# Introduction to Lean Management

Center for
Lean Excellence

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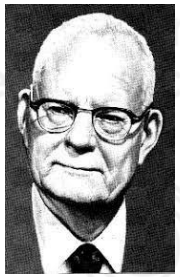
# Evolution of Lean Management

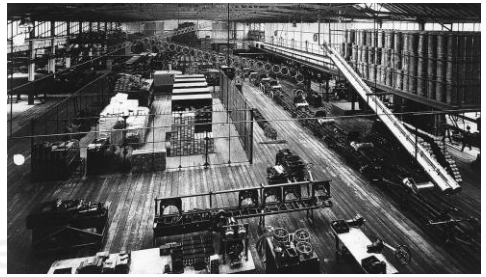
# Evolution of Lean Management

1945
World War 2

1948
Taichi Ohno
Toyota



Knowledge
From USA



- Factory visits to USA
- 9x productivity difference
- Toyota didn't have resources

New Realization at Super markets
Just In Time Thinking

Scientific
Thinking Vs
Kaizen Thinking

# Evolution of Lean Management

1945
World War 2

1948
Taichi Ohno


1973
Oil Crisis


1983
Toyota's JV with GM


1990
Word "Lean"

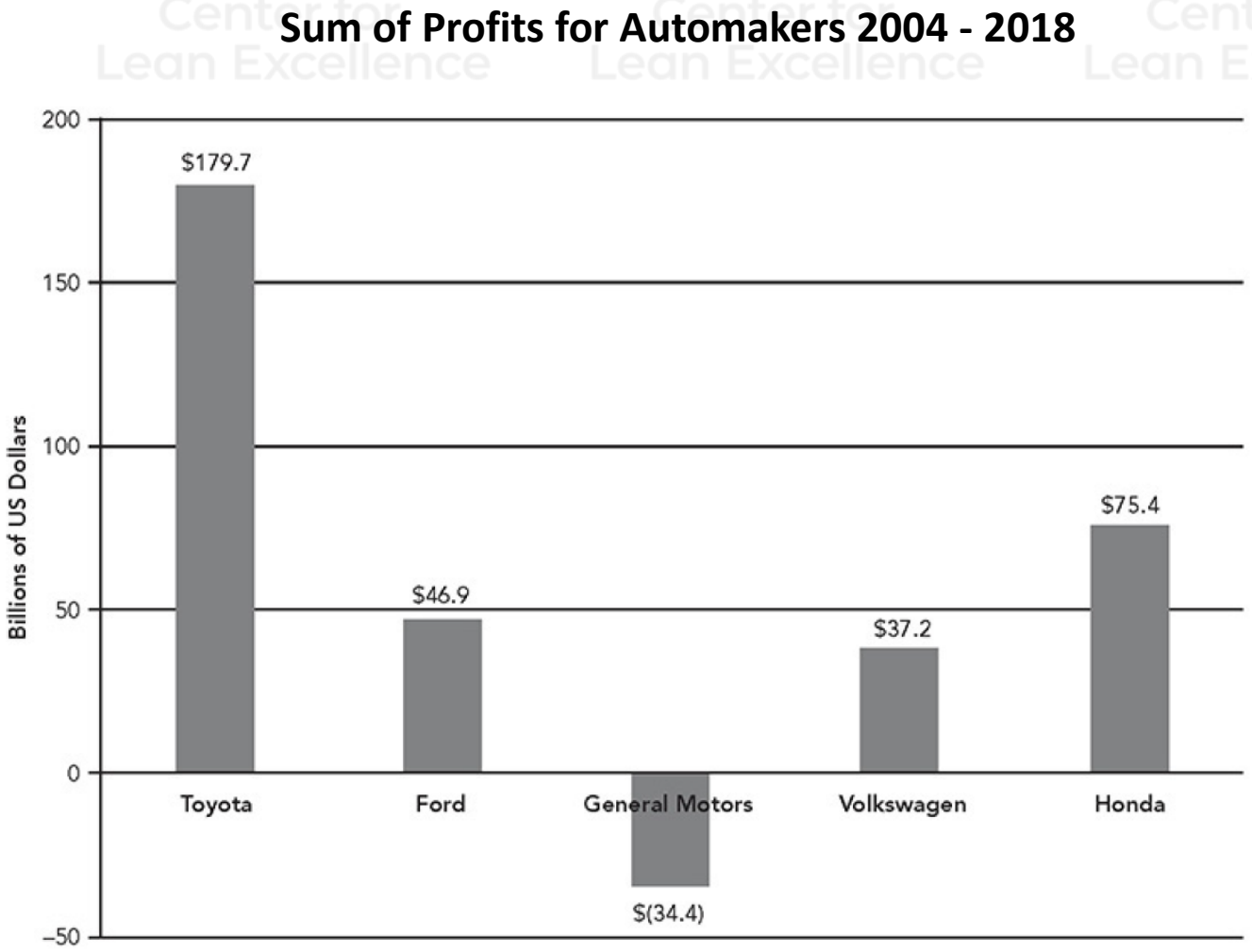
# The NUMMI Story


**Worst Plant**

**Win Win Situation**

**Became The Best**

# Toyota Since Then..



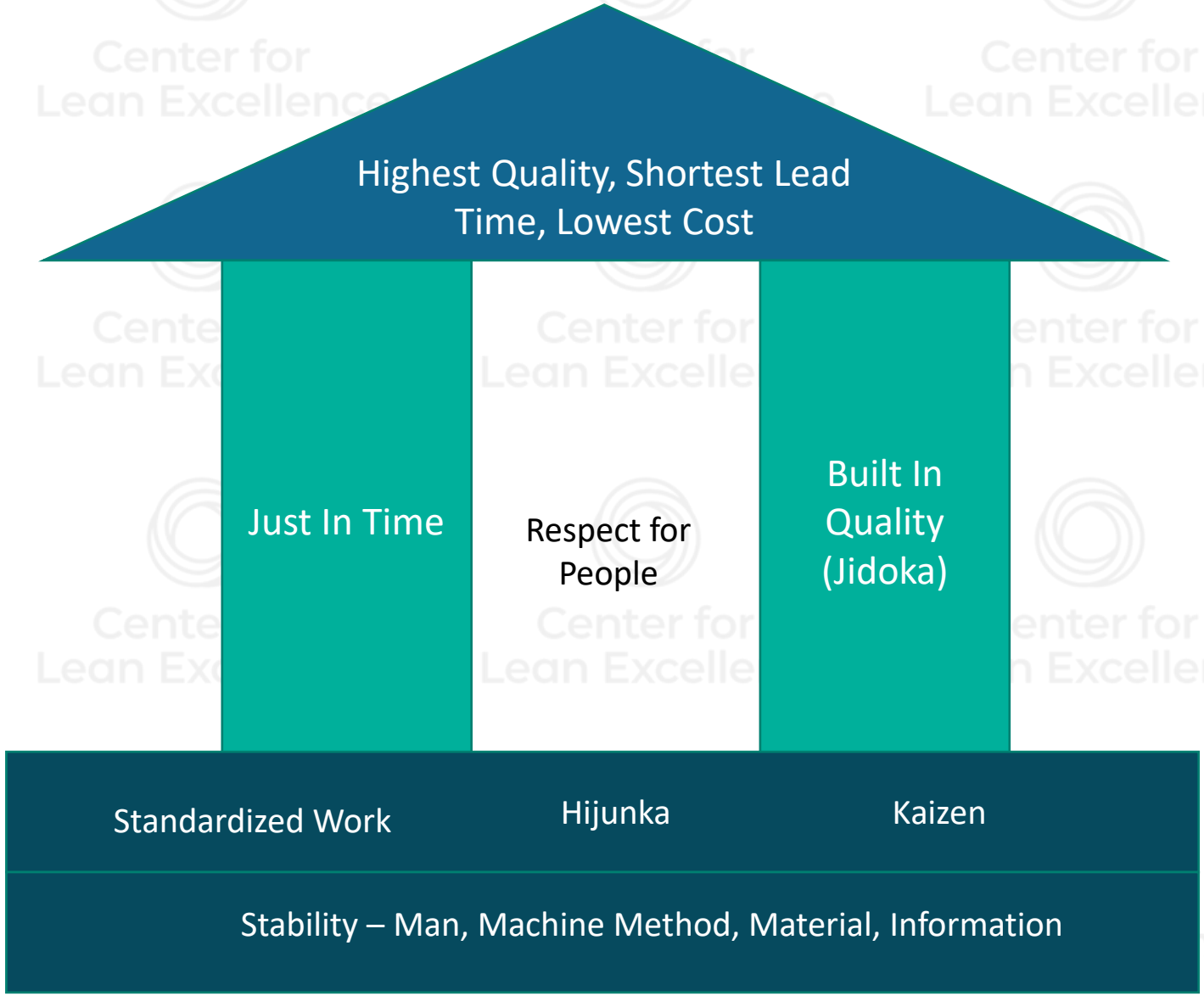

Source: Toyota Way, Jeffry Liker

# Lean Beyond Toyota

Lean Methodologies are successfully implemented in Manufacturing are providing the same benefits in Healthcare, Aerospace, Banking, BPO, Hospitality & Logistics etc.



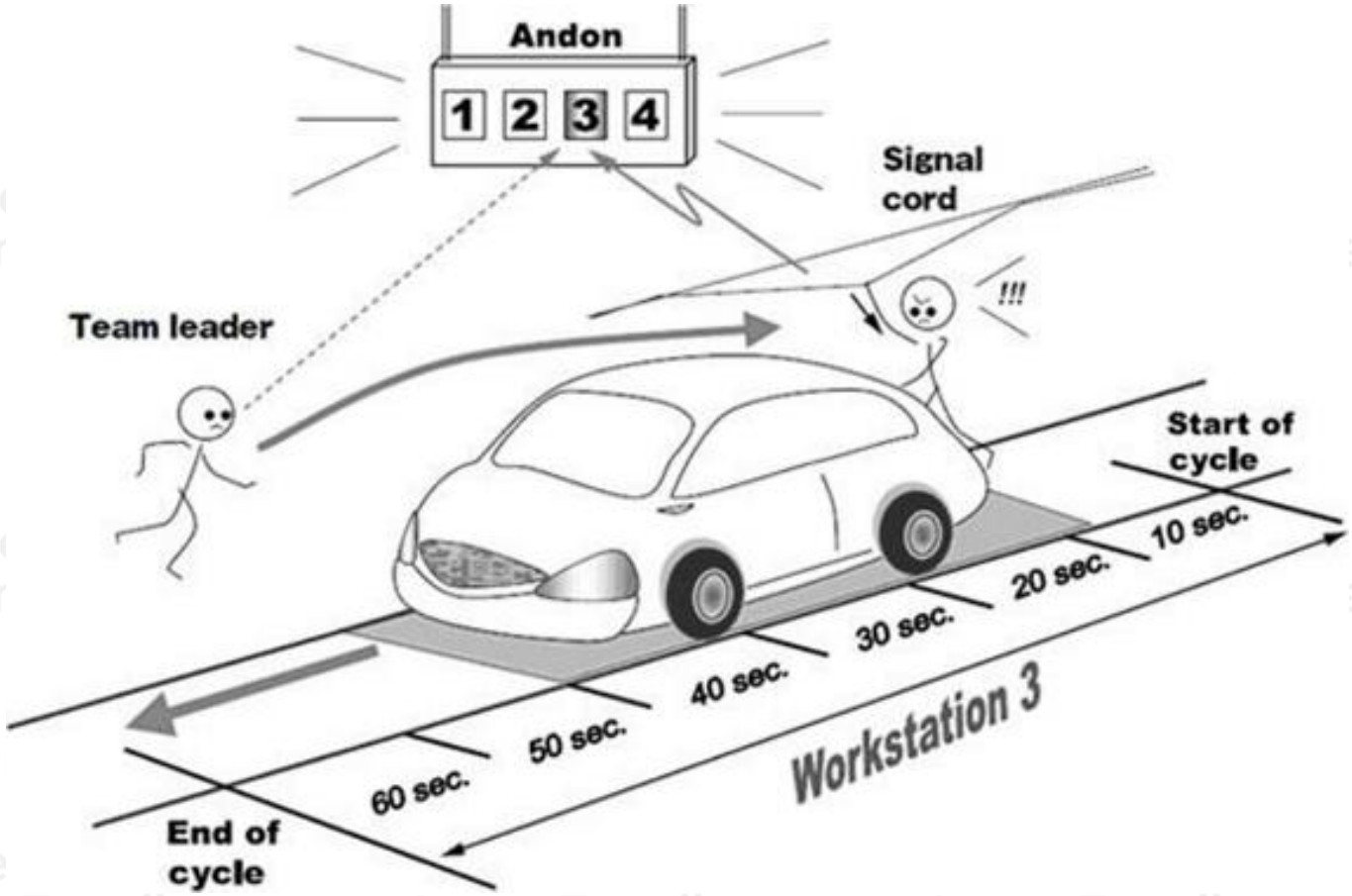

# Lean House



# Andon & Jidoka

Andon – Abnormality light, lantern
Jidoka – Built In Quality

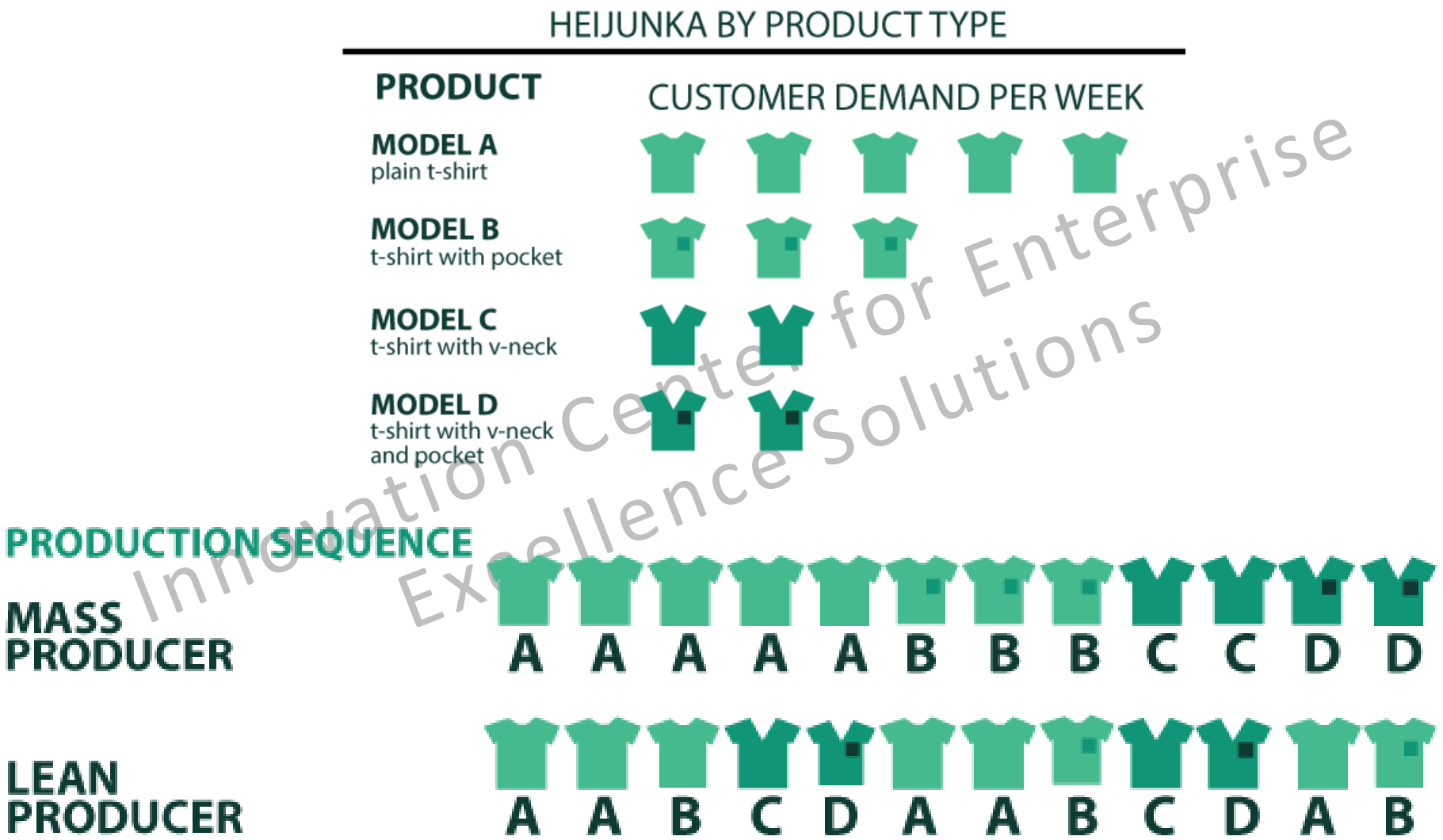
# How Toyota Uses Visual Management in Real Time





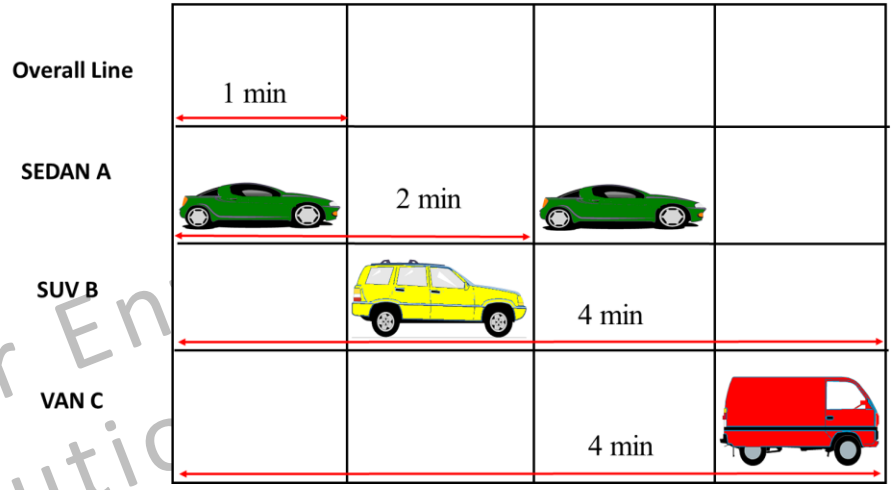
# Mixed Production Heijunka

# Mixed Production – Heijunka Example



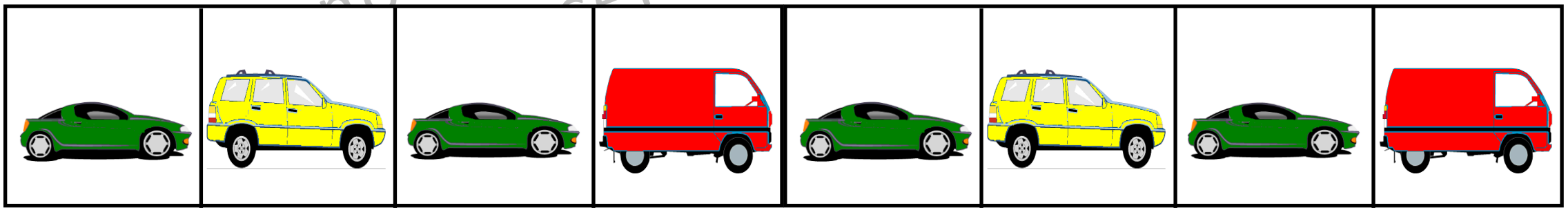
## Example

| Product | Monthly Requirement | Daily Requirement | Takt Time |
|---|---|---|---|
| SEDAN | 4600 units | 230 units | 2 min |
| SUV | 2300 units | 115 units | 4 min |
| VAN | 2300 units | 115 units | 4 min |
| Total | 9200 units | 460 units | 1 min |




Working hours per day – 460 mins ~ 8 hours

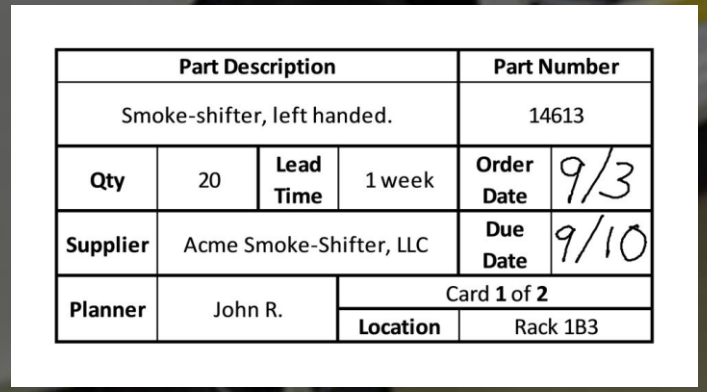
## Production Sequence by Type



No. 1 (A) No. 2 (B) No. 1 (A) No. 3 (C) No. 1 (A) No. 2 (B) No. 1 (A) No. 3 (C)

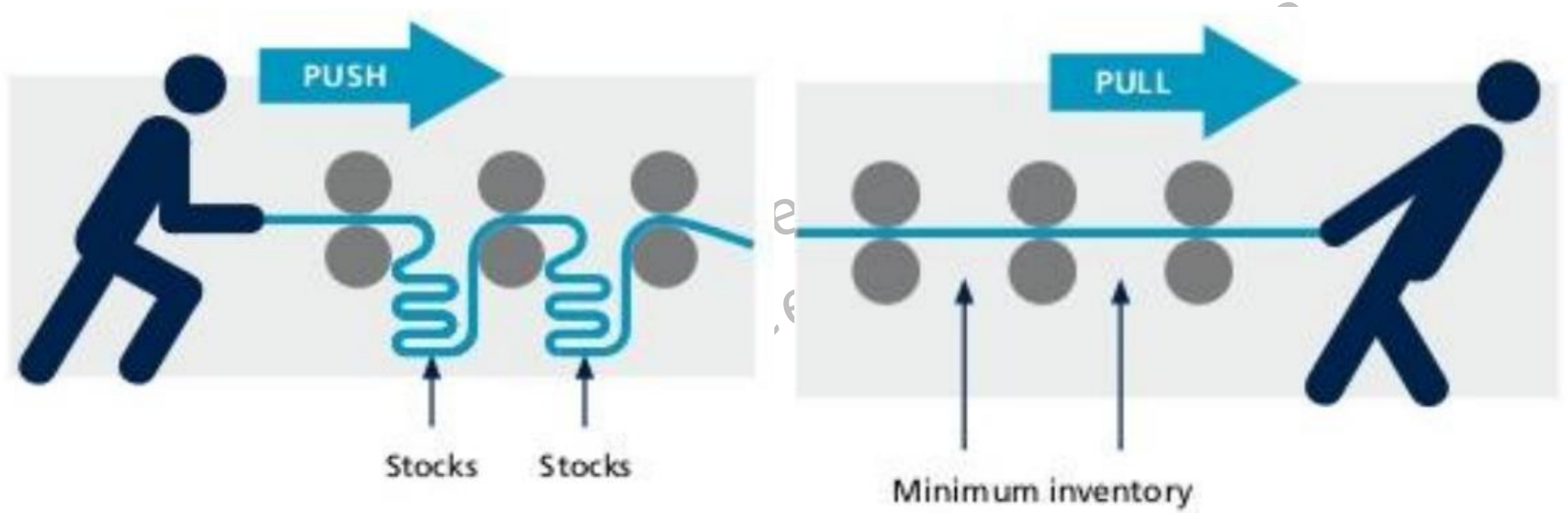
# Kanban & Pull System

Kanban – Signal / Instruction Card



| Part Description | | | | Part Number | |
|---|---|---|---|---|---|
| Smoke-shifter, left handed. | | | | 14613 | |
| Qty | 20 | Lead Time | 1 week | Order Date | 9/3 |
| Supplier | Acme Smoke-Shifter, LLC | | | Due Date | 9/10 |
| Planner | John R. | | Card **1** of **2** | | |
| | | | Location | Rack 1B3 | |

# Push Vs Pull



# What is Lean Management

Session 02

# What is Lean Management ?

## Strategic Level

"It is a strategic approach to provide **optimum value** from the **customer's perspective**, while consuming the **fewest resources** and **utilizing the talents of the people** who do the work"

## Operational Level

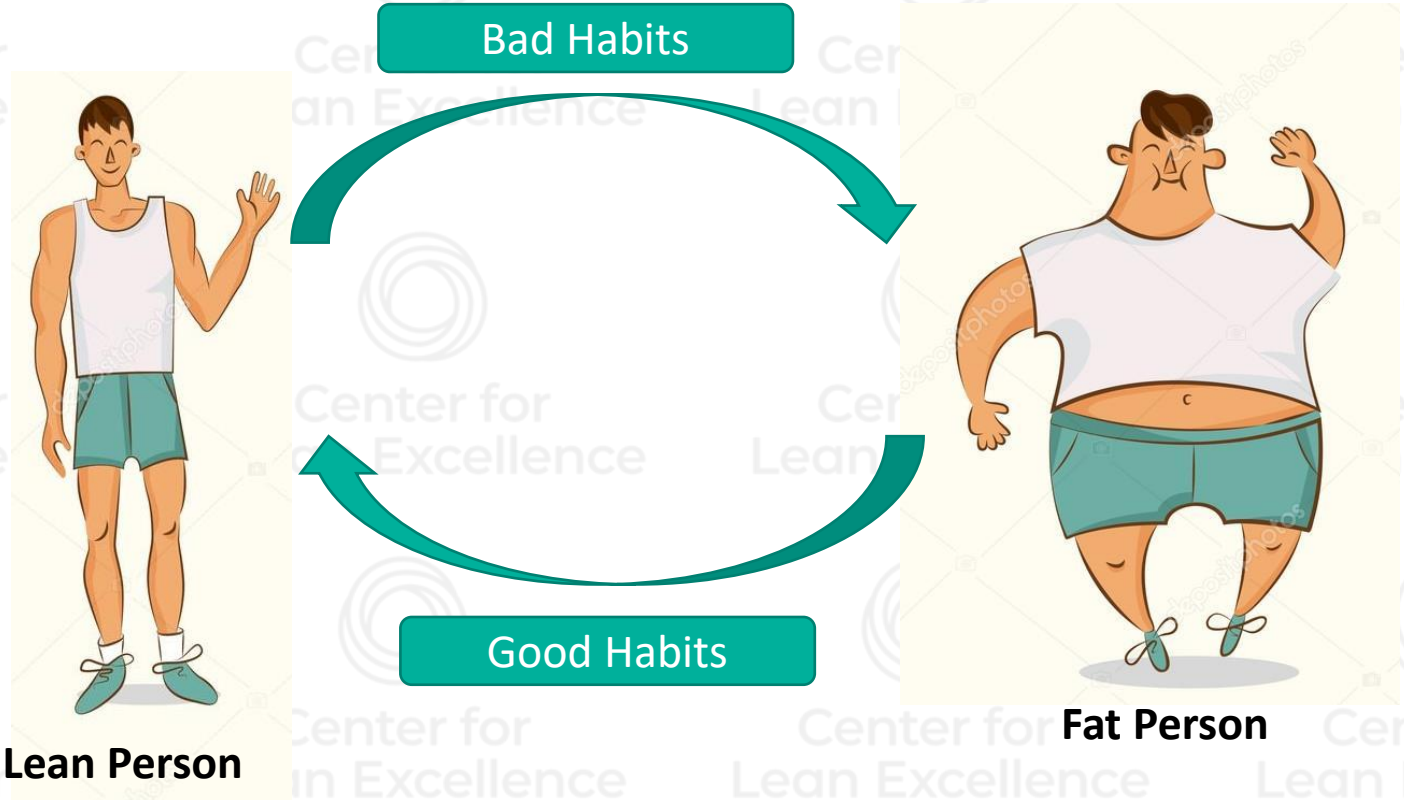
"It is a **systematic approach** to **identify and eliminate non-value adding activities (wastes)** to create more value to the customers"

## Meaning of "Lean"

*Thin, especially healthily so; having no superfluous fat.*

Lean = Toyota Production System (TPS)

**A systematic approach in identifying and eliminating waste through continuous improvement by making products on time with best quality & lowest cost**



# Let’s Understand Value & Waste

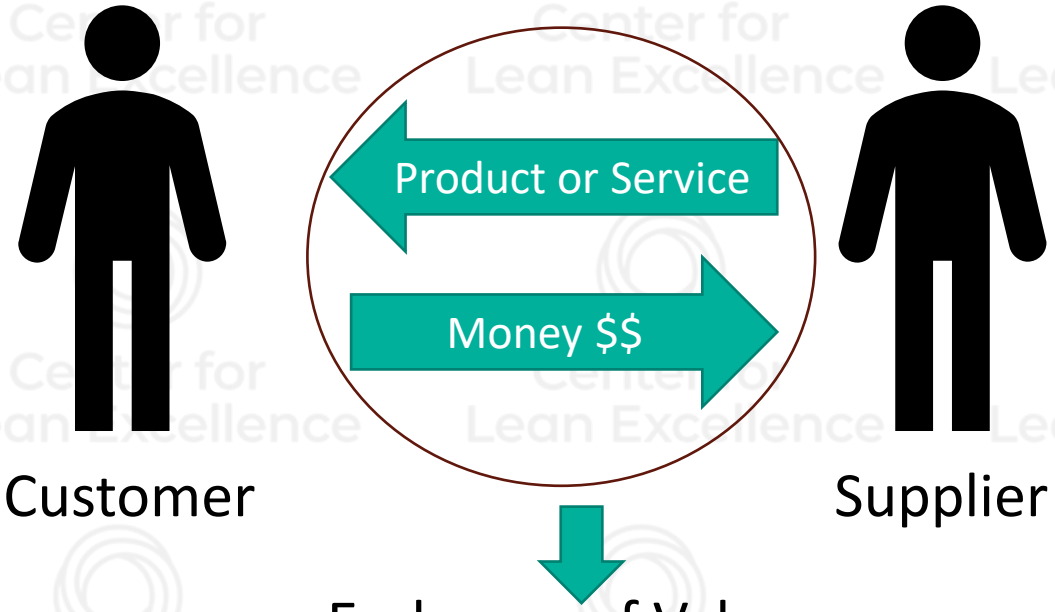
# What is a Business

## Need for a Product or Service

Cost

Quality

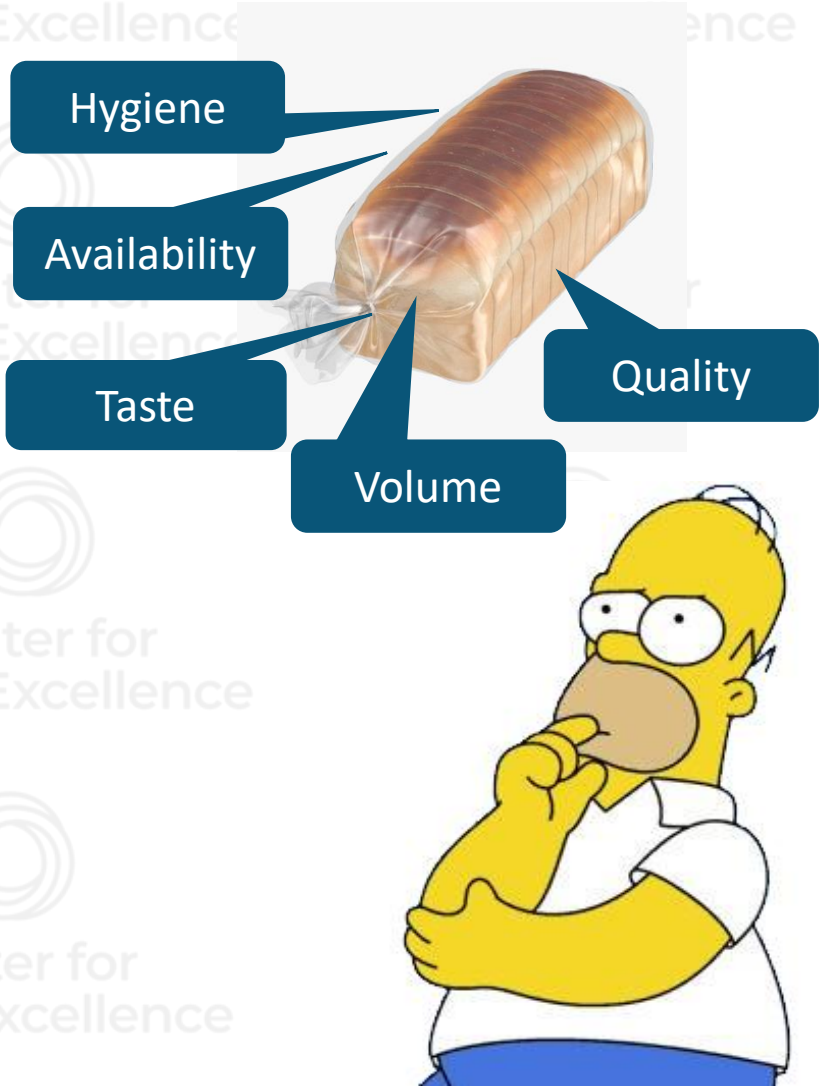
Lead time




Capability

Capacity

# What is Value?




What Customer is Willing to Pay for Your Product or Service

You go to Grocery to buy a loaf of bread, what are your expectations?

**Understanding the value from Customer's Perspective is Important**



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# What value do you offer your customers ?

# Types of Customers

Internal Customers


External Customers

# What are the activities you do to create value to your customers ?

# Types of Activities

1. Value Adding Activities

2. Waste Activities
   - Obvious Waste
   - Necessary Non Value Adding Activities

# Types of Activities

1. Value Adding Activities

2. Waste Activities
   - Obvious Waste
   - Necessary Non Value Adding Activities

# Value Adding Activities

Any **activity** in the process that **change shape, form or function** of the product or service and **customer is willing to pay** for that activity.

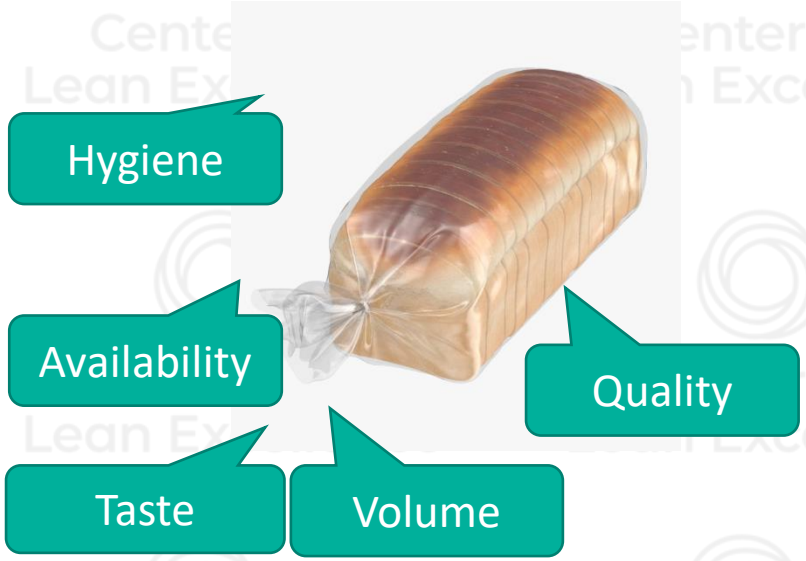
**Value Adding Activities** must satisfy the following :

- Work that transforms the **material** or **information**
- Work that the customer is willing to pay for

# Understanding Value Adding Activities

**Value** ← **Activities**

What customer is willing to pay for



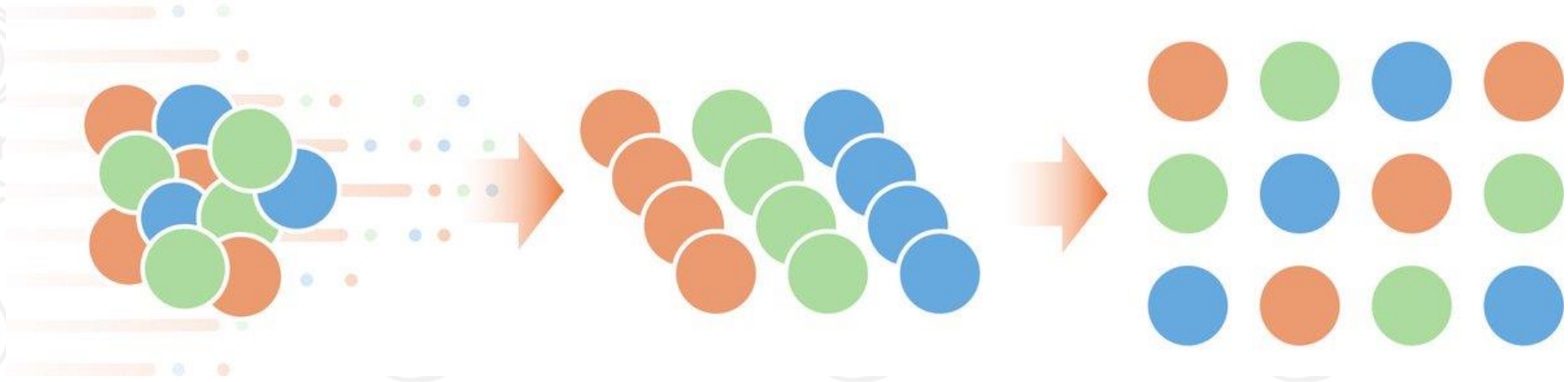

**Value Adding Activities:**
Activities that change shape, form or function

# What are Value Adding Activities in Knowledge Work?

DATA

INFORMATION

KNOWLEDGE



# Examples of changing Shape, Form & Function at Knowledge Work

- Computerizing data from papers into spreadsheets
- Feed data into systems
- Capture knowledge from different sources (Example: meeting minutes, discussions)
- Data conversion to information and knowledge
  - Brainstorming
  - Simulations
  - Trials
  - Experiments
- Change data structures using tables and formats
- Formulas to create information

# 5 Mins Break

# Types of Activities

1. Value Adding Activities

2. Waste Activities
   - Obvious Waste
   - Necessary Non Value Adding Activities

# What is a Waste Activity ?

Any **activity** in the production or service delivery **process** that **consumes resources/ add a cost** (to Manufacturer/ Service Provider or to the end customer) **without adding a value** is a waste

# Two Types of Wastes

1. Obvious wastes

2. Necessary Non-Value Adding Activities

# What are Necessary Non Value Adding Activities

Activities that do not add value to the product or service, but are currently necessary.

For Example :

- Technology or investment limitations (capability of available equipment, machines and methods)
- Activities requested by the customer (customer specification)
- Industry / Compliance standards
- Government or legal regulation

**Necessary non value adding activities are bit tricky to understand, do not mix them up with Wastes**

# Two Types of Wastes

1. Obvious wastes

2. Necessary Non-Value Adding Activities

# Types of Obvious Wastes (Muda)

## Transportation

**Wasted time, resources and costs when unnecessarily moving products, parts or materials**

## Inventory

**Waste due to keeping unnecessary products, semi-finished goods and materials in stocks**

## Motion

**Wasted time, resources and energy due to unnecessary human motions**

## Waiting

**Waiting form time spent waiting for the next process step to occur**

## Over Production

**Waste from making more products or parts then customer demand**

## Over Processing

**Waste related to additional effort to achieve or verify the required quality level**

## Defects

**Waste form a product or service failure to meet customer expectation**

## Non-Utilized Capabilities

**Waste due to under-utilization of people's talents, skills and knowledge**



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# Transportation

**Definition:** Movement of product or materials from one place to another (by hand carry, by cart, by conveyor, by truck, etc.) without adding value.


## Why a Waste:

Transportation also adds cost, The more you move material- the more opportunity to damage, requires more resource and disconnects parts of the value stream, have to keep higher inventories

Examples: ……..?

Hands-off of information between people and systems, Manual Approvals, Signatures,  Unnecessary printouts

# Inventory

**Definition**

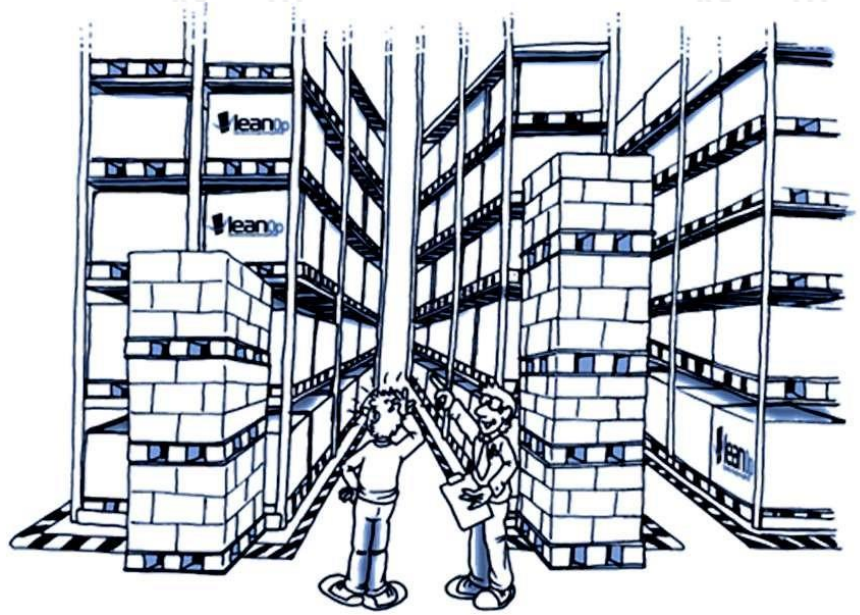
Holding material (raw, WIP, finished) beyond what is necessary to meet immediate customer demand

**Why a Waste:**

lengthens lead time, ties up working capital, increases risk of obsolescence, spoilable, and quality issues, High space requirement.  Inventory also hides problems

Examples……..?

Files to be approved, Work in Progress, Any form of batch processing,



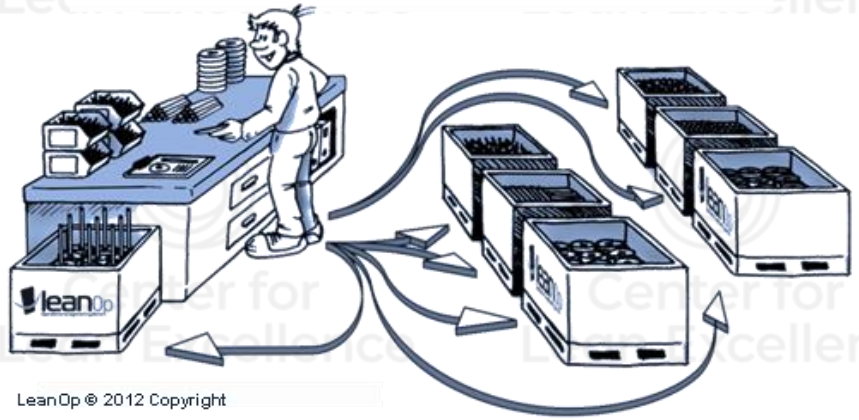
# Motion

## Definition

- *"To move and add value is called work. To move and not add value is called motion. Motion, then, means moving without working or moving and adding cost".*


## Why a Waste:

Wasted or lost time, ergonomic problems, injuries, less efficiency, less productivity, high fatigue and extra cost




Examples: ????

Finding missing information, Not knowing shortcuts, Too many touch points

# Waiting

**Definition:**

people or machinery "sleeping" or sitting idle due to material shortages, unbalance work loads, missing instructions.

**Why a Waste:**

idle time, lost capacity, unhappy customers, under utilization of resources

Examples .....?

Waiting for information, instructions, approvals, until previous process, computer break down, system updates

# Over Production

## Definition

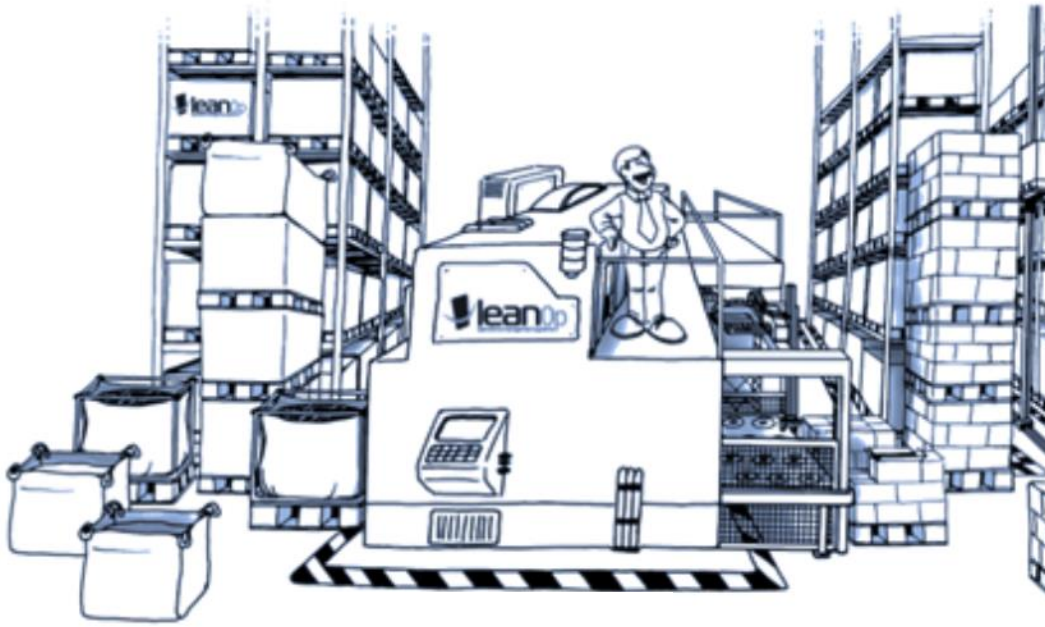
To produce sooner, faster or in greater quantities than the immediate customer demand.

## Why a Waste:

lack of resource optimization, excess transportation, extra space, inventory carrying costs, potential quality issues.

Examples in Finance ?

Unnecessary information, Just in case reports, Too many information in excel sheets and PPTs



# Over-Processing

**Definition**

Performing any operation that is not required to manufacture or assemble the product to the customer's expectations.

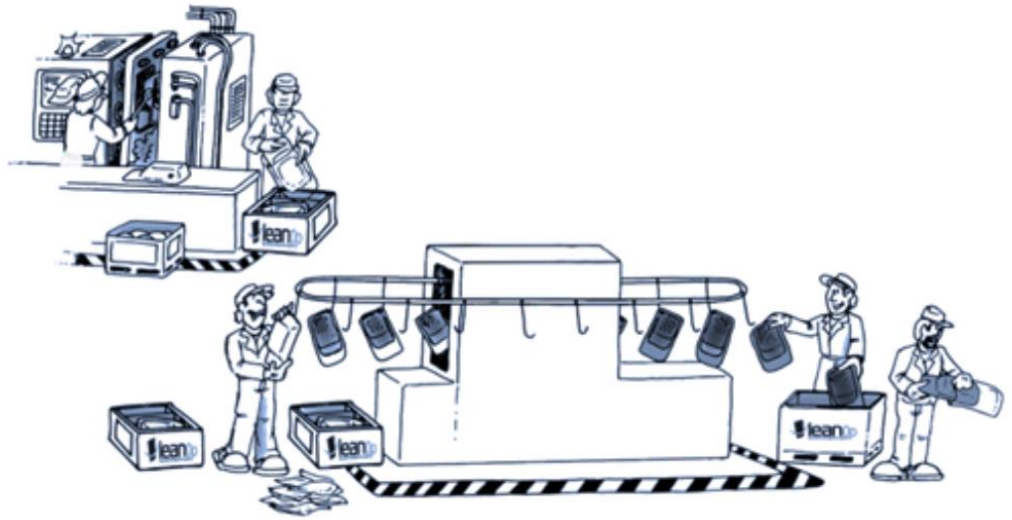
"Processing beyond the standard required by the customer."

**Why a Waste:**

Wasted time & resources, added cost, need extra effort

Examples ……..?

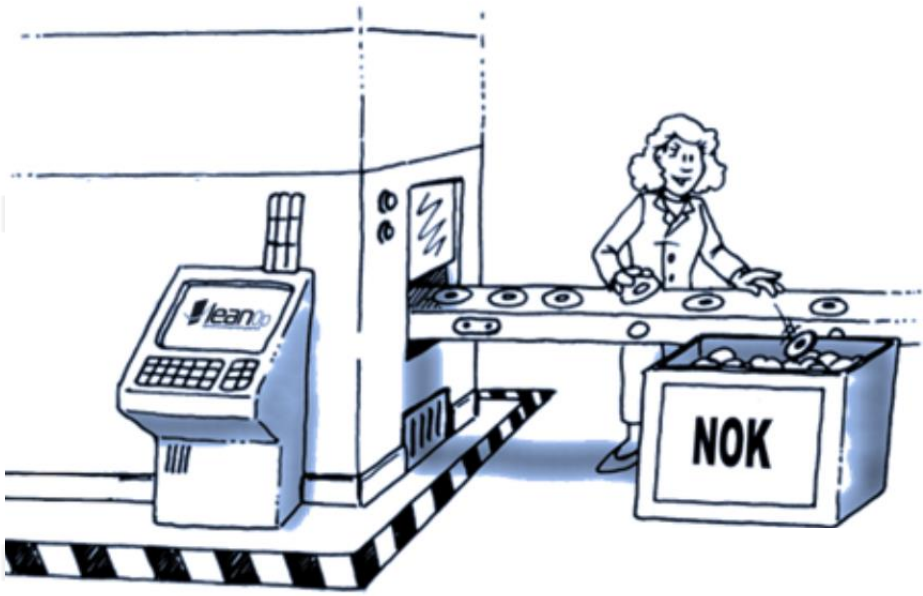
Excessive reviews, Checking someone else's work, Recalculating system information, Lack of knowledge on excel formulas



# Defects (Correction, Rejects)

**Definition:**

Producing a product that must be touched up, reworked, or scrapped ---any Rework or Reject & which the customer would deem unacceptable to pass the quality standard




**Why a Waste:**

Loss of productive time, Loss of production capacity, duplicated effort, extra material costs, potential defects to customer

Examples ……?

Missing information, data entry errors, incorrect information

# Under Utilised Human Capability (Skills)

**Definition:**

Human Capital is not used up to potential

**Why a Waste:**

Underutilized capabilities and people's thinking power is not used in organizations continuous improvement. Leeds to more recruitments. Hide growth opportunities for people.

Examples ……?

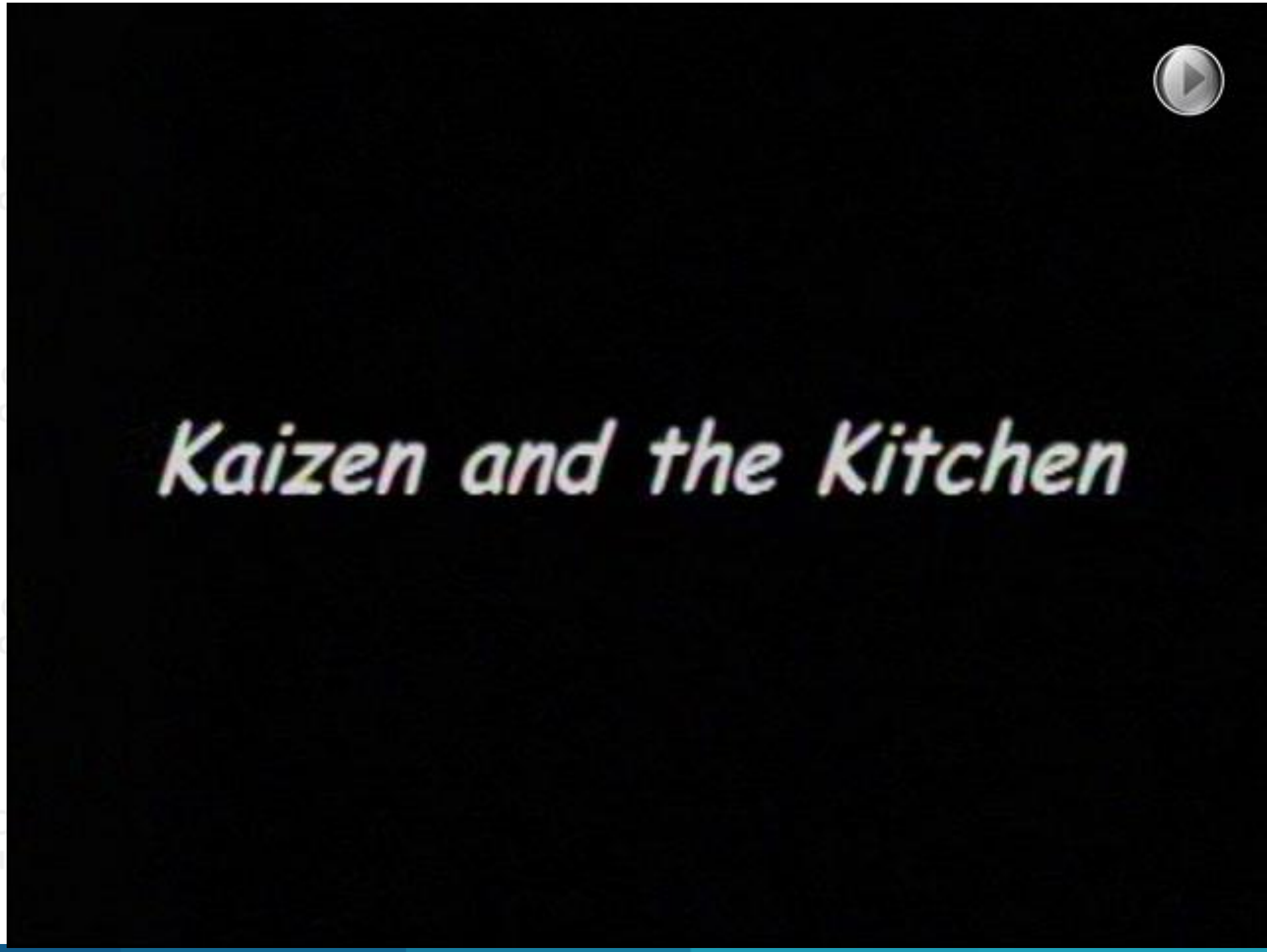
1) Baker used for transportation of vegetables
2) Hire two under utilized people for two tasks because organization does not have skill analysis
3) Wrong person get measured for wrong skills since he came to the job for the available position.
4) People's ideas are not heard by the management in improving the business

# What are the Wastes in Knowledge Process

| | Examples for Wastes |
|---|---|
| Transportation | Hands-off of information between people and systems, Unnecessary printouts |
| Inventory | Files to be approved, Any form of batch processing, |
| Motion | Finding missing information, Not knowing shortcuts, Too many touch points |
| Waiting | Waiting for information, instructions |
| Over Production | Unnecessary information, Just in case reports, Too many information in excel sheets and PPTs |
| Over Processing | Excessive reviews, Checking someone else's work, Recalculating system information, Lack of knowledge on excel formulas |
| Defects | Missing information, data entry errors, incorrect information |

# Activity

Identify Waste



# Spot Wastes


## Did You Notice ?

Motion Waste
- Reaching to get items
- 90 D Turning to enter numbers

Over Processing
- Same bar code over and over
- Typing bar code numbers

Waiting
- Talking to other customers

Defects
- Credit card not working

# Time Study Summary

| # | Activity | # Items | Value Adding Time | Waste Time | Total Value add time | Total Waste Time |
|---|---|---|---|---|---|---|
| 1 | Bar code reading in first time | 15 | 1 | 1 | 15 | 15 |
| 2 | Bar code reading in two or three times | 6 | 1 | 2 | 6 | 12 |
| 3 | Type bar code manually | 8 | | 5 | | 40 |
| 4 | Talk to the customer | | | 27 | | 27 |
| 5 | Talk to others | | | 33 | | 33 |
| 6 | Go to the other counter | | | 35 | | 35 |
| 7 | Settling the balance maney | | 2 | | | |
| 8 | Handover the receipt | | 1 | | | |
| | Total | 29 | | | 21 | 162 |
| | | | | | 183 | |
| | **Value Adding %** | | | | **11%** | **89%** |

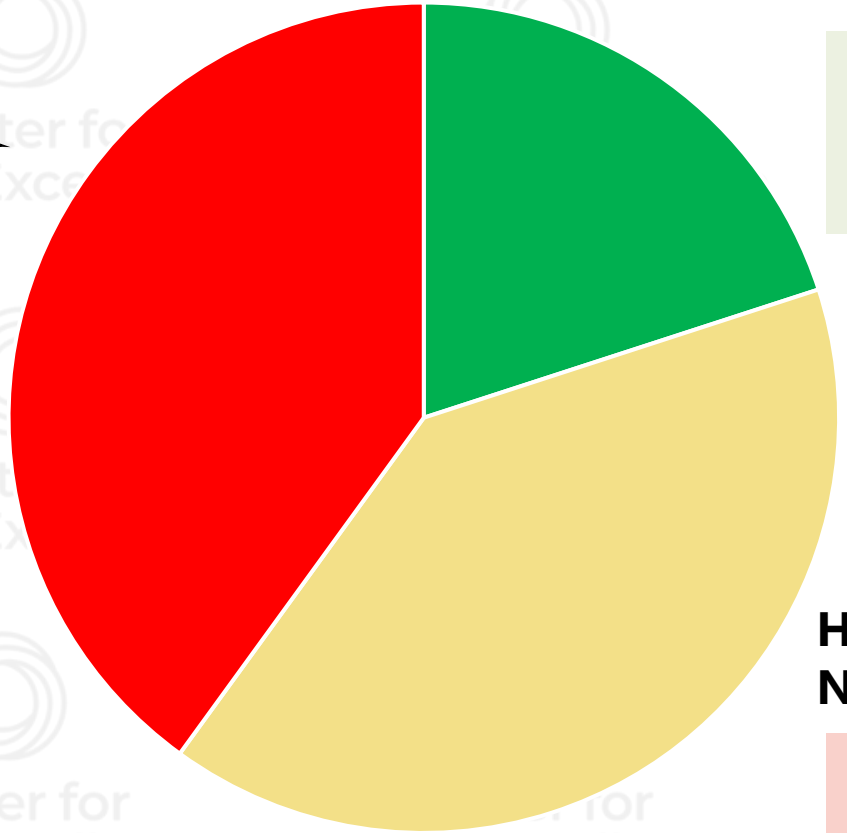
# Value and Waste

**Optimize**

**Eliminate**

**Value Adding Activity**

Change the form, shape or the function of material/product in a way that the customer is willing to pay



**Minimize**

**Obvious Waste**

Not necessary for the customer or business
(add cost, no value)

**Hidden Wastes – Necessary Non- Value adding activities**

Do not add value to customer, but require for the business for now

# Improve continuously or Lose in Competition

**Customer always wants better quality, lower cost and availability of product/ service**

**Business can never be satisfied with current attainment.**

**Need continuous drive to achieve;**

**Shortest Lead Time**

**Lowest Cost**

**Best Quality**


**,to be ahead in the competition**



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# Activity

- Go to the floor and find waste activities