

Project Title - Development of Demonstration Companies (DMP)

Duration – 18th December 2023 – 09th August 2024

Objective -

Develop and establish model companies/ organizations to apply Productivity concepts, tools, techniques, and methodologies.

Share experiences, gains, and successes at the company/ Organizational level through the project.

Set as a benchmark or reference model on the specific productivity improvement in the member countries

Selected Companies -

J A K Plastics (Pvt) Limited

Kiyota Coffee Company (Pvt) Limited

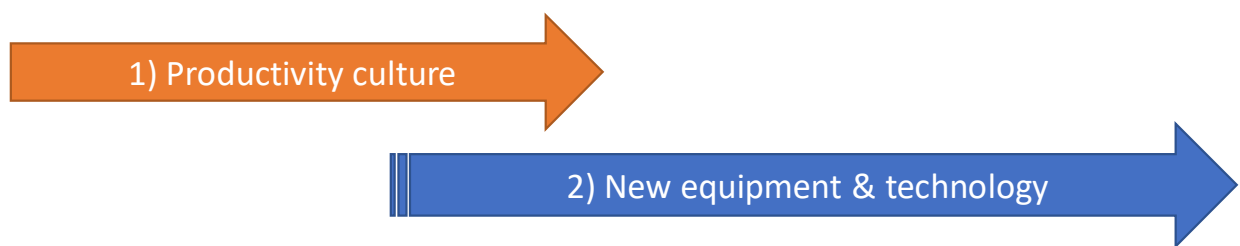
Roo Prabha (Pvt) Limited

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2. What kind of frameworks to apply?
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0. PRODUCTIVITY Concept

- State-of-the-art technology & equipment tend to be highlighted to catch up global manufacturing.
- However, consider first if our workplace is lean enough to be productive.
- Technology and equipment need to be invited after the establishment of a productivity readiness
- Technology & equipment will perform well only in the culture of productivity.

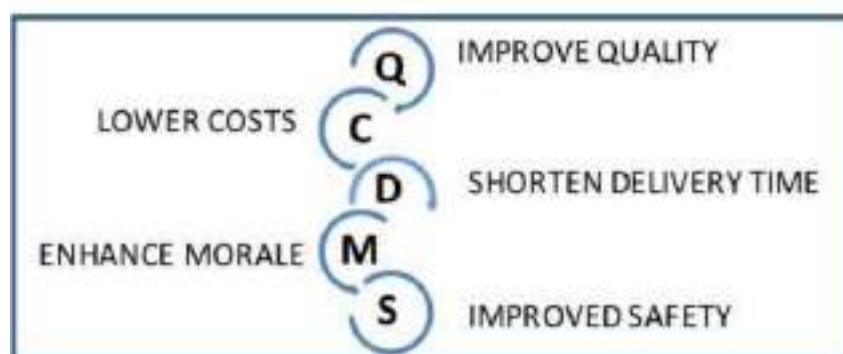


0. PRODUCTIVITY Concept

What are elements of the productivity?

The five elements should be improved (PRODUCTIVITY) for better productivity.

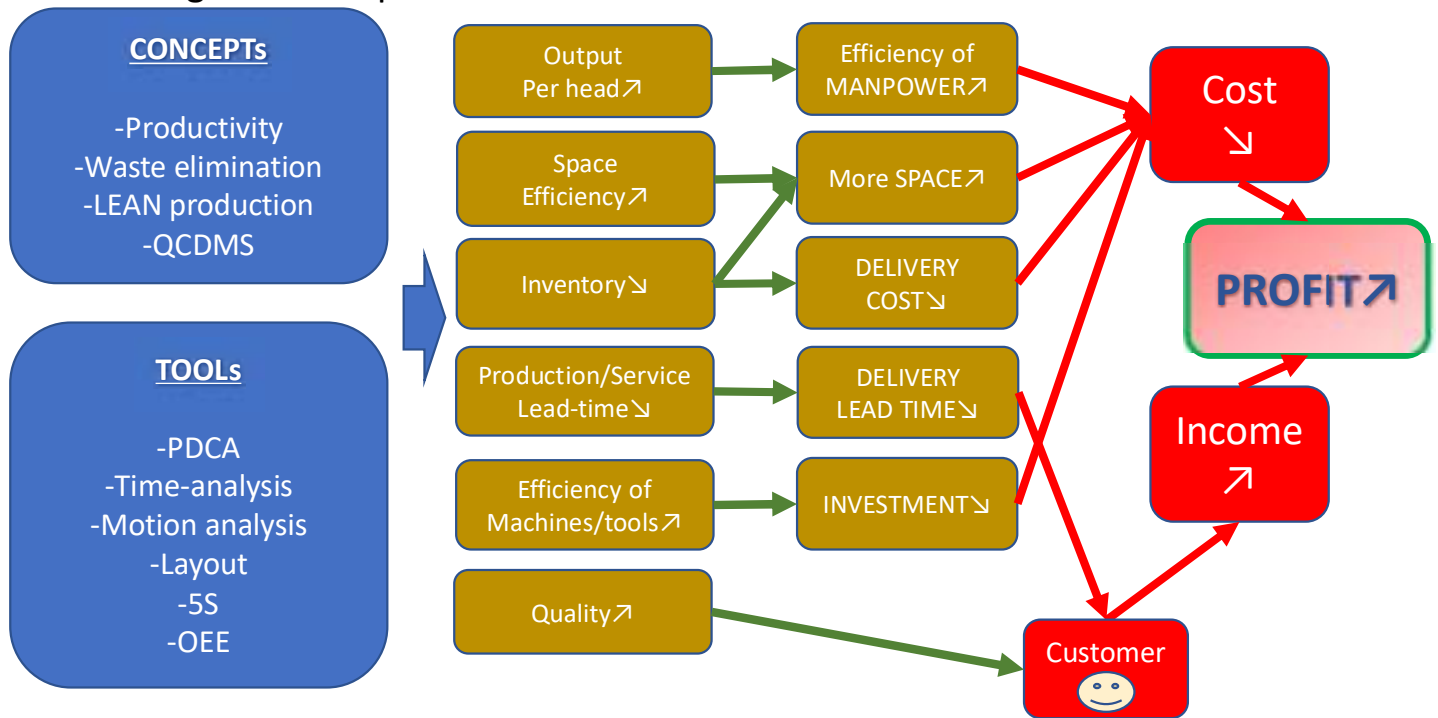
- Quality, Cost, Delivery (Time), Morale and Safety = "QCDMS"



0. PRODUCTIVITY Concept

The overall goal of PRODUCTIVITY is the profitability.

The good profitability through the betterment of “QCDMS” is achieved by this logic and the parameters.



0. PRODUCTIVITY Concept

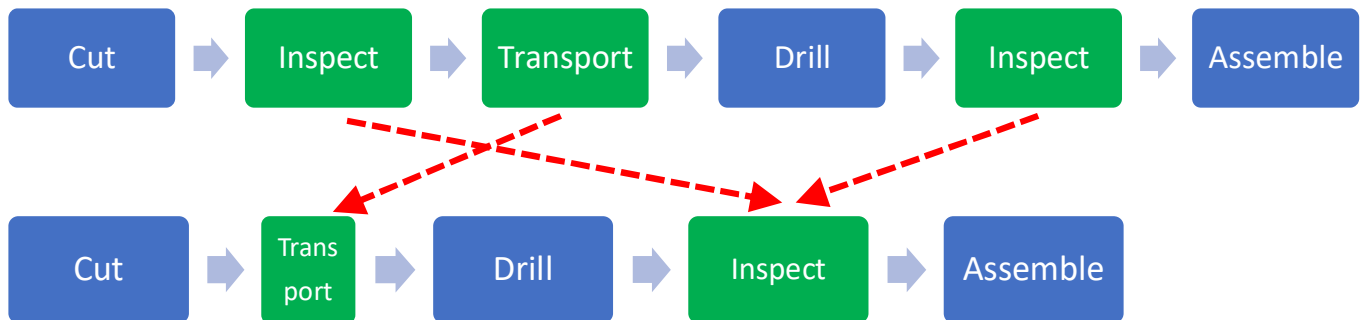
“5S” is the first step to organize a workplace and identify any inefficiencies.

“5S” is not only a tool to organize workplaces, but a philosophy of our readiness for the productivity. (Refer to “5S manual” edited by NPO)

SORT	Separate and trash unnecessary items	Avoid waste of space, waste of time for searching, and contamination of quality
SET IN ORDER	Put back items to original position after use	Avoid waste of time for searching items, Labor safety
Shiny CLEAN	Clean up the workplace	Prevent any accidents, machine break-down, or material wastage
STANDARDIZATION	Set rules to clean up to share by every staffs	Everyone needs to understand and join in the workplace should clean up the worksite
SUSTAIN	Everyone continue cleaning up	The cleaning activity should be sustainable

0. PRODUCTIVITY Concept

- Identify value-adding motions & NON-value ones in the workplace.
- Eliminate NON-value ones to reduce its lead-time & cost.
- Concentrate on value-adding to sustain good quality.



Inspection and transportation are non-value actions to be reduced or minimized in the above case.

0. PRODUCTIVITY Concept

PRODUCTIVITY is a “Continuous Improvement”.

PRODUCTIVITY always starts from planning with Where?, What?, Who?, When?, and How?.

Once a PRODUCTIVITY action is done, don't forget checking the outcome with the parameters.



1. How do we approach PRODUCTIVITY points?

To implement PRODUCTIVITY “Continuous Improvement”, the first step is to have strong will to change ourselves for further growth.

With that mindset, let’s start journey to identify at where issues & challenges are hidden.

The top management have to be committed and should support managers and workers.

The managers should understand and have all skills to complete the project. Planning, Observing, Waste-sensitiveness, and Analyzing skills are expected.



1. How do we approach PRODUCTIVITY points?

A template can be developed to cover all the PDCA process of a PRODUCTIVITY project.

Such standardized sheet will ease dissemination of outcomes to other areas and motivate workers.

RAIZEN SHEET	
1. TEAM	
2. BACKGROUND	
3. INTERVIEW THE TOOLS	
4. GOAL SETTING	
5. SELECTION & JUSTIFICATION OF THEME	Productivity - Quality - Cost - 0000
6. UNDERSTAND PROCESSES & EQUIPMENT	
7. GROUP STUDY SITUATION	
8. ESTABLISH THE OBJECTIVE	
9. FUTURE PLAN	
10. ROOT CAUSE ANALYSIS	
11. IMPLEMENTATION OF RESULTS	RESULTS P/Q/C/D/S/M
12. FUTURE PLAN	
BEFORE	AFTER

1. How do we approach PRODUCTIVITY points?

Repeat “Why?” to reach a hidden CORE-problem.

Solutions to surface problems will NOT bring us real benefits.



1. How do we approach PRODUCTIVITY points?

① A lot of motions by a worker

We can find PRODUCTIVITY chance where a single worker is using hands, eyes, legs and bodies.



1. How do we approach PRODUCTIVITY points?

① A lot of motions by a worker (Solutions)

Some of motions are "Eliminated", "Combined", "Rearranged" or "Simplified".

(ECRS)

Eye motion, Hand motion, Leg motion are the target

ECRS 改善の4原則			
Eliminate	Combine	Rearrange	Simplify
やめる	結合	入れ替え	簡単化



1. How do we approach PRODUCTIVITY points?

① A lot of motions by a worker (Solutions)

What we can suggest to workspace

- Use one hand → Use both hands
- Use both hands + Use foot
- Use a turntable to move a product, not moving around it
- All necessary tools and information must be located in an arm-range of worker



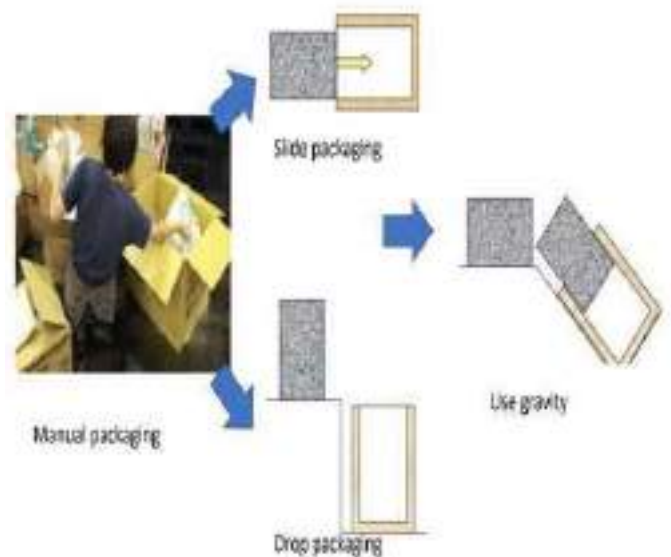
1. How do we approach PRODUCTIVITY points?

① A lot of motions by a worker

(Solutions)

What we can suggest to workspace

- Lift up → Slide
- Use gravity



1. How do we approach PRODUCTIVITY points?

② Inventory in production process (WIP)

Where we see piles of WIP (Work In-Process), there may be line un-balancing among stations



1. How do we approach PRODUCTIVITY points?

② Inventory in production process (Solution)

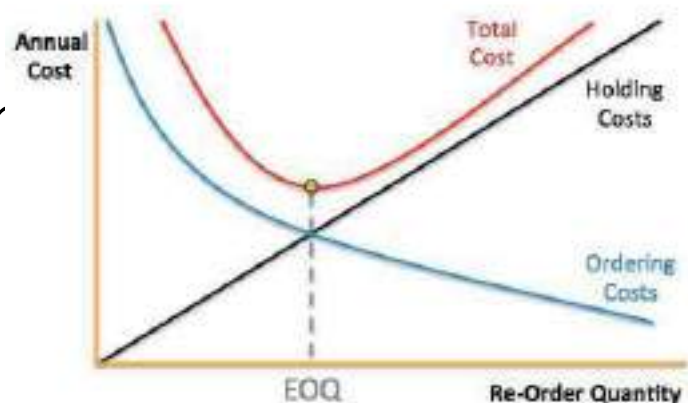
Check line balancing among work stations to flow items smoothly to balance workload
(An example of line balancing is shown later)



1. How do we approach PRODUCTIVITY points?

② Inventory in production process (Solution)

Check EOQ (Economic order quantity) to
Minimize WIP.



$$EOQ = \sqrt{\frac{2(\text{Annual Demand} * \text{Cost per Order})}{\text{Annual holding cost per unit}}}$$

1. How do we approach PRODUCTIVITY points?

③ Transportation

There will be a PRODUCTIVITY opportunity where you see a lot of hand-carry transportation.



1. How do we approach PRODUCTIVITY points?

③ Transportation

(Solutions)

- Minimize burden by using trolley, roller conveyer, or other tools to use gravity
- Minimize human transportation, and maximize product transportation
- Automate transportation



1. How do we approach PRODUCTIVITY points?

④ Items on the floor

Keeping items on the floor causes extra motions of collecting and lifting by hands.

It may also causes high defect rate caused by contamination or dirtiness



1. How do we approach PRODUCTIVITY points?

④ Items on the floor

(Solutions)

- Set rule to leave nothing on the floor
- Organize tables and shelves by disposing all unnecessary items
- Prepare boxes or trolleys
- Install roller conveyers



1. How do we approach PRODUCTIVITY points?

⑤ Optimize production status

Without sharing philosophy, goal, target, or progress of a work area, workers will lose their way and be demotivated.



1. How do we approach PRODUCTIVITY points?

⑤ Optimize production status (Solutions)

- Optimize corporate philosophy
- Optimize target (daily, weekly, monthly)
- Optimize workers (Skills, good practices)
- Optimize progress (Gap between target and output)
- Optimize quality (Defect rate, remarks)
- Optimize procedure (Work flow, quality sample)



1. How do we approach PRODUCTIVITY points?

⑥ Operation with minimum tools

All necessary tools should be placed within arm-range to minimize workers' un-necessary motions.

Un-organized tools may produce over-stock of tools



1. How do we approach PRODUCTIVITY points?

⑥ Operation with minimum tools

(Solution)

■ Organize worktable/desk with identifying position of tools



1. How do we approach PRODUCTIVITY points?

⑥ Operation with minimum tools

(Solution)

- Organize paper folders, molds, and patterns by color, number or alphabet order.

• File control



Diagonal line on the file faces easily identifies the original positions and time waste for searching the original position



1. How do we approach PRODUCTIVITY points?

⑦ Smoother communication among line staffs

Where we see a lot of shouts to call line managers and walk of workers/managers to chat, we need improvement for smoother communication.

Providing 3 types of cards to all line workers will reduce waste of time and easily identify workers' status especially in a big production line.

- RED: Please help!
- YELLOW: Please check quality!
- GREEN: Need parts!



1. How do we approach PRODUCTIVITY points?

⑧ More engagement of workers

- "want to keep motivating workers."
- "want to give more responsibility and commitment to work"
- "want to work with us in a longer span"



1. How do we approach PRODUCTIVITY points?

⑧ More engagement of workers (Solution)

- This company shifted all the single-skilled workers to multi-skilled.
- Each worker started to complete the whole production process.
- Their wage was incentivized by the volume and the quality, which increased productivity by 20%



2. What framework do we apply?

<5S>

- “5S” is the starting point to keep workplace organized.
- Removal of any physical wastes in workplace will set readiness to change work system



2. What framework do we apply?

<5S>

5S slogan is put on walls to share its concept in the companies.

But, it is also important to share what should be implemented to follow the slogan.

Check and evaluate if 5S helps for keeping workplace productive.

5S Element	Number	Evaluation Criteria
Classify <i>Seiri</i>	I	Are corridors open and free of obstruction?
	II	Is the work area free of fluid leaking or trash?
	III	Is the work area free of unnecessary articles?
	IV	Is the work area free of material on excess?
	V	Is the information active on the blackboard?
	VI	Are the walls clear of unused stuff?

5S Element	Number	Evaluation Criteria
Organize <i>Seiton</i>	VII	Evaluate any storage information.
	VIII	How are shelves, desks and work surfaces accommodated?
	IX	How are materials and tools stored?
	X	Evaluate the places for the containers and packing?
	XI	Order and arrangement of items on the floor.
	XII	Accessibility for tools of the machines and Measuring instruments.

2. What framework do we apply?

<5S>

5S Element	Number	Evaluation Criteria
Cleaning <i>Seiso</i>	XIII	Storage of tools and instruments.
	XIV	Is it clean when maintenance is needed?
	XV	Evaluate the cleaning of the work area.
	XVI	Safety of the team. Areas are protected and safe for everyone?
	XVII	Evaluate the status of the equipment. cleaning and general appearance.

5S Element	Number	Evaluation Criteria
Standardize <i>Seiketsu</i>	XVIII	Is there a visual diagram with color codes?
	XIX	Evaluate emergency exits.
	XX	Verify that the corridors are light and clearly marked.
	XXI	General area has limited quantities for materials and are well marked.
	XXII	Clear documentation exists on the control of information.

5S Element	Number	Evaluation Criteria
Maintain <i>Shitsuke</i>	XXIII	Corridors are clean and maintenance is remarkable.
	XXIV	Maps and drawings are always available to compare.
	XXV	Tools can be stored in the warehouse.
	XXVI	Evaluates the involvement of superiors in 5s.

2. What framework do we apply?

<7 wastes>

- There are 7 types of waste in our workplace.
- Observe your workplace to identify these wastes.

7 Wastes of Lean



2. What framework do we apply?

<3Ms>

- Waste of motion or waste of transportation exist in our work system.
- Observe your factory to identify any MURI (Overburden), MURA (Unevenness) and MUDA (Waste) .



Muri = overburdened



Mura = unevenness, fluctuation, variation



Muda = waste



No Muri, Mura, or Muda



2. What framework do we apply?

<Time analysis>

- By directly observing the actions of workers, we can improve their "actions and methods" during work.
- Then, determine the "standard time" required for the work.



<Regular steps of the time analysis>

- ① Divide the work into several "elementary works".
- ② Measure and record the time for "each element work".
- ③ Calculate the average observed time value for each Element Work.
- ④ Convert "observation time value" to normal speed.
- ⑤ Calculate the net "Cycle Time" by summing the "Net Time" of "Each Element Work".
- ⑥ Calculate the "margin time" by multiplying the "net cycle time" (net work time) by the "margin rate".
- ⑦ The sum of "net cycle time" (net work time) and "slack time" is the "standard time" for that task.

2. What framework do we apply?

<A case of simple time analysis>

- 1) Measure processing time of each work station at a parts making line (left) and its assembly line (right)
- 2) Calculate production time with necessary number to produce one final product
- 3) These can be accurate standard times per station after repeating some more.



Parts manufacturing line

#	Process time (sec)	pc for 1 product	Production time
1	6.4	2	12.8
2	6.5	2	13
3	13.5	2	27
4	58.6	1	58.6
5	40	1	40
6	28.5	4	114
7	8.1	4	32.4
8	36	1	36
Total time (sec)			333.8
Max gap (sec)			58.6-12.8
			45.8

Parts assembly line

#	Process time (sec)	pc for 1 product	Production time
1	46	1	46
2	18	1	18
3	95	1	95
4	180	1	180
5	132	1	132
6	300	1	300
Total time (sec)			771
Max gap (sec)			300-18
			282

2. What framework do we apply?

<A time-analysis example of application to line balancing>

<Parts manufacturing line>

- 1) The parts manufacturing line can reduce 2 workers.
- 2) A worker can be assigned to #6 to reduce its production time.
- 3) As a result, this line get smaller gap time without changing the total production time.

<Parts assembly line>

- 1) Parts assembly line can also reduce 2 workers without changing total production time.
- 2) A worker can be assigned to #6 to make its productivity double.

Parts manufacturing line

#	Process time (sec)	pc for 1 prod	Production time
1	6.4	2	52.8
2	6.5	2	
3	13.5	2	
4	58.6	1	58.6
5	40	1	40
6	28.5	2	57
6'	28.5	2	57
7	8.1	4	32.4
8	36	1	36
Total time (sec)			333.8
Max gap (sec)			58.6-32.4
			26.2

Parts assembly line

#	Process time (sec)	pc for 1 prod	Production time
1	46	1	159
2	18	1	
3	95	1	
4	180	1	180
5	132	1	132
6	300	1	300
6'	300	1	300
Total time (sec)			771
Max gap (sec)			300-132
			168

2. What framework do we apply?

<Motion improvement>

Observe workers' motion and eliminate un-valued motions.

Set the best motion as the standard.

Tips to improve motions : Check your **LEGS**, **HANDS**, and **EYES**.

LEGS	•Are you walking a long distance during an activity ? •Can you put two processes closer? One step = 0.8 sec.
HANDS	•Is one hand doing nothing? •Aren't you repeating same motions? •Are you using the right hand and the left hand? Moving a hand by 20cm = 1.0 sec.
EYES	•Aren't you checking the same point twice? •Aren't you looking for tools and materials? •Do you put all the necessary things around you? Looking back =0.6sec.

2. What framework do we apply?

<LEAN manufacturing>

“Lean” means elimination of any wastes.

- Eliminate physical wastes by 5S
- Eliminate time wastes and motion wastes by analyzing existing production system
- Optimize all information and share with workers
- + Install state-of-the-art machinery

These efforts will make your production system lean.



2. What framework do we apply?

<Change management>

- In order for a company to continuously grow in an **era of VUCA**, it is necessary to flexibly adjust its management to the trend.

However, if **such strategy is not shared** to every member of the company, the project may not proceed successfully.

- “Change management” is useful in such situations, because it will be easier to align the business to a trend with **the sympathy of employees**.

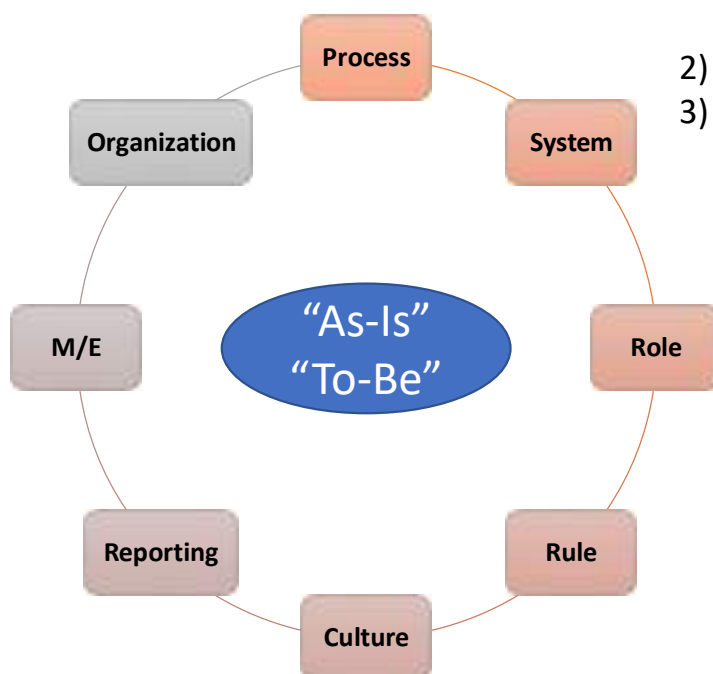


2. What framework do we apply?

<Change management>

Change impact analysis to choose area of change.

- 1) Identify “As-Is” and “To-Be” of each factor
- 2) Analyze where risks are
- 3) Identify what should be changed



2. What framework do we apply?

<Flow of the change management after the change impact analysis>

- **1. Raise awareness of crisis** (As-is + To-be)
- **2. Form a team** (Top commitment + Professionalism)
- **3. Clarify your vision** (Simple vision + strategy)
- **4. Share your vision with all** (Looking at same direction)
- **5. Encourage proactiveness**
(Bottom-up approach to organizational movement)
- **6. Achieve short-term goals** (Small start and rapid outcome)
- **7. Make the most of the achieved goals for the next** (PDCA cycle)
- **8. Disseminate the new way to others**
(To make it a organizational culture)



2. What framework do we apply?

<A case of change management application to 5S action>

Work space was neatly housekept by recognizing that un-organized workstation contains lots of waste.



2. What framework do we apply?

PRODUCTIVITY concept and framework can be adoptable to all type of workplace.



3. TIPS for successful PRODUCTIVITY

1. PRODUCTIVITY is not a concept of blame someone's inefficiency. PRODUCTIVITY is here to find potentialities of growth. Let's think how we can improve ourselves better!



3. TIPS for successful PRODUCTIVITY

2. PRODUCTIVITY is an all inclusive activity by all staffs.
Some “Bottom-up” approach can be recommended to get commitment

- 5 minutes housekeeping time before/after working time
- PRODUCTIVITY contest & rewards
- Put pictures of the best practices and ton the wall



3. TIPS for successful PRODUCTIVITY

3. Cascade down the movement by starting small

- Train managers to be issue-oriented and get their consensus before launching
- Select a small space to start
Director’s office, Toilet, Meeting room, Entrance, etc.
- Keep before/after photos
Achievement should be optimized to disseminate its movement



3. TIPS for successful PRODUCTIVITY

4. Comprehensive approach for boosting PRODUCTIVITY movement.

- Regional competition of 5S/PRODUCTIVITY by enterprises by an authority
- Regular visits by experts to see progresses
- Cross-sectional meeting to share progresses
- Take educational sectors on the same board
(ex. PRODUCTIVITY course in schools and application to internship program)



<https://jasteca.net/5s-award.php>

3. TIPS for successful PRODUCTIVITY

5. Training to mid-class workers

In addition to the commitment by top management, production managers / line managers are also expected to be committed to productivity actions.

- Train managers to observe their workspace
- Train managers to apply productivity tools
- Assign managers to improve productivity
- Give its incentive to managers



3. TIPS for successful PRODUCTIVITY

6. Measure tangible outcomes and share with workers

- Improvements in lead time
- Improvements in quality
- Improvements in cost

Some of the profit gained are expected to be given back to workers.



4. Impacts generated in the project

1. Elaboration with Japanese companies

To solve quality issues, this project link member companies with Japanese companies.

- Analysis of defected materials by a Japanese company
- Getting a quotation from a second-hand machine trader in Japan
- Potential clients in Japan



4. Impacts generated in the project

2. Mind-set for productivity

Site-visit and observation reveals opportunities for improvement.

Eyes from outside will bring a fresh awareness to their operation.



4. Impacts generated in the project

3. Internal dissemination

Such awarenesses were shared with managers and staffs.

Problem identifications and solutions will be a part of capacity building



4. Impacts generated in the project

4. Profit creation

Better profitability by aligning with the productivity logic.

