

Sa 01

Syllabus

Su 02

Mo 03

Traditional

Tu 04

We 05

1. Productivity / ILO Approach

Th 06

2. Functional approach

Fr 07

3. Value Analysis / Value engineering

Sa 08

4. Quality Circle

Su 09

5. Thinking techniques

Mo 10

→ Synthetic

Tu 11

→ Brainstorming

We 12

→ Creative based

Th 13

Actual Syllabus

Fr 14

Sa 15

1. Productivity

Su 16

1A. M = efficiency

Mo 17

B. Effectiveness

Tu 18

C. Define customer

We 19

Opaper D. Value adding v/s non-value adding
time

Th 20

Fr 21

E. Difference between manufacturing
& Service

Sa 22

Su 23

F. Basic Ops Terms

Mo 24

cycle time | Lead time | TAKT Time

Tu 25

OTIF | PV = Process velocity

We 26

Th 27

Fr 28

Sa 29

Su 30

Mo 31

VIVA - 26th Feb

2011

January

2. Lean = 3M

- MUDA
- MURA
- MURI

Saturday
Day (001/364)

01

3. 5S / Process flows.

4. Value stream map.

5. SMED

6. Problem Solving

7. Case study - Video * Exam question

8. Viva (20mks, based on course covered in 7 sessions)

• No notes from "me"

• Attendance not compulsory

Internal → 20
↳ Viva
↳ Attendance

Questions for exams:

① Case study as explained in class.

② MCQs

③ Match the column.

④ 1 question on thinking techniques

⑤

02 Sunday

Wk	January	2011	Wk	February	2011
01	Mo Tu We Th Fr Sa Su	31 1 2	06	Mo Tu We Th Fr Sa Su	1 2 3 4 5 6
02	3 4 5 6 7 8 9		07	7 8 9 10 11 12 13	
03	10 11 12 13 14 15 16		08	14 15 16 17 18 19 20	
04	17 18 19 20 21 22 23		09	21 22 23 24 25 26 27	
05	24 25 26 27 28 29 30		10	28	

Work to do:

03

Monday
Day (003/362)Lecture 1 - 18.12.16

→ Define Customer.

- Consumer of services/products
- Pays for products/services
- finds value for the product
- Has a need/want

Anybody who receives a p/s or knowledge or info → customer

Anybody who gives → supplier



eg: while writing

exams, student should write answers as the prof wants hence customer becomes supplier & supplier becomes customer.

Customer Types → Internal (eg: mktg to finance, HR to mktg)
→ Internal.

Work to do



Behaviour is a mirror in which every one shows his image.

→ Define productivity

Tuesday
Day (004/361)

04

$$\uparrow \text{Productivity} = \frac{\text{Output} \uparrow}{\text{Input} \downarrow}$$

Input → men, machine, infra, material, utilities

→ Define efficiency

$$M = \frac{O/P}{I/P}$$

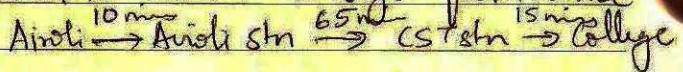
effectiveness:

- Quality of o/p

- less amt of resources gives more o/p

→ Lead Time

Time taken to reach college from home



→ Cycle Time

Individual time taken for each process.

→ Value adding Time

Time reqd. to produce a product or deliver a service for which the customer pays.

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Work to do

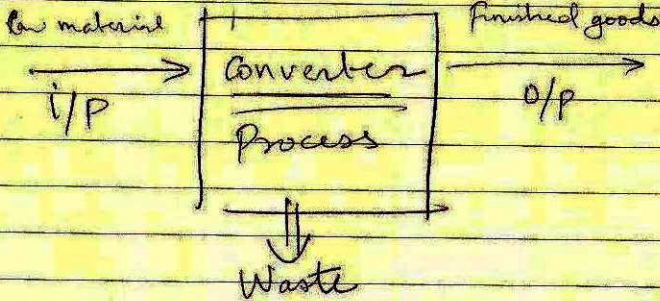
Set + waste = lead time

05

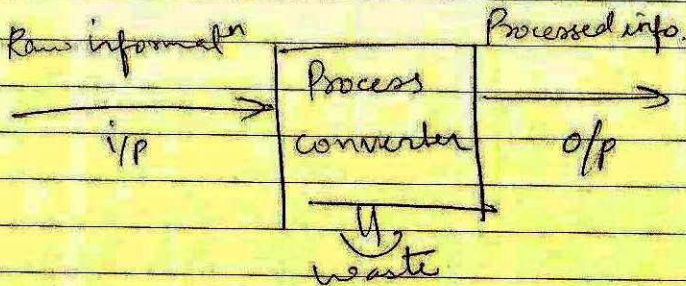
Wednesday
Day (005/360)

→ Difference between mfg & service

~~Mfg~~



Service



→ Process Velocity.

$$\text{Velocity} = \frac{\text{displacement}}{\text{time}} \uparrow$$



True dignity is never gained by place, and never lost when honours are withdrawn.

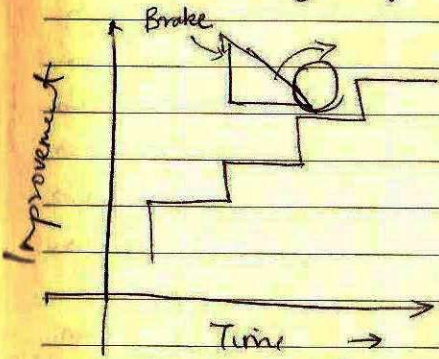
Work to do

2011

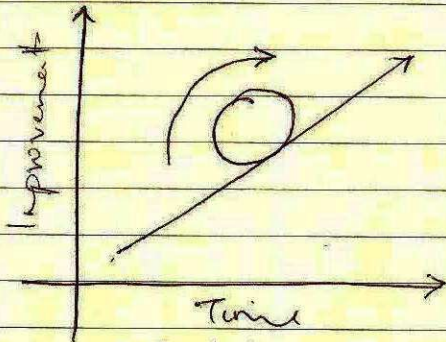
The m/c that chaged this world
- James Wom January

→ Lean = ^{finding b} Eliminating Waste → MUDA
Thursday Day (006/359) 06

→ Kaizen (Kai-Charge, zen-good).
• continuous improvement
• change for good.

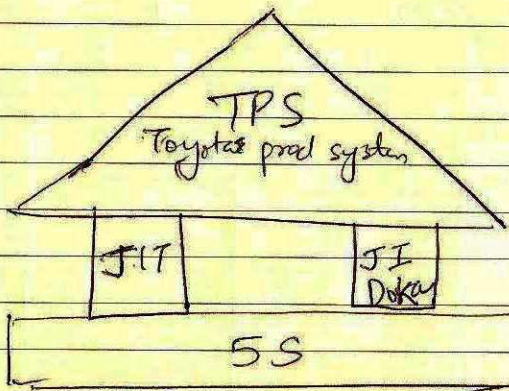


Continual Improvement



Continuous Improvement

Kaizen philosophy



Automated with human intervents

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Work to do

JIT-Doker → 1st pillar
JIT → 2nd pillar

Actual Kaizen
TPS

07 Friday
Day (007/358)

Do not pass defective products to the next stage

→ Value Add v/s Non value add

Play Act

Steps	Process	(I) Five star Time	(II) Udupis Time
1	Enjoying Ambience	3 min	1 min
2	Menu time	10 min	2 min
3	Order time	10 min	5 min
4	Travel time	3 min	30 sec
5	Setting upms.	10 min	10 min
6	Coffee prep. time	2 min	2 min
7	Coffee delivery	1 min	1 min
8	Coffee drinking	10 min	10 min
9	Billing time.	8 min	5 min
		<u>52 ~ 60</u>	<u>37 ~ 35</u>

Process Velocity PV
or (Service velocity)

$$= \frac{20}{60} = 33.33\% = \frac{20}{35} = 57\%$$

Work to do



Our world is a college,
events are teachers,
happiness is the
graduating point,
character is the diploma
God gives man.

$LT = ECT + \text{Non value add (NVA)}$



Saturday
Day (008/357)

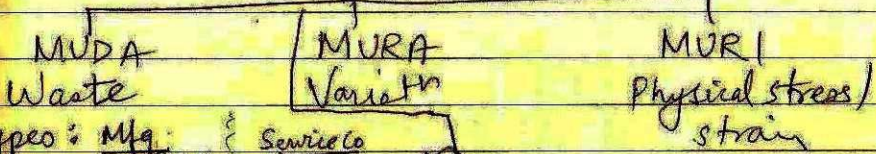
08

Lecture 2 - 08/01/17

Lecture 2
08/01/17

Productivity Technique

Lean → 3M



- 7 types: Mfg
- Transportat^n
 - Inventory

- Semioco
- Waiting
 - Overprod^n

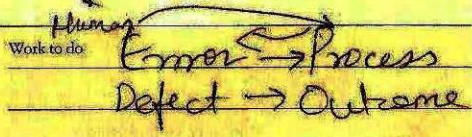
- W
D
R
M
P
I
I

1st step → operations / productivity / assets

- Motion (Human)
- Waiting
- Overprod^n
- Overprocessing
- Defects
- Rework
- Motion
- Overprocessing
- Intellectual
- Technology of Transportat^n

09 Sunday

DOWN-TOWN



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10

Monday
Day (010/355)→ MURA (Variatⁿ)

- Variatⁿ needs to be controlled
- It needs to be identified first

→ MURI (Physical stress)MURA : MURA means irregularity

- Whenever a smooth flow of work is interrupted in an operator's work, the flow of ^{parts} parts/machine/service, there is MURA

For eg: Assume that operators are working on the line and each person is performing a given repetitive task before sending it to the next person. When one of them takes more time to do the job than the others, MURA as well as MUDA is seen.

Looking for such irregularities becomes an easy way to start improving the process on a continual basis.

MURI : MURI means strenuous conditions for both human beings & machine.

Work to do



You can't establish sound security on borrowed money.

For eg: If a newly hired worker is assigned to do the job of an experienced worker without sufficient training, the job will be strenuous for him.

Tuesday
Day (011/354)

11

MUDA : MUDA means waste

• Work is a series of processes or steps, starting with raw material and ending with a final product/service.

• At each process, value is added to the product/service and then sent to the next process.

• The resources at each process - people & machines - either do add value or do not add value.

• MUDA refers to any activity that does not add value.

MUDA is classified into 7 categories:

① Overproductⁿ : It is a function of the mentality of the line manager who is worried about such problems as m/c failure, rejects, absenteeism and who feels compelled to produce more than necessary just to be on the safe side. This type of MUDA results from getting ahead

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Work to do

12

Wednesday
Day (012/353)of the productⁿ schedule.

- ② Inventory: Final products, semi-finished products, parts and supplies ^{kept} in inventory do not add value. Rather, they add to the cost of operations by occupying space and by requiring additional equipment / facilities.
- ③ Defects/Rejects: Rejects interrupt productⁿ and require expensive rework. Often, the rejects must be discarded which is a great waste of resources and efforts.
- ④ Motion: Any motion of a person's body not directly related to adding value is un-productive.
- ⑤ Overprocessing: Sometimes inadequate technology or design leads to MUDA in the processing world itself. Processing here refers to modifying a work piece or a piece of informatⁿ.
- ⑥ Waiting: It occurs ^{either} ~~at~~ the hands of the operator/people are idle.
- ⑦ Transportatⁿ: In workplace/shopfloor, one notices all sorts of transport by such means as trucks, forklifts & conveyors. Transport is an essential part of operations but moving materials or products adds no value.



It is terrible thing to look over your shoulders when you are trying to lead-and find no one there.

Work to do

Summary : → oil filling line
→ fill oil in jars

Thursday
Day (013/352)

13

① Write down the processes
↳ activity which takes place logically

Process

1. Storage of empty oil jars near line
2. Uncapping of jars.
3. Removing stickers
4. Labelling of jars
5. Jars on conveyor.
6. Oil filling
7. Seal
8. Capping
9. Uncapping
10. B/C for leakage
11. Weighing
12. Storage of corrugated boxes
13. Packing
14. Taping

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Work to do

Planned 630 jars / shift
January Actual 510 jars / shift

2011

14 Friday
Day (014/351)

- sticking labels on jars
- picking up jars & putting it on assembly line.
- removing caps from jars.
- some machines ~~pieces~~ identifier.
- one m/ch fills oil.
- putting caps back on jars
- weight of oil filled is verified.
- checking for spillage of oil by verifying seal.
- checking if caps fit properly.
- reprocessing it
- checking after reprocessing
- revalidating
- Assembling carton box.
- Sending valid jars to carton for packaging
- Carton packed and sent ahead



Laughter is a tranquilizer
with up side effects.

Work to do

17 Monday
Day (017/348)

MUDA	MURA	MURI
① MUDA of inventory storage of jars	1. Variate in labelling	1. Uncapping of caps
2. Idle time for people → jars.	2. MURA of capping.	2. Light strains
3. Motion	3. MURA for lifter	3. Manual packed bones & placing it on pallets
4. Waiting	4. Size of jars	4. No linear process
5. Defect - sealing	5. MURA in pegging	5. Bending & lifting of jars
6. Unnecessary m/c		6. Putting jars on conveyor.
7. Removing of sticker twice		7. MURI of capping while recapping
8. Weighing of product again		8. MURI working conditions
9. MUDA of people on line		
10. Capping Uncapping		
11. Doing overprocessing		
12. Rework for resealing		
13. Rework labelling		
14. Transport of material		
15. QC check - recheck		
16. MUDA of capping		



Friends should be like books, easy to find when you need them, but seldom used.

Work to do

2011

Lecture 3 - 29/01/17

5S - Spaghetti Diagram

Tuesday 18
Day (018/347)

5S:

S-Seiri ^{→ Straighten out} Cleanliness (CANDO)

S-Seiton ^{→ Arrange} Arrange

S-Seison ^{→ clean} Neatness.

S-Seiketsu ^{→ Discipline} Discipline

S-Shitsuke ^{→ Standardize^m} Organize Top 4 regularly

5S → 5 steps to keep your workplace organized

In mfg org, anything that you search for physically, should be available to you in 30secs or else it ~~gives~~ leads to lead time

(SN in AP)

→ Seiri: The first step ~~maintain~~ classifying items in gembra (workplace) into 2 categories:

- ① Necessary & ② Unnecessary.

The objective is to remove the unnecessary items from the gembra. A ceiling on no of

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Work to do

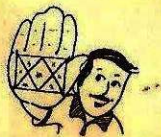


19 Wednesday
Day (019/346)

necessary items should be established. All sorts of objects can be found in gumbra. ~~The~~ ^A closed loop look reveals that only a small no of them are needed in daily work. Many others either will never be used or will only be needed in the distant future. The workplace usually is full of trash, rejects, work in process, desks, workbenches, files or documents & other items.

An easy rule of thumb is to remove anything that will not be used within the next 30 days. Seiri often begins with a red tag campaign. Select one area of workplace as the site for Seiri. Members of a team are usually handed these red tags. These red tags are placed on items which are unnecessary. The larger the red tags & ~~the~~ greater the number, the better. When it is unclear, whether or not a particular item is needed, a red tag should be placed on it. By the end of this exercise, the area will be covered with 100's of red tags. Things that will not be needed within the next 30 days but maybe needed at some point in the future, ~~are~~ are

Work to do



The future is not in the
hands of fate but is ours.

moved to a red tag area. Eliminating unnecessary items via the red tag campaign also frees up space enhancing flexibility in the use of work area, because once unnecessary items have been discarded, only what is needed remains.

Thursday
Day (020/345)

20

→ Seiton: Once Seiri has been carried out, all unnecessary items have been removed from Gemba leaving only the minimum no. needed. But these needed items, can be of no use if they are stored too far away from the work station or in a place where they cannot be found. Seiton means classifying items by use and arranging them accordingly to minimize search time & effort. To do this, each item must have a designated address, name & volume. Not only the location, but also the maximum no. of items allowed in the workplace must be specified.

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Work to do

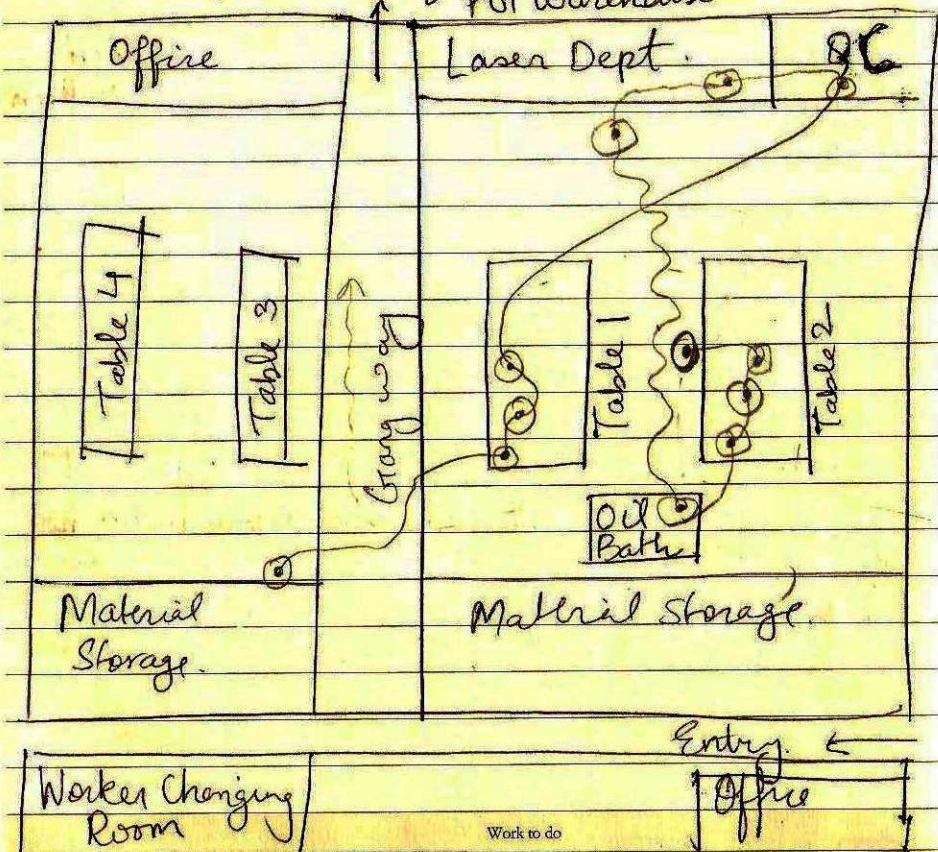
21

Friday
Day (021/344)

Spaghetti Diagram

Video eg: get the product → put tag → send it ^{away}

• paper & pencil techniques used to determine material flow in a factory ^{warehouse} ~~warehouse~~.
F&T warehouse



A man comes to measure his greatness by the regrets, envies and hatreds of his competitors.

Work to do

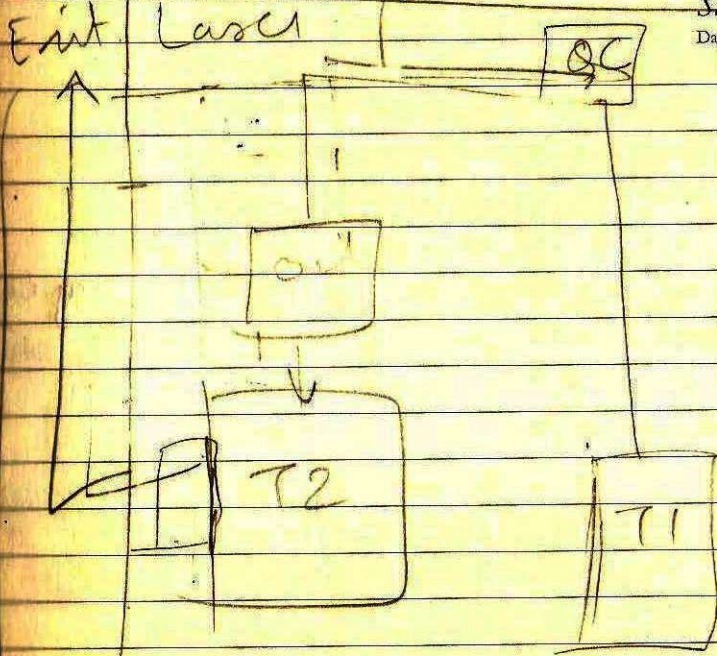
2011

January

After improvements

Saturday
Day (022/343)

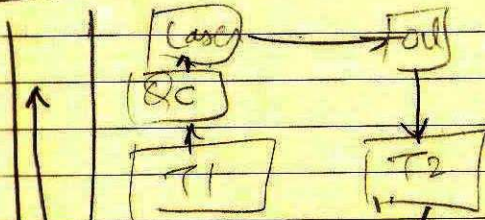
22



By changing tables

Material

23 Sunday



without changing tables

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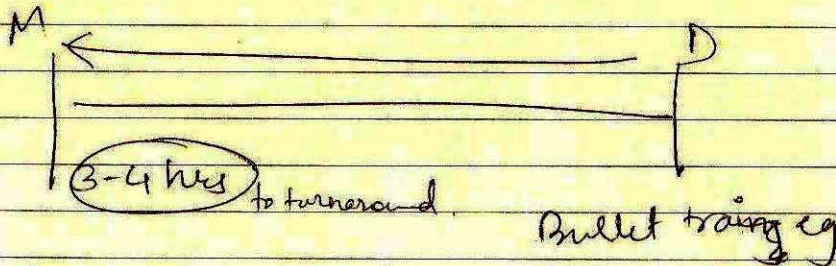
19/2/17.

SMED - A revolution in mfg.

2011

Lecture 5 - 19/2/17

24 Monday
Day (024/341)



1. Cleaning
2. Maintenance
3. Services
 - ↳ Food
 - ↳ Drinks
 - ↳ sheets/napkins.

4. Co-ordinatⁿ

Shigeo Shigeo → SMED or Quick Changeovers

~~FW Taylor~~ →

Single minute exchange of ~~die~~ ^{die}

SN on SMED & P

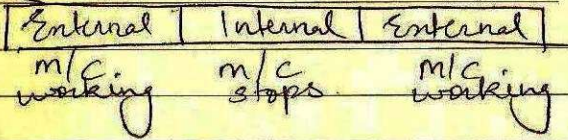


Humour is by far the most significant activity of the human brain.

Work to do:

3 part process → for any changeover
 ← Time → Tuesday
 Day (025/340)

25



- 1) Getting part right
- 2) Preparing.

→ Changeover Time : Time between completions of the current processing task up to the time when the next processing task produces the first defect free product.

$$\text{Changeover time} = \text{Internal c/o time} + \text{External c/o time}$$

When the m/c is not running/adding value

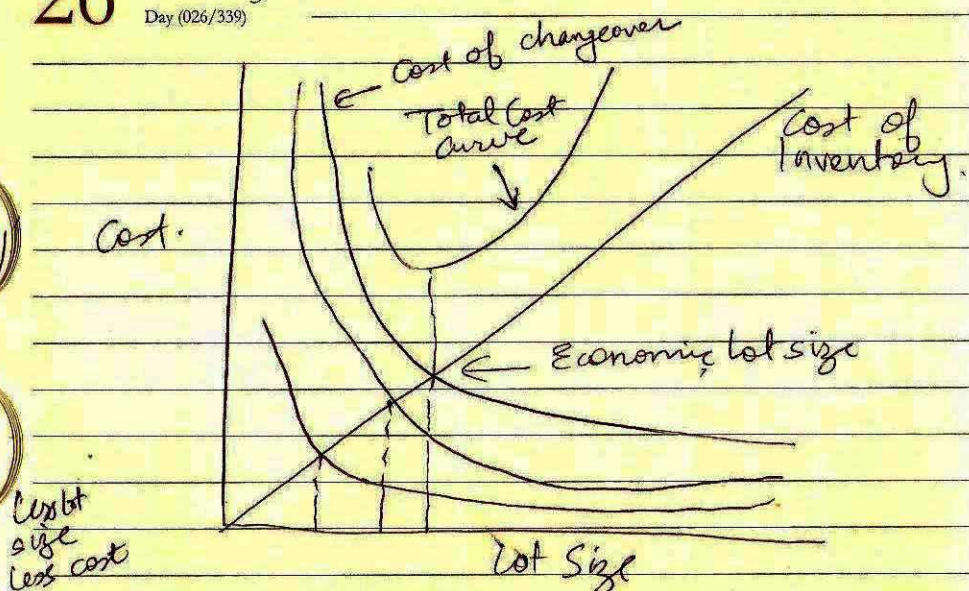
↓
 Procedures being done when the m/c is operating

Includes some purely non value adding Activities - MUDA

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26 Wednesday
Day (026/339)

The Optimization Model



$$SMED Index = \frac{\sum \# \text{ of C/O under 10 mins}}{\text{Total change over}}$$

$$\text{Value adding ratio} = \frac{VA}{LT}$$

Reducing changeover time helps increase Manufacturing

Work to do



A man in a passion rides a horse that runs away with him.

~~Changes in charges~~

1950 - 1 person charging the
type.

Time → 58 secs

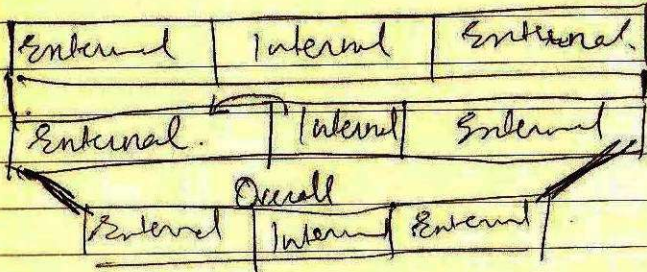
Time → 3.1 sec.

Car stop

SMED Trolley

Reduce change points (video)

→ convert internal process to external



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Work to do

January

Increase # of men
Alternate set of dies

2011

28

Friday

Day (028/337)

SrNo	Activity	Category. (int/ent/waste)	Time (min)	Improvement plan
1	Setup m/c for next step.			
2	Bring table near.			
3	Increase # of men			
4	Alternate set of dies			
5	Oil Brush.			
6	Sliding			
7	Smaller sheet used for testing			

Lecture 7 - 05/03/17

super market woman

What are the learnings from the movie?



The journey of thousand
miles begins with one
step.

Work to do

Saturday
Day (029/336)

29

Mktg	Finan c	Ops	HR	IT
Selling on discount strategy	Opportunity Cost	Assembly line	HR policies	Use of IT.
flash sales.				
raising original price				

Labels facing customer

- cleanliness, clean uniforms
- Starting with a sale
- pay attention to customers (needs, smile).
- competition - selling store

1 million → 3 million

• Vegetable section first → what is not available for the housewife

• Market research

30 Sunday

• morning sales

• Price monopoly

• Assembly line v/s manual workers

• make customers happy

• Have hygiene rules

• proper price tags

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31

Monday

Day (031/334)

- Address the issues upfront.
- Raising price of another product to cover cost for a non-selling product.
- Lower price of an older product.
- Selling one product triggers selling of another product.
- Risky reputat^{ion}
- Order more if in demand.
- People believe in advertisements.
- Customer satisfact^{ion} is topmost priority.
- If you lose customer, you lose reputat^{ion}.
- ~~hardly~~ having alternatives (eggs vs corpons)
- Replacing org with duplicate products & doing price bargain.
- Taking your product door to door.
- Knowing your customer base.
- Getting best value for hard earned money.
- Customer friendly.
- Checking out supplier goods.
- Adulterat^{ion} of food.
- Making suppliers an imp stakeholder.
- Taking inputs from customers.
- Never deceive customers.
- Trusting your own org - drinking your own wine.

Work to do



Advice after injury is like
medicine after death.

- Tu 01 • Be aware about the business & other
 We 02 environmental factors
 Th 03 • Be aware about each & every thing in
 Fr 04 your business
 Sa 05 • Start new traditions, get rid of old.
 Su 06 • Back office should be efficient
 Mo 07 • Importance of ethics
 Tu 08 ,
 We 09
 Th 10 Who is the customer → Housewives
 Fr 11
 Sa 12 Objective of the business → provide fresh food
 Su 13 to be at place where actually work happens
 Mo 14 ↳ Gembira
 Tu 15 Paper
 We 16 • Basic definitions (1st lecture)
 Th 17 & Notes
 Fr 18 • Match the column
 Sa 19 • MUDA, MURA, MURI (7 types of wastes)
 Su 20 • Differential diagnosis
 Mo 21 • Spaghetti diagram
 Tu 22 • SMED / Quick changeover
 We 23 (PI pickup)
 Th 24 • 5S
 Fr 25 • Movie - supermarket woman
 Sa 26
 Su 27
 Mo 28

2011

HR

No harmonization

- Customer centricity or views
- Motivation of employees
- Friendly work environment
- Standardization of policies
- Trust
- Autonomy employee
- Driving change
- Agility
- Knowledge transfer
- Conflict mgmt

Ops

- Repeating X operations of competitor (start is not stocked up)
- non-utility of resources (assembly line)
- Differential design or vegetable (where it's out)
- PDCA (plan do check act)

Finance

- opportunity cost for apples
- opportunity cost for fish
- Discounts 30% on 200 paks or 10% on 5500 paks
- forecasting financial results

Mktg

- Customer view
- Market research
- Customer base
- ABC / number
- repeat customer
- stranger
- night product
- more

MAR

APR

Wk	February 2011						Wk	March 2011						
	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
06		1	2	3	4	5	6	10	1	2	3	4	5	6
07	7	8	9	10	11	12	13	11	7	8	9	10	11	12
08	14	15	16	17	18	19	20	12	14	15	16	17	18	19
09	21	22	23	24	25	26	27	13	21	22	23	24	25	26
10	28							14	28	29	30	31		

Work to do