

RDP Supply Chain Lean Awareness

Workshop

20/03/23



BBI Services

Building Business Improvement

Lean in construction



History



62 weeks



1913
Henry Ford
assembly line

1930
Empire State
Building

1949
Prof. E.
Deming PDCA

1993
Term 'Lean
Construction'
first used



1870
Chicago Meat
Packing

1931
Hoover Dam –
Gantt charts

1945
Toyota JIT
system

1990
Last Planner
system

Flowline – work
moves not the
person



Taiichi Ohno
(1912 – 1990)

Known as
Collaborative
Planning



Need for Lean in construction

How would you like to work on a project that has.....

- 🌐 Poor communication / mixed messages
- 🌐 Ever changing priorities
- 🌐 Rework and snags
- 🌐 Conflict between different contractors
- 🌐 Overly complicated processes
- 🌐 Unrealistic timeframes to complete activities
- 🌐 Pressure to reduce costs and labour



Voice of the customer

Lean can help us achieve customer satisfaction, but who is the customer?

- 🌐 The client
- 🌐 The principal contractor
- 🌐 The follow on trade / contractor
- 🌐 The suppliers
- 🌐 The end user
- 🌐 The public



Implementing Lean

If you have already started on a Lean journey or are planning to, what was the reason?

- 🌐 The client told us we had to
- 🌐 It's part of our contract



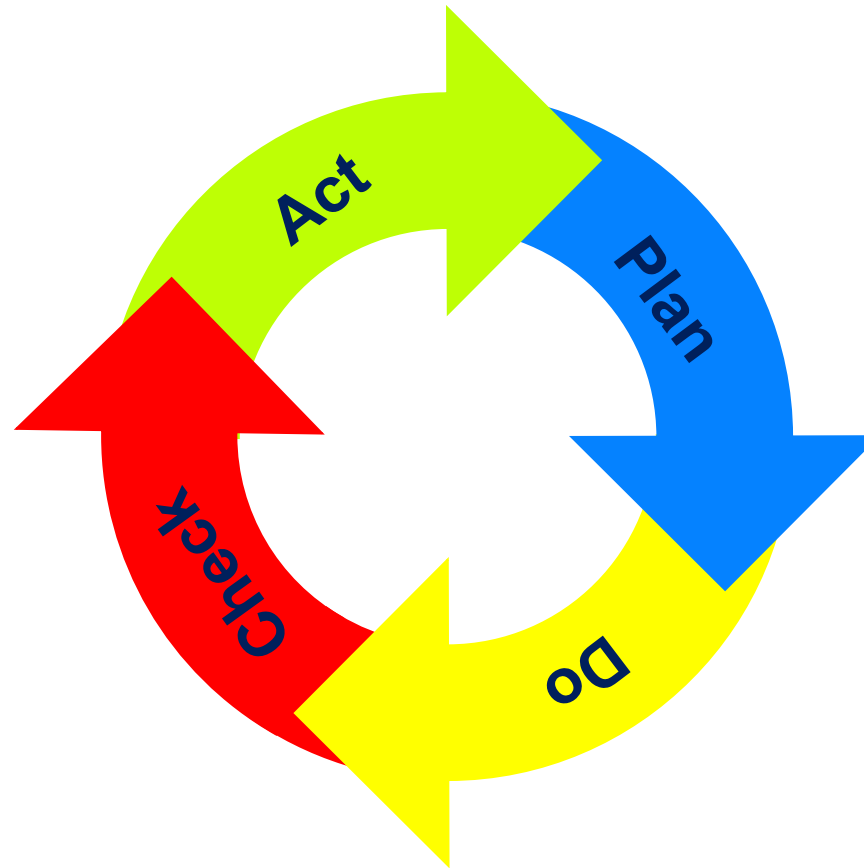
Or

- 🌐 To improve our business and become more profitable



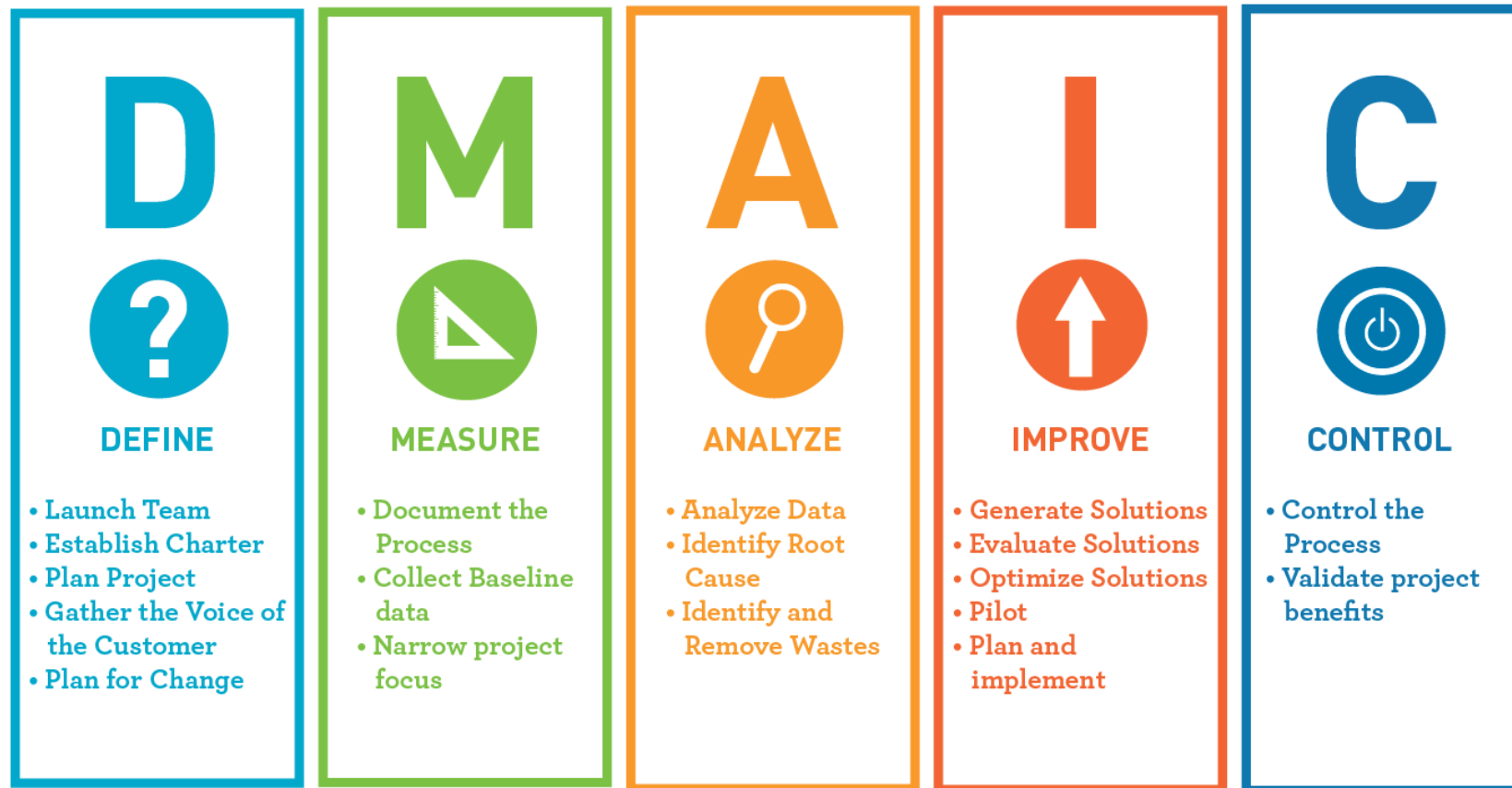
Frameworks for improvement

PDCA is a simple tool that can be applied to all aspects of construction



Frameworks for improvement

DMAIC is a data driven structured improvement methodology



What can it achieve?

Government

Issues – low productivity, weekly delays, lack of clarity.

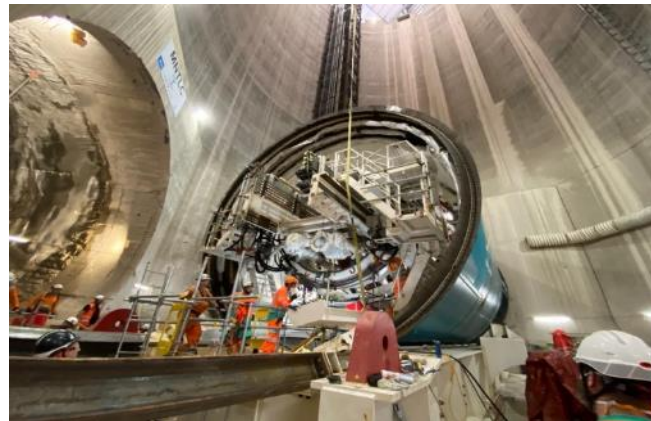
- 🌐 **30% productivity improvement** - Kitting solution of all parts & all information to supporting members deployed
- 🌐 **2 Weeks Early completion** - simplified project management & control system



Infrastructure

Issues – milestones not being met, productivity increase needed.

- 🌐 **28% reduction in ring build times** – Implemented process improvements, now meeting stretch targets
- 🌐 **23% reduced excavation times** – Reduced downtime so stretch targets met and maintained.



Residential

Issues – weekly activity counts needed to improve (PPC)

- 🌐 **£2.5 million** cost avoidance
- 🌐 **31% increase** in weekly activity completion - improved from 55% to 86%
- 🌐 **3 weeks saved from critical path** through supply chain improvements on steelwork deliveries



Three-pronged approach

People – change behaviours, build teamwork, develop skills and embed an improvement mindset at all levels

Process – apply World Class Production practices blended with Construction best practices.

Performance – tackle opportunities to reduce programme durations, reduce risks and embed routines

✓ **Programme certainty & betterment**

✓ **Productivity & quality improvement**

✓ **Reduce costs & risks**

✓ **Improved sustainability measures**



Lean tools and techniques



Lean tools and techniques

Think of the tools and techniques as a tool box – you need to select the correct tool for the job. The key tools are –

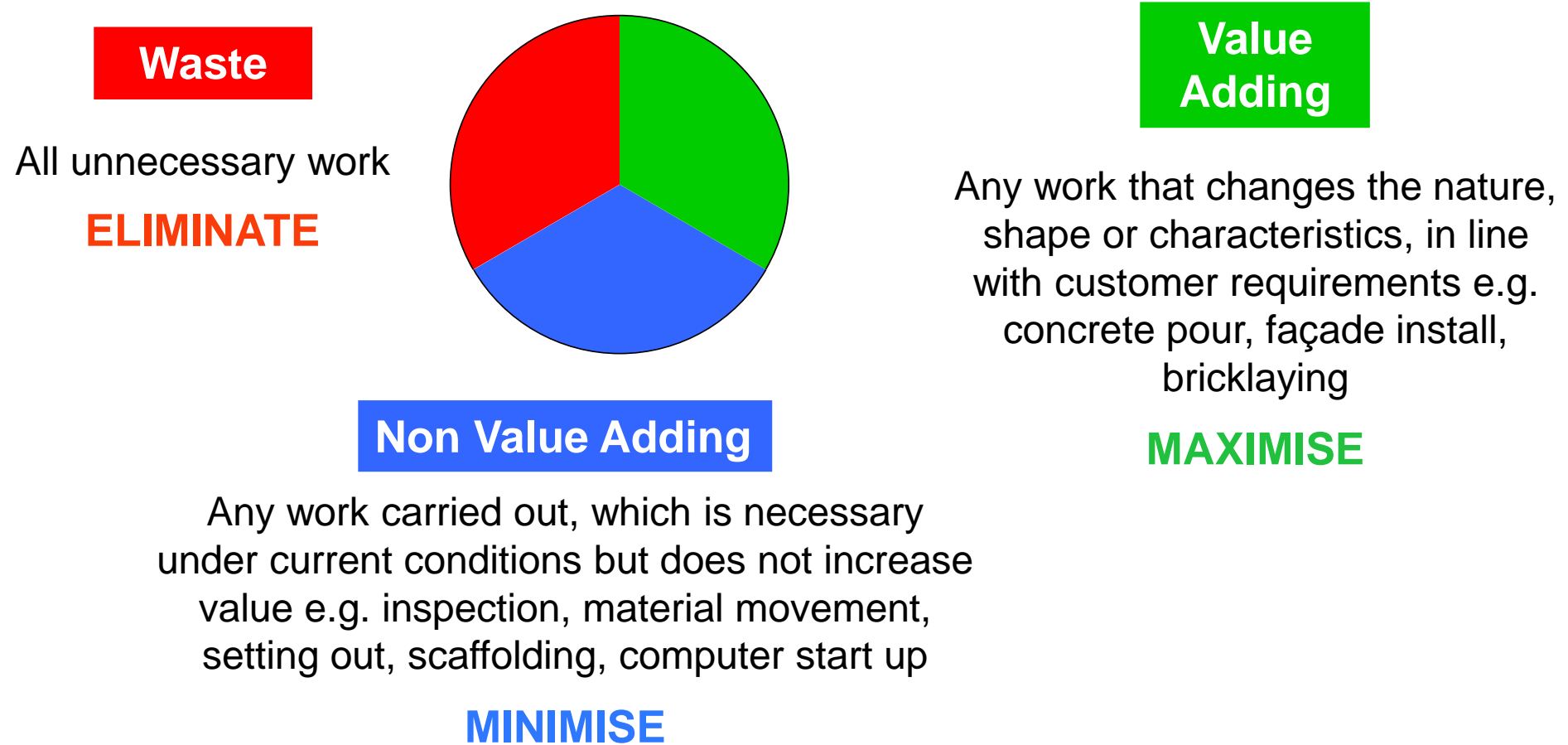
- 🌐 7 Waste
- 🌐 5S Workplace Organisation
- 🌐 Collaborative Planning
- 🌐 Visual Management
- 🌐 Standard Work
- 🌐 Problem Solving



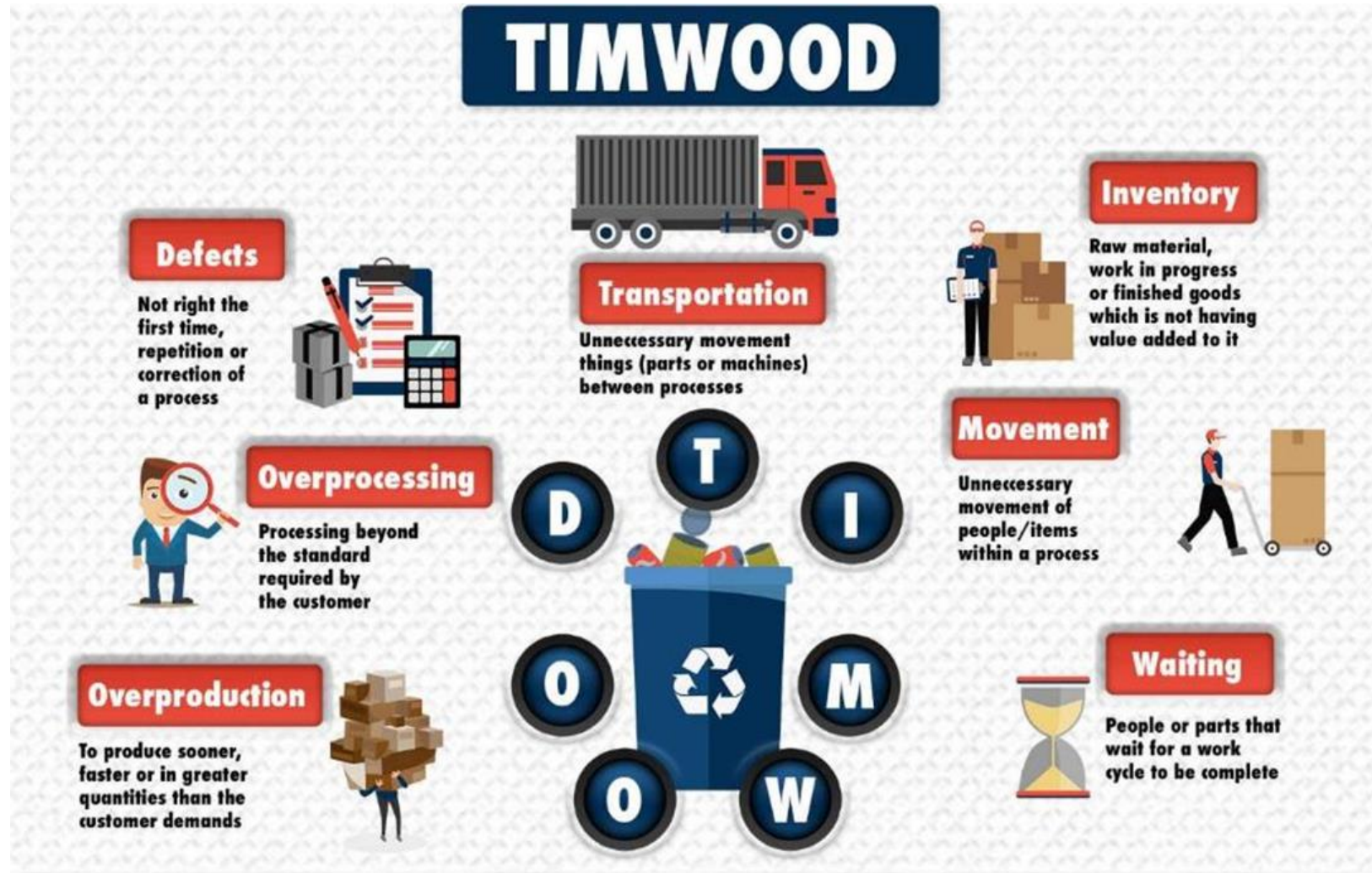
Data and Go-Look-See will let us know which is the most important job we should be working on.



What is work?



7 Waste



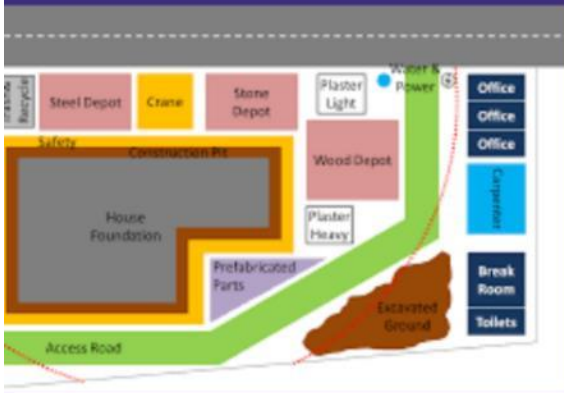
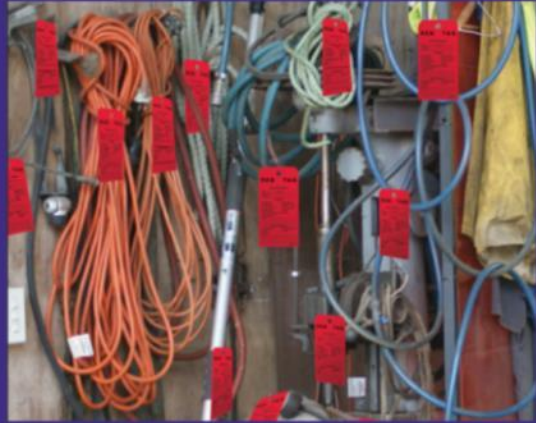
The 8th Waste
Underutilising
people's skills,
talent and
knowledge



5S Workplace Organisation



5S Examples



Collaborative Planning

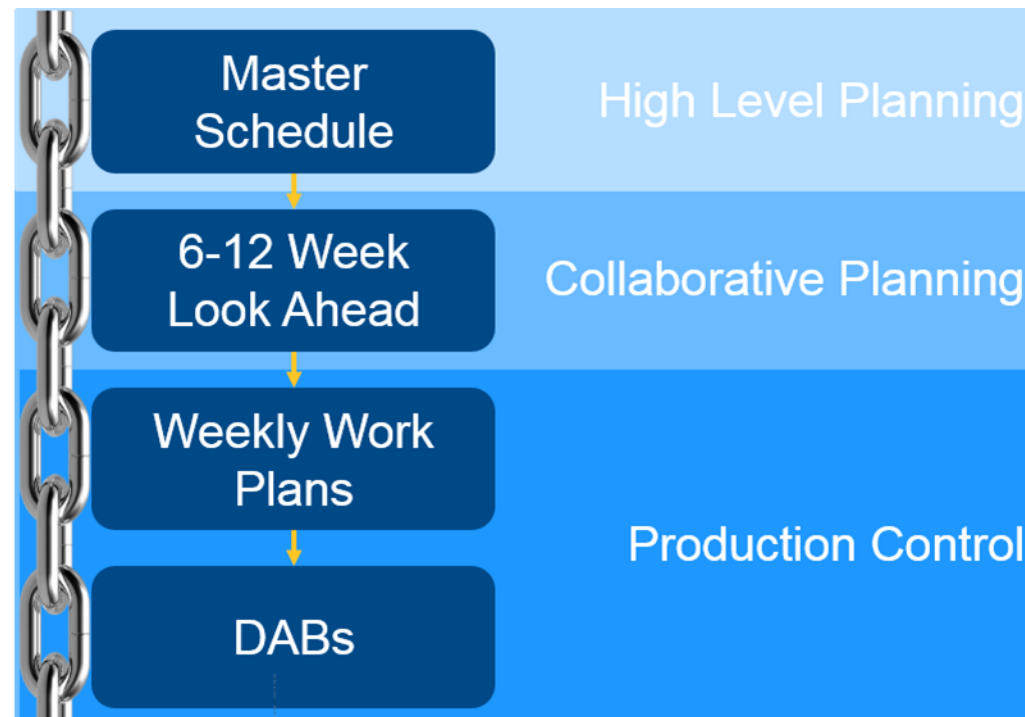
The collaborative planning system helps us to -

- 🌐 Deliver better value to the customer to increase satisfaction
- 🌐 Remove waste from work processes to reduce time and cost
- 🌐 Increase programme certainty
- 🌐 Visualise programme
- 🌐 Align all involved
- 🌐 Identify opportunities



How processes link together

By linking our master schedule, collaborative planning and DABs processes we ensure clear, aligned and focussed communication across the project



Visual Management

Make the site talk to you! Good visual management needs no interpretation and provokes the correct reaction to an issue

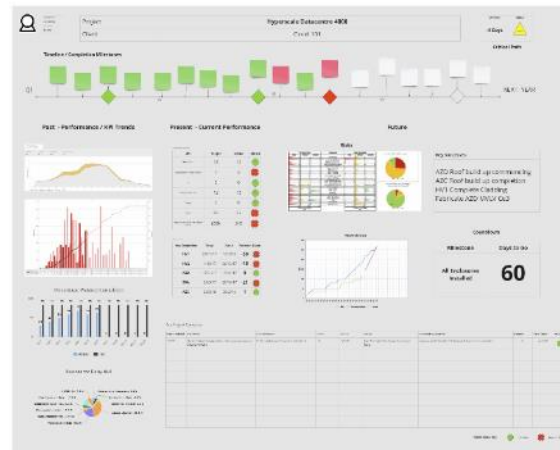
SITE SAFETY			
	All visitors and drivers must report to site office		Children must not play on this site
	Construction work in progress Parents are advised to warn children of the dangers of entering this site		High visibility jackets must be worn
	Report all accidents immediately		Danger Deep excavations
	Safety helmets are provided for your safety and must be worn		Danger Beware of trucks
	Protective footwear must be worn		No unauthorised access



Control rooms

The aim of control rooms and review meetings are to -

- 🌐 See the current project situation at a glance
- 🌐 Expose the key issues across the project
- 🌐 Drive the right actions that improve project performance



Standard Work

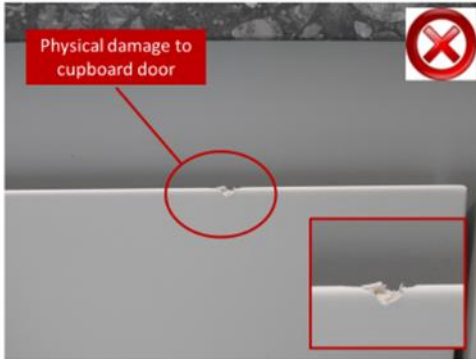


Standard work is the process of removing variation, the aim is to achieve customer satisfaction, every time, through effective management of workplace methods



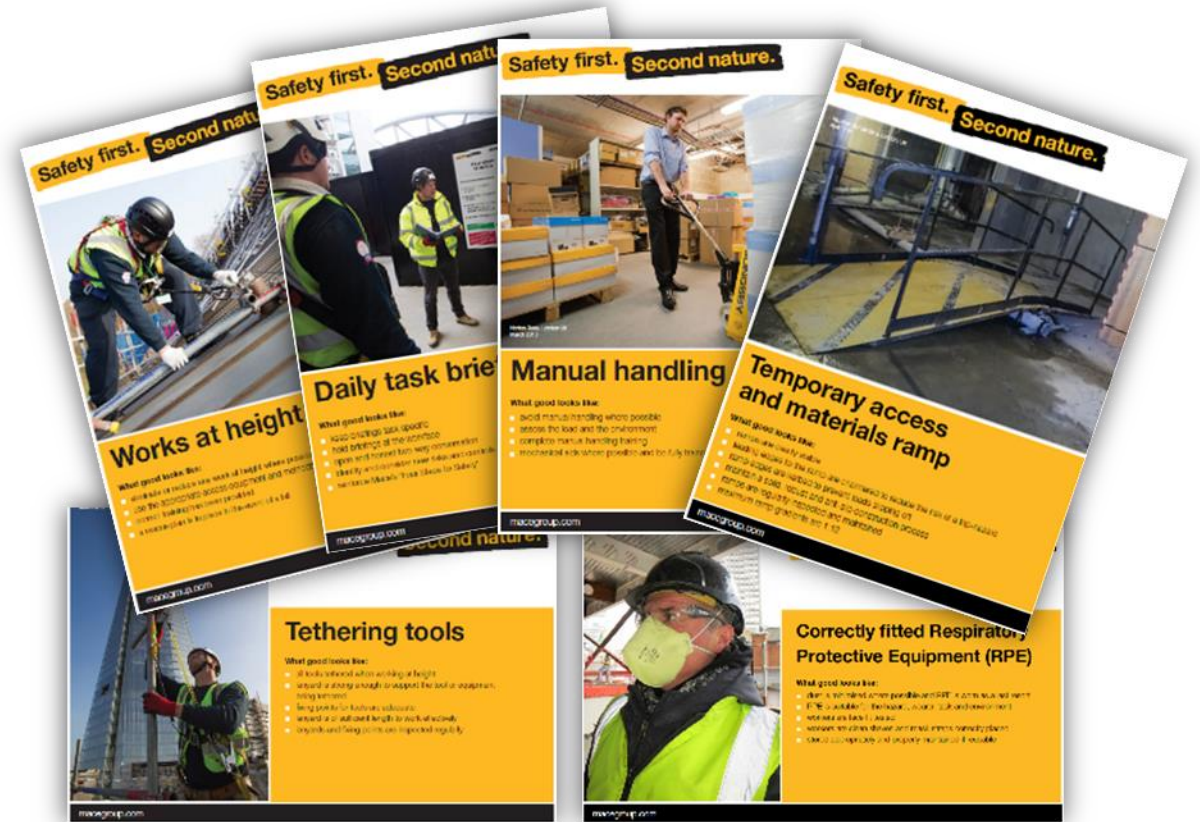
Standard Work

Apartment Visual Standards – Kitchens



Unacceptable Standard
Any scratches, chips and/or damage defects on kitchen units and cupboards

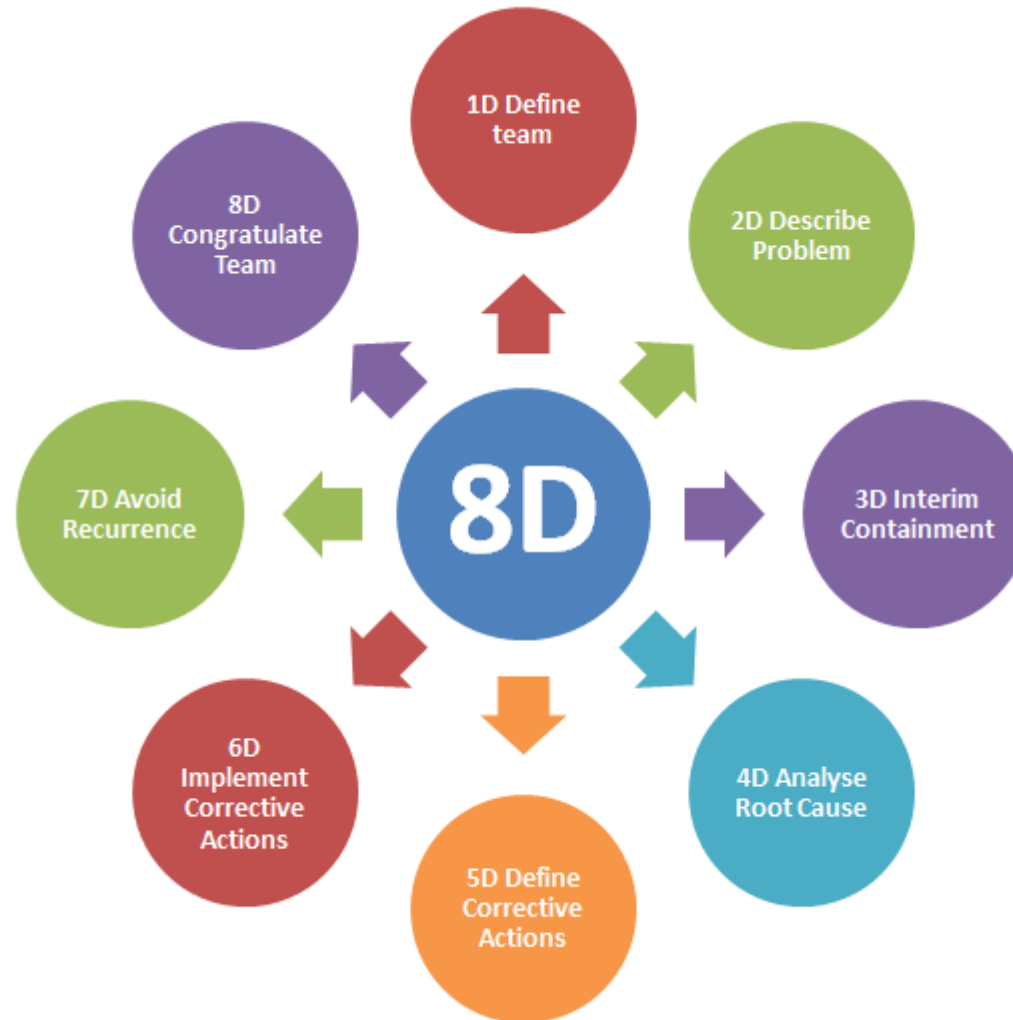
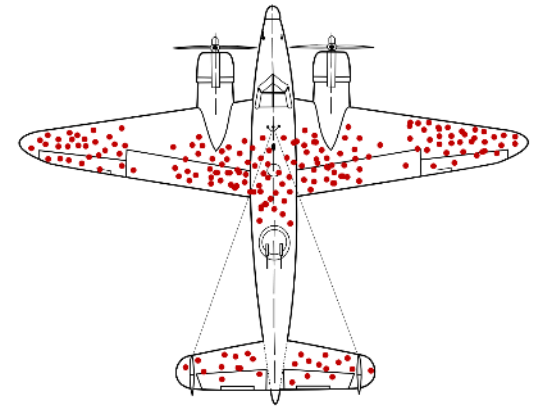
Acceptable Standard
Kitchen units and cupboards free from any scratches chips or physical damage defects



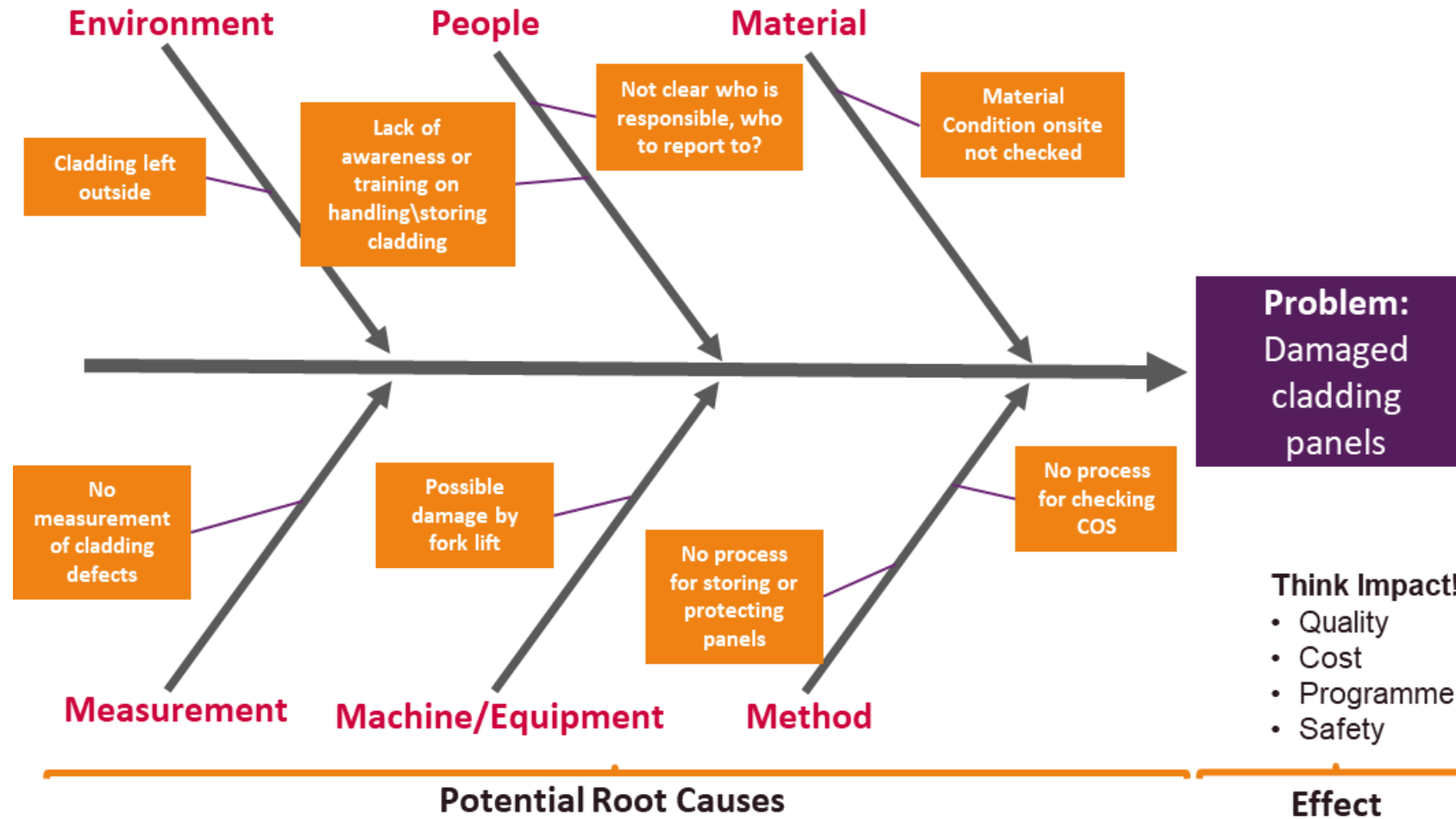
Problem Solving



8D approach



Practical problem solving



Problem solving example

Initial Problem Perception

The four by four broke down due to a gearbox issue.

Team: Driver, Mechanic, other vehicle user, graduate "fresh eyes".

Step 1: Clarify the problem

Remember without data "you are just someone with an opinion".

PPS Tools for data collection

Problem Statement: Lack of oil in the gearbox.

Step 2: Point of Cause

Parking Bay
Cobham

No oil on floor

Parking bay
Stuart hill

No oil on floor

Maintenance
shop

Further
investigation

Truck broken
down

Not clear why it's
broken down

No oil found
in gearbox

Issue with lack of
oil identified.

Containment: Is there a best way to contain or correct the problem?	Who	When	Status
Add check on daily start of shift checks for oil deposits on the area directly under the gearbox.	Gerry	01/03/2023	●
			○
			○

Key:	Activity Identified	Activity Implemented	Activity Confirmed	Activity Effective

Step 3: Target To eliminate the potential for the oil level in the gearbox to go below an acceptable level that can cause damage.

Step 4: Cause and Effect (Brainstorming) & Root Cause Investigation

Cause Investigation			5 Why Investigation		
Item Checked.	What was checked	Status	Why?	Therefore	
Oil change standard not clear.	The standard work wasn't clear on the key quality / safety point that a NEW copper seal is required.	●	Old copper seal refitted during oil change.	Therefore	
Filter spoken to regarding the use of the copper washer.	The fitter confirmed the new seal rolled away and, couldn't be found so they reused the old seal.	●	The fitter was unaware of how critical the use of a new seal was to prevent oil leaking from the drain plug.	Therefore	
			The standard work documents simply stated fit copper seal.	Therefore	
			No one was aware the seal is designed as a "once only fit" part.	Therefore	
				Therefore	

Direct Cause: Old copper seal refitted during oil change.

Root Cause: Standard work documents not clear regarding critical quality aspects of process.

Step 5 & 6: Identify and Implement Countermeasures (Corrective Actions & Preventive Actions)

Who	When	Status	
Modify standard work documentation to highlight the requirement to use a new copper seal.	Gerry	12/03/2023	●
Retrain everyone who carries out oil changes on gearboxes. Down grade skills matrix until retrained.	Gerry	20/03/2023	○
Carry out buddy checks until all retraining confirmed.	Gerry	01/04/2023	○

Step 7: Check the Results Check gearbox oil levels for four weeks on vehicles that have had a gearbox oil change. Plus carry out "running a rabbit on two fitters to confirm the adoption of the new standard work.

Step 8: Standardise and Share Create and share alert to the other maintenance Teams across GallifordTry. In addition share the revised standard work documentation at the next monthly maintenance Team meeting.



5 Why example

Why? Old copper seal refitted during oil change.



Why? The fitter was unaware of how critical the use of a new seal was to prevent oil leaking from the drain plug.



Why? The standard work documents simply stated fit copper seal.



Why? No one was aware the seal is designed as a "once only fit" part.



Why?



Applying the tools in practice

People

Business improvement training (Lean tools and techniques)

- Funded using CITB levy
- Specific improvement activities leading to ROI
- Personal development benefits for participants
- Supported by onsite business improvement specialist

Improvement Foundation Modules

Modular & onsite or offsite digital delivery approach:

- Complete all modules within a programme (2 per day)
- Pick and mix selection to suit your needs



Base awareness modules			
Introduction To improvement: Outline key Lean tools techniques, and explain how these can benefit the organization.	Construction & Waste: Understand the three types of work and how to identify and see waste and identify courier measures	Problem Solving & Continuous Improvement: Practical understanding and application of Lean structured approach to problem solving.	Visual Management: Practical understanding of the benefits of Visual Management, the purpose and aims and how this supports performance & continuous improvement.
Collaborative Planning and Production Control: Demonstrate the purpose and benefits of collaborative planning and how to introduce a production control approach.	5S Workplace Organisation: Demonstrate the benefits of 5S in the workplace and what best practice looks like as a foundation for productivity.	Standardised working: Work through how to generate and the benefits of standardising work, and outline how to use process mapping to standardise a processes	Value Stream Mapping: Describe the purpose and benefits of value stream mapping, and outline how to use value stream mapping to analyse a simple process.

experiential | facilitator-led | live | remote learning

Building Business Improvement

Process

Improve productivity & effectiveness of processes

- Façade offsite window installation labour requirements
- Façade onsite installation productivity – critical path activity
- Tower crane utilisation
- Collaborative planning
- Fit-out sequence process mapping to reduce lead time

Company		SRM		Created by		L Marlow											
Area		South tower		Date		26-Jan											
Crane reference		TC5		Issue number		1											
Job content		From: Day 7 MFCE plan		To:													
No.	Work Element	Duration				Clock time							UET: minutes				
		Waiting	Idle	Stopped	Other	9	10	11	12	13	14	15		16	17		
1	Lift steel and position for 3 columns	30															
2	Strike, move formwork and position for 3 columns	40															
3	Delay due to TC3 opening in area		15														
4	Strike, move formwork and position for 3 columns	10															
5	Lift steel for pour 1 area	60															
6	Move pallet of sheet pty for pour area 2	15	180														
7	Strike columns and move formwork	15															
8	Lift beams for decking pour area 2	30	5														
9	Lift concrete for GF Walkway and pour MRP L1B	60															
10	Lift concrete and pour 3 columns	30	10														
11	Lift decking material from L13 carlock	45															
12																	
13																	
14																	
15																	
Category time		335	195	15													
Total time			545														

Performance

Improved performance management to achieve milestones

- PPC improvement
- Control room
- Problems solved in advance – collaborative planning, make ready needs
- Performance culture & routines embedded



Building Business Improvement

Spirits of improvement

1. Challenge all the fixed ideas
2. Do it now! No excuses
3. Use your wisdom, not money!
4. Get to the root causes by asking 'why?' five times
5. Improvement is infinite, better is not good enough

