
MINI: HOMECOMING
KGF

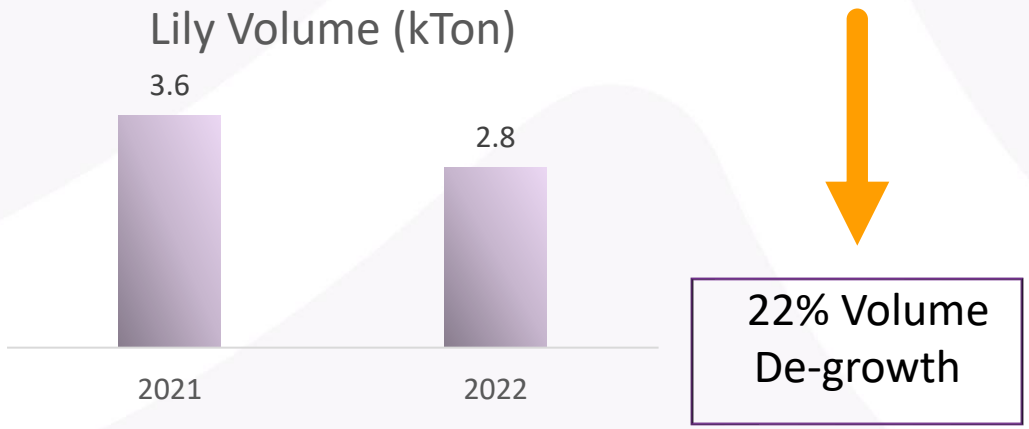
STEP-01

BACKGROUND

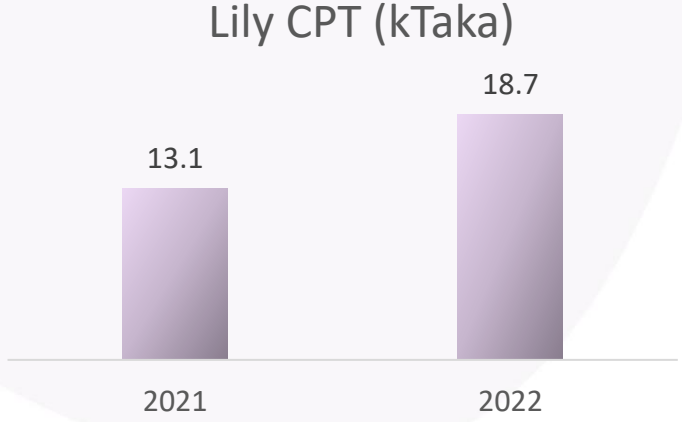
Mini soap in 3P Factory

KGF Capacity Constraint

NMSCC Cost 7.4 Crore BDT per year



22% Volume De-growth



42% CPT Increase

STEP-01

BACKGROUND

What Can We Do….?

Absorbing Mini Soap line in an already existing factory.

The First Suggestion

WHY NOT KGF??

CHALLENGE!!

ARCE

Key Head	KGF	ARCE
IRR	85%	31.5%
Pay Back	1.1yrs	2.8yrs

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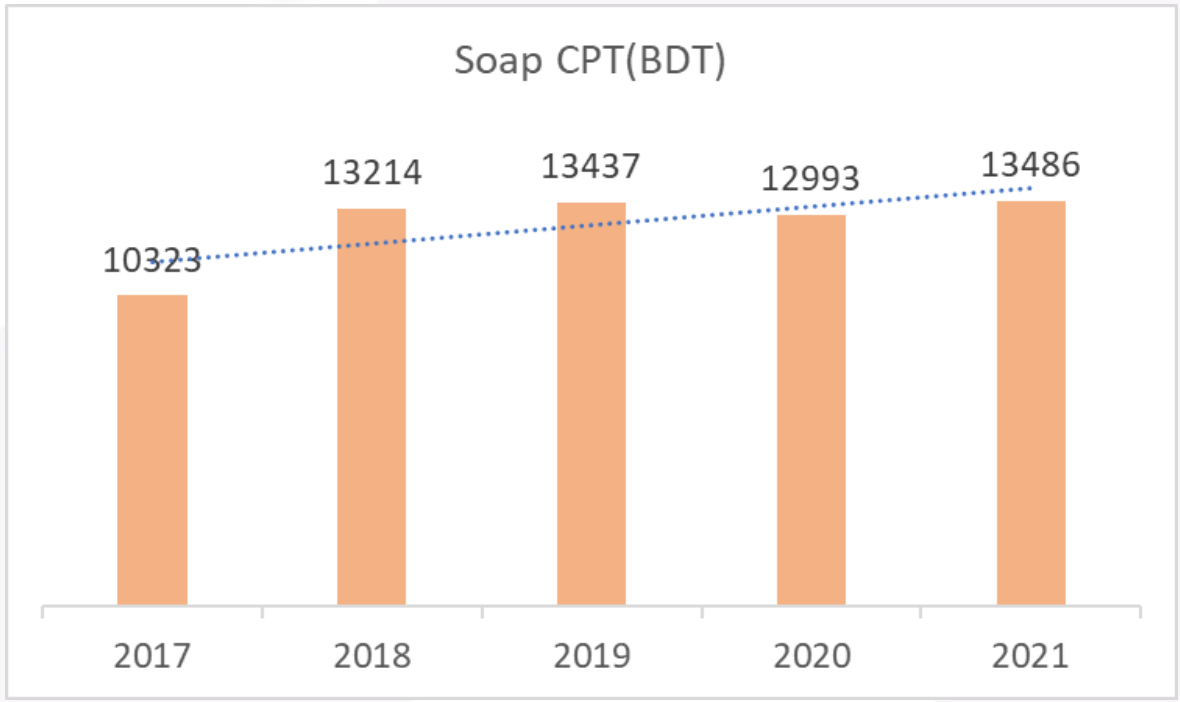
STEP-02

LOSS STRATIFICATION



Increasing Soap CPT trend due to decreased volume

3p labor cost to bag noodles for lily(Extra pressure on KGF for 3p intake)

High cost of sack and poly for bagging noodles

High transport cost to transfer noodles in lily

We will fit lily line In Soap plant

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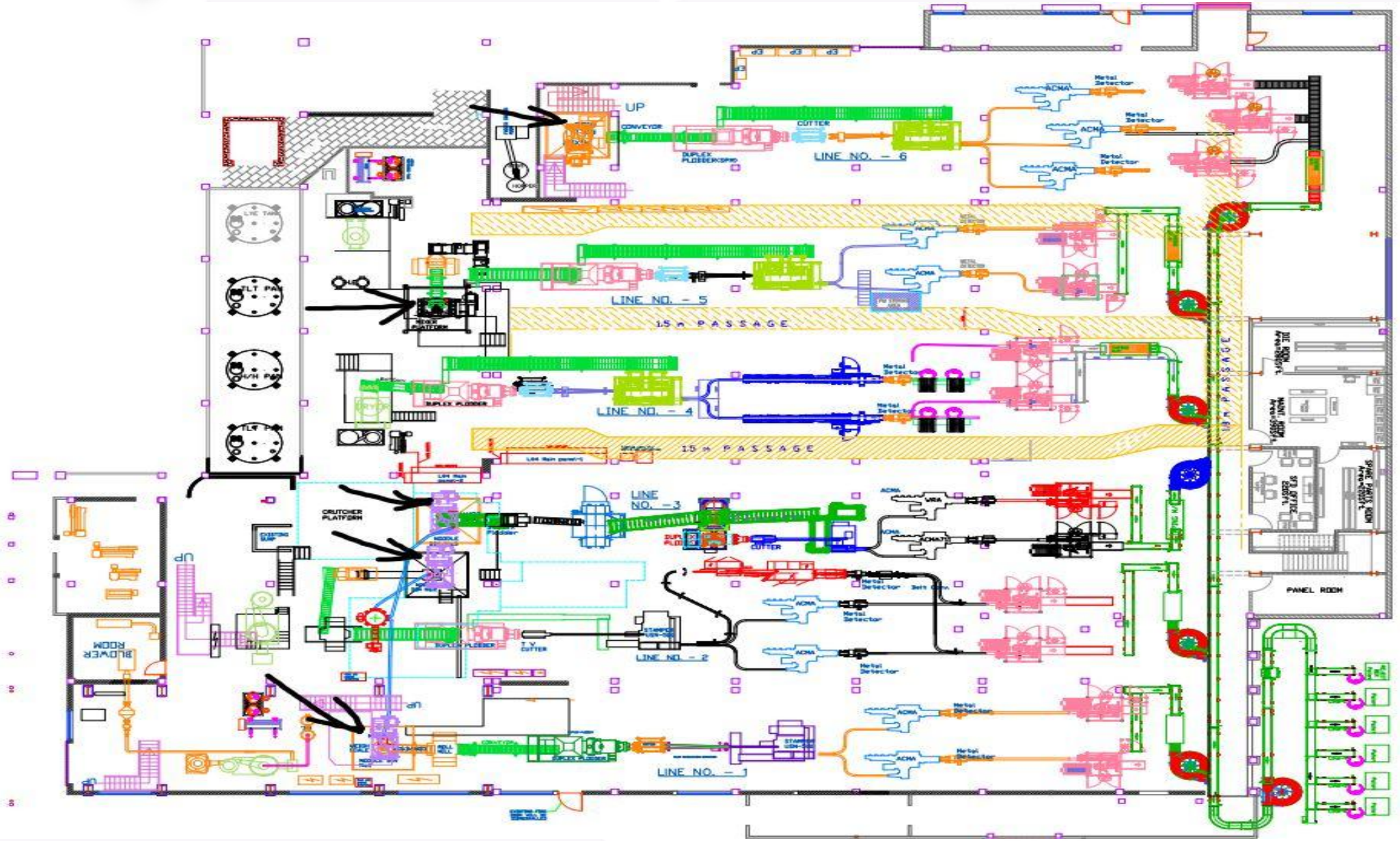
STEP-03

SFD Layout



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STEP-03

LINE SELECTION

X	Line-1	Highest Stamper Stroke 36, layout not feasible
X	Line-2	Highest Stamper Stroke 36, layout not feasible
X	Line-3	Highest Stamper Stroke 40, layout not feasible
✓	Line-5	Stamper stroke 51upm, layout feasible
X	Line-6	Layout not feasible, Mixer bottleneck, already running in TLO

Line-5 Is Selected

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STEP-03

CU Evaluation

Considering LTCP Volume

OEE of the line is considered as 70% , Increase in OEE by 500 BPS will lead to CU dropping to around 80% , hence no risk from that side .

Year	2020	2021	2022	2023	2024	2025	2026
Envelope & Carton Vol (MT)	41020	37228	40265	41768	43095	44258	45443
Flow wrap	3675	2862	3071	3271	3352	3518	3728
YOY Growth(Flow Wrap)		-22%	7%	7%	2%	5%	6%
Total (Env + Carton + FLow)	44695	40090	43336	45039	46447	47776	49171
CU % Including Lily			77%	79%	82%	84%	87%

What we require To feed 7% Growth

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STEP-03

Decision Making

AT LINE-5 Two Run Strategies Could be Implemented

Plan-A

We dedicatedly run 35g or 100g and do change over in between when required

Plan-B

Simultaneously run 35g in one side of Stamper and 100g in another side

Stamper could go up to 42 Strokes per minute

	PLAN-A		PLAN-B	
	35g OR 100g Run Strategy		35g AND 100g Run Strategy	
SKU	35g	100g	35g	100g
No. of Cavity	24	14	12	7
	380	360	BOSCH Max Speed-380	ACMA Max Speed-360
Stamper Stroke	15/16	25/26	32	32
				Stamper Becomes a Bottle Neck
Daily	13.41	36.29	13.41	22.58
Average Monthly Demand	350		350	677.376
Run per Month(Day)	26	4	30	30
Volume per Month	350	145.152	402.192	677.376
Total Monthly Production	495.152		1079.568	
Delta Volume per Month	584.416			
Delta Volume per Annum	**6311.6928**			

If we Choose Plan-B

Cons of Plan-A:

- Number of Change Over is high
- Change Over loss is High
- Inconsistent delivery

Pros of Plan-B:

- Number of Change Over is ZERO
- Change Over loss is ZERO
- Consistent Delivery

Delta Volume 6311 T/ Annum

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STEP-03

Option Evaluation

What we require — To feed 7% Growth

New Flow Wrap Machine

- Two Machine 2*300 UPM → Layout constraint → Not feasible X
- One Machine 1*500 UPM → A Capex of 3 Crore BDT → High Cost X

NOW??

Upgrade the existing Flow Wrap Machine from 300 to 400 UPM

- Minimum Capex
- Maximum Profit

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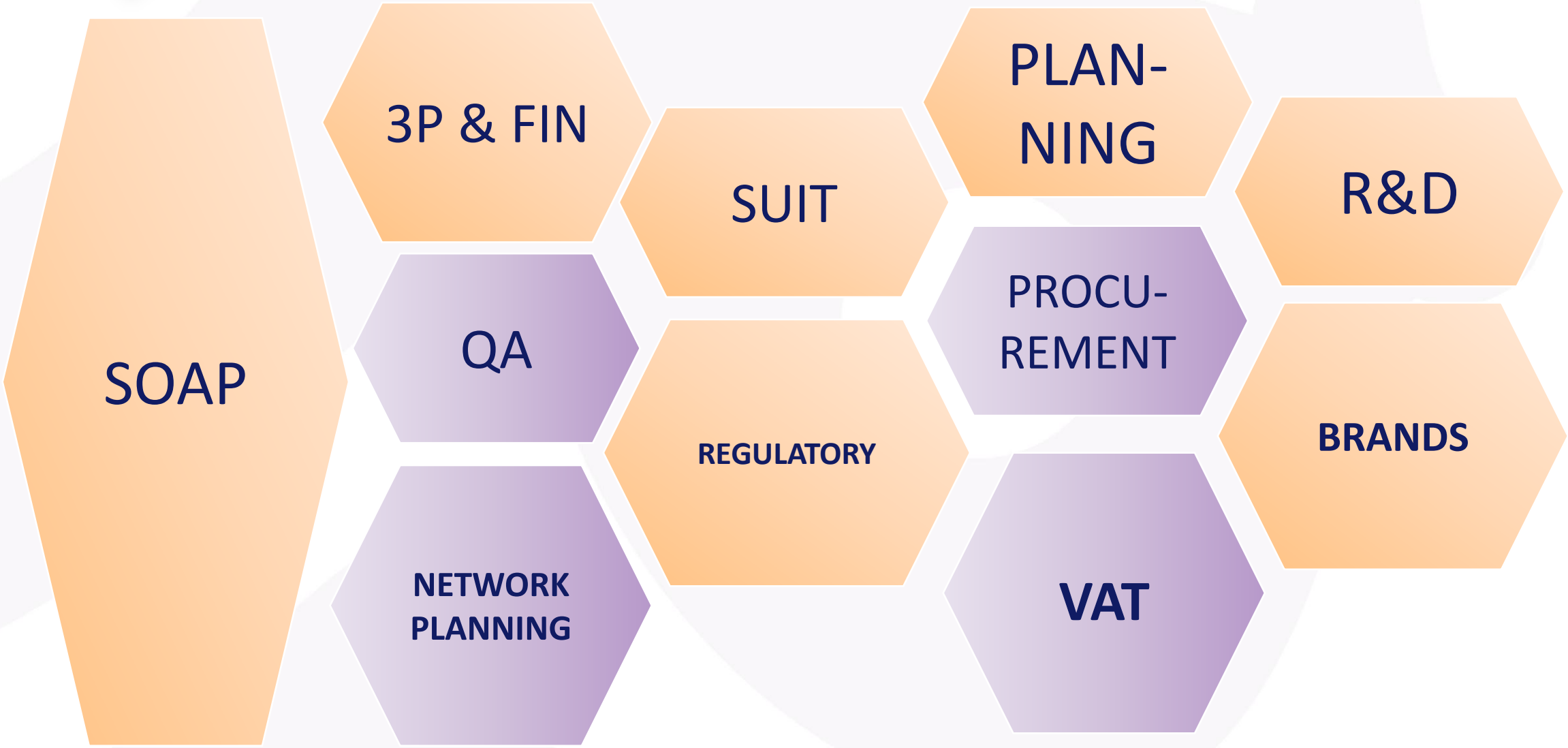
STEP-04

Cross Functional Team Formation



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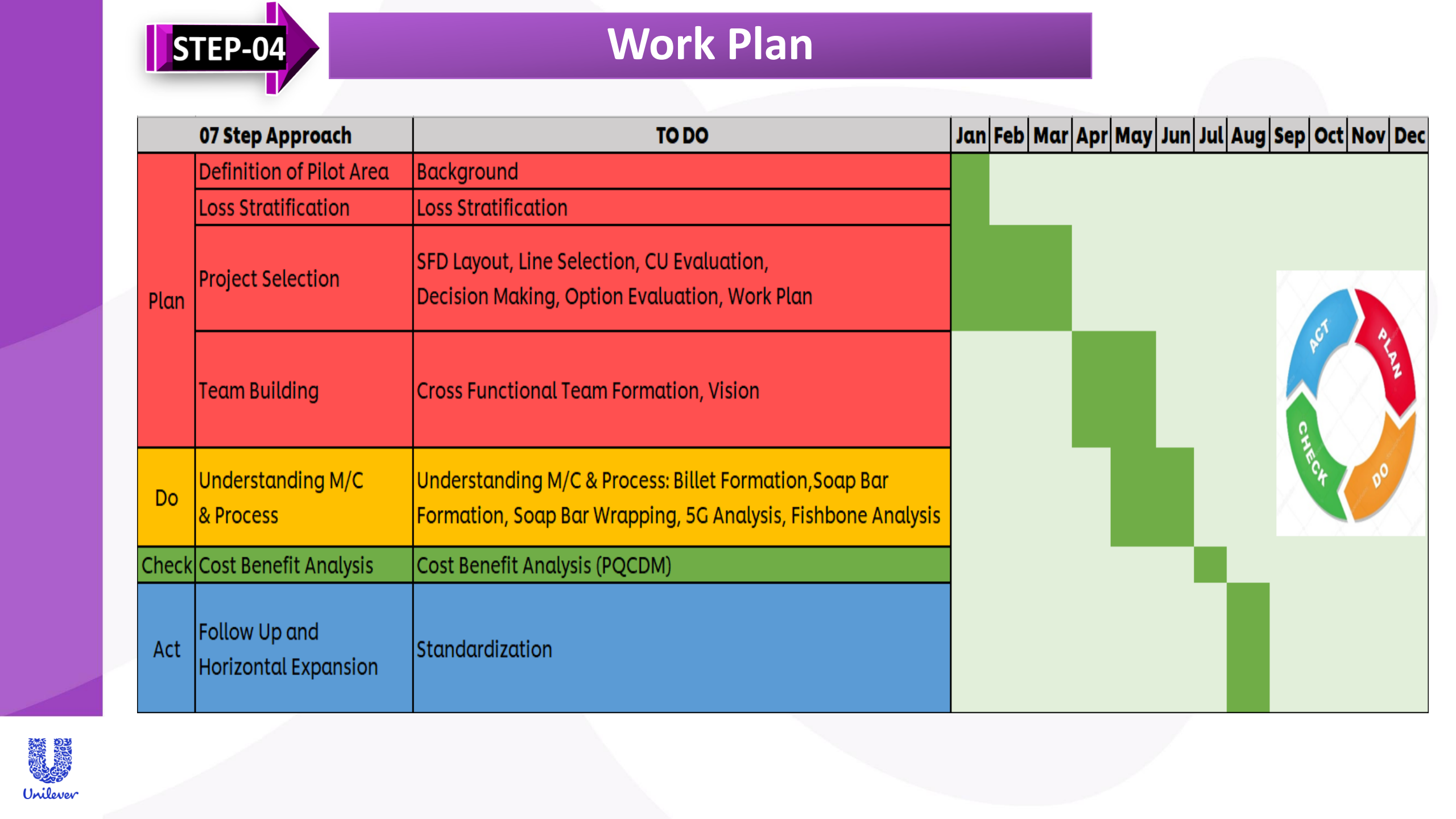
STEP-04

Work Plan

07 Step Approach		TO DO
Plan	Definition of Pilot Area	Background
	Loss Stratification	Loss Stratification
	Project Selection	SFD Layout, Line Selection, CU Evaluation, Decision Making, Option Evaluation, Work Plan
	Team Building	Cross Functional Team Formation, Vision
Do	Understanding M/C & Process	Understanding M/C & Process: Billet Formation,Soap Bar Formation, Soap Bar Wrapping, 5G Analysis, Fishbone Analysis
Check	Cost Benefit Analysis	Cost Benefit Analysis (PQCDM)
Act	Follow Up and Horizontal Expansion	Standardization



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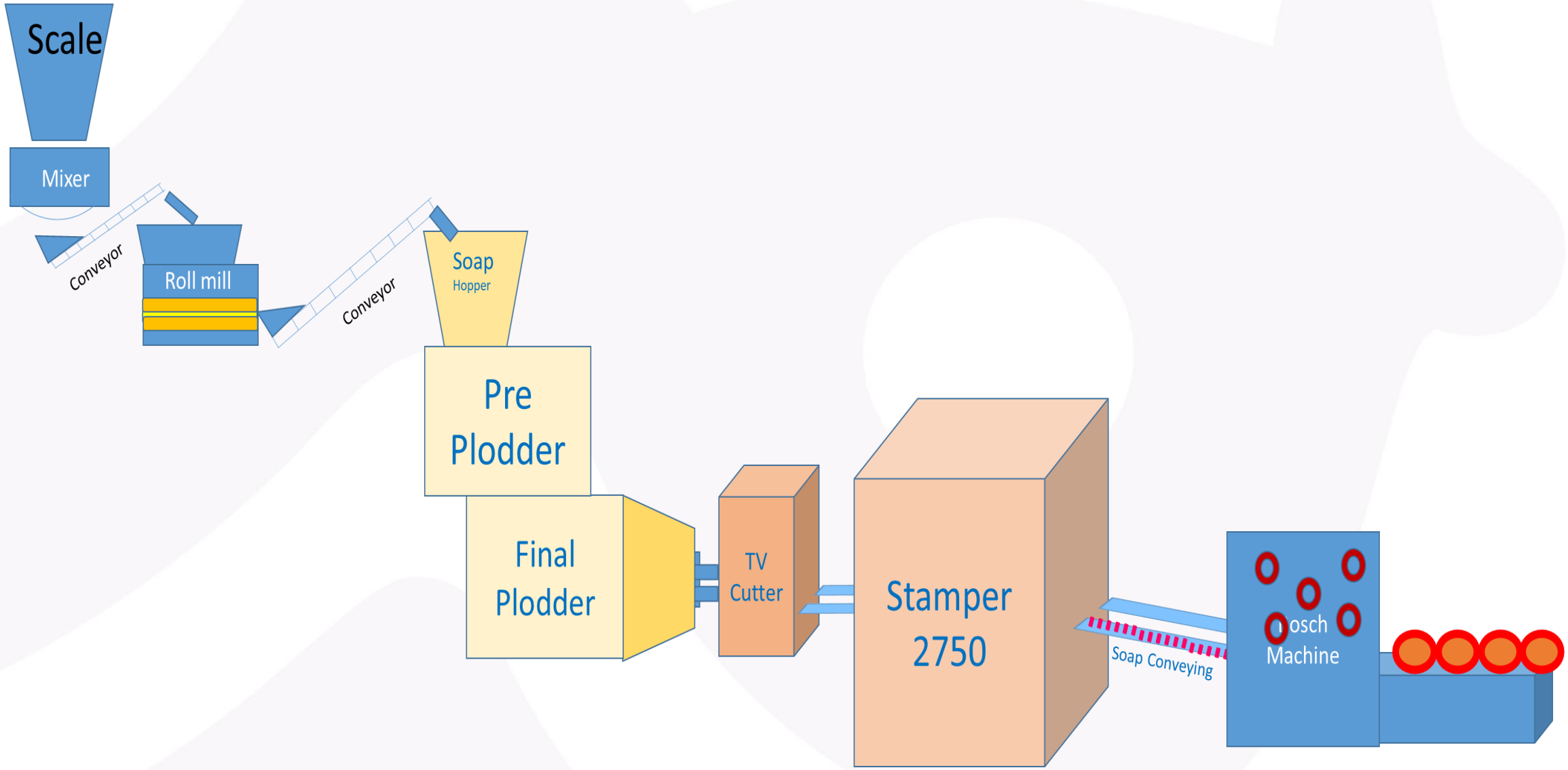
STEP-04

Vision

NMSCC cost Saving BDT 6.0 Cr/Yr

STEP-05

Understanding M/C & Process



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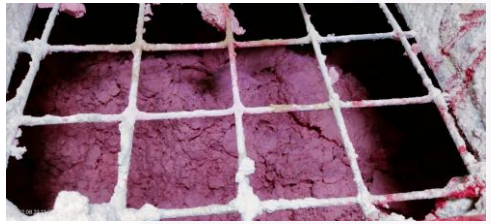
STEP-05

Understanding M/C & Process: Billet Formation



soap mixing in Mixer
after addition Of all
ingredients as per SOP

Mixed soap is transferred
to roll mill through
transfer belt where soap
grit controlled

From rollmill soap is transferred to duplex plodder.
In pre-plodder, foreign particle of soap is removed by a mesh filter.
In final plodder vacuum is created to make the soap air free

After vacuum, soap is heated
At 60-70degree C at cone heater
for Smooth billet surface

Air free soap is coming out of
Eye plate (fixes bar orientation)
as soap billet after going
through Extrusion process

Soap bar after eye plate is
Cut in specified length by
Electronic cutter into bsillet

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STEP-05 Understanding M/C & Process: Soap Bar Formation

After electronic cutter, billet is fed into the USN 2750 stamper through conveyor

Billet lifter arm sucks the billet for lifting from the conveyor through vacuum

Lifter arm lifts the billet and puts it on the lower die surface

Upper die and lower die presses against each other to form soap bar

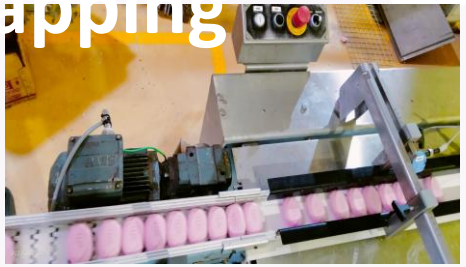
Tablet lifter arm lifts the soap bar from lower die surface and discharges to the delivery conveyor belt

Soap bar is finally formed and discharged through flexlink conveyor

STEP-05

Understanding M/C & Process: Soap Bar

Through flexlink and IL5 Conveyors soap bar is fed to the wrapping machine IL5210 BOSCH

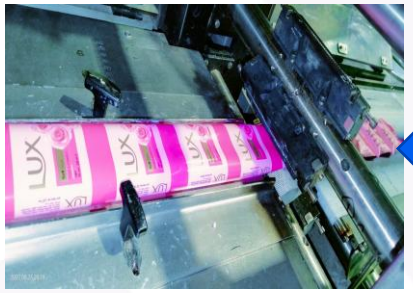


Soap bar transfer from flexlink conveyor to IL5 conveyor where soap bar is separated through speed synchronization

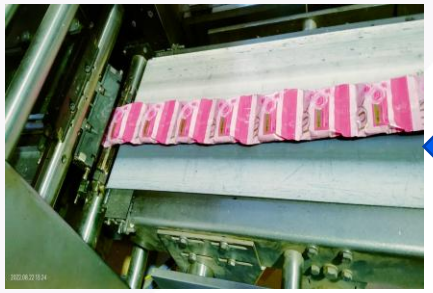
Soap bar is being transferred From IL5 to finger conveyor where Soap bar is being pocketed and Stabilized to maintain certain repeat Length between soap bar

Reel holder holds the laminate reel and transfers the laminate to sachet forming box

Laminate in the sachet forming box forms the sachet with soap bar inside



Sachet is being sealed and cut in the batch cutter section



Generating a string of 12 soap sachet in a row which is to be packed manually by 3p

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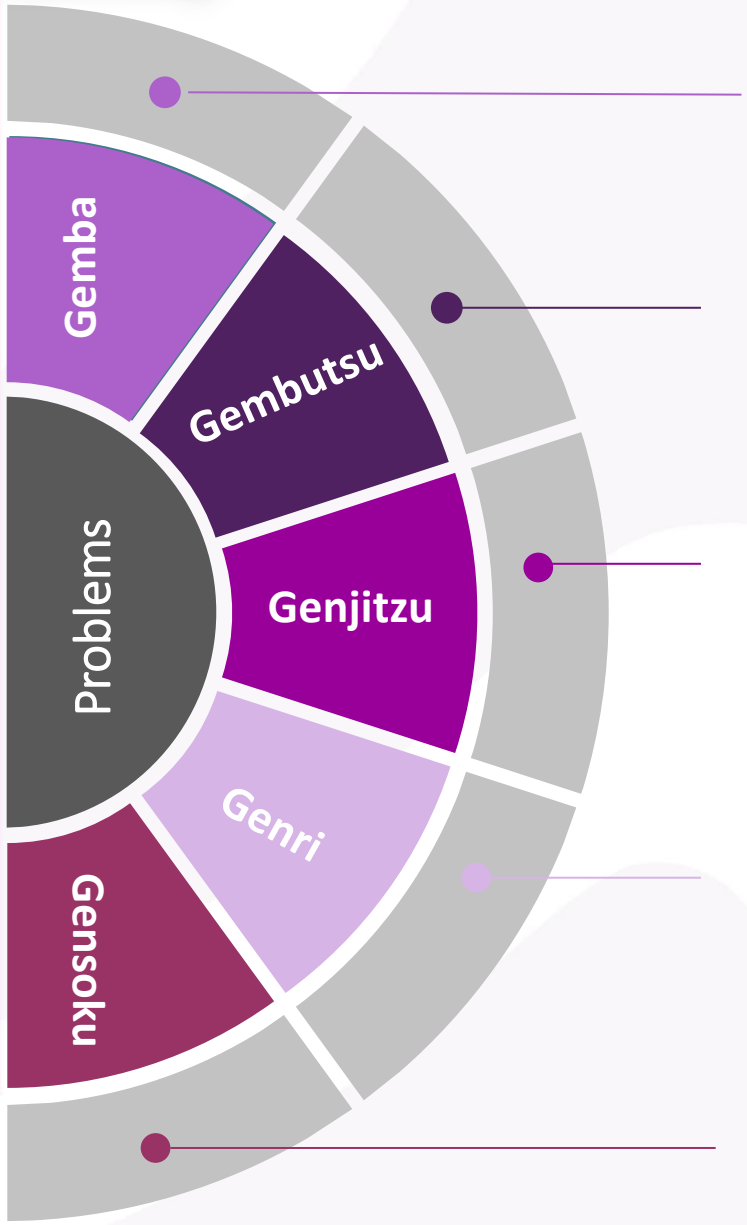
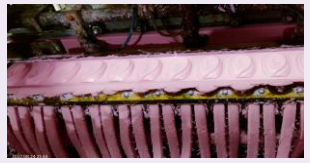
STEP-05

5G ANALYSIS



1st G	**GO TO THE SPOT**	Mixer, Plodder, Cutter, Stamper
2nd G	**EXAMINE THE OBJECTS**	EXAMINE THE BILLET DIMENSIONS
3rd G	**CHECK FACTS AND FIGURES**	 JAMMING BEFORE STAMPER  HIGH OFFCUT RECYCLE  BENT BILLET
4th G	**REFER TO THEORY**	STAMPER JAMMING DUE TO DIFFERENTIAL PLODDING, HIGH OFFCUT RECYCLE, UNSTABLE BILLET
5th G	**FOLLOW THE STANDARD**	LINE STABILIZATION

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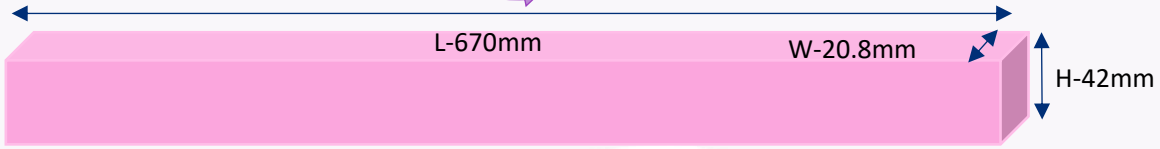
STEP-05

Identified Problems- Billet

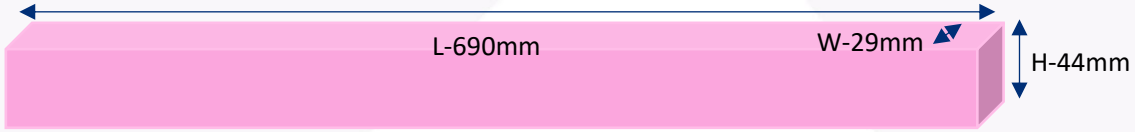
Stamper Jamming

DIFFERENTIAL PLODDING

When same plodder is used to make different dimension billets



Weight-670g



Weight-960g

Criteria

- **Maximum**
  - Stability
  - Capacity
- **Minimum**
  - Offcut Recycle
  - Differential plodding

CAN NOT AGGREGATE!

Unstable Bar

BILLET LOW STRENGTH

Reduced dimension of billets result in low strength of billet

Use similar dimension billet for both SKUs

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STEP-05

Trial and Error

Target offcut recycling: Less than 40%

Trial 1:

Offcut recycling: 66.4%

TOO HIGH

Decision: Change die orientation

Trail 2:

Issues that arise from high offcut recycling:

- Overload on stamper
- Stamper lifetime reduction
- Soap becomes hard

No. of Cavity	Stamper Strokes
9	45
12	32

Capacity Unlock

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STEP-05

Trail 2 (Cont):

Offcut recycling: 55%

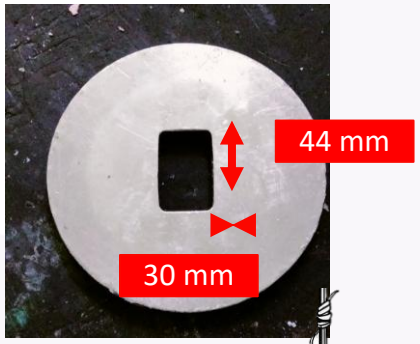
Still TOO HIGH

OFFCUT MUST BE BROUGHT UNDER 35%

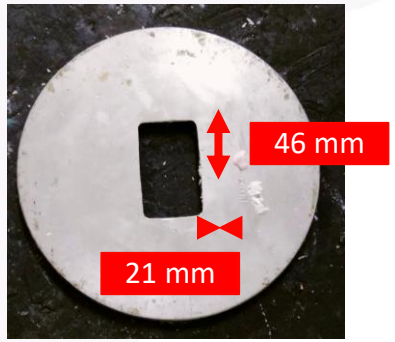
Decision: Change billet dimension

Trial 3:

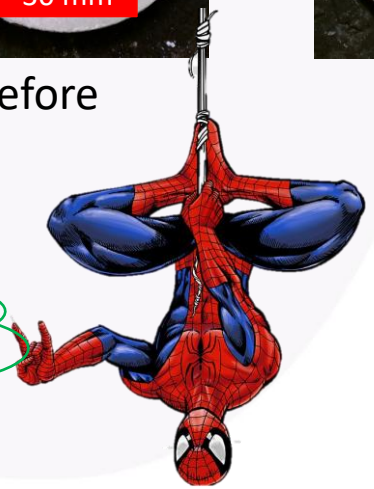
Offcut recycling: 34.8%



Before



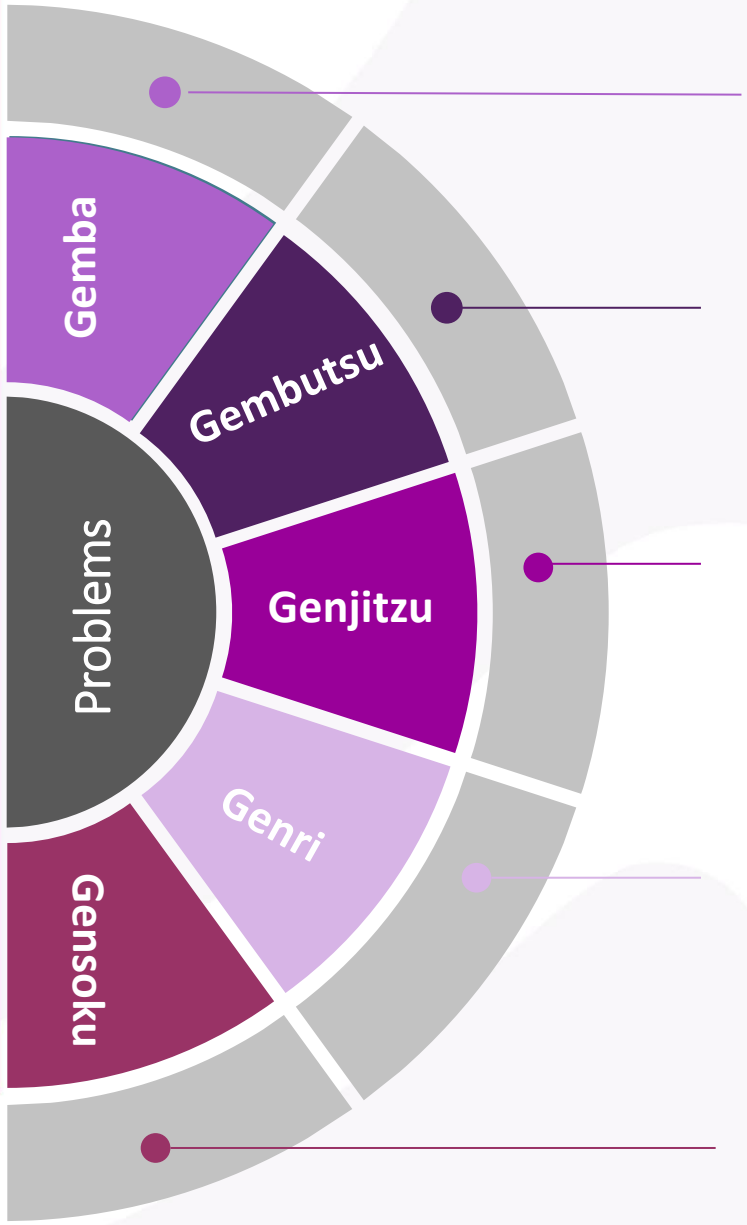
After



Offcut Reduced, Capacity Unlocked

STEP-05

5G ANALYSIS



1st G	**GO TO THE SPOT**	Flexlink conveyor
2nd G	**EXAMINE THE OBJECTS**	CONVEYOR JAMMING
3rd G	**CHECK FACTS AND FIGURES**	 JAMMING
4th G	**REFER TO THEORY**	JAMMING IN CONVEYOR DUE TO ROUGH SURFACE OF FLEXLINK AND GUIDER, CONVEYOR ANGLE
5th G	**FOLLOW THE STANDARD**	LINE STABILIZATION

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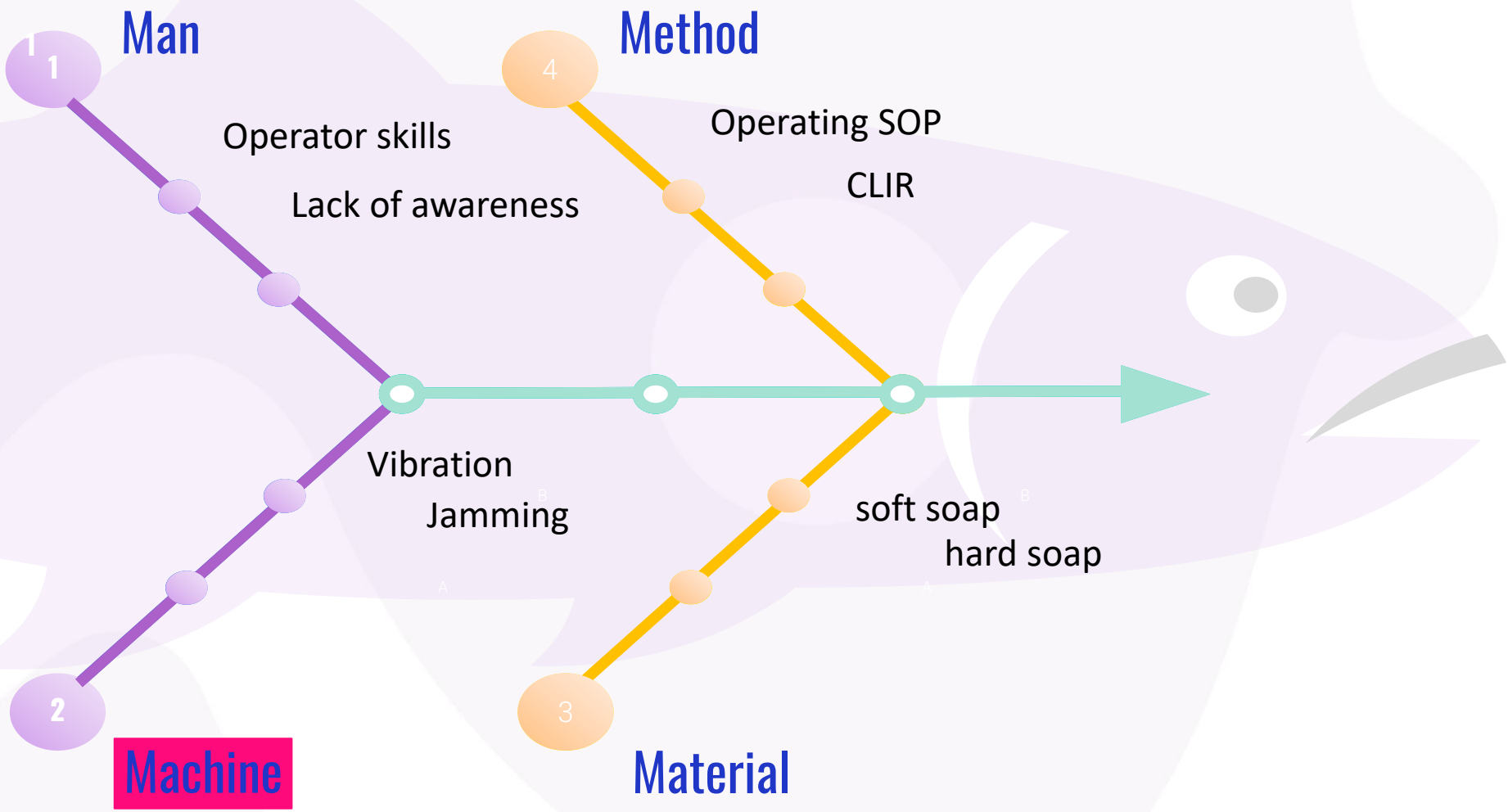
STEP-05

4M (fishbone) Analysis- Flexlink conveyor



STEP-05

RCA- FLEXLINK CONVEYOR

phenomenon		concept advancing method					countermeasures
where	what	why	why	why	why	why	
Bosch infeed flexlink conveyor	jamming 	1. flexlink guider rough surface 	1.CLIR ensured				
		2.sticky soap	2. high moisture soap from mixer	2. low TFM noodle from dryer	2.Dryer operation to be fixed at >74.6 TFM		
		3. flexlink conveyor rough surface 	3.CLIR ensured				
		4.Soap rotation on conveyor	4.soap colliding with each other	4. soap bar getting stuck with each other at guider end at while rotating at 90degree angle 	4. soap momentum high while travelling at that 90degree conveyor angle	4. flexlink conveyor travel angle 90 degree 	1. Conevyor travelling angle change to 45 degree

Kaizen1

Before:

Soap travelling angle was at 90degree

After:

Soap travelling angle is 45degree and soap is travelling smoothly

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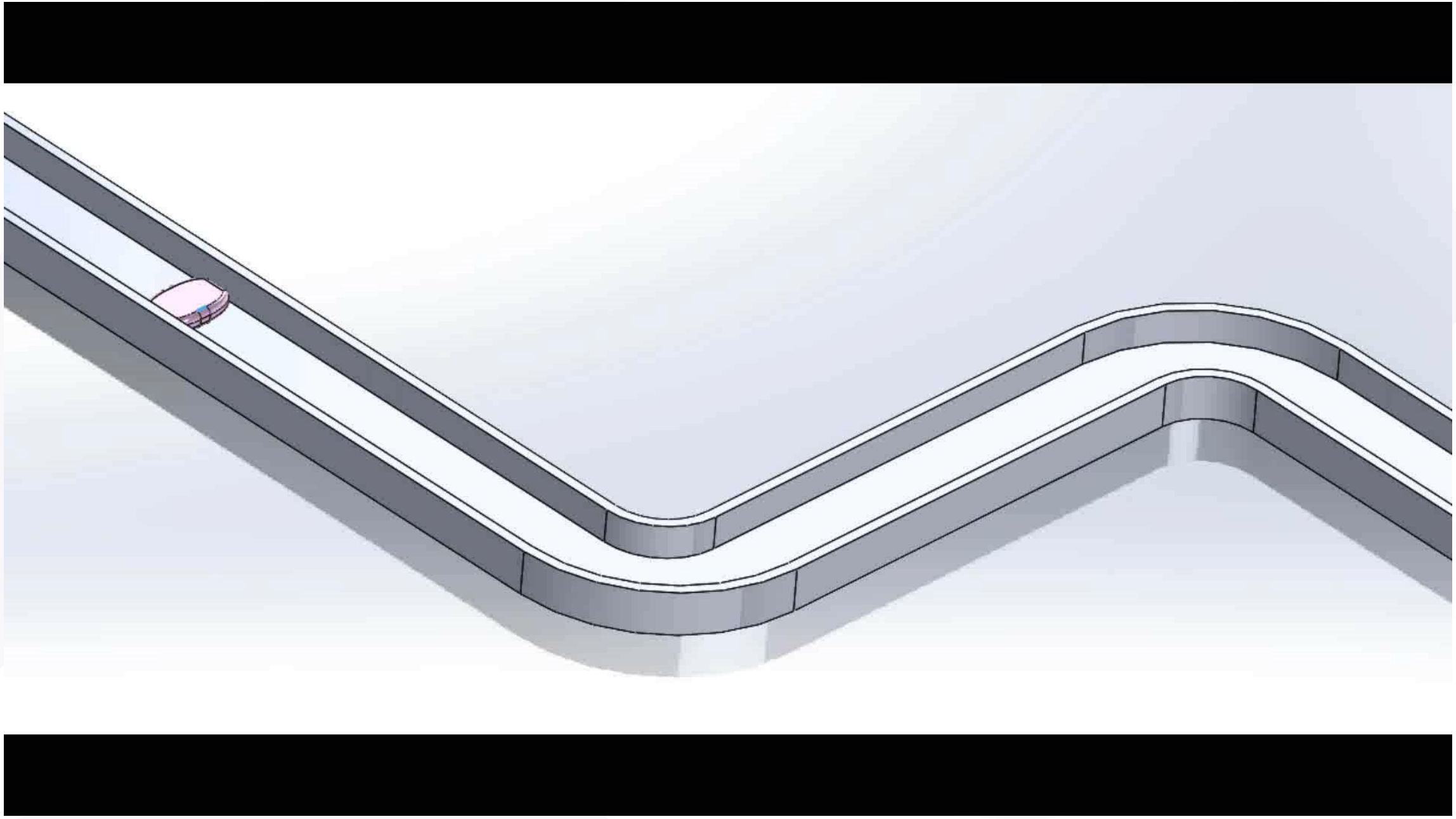
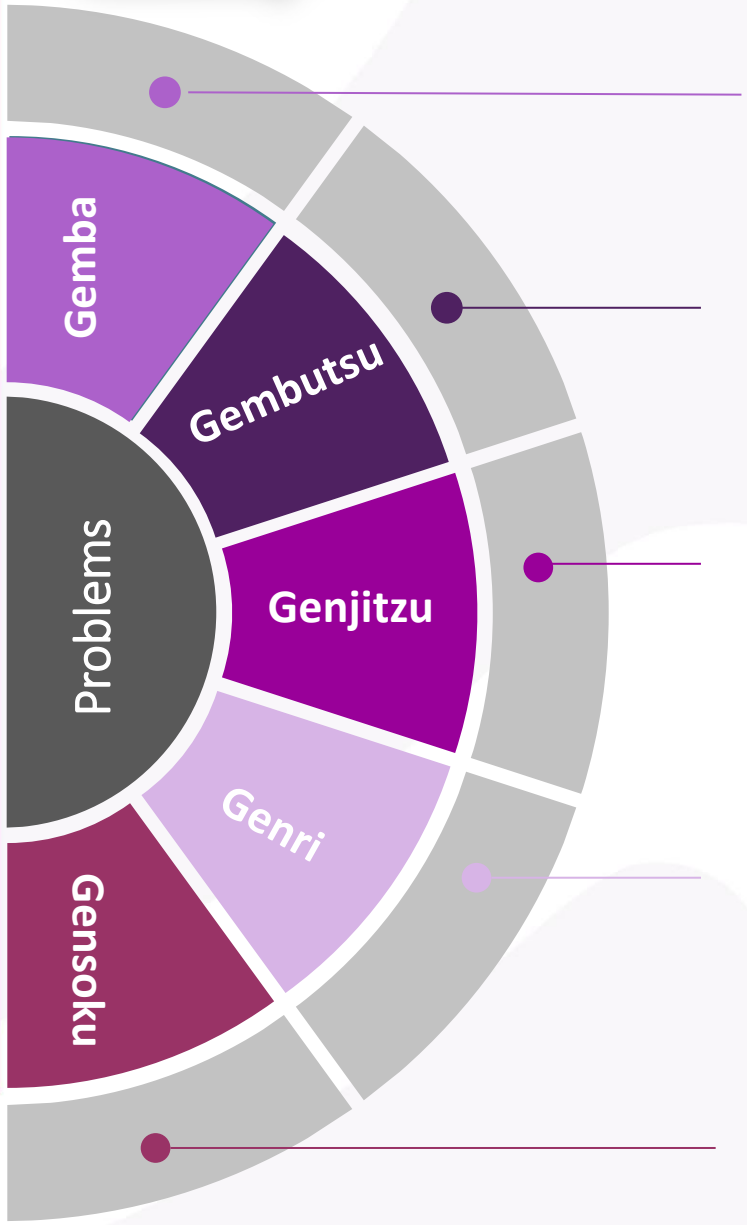
Kaizen-1 Animation



STEP-05

5G ANALYSIS



1st G	**GO TO THE SPOT**	BOSCH
2nd G	**EXAMINE THE OBJECTS**	IMPROPER SEALING
3rd G	**CHECK FACTS AND FIGURES**	 IMPROPER SEALING/CUTTING
4th G	**REFER TO THEORY**	IMPROPER SEALING/CUTTING DUE TO DOUBLE SOAP, VERTICAL SOAP
5th G	**FOLLOW THE STANDARD**	LINE STABILIZATION

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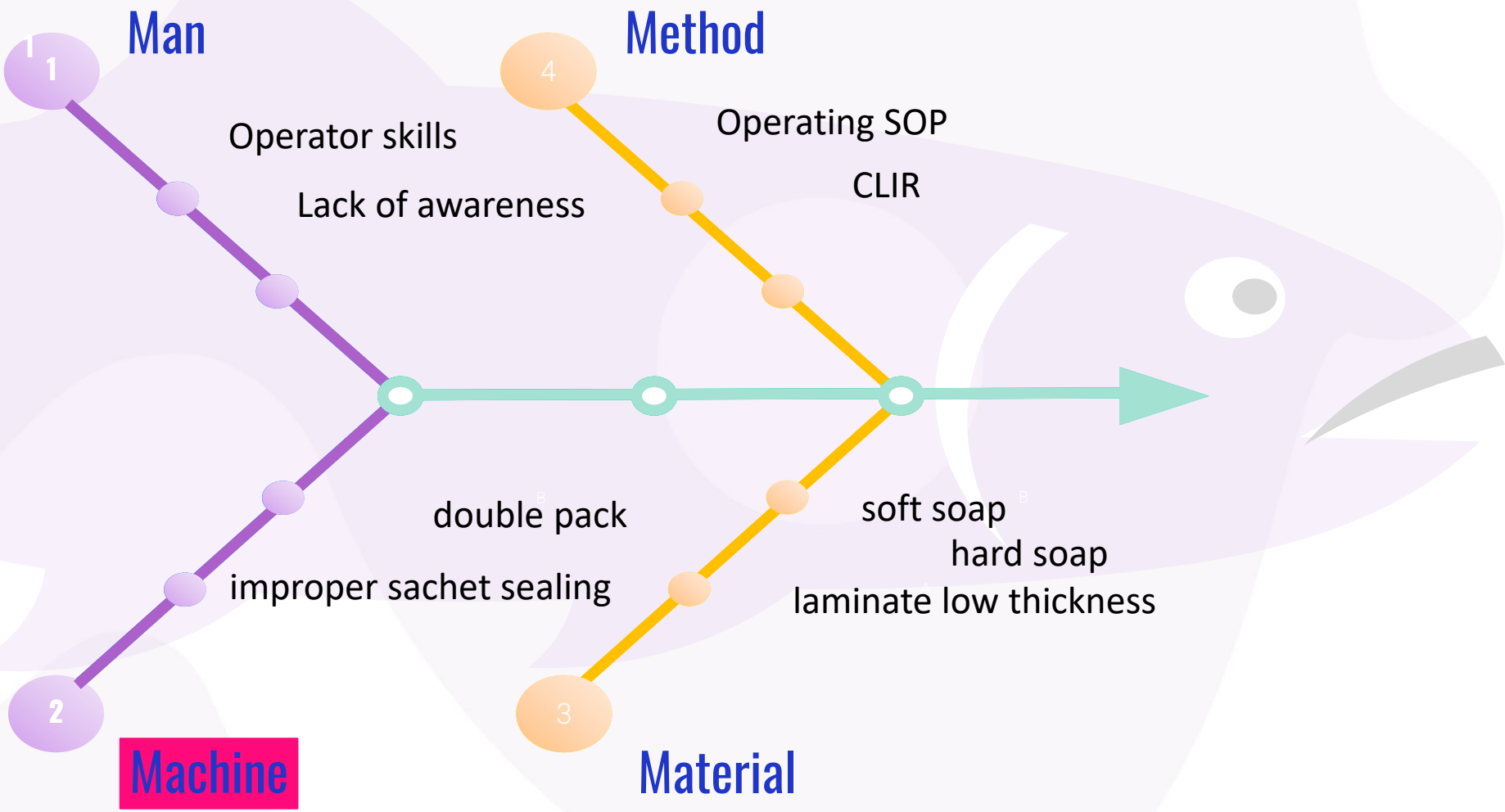
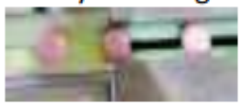
STEP-05

4M (FISHBONE) Analysis- BOSCH



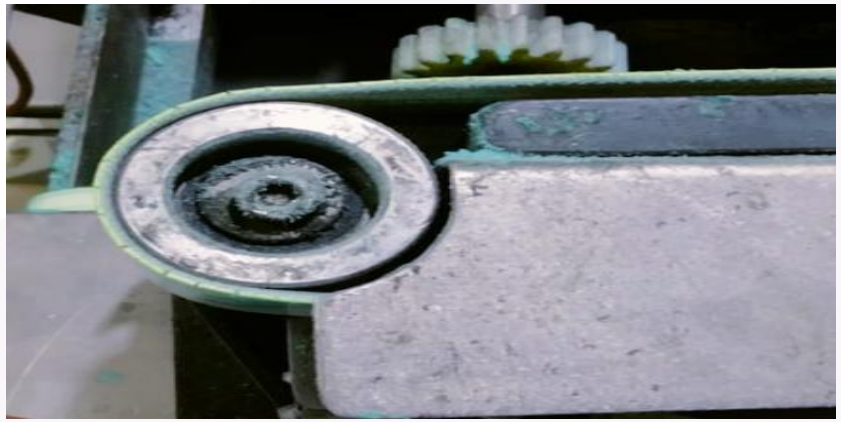
STEP-05

RCA - BOSCH

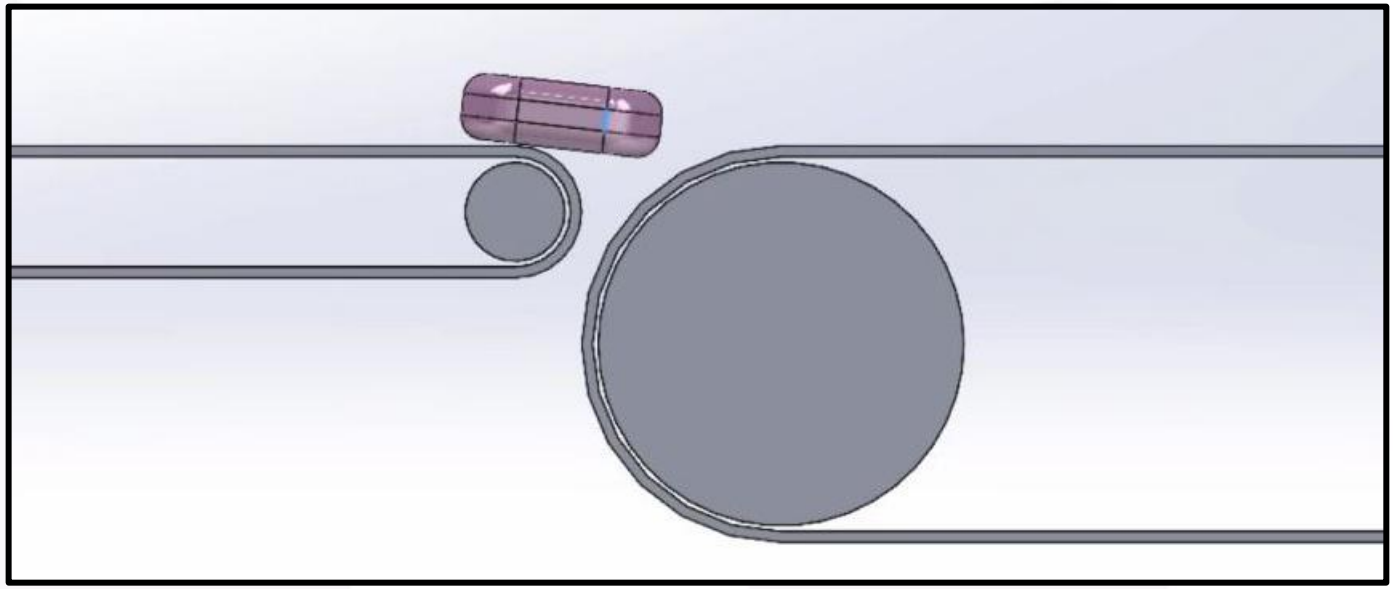
phenomenon		concept advancing method						countermeasures
where	what	why	why	why	why	why	why	1. Gap between the conveyor to be reduced 2. finger size increase with respect to soap length
BOSCH	improper sealing in sachet/cutting	1. soap in sealing area 	1.1 double soap in sachet  1.2 Soap rotation in vertical position in pocket conveyor 	1.1.1 Soap tilting Gap conveyor to finger conveyor  1.2.1 guider and conveyor rough surface 1.2.2 Finger contact area low with respect to soap length (62mm) 1.2.3 improper finger shape	1.1.1 Gap between two conveyor (18mm) is high with respect to soap bar width (25mm) 1.2.1 CLIR ensured 1.2.2 Finger size (7mm) with respect to soap length	1.1.1 Gap conveyor dia (10mm) and flexlink conveyor drive (40mm) dia is different		
		2.Heater temperature low	2. heater temperature fixed at 180degree					
		3. Jaw pressure low	3. jaw pressure adjusted					
		4. sealing jaw dirty	4. CLIR ensured					
		5. Cutter sharpness low	5. Cutter replacement SOP developed					

STEP-05 KAIZEN-2

Before:

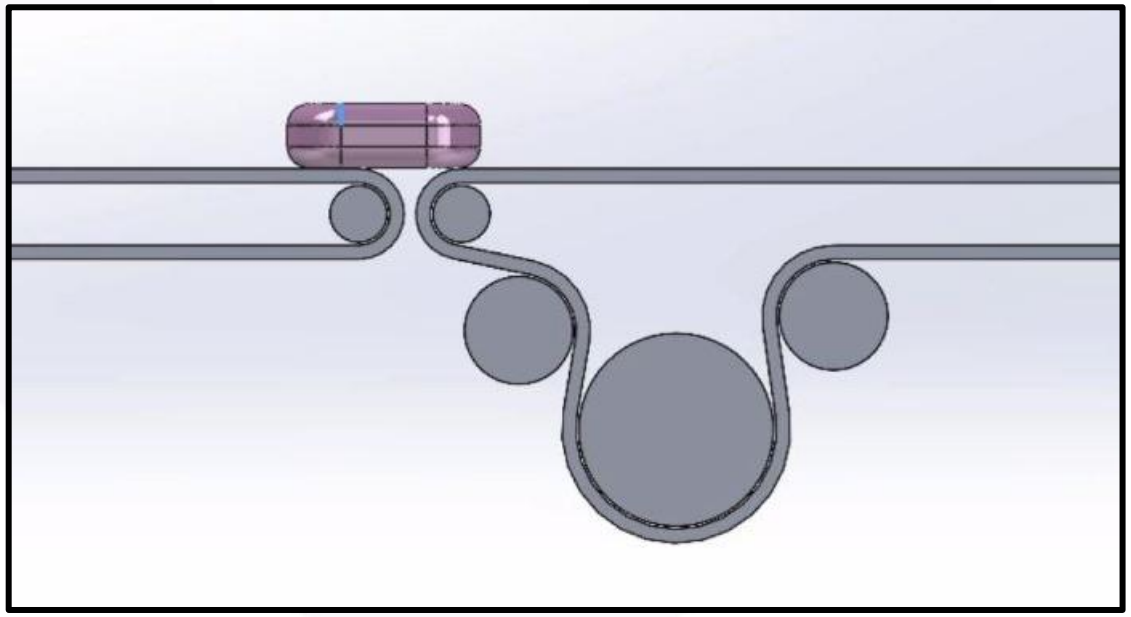


Finger conveyor drive roller dia 40mm



After:

3 roller added of dia 10mm to reduce the conveyors gap to 8mm



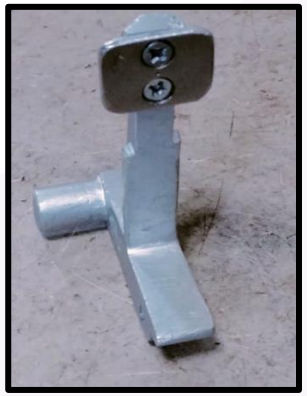
KAIZEN-3

Before:

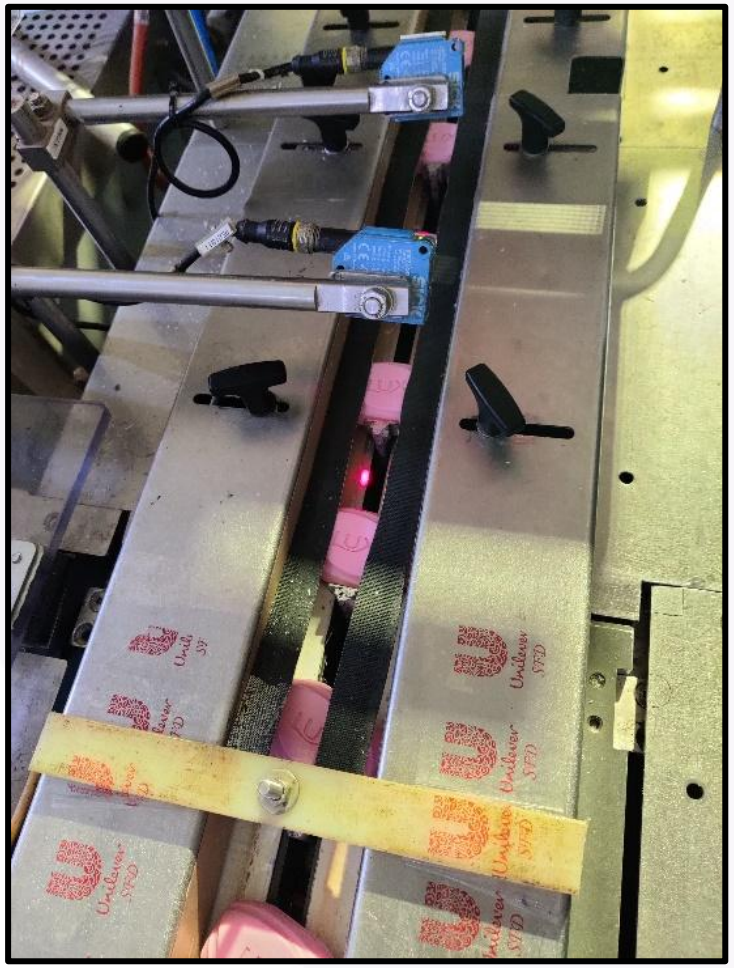
Finger width
7mm

KAIZEN-3

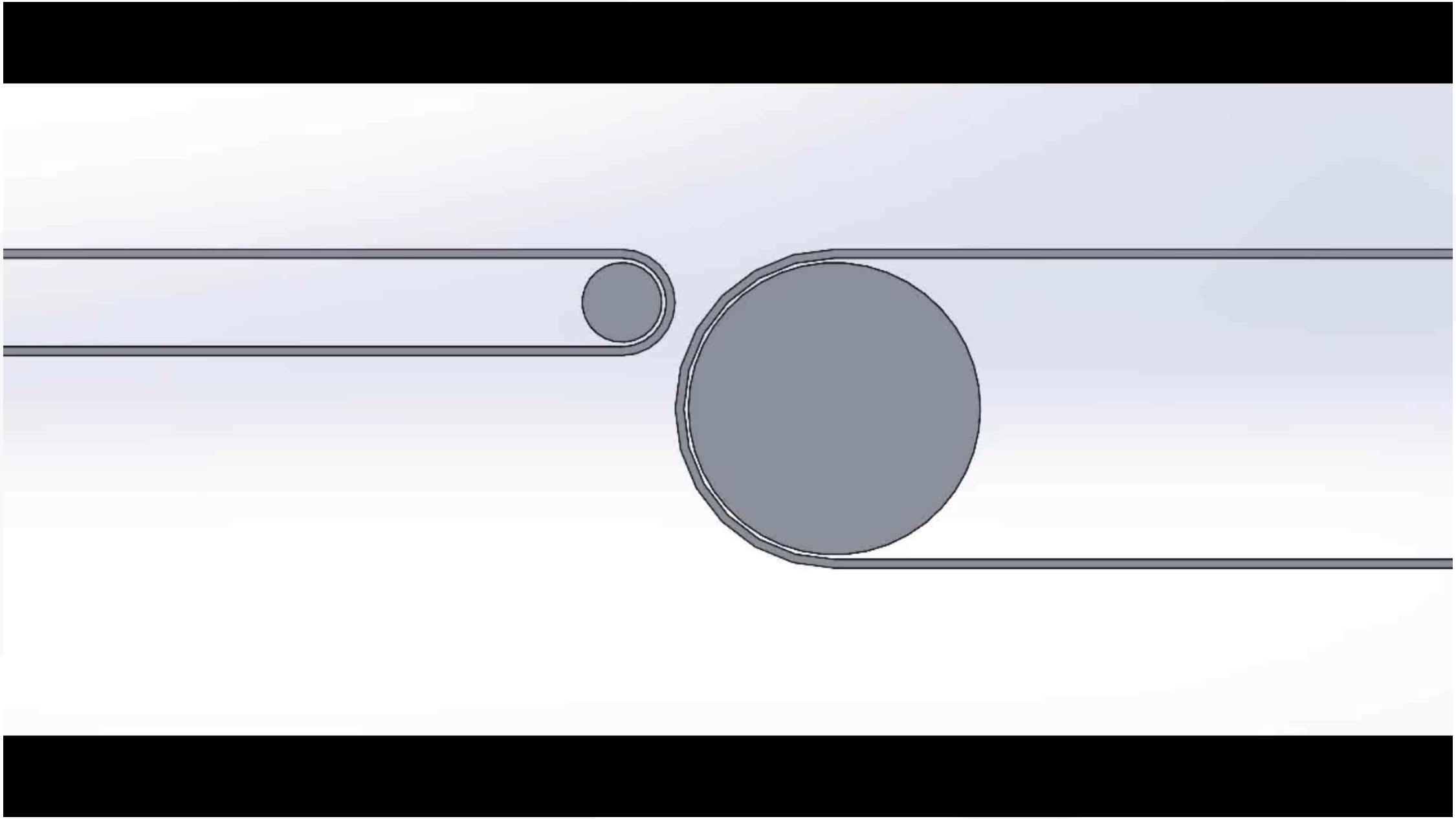
After:



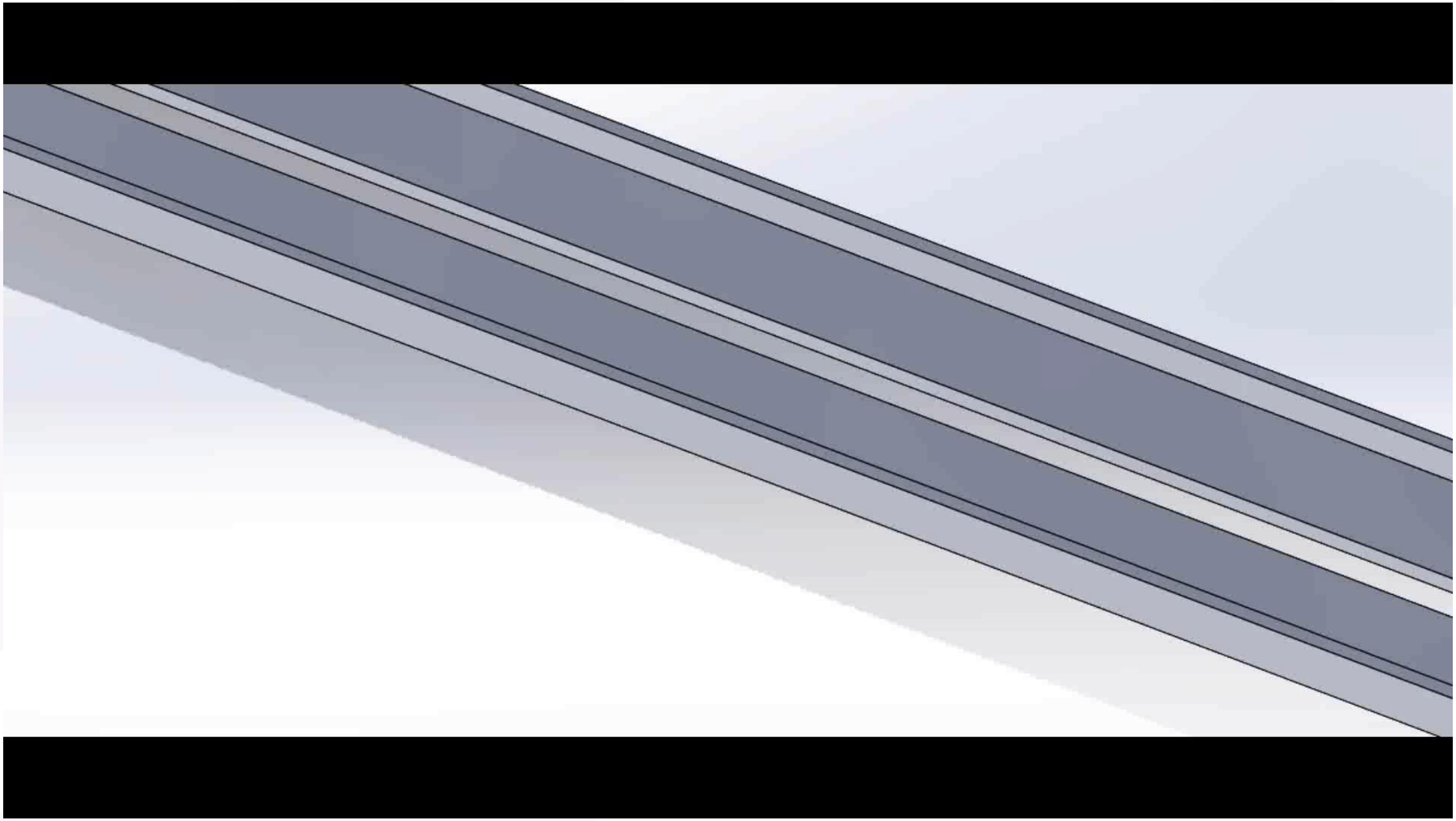
Finger width
20mm



Kaizen-2 Animation



Kaizen-3 animation



STEP-06

Cost Benefit Analysis

Capex:3.9 Cr

NMSCC cost leverage 407bps

Skin Cleansing GM Improvement 45 bps

NMSCC cost savings 5.6Cr BDT/Yr

DNS KGF CPT decrease 2-3%

Plastic saving 920kg

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STEP-06

Cost Benefit Analysis (PQCDM)

P- Addition of Lily Volume 3000T/yr

Q-Better Governance and more skilled labor

C- Savings 5.6Cr BDT/ Year

D- Better quality, product delivery from safer environment

S- Better Governance

M-Passionate workforce as own creative work has been recognized

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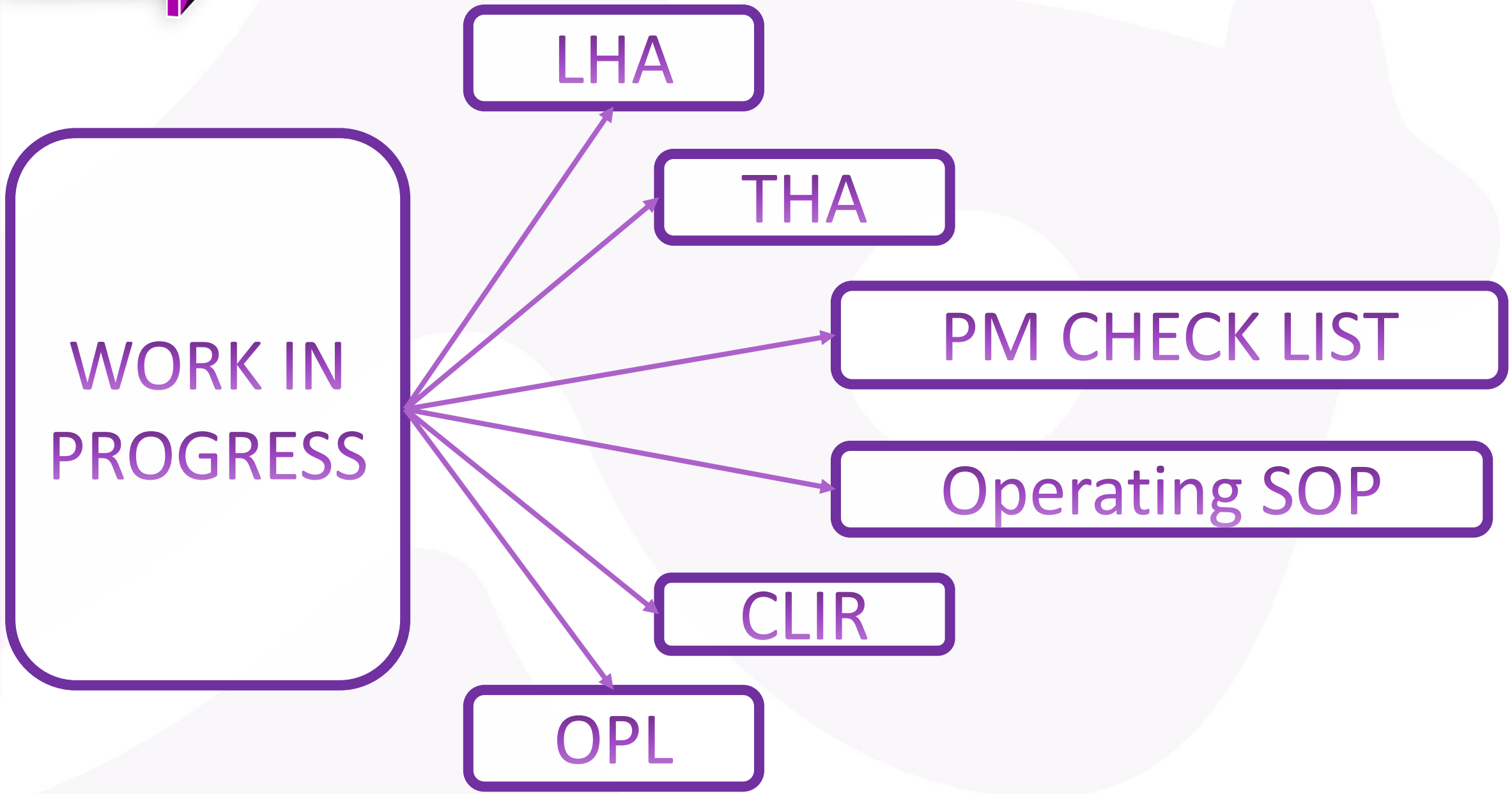
STEP-07

Standardization



STEP-07

Future Plan

Mini: Home Expansion Capacity Increase

Lily in L-4 Bosch-2

Installing Up-Spiral & Down-Spiral After L-5 Stamper

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Thank You!!!

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