

Lean Supply Chain

Workshop

Agenda

Time	Activity
08:45	Arrive, Coffee
09:00	Welcome
09:10	Overview of PBR Australia
09:30	Plant Tour
10:30	Break
10:45	Lean & Agile Supply Chains
11:15	Lean Supply Chain Tools – Supply Chain Wastes
11:45	Go to Supply Chain “Gemba” – Waste Identification
12:30	Lunch
13:15	Report Back on Wastes
13:45	5S in the Supply Chain
14:15	Go to Supply Chain “Gemba” – 5S Opportunities
14:45	Report Back on 5S
15:00	Break
15:15	Value Stream Mapping the Supply Chain
15:45	Worked Example of a Value Stream Map using PBR
16:15	Report Back on VSM
16:30	Elevator Speech – Lean Supply Chain Opportunities – Discussion
17:00	Close

So What Is Lean Again?

The Old Story:

- Its about zero inventory and no buffers
- Its about JIT and KanBan
- Its about Andon Lights and stopping the line
- Its about Single Piece Flow & Cells
- It only works if you are building cars or in a repetitive manufacturing environment!

So What Is Lean Again?

The New Story = *The 4 P's*:

- Its about the right *Philosophy*
- Its about the right *Processes*
- Its about the right *People*
- Its about *Problem Solving*
- Its about picking the right bits from the Lean Toolbox and applying them in accordance with the **4 P's**

The Toyota Way (Not The Toyota Production System)

The Toyota Way has 14 Principles:

- **Principle 1.** Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals.
- **Principle 2.** Create continuous process flow to bring problems to the surface
- **Principle 3.** Use “pull” systems to avoid overproduction.
- **Principle 4.** Level out the workload (heijunka). Work like the tortoise, not the hare).
- **Principle 5.** Build a culture of stopping to fix problems, to get quality right the first time.
- **Principle 6.** Standardized tasks are the foundation for continuous improvement and employee empowerment.
- **Principle 7.** Use visual control so no problems are hidden.

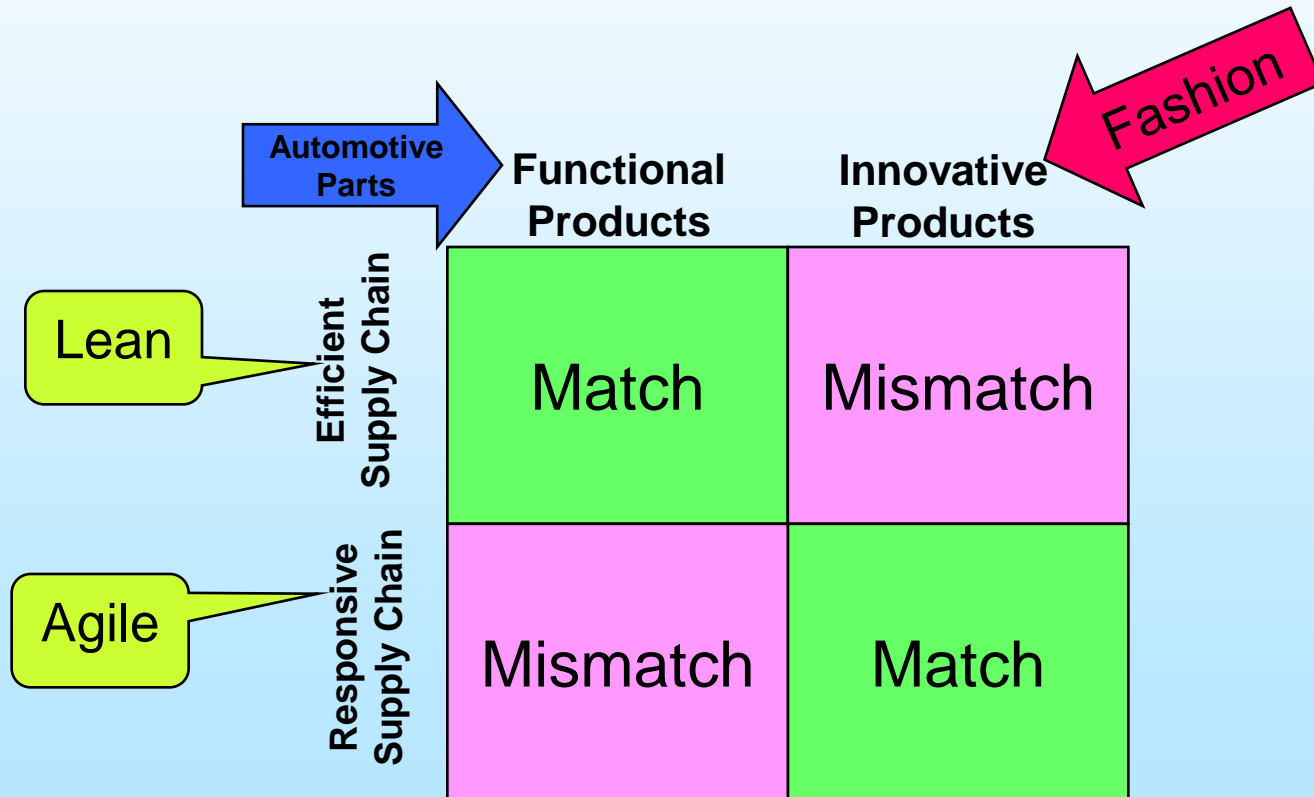
The Toyota Way (Not The Toyota Production System)

- **Principle 8.** Use only reliable, thoroughly tested technology that serves your people and processes.
- **Principle 9.** Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.
- **Principle 10.** Develop exceptional people and teams who follow your company's philosophy
- **Principle 11.** Respect your extended network of partners and suppliers by challenging them and helping them improve.
- **Principle 12.** Go and see for yourself to thoroughly understand the situation (genchi genbutsu).
- **Principle 13.** Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly.
- **Principle 14.** Become a learning organization through relentless reflection (hansei) and continuous improvement (kaizen).

So Are Any Of The Principles
Not Able To Be Applied In A
Supply Chain Environment?

The Lean Versus Agile Argument

Some commentators have argued that Lean is not flexible and to really satisfy customers you must be Agile!



Nothing Has To Be That Rigid!

- A new concept points to a hybrid Supply Chain which takes the best elements from both Lean & Agile
 - It has an unfortunate name:

Leagility

Leagile Supply Chains:

- Are Lean on the upstream side until customer specific customisation is required
 - Raw Material Supply, Manufacturing
- Are Agile on the downstream side to respond to actual customer demand
 - Finished Goods Warehousing, Configuring To Order, Distribution

Do what is sensible for your Business

The Key Area of Misunderstanding With Lean:

The Role of Inventory:

- Inventory is the “Marker” for problems in a Supply Chain
- However some Inventory is necessary
 - Even Toyota will add inventory to smooth flow
- Inventory reduction programmes that attack inventory rather than root cause are doomed to fail
 - (The number 1 cause is “Over Production”)
- Address the root cause and Inventory will come down
- Treat Inventory as a blessing – You have the information you need to identify the problem/s in your Supply Chain

Waste!

Waste!

A Working Definition:

Anything that adds cost but does not add value in the eyes of the **Customer!**

A useful definition but open to abuse

The Toyota 7 Waste's (MUDA)

1. Transport
2. Inventory
3. Motion
4. Waiting
5. Over Production
6. Over Processing
7. Defects

Another View of Waste:

1. Over Production
2. Inventory
3. Excessive Materials Handling
4. Waiting
5. Fiddling
6. Excessive Movement
7. Defective Parts
8. Defective Equipment
9. Workload Balance
10. Extravagant Use of Resources
11. Poor Design
12. Monitoring

Supply Chain is Different from Manufacturing

- It has a “Boundary Spanning” Role
- Ability to “Control” activity is not as great
- Most of the activity happens “out of sight”
- Access to information is critical
- Transport is a Batch Process
- Regulations have a significant impact
- ?
- ?

So If Supply Chain is Different!

Should different Waste Categories be Considered?

1. Inventory
2. Transportation
3. Leadtime
4. Space Utilisation
5. Packaging
6. Complexity

Robert J Bowman *“Born On The Assembly Line”*

What Else?

- 7.
- 8.



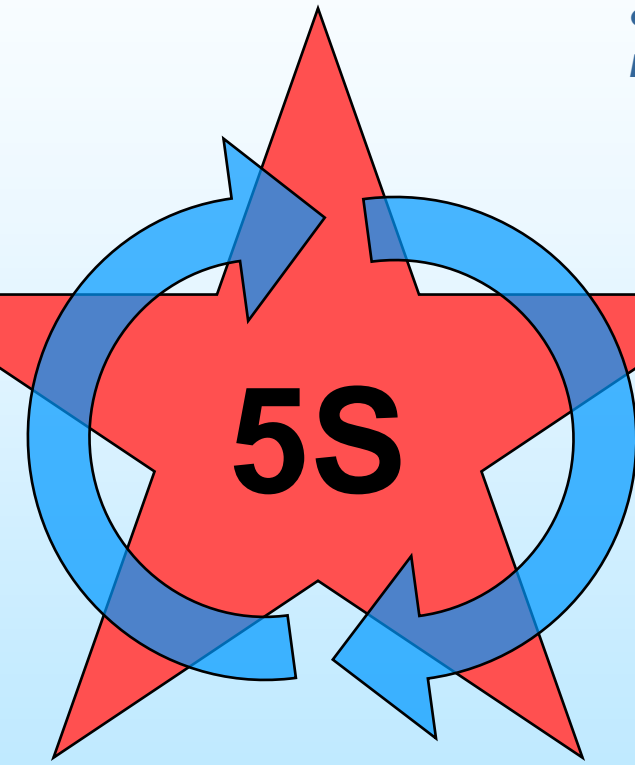
~~Seiri~~ Sift

Determine what is necessary & what is unnecessary & get rid of the unnecessary

~~Seiton~~ Sort

Have a place for everything and everything in its place

5S



~~Seiso~~ Sweep

Keep the workplace clean

~~Seiketsu~~

Standardise

Create Procedures to manage previous 3S

Sustain

Use regular audits to stay disciplined

Discipline procedures of the other 4S

~~Spirit~~

Personal appearance



Sift

Determine what is necessary & what is unnecessary & get rid of the unnecessary

Summary

- 5S is about cultural change so involve the entire team
- Use the **Red Tag** process to get rid of the clutter
- Review Inventory Levels across the value stream
- Once you have removed material define how it can return
- The aim is for maximum impact



Sort

*Have a place for everything
and everything in its place*

Summary

- Sort is aimed at organising the workplace
- Go to the Spaghetti Diagram before finalising layouts
 - Travel Distance & Backtracking
- Think “Visual Control”, can you see when its gone wrong?
- Shadow Boards at the work station = floor markings and parking bays in the Supply Chain



Remember:
 improvements to
 Layout and
 Housekeeping don't
 just hit the bottom
 line directly



Sweep

Keep the workplace clean

Summary

- Sweep is more than a weekly/monthly Bull Session
- Use the team to define what a clean workplace looks like
- Have the work teams do the 5S audits
- Leverage the benefits of clean equipment – reliability
- Work out where the dirt comes from – fix it at source
- Management must commit to maintaining the standard:
 - Painting Schedule, Lighting etc



Spick & Span

Personal Cleanliness and hygiene Or Standardise the gains

Summary

- It is worth considering appearance of the people who work for you in the supply chain, often it is the delivery driver (a 3rdParty) who is the manifestation of your company to the customer.
- Standardise covered under Systematic



Systematic

Put in place the Disciplines and standards so that gains are maintained

Summary

- This element is about checklists, timing, authorities and approvals.
- It is the wedge that prevents backsliding to the previous way things were done.
- It is the basis for the next round of 5S continuous Improvement

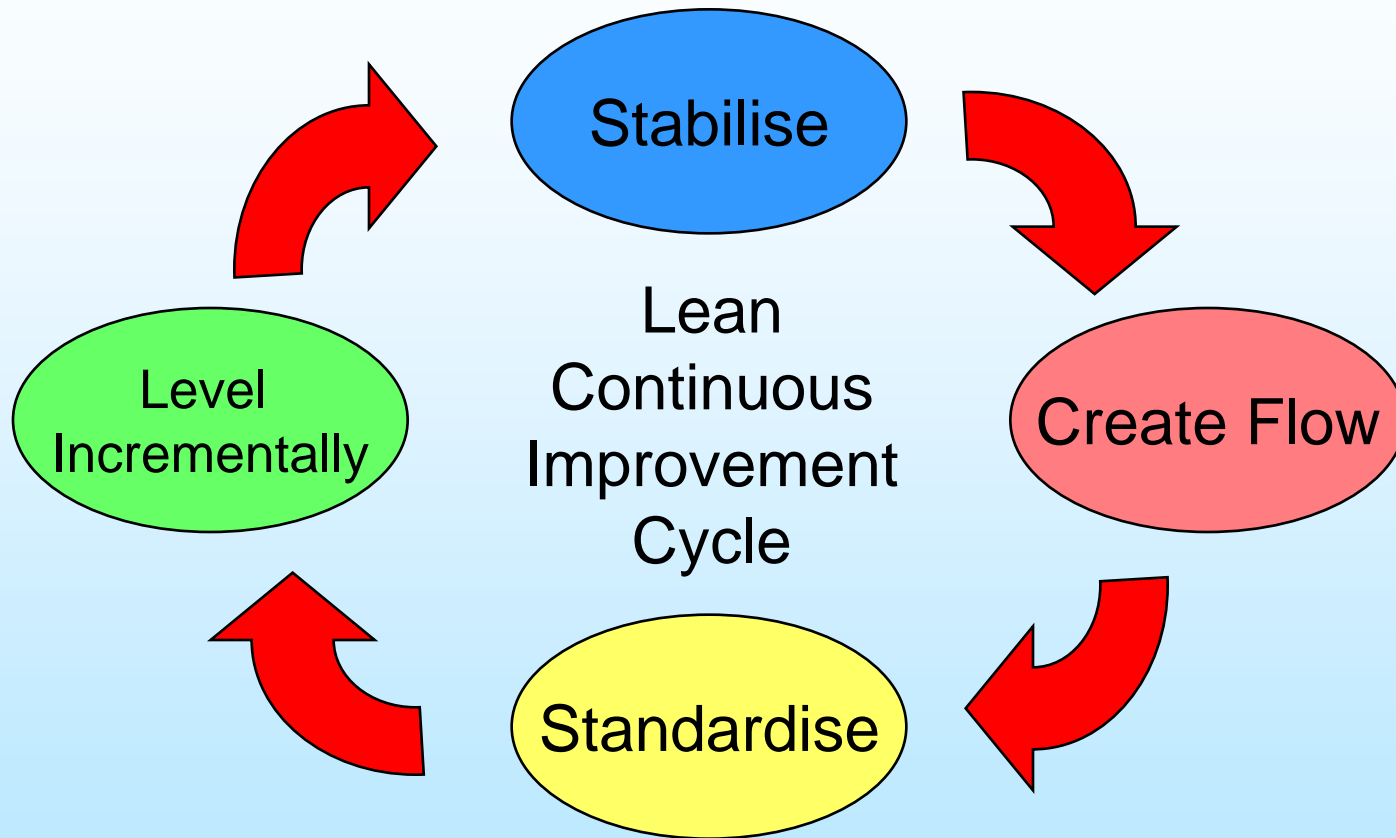
So Why Are We Doing 5S?

Traditional Answer = To improve:

- Productivity
- Quality
- Shopfloor Control
- Impress Management & Visitors
- And never ever forgetting SAFETY

The Toyota Way Answer:

- To Surface Problems
- To aid Visual Management
- To take first step towards Stability

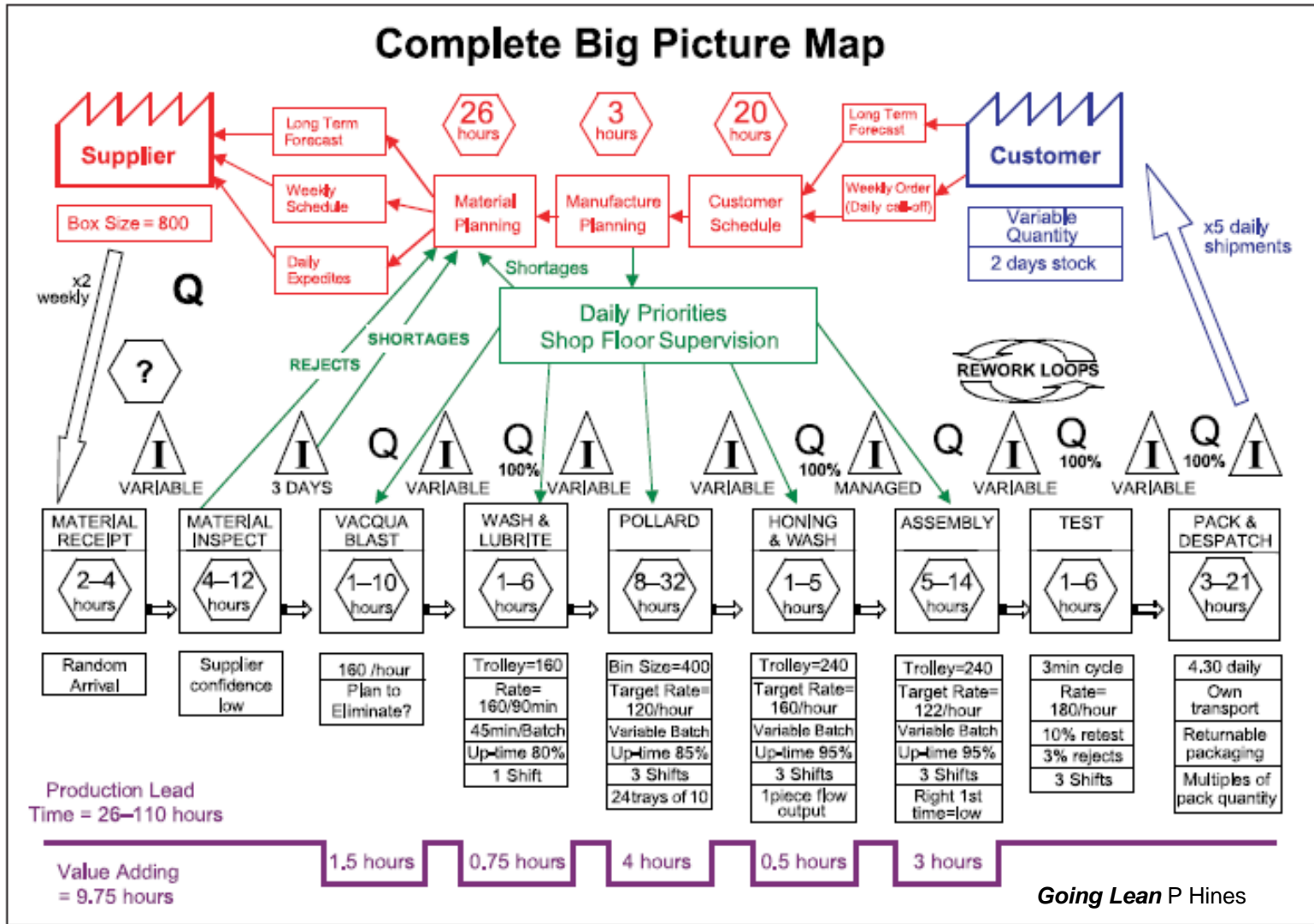




Final Hint:

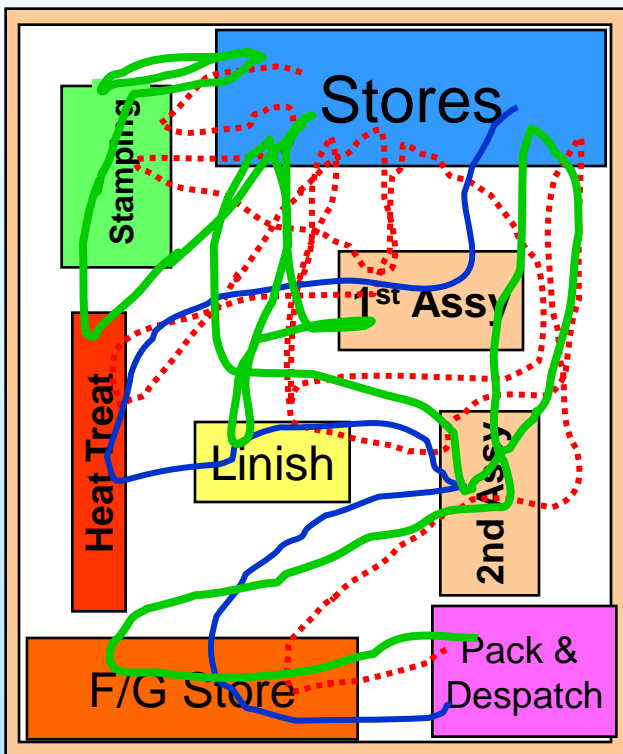
It's never a "good look" to impose stringent Housekeeping Standards on the Shopfloor when you don't achieve them in the office

Value Stream Mapping

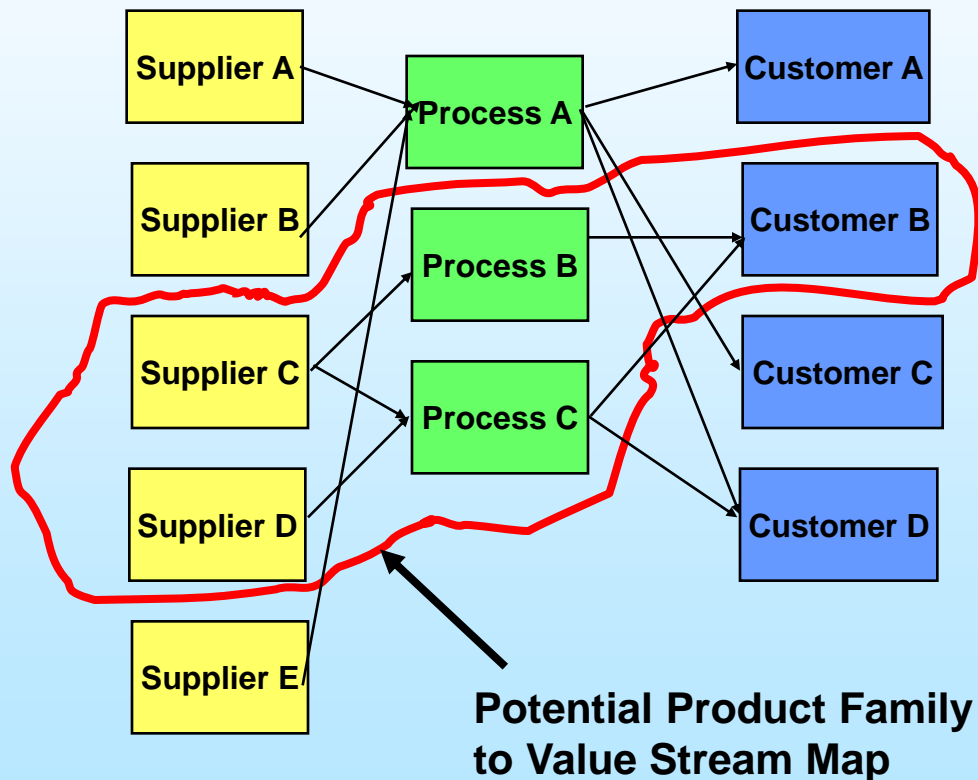


Some Maps To Consider Before The VSM:

Spaghetti Diagram

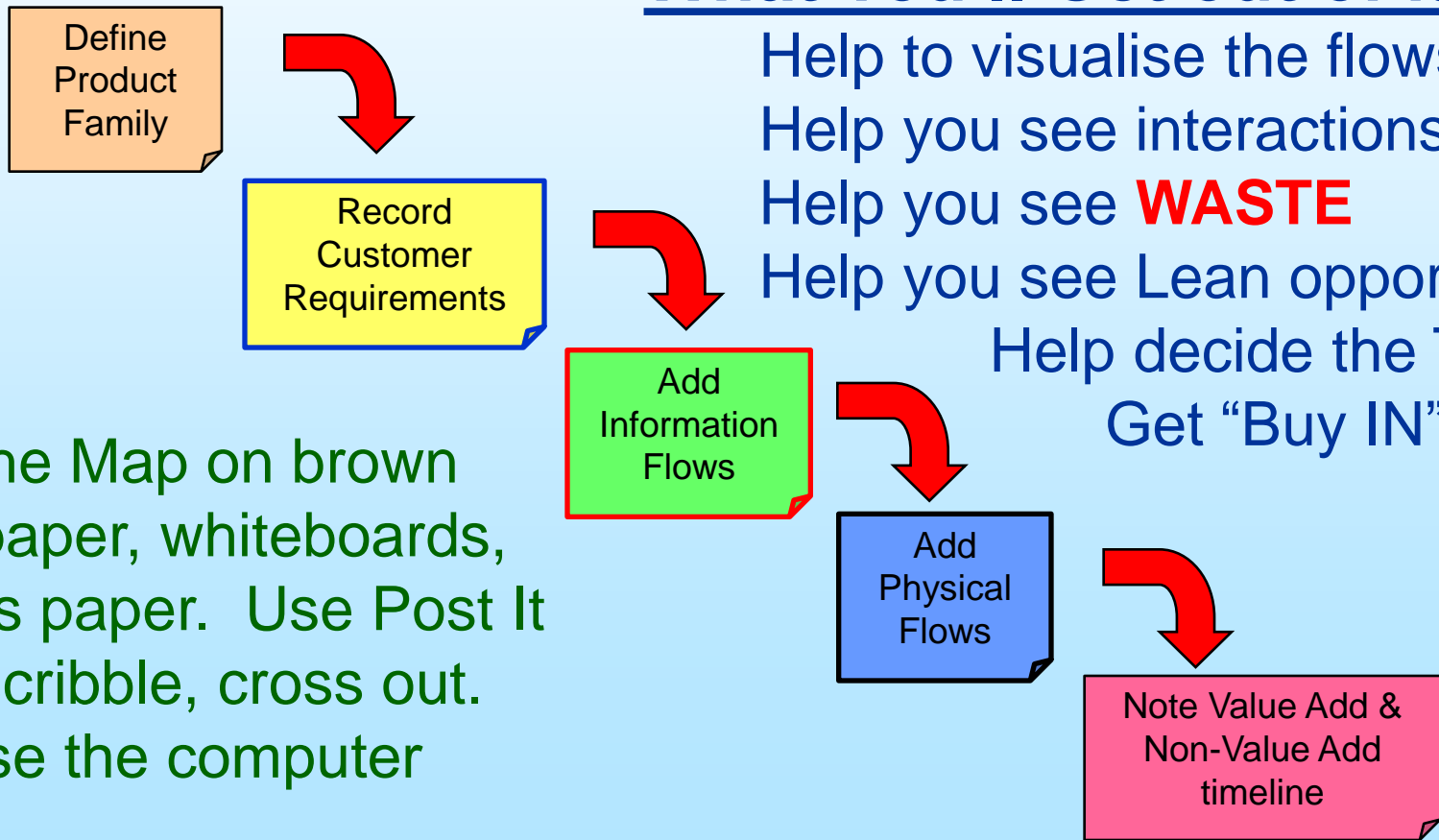


Value Chain Interaction Map



The VSM Process

- Creating the VSM is a “Go To Gemba” Process
- It should be done by Management who control the Stream
- VSM Steps:



What You'll Get out of it:

- Help to visualise the flows
- Help you see interactions
- Help you see **WASTE**
- Help you see Lean opportunity
- Help decide the Team
- Get “Buy IN”

Draw The Map on brown parcel paper, whiteboards, butchers paper. Use Post It notes, scribble, cross out. Don't use the computer

Value Stream Mapping

- Having a Value Stream Map (VSM) doesn't make you lean
- VSM are **meant** to be done across the Supply Chain
- Like other Lean Process it is possible to get too much detail
- The Current State Map should not be a work of art!
- Don't move too early to remove waste
 - Single Point Kaizen (Titanic's Engine Room)
- Once your Future State Map is implemented it becomes the Current State Map for the next cycle of improvement!

APPENDIX A - Extended Value Stream Mapping Icons

The icons and symbols for current and future state mapping fall into three categories: Material Flow, Information Flow, and General Icons.

Material Icons	Represents	Notes
	Manufacturing Process	One process box equals an area of flow. All processes should be labeled. Also used for departments, such as Production Control.
	Outside Sources	Used to show customers, suppliers, and outside manufacturing processes.
	Data Box	Used to record information concerning a manufacturing process, department, customer, etc.
	Cross-Dock	
	Warehouse	
	Plane Shipment	Note frequency of shipments.
	Train Shipment	Note frequency of shipments.
	Truck Shipment	Note frequency of shipments.
	Inventory	Count and time should be noted.

Material Icons	Represents	Notes
	Movement of production material by PUSH	Material that is produced and moved forward before the next process needs it; usually based on a schedule.
	Movement of finished goods to the customer	
	Milk Run	
	Expedited Transport	
	Supermarket	A controlled inventory of parts that is used to schedule production at an upstream process.
	Withdrawal	Pull of materials, usually from a supermarket.
	Transfer of controlled quantities of material between processes in a "First-In-First-Out" sequence.	Indicates a device to limit quantity and ensure FIFO flow of material between processes. Maximum quantity should be noted.

Information Icons	Represents	Notes
	Manual Information flow	For example: production schedule or shipping schedule.
	Electronic Information flow	For example via electronic data interchange.
	Information	Describes an information flow

Information Icons	Represents	Notes
	Production Kanban (dotted line indicates kanban path)	The "one-per-container" kanban. Card or device that tells a process how many of what can be produced and gives permission to do so.
	Withdrawal Kanban	Card or device that instructs the material handler to get and transfer parts (i.e. from a supermarket to the consuming process).
	Signal Kanban	The "one-per-batch" kanban. Signals when a reorder point is reached and another batch needs to be produced. Used where supplying process must produce in batches because changeovers are required.
	Kanban Post	Place where kanban are collected and held for conveyance.
	Kanban Arriving in Batches	
	Load Leveling	Tool to intercept batches of kanban and level the volume and mix of them over a period of time.
	Control Center	
	Phone	
	Orders	
	Operator	Represents a person viewed from above.

Value Stream Mapping Symbols

The Elevator Speech:

The 2 minute conversation you have with your boss when you get back from the workshop.

What Is Lean Supply Chain?

What Are the Opportunities?