



Cultura de Excelencia Operacional en ambiente EMS.

ZOLLNER ELECTRONICS

Ing. Octavio Matus
Ing. Víctor Sánchez

Costa Rica Operation



Costa Rica Operation (Customers)



Costa Rica (Strategic Plan)

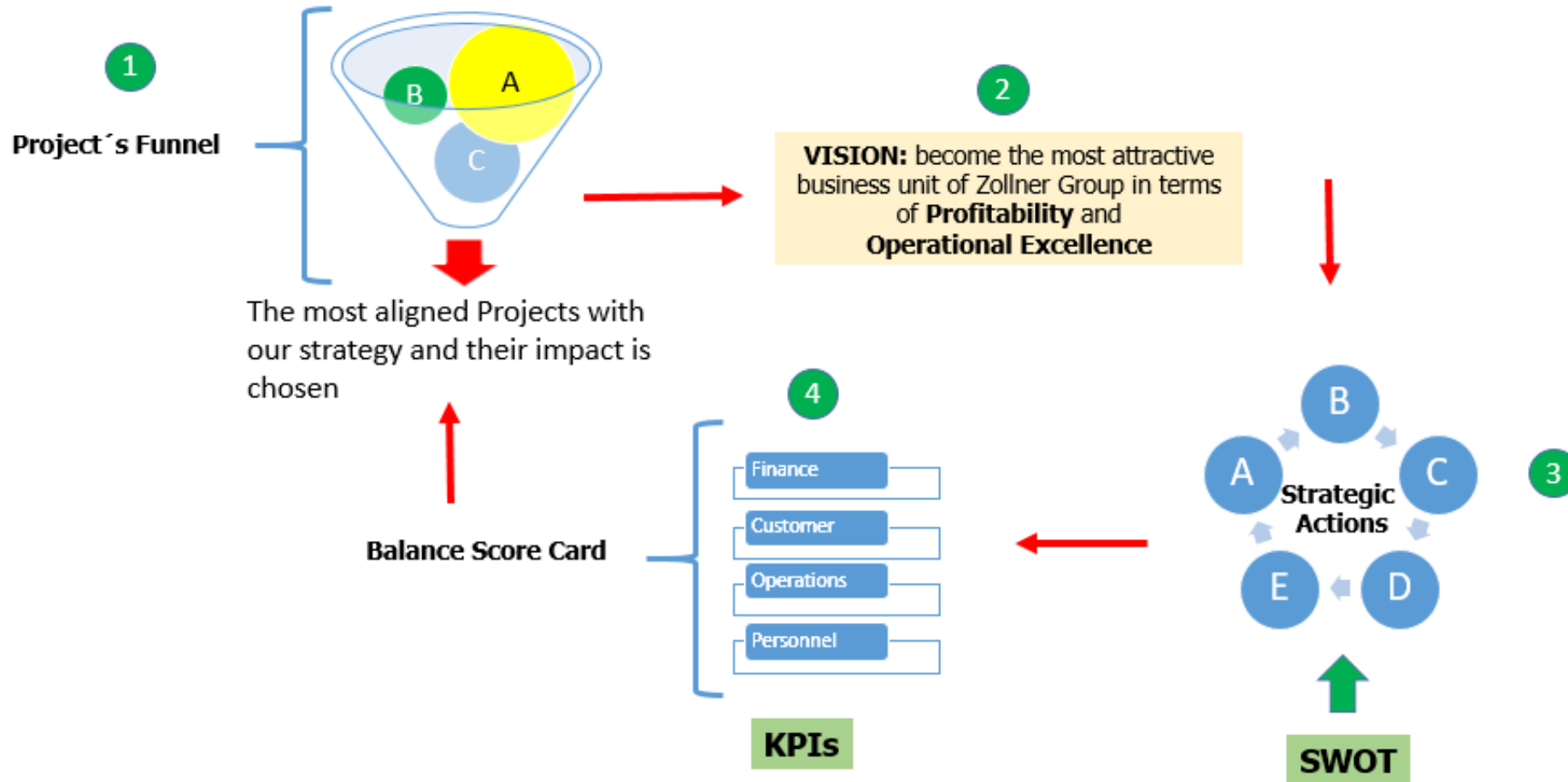


Strategic Plan Zollner Costa Rica

Rev F

MISSION	<p>1. Market: Automotive, Industrial, Medical Electronics and Aerospace 2. Sales market location: Americas 3. Products: PCBA, Mecatronics and Services 4. Differential: talented and highly educated workforce & expertise & continuous improvement</p>							
VISION	<p>Become the most attractive business unit of Zollner Group in terms of: Operational Excellence and profitability</p>							
VALUES	RESPECT	LOYALTY	COMMITMENT	ETHIC	HONESTY	QUALITY	CONTINUOUS IMPROVEMENT	ENVIRONMENTAL COMMITMENT
Strategy: Create a profitable Zollner plant								
OBJECTIVES	Maximize/increase revenues/increase customer base	Customer Service Excellence Orientation	Be a World Class Manufacturing facility/Lean Six sigma philosophy	Create a GPTW Teamwork, Proud, Fair, Respect, Credibility				
KPI's	<p>1. SALES 2. EBITDA/EBIT/EVA 3. ITO 4. NNIR (Not Necessary Inventory Rate) 5. Freight Cost (In/Out) 6. Material Cost 7. Inventory Accuracy 8. Electricity Consumption 9. Nitrogen Consumption</p>	<p>1. OTD 2. CUSTOMER COMPLAINS 3. CUSTOMER SATISFACTION</p>	<p>1. OEE 2. Internal Failure Cost 3. DPMO 5. Closing Orders 6. Orders Confirmation 7. Planning Accuracy 8. IT AVAILABILITY 9. Backlog Quote (Open Order)</p>	<p>1. TURN OVER 2. GPTW Metric 3. ABSEENTISM 4. ACCIDENT RATE</p>				
BSC	FINANCE	CUSTOMER	PROCESS	PEOPLE				

Project definition and selection



DMAIC Activities (LSS Projects)

**Project
Status**

2024

Define

- Review Project Charter
- Validate Problem Statement and Goals
- Validate Voice of the Customer and Voice of the Business
- Validate Financial Benefits
- Validate High-Level VSM and Scope
- Create Communication Plan
- Select and Launch Team
- Develop Project Schedule

Measure

- Value Stream Map for Deeper Understanding and Focus
- Identify Key Input, Process and Output Metrics
- Develop Operational Definitions
- Develop Data Collection Plan
- Validate Measurement System
- Collect Baseline Data
- Determine Process Capability
- Complete Measure Gate

Analyze

- Identify Potential Root Causes
- Reduce List of Potential Root Causes
- Confirm Root Cause to Output Relationship
- Estimate Impact of Root Causes on Key Outputs
- Prioritize Root Causes
- Complete Analyze Gate

Improve

- Develop Potential Solutions
- Evaluate, Select, and Optimize Best Solutions
- Develop 'To-Be' Value Stream Map(s)
- Develop and Implement Pilot Solution
- Confirm Attainment of Project Goals
- Develop Full Scale Implementation Plan
- Complete Improve Gate

Control

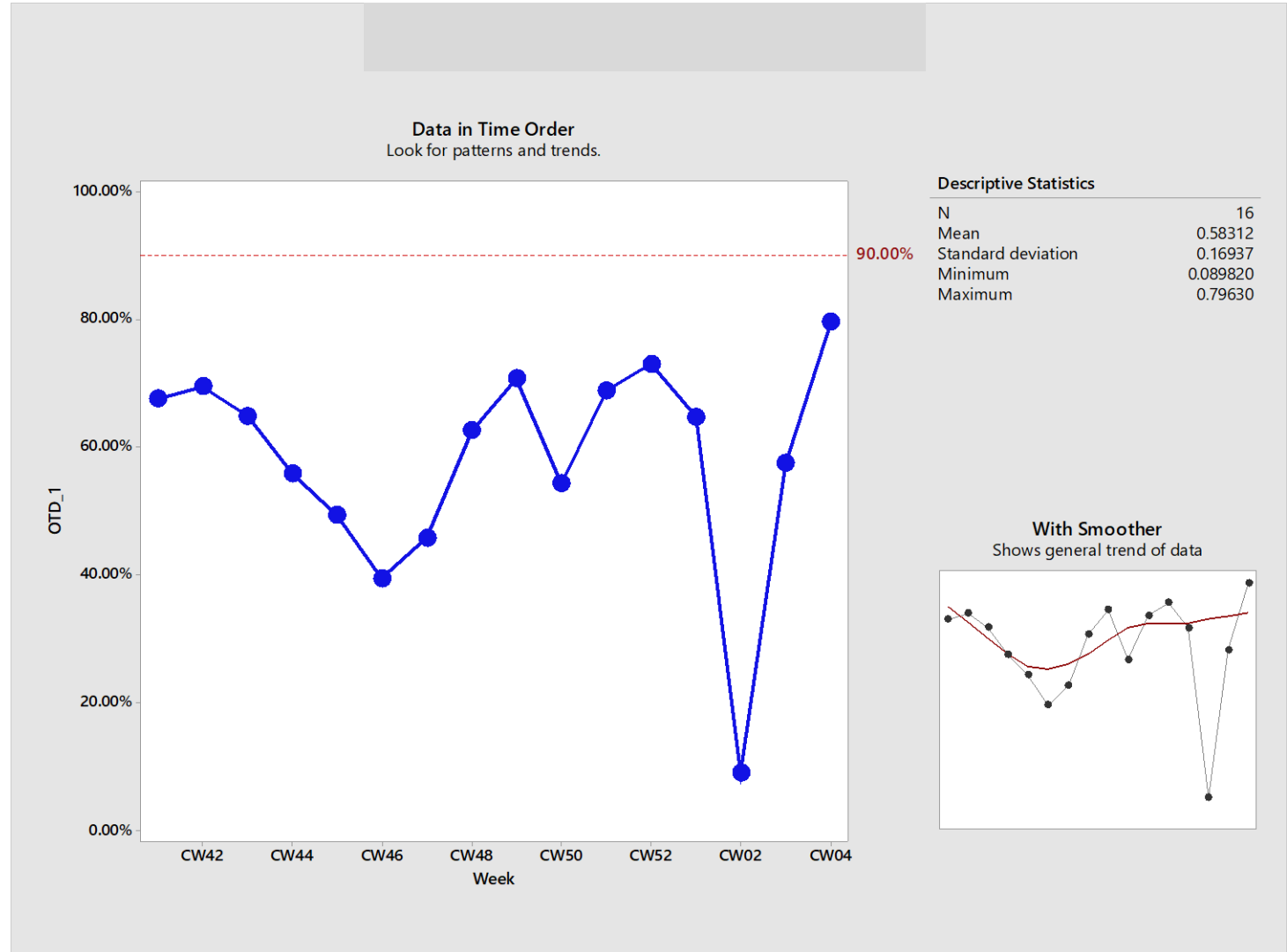
- Implement Mistake Proofing
- Develop SOP's, Training Plan & Process Controls
- Implement Solution and Ongoing Process Measurements
- Identify Project Replication Opportunities
- Complete Control Gate
- Transition Project to Process Owner

Gate Reviews

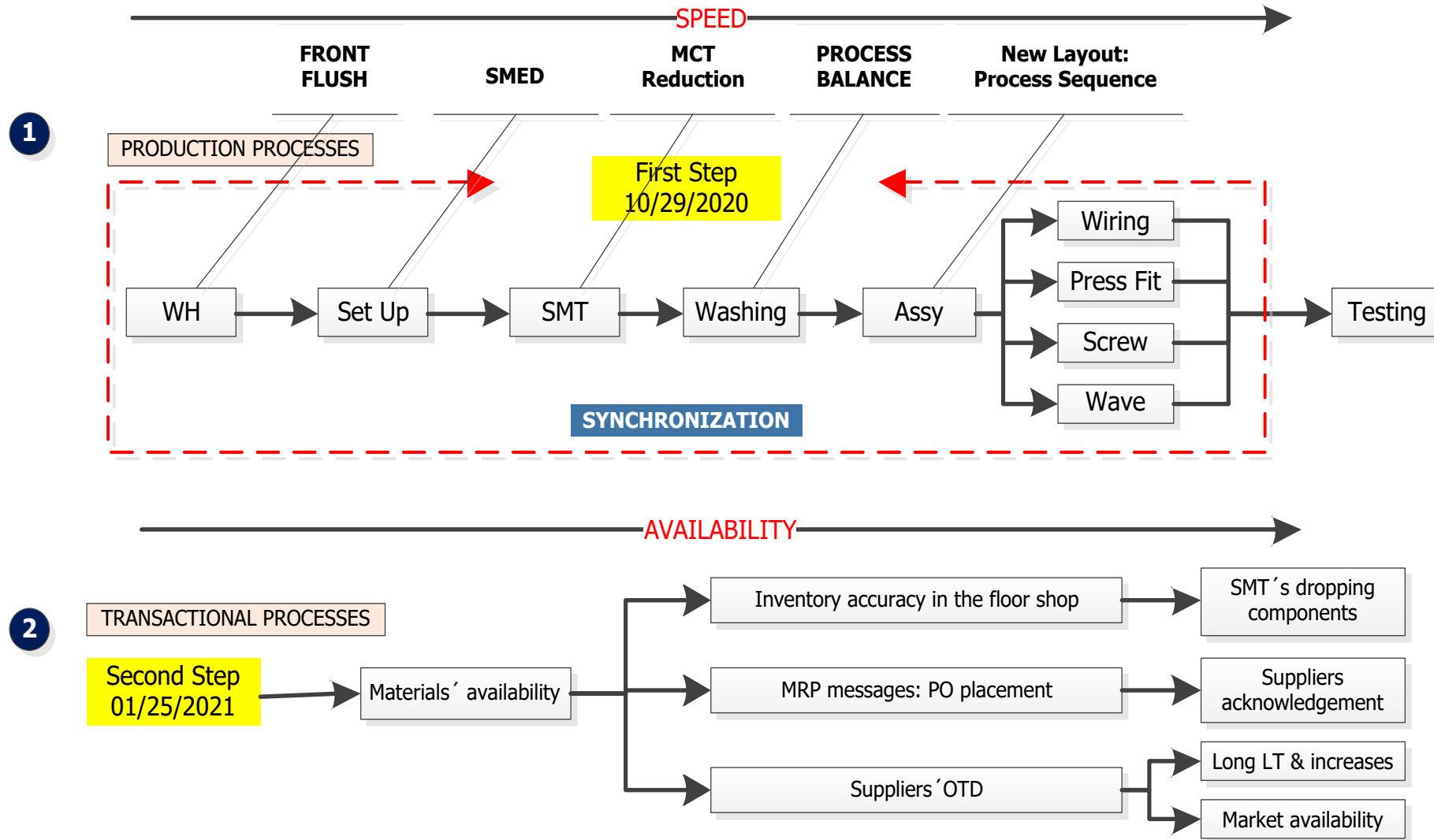
Costa Rica Operation (Define)



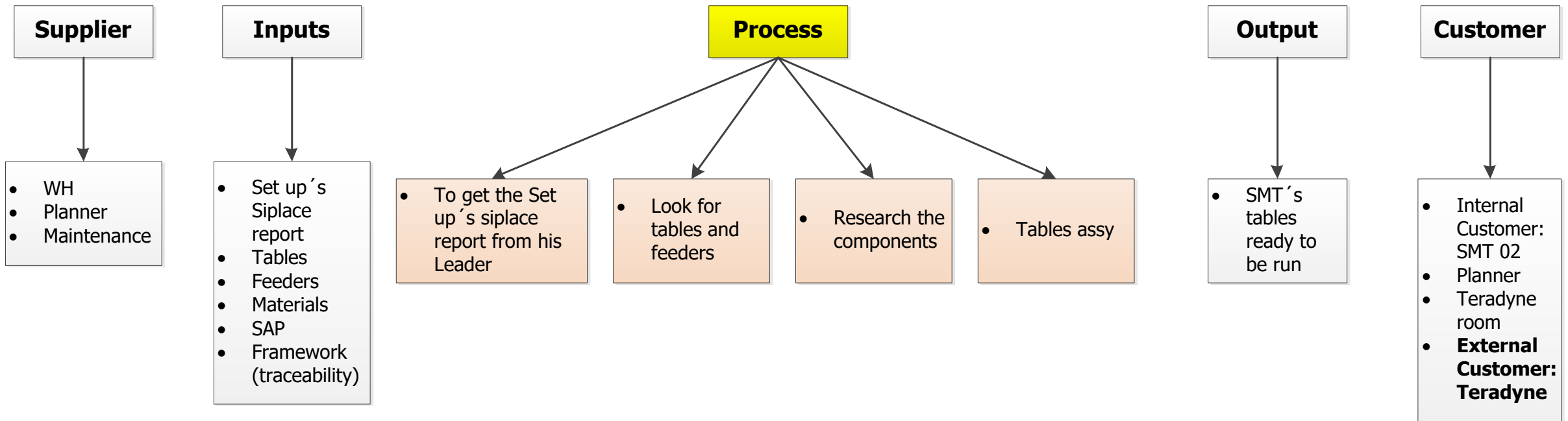
“El indicador de entregas a tiempo “OTD” estuvo en 58.31% (media), generando un impacto en el OTD y también en las ventas.



Costa Rica Operation (Define)

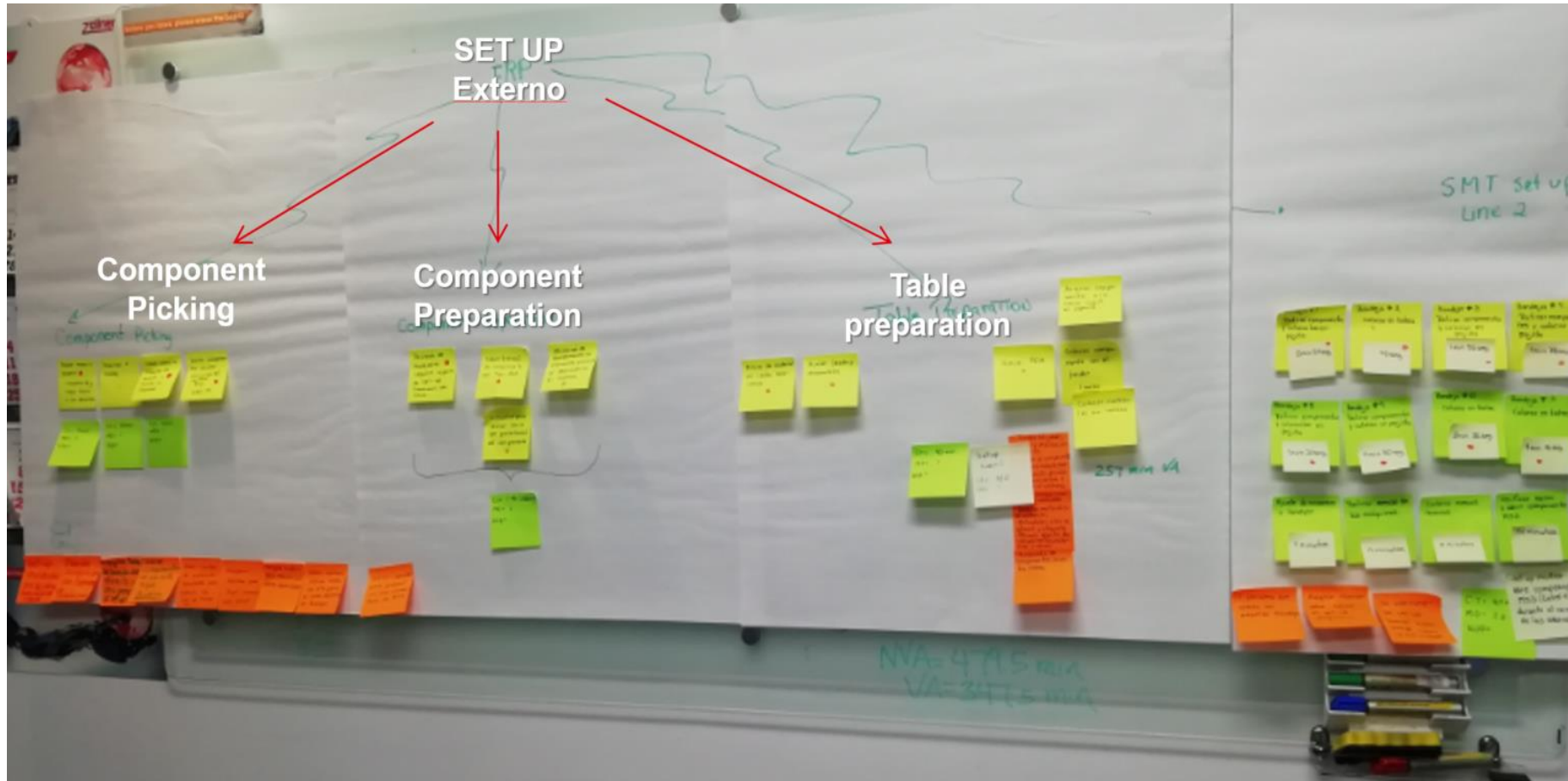


SIPOC Diagram



SMT process (External Set Up)

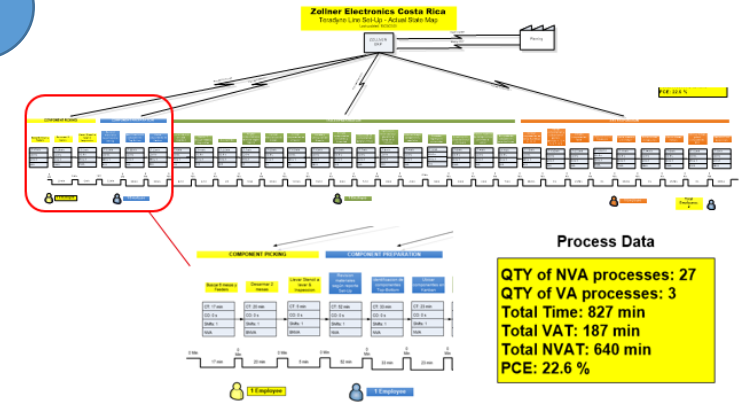
Costa Rica Operation (Measure)



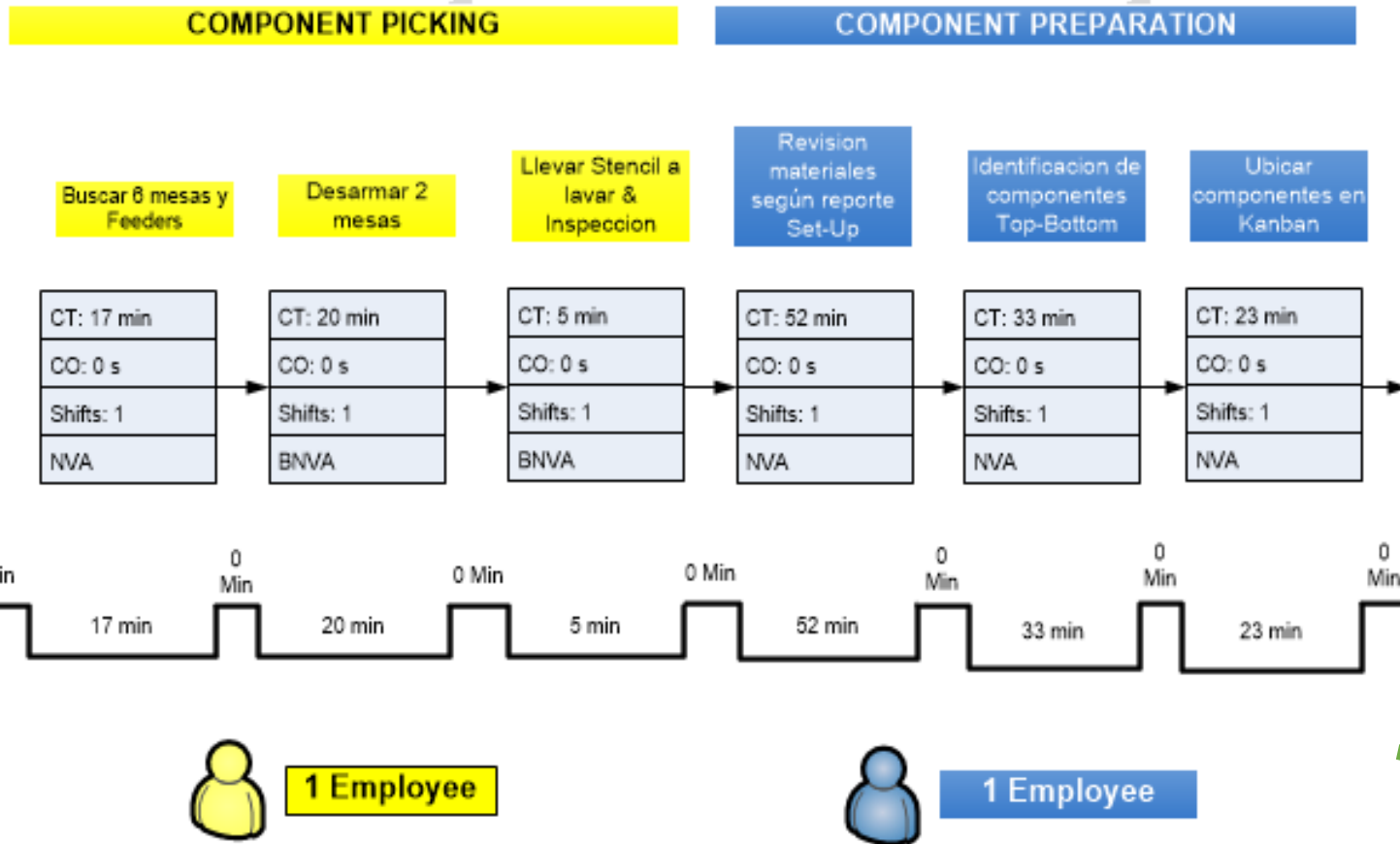
Costa Rica Operation (Measure CVSM)



1



2



Process Data

QTY of NVA processes: 27
QTY of VA processes: 3
Total Time: 827 min
Total VAT: 187 min
Total NVAT: 640 min
PCE: 22.6 %

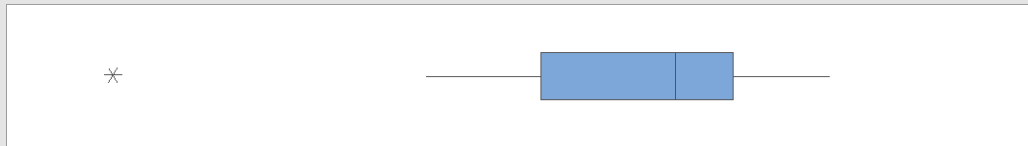
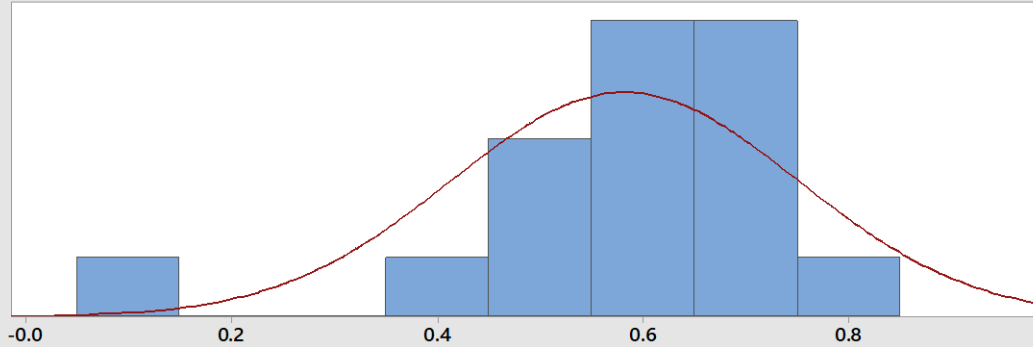
3

Costa Rica Operation (Measure)

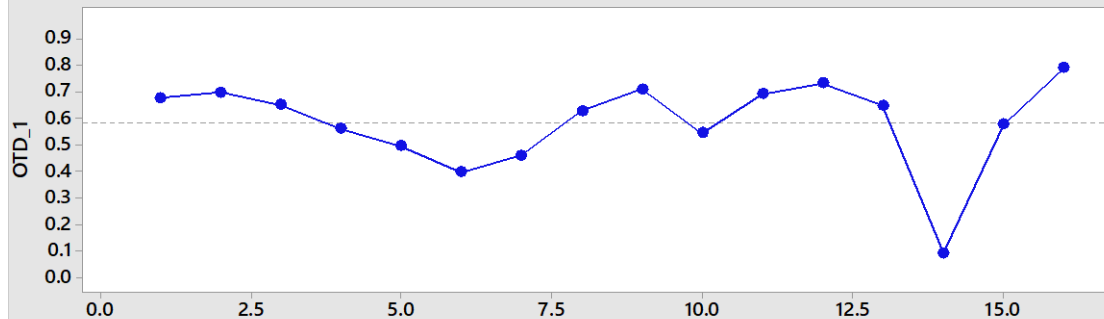


Graphical Summary of OTD_1 Teradyne
CW 41 -CW04

Distribution of Data
Examine the center, shape, and variability.



Data in Worksheet Order OTD
Investigate any outliers (marked in red).



Descriptive Statistics

N	16
Mean	0.58254
StDev	0.16861
Minimum	0.0898
5th percentile	*
25th percentile	0.50554
Median	0.63665
75th percentile	0.69371
95th percentile	*
Maximum	0.787

95% Confidence Intervals

Mean	(0.49269, 0.67238)
Median	(0.53105, 0.69041)
StDev	(0.12455, 0.26095)

Normality Test

Decision	Fail
P-value	0.040

- Semanas analizadas: **16 semanas.**
- Media de indicador de OTD: **58.25%**
- El comportamiento del proceso **no es normal** entre semanas.

P-Value <0.05

Costa Rica Operation (Analyze)

Process Actions

- To analyze the current backflush system vis-a-vis High-Mix/Low Volume
- Determine a new methodology to reduce the picking process (Kaizen)

Process Actions

- To buy a new T&R machine
- In the mean time, analyze upfront the production planning to manufacture the necessary trays

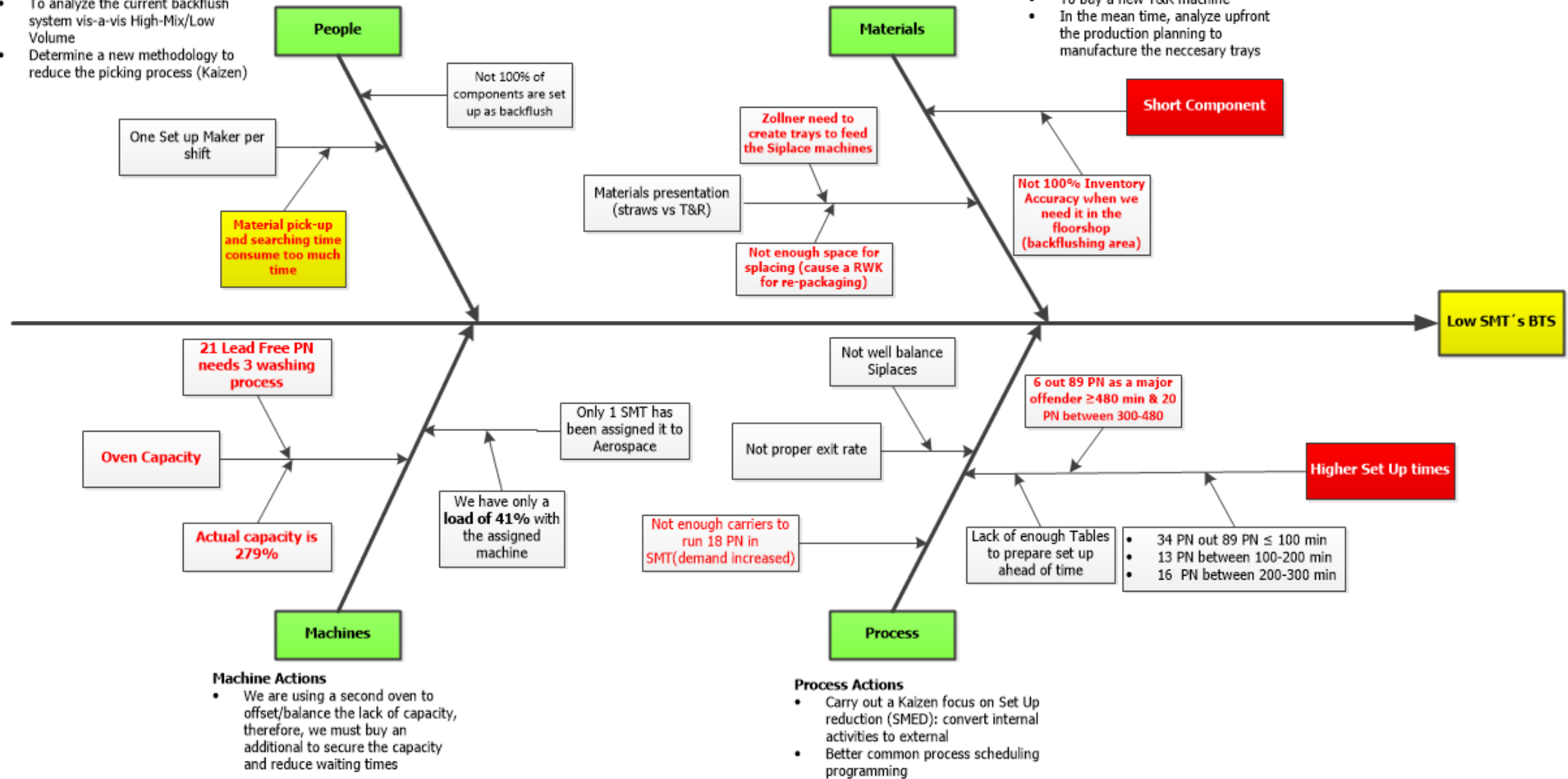


Diagrama de Ishikawa : Bajo cumplimiento del BTS

139 componentes

✓ **139x2.5= 347.5 min**

✓ 289_005_OC > 237.5 individual time

✓ 289_011_0B > 307.5

545 min Total time

545 min Before
347.5 min After

- Common parts set up
- 3 Families per table

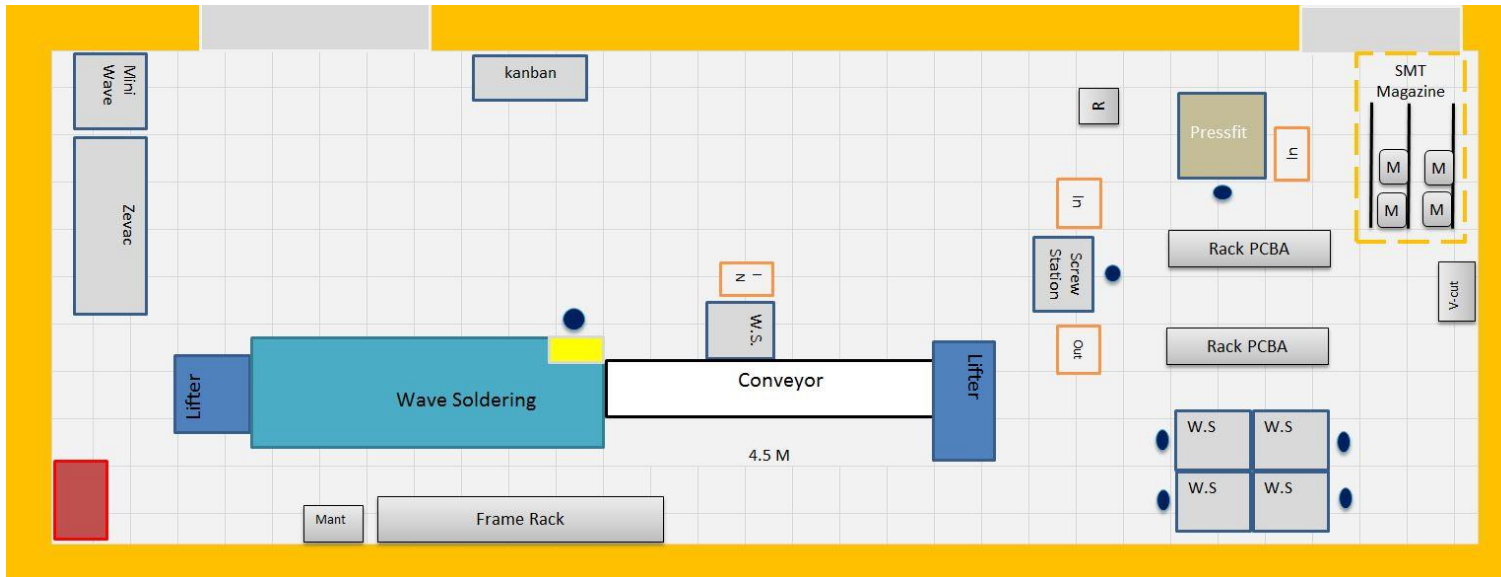
Improve

1

Agrupación por Familias (36% de reducción de Tiempo)

3

Nuevo Layout



2

Preparación de Mesas)

58 position

51 position in reels : 1,47 min per feeder
5 position in bag: 2, 8 min per component

STD time **2.41 hours**
Real time **1.40 hours**

Component:

- Resistors

Reduction of 42%



Costa Rica Operation (Improve)

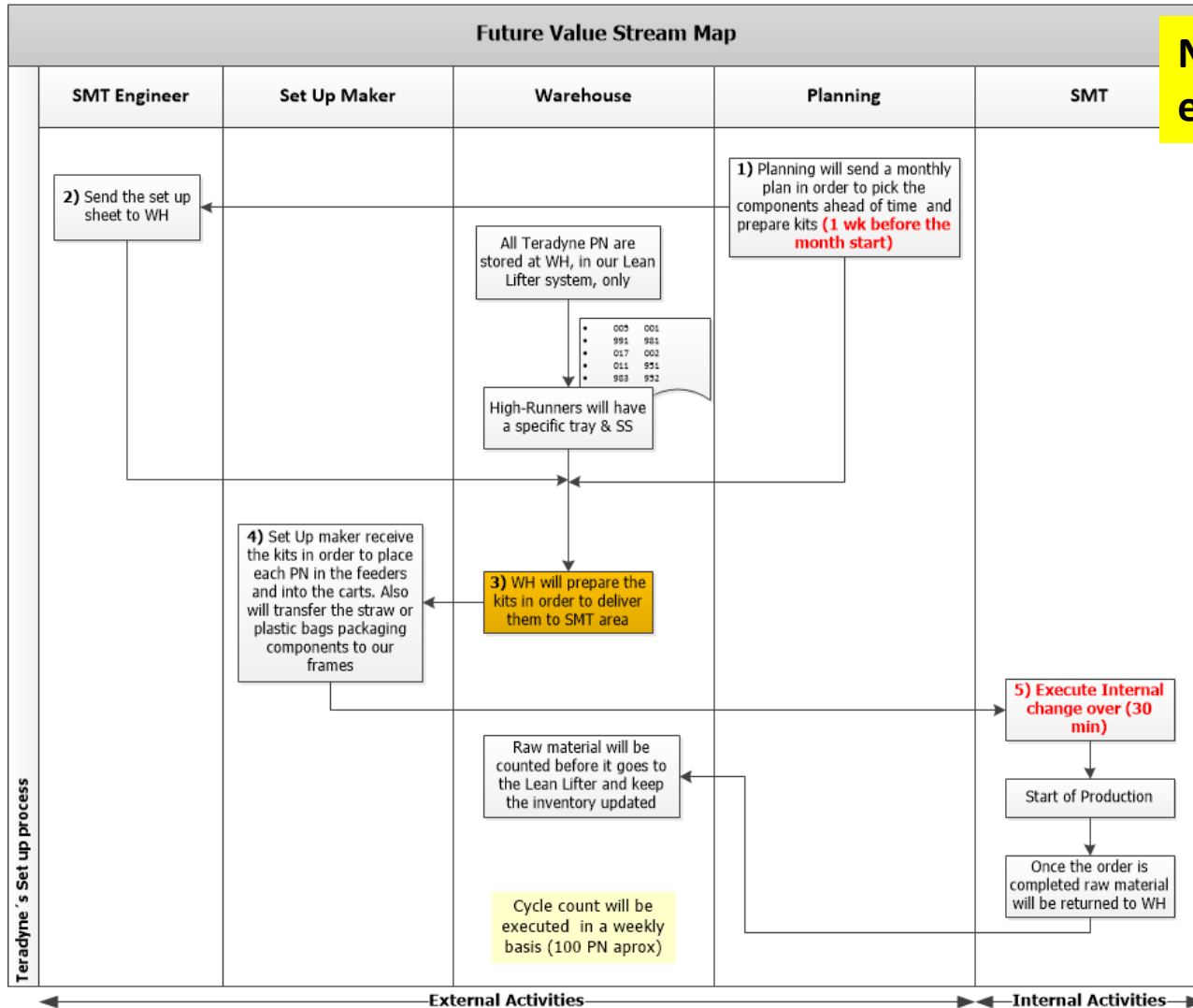


Otras Mejoras implementadas

Improvement Steps				
Planner/Buyer	Creates a monthly plan to warehouse for component preparation (kits), visibility	In order to reduce set up we can run at once the month-demand for High runners instead of once per week	Analyze the 80 PN we are purchasing today with straws in order to eliminate such package and reduce extra handling cost for Zollner	
WH	Re-locate raw material in WH (100%) and carry out a cycle count	We will allocate the High Runners components together inside the lean lifter to reduce preparation time	Constant cycle time to reduce shortages components risks: the components that will be returned to WH will be counted	Weekly cycle count (100 PN per week)
Production	Establish table's parking lot	Train/show employees new methodology	Implement a progressive set up to maintain a min time for internal activities	Split out the current set-up maker tasks in order to keep him focus on his responsibilities (no stencil washing)
Tool Shop	Manufacture additional trays/frames for non-T&R components	SMT frames's furniture per sensitive components		
MRO Buyer	To buy a new T&R (packaging) for the parts coming in plastic bags and straws			



Costa Rica Operation (Improve)



Nuevo proceso estandarizado de Set Up



Evacuates the water tank in 2.5 minutes. Before: 8 min
69% improvement

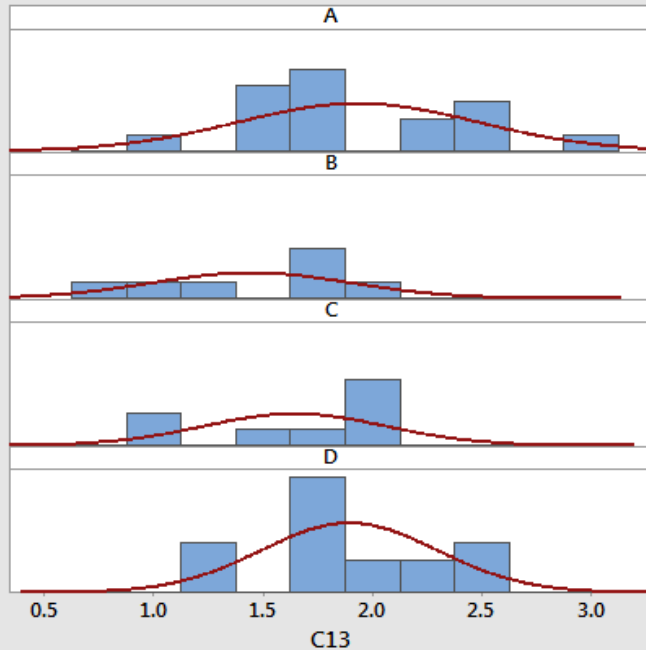
Costa Rica Operation (Improve)



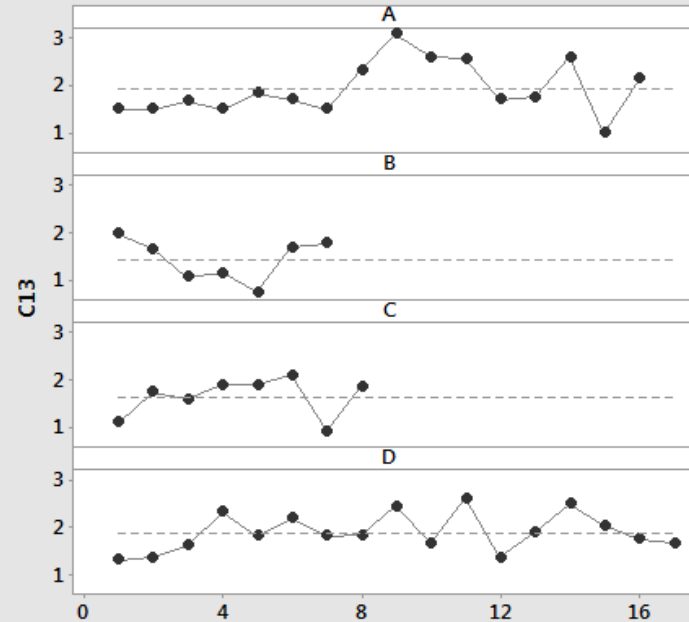
External Set up per Shift CW47-50

Summary Report

Distribution of Data
Compare center, shape, and variability.



Data in Worksheet Order
Investigate any outliers (marked in red).

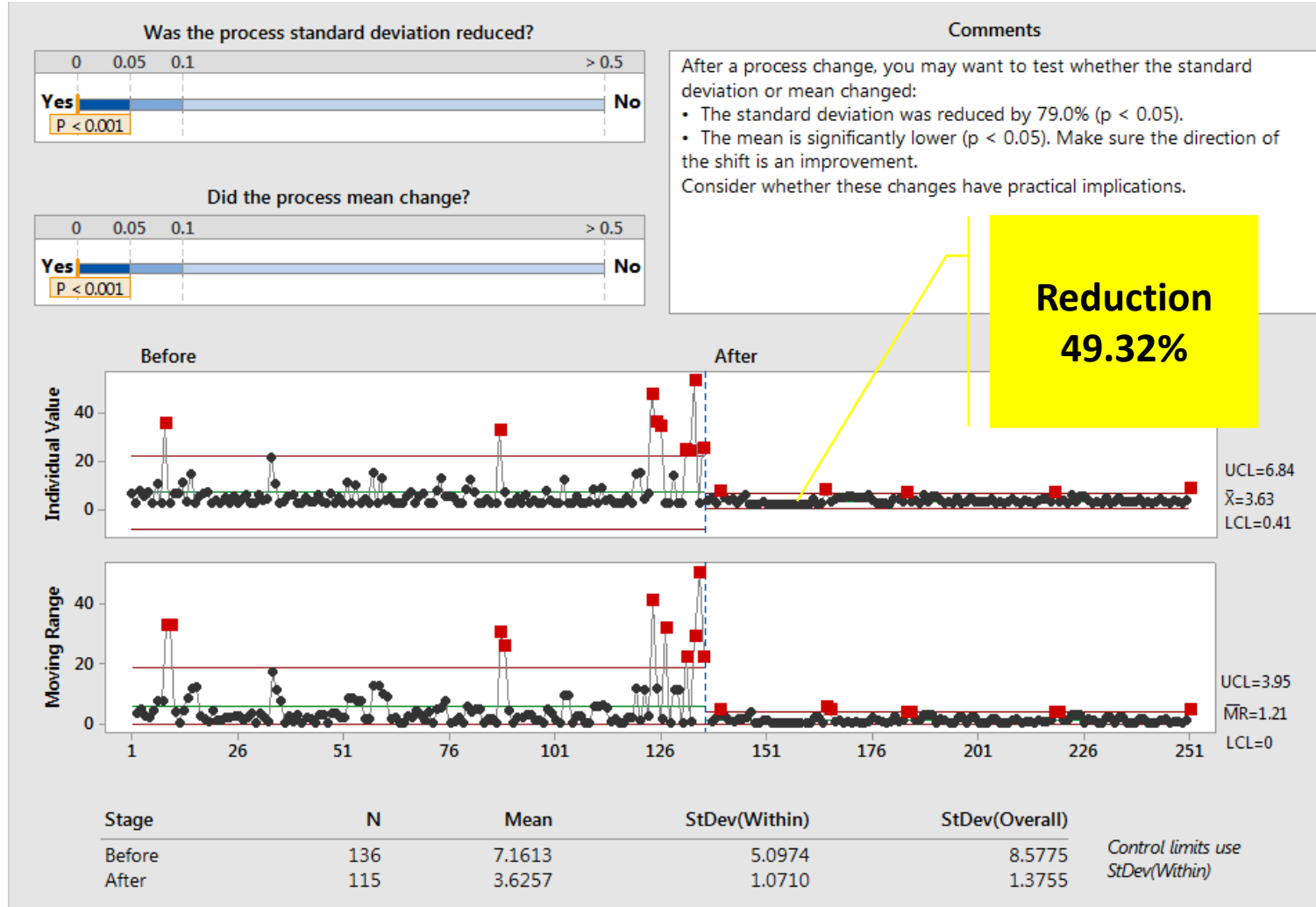


Group	N	Mean	95% CI	StDev	Normality Test					
					95% CI	Min	Median	Max	P	Decision
A	16	1.9373	(1.6415, 2.2330)	0.55508	(0.4100, 0.8591)	1.0000	1.7371	3.0833	0.098	Pass
B	7	1.4504	(1.0310, 1.8698)	0.45345	(0.2922, 0.9985)	0.7500	1.6667	2.0000	0.401	Pass
C	8	1.6485	(1.2990, 1.9980)	0.41805	(0.2764, 0.8509)	0.9230	1.8125	2.1111	0.103	Pass
D	17	1.8977	(1.6896, 2.1057)	0.40465	(0.3014, 0.6158)	1.3158	1.8182	2.6190	0.378	Pass

Set ups between shifts shows a similar performance (normal)

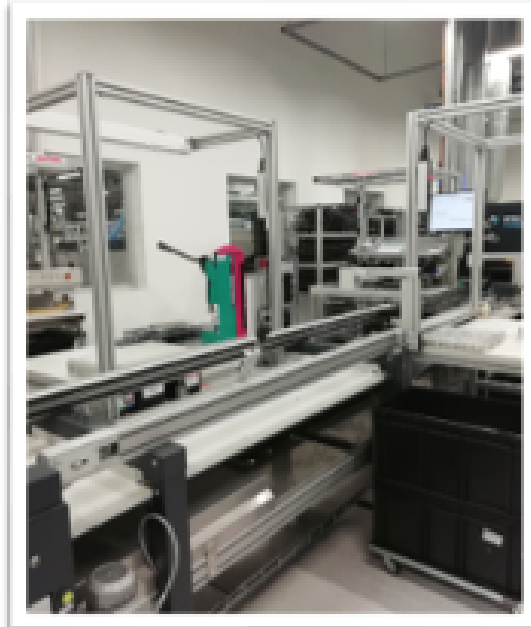
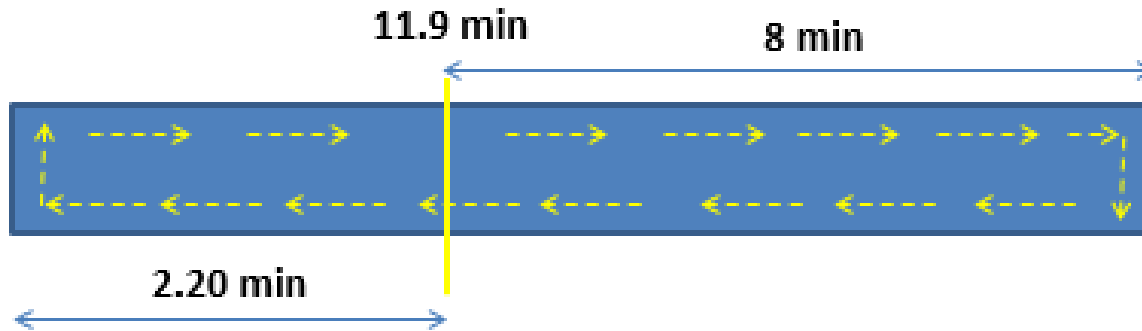
Target < 2.5 min

Costa Rica Operation (Improve)



Cicle time reduction

Costa Rica Operation



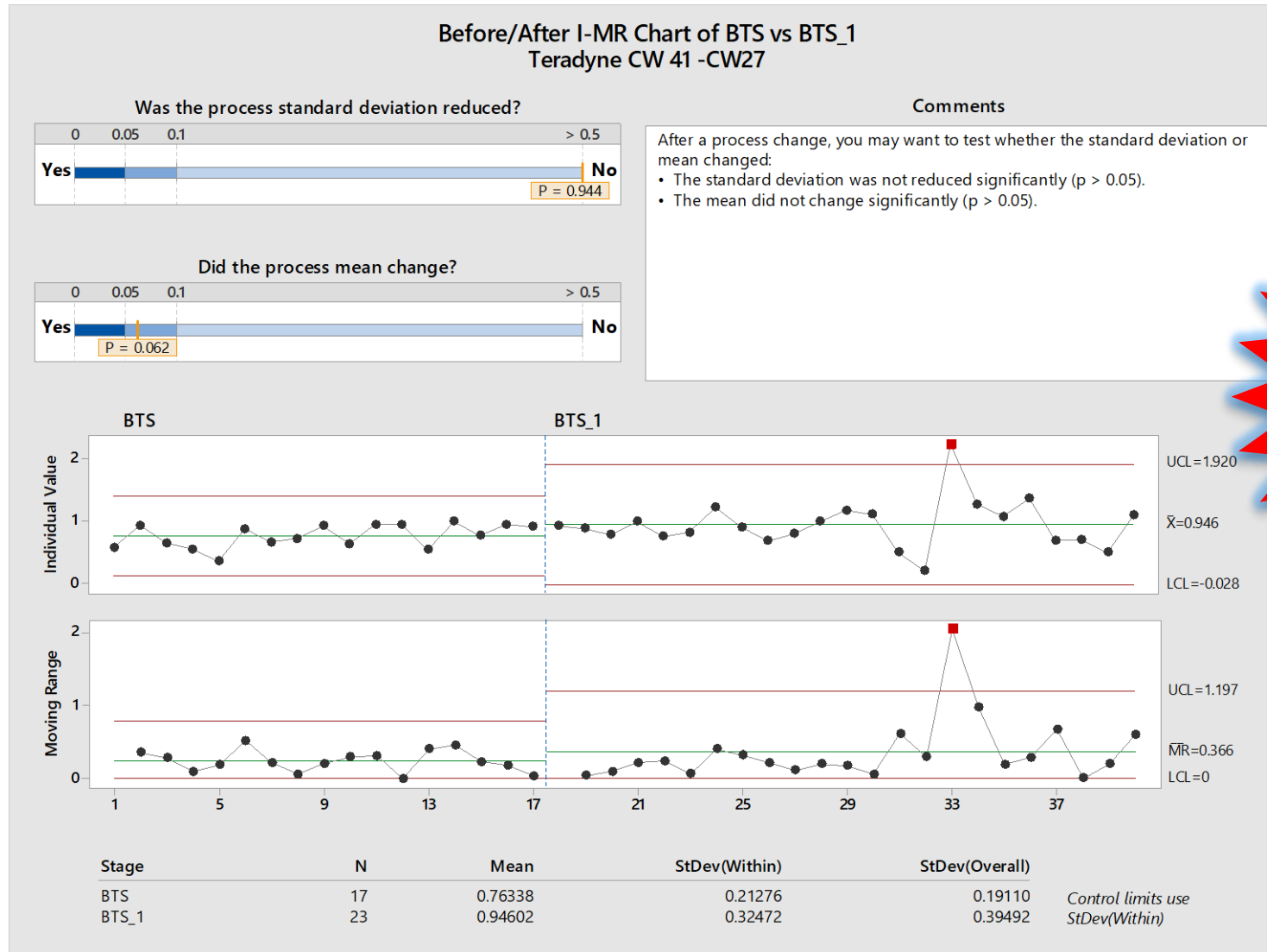
El transportador se acortó para disminuir el tiempo del ciclo y mejorar la optimización del área

**23.9 %
Reduccion
del tiempo**

Reducción de transporte (Tiempo de procesamiento)

10.5m	13.1	min	Teórico
12.5m	15.6	min	Tiempo real
9.5m	11.9	min	Nuevo

Costa Rica Operation

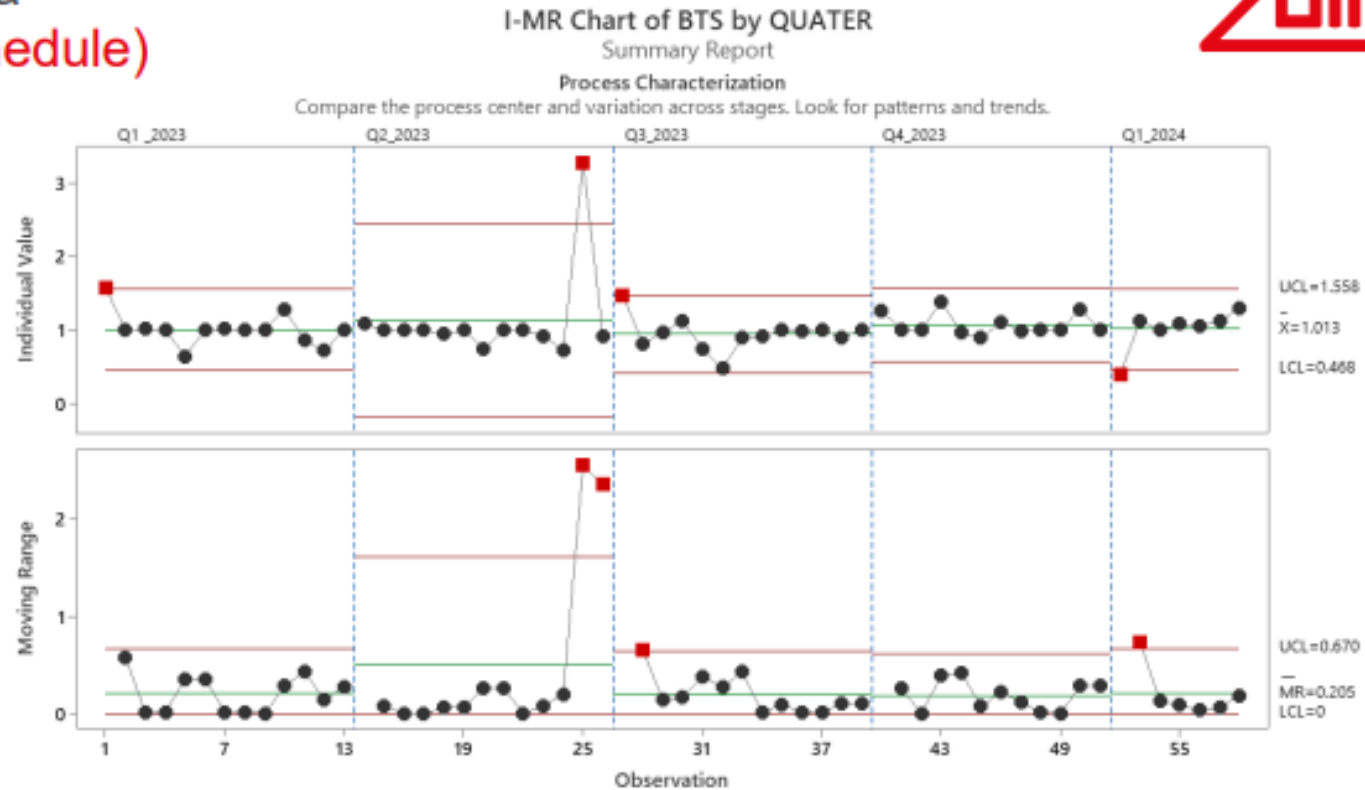


23,68%
BTS
Improvement

Costa Rica Operation



Zollner Costa Rica BTS (Build to Schedule)



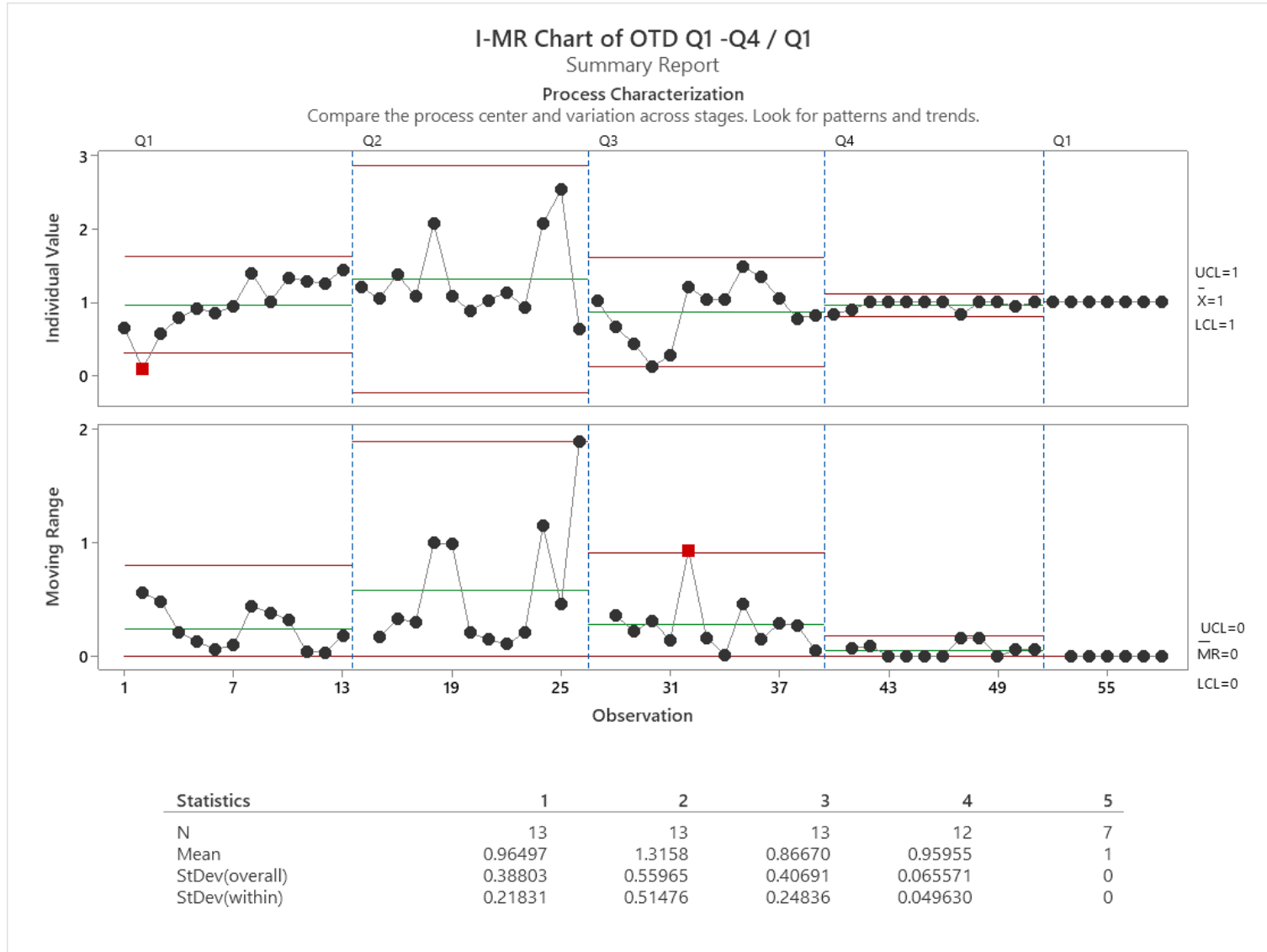
Statistics	Q1_2023	Q2_2023	Q3_2023	Q4_2023	Q1_2024
N	13	13	13	12	7
Mean	1.0086	1.1243	0.94499	1.0737	1.0129
StDev(overall)	0.23104	0.65655	0.22370	0.15347	0.28661
StDev(within)	0.18263	0.43652	0.17480	0.16641	0.18174

- Confidential -

Status: date

17

Costa Rica Operation



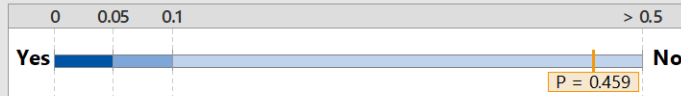
OTD (On Time Delivery)

Costa Rica Operation

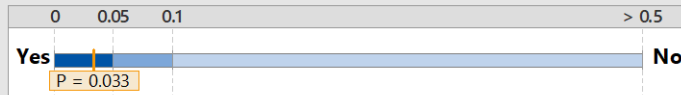


Before/After I-MR Chart of Ventas 2_1 vs Ventas 2_2
Summary Report

Was the process standard deviation reduced?



Did the process mean change?

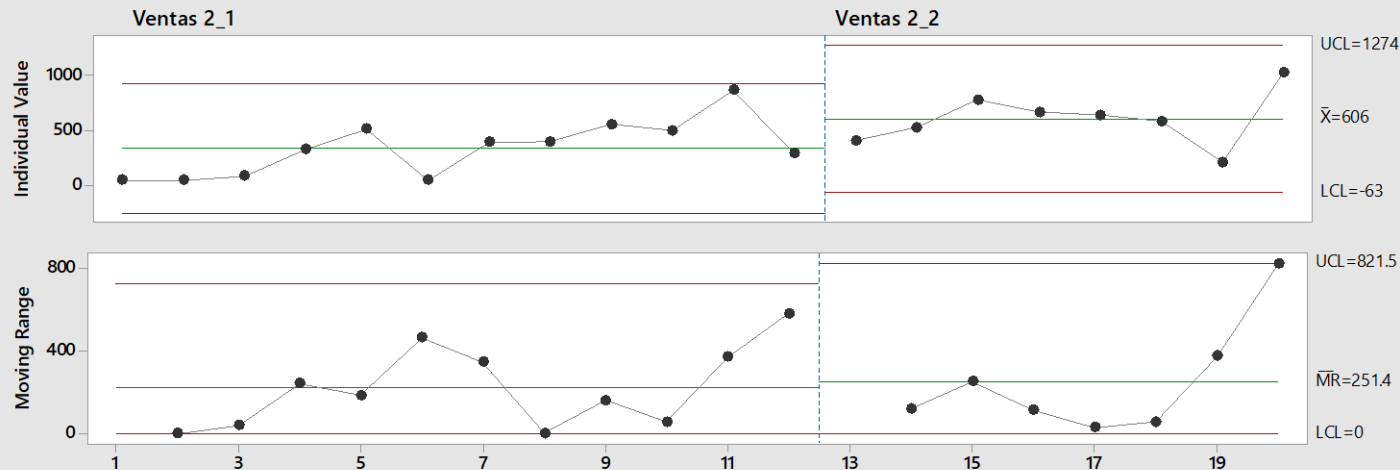


Comments

After a process change, you may want to test whether the standard deviation or mean changed:

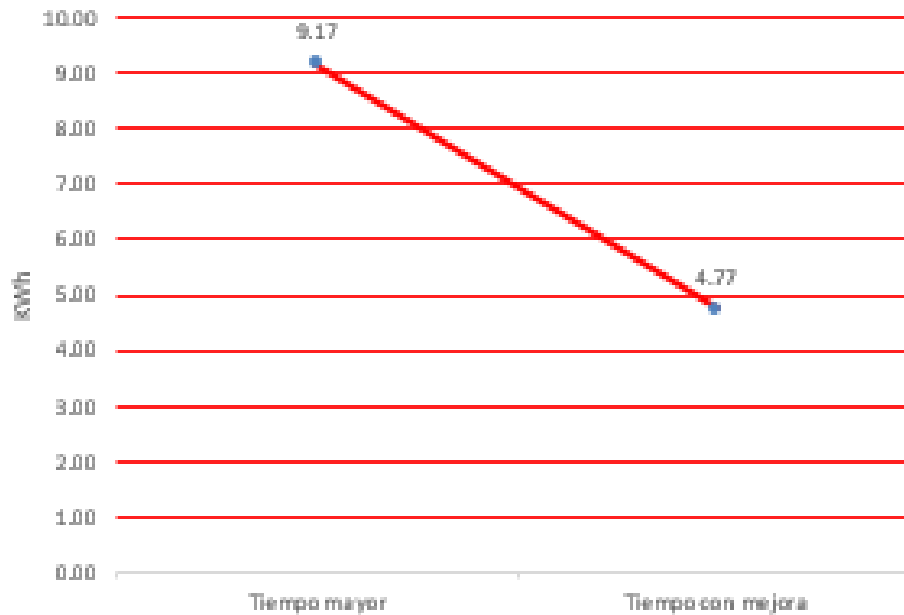
- The standard deviation was not reduced significantly ($p > 0.05$).
- The mean is significantly higher ($p < 0.05$). Make sure the direction of the shift is an improvement.

Consider whether the change in the mean has practical implications.



Stage	N	Mean	StDev(Within)	StDev(Overall)	Control limits use
Ventas 2_1	12	340.83	196.65	253.63	StDev(Within)
Ventas 2_2	8	605.75	222.90	244.06	StDev(Within)

Costa Rica Operation



La mejora en los tiempos impacta significativamente el consumo de energía. Los kWh consumidos por cada número de parte, en el proceso, se reducen en un 52%.



Unidades	Tiempo anterior	Tiempo con mejora	Mejora	Reducción
Min	5004.48	2602.33	2402.15	52%
Horas	83.41	43.37	40.04	
KWh	9.17	4.77	4.40	





¡MUCHAS GRACIAS!