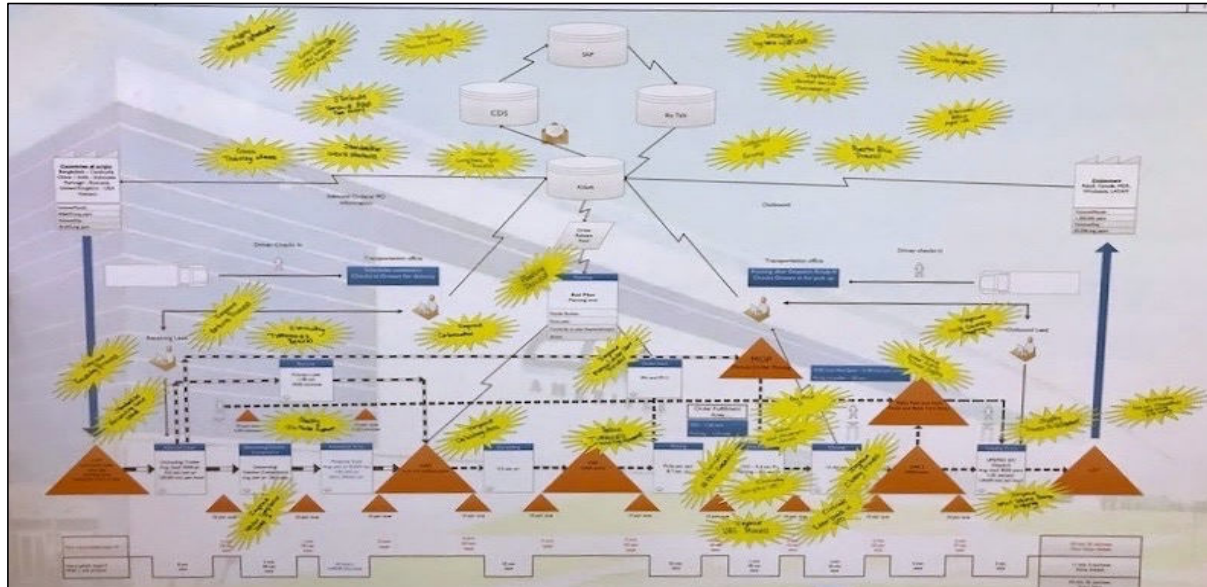


Value Stream Mapping



**SMART Improvements
in Manufacturing:
Improve the Right Stuff First**

SMART
MANUFACTURING
CONFERENCE

MANTEC 
Advancing Your Manufacturing Business Together

 **GO-LEAN-SIX**
Better Quality Faster

Your Presenter Today

Dan Roth
President



239-896-3599 Dan.Roth@Go-Lean-Six.com

www.Go-Lean-Six.com



Agenda: Value Stream Mapping (VSM)

- Live Survey – Biggest Issues?
- 1st Story Time – VSM Example - Textiles
- Value Stream Mapping (VSM) Defined
- Why VSM
- 8 Steps of VSM
- 2nd Story Time – VSM Example – Machine Building
- Live Survey – Top Benefits of VSM?
- Questions



Live Survey

What are your top 3 issues in manufacturing?



Losing Customers!



Low Margins/High Costs!



Quality Issues!



Not Enough Capacity!



Supply Chain!



Long Lead-times!



Skilled Workers!



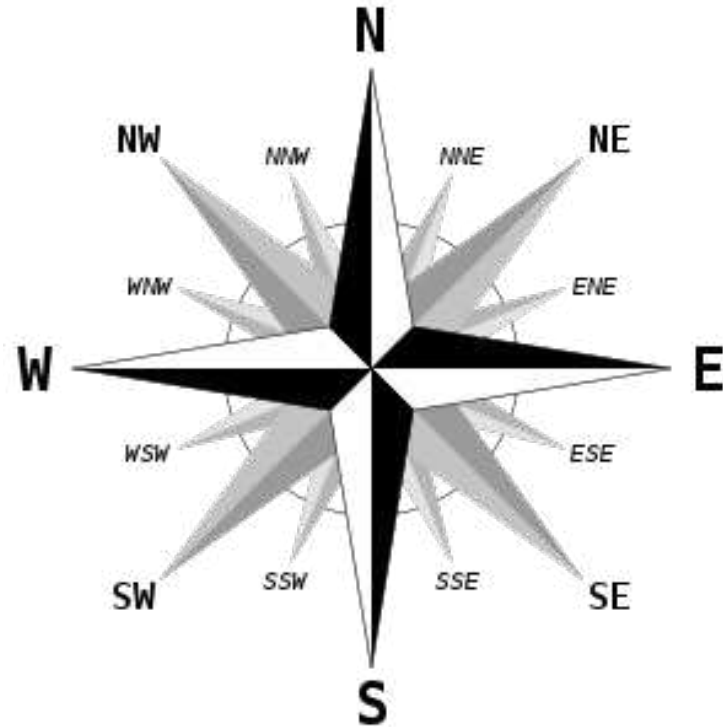
Did you ever start a trip and not know where you are going?



We do it all the time with improvements. A shot in the dark. No real plan. We know this "should" be helpful, but is it the best place to start?


























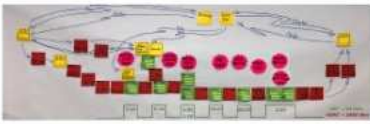
Benefits of knowing where you're going

- Not going in blind
- Best benefit for your investment
- Data driven improvements
- Fix real issues – not squeaky wheel
- Faster results
- No restarts
- Everyone agrees on the path
- Greater buy in
- Etc.



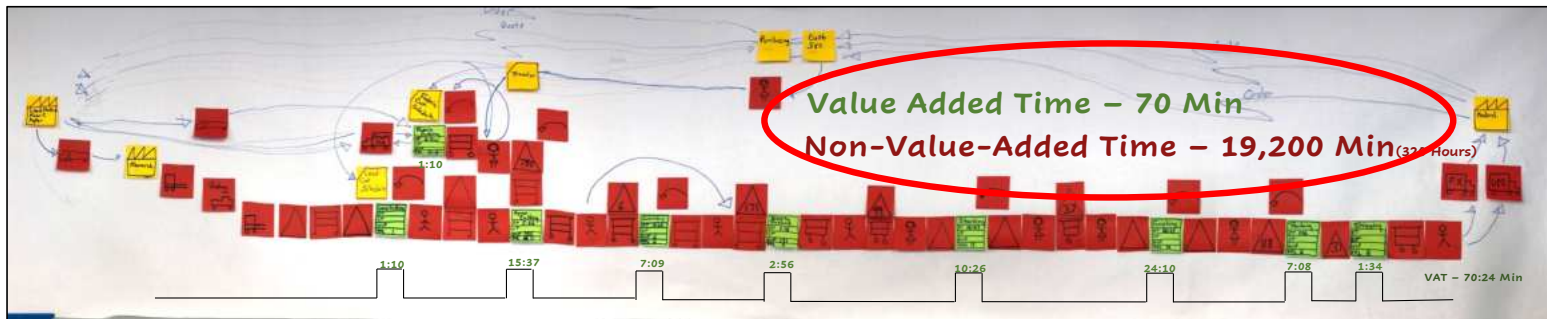
Story Time

A3 Problem Solving Tool - Understanding the Problem

 Go-Lean-Six DMAIC Kaizen: __Apron Lead Time Reduction__ 																																																		
Champion: Lee Ann Leader: Eric Facilitator: _Dan Roth_ Recorder: _Carolyn_																																																		
Project Team: _																																																		
Problem / Opportunity: (SMART Statement) <i>As of July 2021, I's lead-time for radiation protective garments is 8+ weeks while the competition's is 2 to 4 weeks. If nothing is done to meet or beat the competition's lead-time will continue to lose business.</i>	Problem Statement																																																	
In scope: Deliverables: Create Current State Map Identify Improvement Opportunities Create Future State Map Develop Action Plan to achieve future state	DMAIC Team Progress <table border="1"> <tr> <td>Key:</td> <td>Planned </td> <td>Completed </td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DATE:</td> <td>08/01/21</td> <td>09/01/21</td> <td>10/01/21</td> <td>11/01/21</td> <td>01/01/22</td> <td></td> </tr> <tr> <td>Define</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Measure</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Analyze</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Improve</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Control</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Key:	Planned 	Completed 					DATE:	08/01/21	09/01/21	10/01/21	11/01/21	01/01/22		Define							Measure							Analyze							Improve							Control						
Key:	Planned 	Completed 																																																
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Current State Metrics (KPI's): <table border="0"> <tr><td>Lead Time</td><td>8-12 Weeks</td></tr> <tr><td>WIP</td><td>2783</td></tr> <tr><td>Orders/Day</td><td>150</td></tr> <tr><td>Cycle Time</td><td></td></tr> </table>	Lead Time	8-12 Weeks	WIP	2783	Orders/Day	150	Cycle Time		Desired Future State Metrics (KPI's): <table border="0"> <tr><td>Lead Time</td><td>< 2 Weeks</td></tr> <tr><td>WIP</td><td>300</td></tr> <tr><td>Orders/Day</td><td>300</td></tr> <tr><td>Cycle Time</td><td></td></tr> </table> 	Lead Time	< 2 Weeks	WIP	300	Orders/Day	300	Cycle Time																																		
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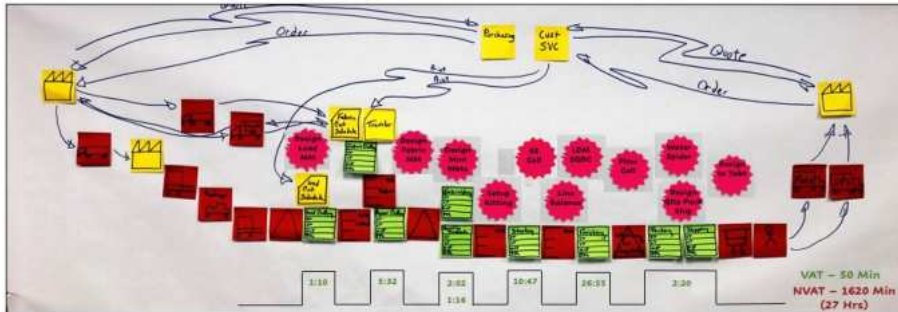
Story Time

Current State Value Stream Map Apron Production Line



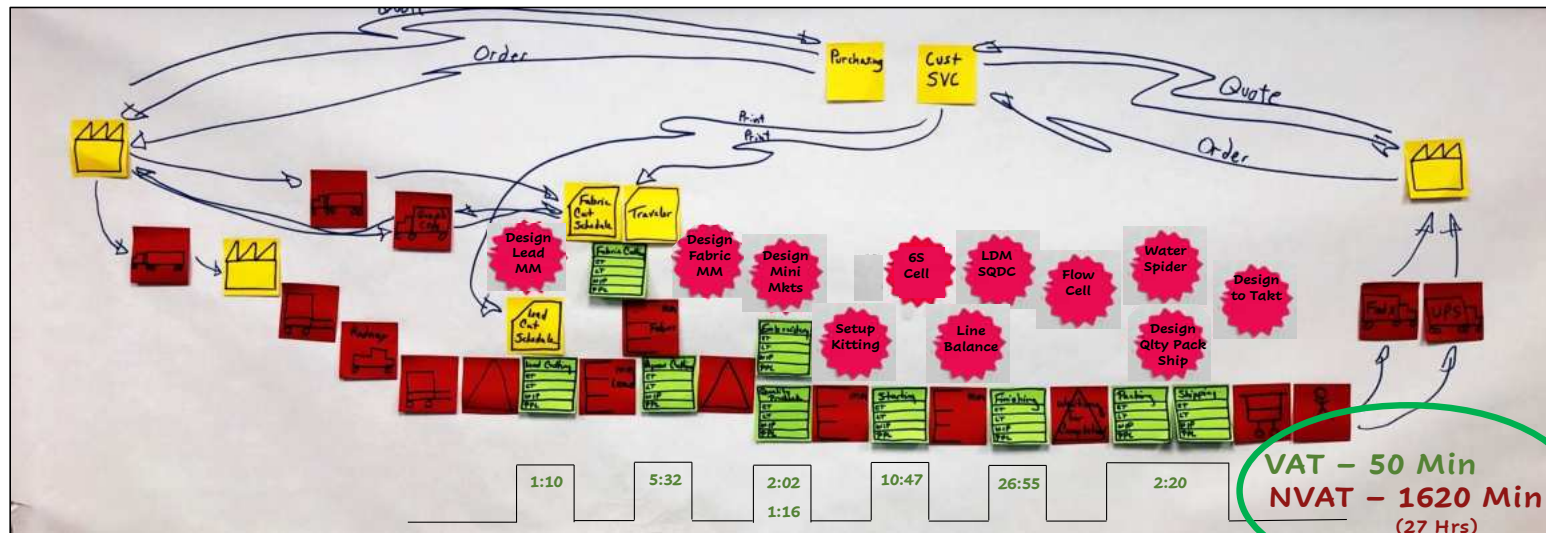
Story Time

Future State Value Stream Map with kaizen bursts Apron Line



Story Time

Future State Value Stream Map with kaizen bursts - Apron Line



Value-Added Time - Previously 70 Min - New 50 Min

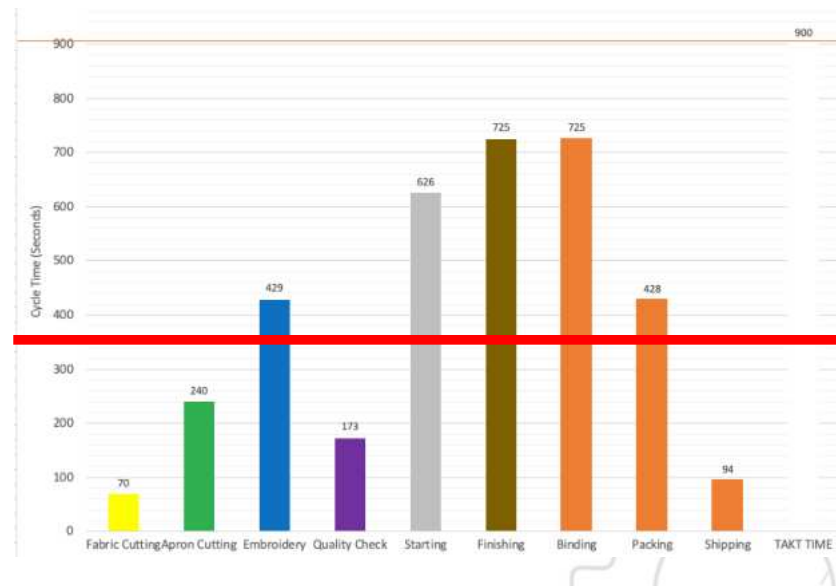
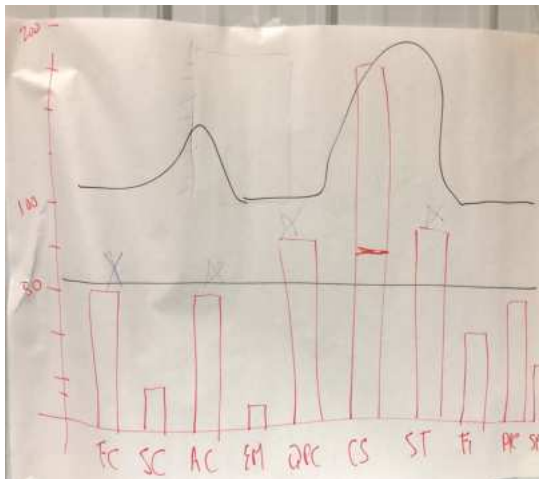
Non-Value-Added Time - Previously 19,200 Min - New 1,620 Min

91.6% reduction in wasted time!

Story Time

Major Steps in Creating Lean Work-cell Layout

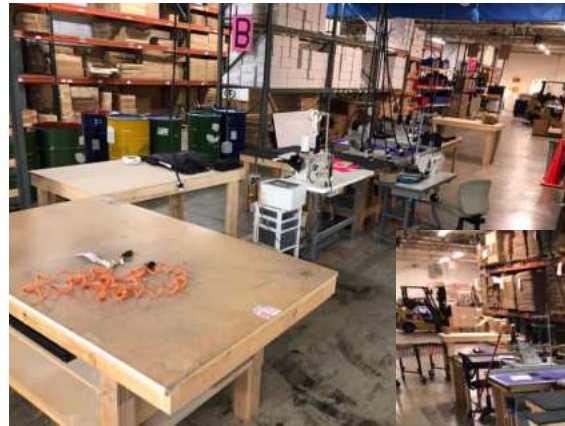
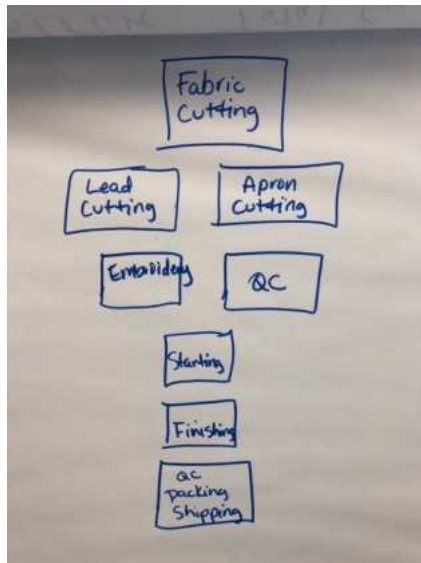
- Lean Statistical Line Design**
- Balance the Process (Yamazumi)**
- Kanban pull system**
- One piece flow**
- 6S Workplace Organization**
- Etc.**



Story Time

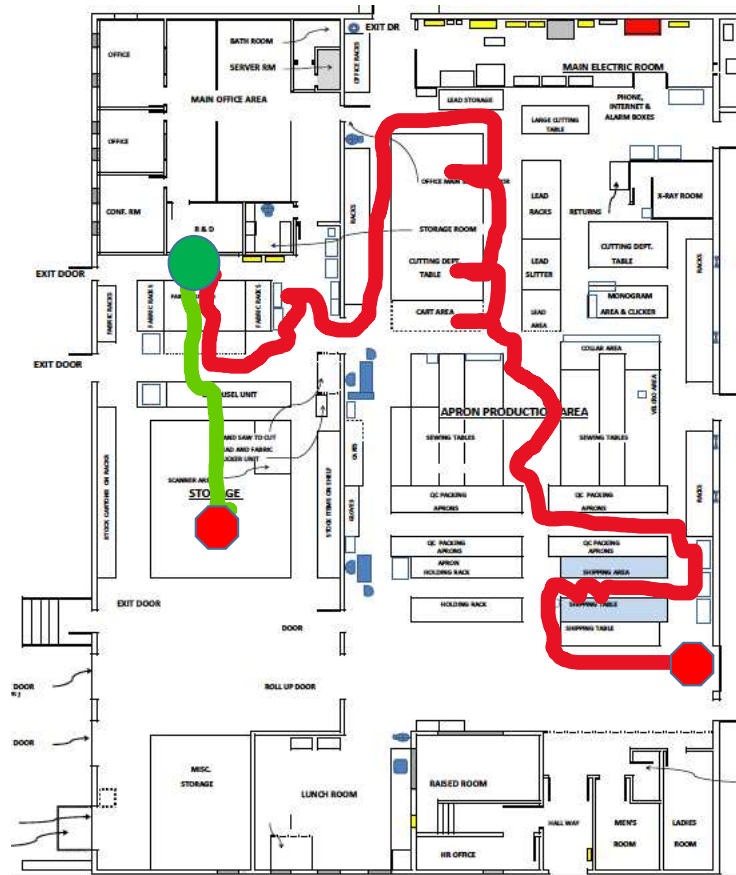
Major Steps in Creating Lean Work-cell Layout

6S & Implement the Lean Line Design – LOLA– 2 hrs raw material to finished. Lead time < 2 wks.



Story Time

And they lived happily ever after!



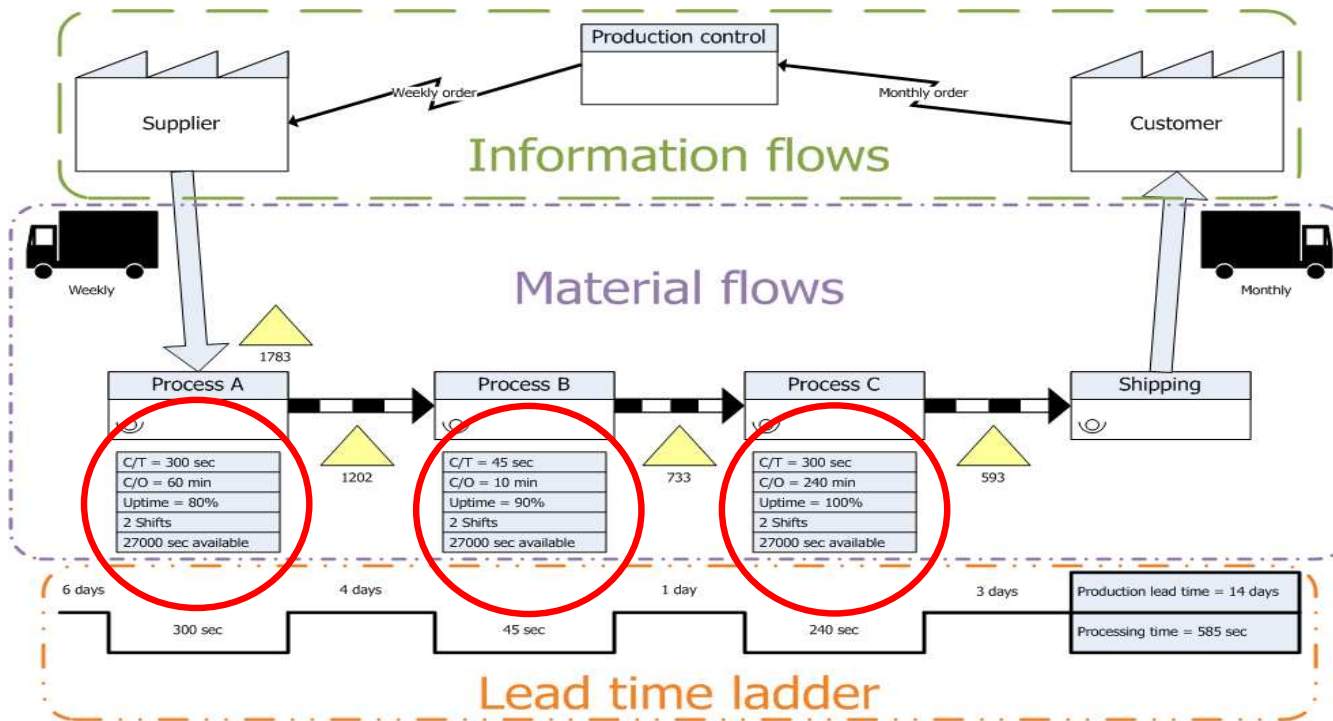
Results of the Lean Optimization Line Continuous Flow Cell Design Project

Old Process 400+ ft
8 - 12 week lead time

New Process 75 ft
Less than 2 week lead time

Slashed lead-time by more than 90% in less than 6 months

Value Stream Mapping is a powerful tool for identifying, analyzing, and planning Lean improvement initiatives using process data and analysis.



Keys of VSM

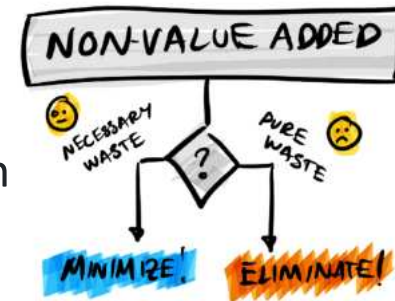
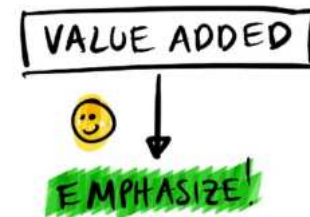
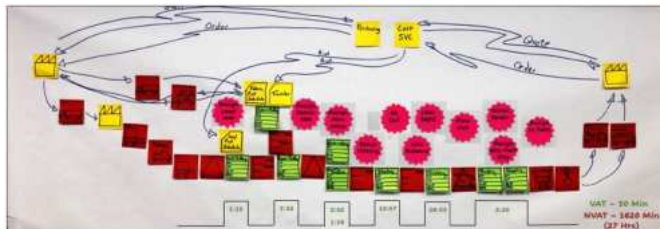
1 - Define value-added and non-value-added - for your customer.

Value-Added = Changes to Form, Fit, or Function

2 - Use a team. No one person understands all the complexities of your work

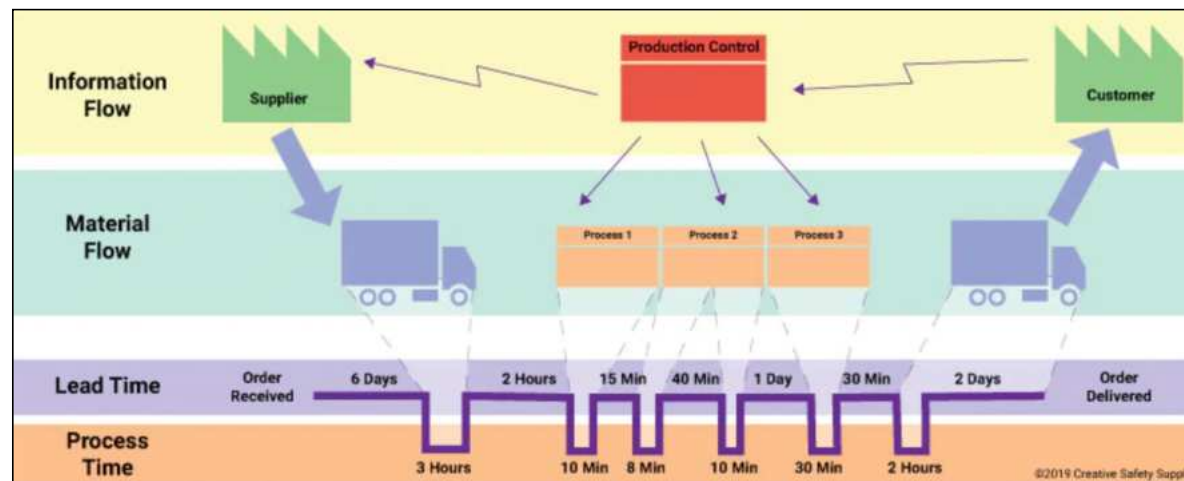
3 - Utilize a visual image of your value stream (Map).

It's easier & quicker to understand a visual & get buy in



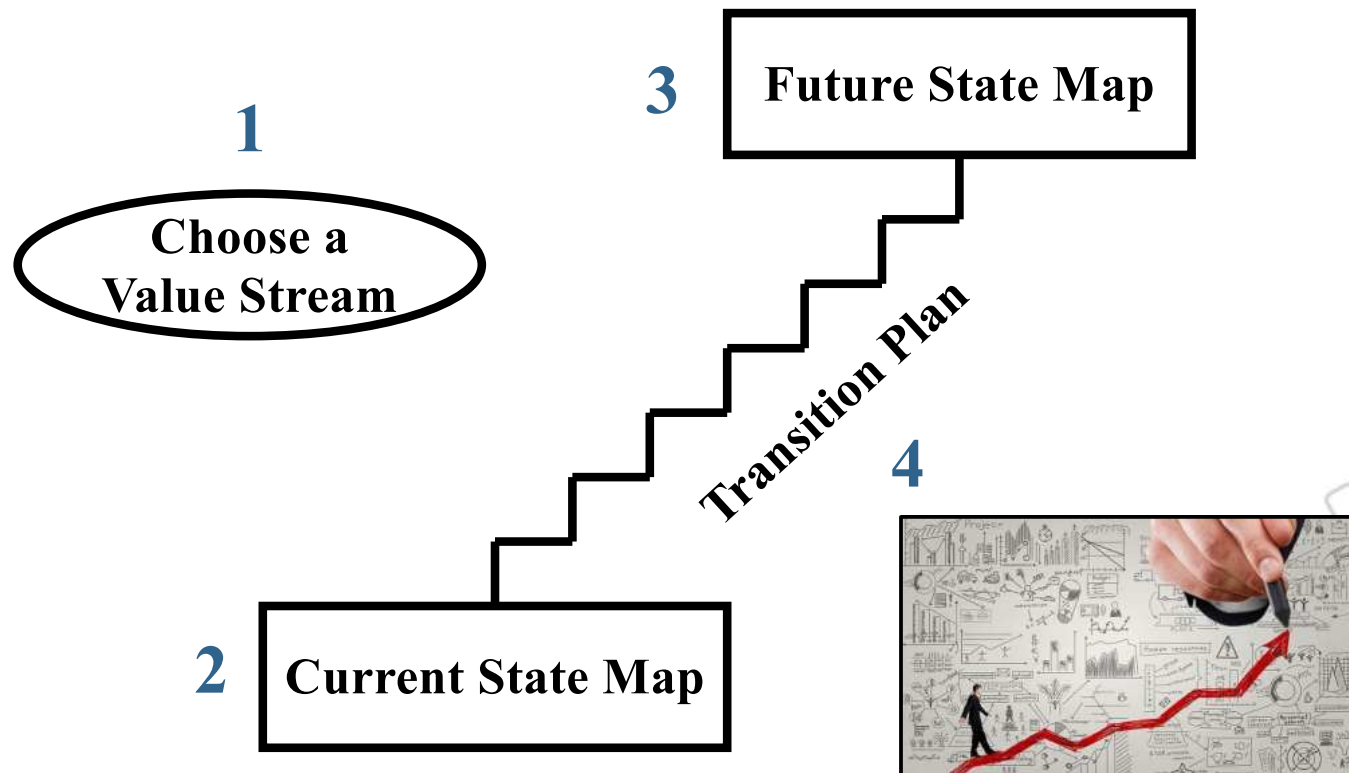
What is a Value Stream?

The process required to bring a specific product through all steps, from receiving the order to shipping the product.
Converting raw material to customer specifications and delivered.



The map is a visualization of the steps, activities, and tasks that are “needed” to add value for your customer

Value Stream Mapping - Major Steps



Why Value Stream Mapping?

VSM helps you to identify hidden waste so you can remove it from your process

- \$ **D**efects
- \$ **O**verproduction
- \$ **W**aiting
- \$ **N**ot utilizing talent
- \$ **T**ransportation
- \$ **I**nventory excess
- \$ **M**otion waste
- \$ **E**xcess Processing



Reducing waste lowers costs, shortens lead-time, increases profit...

Why Value Stream Mapping?

Shorter Lead-Times Please Customers



Focus is on value added time.

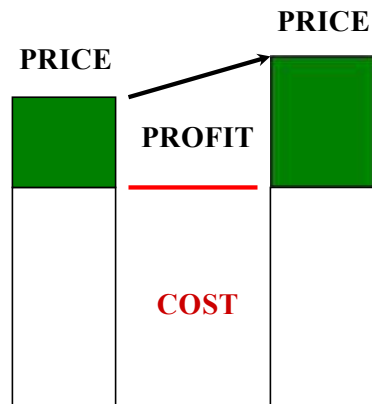


Focus is on non-value-added time.



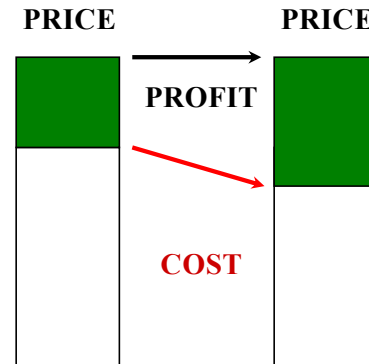
Why Value Stream Mapping?

Lowering Costs Pleases Customers, Owners, & Employees



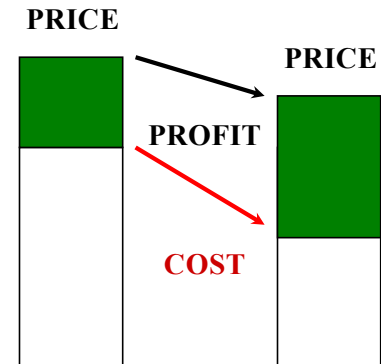
TRADITIONAL THINKING

COST + PROFIT = PRICE
Happy share holders
Unhappy customers



IMPROVED THINKING

PRICE - COST = PROFIT
Happy share holders

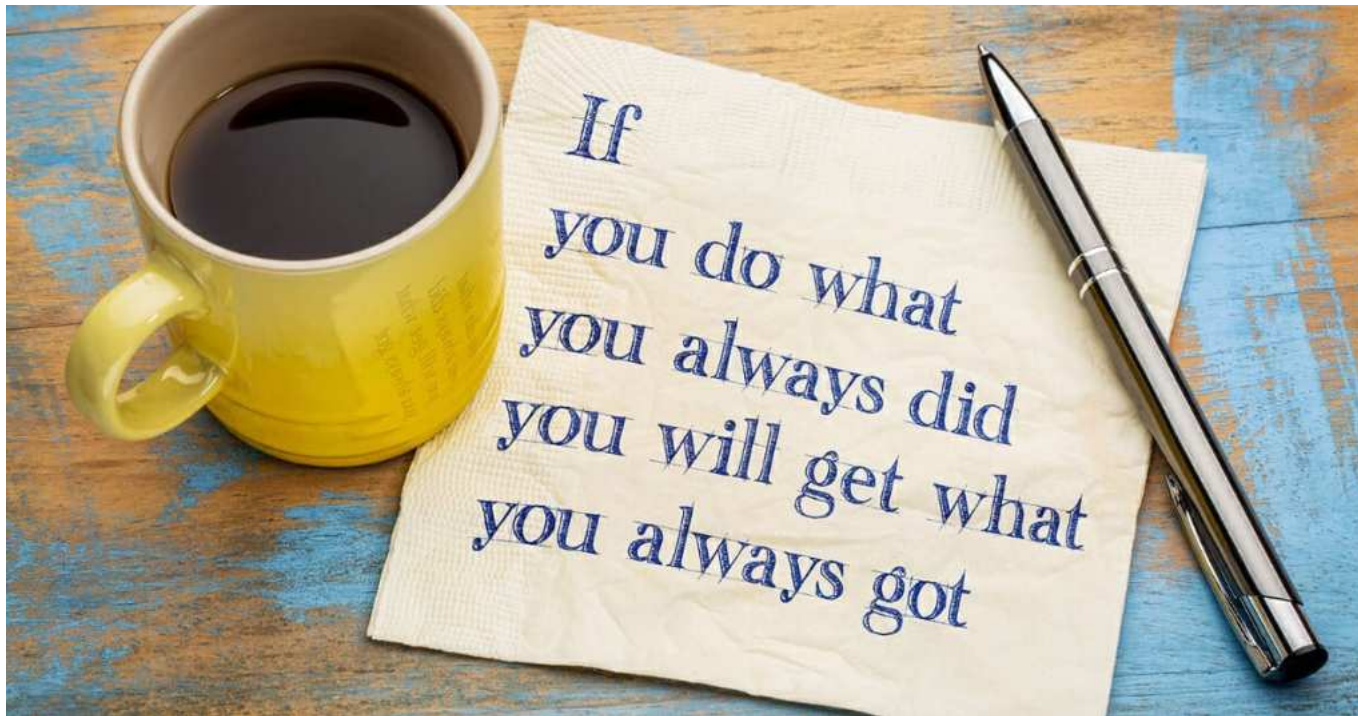


LEAN THINKING

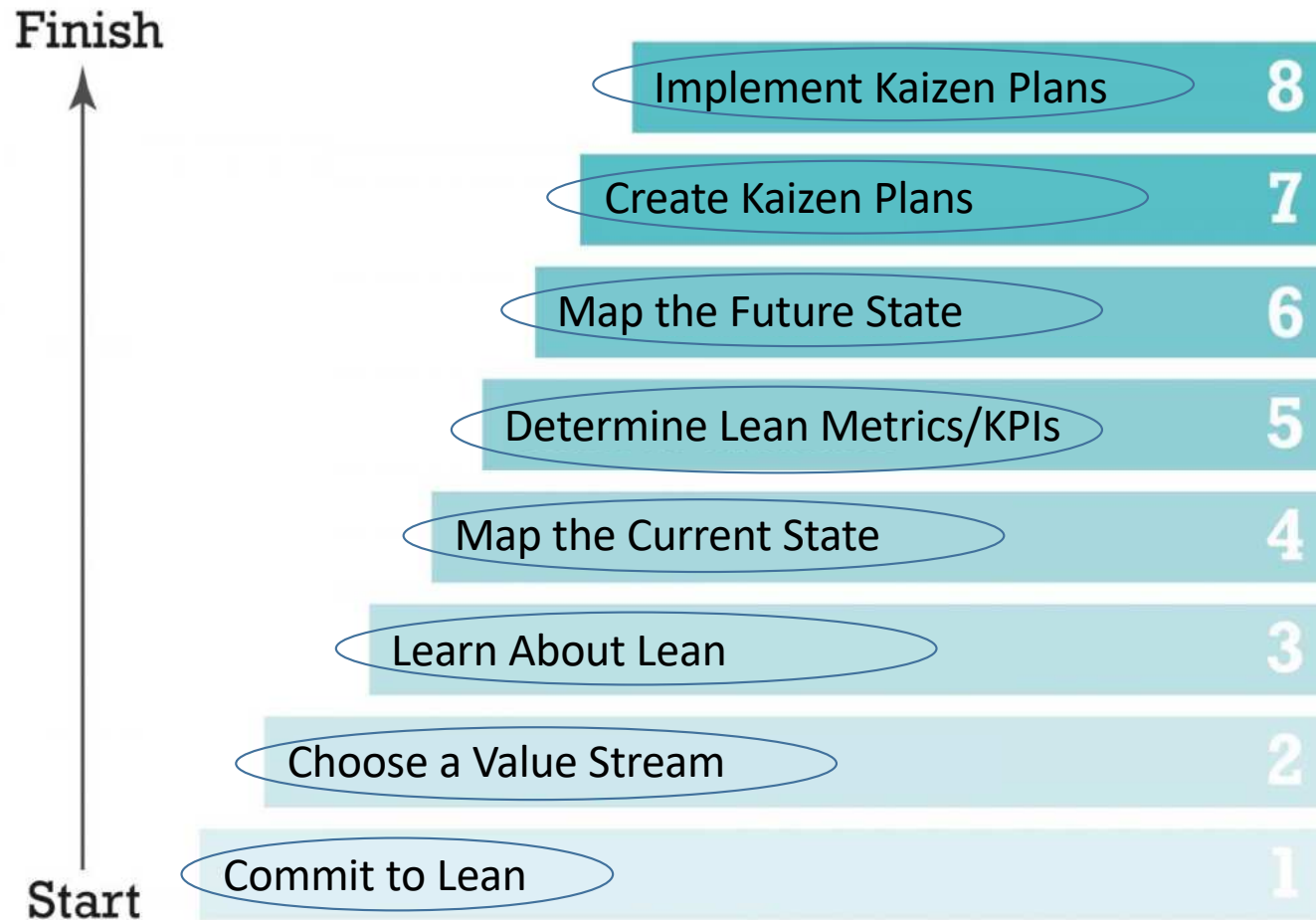
PRICE - COST = PROFIT
Happy share holders
Happy customers

Why Value Stream Mapping?

If you don't improve you lose!



The Eight Steps of Value Stream Mapping



Commit to Lean

1

- ❑ **Management Commitment to Lean Continuous Improvement**
- ❑ **Invest in the Business**
- ❑ **Invest in Your People**
- ❑ **Short-Term Pains and Long-Term Gains**
- ❑ **Implementing Lean Transforms the Culture**



“What if we don’t change at all ...
and something magical just happens?”

Choose a Value Stream

2

Product Quantity/Profit Analysis

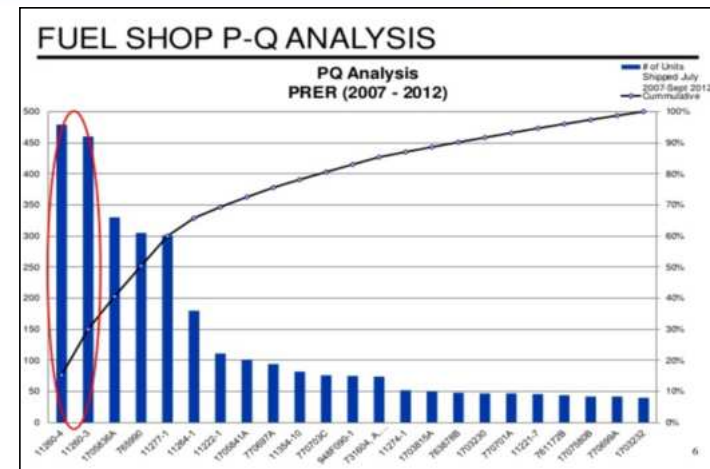
A PQA helps you see the highest to lowest demand for all products.

Product-Routing Analysis = Family

A matrix used to determine how to group similar products together (80%+ similar steps)

Top Customer(s)

Customer Complaints



PRODUCTS	Assembly Steps and Equipment							
	1	2	3	4	5	6	7	8
A	X	X	X		X	X		
B	X	X	X	X	X	X		
C	X	X	X		X	X	X	
D		X	X	X			X	X
E		X	X	X			X	X
F	X		X		X	X	X	
G	X		X		X	X	X	

Source: Rother and Shook 1999, p. 6.

- ❑ **Training and Doing - A Balancing Act**
- ❑ **Train the Key Concepts of Lean as Needed for VSM**

You need your team to be able to see waste and know that there are tools available to deal with that waste



What might you need to learn?

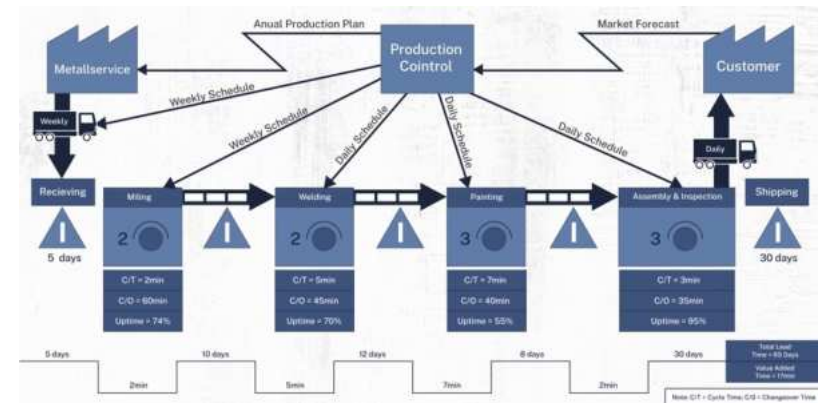
- 8 Wastes
- Value-Added vs Non-Value-Added
- 6S Workplace Organization
- Quick Changeover
- Root Cause Corrective Action
- Lean Cell Design
- Flow : Continuous Flow, Work Cell, Kanban
- Etc.



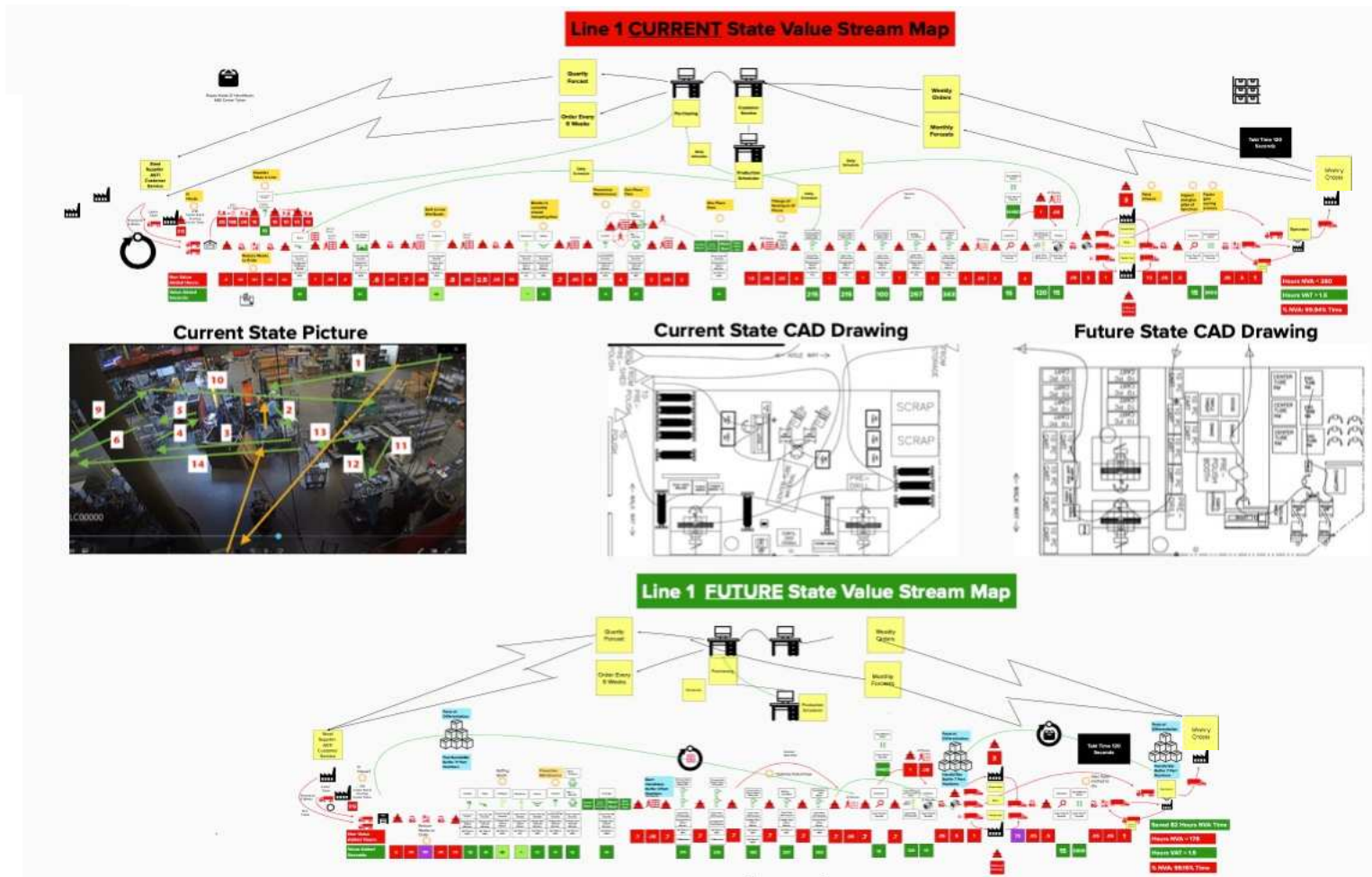
Map the Current State

4

- ❑ **Value Stream Mapping:**
 - ❑ Map Material & Info Flow
- ❑ **How to Map the Current State:**
 - ❑ Gather Data
 - ❑ Do a Team Gemba walk
 - ❑ Create the Current State Map
 - ❑ Have Others Review the Map



Digital - Value Stream Mapping (Mural.com)

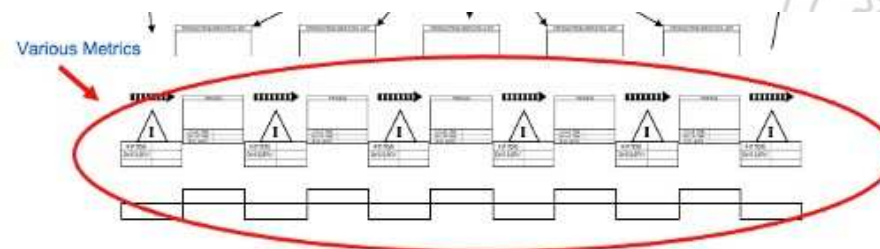
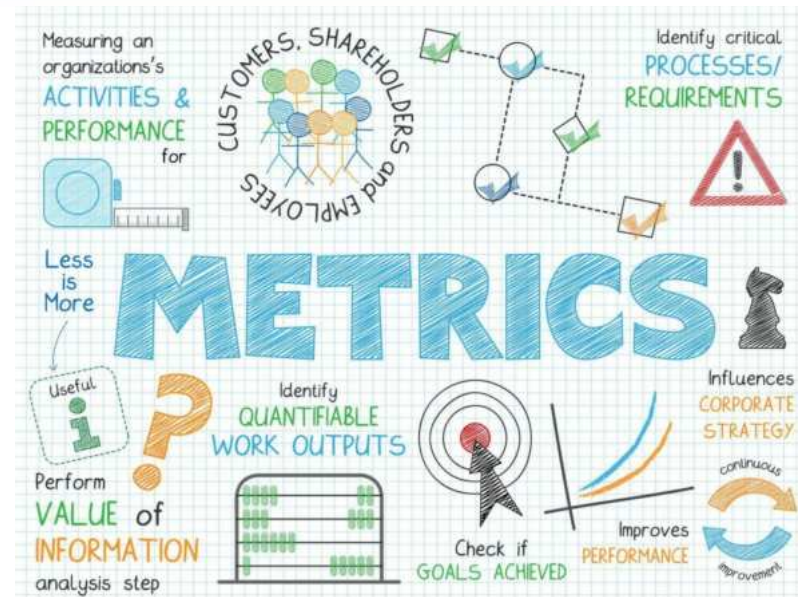


Determine Lean Metrics

5

□ Identifying Lean Metrics

- WIP at each location
- Cycle Time
- Lead Time
- On-time Delivery
- Overall Equipment Effectiveness (OEE)
- Changeover Times
- Inventory On-hand
- Customer Satisfaction
- Defect Rate
- Machine uptime
- Etc.



An illustration of two businessmen in business attire climbing a large, 3D red bar chart that rises from left to right. The chart is set against a light gray grid background. One businessman is at the base of the first bar, while the other is at the top of the tallest bar, reaching out to assist him. The overall scene conveys a sense of teamwork and upward progress.

You must collect data to measure.

You must measure to improve.

You must improve to survive.

Map the Future State

6

Map the Ideal Future-State

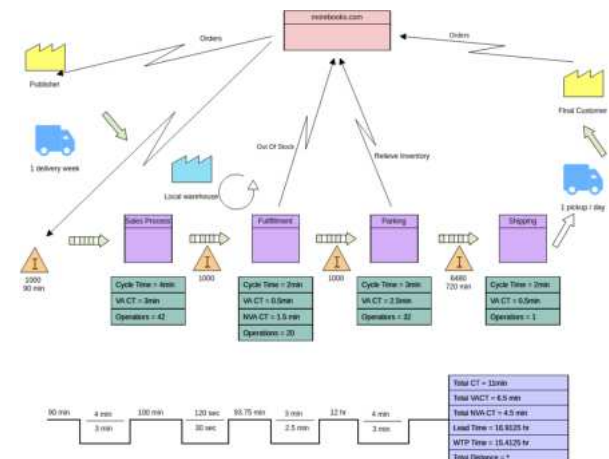
Focus on:

Demand:

- The Customer Comes First
- Design a Future State that includes Customer Demand - takt time +20%

Flow:

- Flow Eliminates Waste
- Design Future State that Includes Continuous Flow Elements

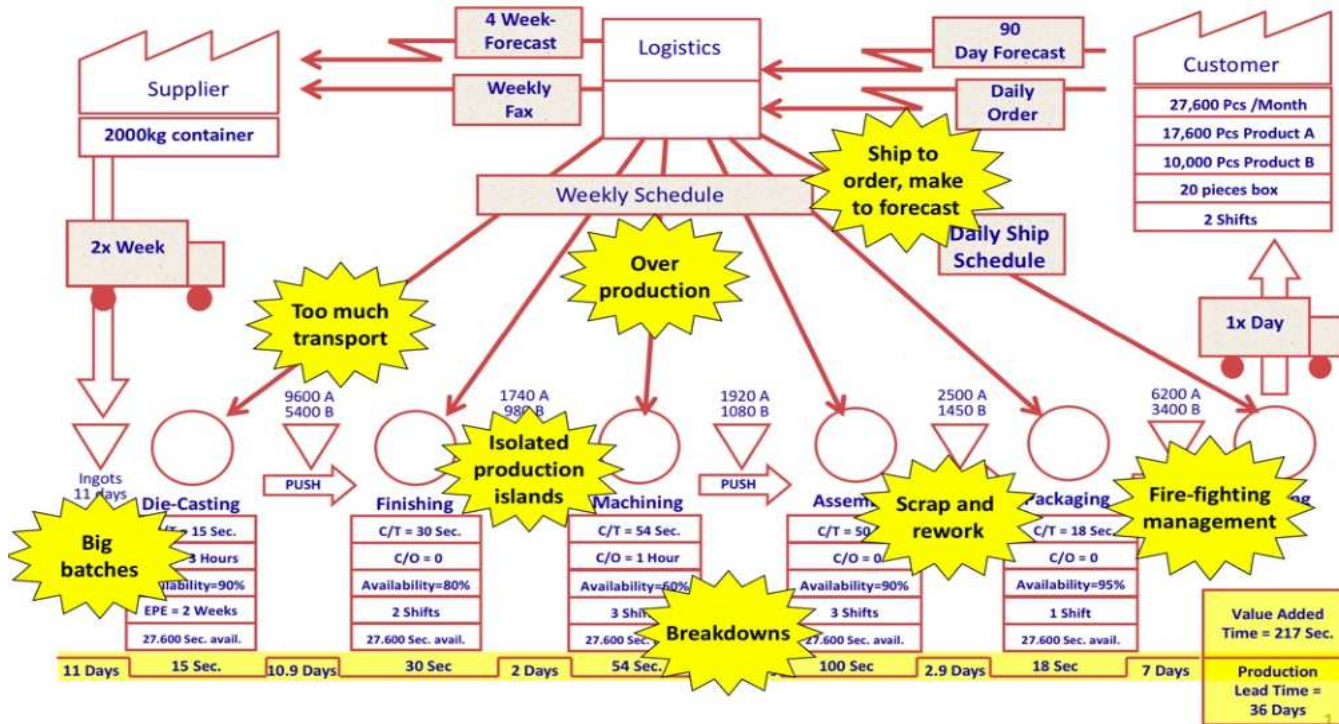


Create Kaizen Plans

7

How do we get from current to future state?

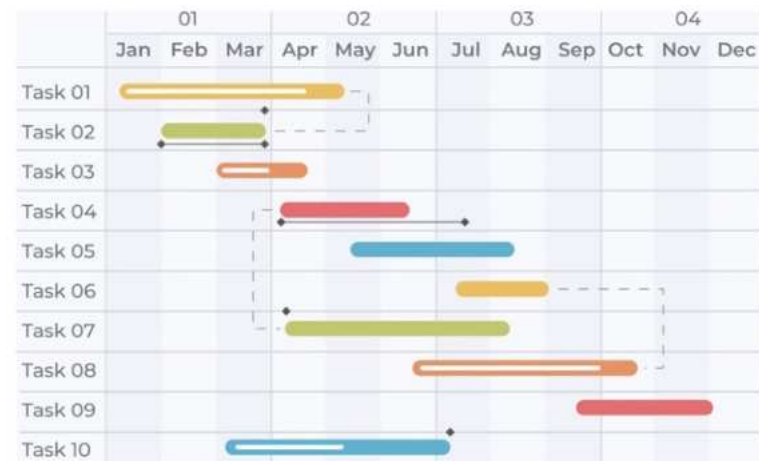
Kaizen Events (Kaizen Bursts)



Create Kaizen Plans

7

- ❑ Value Stream “Kaizen” Events:
 - ❑ Plan Concurrent & Consecutive Kaizens – Project Management
 - ❑ Milestones: Break the Plan into Manageable Pieces
- ❑ Management Presentation
- ❑ Prepare for Implementation



Implement Kaizen Plans

8

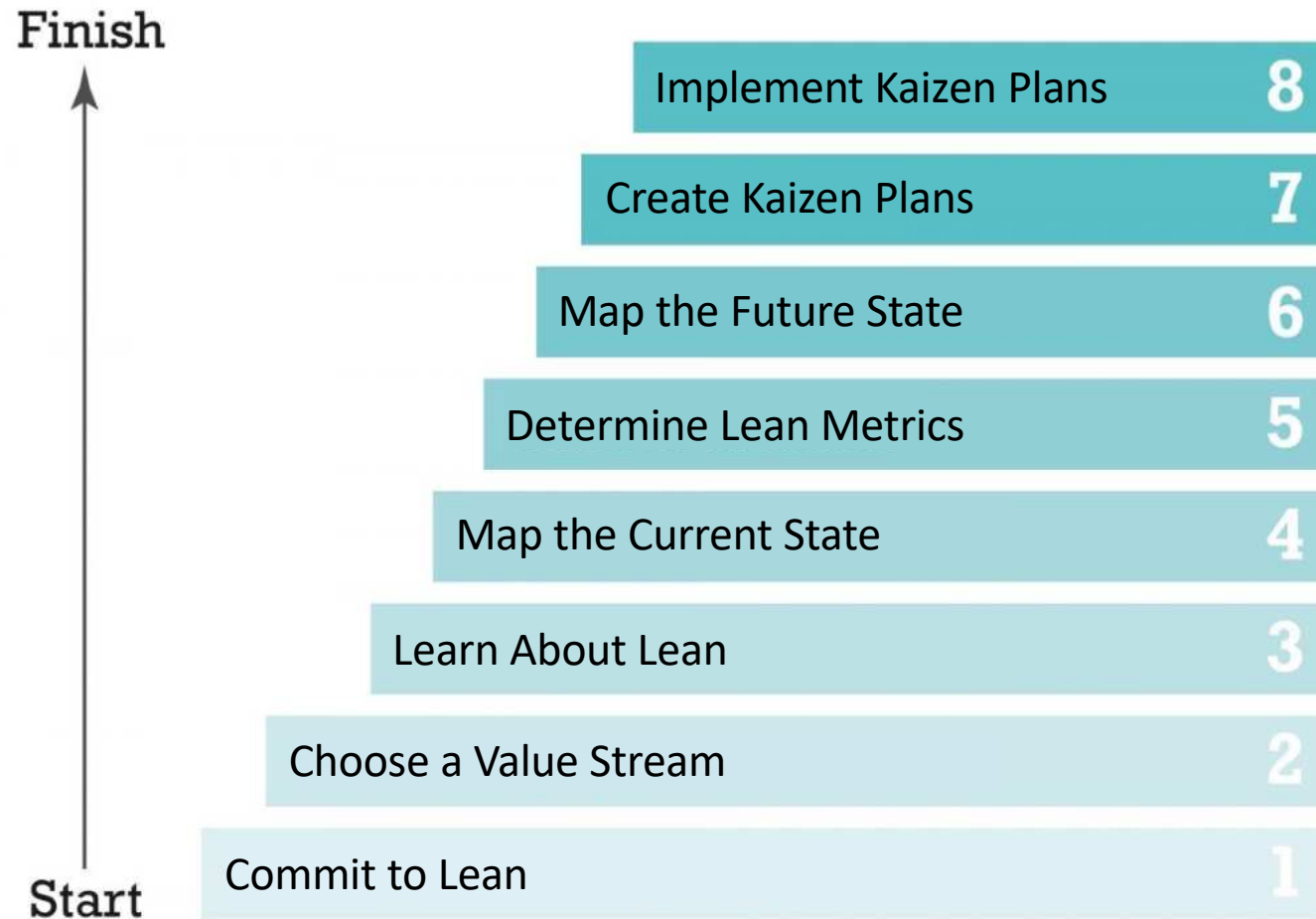
- ❑ Kaizen Project Management
- ❑ Change Management – Bring People Along

Kai - Zen

(Change)

(Good)

The Eight Steps of Value Stream Management



Story Time *SMART* improvements with **Value Stream Mapping**

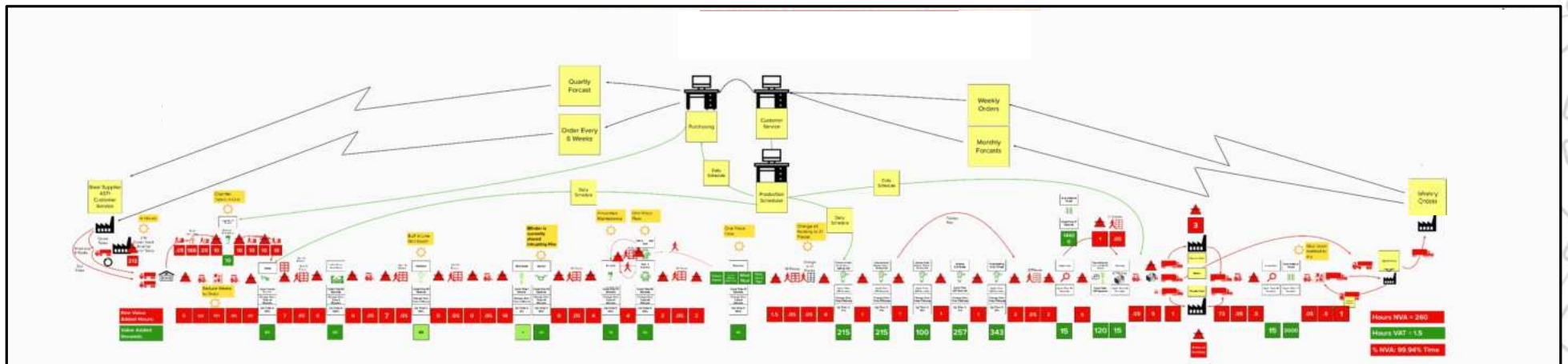
Problem: Long lead-times & too much waste in the process = losing customers

Solution: Start with VSM - use data to find the hidden wastes

Full Lean implementation

Lean Line Design - Went from station building to a Lean flow line.

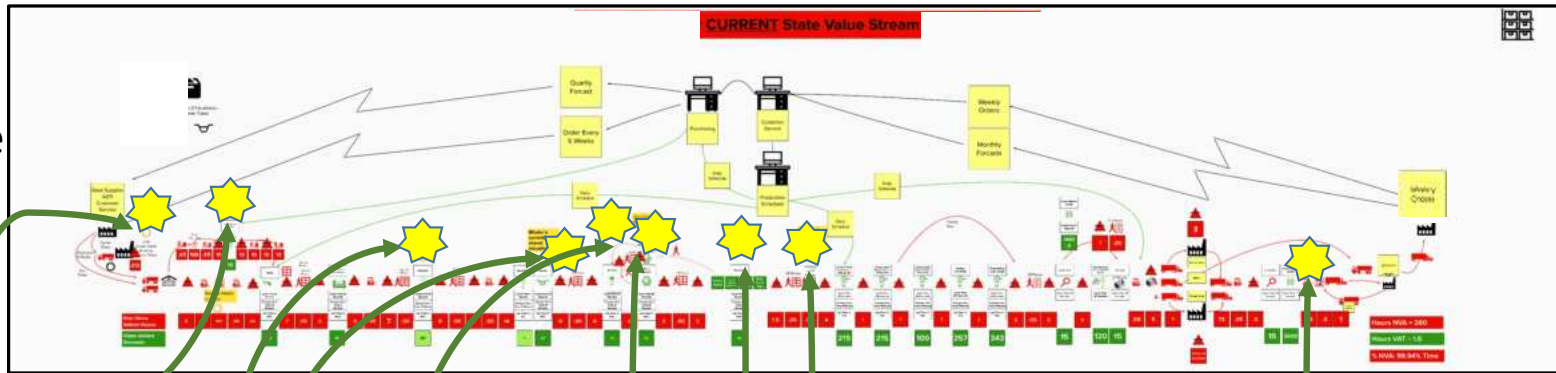
Lean Office - Leaned out the office engineering process.



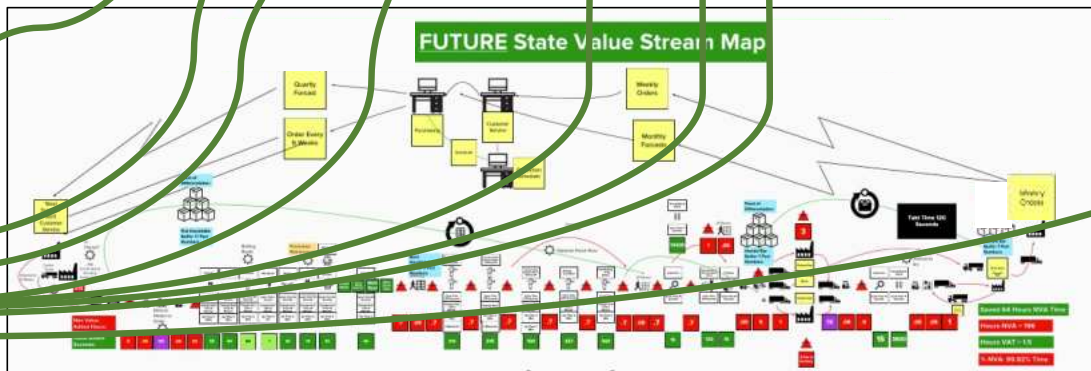
Story Time

Key Elements of Value Stream Mapping

Current State Map



Future State Map



Transition Plan



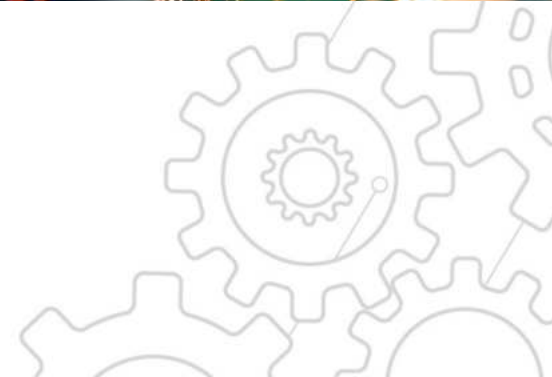
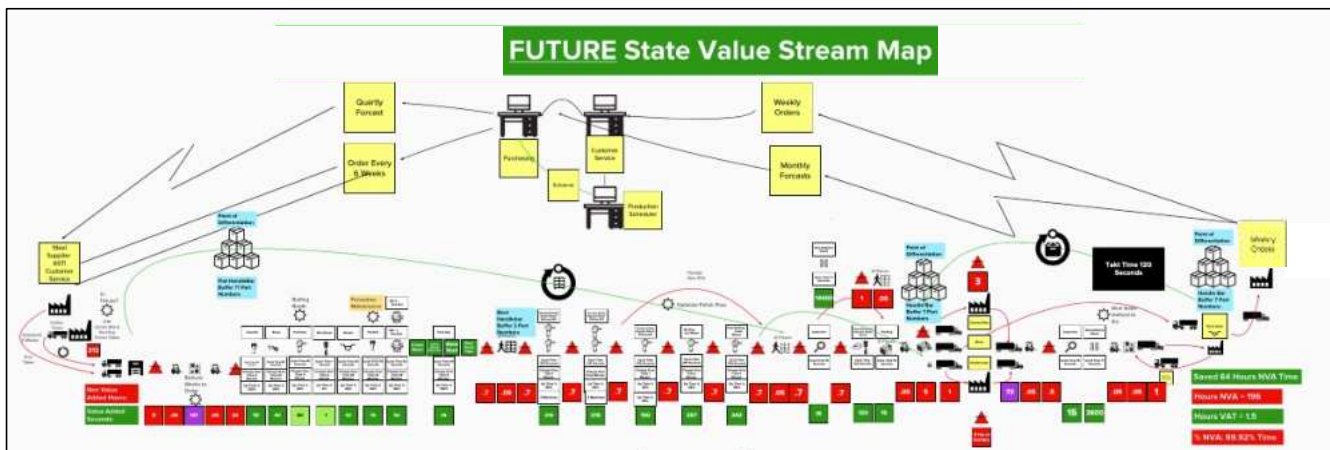
SMART improvement opportunities with Story Time **Value Stream Mapping**

Results:

Slashed lead time by more than 66% in less than one year.

Won back previous customers.

New Opportunities: Excess Capacity, Sales, Hiring



Live Survey - Value Stream Mapping Benefits

What do you see as the top 3 benefits of Value Stream Mapping?

Clear Visual of the Entire Process - Shows all the steps involved and how they interconnect

Identification of Waste - Helps in identifying non-value-added activities

Improved Efficiency - Pinpointing inefficiencies and bottlenecks

Data-Driven Decision-Making - Data-driven comprehensive view of the process

Reduction in Lead Times - Streamlining processes and eliminating waste

Cost Reduction - Eliminating waste reduces the costs of production

Increased Capacity - Finds hidden capacity in your processes and machines

Better Resource Utilization - Optimizes labor, materials, and equipment

Happy Customers! - Focus on activities that add value to the customer

Live Survey

What are the top 3 benefits of Value Stream Mapping?

 Clear Visual of the Entire Process

 Identification of Waste


 Improved Efficiency

 Data-Driven Decision-Making

 Reduction in Lead Times

 Cost Reduction

 Increased Capacity

 Better Resource Utilization

 Happy Customers!



SMART Improvements in Manufacturing: Improve the Right Stuff First

The floor is open for questions or comments



Dan Roth

President of Go-Lean-Six

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