USING LEAN TOWARDS IMPROVING OPERATIONAL EFFICIENCY IN HOSPITALS

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ACKNOWLEDGEMENT

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SESSION COVERAGE

- ❑ Understand what "Lean" is not about
- ❑ Lean – Evolution & Definition
- ❑ Why Lean is required for Healthcare Organization?
- ❑ Lean details
- ❑ Lean Tools & Techniques

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LET US UNLEARN ……"LEAN" IS NOT ABOUT…..

- Manpower Reduction
- Quality
- TQM
- Inventory Reduction
- Cost Reduction
- TPM
- Improvement in layout
- Six Sigma
- Jut-in-Time

…. But it has got to do with all the above…….

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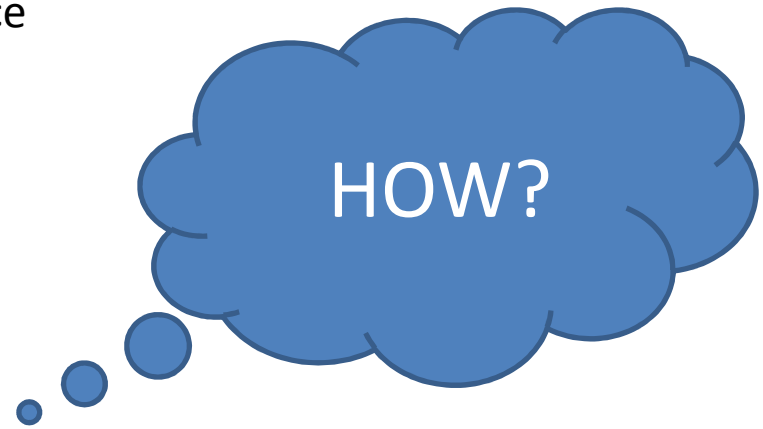
HOW LEAN EVOLVED?

The 3 Prime Targets for any Industry for sustenance

- QUALITY PRODUCT / SERVICE
- COST EFFECTIVENESS
- TIMELY DELIVERY



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PRODUCTIVITY IMPROVEMENT?

- Industrial Engineering studies on processes

- Equipment down-time reduction → TPM – Preventive / Productive

- Equipment set-up time reduction → Simplify, Eliminate, Combine operations

- Process time reduction →
  - Procurement time
  - Layout modifications
  - M/c improvement
  - Automation
  - Autonomation

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DELIVERY IMPROVEMENT?

➢ JUST-IN-TIME DELIVERIES

- ❑ Inventory Management, Supply chain Management → Outsourcing
- ❑ Batch Processing "to" Small Lot Processing → Down-sizing
- ❑ Flow Production → **TPS (Toyota Production System)**

For Healthcare Organizations (HCO):

- ❑ A combination of the above tried
- ❑ Extension of Manufacturing solutions

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PRESENT TREND

- TOTAL QUALITY MANAGEMENT

- COST REDUCTION Efficiency Improvement, Inventory Management

- JUST-IN-TIME DELIVERIES
  - Inventory Management, Supply chain Management
  - Batch Processing "to" Small Lot Processing
  - Flow Production → TPS

Instead of working on each of the above "Island Solutions", How to collectively get the best outcome?

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MAJOR WEAKNESS WITH THE PREVIOUS APPROACH..

- All the above talked about improvements within; For whom?
- Processes were looked into for getting isolated benefits
- Improvement teams working in isolation, sometimes at cross purposes
- Shifting of responsibility

THE VERY PURPOSE OF EXISTENCE OF BUSINESS IGNORED

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PURPOSE OF HEALTHCARE ORGANIZATION

- Correct Understanding of the patient needs / requirements
- Translation of the patient requirements to achievable actions
- Providing the means for meeting the patient needs
- Through set of actions meet / exceed the expectations of the patients
- Thereby leading to growth of the organization

PURPOSE OF ANY BUSINESS???

- PROFITABILE GROWTH

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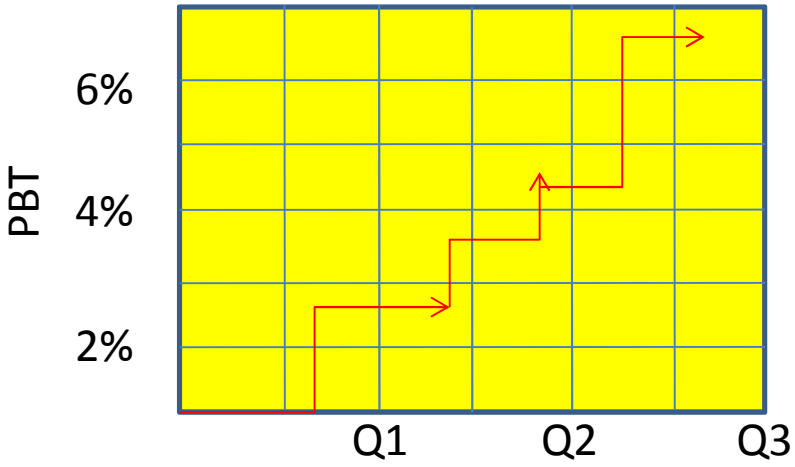
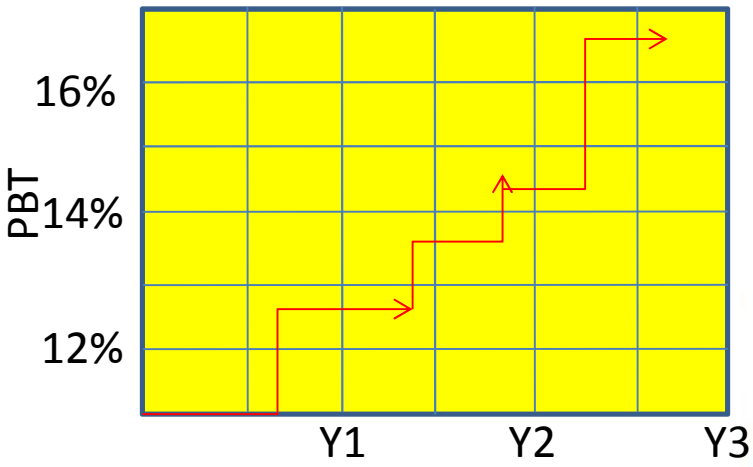
HOW TO MAKE GROWTH HAPPEN?

- PROFITABILE GROWTH

=

- Creation of Value for customer
- Creation of Wealth for the organization





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WHAT IS VALUE ADDITION?

There must be 3 important things for an activity to add value:

1. The customer must be willing to pay for that activity / service

2. The activity must transform the product or service

3. The activity must be done correctly the first time

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EXAMPLES OF VALUE ADDITION

VA – VALUE ADDED **NVA – NON-VALUE ADDED**

Department	*Role*	*VA Activity Example*	*NVA Activity Example*
Operating room	Surgeon	Operating on patient	Waiting for delayed procedure or performing unnecessary steps
Pharmacy	Pharmacy technician	Creating an IV formulation	Reprocessing medications that were returned from patient units
Inpatient unit	Nurse	Administering medications to a patient	Copying information from one computer system into another
Radiology	Radiology technician	Performing MRI procedure	Performing a medically unnecessary scan
Laboratory	Medical technologist	Interpreting a test result	Fixing a broken instrument

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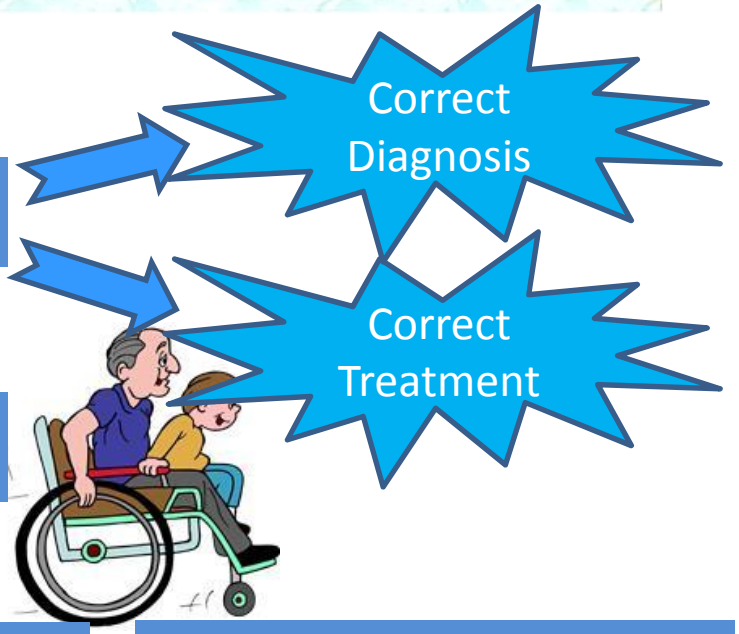
FACTORS ENHANCING VALUE

Q
- Quality of care

S
- Speed of delivery of care

E
- Overall Experience of patients
- Care Environment

C
- Cost



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HOW TO CREATE WEALTH?...

"Wealth" is the result of ……."accumulated Goodwill"

Gained through……..

- Overcoming "Negative" effects of :
  - Delays / errors
  - Wrong diagnosis / wrong treatment
- Positive feel from the customers (Patronage)
- Cost reduction

Perfect Process

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CHARACTERISTICS OF A PERFECT PROCESS?

Safe	Injury Free
Comfortable	Fatigue Free
Interesting	Boredom Free
Challenging	Have a sense of providing value
Creative	Have a sense of personal fulfillment & accomplishment

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FEATURES OF A PERFECT PROCESS?

Each activity within the process must be:

- ❑ Valuable
- ❑ Capable – of delivering consistent Quality
- ❑ Available- Resources available
- ❑ Adequate-Free from Constraints
- ❑ Flexible-Quick to respond to customer requirements

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FEATURES OF A PERFECT PROCESS?

REGISTRATION

- ❑ Valuable ?
- ❑ Capable – of delivering consistent Quality ?
- ❑ Available- Resources available ?
- ❑ Adequate-Free from Constraints ?
- ❑ Flexible-Quick to respond to customer requirements?

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PROCESS FOR OPD IN HCO

Registration

- Patient walks in through entry
- Search for registration counter
- Patient waits in queue for 20 Mins.(stands)
- On their turn, give details of name, age, address, contact details, illness
- Details get entered in register by clerk in 8 minutes.
- OP slip generated with room number

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PROCESS FOR OPD IN HCO

OP Clinic-General

- Patient searches for room number indicated in OP slip
- Patient walks for 30 feet to locate the OP clinic
- Patient waits in queue for 25 minutes.
- On his turn, patient enters the clinic room
- Doctor examines the patient physically (1 Min.)
- Doctor checks the weight, pulse manually (stethoscope non-functional) and records on OP slip (2 Min.)
- Doctor prescribes lab blood test on another slip (1 Min)
- Patient leaves clinic room and moves to registration area (30 feet) for making payment for lab test.

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PROCESS FOR OPD IN HCO

Laboratory

- After making payment (2 Min.) , the Patient searches for laboratory
- Walks about 60 feet & locates lab
- Patient waits in queue for 20 Mins.(stands)
- On his turn, enters the lab & gives the lab slip.
- Blood Sample is collected (3 Min.)
- Patient details of name, age, address recorded (2 Min.)
- Patient waits for 1 hour
- Lab report is given to patient (1 Min.)
- Patient leaves the lab.

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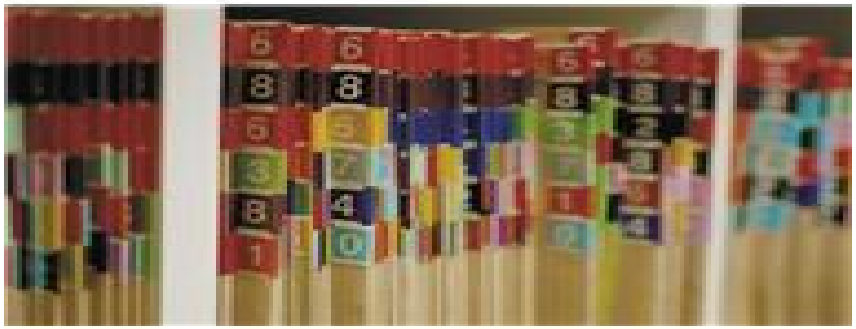
EXAMPLE : PROCESS FOR OPD IN HCO…Contd…

OP Clinic-General

- Patient waits for 20 Mins. in OP clinic area with test report & OP slip
- On his turn, patient enters the clinic room
- Doctor checks the lab report of the patient
- Doctor prescribes medicines on OP slip (2 Min.)
- Patient leaves clinic room



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EXAMPLE: PROCESS FOR OPD IN HCO…Contd…

Dispensary

- Patient reaches dispensary after walking about 30 feet
- Patient waits in queue for 20 Mins.(stands)
- On his turn, gives the medicine slip.
- The pharmacist checks for the medicines in the racks
- Reaches out for a carton stored in the top rack (6 ft. high), pulls down the carton
- Searches for the medicines for 8 min. to locate the medicines
- Issues medicine to the patient and records in the register of medicine issue
- Patient leaves the dispensary after 10 Mins.

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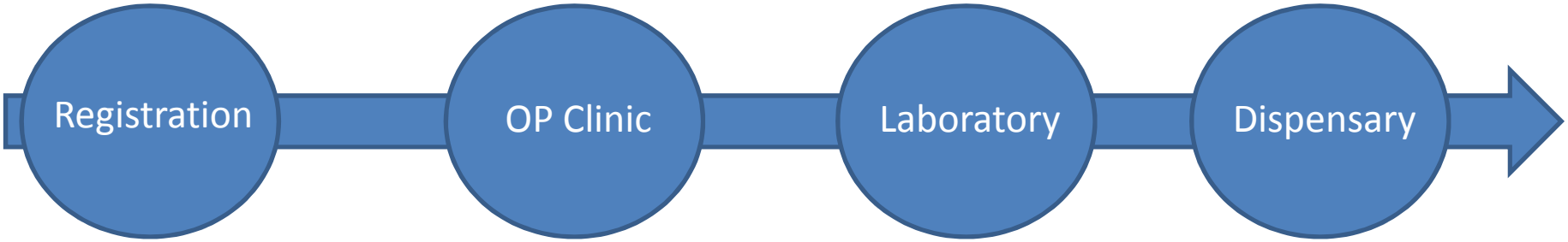
EXAMPLE : PROCESS FLOW FOR OPD IN HCO…Contd…



Tr = 8 Min.
D= 30
M =

Tr = 2 Min.
D= 30
M = 30'

V: V+NV
C: ?
A: Avl.?
A: Adequate
F: F

Tr = 1+2+1 Min.
D= 25 Min.
M = 30'

Tr = 2 Min.
D= 20 Min.
M = 30'

V: V+NV
C: ?
A: Avl.?
A: C?
F: F

Tr = 3+2+15+1 Min.
D= 20 Min.+ 60 Min.
M = 60'

V: V+NV
C: ?
A: Avl.?
A: C
F: F

Tr = 2 Min.
D= 20 Min.+ 8 Min.
M = 30'

T'PUT TIME1: 219

T'PUT TIME2: 99

V: V+NV
C: ?
A: Avl.?
A: C
F: F

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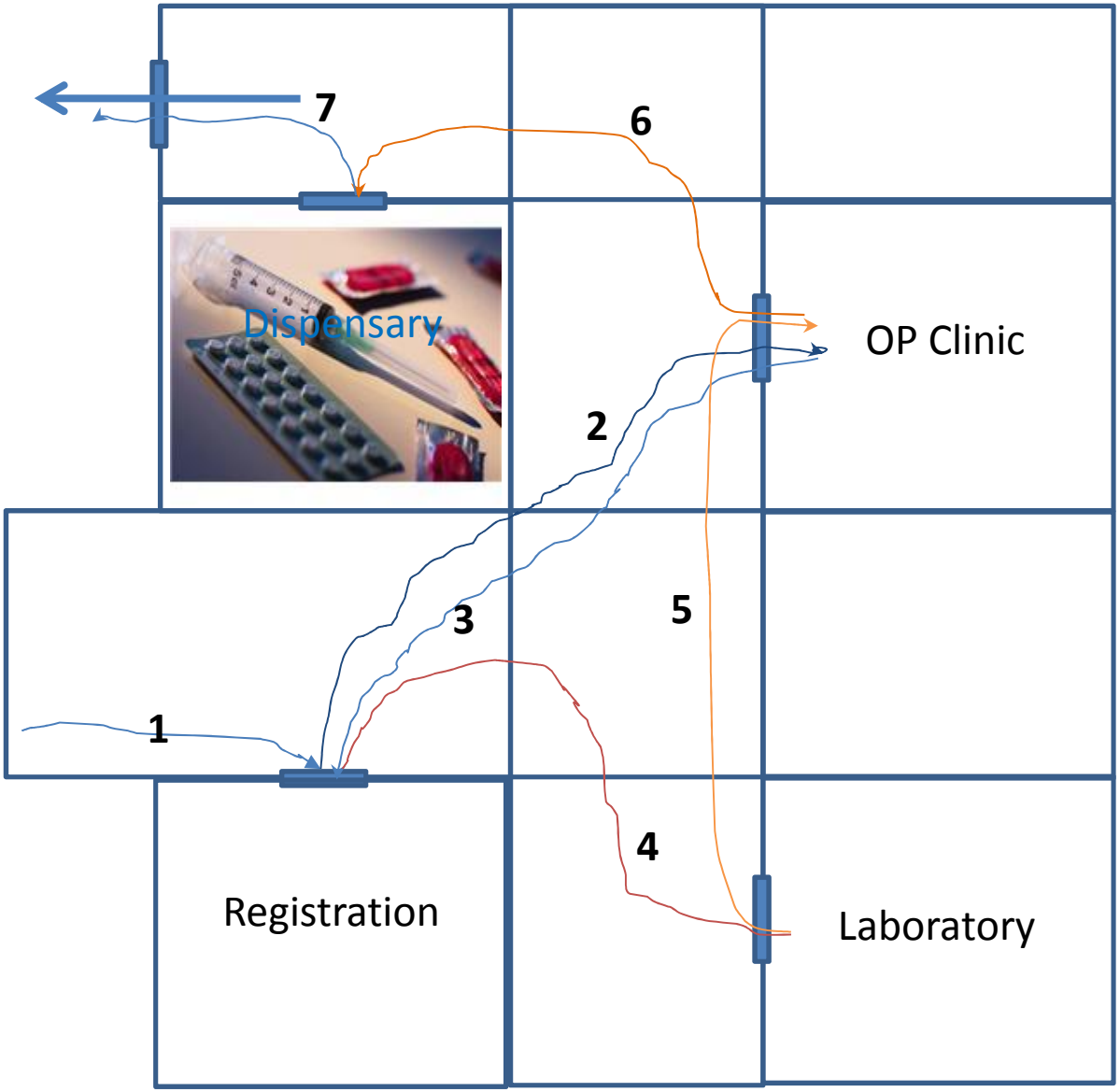
EXAMPLE : OPD LAYOUT – PATIENT MOVEMENT



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EXAMPLE : PROCESS FOR OPD IN HCO…Contd…

THE NON-VALUE ADDING ACTIVITIES

Registration	OP Clinic-General	Laboratory	Dispensary
Search for registration counter	Patient searches for room number indicated in OP slip	After making payment, the Patient searches for laboratory	Patient reaches dispensary after walking about 30 feet
Patient waits in queue for 20 Mins.(stands)	Patient walks for 30 feet to locate the OP clinic	Walks about 60 feet & locates lab	The pharmacist checks for the medicines in the racks
	Patient waits in queue for 25 minutes.	Patient waits for 1 hour	The pharmacist checks for the medicines in the racks
	Patient waits for 20 Mins. in OP clinic area with test report & OP slip		Reaches out for a carton stored in the top rack (6 ft. high), pulls down the carton
			Searches for the medicines for 8 min. to locate the medicines

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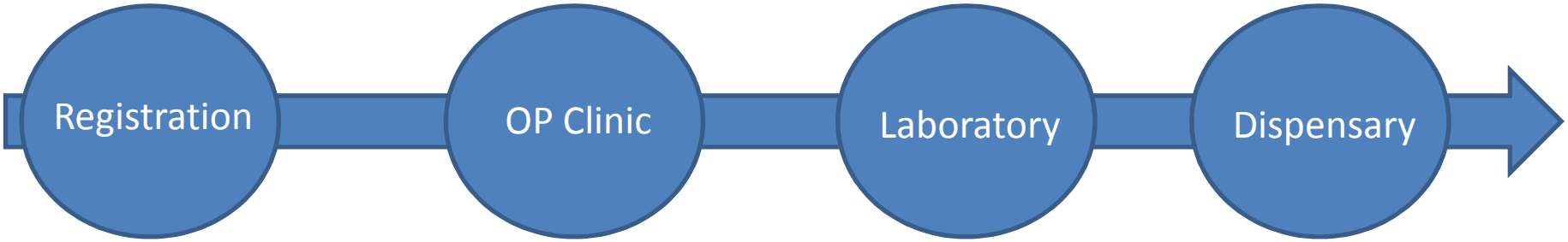
EXAMPLE : PROCESS FOR OPD IN HCO…VA activities

Registration	OP Clinic-General	Laboratory	Dispensary
Patient walks in through entry	On his turn, patient enters the clinic room	locates lab	On his turn, gives the medicine slip.
On their turn, give details of name, age, address, contact details, illness	Doctor examines the patient physically; Doctor checks the weight, pulse and records on OP slip	On his turn, enters the lab & gives the lab slip.	locate the medicines
Details get entered in register	Doctor prescribes lab blood test on another slip	Blood Sample is collected	Issues medicine to the patient and records in the register of medicine issue
OP slip generated with room number	Patient leaves clinic room and moves to registration area for making payment for lab test	Patient details of name, age, address recorded	Patient leaves the dispensary after 10 Mins.
	On his turn, patient enters the clinic room	Lab report is given to patient	
	Doctor checks the lab report of the patient Doctor prescribes medicines on OP slip		

EXAMPLE : PROCESS FLOW FOR OPD IN HCO…Contd…



Registration	OP Clinic	Laboratory	Dispensary
Tr = 2 Min. D= M =	Tr = 1+2+1 Min. D= M = 30’	Tr = 3+2+15+1 Min. D= M = 60’	Tr = 2 Min. D= M = 30’
Tr = 2 Min. D= M = 30’	Tr = 2 Min. D= M = 30’		
V: V+NV C: ? A: Avl.? A: Adequate F: NF	V: V+NV C: ? A: Avl.? A: C F: NF	V: V+NV C: ? A: Avl.? A: C F: NF	V: V+NV C: ? A: Avl.? A: C F: NF

TAKT TIME: 33

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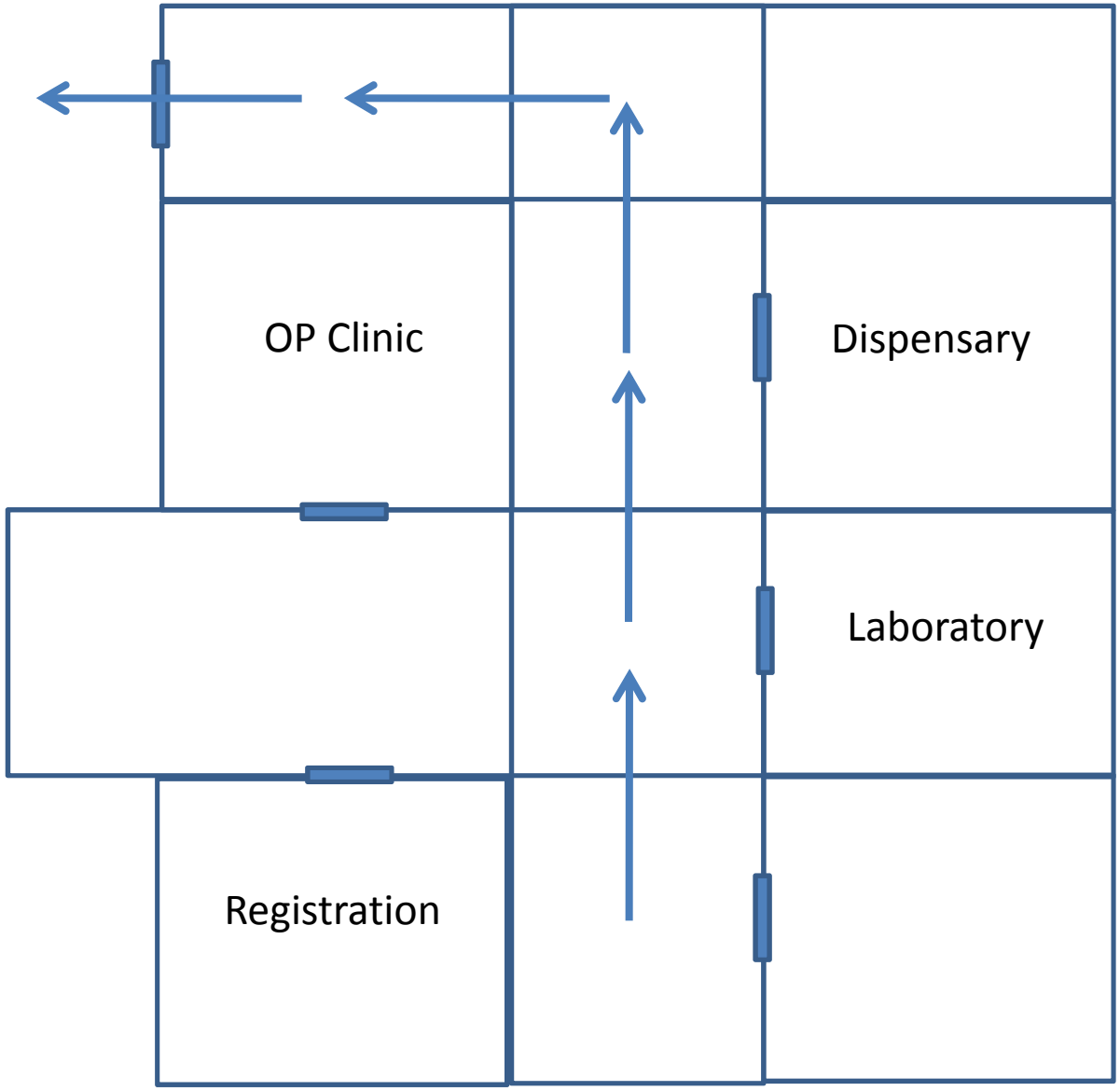
EXAMPLE : OPD LAYOUT MODIFICATION



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TYPICAL NON-VALUE ADDED..EXAMPLES

INSPECTION???

Pharmacists verifying prescriptions for proper dosing

Pharmacist double checking the work of pharmacy technicians on the stocks checked by them

Nurses double-checking the dosage and the right medication to the right patient

Are the above steps necessary?

Do they add value?

When can we eliminate them?

HOW?? → ERROR-PROOFING

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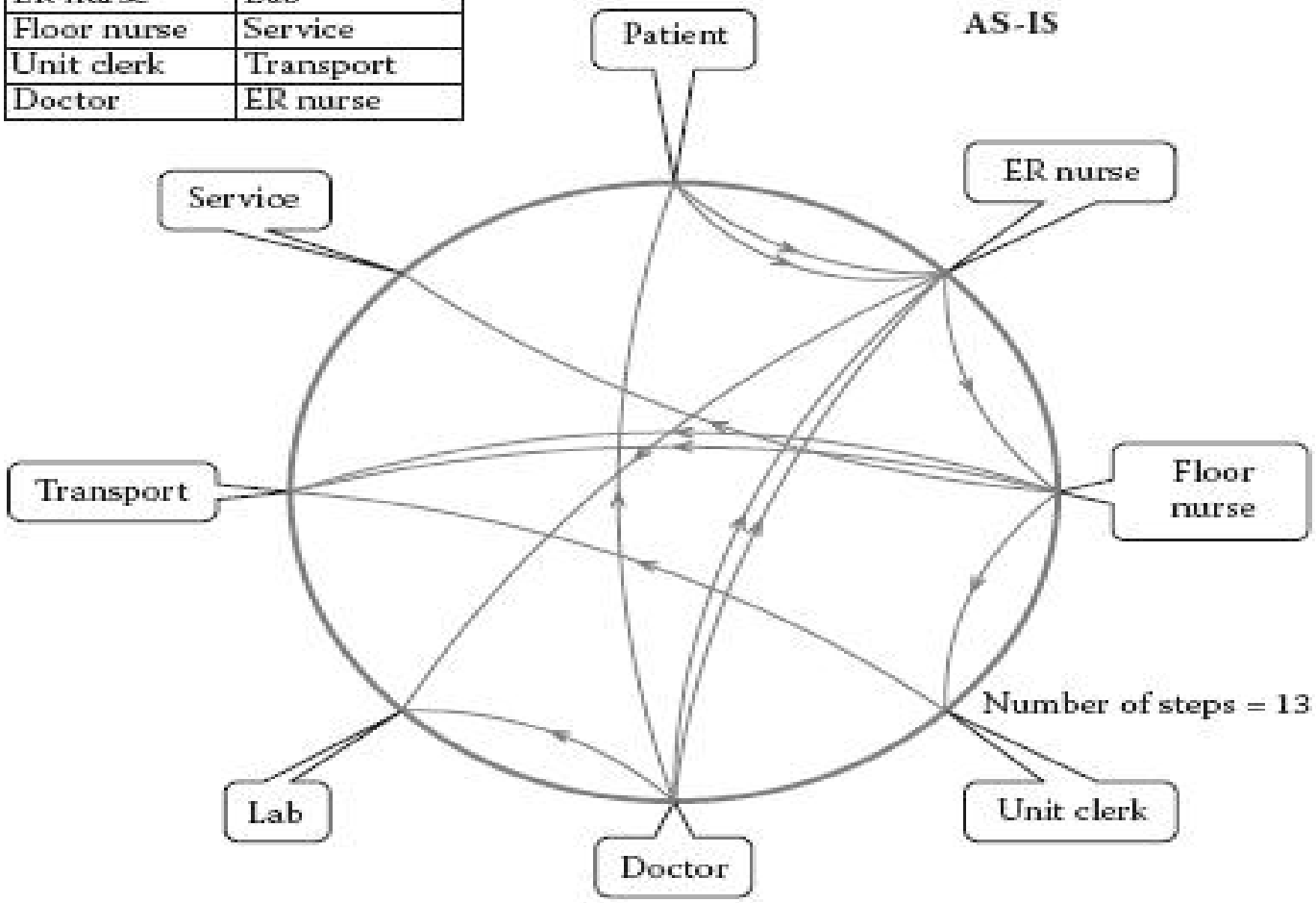
NON-VALUE ADDED ACTIVITIES - MOTION……

From	To
Patient	ER nurse
ER nurse	Floor nurse
Patient	ER nurse
Doctor	ER nurse
Doctor	Patient
ER nurse	Lab
Floor nurse	Service
Unit clerk	Transport
Doctor	ER nurse



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TECHNIQUES TO CREATE PERFECT PROCESS?

- ❑ Valuable → ❑ Lean
- ❑ Capable → ❑ Six Sigma
- ❑ Available → ❑ TPM
- ❑ Adequate → ❑ TOC
- ❑ Flexible → ❑ TPS

(Fast Delivery)

L

E

A

N

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TOYOTA PRODUCTION SYSTEM - PHILOSOPHY

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CONCEPT OF TOYOTA PRODUCTION SYSTEM (TPS)

Best Quality

Lowest Cost

Shortest LT

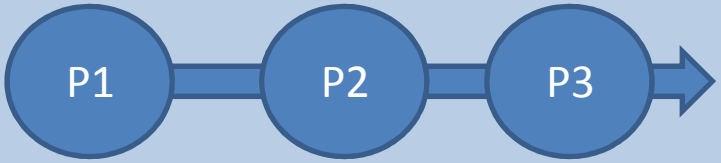
- Shortening production flow

Eliminate waste

Batch Production

Batch size: 1000

Customer req.: 600



T1: 8 Min. T2: 16 Min. T3: 4 Min.

10 d + 20 d + 5 d = 35 d

P1: 8 X 600 Mins. = 4800 Mins.

Available time per day = 8 hours

= 4800 Min.

In 35 Days, customer requirement of 600 will get ready for delivery

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CONCEPT OF TOYOTA PRODUCTION SYSTEM (TPS)

Best Quality

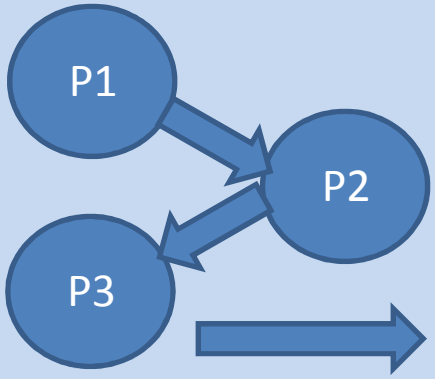
Lowest Cost

Shortest LT

- Shortening production flow

Eliminate waste

TPS – Single piece Flow



- Every 16 Min. 1 product out
- Every 4 Hours, 15 products out
- Every Day, 30 products out

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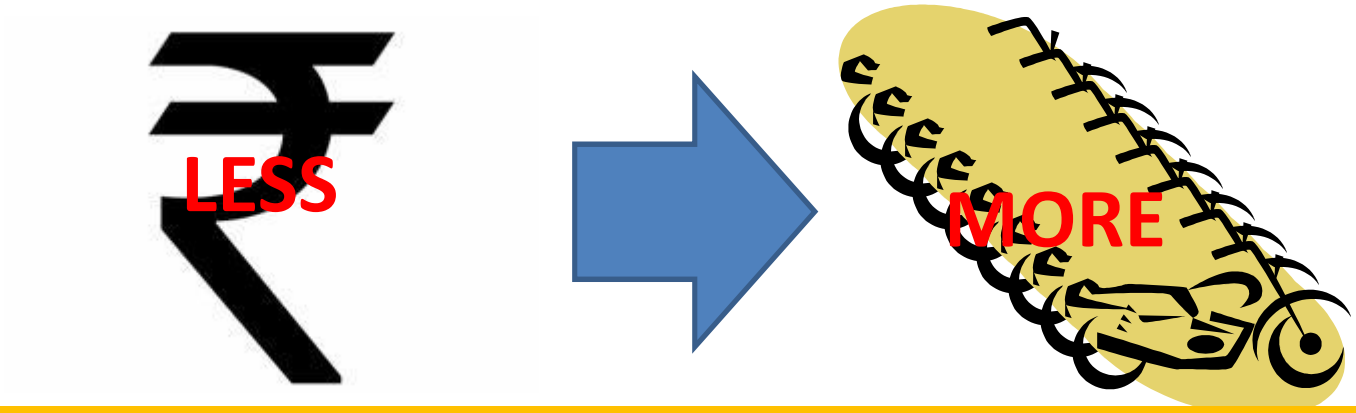
WHAT IS LEAN?



- A series of concepts, principles, using specific tools designed to perfect the processes that can deliver the “Most Value” to the “Customers” while consuming the “Fewest Resources”

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UNDERSTANDING LEAN HEALTHCARE?

Any HCO uses 4 kinds of Resources & provides service through certain process

PT. → **IN**

1. Manpower
2. Equipment
3. Materials
4. Methods










PT. → **OUT**

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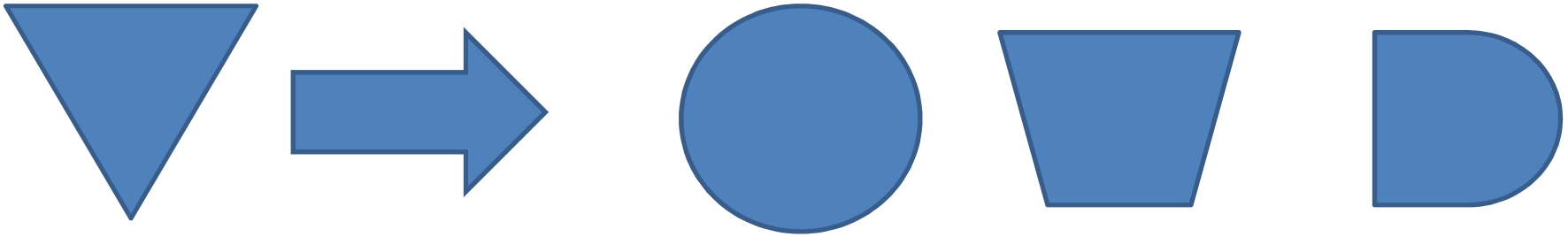
AND TYPICAL PROCESSES INCLUDE…….



i) Waiting ii) Movement (or) Transportation iii) Process iv) Checking v) Delays

-- Some add "Value"

-- Some add "No Value"

"Waste"

Known as "MUDA" in Japanese Parlance
Other Wastes include:
"MURI" : Overwork;
"MURA": Uneven workloads

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TYPES OF WASTE IN A HCO

1. Over processing	Lab., Discharge
2. Errors	Errors in diagnosis, reports
3. Inventory	Inventory-Medicines, stores
4. Inappropriate Processing	Processing-unnecessary steps
5. Transportation	Transportation-unnecessary movement between two processes due to layout issues
6. Waiting	Waiting between processes
7. Motion	Unnecessary movement of body parts due to searching, reaching out to higher level,

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TYPES OF WASTE IN A HCO..

Type of Waste	Description	Hospital Examples
Defects	Time spent doing something incorrectly, inspecting for errors, or fixing errors	Surgical case cart missing an item; wrong medication (or) wrong dosage administered to patient
Overproduction	Doing more than what is needed by the customer	Doing unnecessary diagnostic procedure
Transportation	Unnecessary movement of the product in a system (patients, specimens, materials)	Poor layout such as the Cath Lab being located a long distance from the ED
Waiting	Waiting for the next event to occur or next work activity	Employees waiting because the work loads are not Level; Patients waiting for an appointment

....

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Adapted from "Lean Hospitals" by Mark Graben

TYPES OF WASTE IN A HCO

Type of Waste	Description	Hospital Examples
Inventory	Excess inventory cost through financial costs; storage & movement costs; spoilage, wastage	Expired supplies that must be disposed off, such as, out-of-date medications
Motion	Unnecessary movement by the employees in the system	Nursing staff walking miles per day due to poor layout
Over processing	Doing work that is not valued by the customer, or, caused by definitions of quality that are not aligned with patient needs	Time, date stamps put on to forms but the data are never used
Human Potential	Waste and loss due to not engaging employees, not listening to their ideas, or not supporting their careers	Employees get burned out and quit giving suggestions for improvement

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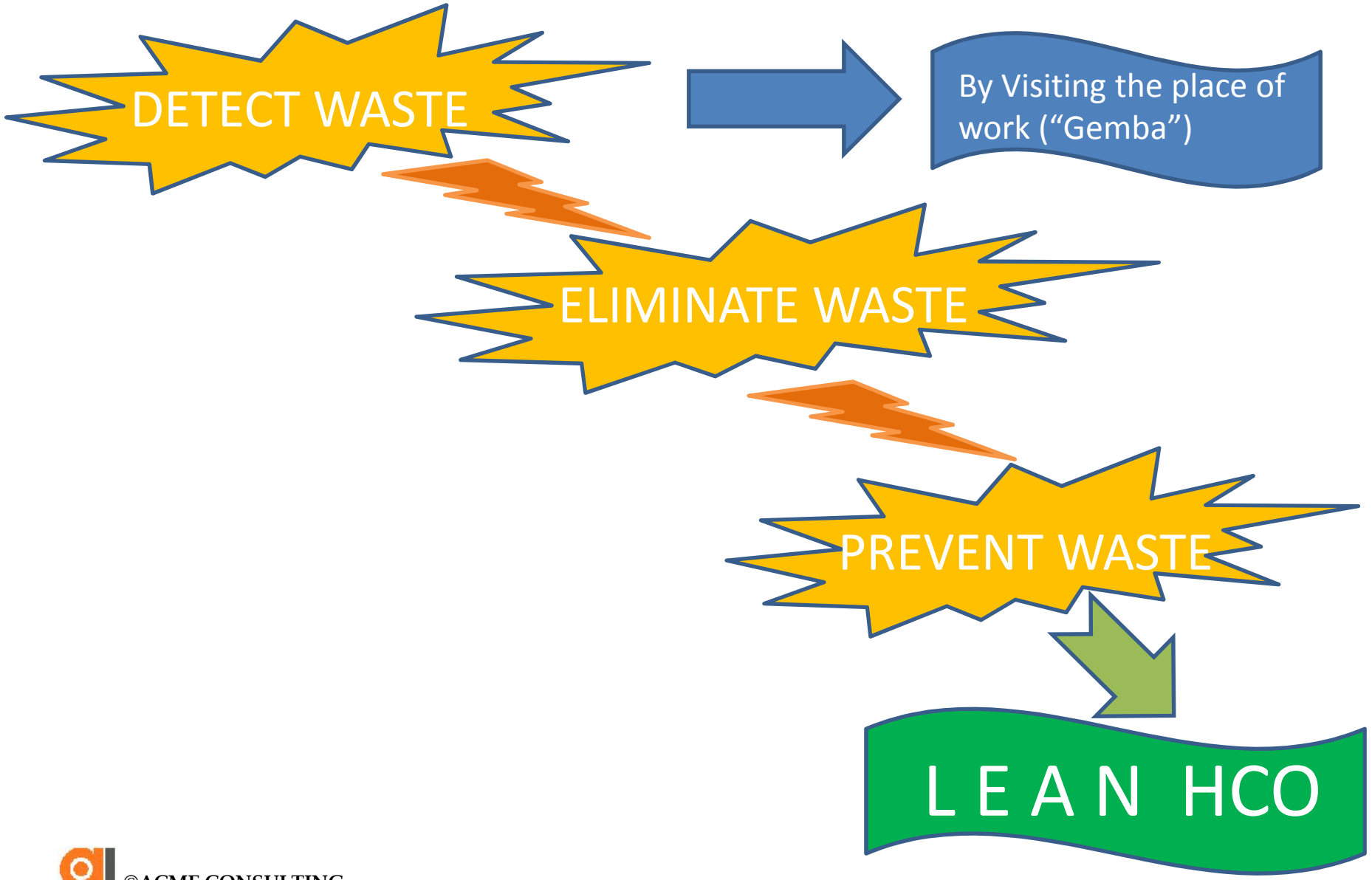
LEAN APPROACH



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LEAN HEALTHCARE PRINCIPLES

LEAN……

A New way of thinking

To create the Lean HCO, change the way of thinking of people within the HCO

To ensure Lean service provisioning

To ensure Quick patient flow

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LEAN…..THE TOYOTA WAY

James P. Womac & Daniel T. Jones defined Five Principles that defined Lean Environment

1. SPECIFY "VALUE" FROM CUSTOMER PERSPECTIVE
2. IDENTIFY "VALUE STREAM" FOR EACH TYPE OF SERVICE
3. MAKE THE "VALUE FLOW " WITHOUT INTERRUPTIONS FROM BEGINNING TO END
4. LET THE CUSTOMER PULL VALUE FROM THE PROCESS
5. PURSUE PERFECTION – CONTINUAL IMPROVEMENT

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STEPS FOR LEAN HCO…..1.

1. SPECIFY "VALUE" FROM PATIENT PERSPECTIVE

PERCEIVED VALUE BY PATIENT:

- Quick Service – No waiting
- Reliable Service – Correct diagnosis, correct treatment
- Low Cost
- Pleasant experience (Environment) – Courtesy, Care, Concern

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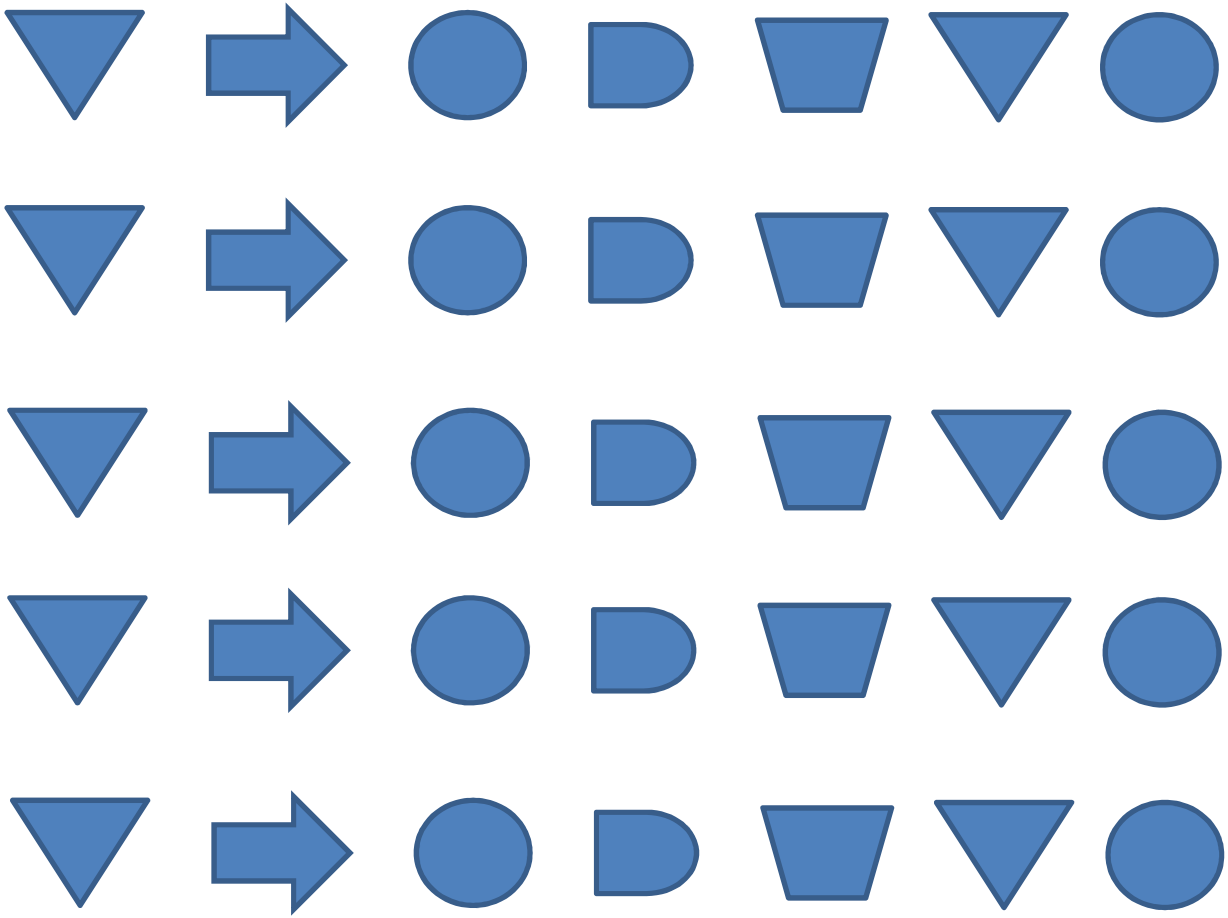
STEPS FOR LEAN HCO…..2.

2. IDENTIFY "VALUE STREAM" FOR EACH TYPE OF SERVICE

TYPES OF SERVICES

1. OPD Service
2. IPD Service
3. Surgical Service
4. Maternity care Service
5. Pediatric Service



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TYPICAL VALUE STREAM FOR HCO…..3.

Patient Pathway/ Value Stream	*Possible Starting Points*	*Possible Ending Points*
Emergency department	Phone call made for ambulance	ED discharge
	Arrival at door	Start of cath lab procedure
		Moved into room
		Discharge from inpatient care
Outpatient surgery	Arrival at door	Start of procedure
	First call for scheduling procedure	Start of postanesthesia care unit (PACU)
	First referral from general practitioner	Discharge
Outpatient cancer treatment	Arrival at door	Start of treatment
		Discharge
Scheduled inpatient surgery	Arrival at door	Start of procedure
	First call for scheduling procedure	Start of PACU
	First referral from general practitioner	Movement into room
		Discharge
Patient discharge process	MD writing discharge order	Patient ready to leave
		Patient physically out door
		Room physically ready for next patient
Radiology	Order for procedure	Start of procedure
	Arrival at outpatient center	End of procedure
	Start of procedure	Report verified

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STEPS FOR LEAN HCO…..4…Contd…(Example)

Product/Value Stream	*Possible Starting Points*	*Possible Ending Points*
Laboratory testing	MD giving stat order	Arrival at laboratory
	Collection of specimen	Start of testing
	Arrival at laboratory	Release of test result
Pharmacy medications	Signal for replenishment is given	Medication sent to unit
	Order written by MD	Medication delivered to unit for storage
		Medication administered to patient
Pathology	First call to schedule biopsy procedure	Specimen delivered to histology
	Specimen taken from patient	Slide delivered to pathologist for reading
		Pathologist report sent to physician
Information systems call center support	Initial problem call to IS	Resolution of IS issue

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ILLUSTRATION OF FLOW IN LABORATORY..

Flow of a tube of Blood from sample collection to report

- Phlebotomist drawing blood sample from patient
- Wait for an hour till a batch of 10 samples is accumulated
- Put the specimen in an automated test instrument
- The technician reads a slide for the cell count and records in register
- Wait for preparing report
- Verify the information from the system

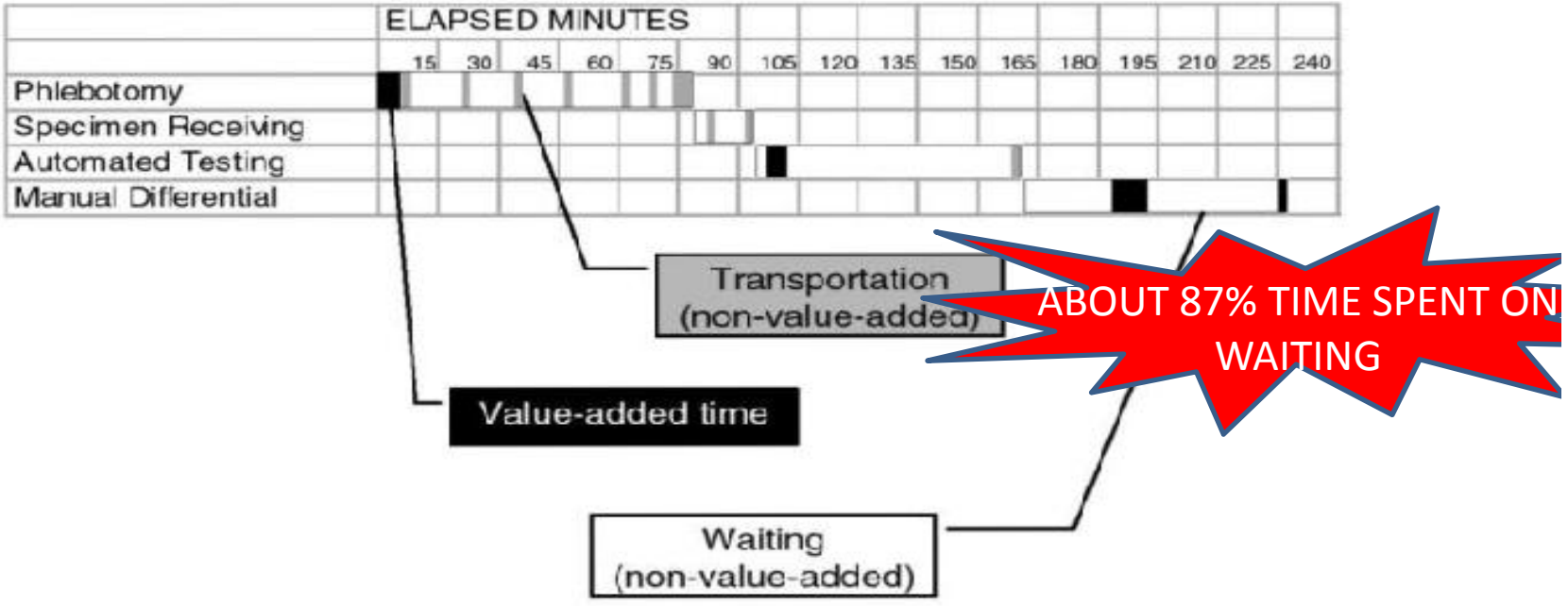
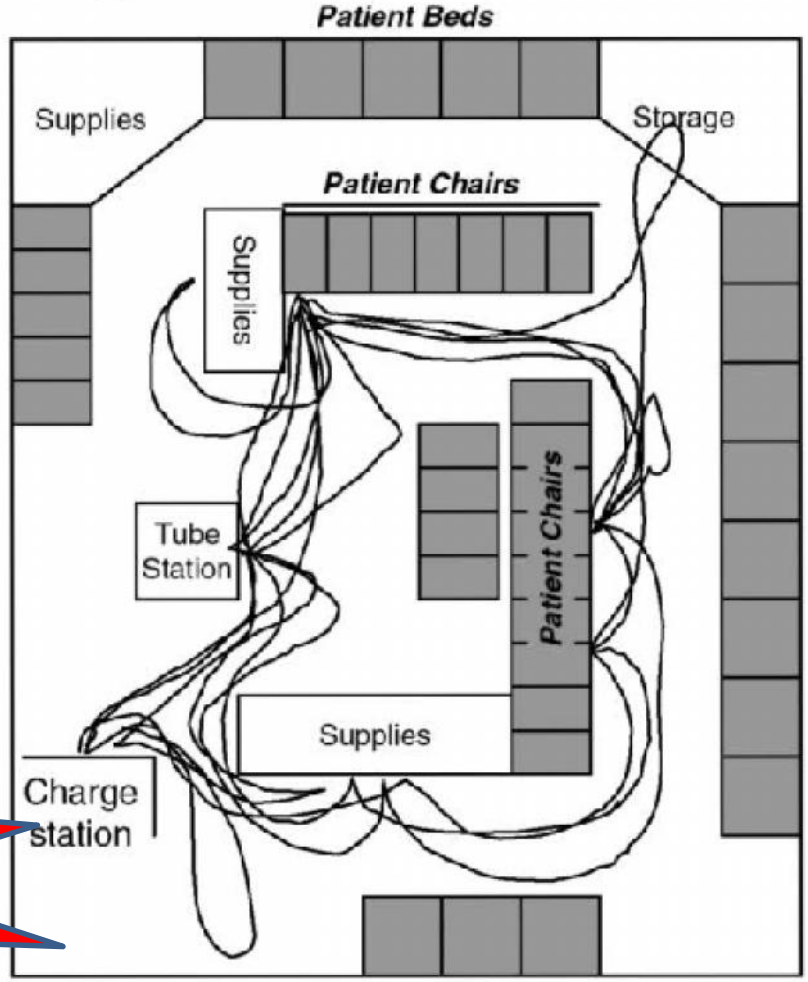


ILLUSTRATION OF WALK BY NURSING..

Nursing – Chemotherapy area

- Taking patients to their chair or bed and prepping them for treatment
- Getting medications and starting injections and drips
- Responding to patient requests for pain, comfort, or other needs
- Answering questions about the treatment and process for patients and their families
- Stopping the treatment and preparing the patient to go home

Walking pattern of one nurse in a chemotherapy center.



- 1825 ft. walked in 50 Mins.
- 32% of Nurse's time spent on walking
- Only 30% of the time spent on VA

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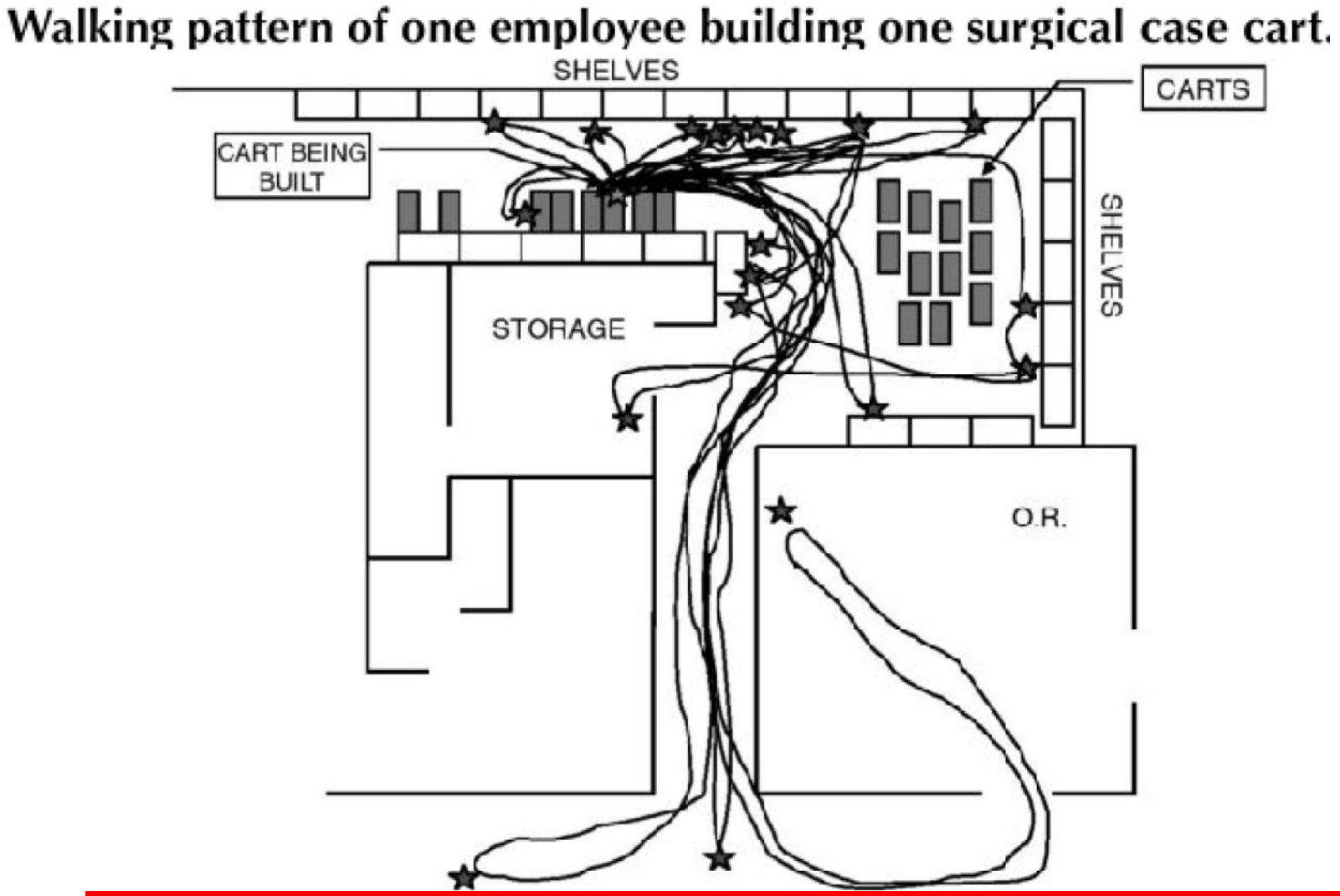
ILLUSTRATION OF WALK IN BUILDING OT CASE CART..



A technician and nurse walking more than 1000 ft. to build a crash cart resulting in contributing 44% of technician's time and 36% of nurse's time

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Adapted from "Lean Hospitals" by Mark Graben

STEPS FOR LEAN HCO…..3.

3. MAKE THE "VALUE FLOW " WITHOUT INTERRUPTIONS FROM BEGINNING TO END

- Use Lean Tools to eliminate "waste" and facilitate Flow without interruptions

- Value Stream Mapping
- Kaizen
- 7 QC Tools
- JIT & KANBAN
- SMED
- Standardization
- Cellular Concept
- 5 S Technique
- TPM

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STEPS FOR LEAN HCO…..4…Contd…

4. LET THE PATIENT PULL VALUE FROM THE PROCESS

- After removal of "waste", only value added activities remain
- The patient pays only for the value of service provided
- The patient flow between the processes is improved
- The patient gets faster services
- This results in increased number of patients getting the services in a given time
- Benefits the HCO as well

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STEPS FOR LEAN HCO…..5…Contd…

5. PURSUE PERFECTION – CONTINUAL IMPROVEMENT

- Continue identifying the "waste" and improving up on the processes
- Improve the processes for further reduction in the process time
- The patient gets improved services faster
- This sets in an improvement trend across the HCO
- Newer value added services could be introduced by the HCO for the benefit of the Patient

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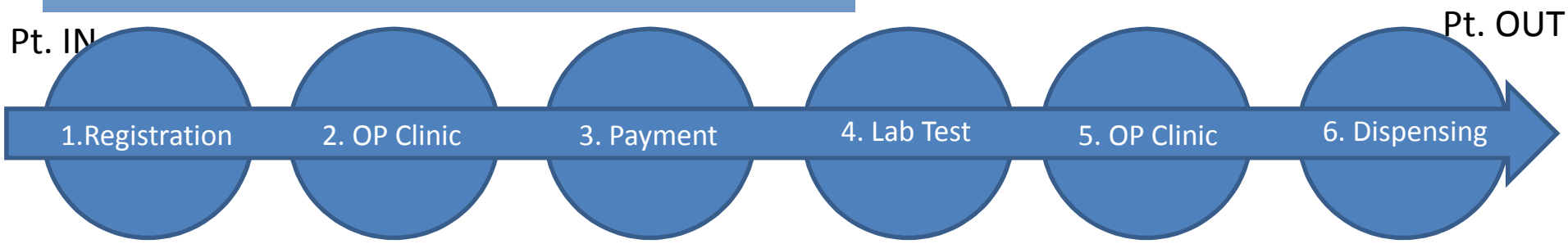
VALUE STREAM MAPPING

VSM of– current state



- Value Stream Mapping consists of drawing the process flow as it is happening at present.
- May consist of both Value Added & Non-Value Added activities
- The Value stream mapping is for an entire Product / Service group right from the initial input to the final output (outcome) of the group of processes leading to the customer
- In case of a Health Care Organization (HCO), any of the end-to-end process of a patient service can be mapped for Value Stream like:
  - ❑ OPD Services
  - ❑ Emergency Services
  - ❑ IPD Services
  - ❑ Maternity Services
  - ❑ Surgical Services – Each category of Surgical service

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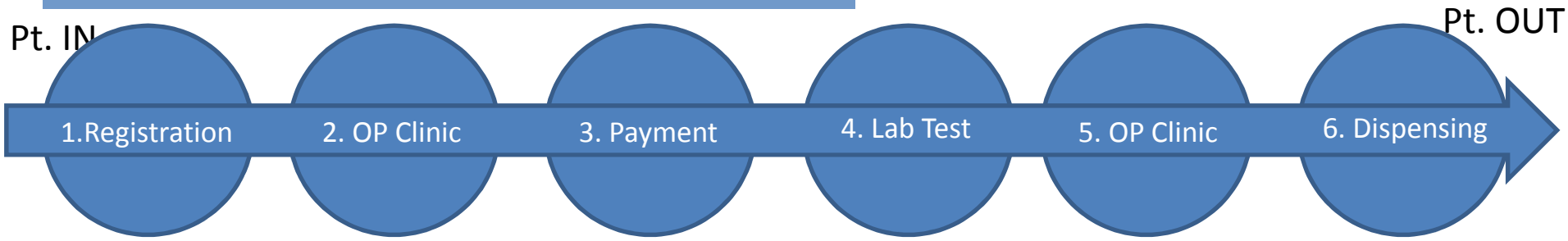
VALUE STREAM MAPPING – CURRENT STATE

VSM of OPD process – current state



1.Registration	2. OP Clinic	3. Payment	4. Lab Test	5. OP Clinic	6. Dispensing
Prep: 10 min. Operation: 2 Min. Waiting: 20 Min. Movement: 0 ft. Walk time: 0 Min. Uptime: 360 Min. No. of pts. 200	Prep: 0 min. Operation: 4 Min. Waiting: 25 Min. Movement: 30ft. Walk time: 2 Min. Uptime: 360 Min. No. of pts. 200	Prep: 5 min. Operation: 2 Min. Waiting: 2 Min. Movement: 30ft. Walk time: 2Min. Uptime: 360 Min. No. of pts. 20	Prep: 5 min. Operation: 5 Min. Waiting: 80 Min. Movement: 60ft. Walk time: 4 Min. Uptime: 360 Min. No. of pts. 20	Prep: 0 min. Operation: 2 Min. Waiting: 20 Min. Movement: 30ft. Walk time: 2 Min. Uptime: 360 Min. No. of pts. 20	Prep: 0 min. Operation: 2 Min. Waiting: 28 Min. Movement: 30ft. Walk time: 2 Min. Uptime: 360 Min. No. of pts. 200
20+2	2+25+4	2+2+2	4+20+5+60	2+20+2	2+26+2+2
D+O S = 10	T+D+O	T+D+O S = 5	T+ D +O+D S = 5	T+ D +O	T+D+M+O

D: Delay / Waiting;
T: Transport / Walk;
O: Operation;
M: Motion
S: set-up

Through-put Time with Lab: 204 Min.

Through-put Time without Lab: 85 Min.

Ideal Through-put Time: 8 Min.

Ideal Through-put Time with Lab: 17 Min.+ Test time

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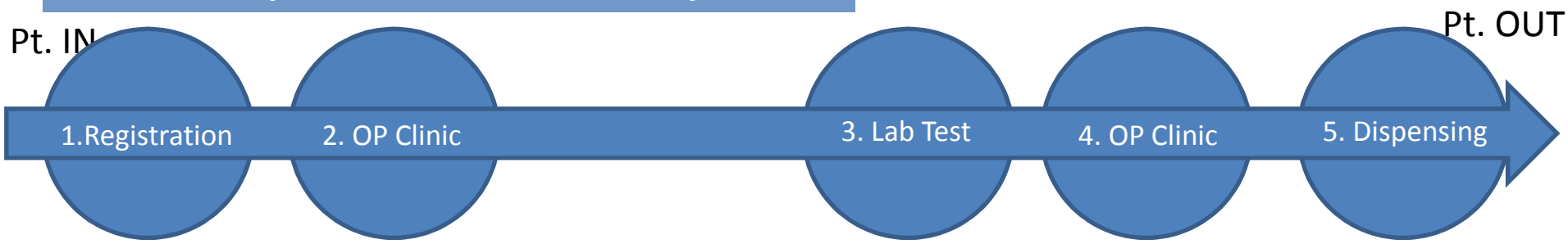
VALUE STREAM MAPPING – CREATE FUTURE STATE MAP

VSM of OPD process – Future state Map



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2	4		2+5+20	2	2
O	O		O1+O2+O3	O	O
S = 10		S = 5	S = 5		

D: Delay / Waiting;
T: Transport / Walk;
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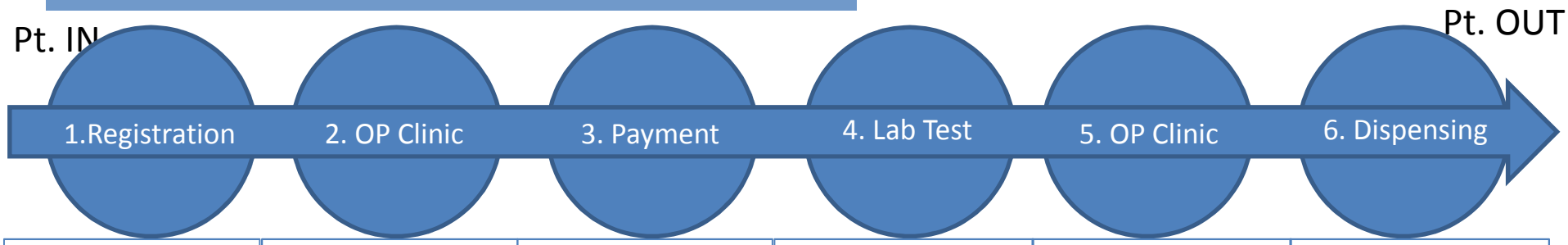
VALUE STREAM MAPPING – ANALYZE CURRENT STATE

VSM of OPD process – Analysis of Current state



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1. SW On Computer 2. Enter Pt. Name, Age, Address, Nature of ailment 3. Give print of OP slip 4. Tear off and handover	1. Receive OP slip 2. Enter Pt. Name, Nature of ailment 3. Check patient vitals –Pulse, BP, Wt., 4. Record details in Pt. Register 5. Prescribe lab test if necessary 6. Prescribe medicine				

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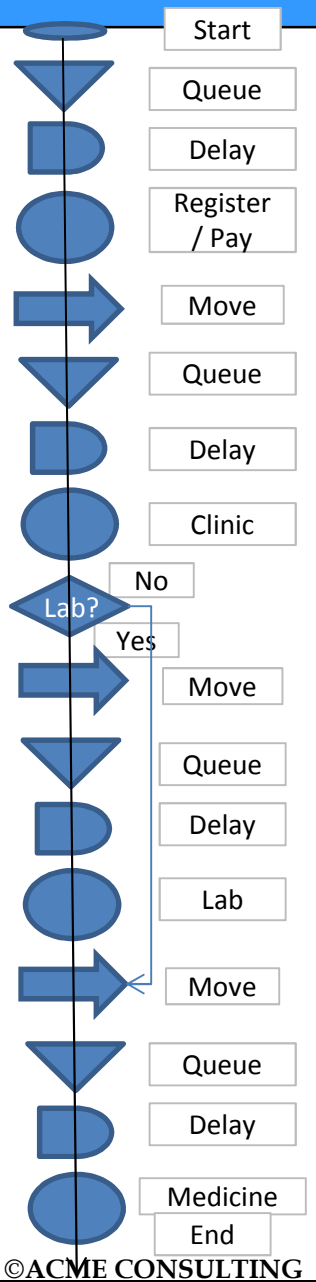
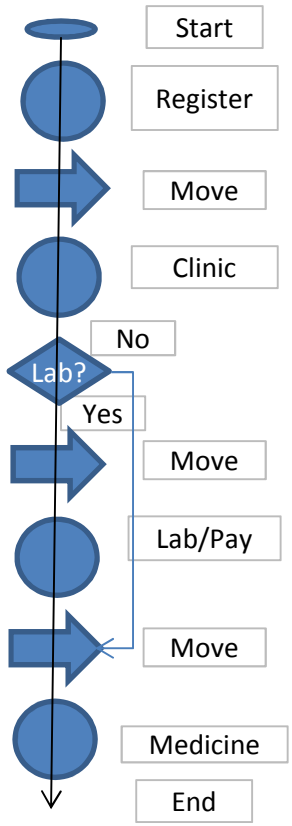
Current state	Measurement of Current state	Analysis	Improved state
	Measurement of processes in current state	Determination of activities that do not add value	Reduction of activities that do not add value. <u>Improved Flow:</u>
	No. of processes: Cycle time of process:	Transport: 6 Delays: 7 Decision: 2 Check: 10 Documentation: 7 Motion: 1	
	Total No. of activities: 42 Core activities: 9 Non-value added activities: 33	Muda and activities that do not add value constitute 79% of all the process activities	

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VALUE STREAM IMPROVEMENT PLAN..

- Based on the Future State Mapping of the processes and the Analysis of the deficiency of the current state, an Improvement Plan is to be prepared

- While preparing the improvement plan, ensure suitable time-lines are identified for completion of the improvement

- Identify the persons responsible for creating the improvement at each of the process areas leading to improved customer delivery of the services

- Use of appropriate Lean Tools also needs to be identified for effecting the improvements

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VALUE STREAM IMPROVEMENT PLAN

		Yearly Value Stream Plan (Months)											
S. N.	Value stream Objective	Goal	1	2	3	4	5	6	7	8	9	10	11	12
1.	Reduce delays / waiting	1. Registration area from 20 Min. to 5 Min.												
2.	Reduce Transport / Movement	1.Combine operation- collection of payment for test at Lab itself 2.Relocate lab near to clinic and dispensary												
3.	Reduce documentation	1. Have a system of patient identification at Registration with networked computers at each of the patient care areas												

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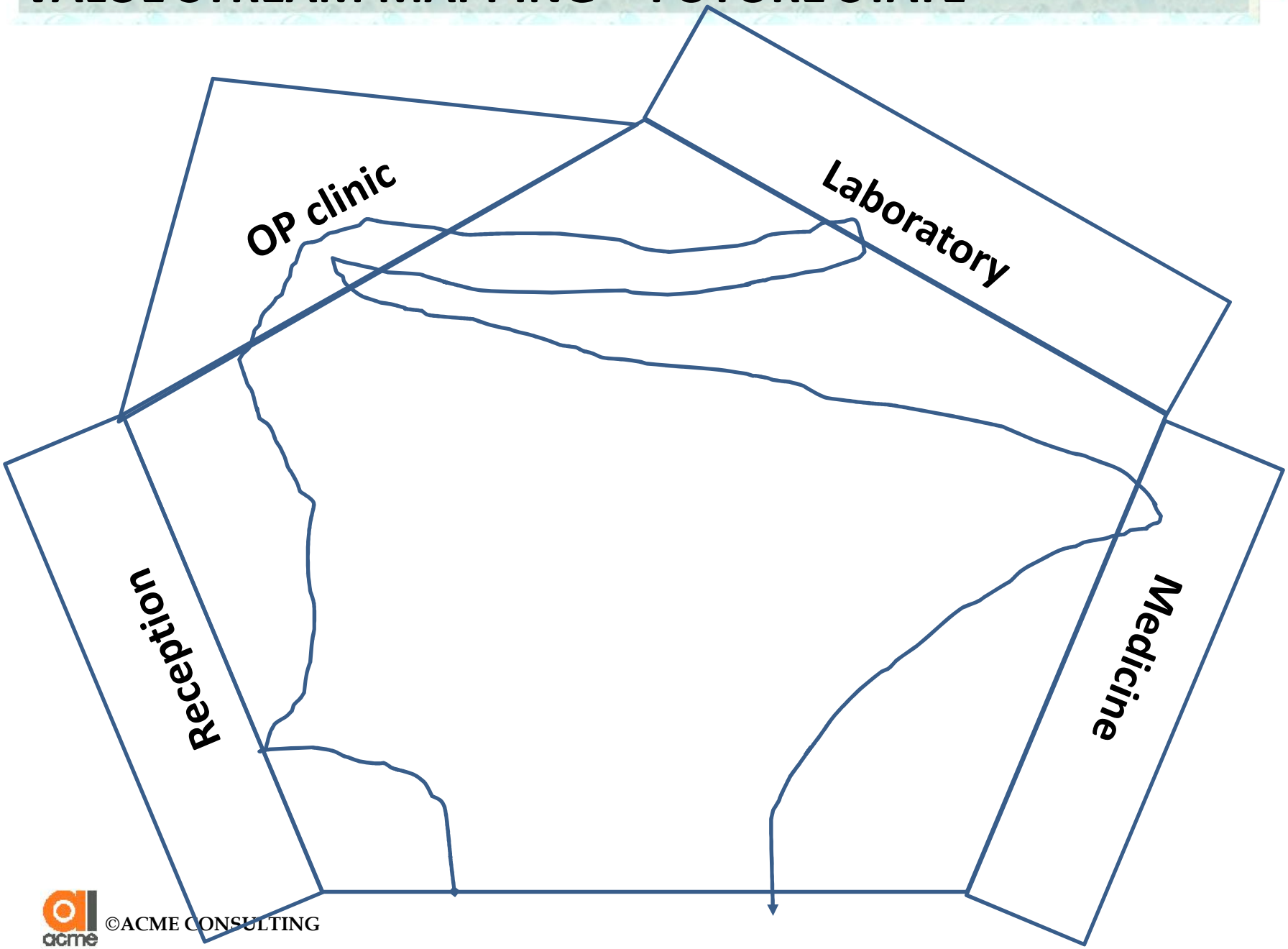
VALUE STREAM MAPPING – FUTURE STATE



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THE LEAN TOOLS

LEAN TOOLS FOR HCO

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IMPROVEMENTS THROUGH KAIZEN

- WHAT IS KAIZEN?

- KAI = CHANGE
- ZEN = GOOD (FOR THE BETTER)

- KAIZEN = CHANGE FOR THE BETTER = CONTINUAL IMPROVEMENT

- KAIZEN = Problem Solving Technique

- Problem Solving Technique:
  - Understand the problem, which is the cause of shortfall between target (desired state) and the current state
  - Act on the causes to eliminate them
  - A problem is to be considered as an opportunity for improvement

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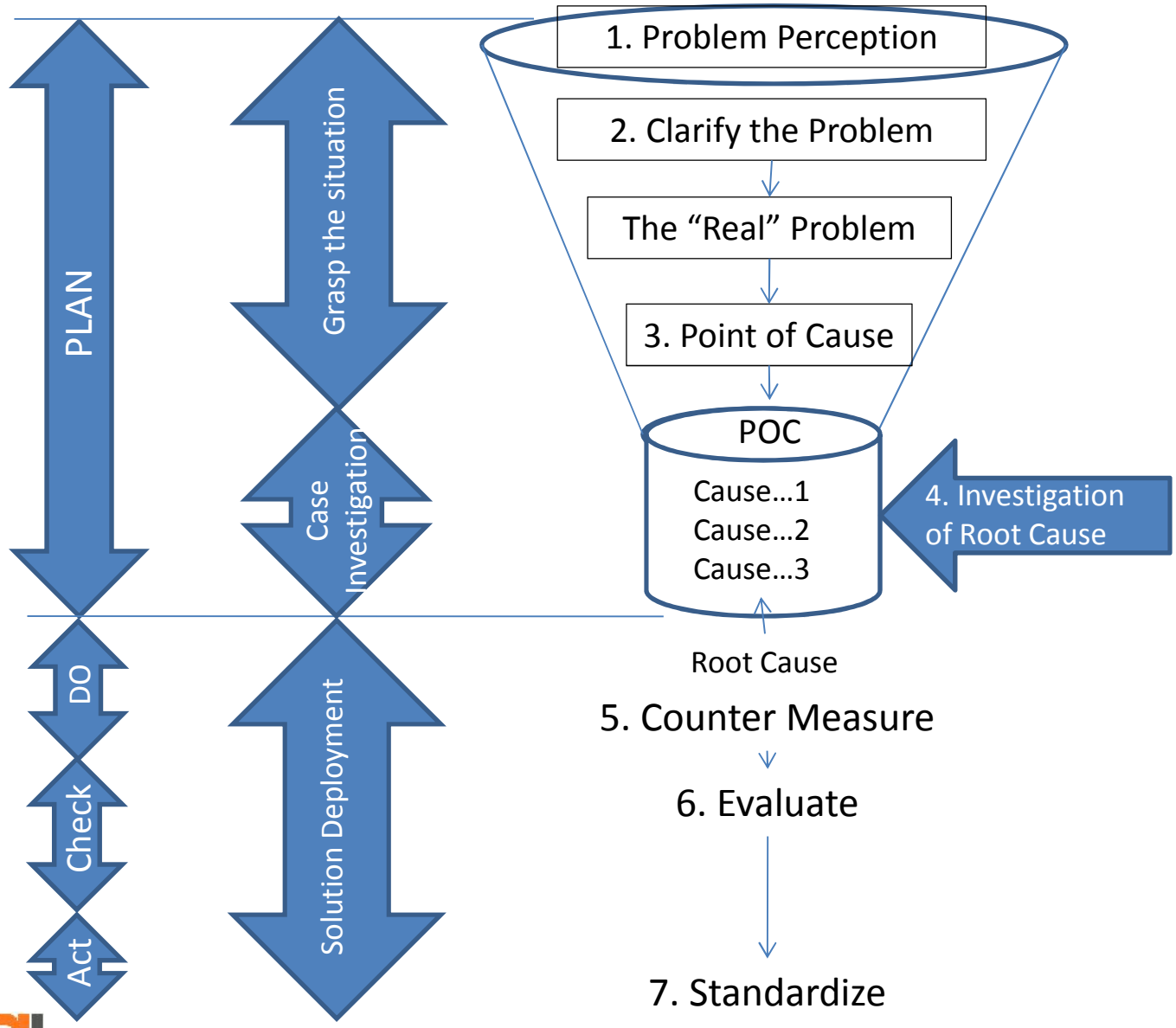
KAIZEN: PRACTICAL PROBLEM SOLVING-TOYOTA WAY



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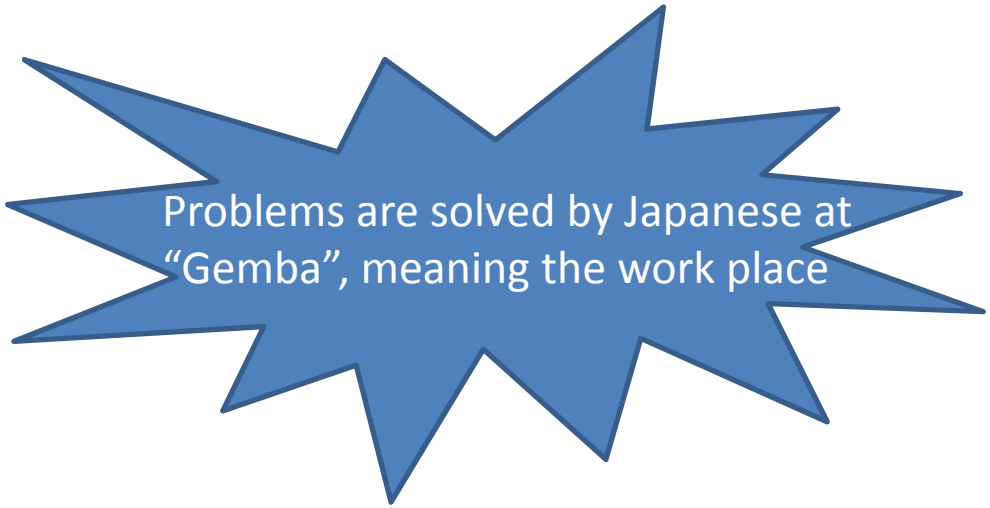
KAIZEN: PROJECT TEAM

- Form a cross functional Project team
- Impart Training to the team members on Problem solving techniques
- Develop capability on the use of Problem solving techniques
- Take one problem at a time and analyze
- Develop solutions using effective problem solving techniques
- Implement solutions



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KAIZEN PROJECT SUMMARY

Process Area		Team Leader		Date	
Location		Team Members		Takt Time	

Performance Measure	Before	Goal - % Improvement	Actual Results	% Improvement
Crew Size				
Cycle Time				
WIP				
Inventory				
Space used				
Productivity (Output / person/time)				
5S Rating				
No. of errors				
Set Up Time (Min.)				

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LEAN BENEFITS

- **The customer /patient gets the benefit of faster quality services**
- **Increased throughput – in terms of increased patients being serviced**
- **Frees up the locked capacity by removing the constraints**
- **Facilitates avoiding / delaying capital expansion / construction**
- **Reduced inventory in Pharmacy stores thereby resulting in reduction in inventory costs**
- Labour cost savings
- Adds to the bottom line of the Hospital
- **Better co-ordination between the various internal departments**
- Even distribution of work due to standardisation
- Minimises the unnecessary long-walks of staff and repeat activities
- **Revenue growth opportunities get explored as resources are made available**
- Improved work culture
- Increases the overall satisfaction of the patients and the employees
- **Improves the morale of the hospital employees-staff, doctors, nurses and administrators**

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7 QC TOOLS

1. Cause & Effect Diagram
2. Pareto Chart
3. Histogram
4. Check Sheet
5. Control Chart
6. Bar Graph
7. Scatter Diagram

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SMED

PRINCIPLES OF SMED

- Dr. Shigeo Shingo developed the concept of "**Single Minute Exchange of Dies**" in 1950 while working with Toyota Motors

SMED Principle consists of 4 steps:

- Preparation, after process adjustments, checking materials & tools
- Mounting of tools / accessories
- Measurements, setting, calibration
- Trials – actual performance of the core process

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SMED

3 STAGE PROCESS OF SMED

- Identifying Internal & External set-up
- Converting Internal set-up to External set-up
- Streamlining all aspects of set-up

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SMED – ILLUSTRATED-1

Operation Theatre set-up:

S.N.	Set-up activities	Internal / External
	Surgeon gives written pre operative instructions to ward nurse (e.g) Nil orally, enema etc.	E
	Physical Preparations (Shaving of site, enema, bath, dress, valuables / jewellery) is done	E
	Staff nurses receive the patient sent from the ward and transfers him / her to the pre-operative area with the assistance of the attendee.	I
	Written **Consent for Surgery is obtained from the** patients / patient's relatives.	I / E
	Theatre preparation – Theatre sterilization	E
	- Medicine trays, Instruments, Operating table, sheets,	E
	- Anesthesia equipment, Lighting, Gases, AC, Running water in taps	E
	- PPEs	E

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SMED – ILLUSTRATED-2

I - Internal **E - External** **R – Reduction scope**

SN	Activities in Diagnostic X-Ray	I / E
	Pt. enters with test prescription	I
	Technician locates the register	R
	Pt. details entered in register	I
	Asks Pt. to remove any metallic objects	I
	Makes Pt. stand in front of the machine	I
	Technician moves to cabinet	I
	Lifts cassette containing film and moves to register location	E
	Takes a sticker & notes down the Pt. No.	I
	Affixes the sticker to the cassette	E
	Moves to machine and loads the cassette	E
	Moves to Pt. and adjusts position of Pt.	I
	Moves to M/c and adjusts horizontal & vertical position of cassette	E

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SMED – ILLUSTRATED-2…..

S N	Activities in Diagnostic X-Ray	I / E
	Moves to switch area & switches off main light	R
	Moves to M/c console and operate M/c	I
	Asks Pt. to wait and moves to cassette	I
	Removes the cassette	I
	Moves to dark room – 6 ft.	I
	Checks the cassette for right exposure	I
	Comes back and asks Pt. to go	I
	Moves to switch board and switches on the lights	R

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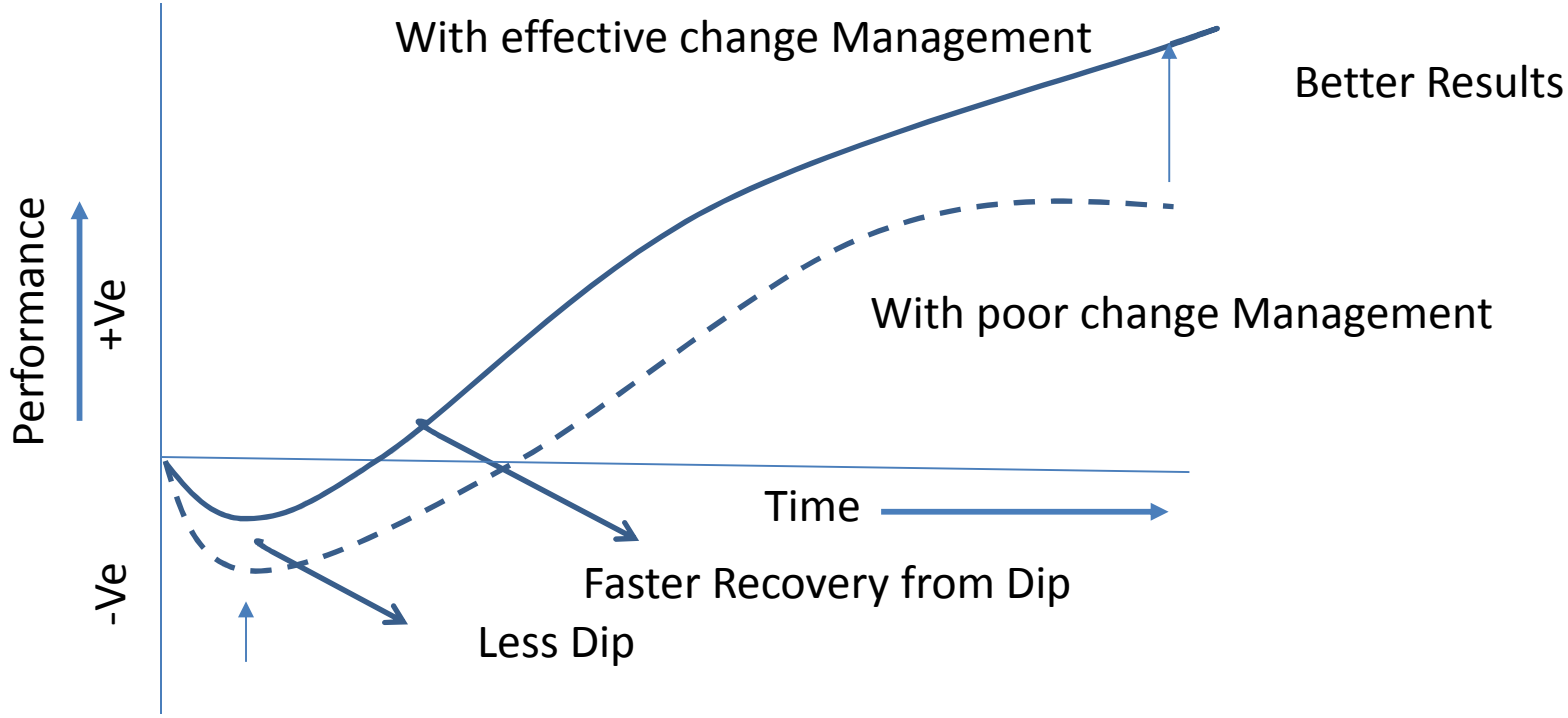
LEAN CHALLENGE..



- 80 – 90 % of Lean implementation challenge is related to people & acceptance of change
- 10 – 20 % of challenge is related to implementation of technical tools & methods
- Requires regular training on new processes or communication

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SUCCESS SNAPSHOTS OF LEAN

Between 2004 and 2011 – for a typical 500 beds Hospital:

Laboratory: By the end of 1st Year:

- Testing turnaround times reduced by 46%
- 1000 sq.ft. space freed
- Productivity improved by 10%

Laboratory: By the end of Year 2011:

- Collection time to result provisioning time : 34 Mins. For Bio-chemistry
- 17 Mins. For CBCs (Coagulate Blood Count)
- Variation reduced as 98% of CBC results are achieved within 20 Mins.

By the end of Year 2011:

- Quality measured at a rate of 59 defects per million opportunities (5.4 Sigma)
- Employee satisfaction highest in the last 6 years

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LEAN - SUMMARY

- Know your Patients and their Needs / Expectations
- Select Value Stream - a Specific Service for Lean Initiative
- Map the Current status of the Identified Value Stream
- Map the Future State of the Identified Value Stream
- Identify & Analyse the "Wastes" in the Current Value Stream
- Remember QSEC and V/C/A/A/F of Perfect Process
- Eliminate the "Wastes" in the Current Value Stream & Reorganize the Value Stream
- Improve the Value Stream through Lean Tools to achieve Perfect Processes

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THANK YOU

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