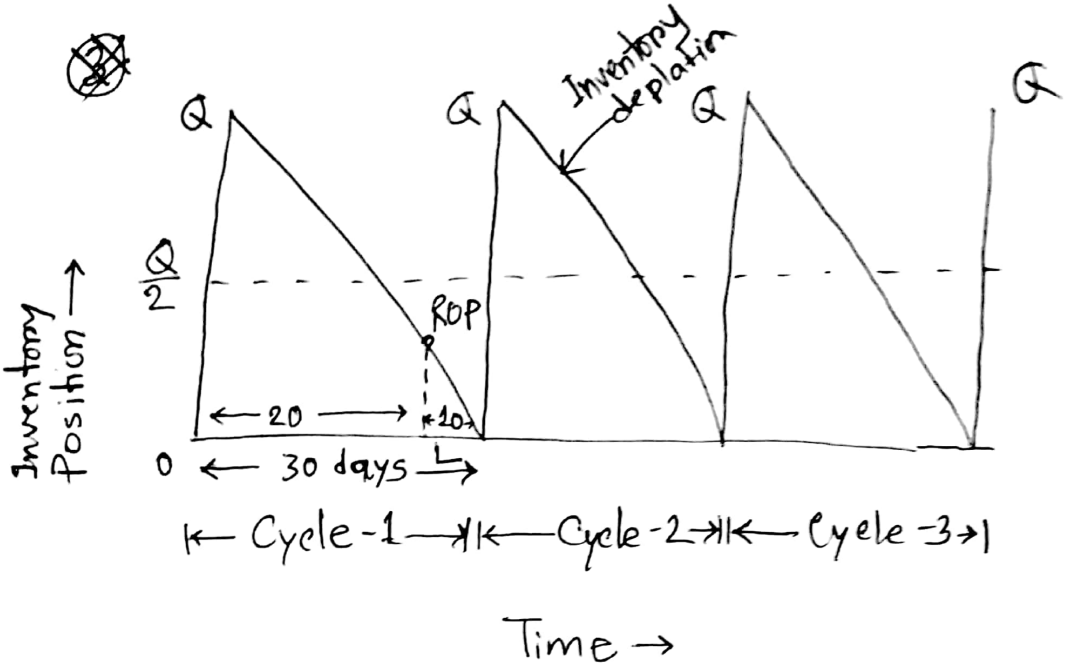
{ Z এর Value বের এর Table থেকে নিতে হবে। }

$= 1.42 \times 5.2$ units

$= 73$ units

" At 92% cycle Demand level Z value corresponds to 1.42 (as per normal distribution Table) " ← Must লিখতে হবে।

$\therefore$ ROP = 300 + 73 = 373 units



③ IP = OH + SR - BO

= 40 + 440 - 0

= 480 units

Since, ~~ROP~~ IP 480 units exceeds ROP 373 units, so do not place a new order.

Robiul Sir | Hum 2113 | 11/A | 06.05.18

④. Total cost of Holding & Ordering,

$$C = \frac{EOQ}{2}(H) + \frac{D}{EOQ}(S)$$

$$= \frac{440}{2}(9.40) + \frac{26000}{440}(35)$$

$$= \$\ 4138$$

⑤ Time between order

$$TBO = \frac{EOQ}{D} \times 260 \text{ days}$$

$$= 4.4 \text{ days}$$

solved Prob-2

Production Per day = 190 barrels

demand per day = 30 "

Holding cost $ 0.21/barrel/year

Assume 350 days/year

Annual Demand 10,500 barrels

Calculate: 1) ELS

2) TBO

3) Production Time during each cycle

4) TC

① $ELS = \sqrt{\frac{2DS}{H}} \sqrt{\frac{P}{P-Q}}$

$= \sqrt{\frac{2 \times 10500 \times 200}{0.21}} \times \sqrt{\frac{190}{190-30}}$

$= 4873.4$ barrels

≈ 4873 barrels

$P = 190$
$Q = 30$
$H = 0.21$
$S = 200$
$D = 10500$

② $TBO = \frac{ELS}{D} \times 350$ days

$= \frac{4873}{10500} \times 350$ days

$= 162$ days.

③ Production time during each cycle $= \frac{4873}{190}$

$= 26$ days

④ Total Cost, $TC = \frac{ELS}{2}\left(\frac{P-Q}{P}\right)(H) + \frac{D}{ELS}(S)$

$= \frac{4873}{2}\left(\frac{190-30}{190}\right)(0.21) + \frac{10500}{4873}(200)$

$= \$ 861.$

Inventory Control

Q. 1. Cost associated with holding inventory

2. Types

3. EOQ, ELS, ROP, Lead time, Safety Stock

Cost of holding High Inventory

1. Interest / Opportunity cost
2. Storage and Handling cost
3. Taxes, Insurance, Shrinkage cost

Manufacturer → Dealer → Whole-seller → Retailer → Customer

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Management

11/E
23.06.18

Plant Layout (কারখানা বিন্যাস)

* What is a layout planning?

-A layout planning involves decisions about the physical arrangement of economic activity centers needed by the factory's various processes.

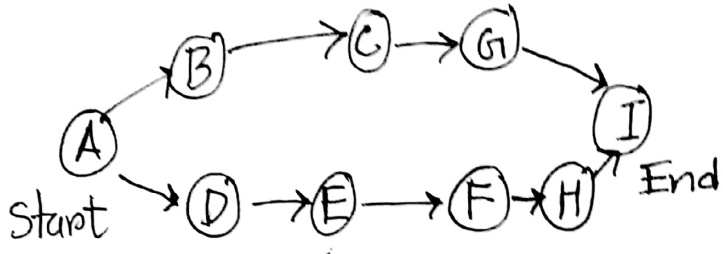
1. What Centers should the layout includes?
2. How much space and capacity does each center need?
3. How should each center's space be configured?
4. Where should each center be located?

Types of Layout (On the basis of visibility)

1. Flexible Flow Layout (FFL)
2. Line Flow Layout (LFL)
3. Hybrid Layout (HL)
4. Fixed Position Layout (FPL)

- FFL : A Layout in which resources are arranged by function.

- LFL : A Layout in which workstations are arranged in a linear path.



- HFL: A layout which is combination of both Flexible flow layout and Line flow layout.

- FPL: A layout in which manufacturing site is fixed in a place, employees along with their equipment come to the site to do their job.

Management Hum 2113 12/A 24.06.18

A company is selling up an assembly line to produce 192 units per eight hours shift.

Work Elements	Time set	Immediate Predecesor (S)
A	40	None
B	80	A
C	30	D, E, F
D	25	B
E	20	B
F	15	B
G	120	A
H	145	G
I	130	H
J	115	C, I

1) What is Cycle Time?
2) What are the minimum number of work station?
3) Use the largest work element, time rule to work out a solution and show your solution in a procedence diagram.

④ Efficiency?

⑤ Balance Delay?

soln:

① Cycle Time $(c) = \frac{1}{r}$

$= \frac{8 \times 3600}{192}$

$= 150$ seconds/station

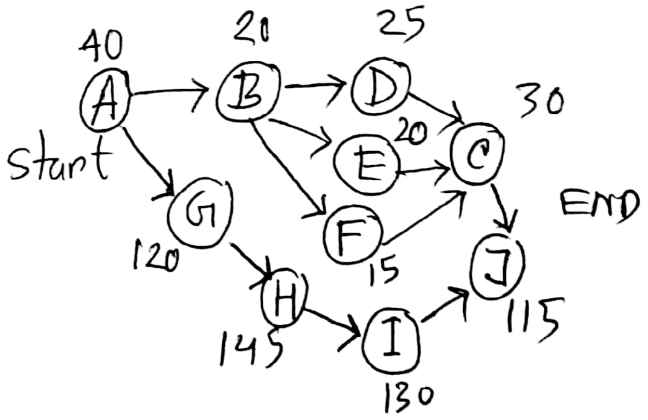
r = desired output rate per hour in unit

② No. of station $(n) = \frac{\Sigma t}{c} = \frac{720}{150} = 4.8$

≈ 5 stations

Σt = total time required to produce one unit

③ Precedence Diagram



Line Balancing

Station	Candidate(s)	Choice	Time (sec)	Cumulative Time (sec)	Idle Time (sec) C = 150 sec
S_1	A B ~~D, E, F~~	A B D	40 80 25	40 120 145	110 30 05
S_2	E, F, G E, F	G E	120 20	120 140 ~~130~~ ~~120~~	30 10
S_3	F, H	H	145	145	05
S_4	F, I F	I ~~F~~	130 15	130 145	20 05
S_5	C J	C J	30 115	30 ~~115~~ 145	120 05

C = Cycle Time

④ Efficiency : $\frac{\Sigma t}{nC} \times$ ~~100~~ 100

$$= \frac{720}{5 \times 150} \times 100$$

$$= 96\%$$

⑤ Balance Delay = 100 − Efficiency

$$= 100 - 96$$

$$= 4\%$$

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Trip Matrix

13/A

01.07.18

Trips between departments :

Dept.	A	B	C	D	E	F
A		8	3		9	5
B				3		
C					8	9
D						3
E						3
F						

a) Use trail and error to find a better layout (Assume Dept. E and F to remain at its current layout)

b) How much better is your proposed layout then the current one in terms of WD (Weighted Distance) score?

Current Layout

E	B	F
A	C	D

Proposed Plan-1

E	C	F
A	B	D

Dept. Pair	No. of trips (w)	Current Plan		Proposed Plan-1		Paposal-1
		Distance (d)	Wd	d	wd	
A, B	8	2	16	1	8	
A, C	3	1	3	2	6	
A, E	9	1	9	1	9	
A, F	5	3	15	3	15	
B, D	3	2	6	1	3	
C, E	8	2	16	1	8	
C, F	9	2	18	1	9	
D, F	3	1	3	1	3	
E, F	3	2	6	2	6	
			$\Sigma wd = 92$		$\Sigma wd = 67$	

efficiency $= \frac{(92-67)}{92} \times 100 = 27.17\%$

weighte distance Score of current layout dropped from 92 to 67, a 27% reduction.

Performance Criteria

1. Level of Capital investment
2. Requirements for material handling
3. Ease of stock picking
4. Work Environment

5. Ease of equipment maintenance.
6. Employee Attitude
7. Amount of flexibility needed
8. Customer satisfaction, ~~commercial~~ convenience and level of sale.