4 Step Rapid Problem Solving
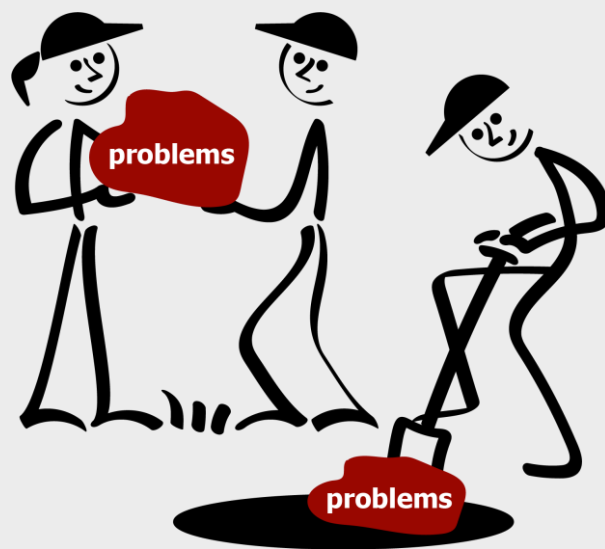
⊕ Understanding: Skill Level 2

Delegate Workbook Non-Manufacturing
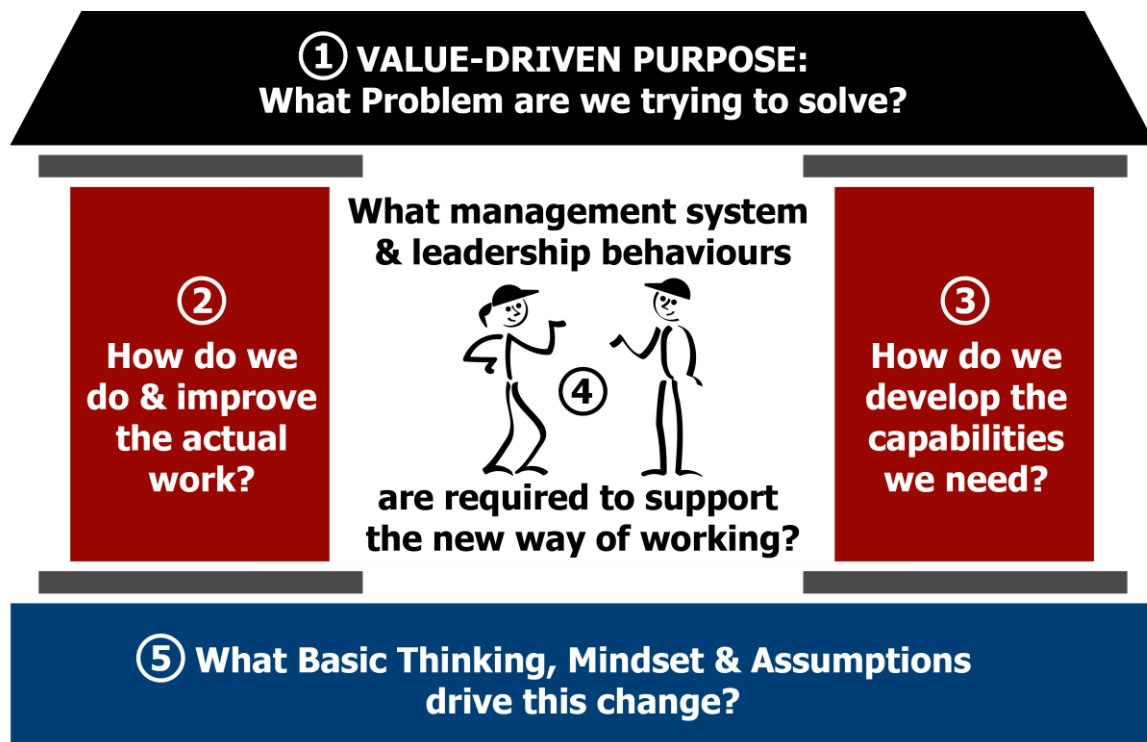
Developing your Lean Journey

The **Lean Transformation Framework (LTF)** helps determine the best lean journey for your situation. Based around five questions, it starts by asking "What problem are we trying to solve?" We use the LTF to help decide how to support your needs and progress your lean journey.

① **VALUE-DRIVEN PURPOSE:**
What Problem are we trying to solve?

What management system & leadership behaviours are required to support the new way of working?

② How do we do & improve the actual work?

④

③ How do we develop the capabilities we need?

⑤ What Basic Thinking, Mindset & Assumptions drive this change?

To understand how we can support you on your **Lean Learning Journey** visit our website www.leanuk.org. We have a range of products and services that you and your organisation can use to become self reliant at Lean thinking and practice.

Lean Enterprise Academy ®

Lean Enterprise Academy

Congratulations and thank you for purchasing and/or downloading this material from the Lean Enterprise Academy.

At the Lean Enterprise Academy we help our customers develop their capability by providing products and support using three core processes: Learn, Teach & Coach and Share. We know from practical application that skill/capability development is best described as a journey. Therefore we have developed a guided learning path called the Lean Learning Journey.

The Lean Learning Journey process is based around Four Skill Levels; Knowledge, Understanding, Capable and finally, Can Do Well and Teach & Coach Others. Our aim is for you to become self reliant on your Lean Learning Journey so that you can share your learning, develop others in your team/organisation and become effective learners for life.

To align with our customer needs we launched the Lean Learning Platform on our website in late 2020. The platform includes a selection of guided learning courses and materials available so you can develop your skills throughout your Lean Learning Journey.

Thank you for being a part of the Lean Enterprise Academy and good luck on your Lean Learning Journey!
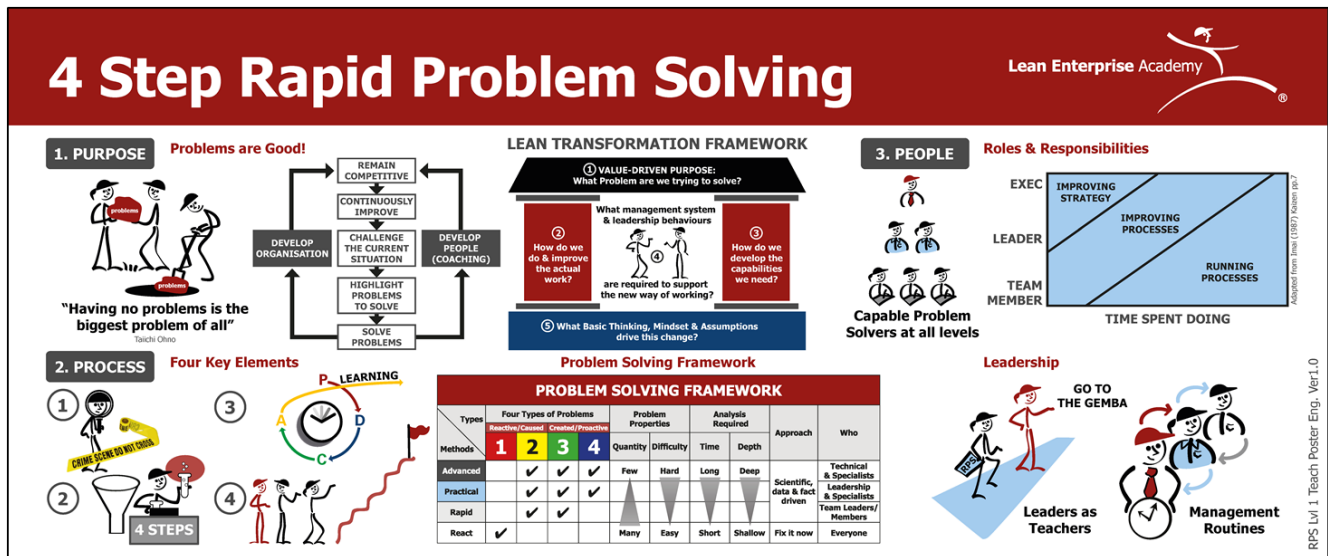
Best wishes,

Dave Brunt

CEO, Lean Enterprise Academy

4 Step Rapid Problem Solving – Skill Level 1: Knowledge
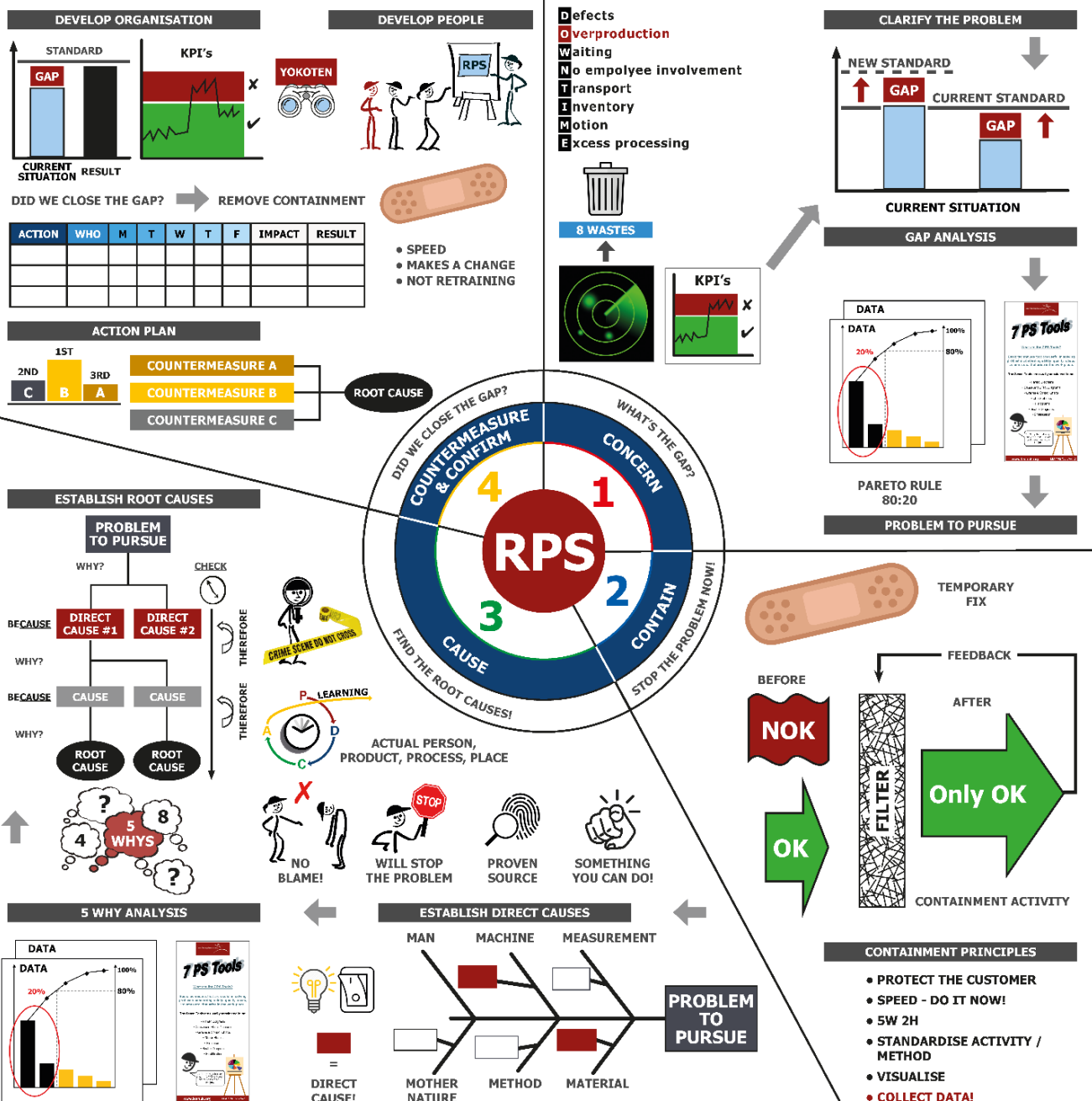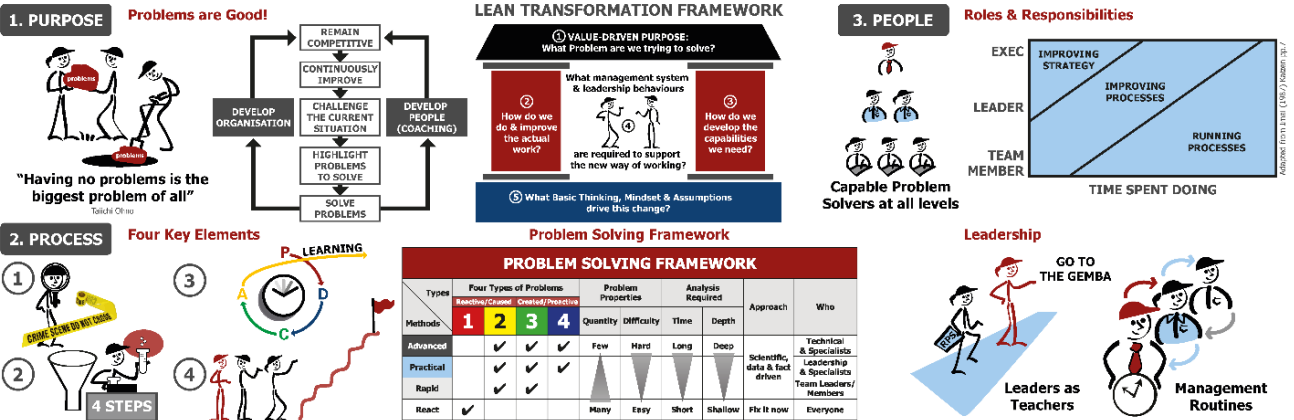
Please use this page to make any notes during the training:

1.0   Purpose

2.0   Process

3.0   People

4 Step Rapid Problem Solving

Lean Enterprise Academy

1. PURPOSE

Problems are Good!

REMAIN COMPETITIVE → CONTINUOUSLY IMPROVE → CHALLENGE THE CURRENT SITUATION → HIGHLIGHT PROBLEMS TO SOLVE → SOLVE PROBLEMS

DEVELOP ORGANISATION — DEVELOP PEOPLE (COACHING)

"Having no problems is the biggest problem of all"
Taiichi Ohno

LEAN TRANSFORMATION FRAMEWORK

① VALUE-DRIVEN PURPOSE: What Problem are we trying to solve?

② How do we do & improve the actual work?

What management system & leadership behaviours are required to support the new way of working?

③ How do we develop the capabilities we need?

④

⑤ What Basic Thinking, Mindset & Assumptions drive this change?

3. PEOPLE

Roles & Responsibilities

Capable Problem Solvers at all levels

EXEC — IMPROVING STRATEGY
LEADER — IMPROVING PROCESSES
TEAM MEMBER — RUNNING PROCESSES

TIME SPENT DOING

2. PROCESS

Four Key Elements

① ② ③ ④

P LEARNING A D C

CRIME SCENE DO NOT CROSS

4 STEPS

PROBLEM SOLVING FRAMEWORK

Types	Four Types of Problems				Problem Properties		Analysis Required		Approach	Who
	Reactive/Caused		Created/Proactive							
Methods	1	2	3	4	Quantity	Difficulty	Time	Depth		
Advanced	✔	✔	✔		Few	Hard	Long	Deep	Scientific, data & fact driven	Technical & Specialists
Practical		✔	✔	✔						Leadership & Specialists
Rapid		✔	✔							Team Leaders/ Members
React	✔				Many	Easy	Short	Shallow	Fix it now	Everyone

Leadership

GO TO THE GEMBA

Leaders as Teachers

Management Routines

DEVELOP ORGANISATION

STANDARD — GAP — CURRENT SITUATION — RESULT

KPI's — YOKOTEN ✗ ✓

DID WE CLOSE THE GAP? → REMOVE CONTAINMENT

ACTION	WHO	M	T	W	T	F	IMPACT	RESULT

- SPEED
- MAKES A CHANGE
- NOT RETRAINING

ACTION PLAN

1ST — 2ND — 3RD
C B A

COUNTERMEASURE A
COUNTERMEASURE B — ROOT CAUSE
COUNTERMEASURE C

DEVELOP PEOPLE

RPS

Defects
Overproduction
Waiting
No employee involvement
Transport
Inventory
Motion
Excess processing

8 WASTES

KPI's ✗ ✓

CLARIFY THE PROBLEM

NEW STANDARD — GAP — CURRENT STANDARD — GAP

CURRENT SITUATION

GAP ANALYSIS

DATA — DATA 20% 100% 80%

7 PS Tools

PARETO RULE 80:20

PROBLEM TO PURSUE

ESTABLISH ROOT CAUSES

PROBLEM TO PURSUE

WHY? — CHECK

BECAUSE — DIRECT CAUSE #1 — DIRECT CAUSE #2 — THEREFORE

WHY?

BECAUSE — CAUSE — CAUSE — THEREFORE

WHY?

ROOT CAUSE — ROOT CAUSE

? 8 4 5 WHYS ?

CRIME SCENE DO NOT CROSS

P LEARNING A D C

ACTUAL PERSON, PRODUCT, PROCESS, PLACE

✗ NO BLAME! — STOP WILL STOP THE PROBLEM — PROVEN SOURCE — SOMETHING YOU CAN DO!

5 WHY ANALYSIS

DATA — DATA 20% 100% 80%

7 PS Tools

ESTABLISH DIRECT CAUSES

MAN — MACHINE — MEASUREMENT

PROBLEM TO PURSUE

= DIRECT CAUSE! — MOTHER NATURE — METHOD — MATERIAL

RPS

4 COUNTERMEASURE & CONFIRM — DID WE CLOSE THE GAP?
1 CONCERN — WHAT'S THE GAP?
2 CONTAIN — STOP THE PROBLEM NOW!
3 CAUSE — FIND THE ROOT CAUSES!

TEMPORARY FIX

BEFORE — NOK — OK

FILTER — FEEDBACK — AFTER — Only OK

CONTAINMENT ACTIVITY

CONTAINMENT PRINCIPLES

- PROTECT THE CUSTOMER
- SPEED - DO IT NOW!
- 5W 2H
- STANDARDISE ACTIVITY / METHOD
- VISUALISE
- COLLECT DATA!

RPS Lvl 1 Teach Poster Eng. Ver1.0

4 Step Rapid Problem Solving – Skill Level 2: Understanding

Please use this page to make any notes during the training:

1.0   Concern

2.0   Contain

MUDA – The 8 Wastes

MUDA - The 8 Wastes
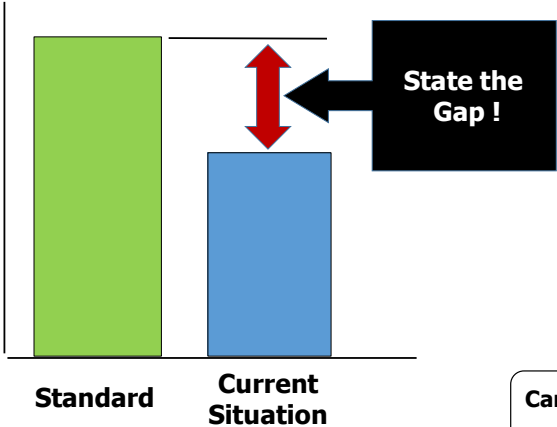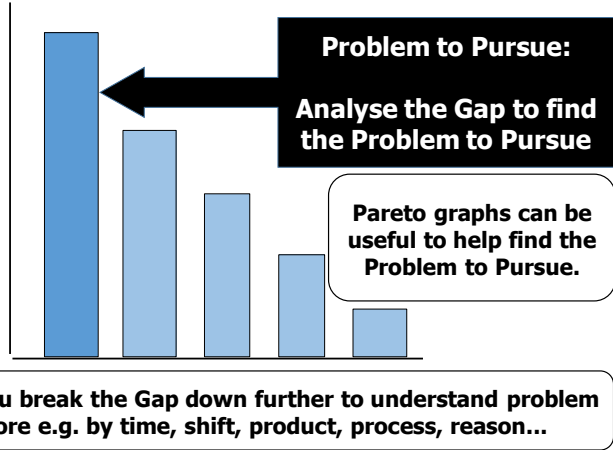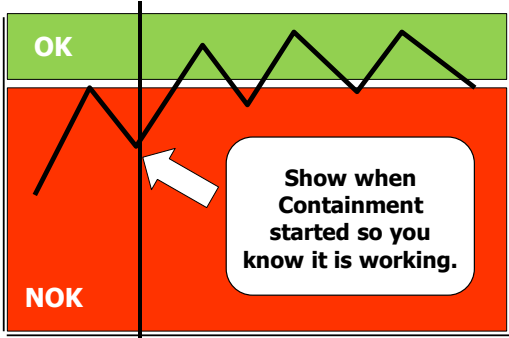
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	Non-Manufacturing				Manufacturing	
EXAMPLE	**DESCRIPTION**	**TYPE OF WASTE**			**DESCRIPTION**	**EXAMPLE**
• Data entry errors • Recalculating figures • Reconciliation • Incomplete or missing information	A product, process, activity or information flow is not right the first time.	DEFECTS	**D**	DEFECTS	A product, process, activity or information flow is not right the first time.	• Scrap • Rework • Incomplete or missing information
• Producing reports that no one reads or needs • Making extra copies just-in-case • Entering repetitive information on multiple documents • Memos or emails to everyone	Producing more than needed. Producing faster than needed. Duplication of effort.	OVER-PRODUCTION	**O**	OVER-PRODUCTION	Producing more than needed. Producing faster than needed. Duplication of effort.	• Producing product that no one needs • Making extra product just-in-case • Making product to improve OEE • Making product too early • Producing more to avoid change-overs • Batching to avoid change-overs
• Waiting for approvals or signatures • Attendees not all on time for meeting • Slow system response time • Delays in receiving information • Printer or computer break-down	Delays caused by unsyncronised process activities.	WAITING	**W**	WAITING	Delays caused by unsyncronised process activities.	• Waiting for equipment/machine cycles to finish • Attendees not on time for meetings • Delays in receiving information/approvals • Equipment/machine breakdowns • Slow system response time
• Not involving people to improve the work & solve problems • Leaders not teaching and coaching employees • No training / development	Not using / developing employees talent or creativity.	NO EMPLOYEE INVOLVEMENT	**N**	NO EMPLOYEE INVOLVEMENT	Not using / developing employees talent or creativity.	• Not involving people to improve the work & solve problems • Leaders not teaching and coaching employees • No training / development
• Multiple hand-offs / approvals • Tracking & expediting reports • Complex information & data management	An unnecessary material or information movement.	TRANSPORT	**T**	TRANSPORT	An unnecessary material or information movement.	• Moving parts between processes or in and out of storage • Multiple handling of same product • Spaghetti flow
• Excessive office supplies • Obsolete other files & equipment • Lack of memory space • Copying / Printing unnecessary documents • FISH (First In Still Here) rather than FIFO (First In First Out)	Any unnecessary or additional materials / data / information.	INVENTORY	**I**	INVENTORY	Any unnecessary or additional materials / data / information.	• Excessive stock in warehouse • Material between processes • Making just in case • FISH (First In Still Here) rather than FIFO (First In First Out)
• Looking for paperwork • Searching for files • Additional walking due to poor office layout • Sorting through data • No standard work defined	Any unnecessary motion that doesn't add value to the product and / or process.	MOTION	**M**	MOTION	Any unnecessary motion that doesn't add value to the product and / or process.	• Excessive equipment/machine movements • Reaching too far for products • No standard work defined
• Multiple signatures / approvals • Re-entering data • Unused reports	Additional activity that adds no value to the product / process from the customers perspective.	EXCESS PROCESSING	**E**	EXCESS PROCESSING	Additional activity that adds no value to the product / process from the customers perspective.	• Doing more than the standard specification requires • Polishing, over painting, wrapping • Excessive reporting

MUDA - The 8 Wastes Teach Poster Eng. Ver.2.0

Notes:

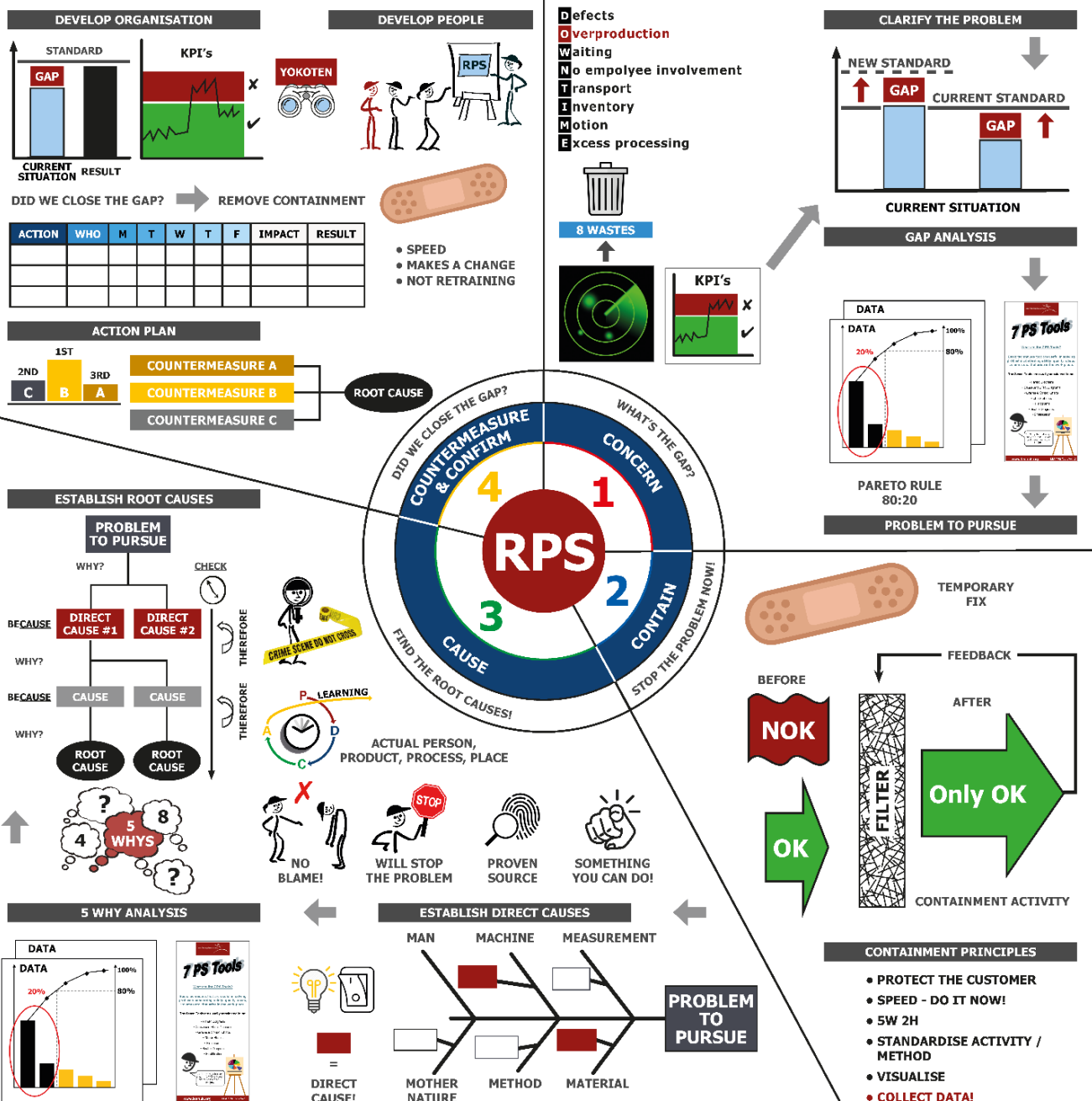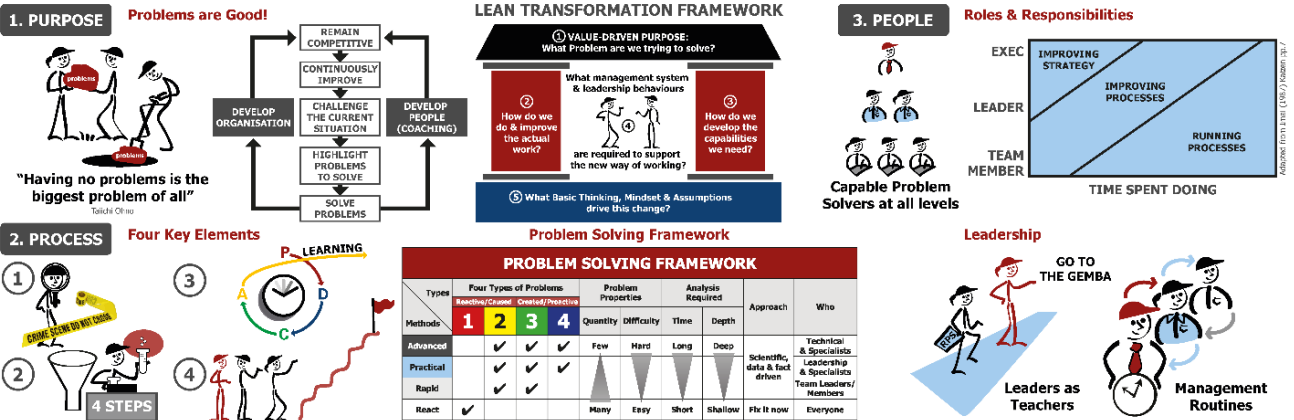# What the Story Should Look Like – RPS Quadrant Chart

Step 1	CONCERN - What's the GAP?

1.1 Background

- Why are you tackling this problem and why is it important?

- How would you introduce this problem to someone else?

- Where did the problem come from?

- Scope of the subject/problem?

- What would happen if you did nothing or impact to the business?

> Use a graph, a sketch or a photo to help explain the Background....

1.2 Clarify the Problem - Gap

State the Gap !

Standard　　**Current Situation**

1.3 Gap Analysis

Problem to Pursue:

Analyse the Gap to find the Problem to Pursue

> Pareto graphs can be useful to help find the Problem to Pursue.

> Can you break the Gap down further to understand problem more e.g. by time, shift, product, process, reason...

Step 2	CONTAIN - Can we stop the problem now?

Who:

What:

Where:

When:

Why:

How:

How Much:

> Use the 5W's 2H's to clearly explain what the Containment activity is.

> Clearly visualise the result of the Containment activity to show that it is working.

Standard

OK

NOK

> Show when Containment started so you know it is working.

2.1 Containment Result

> Does the Containment activity have any other impact/consequence? Do you need to track or visualise that?

Containment Result:

Has it closed the Gap for now?

Standard　　**Current Situation**

What the Story Should Look Like – RPS Quadrant Chart

Step 3	CAUSE - Investigate and find the root causes?

3.1 Direct Cause Investigation

Mother Nature Machine Man

DIRECT CAUSE NOK

CAUSE OK

Measurement Method Material

Problem

Problem to Pursue:

Problem

3.2 Data to Prove the Direct Causes

Direct Causes:
- Have cause/effect relationship on the problem.
- Light switch test.
- Proven with data or experiment.

3.3 Root Cause Investigation

Problem to Pursue

WHY? beCAUSE
WHY? beCAUSE
WHY? beCAUSE

DIRECT CAUSE **DIRECT CAUSE**

CAUSE........ **CAUSE........**

ROOT CAUSE 1 **ROOT CAUSE 2**

Therefore
Therefore
Therefore

Timeframe

Characteristics of a Root Cause:
- It does not blame anyone.
- You can do something about it.
- It will change the way you do things in the future.
- It is not to re-train someone !!
- It will Stop the Problem.

Step 4	COUNTERMEASURE & CONFIRM - Did we close the GAP?

4.1 Countermeasure Plan

	Root Cause	#	Countermeasure Action	Who	When	Impact
1						**Quantify the impact on the problem.**
2						

List the Root Causes.

Number and list the Countermeausre Actions, who will do them, when they will be completed.

4.2 Confirm Results

Direct Causes

!

Show results to demonstrate that the Direct Causes have been eliminated.

Gap Closure

Standard **Current Situation**

Show how much the Gap has been closed.

Results Evolution - Sustainment

Standard

Show when Countermeasures implemented

Show when Containment removed

Summarise the results
What did you learn....
Yokoten/Look across...
What will you do next..

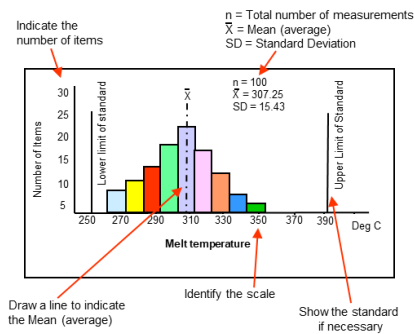# 4 Step Rapid Problem Solving – Skill Level 2: Understanding

Please use this page to make any notes during the training:
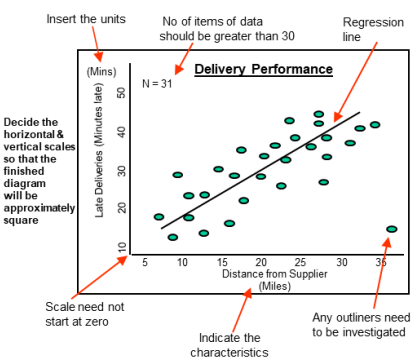
3.0   Cause

4.0   Countermeasure & Confirm

The 7 Problem Solving (PS) Tools

HISTOGRAMS : To understand the form of a distribution, & compare it to a standard
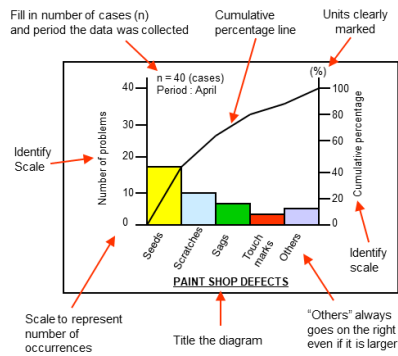
Indicate the number of items

n = Total number of measurements
$\overline{X}$ = Mean (average)
SD = Standard Deviation

n = 100
$\overline{X}$ = 307.25
SD = 15.43

Draw a line to indicate the Mean (average)

Identify the scale

Show the standard if necessary

Melt temperature

Number of items

Lower limit of standard

Upper Limit of Standard

Deg C

SCATTER DIAGRAMS:
To find the correlation between paired data

Insert the units

No of items of data should be greater than 30

Regression line

Delivery Performance

N = 31

Decide the horizontal & vertical scales so that the finished diagram will be approximately square

Late Deliveries (Minutes late)

(Mins)

Distance from Supplier (Miles)

Scale need not start at zero

Indicate the characteristics

Any outliners need to be investigated
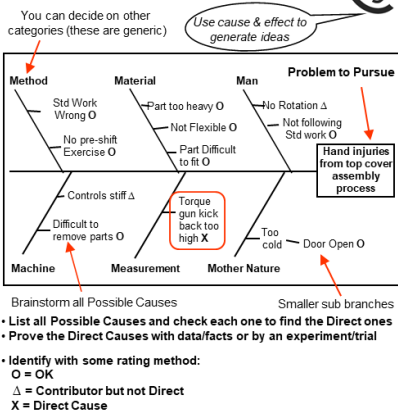
Stratification

What is Stratification?

It means the dividing up and organising data into a number of strata or layers. Put another way, a single population is divided - by workforce, machinery, working methods, raw materials etc. - taking note of common data points, peculiarities or characteristics, into a number of groups (called strata) having the same points in common.

Categories of Stratification
(Particular Subjects to Stratification)

1. By time: month, week, day, dayshift, nightshift, day of the week, time, morning, afternoon, etc.
2. By process:
   machine, tool, jig, die, age of machine, etc.
3. By working method:
   temperature, pressure, air temperature, humidity, weather, speed, standardised work etc.
4. By workforce:
   section, work group, task force, relieving, new/old, expertise, age, experience, etc.
5. By product:
   batch number, supplier, inspection equipment, etc.

What can I use this tool for?

- Separating out information in order to investigate and find the real contributing factors

- Data may initially tell you one thing, but by breaking it down further you may see a very different story.

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7 PS Tools

What are the 7 Problem Solving Tools?

Basic techniques that are useful in solving problems concerning safety, quality, costs, volumes etc. that arise in the work place.

The Seven Tools are:

- Pareto Diagrams
- Cause and Effect Diagrams
- Graphs & Control Charts
- Check Sheets
- Histograms
- Scatter Diagrams
- Stratification

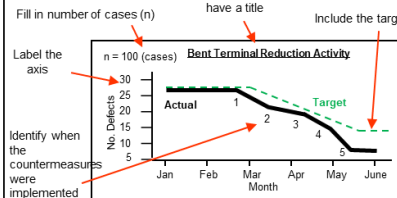Don't try to go it alone! Study the "7 PS Tools" and make them work for you!

PARETO DIAGRAM:
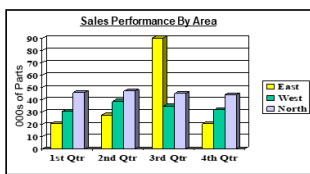To understand the key issues from many

Fill in number of cases (n) and period the data was collected

Cumulative percentage line

Units clearly marked

n = 40 (cases)
Period : April

(%)

Identify Scale

Number of problems

Cumulative percentage

Seeds Scratches Sags Touch marks Others

PAINT SHOP DEFECTS

Scale to represent number of occurrences

Title the diagram

"Others" always goes on the right even if it is larger

Identify scale

CAUSE & EFFECT DIAGRAMS:
To establish the Direct Causes

Use cause & effect to generate ideas

You can decide on other categories (these are generic)

Problem to Pursue

Method
- Std Work Wrong O
- No pre-shift Exercise O

Material
- Part too heavy O
- Not Flexible O
- Part Difficult to fit O

Man
- No Rotation △
- Not following Std work O

Hand injuries from top cover assembly process

- Controls stiff △
- Difficult to remove parts O

Torque gun kick back too high X

Too cold

Door Open O

Machine   Measurement   Mother Nature

Brainstorm all Possible Causes

Smaller sub branches

- List all Possible Causes and check each one to find the Direct ones
- Prove the Direct Causes with data/facts or by an experiment/trial

- Identify with some rating method:
  O = OK
  △ = Contributor but not Direct
  X = Direct Cause

GRAPHS :
To make data become useful information easily

Line Graph

Fill in number of cases (n)

Graphs should have a title

Include the target

Label the axis

n = 100 (cases)

Bent Terminal Reduction Activity

Actual

Target

Identify when the countermeasures were implemented

No. Defects

Jan Feb Mar Apr May June

Month

Bar Graph

Sales Performance By Area

000s of Parts

1st Qtr 2nd Qtr 3rd Qtr 4th Qtr

East
West
North

Pie Chart

Vehicle Colour Selection

Each Segment shows the percentage

n = 2000

Too many Segments can be confusing

Red
Blue
Silver
White
Black

Spider Graph

Training Course Results (Percentage)

Problem Solving

Leadership Skills

PS Tools

Job instruction

Kaizen

CONTROL CHARTS:
To investigate whether a process is stable or not

$\overline{X}$ chart monitors that the process is in control and producing within specification

Warning Limits are calculated statistically

Shows subgroup size

Action required (above upper warning limit)

$\overline{X}$ chart

Hole Diameter

N=5

Upper Warning Limit

Target (mean)

Lower Warning Limit

$\overline{X}$

Time

Range Chart

Upper Warning Limit

R

Time

Indicates the Type of control chart

Range chart - indicates that the width of the distribution is in control

Action required (above upper warning limit)

CHECK SHEETS:
To collect data

Now we have collected data it will help make better decisions

Make boxes to fill in regular items

Decide on how to stratify

Ensure you have identified the source of the data

		Week No.	24				
Process	IP Inspection						
Group	Inspection	Completed by	J Bloggs				
Shift	Yellow						

I P Harness Defects

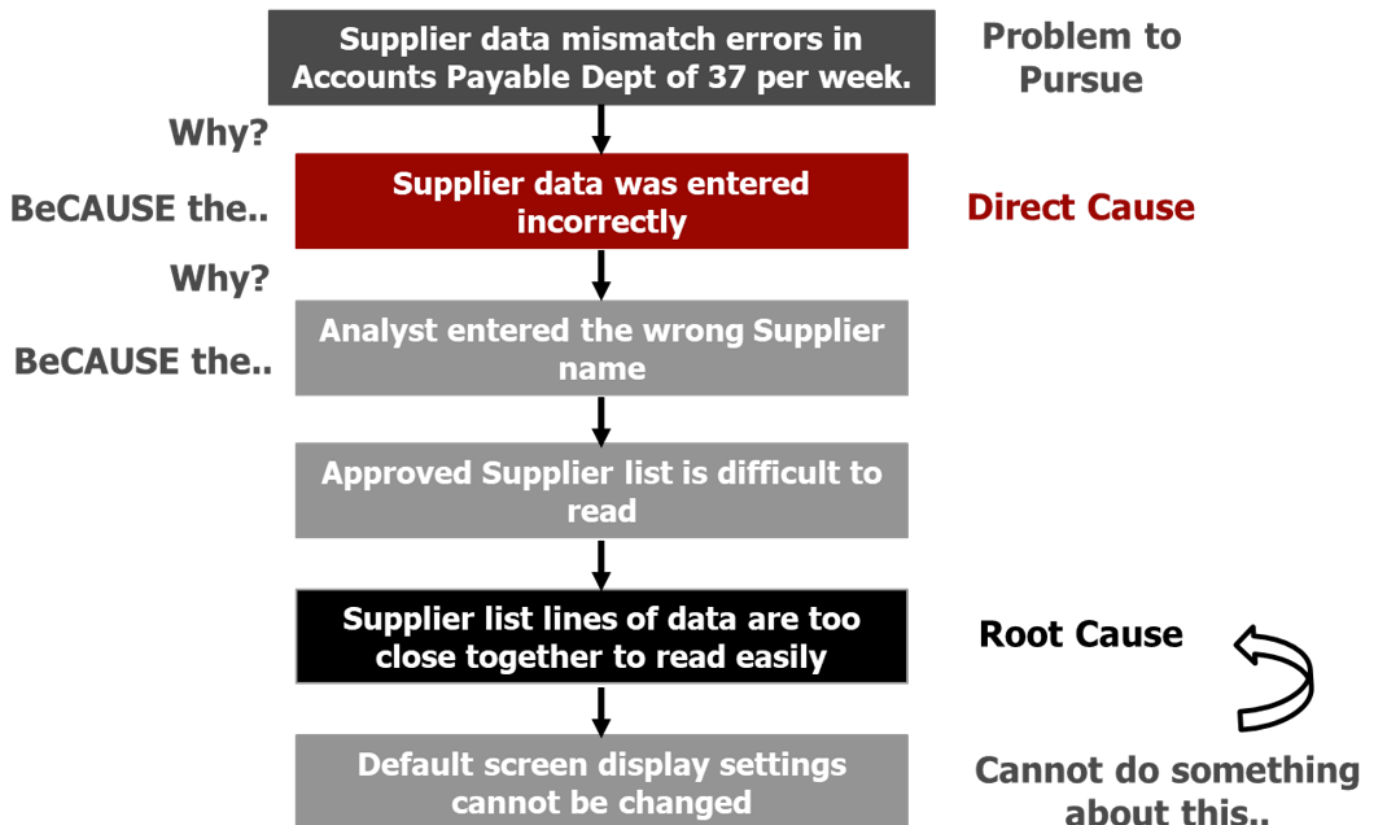| Defect	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Loose screw	///	/	////	//	//			12
Cross thread	/	//			/			5
Part missed	//	//	////	//	//			12
Wrong part fitted	////			//				6
Gap too large	//	///	////	/				10
Scratched part	////		/	////				12
Total	14	8	16	9	10			57

Add Totals

Fill in data

Try to involve the end user in the design of your check sheet. This helps to gain their commitment to filling it in!

Root Cause Analysis Examples

	Breakdown of Machining Centre #123 of 137 mins/week	**Problem to Pursue**
Why?	↓	
BeCAUSE the..	**Machine circuit board overload and the fuse blew**	**Direct Cause**
Why?	↓	
BeCAUSE the..	**Main spindle bearing seized - not sufficiently lubricated with oil**	
	↓	
	The oil lubrication pump was not pumping sufficiently	
	↓	
	The oil pump shaft was worn out	
	↓	
	Metal shavings were in the pump	
	↓	
	There is no filter on the oil pump sump to stop the shavings	**Root Cause**

Adapted from Ohno TPS Beyond Large Scale Production – Pg 17

	Supplier data mismatch errors in Accounts Payable Dept of 37 per week.	**Problem to Pursue**
Why?	↓	
BeCAUSE the..	**Supplier data was entered incorrectly**	**Direct Cause**
Why?	↓	
BeCAUSE the..	**Analyst entered the wrong Supplier name**	
	↓	
	Approved Supplier list is difficult to read	
	↓	
	Supplier list lines of data are too close together to read easily	**Root Cause** ↰
	↓	
	Default screen display settings cannot be changed	**Cannot do something about this..**

4 Step Rapid Problem Solving Quadrant Chart

RPS Title

| Step 1 | CONCERN - What's the GAP? |

1.1 Background

1.2 Clarify the Problem - Gap

1.3 Gap Analysis

Problem to Pursue:

| Step 2 | CONTAIN - Can we stop the problem now? |

Who:

What:

Where:

When:

Why:

How:

How Much:

18

4 Step Rapid Problem Solving Quadrant Chart

SITE	RPS LEADER	TEAM MEMBERS	DATE	Signature	Approval

Step 3	CAUSE – Investigate and find the root causes?
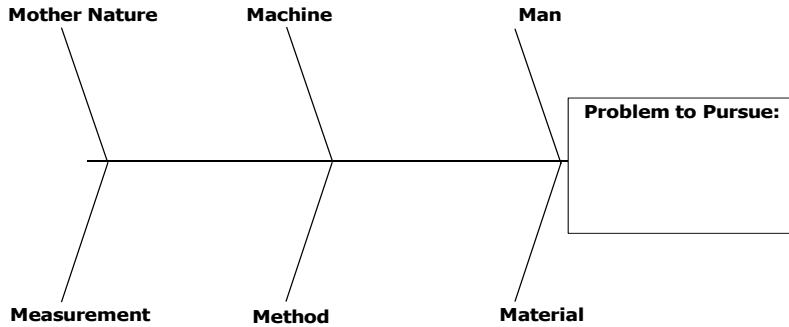
3.1 Direct Cause Investigation

3.2 Direct Cause Proof

Mother Nature **Machine** **Man**

Problem to Pursue:

Measurement **Method** **Material**

3.3 Root Cause Investigation

Problem to Pursue		
Direct Causes		
Why ?		
Why ?		
Why ?		
Why ?		
Root Causes		

Step 4	COUNTERMEASURE & CONFIRM – Did we close the GAP?

4.1 Countermeasure Plan

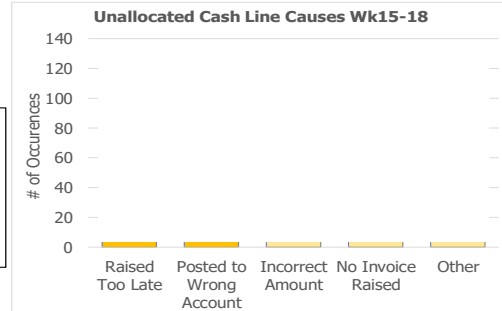| Root Cause(s)	#	Countermeasure Actions	Who	When	Impact

4.2 Confirm Results

Rapid Problem Solving (RPS) Case Study

The following is a fictional case study to allow you to understand the RPS method in more detail and apply your learning to complete and create an RPS Quadrant Chart (see next pages) using the data provided.

After each Teach session for the steps of Concern, Contain, Cause, Countermeasure & Confirm, read through that section of the case study, and complete the actions set.

RPS Case Study Answer Sheet Steps 1 and 2

	RPS Title
Lean Enterprise Academy / SHARE SELF LEARN RELIANT TEACH & COACH	# MWB Rentals Ltd. Unallocated Cash

Step 1	**CONCERN - What's the GAP?**

1.1 Background

- Unallocated cash is cash received in to the business with no invoice to match off to, or a "Cash Line".

- This can mean that cash is not realised in to the monthly Profit and Loss account affecting cash flow - up to £100k in one month (Feb)!

- This means more work for the Cash & Billing Team to get the invoices raised & match it to the cash.

Average Unallocated Cash Lines - Last 6 Months

	Oct	Nov	Dec	Jan	Feb	Mar
Unallocated Cash Lines	293	155	233	418	518	513
6 Month Average	355	355	355	355	355	355
Standard (Lowest)	155	155	155	155	155	155

1.2 Clarify the Problem - Gap

Average Monthly Unallocated Cash Lines

Gap:

(x-axis: Current Situation Ave Lines/Mth, Standard (Lowest), Gap)

1.3 Gap Analysis - Last 6 Months

Average Unallocated Cash Lines by Department

Problem to Pursue:

(x-axis: Barges & Boats, Properties, Repairs, Utilities, Facilities, Sales)

Step 2	**CONTAIN - Can we stop the problem now?**

Who: Cash & Billing Team.

What: Daily Overtime.

Where: Office/Desk.

When: From Week 14 (April).

Why: To reduce Unallocated Cash Lines by the end of the Month.

How: Manual Matching in Cash/Invoice Accounts System.

How Much: Additional 10 Cash Lines/Day.

Daily Cash Lines Closed with Overtime

Contain Target: 10 Cash Lines / Day →

(x-axis: Mon Tues Wed Thrs Fri for Week 14, Week 15, Week 16, Week 17)
Legend: Cash Lines Closed with O/T — Target

Weekly Overtime Containment Activity Hours

(x-axis: Week 14, Week 15, Week 16, Week 17)
Legend: Overtime Hours

2.1 Contain Result

End of April Unallocated Cash Lines

Contain Impact:

(x-axis: Current Situation End April, Standard (Lowest), Gap)

RPS Case Study Answer Sheet Steps 3 and 4

Lines Improvement

SITE	RPS LEADER	TEAM MEMBERS		DATE	Signature	Approval
Leeds	Sarah	Bob, Petra, Gary, Dave	Ellie, Andy	March - July	*sarah*	**Sue**

Step 3 — CAUSE - Investigate and find the root causes?

3.1 Direct Cause Investigation

Mother Nature Machine Man

Problem to Pursue:

Measurement Method Material

3.2 Direct Cause Proof

Unallocated Cash Line Causes Wk15-18

# of Occurences (0–140)

Raised Too Late | Posted to Wrong Account | Incorrect Amount | No Invoice Raised | Other

Direct Cause 1:

Direct Cause 2:

3.3 Root Cause Investigation

Problem to Pursue:		
Direct Causes:		
Why ?		
Why ?		
Why ?		
Why ?		
Root Causes:		

Root Cause 1:	Root Cause 2

Step 4 — COUNTERMEASURE & CONFRIM - Did we close the GAP?

4.1 Countermeasure Plan

Root Cause		#	Countermeasure Action	Who	When	Impact
1		1				
		2				58% of 237 =
		3				
		4				
2		5				
		6				29% of 237 =
		7				

4.2 Confirm Results

Unallocated Cash Line Causes Wk19-22

Direct Causes Reduced

# of Occurences (0–16)

Raised Too Late | Posted to Wrong Account | Incorrect Amount | No Invoice Raised | Other

Average Unallocated Cash Lines - Jan to July

Wk21 End of May Containment removed

Ave Lines/Month (0–600)

	Jan	Feb	Mar	Apr	May	Jun	Jul
Unallocated Cash Lines	418	518	513	160	180	155	145
2 Month Average	325	468	515	336	170	167	150
Standard (Lowest)	155	155	155	155	155	155	155

Monthly End Data

All Actions Completed in May

Average Unallocated Cash Lines Jun-July

Lines/Month (0–180)

Gap Closed

Current Situation Ave Lines/Mth | Standard (Lowest) | Gap

Result Summary:

MWB Rentals Ltd. RPS CASE STUDY

Instructions:

Read the description of the situation in each step. Then respond to the questions at the end and use the "RPS Quadrant chart worksheet" to record your answers.

Step 1: CONCERN

March – Week 13

MWB Rentals Ltd. is a nationwide company providing rentals such as static homes/lodges, cottages, barges and boats across the UK. Their head office is located in Leeds and over the last twenty years they have acquired hundreds of assets for rental. Also due to a recent, aggressive marketing campaign, they are experiencing a healthy increase in demand.

Sarah, is the Supervisor of the Cash & Billing Team within the Finance Department of MWB Rentals Ltd. Her teams responsibility amongst other things is to ensure that cash received in to the business from rentals, repairs, sales etc. is allocated or matched to the correct invoice each month.

This is an important task as any unallocated cash within the business can't be realised in the Profit and Loss (P+L) of the company. In addition, a healthy cash flow is necessary to allow for the staff payroll each month and pay suppliers, asset repayments, utilities and insurance etc.

Over the last few months Sarah and her team have noticed an increasing trend in the number of unallocated cash lines – this maxed out at a value of nearly £100K for one month!

Being concerned that the situation may get worse as they get busier, Sarah has spent the last week reviewing some performance data to try and understand the current situation better. She pulls the information together in to a matrix.

Unallocated Cash Lines Last Six Months:

Monthly Data	Monthly End Data					
Month	Oct	Nov	Dec	Jan	Feb	Mar
Unallocated Cash Lines	293	155	233	418	518	513
6 Month Average						
Standard (Lowest)						

Actions:
1. *Complete the matrix by calculating the last 6 Months Average of Unallocated Cash Lines and insert your answer in the grey shaded area.*
2. *Select the Lowest Month of Unallocated Cash Lines and insert that number in to the second grey shaded area.*

Using this data Sarah manages to establish a Current Situation (last 6 months average) and a Standard (lowest number in the last 6 months) and hence a Gap.

Having established a Gap, Sarah then starts to break the data down to try and find the greatest contributor to the Gap. It is a lot of data to go through but eventually she summarises it in the matrix below.

Unallocated Cash Lines by Department:

Department	Oct	Nov	Dec	Jan	Feb	Mar	Mthly Average
Sales	0	2	8	4	8	8	
Facilities	10	7	9	12	7	9	
Repairs	15	18	40	40	48	25	
Utilities	12	20	25	6	30	27	
Barges & Boats	198	223	239	250	260	252	
Properties	66	72	69	42	40	29	

Questions:
1. *What is the 'GAP' here? (Gap between the Current Situation and the Standard)*
2. *What does the data tell you about the greatest contributor to the 'GAP'?*
3. *What would be the 'Problem to Pursue'?*

Turn to the next page for the next actions.

Actions:
  1. *Complete the Department Matrix by calculating the Monthly Average for each of the Departments in the grey shaded areas.*
  2. *Clarify the Problem by calculating the Gap between Current Situation and the Standard.*
  3. *Analyse the Gap by making a pareto graph of Average Unallocated Cash Lines by Department.*
  4. *Using the pareto graph decide what the "Problem to Pursue" is for Sarah.*
  5. *Complete the RPS Quadrant Chart with your answers.*

Step 1	CONCERN - What's the GAP?

1.1 Background
- Unallocated cash is cash received in to the business with no invoice to match off to, or a "Cash Line".

- This can mean that cash is not realised in to the monthly Profit and Loss account affecting cash flow - up to £100k in one month (Feb)!

- This means more work for the Cash & Billing Team to get the invoices raised & match it to the cash.

Average Unallocated Cash Lines - Last 6 Months

	Oct	Nov	Dec	Jan	Feb	Mar
Unallocated Cash Lines	293	155	233	418	518	513
6 Month Average	355	355	355	355	355	355
Standard (Lowest)	155	155	155	155	155	155

1.2 Clarify the Problem - Gap

Average Monthly Unallocated Cash Lines

Gap:

1.3 Gap Analysis - Last 6 Months

Average Unallocated Cash Lines by Department

Problem to Pursue:

(Departments: Barges & Boats, Properties, Repairs, Utilities, Facilities, Sales)

Step 2: CONTAIN

Instructions:

Read the description of the situation in each step. Then respond to the questions at the end and use the "RPS Quadrant chart worksheet" to record your answers.

Once Sarah had Clarified the Problem and the Problem to Pursue, she needed to consider how they we going to Contain the Problem and stop it from getting worse.

At the next weekly meeting (Week 14) she takes her Team through Step 1 – Concern of the quadrant chart:

Week 14

Sarah: OK team, so we have identified we have a problem with the number of unallocated cash lines, on average its about 200/month.
How can we ensure the it doesn't get any worse and even better get it back to standard of 155/month by month end?

Bob: We could get some Temporary Staff in...

Petra: Yes, but we'll have to recruit, train them up and it will be the end of the month by then!

Bob: Oh yes. I see, fair enough. What if we outsource until we can get on top of the situation?

Gary: Hmmm, that will take too long Bob as we will need to get any new supplier approved. I guess it would be an expensive option as well. Why don't we just do some overtime to start getting them down over and above what we normally do?

Dave: That's a good idea. We could put that in place in now!

Bob: I'm OK with that.

Sarah: OK, good idea team. We can share the workload amongst us over the next few weeks. Considering what we normally do I reckon we'll need to match at least 10 Cash Lines per Day to get us close to 155 by the end of the month. I'll make the arrangements with HR and propose we start today. Let's make sure we collect some data to track how we are doing, I'll set up a central spreadsheet that we can populate as we go along and complete the section of the RPS Quadrant Chart.

Overtime and a spreadsheet is put in place. Over the following weeks they record their progress.

Day	Week 14					Week 15					Week 16					Week 17					Month End Data Totals
	Mon	Tues	Wed	Thrs	Fri	Mon	Tues	Wed	Thrs	Fri	Mon	Tues	Wed	Thrs	Fri	Mon	Tues	Wed	Thrs	Fri	
Cash Lines Closed with O/T	10	8	15	5	12	11	8	15	9	8	12	6	8	15	10	8	15	15	7	5	202
Overtime Target	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	200
Overtime Hours	4					3.5					4.5					4					16
Unallocated Cash Lines	513	480	466	444	421	380	356	333	301	280	253	240	233	229	201	190	182	181	176	153	153

Questions:

1. What are the 5W's (Who, What, Where, When, Why? and 2H's (How, How Much) for the chosen Containment activity?
2. What is the Impact of this containment activity both in terms of unallocated cash lines and overtime?
3. Did Sarah and the Team manage to close the Gap with their Containment activity?

Actions:

1. Answer the 5W and 2H questions to describe the Containment activity the Team decided upon. Try to be a specific as possible.
2. Visualise the results data above and the impact it has had in terms of meeting their Target, the overtime and closing the gap.
3. Show all your thinking as visually as possible in Step 2 – Contain of the RPS quadrant chart.

| Step 2 | CONTAIN - Can we stop the problem now? |

Who:

What:

Where:

When:

Why:

How:

How Much:

Contain Target: 10 Cash Lines / Day

Daily Cash Lines Closed with Overtime

■ Cash Lines Closed with O/T — Overtime Target

Weekly Overtime Containment Activity Hours

■ Overtime Hours

2.1 Contain Result

End of April Unallocated Cash Lines

Contain Impact:

Current Situation End April   Standard (Lowest)   Gap
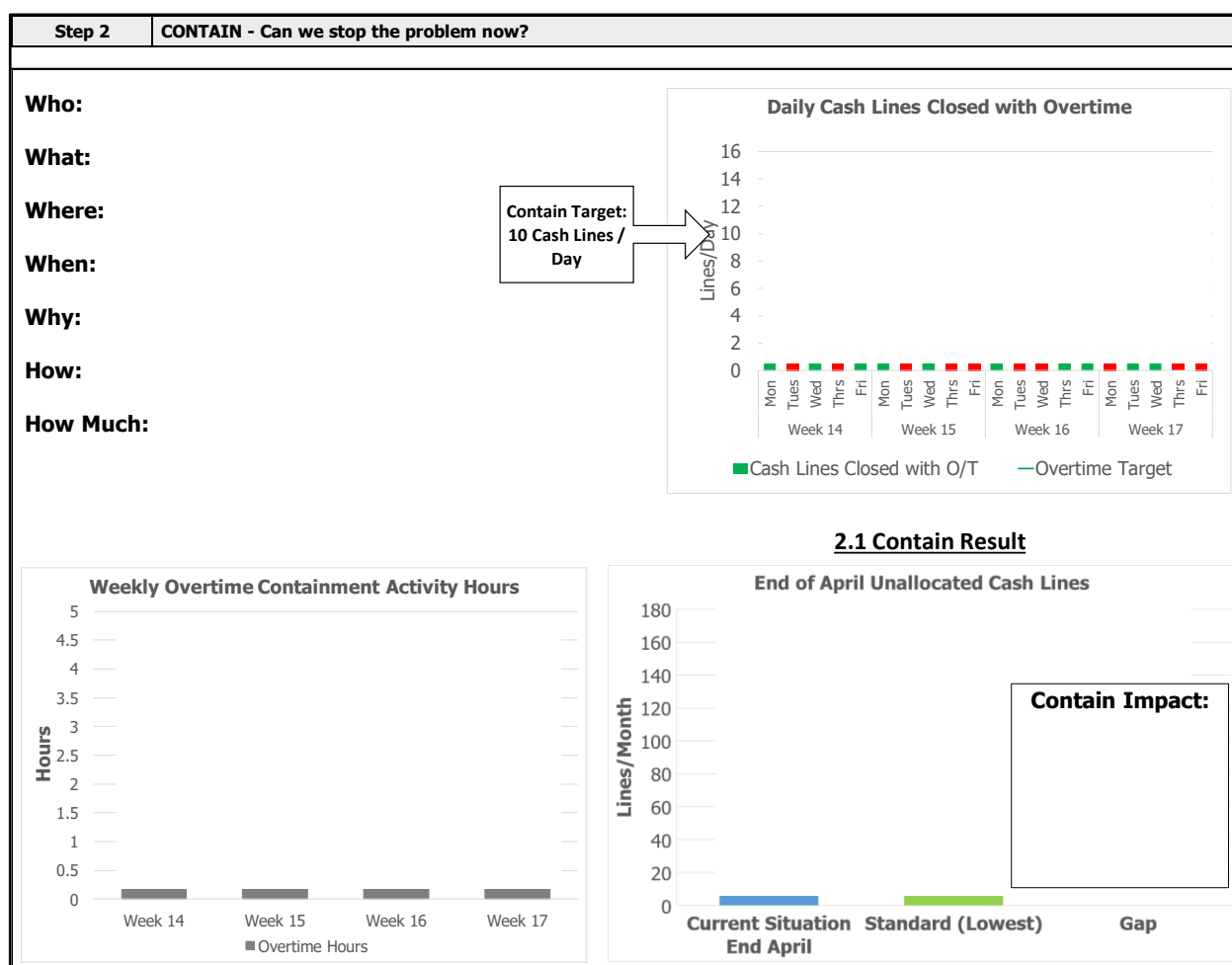
Step 3: CAUSE

Instructions:

Read the description of the situation in each step. Then respond to the questions at the end and use the "RPS Quadrant chart worksheet" to record your answers.

Week 15

Now that they had put some containment in place the team's attention turned to understanding the situation and what the root causes of the problem could be.

To do this Sarah the team leader gets the team together again and asks what they think could be the potential causes of lost time.

Sarah: Ok, so it looks like the containment is working and the number of lines is coming down. Hopefully by the end of the month we should be close to the Standard of 155 Lines but we'll keep tracking it.
So what do you think are the potential causes of the Unallocated Cash Lines for Barges and Boats are, any ideas?

Bob: Well, I think it might be *Incorrect Amounts* – it seems like I'm always having to correct them, especially if people have paid in a different currency from abroad on their credit card.

Petra: I get that as well Bob. It depends upon when the transaction was made versus the monies hitting our account I think. Sometimes I find that *No Invoice has been Raised* at all!

Bob: Me too. Also, they can be *Posted to the Wrong Account*. After a bit of digging I find that its actually a new customer an no account number has been created, especially for the short notice day or weekend hire of boats when people just turn up at the booking offices, especially when the weather is nice.

Gary: Could be *Refunds*, you know when the Barges breakdown – it happen to me last summer! I was stuck in the middle of the waterway for two hours.

Dave: Ha ha, unlucky Gary. I find that the *Invoices are Raised too Late* to be honest. We get the cash but the invoice then arrives later on. Doing the overtime has meant I've matched more later in the day.

Bob: Yes, I've noticed that too Dave – funny isn't it. Perhaps we should just do a night shift instead and match them then.

Petra: Steady on Bob! I'm not doing a night shift, days is bad enough!! I think its either a *Software Error* or just that the *Goods/Services have not been Received.* I have never trusted that new system when it was put in last year.

Sarah: OK, Great discussion team, but we are not going to change the IT system or put a night shift on! Let's get this down on paper and see how much all of this is causing an effect on the problem. I think we need to capture some more data while we do the overtime and record what the causes are of the Unallocated Cash Lines. I expect most of them are Barges & Boat problems anyway so it should give a reasonable representation of what is happening.

Questions:
1. *What are the potential causes?*
2. *Which causes need more data or can they be eliminated now?*

Actions:
1. *Put the Problem to Pursue in the box shown below.*
2. *Put all the potential causes the Team mentioned using a Cause-and-Effect Diagram (Fishbone) on Step 3 – Cause of the RPS quadrant chart.*
3. *For each Potential Cause decide which "bone" it should go under i.e. Man, Machine, Material etc..*

Mother Nature   **Machine**   **Man**

Problem to Pursue:

Measurement   **Method**   **Material**
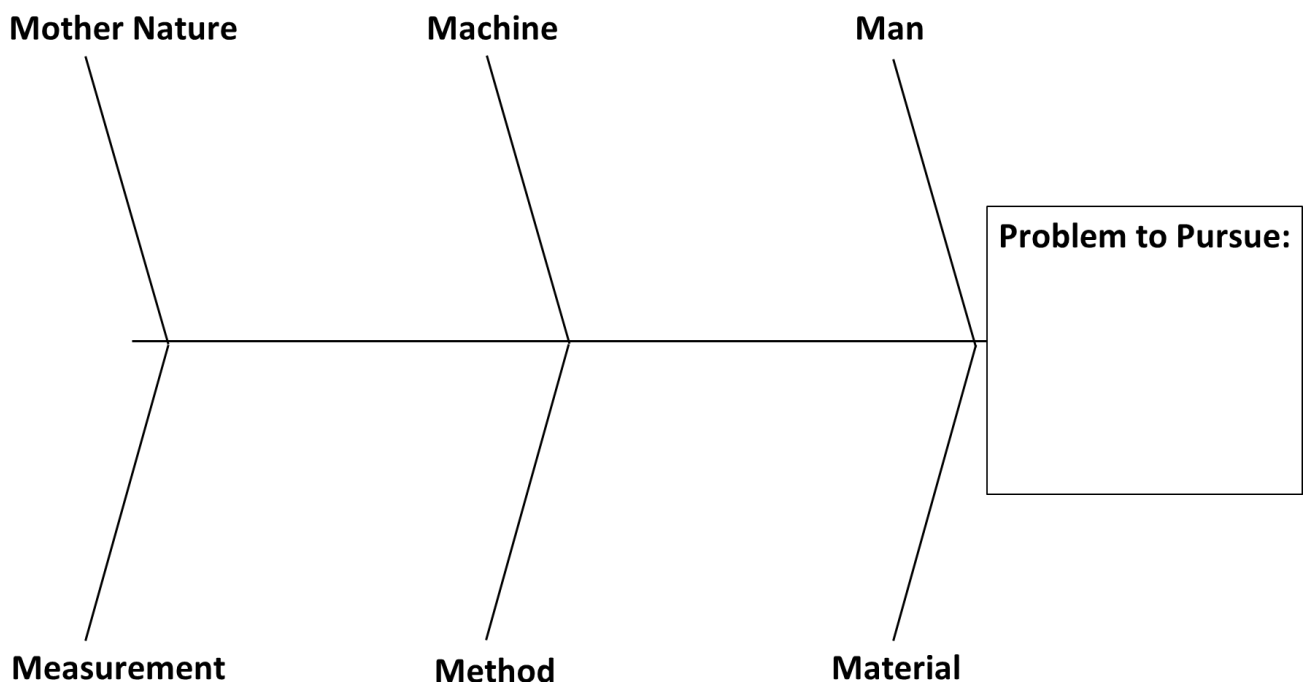
Step 3: CAUSE Continued

Now the group had identified the potential causes they decided to collect more data to help understand which were the direct causes of the problem and which causes had no or little impact. To do this they chose to create a check sheet or tally chart and when they matched a Line during overtime they recorded the reason or cause. They did this for the next four weeks.

The results can be seen below:-

Cause	Wk 15	Wk 16	Wk 17	Wk 18	Totals
Incorrect Amount	6	3	1	4	
Raised Too Late	25	32	33	30	
No Invoice Raised	3	1	0	4	
Posted to Wrong Account	15	13	16	16	
Other	2	2	0	1	

Actions:
1. *Add up the Causes for each Week and put the Totals in the grey shaded column.*

End of Week 18

Now the team had an understanding of what the biggest causes of the problem were. Sarah remembered from her problem solving training the importance of 'GO and SEE' to grasp what was actually happening. As she could physically go to every Barge and Boat Rental office she decided to set up a meeting with the B&B Team Leader Ellie to share the teams findings.

While at the meeting Sarah shared with Ellie their RPS Quadrant Chart progress and findings:

Sarah: So, that's where we are. As you can see from the data we've established two Direct Causes Invoices raised too late and Payment Posted to Wrong Account. What we are trying to do is get to the Root Causes for each of these.

Ellie: Right, yes I see, nice work by the way. What do you mean by Root Causes?

Sarah: Well Direct Causes are light switches - they switch the problem on and off. Root Causes are something, if we put a Countermeasure in place will stop the problem from happening in the future. For example, why are the Invoices raised too Late?

Ellie: Well we usually check *the Invoices and Raise them around 1400hrs*, is that too Late?

Sarah: Ahh, well yes it could be as we start tying to match the *Cash from around 0700hrs*. Why do you do it from 1400hrs?

Ellie: Erm, no real reason, we just always have – even since I joined the company years ago. Why do you do it from 0700hrs?

Sarah: Well, because we have so many to match we just start as early as we can I suppose. Probably pointless though if you aren't raising them till 1400hrs though! Looks like our *processes aren't aligned...*

Ellie: Yeah, indeed! We don't have a *Standard Process for the Timing of Activities* do we?

Sarah: Bingo – Root Cause alert! If we did however we would stop this problem from happening. Can you Raise the Invoices earlier – say by 1000hrs instead or as soon as you take the booking and cash to be honest?

Ellie: I don't see why not, I can speak to the Regional Teams and try and make sure they do it by 1000hrs next week (Week 19).

Sarah: OK, great and I'll change the C&B Teams activities to start from 1030hrs to give a bit of leeway. Nice one, one down, how about the next one. Why are Payments Posted to the Wrong Account do you think? I've brought some examples for you to look at if that helps?

Ellie: So, looking at these most of them are from Birmingham. Lets call Andy in the office down there and see if he knows anything about it.

Ellie and Sarah set up a conference call with Andy in the Birmingham booking office and explain the situation to him.

Andy: Ok, I checked the examples you sent me and we've put them against the *Wrong Customer Account Numbers.*

Ellie: And why is that Andy?

Andy: Well for some of the walk in bookings, the guys *don't know how to set up a new customer account* – we've got a new intake of students to staff the front desk for Easter and they probably *have not been trained* in doing it. Sorry I didn't realise the impact on your team Sarah.

Sarah: That's Ok Andy, at least we know why. Do you do any *training confirmation* with the new staff to check they can do all the tasks?

Andy: No not really. We have been so busy that we have focussed on just taking the bookings. I think we need to go back and confirm they can at least raise new Customer Account Numbers from now on!

Ellie: Root Cause alert! That we be great Andy, when can you do it?

Andy: Well, give me next week (Wk19) to establish who can and can't do this. Then the following two weeks to get the training done. So, by end of Week 21 we should be done.

Ellie: Perfect. Thanks Andy, lets follow up the progress in our weekly call. I think you helped to find the Root Cause!

Andy: Ok Ellie, will do lets talk next week.

Ellie ends the call with Andy.

Ellie: Well, that was interesting. I wonder if we have the same issue in the other regional rental offices.

Sarah: I suspect we do. We should share our learning with the other offices and departments. I think they call it look across or yokoten – something like that anyway. I'll make sure it is in the Countermeasure plan.

Ellie: Good idea and good meeting. Thank you for raising this to my attention.
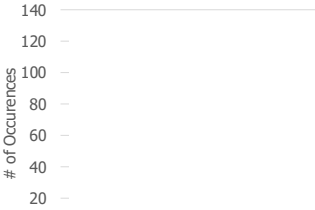
Sarah: No problem, thanks too. This will make a massive impact to my team and the organisation.

Questions:
1. *What does the tally chart data tell you about the Direct Causes?*
2. *What should the team prioritise and investigate to find the Rood Causes?*

Actions:
1. *Visualise the data for the Unallocated Cash Line Causes on the RPS quadrant chart. Use this to highlight the Direct Causes and what the team should focus on first.*
2. *From the Direct Causes complete a 5 WHY analysis and based on all the evidence the team has. Start with the Problem to Pursue, then the Direct Causes and carry on to identify what you think the Root Causes are.*

Step 3	CAUSE - Investigate and find the root causes?

3.1 Direct Cause Investigation

Mother Nature   Machine   Man

Measurement   Method   Material

Problem to Pursue:

3.2 Direct Cause Proof

Unallocated Cash Line Causes Wk15-18

# of Occurences: 0, 20, 40, 60, 80, 100, 120, 140

Raised Too Late | Posted to Wrong Account | Incorrect Amount | No Invoice Raised | Other

Direct Cause 1:

Direct Cause 2:

3.3 Root Cause Investigation

Problem to Pursue:		
Direct Causes:		
Why ?		
Why ?		
Why ?		
Why ?		
Root Causes:		

Root Cause 1:	Root Cause 2

Step 4: COUNTERMEASURE & CONFIRM

Instructions:

Read the description of the situation in each step. Then respond to the questions at the end and use the "RPS Quadrant chart worksheet" to record your answers.

Week 19

Once the team had a grasp of the Root Causes they needed to fix, they needed to determine the Countermeasures that would fix the problem.

To do this Sarah the team leader gets the team together to see what they think:

Sarah: What do you think we could do about this then?

Bob: Well we need to create the standard times for raising invoices by 1000hrs and posting cash from1030hrs. But you've done that with Ellie last week (week 18).

Petra: So, we just need to train everyone to start doing it from 1030hrs this week (week 19) and monitor the results.

Sarah: I'll monitor the results and share the learning with the other Departments too to leverage the benefits.

Dave: And it sounds like Andy has the training confirmation aspects in hand from what you said.

Sarah: Yes, Ellie will follow up with Andy. I just need to monitor those results too and share out the learning.

Dave: How long will all this take then?

Petra: I couple of weeks for the actions and then monitor the results.

Questions:
1. *Draw up a list of possible countermeasures – Consider Countermeasure Action, Who, When and try to calculate the expected Impact using the data from the Unallocated Cash Line Causes graph.*
2. *Who is the most appropriate person to do / check / follow up?*
3. *What and how are you going to do to standardise the process and look across (yokoten) to see if other areas are affected?*

Actions:
1. *Put together a countermeasure plan with a schedule, person responsible and expected impact for each listed.*
2. *Visualise your plan in Step 4 of the RPS quadrant chart.*

	Root Cause	#	Countermeasure Action	Who	When	Impact
1		1				
		2				58% of 237 =
		3				
		4				
2		5				
		6				29% of 237 =
		7				

End of July (Week 30)...

Sarah and the team worked hard to deliver the countermeasures. It had taken persistence and coordination to turn his plans into actions and results. It has also taken good communication and cooperation with other team members and leaders to deal with obstacles that came up. The impact of the countermeasures has, however, become increasingly apparent.

Sarah gets the team together again to share the RPS quadrant chart progress:

Sarah: So, as you know we got all of the actions completed by end of May (Week 21) and have been tracking the results for two months now.

Bob: When did we stop the Containment – beginning of June?

Sarah: Yes it was, I bet you are all missing doing overtime!

Gary: The money yes, not the time..

Sarah: I've also shared the results with the other departments so I expect we should see even less lines going forward.

Dave: Great job team!

Sarah: Have a look at this week's data. There's a great improvement and I want you guys to share this with Sue the Supervisor tomorrow. I'll finish up the RPS quadrant chart and then we are good to go. Mind you I still think there is room for further improvement…

Petra: Right then. Let's go problem solving!

The data captured by the team was as follows:

Unallocated Cash Line Causes Week 21 to 24:

Cause	Wk21	Wk22	Wk23	Wk24	Totals
Incorrect Amount	3	3	5	4	15
Raised Too Late	2	3	1	0	6
No Invoice Raised	4	3	2	4	13
Posted to Wrong Account	1	0	2	0	3
Other	2	2	6	1	11

Unallocated Cash Lines Monthly Performance:

Monthly Data	Monthly End Data						
Month	Jan	Feb	Mar	Apr	May	Jun	Jul
Unallocated Cash Lines	418	518	513	160	180	155	145
2 Month Average	325	468	515	336	170	167	150
Standard (Lowest)	155	155	155	155	155	155	155

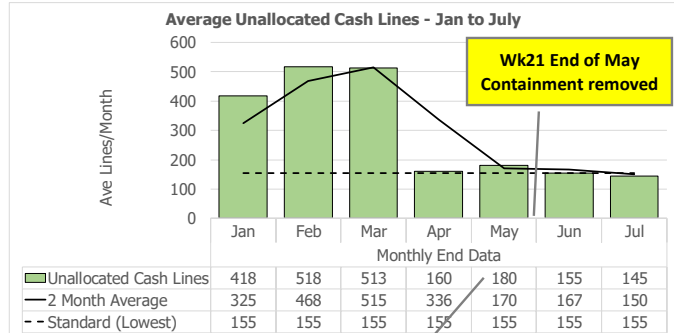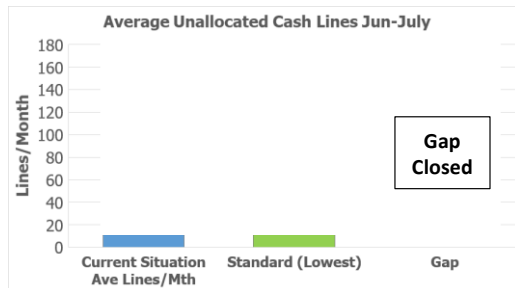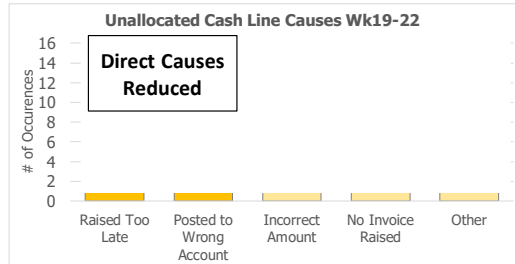**June to July Unallocated Cash Lines Average = 150.**

Questions:
1. *How you will show the results achieved in terms of eliminating the Direct Causes, June to July's performance and gap closure?*
2. *When were the countermeasure actions implemented and when was the containment activity removed?*
3. *What would you focus on next ?*

Actions:
1. *Using the Unallocated Cash Line Causes data, show in the graph that the Direct Causes have been eliminated.*
2. *Using the Demand vs Output data from June to July, show in the graph the that the Gap has been closed.*
3. *Look at the Causes Data. Which item would you focus on next to reduce the number of Unallocated Cash Lines?*
4. *Summarise the Results achieved in short statements in the Results Summary box by answering these questions:*

   - *What reduction in Unallocated Cash Lines has been achieved?*
   - *Has the Gap been closed?*
   - *When did Containment stop?*
   - *Where will you focus next?*

Step 4	COUNTERMEASURE & CONFRIM - Did we close the GAP?

4.1 Countermeasure Plan

Root Cause		#	Countermeasure Action	Who	When	Impact
1		1				58% of 237 =
		2				
		3				
		4				
2		5				29% of 237 =
		6				
		7				

4.2 Confirm Results

Unallocated Cash Line Causes Wk19-22

Direct Causes Reduced

# of Occurences — y-axis: 0,2,4,6,8,10,12,14,16

Categories: Raised Too Late, Posted to Wrong Account, Incorrect Amount, No Invoice Raised, Other

Average Unallocated Cash Lines - Jan to July

Wk21 End of May Containment removed

All Actions Completed in May

Ave Lines/Month — y-axis: 0,100,200,300,400,500,600

Monthly End Data

	Jan	Feb	Mar	Apr	May	Jun	Jul
Unallocated Cash Lines	418	518	513	160	180	155	145
2 Month Average	325	468	515	336	170	167	150
Standard (Lowest)	155	155	155	155	155	155	155

Average Unallocated Cash Lines Jun-July

Gap Closed

Lines/Month — y-axis: 0,20,40,60,80,100,120,140,160,180

Categories: Current Situation Ave Lines/Mth, Standard (Lowest), Gap

Result Summary:

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Rapid Problem Solving (RPS) Evaluation Criteria Guide

The Evaluation Criteria Guide has been created to assist you with being able to determine if the RPS method and Quadrant Chart has been filled out to a satisfactory standard.

Each Step has been broken down in to Expected Content (from the Teach Poster), Evaluation Levels of 1 – 5 and a series of Coaching Questions.

The purpose of the Guide is to help you determine if you, or the person you are coaching has followed the RPS method well enough to achieve a least a **Level 3 Evaluation** rating. If not, then you can use the Coaching Questions to help determine the gaps and work to close them.
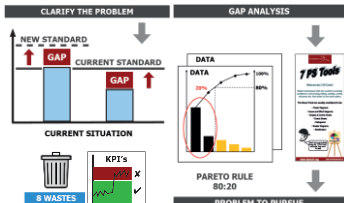
Level 3 is the minimum expectation. Levels 4 and 5 are targets to aim for as you and your colleagues become more experienced and capable of applying the RPS method.

This Evaluation Criteria Guide and the process of evaluation along with other supporting documents is explained further in our **Skill Level 3 – Capable** course.
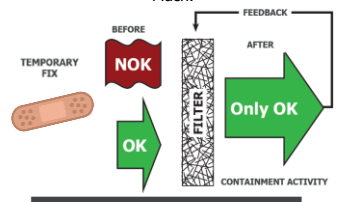
RAPID PROBLEM SOLVING (RPS) EVALUATION CRITERIA

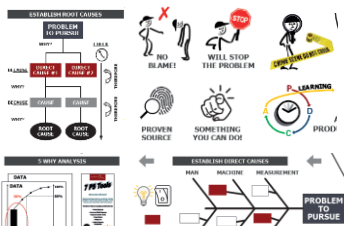RPS Coaching Evaluation Form Ver1.0

1.0 Concern

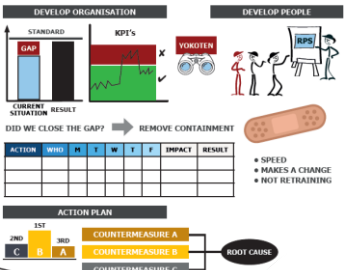| Expected Content	Evaluation Levels	Coaching Questions
- Background/context/why solve this problem? - Clarify the Current Situation, Standard & Gap. - Gap Analysis to define the Problem to Pursue. - Use of the 7 PS Tools to visualise. 	1 Although the problem is stated it's not clear is a problem or why they are tackling it. 2 Gap clearly visualised the Problem Clarified, but Gap Analysis insufficient to truly determine the Problem to Pursue. 3 Gap clearly visualised the Problem Clarified. Thorough, logical Gap Analysis to determine the Problem to Pursue. 4 As 3, but also business impact considered. 5 Content is simple, clear and easy to share with little or no explanation.	a. Describe the problem to me in your own words? b. What's the difference between the Standard & Current Situation? c. What will be the benefit if we solve this problem? d. Can you use the 7 PS to visualise the Gap? e. What would happen if we did nothing? f. How did you decide or select this problem? g. How can you break down the gap? h. What are the biggest contributors to the gap? i. What is the Problem to Pursue here? j. What is the impact of this problem on your area or the business?

2.0 Contain

Expected Content	Evaluation Levels	Coaching Questions
- Customer needs and containment considered. - Speed, priority and feedback. - Who, What, Where, When, Why, How, How Much. 	1 Containment done but method is weak. 2 Contain (5W,2H) done, but the start date, date, impact on gap, actions are unclear. 3 Closed loop containment done. Method, date, actions and impact on gap clearly visualised to demonstrate it is working. Reasons for NOK results explained. 4 In addition it is being used to collect data to understand the problem & causes more. 5 Also, the content is simple, clear and easy to share with no explanation.	a. How did you decide about doing containment? b. What was the method you put in place? c. When did the containment start? d. What is the customers feedback about the containment activity? e. How did you check the containment was working? f. What actions have been taken during the containment activity? g. What did you learn from containment? h. What other areas could be affected by this problem?

3.0 Cause

Expected Content	Evaluation Levels	Coaching Questions
- Cause Effect relationship proved between the Problem to Pursue and the Direct Cause(s). - Use of data and experiments to prove it. - Logical 5 Why Analysis to determine the Root Cause(s) that will stop the Problem. 	1 Direct Cause investigation is weak and the effect on the Problem can't be proven. Based upon intuition, assumption, what they think. 2 Direct Cause investigation is good but the 5 Why Analysis is not logical. No go & see. 3 Logical 5 Why Analysis used to find the Root Causes. Evidence of go & see/investigation. Root Causes will stop the problem. 4 In addition, rapid low cost experiments have been used to prove the Root Causes. 5 Simple, easy to share and understand by anyone.	a. What did you find when you went to see it for yourself? b. How would you summarize the problem in your own words? c. How did you check that they are Direct Causes? (1st Why) d. What did you learn when you asked "why" five times? e. What specific causes did you uncover through your investigation? f. How did you verify the causes? g. What do you think happened in terms of the timing or sequence of events to arrive at the root cause? h. How are you sure that solving this root cause will stop the problem? i. What did you learn from the because/therefore check? j. Why, why, why…….?

4.0 Countermeasure & Confirm

Expected Content	Evaluation Levels	Coaching Questions
- Countermeasures & Action Plan. - Results show Direct Causes have been gone. - Gap Closed, Containment removed. - Standardised and shared learning. 	1 Countermeasures (C/M) are specified but are inadequate to address the Root Cause(s). 2 C/M are logical, address the Root Cause(s). The impact of each C/M has been calculated towards the gap but results are lacking. 3 As 2 but results show Direct Causes eliminated and the Gap closed. Containment removed, results sustained. 4 As 3, but also standardisation and sharing of learning (Yokoten) is completed. 5 The RPS Document is so clear it can be used as a stand alone document to train others.	a. Explain to me how you came up the C/M ideas? b. How did you check they would address the Root Cause(s)? c. How did you decide which one to do first? d. How did you calculate the expected benefit from each C/M? e. How did you agree the plan with the other people involved? f. How did the results impact in closing the gap? g. How did you verify that the results were sustained to remove containment? h. What changes will be needed to standardise this? i. Who else would benefit from knowing about this result? j. What did you learn, what are you going to do next?

Notes:

Notes:

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Notes:

MWB Rentals Ltd. Unallocated Cash

Lean Enterprise Academy

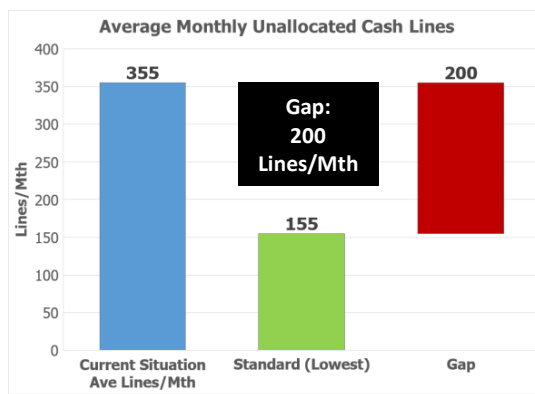| Step 1	CONCERN - What's the GAP?

1.1 Background

- Unallocated cash is cash received in to the business with no invoice to match off to, or a "Cash Line".

- This can mean that cash is not realised in to the monthly Profit and Loss account affecting cash flow - up to £100k in one month (Feb)!

- This means more work for the Cash & Billing Team to get the invoices raised & match it to the cash.
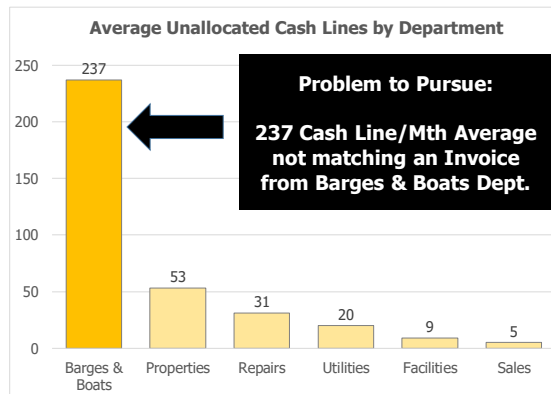
Average Unallocated Cash Lines - Last 6 Months

	Oct	Nov	Dec	Jan	Feb	Mar
Unallocated Cash Lines	293	155	233	418	518	513
6 Month Average	355	355	355	355	355	355
Standard (Lowest)	155	155	155	155	155	155

1.2 Clarify the Problem - Gap

Average Monthly Unallocated Cash Lines

Gap: 200 Lines/Mth

- Current Situation Ave Lines/Mth: 355
- Standard (Lowest): 155
- Gap: 200

1.3 Gap Analysis - Last 6 Months

Average Unallocated Cash Lines by Department

Problem to Pursue:

237 Cash Line/Mth Average not matching an Invoice from Barges & Boats Dept.

- Barges & Boats: 237
- Properties: 53
- Repairs: 31
- Utilities: 20
- Facilities: 9
- Sales: 5

Step 2	CONTAIN - Can we stop the problem now?

Who: Cash & Billing Team.

What: Daily Overtime.

Where: Office/Desk.

When: From Week 14 (April).

Why: To reduce Unallocated Cash Lines by the end of the Month.

How: Manual Matching in Cash/Invoice Accounts System.

How Much: Additional 10 Cash Lines/Day.
155 Unallocated Cash Lines by end of April.

Daily Cash Lines Closed with Overtime

Contain Target: 10 Cash Lines / Day

Legend: Cash Lines Closed with O/T — Overtime Target

Week 14, Week 15, Week 16, Week 17

Weekly Overtime Containment Activity Hours

	Week 14	Week 15	Week 16	Week 17
Overtime Hours	4	3.5	4.5	4

2.1 Contain Result

End of April Unallocated Cash Lines

- Current Situation End April: 153
- Standard (Lowest): 155
- Gap: -2

Contain Impact: Unallocated Cash Lines reduced to 153 by 16 Hours Overtime

Lines Improvement

SITE	RPS LEADER	TEAM MEMBERS	DATE	Signature	Approval
Leeds	Sarah	Bob, Petra, Gary, Dave, Ellie, Andy	March - July	Sarah	Sue

Step 3	CAUSE - Investigate and find the root causes?

3.1 Direct Cause Investigation

Mother Nature **Machine** **Man**

Accounts Software Error

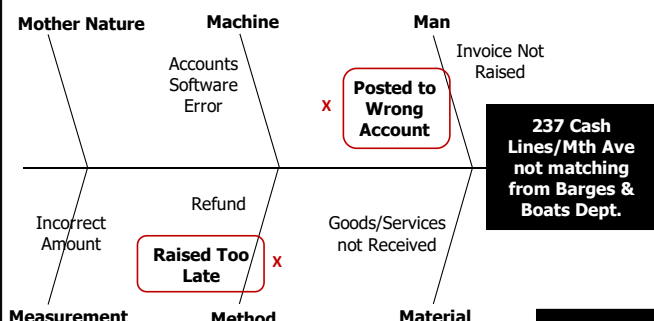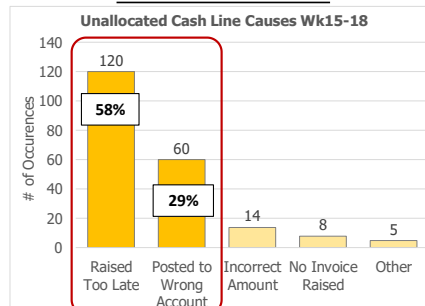Posted to Wrong Account X

Invoice Not Raised

237 Cash Lines/Mth Ave not matching from Barges & Boats Dept.

Incorrect Amount

Refund

Raised Too Late X

Goods/Services not Received

Measurement **Method** **Material**

3.2 Direct Cause Proof

Unallocated Cash Line Causes Wk15-18

Cause	# of Occurrences	%
Raised Too Late	120	58%
Posted to Wrong Account	60	29%
Incorrect Amount	14	
No Invoice Raised	8	
Other	5	

Direct Cause 1: Invoice Raised Too Late

Direct Cause 2: Posted to Wrong Account.

3.3 Root Cause Investigation

Problem to Pursue:	237 Cash Lines/Mth Ave not matching from Barges & Boats Dept.	
Direct Causes:	**Invoices Raised Too Late**	**Payment Posted to Wrong Account**
Why ?	Cash Posted at 700hrs, Invoices Rasied at 1400hrs	B&B Team Members input Wrong Customer Number
Why ?	C&B and B&B Team Processes are not aligned	Didn't know how to Create New Customer Numbers
Why ?	No Standard Process for the Timing of Activites Exist	Not Sufficiently Trained
Why ?		Training Confirmation Process is Inadequate
Root Causes:	**No Standard Process for the Timing of Activities Exists**	**Training Confirmation Process is Inadequate**

Root Cause 1: No Standard Process for the Timing of Activities Exists.

Root Cause 2: Training Confirmation Process in B&B is Inadequate.

Step 4	COUNTERMEASURE & CONFRIM - Did we close the GAP?

4.1 Countermeasure Plan

	Root Cause	#	Countermeasure Action	Who	When	Impact
1	No Standard Process for the Timing of Activites Exist	1	Define a Standard Time for Creating Invoices	Sarah	Wk18	58% of 237 = 137 Cash Lines
		2	Define a Standard Time for Posting Cash	Sarah	Wk18	
		3	Train Staff & Implement	B&B	Wk19	
		4	Monitor Results & Share With Other Depts	Sarah	Wk20	
2	Training Confirmation Process in B&B is Inadequate	5	Define Current State Training Status in B&B	B&B	Wk19	29% of 237 = 68 Cash Lines
		6	Train Staff & Confirm Capable	B&B	Wk20-21	
		7	Monitor Results & Share With Other Depts	Sarah	Wk20	

4.2 Confirm Results

Unallocated Cash Line Causes Wk19-22

Direct Causes Reduced

Cause	# of Occurrences
Raised Too Late	6
Posted to Wrong Account	3
Incorrect Amount	15
No Invoice Raised	13
Other	11

Average Unallocated Cash Lines - Jan to July

Wk21 End of May Containment removed

Monthly End Data	Jan	Feb	Mar	Apr	May	Jun	Jul
Unallocated Cash Lines	418	518	513	160	180	155	145
2 Month Average	325	468	515	336	170	167	150
Standard (Lowest)	155	155	155	155	155	155	155

All Actions Completed in May

Average Unallocated Cash Lines Jun-July

	Lines/Month
Current Situation Ave Lines/Mth	150
Standard (Lowest)	155
Gap	-5

Gap Closed

Result Summary:
- **Unallocated Cash Lines Reduced Average from 355 Oct-March to 150 Jun-July.**
- **Gap Closed without Overtime - Stopped Wk21 end of May.**
- **Focus on "Incorrect Amounts" next.**

Lean Enterprise Academy

We are a not for profit organisation, established to help customers become self-reliant on their lean journey. Through research, products and services we provide better, faster and cheaper ways to learn and improve. Our Senior Lean coaches have a combined total of over 70 years Lean experience and have worked with hundreds of companies across the globe.

Lean Enterprise Academy
San Remo
13 Trinity Square
Llandudno
Conwy
LL30 2RB
Tel: 01600 890590
Email: info@leanuk.org
www.leanuk.org