# QC Tool Method & New QC Tool Method

QC – 7 Tools

Effective method to organize numerical data

ie reject rates, failures

New QC – 7 Tools

Effective method to organize written/verbal data

ie opinions, survey responses.
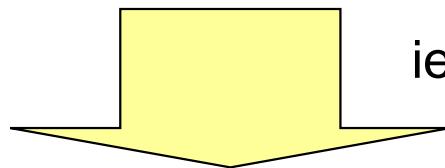
Provides the means to solve problems

(Select the most effective method)

New QC methods discussed here are 1. Affinity diagram, 2. Association diagram, 3. Systematic diagram, 4. Matrix diagram.

What are new the QC tools?

- New QC Tools are:
  - Affinity diagram
  - Association or Relations diagram
  - Systematic diagram
  - Matrix diagram
  - Matrix data analysis method
  - Arrow diagram method
  - PDPC method

What are the new QC tools?

- Purpose of new QC tools?
    - Organize written/verbal data
    - Draw new ideas
    - Validate plans
    - Cover all issues
    - Everyone can understand methods
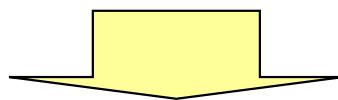
Look for the real problem(s)& determine future direction

What are the new QC Tools?

P1- Make uncertain problems clear

| Affinity diagram | Association / Relations diagram |
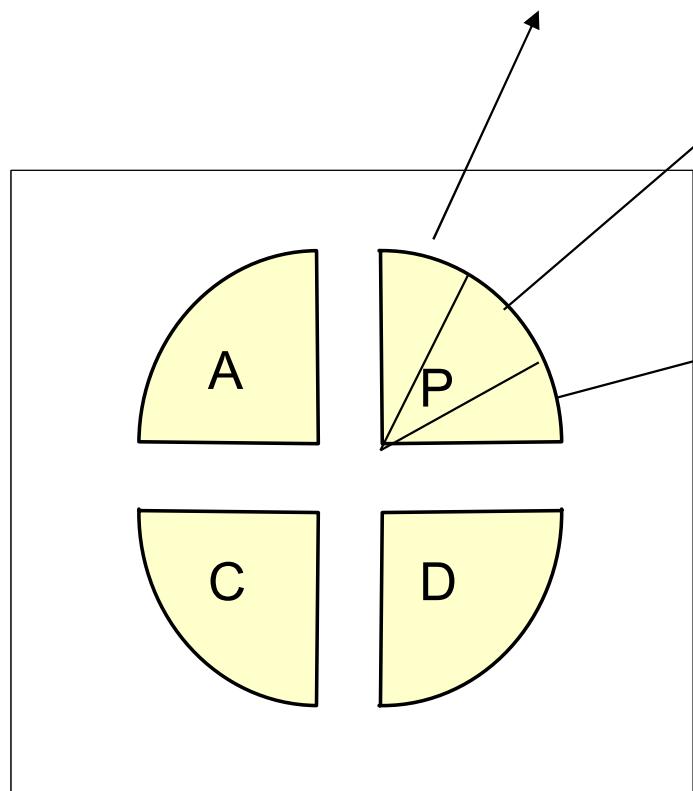
P2 – Develop counter measures to be taken

| Matrix method | Systematic method |

P3 - Scheduling

| Arrow diagram | PDPC method |

7 QC tools

A   P
C   D

What is an Affinity Diagram?

An affinity diagram is a collection of verbal data arranged in categories to identify overall / larger problems.
This tool helps in organizing specific issues into broader categories for countermeasuring and problem identification.
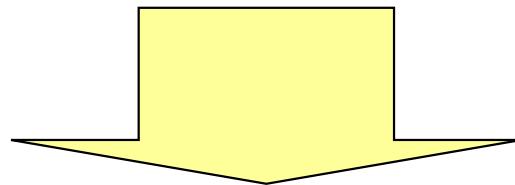
Clarifies problems that you do not fully understand

What is an Affinity Diagram?

It's basically a well organized brainstorming session - you include all possibilities…..

Deals with Problems / Issues that are not clear.

Problem which are likely to Occur in the future

Issues which we have never Experienced before

Issues which we have never had Previous interest in

Deals with both:

Problems which are not difficult to solve

Immediate problems that must be solved
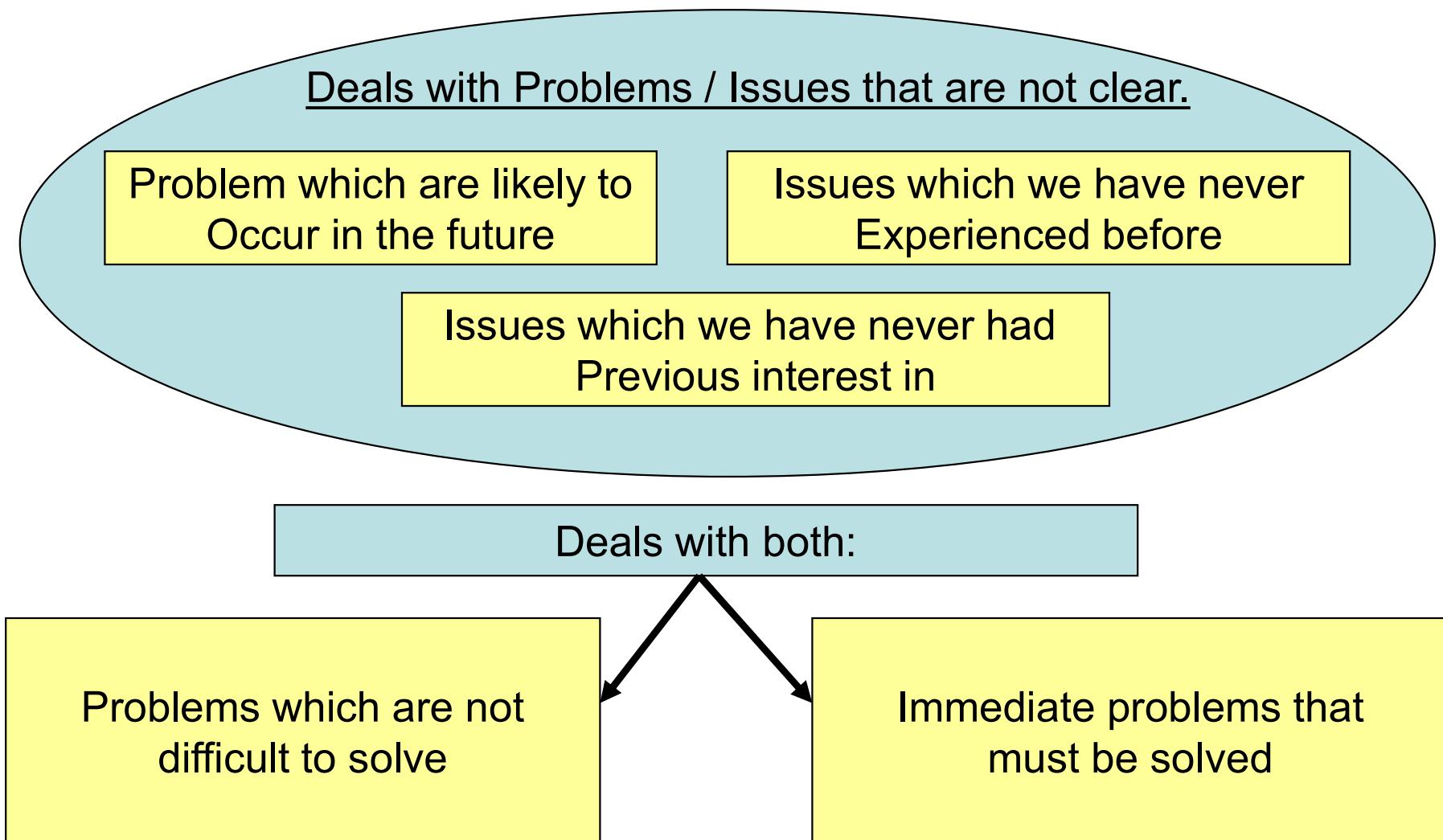
How to create an Affinity Diagram

Start: Choose a broad issue or problem to work on.

Step 1: Create data points – write possible concerns on pieces of paper and post on board – call it out as you apply it. *(Make them specific)*

Step 2: As a group, but with no talking, arrange the separate data points into categories. **(On the board)**

Step 3: Choose a heading for each category & place it on the top of the category. *(Make it a sentence)*

**Step 4:** Finalize data points in each category for each heading.

End: Draw a rectangle to encompass each category.

How to create an Affinity Diagram

Start: Pick a topic / problem / issue for discussion:

Example 1: The training room is not used efficiently

Example 2: Parts on the floor are getting damaged with no explanation.

Training Room Not used Efficiently

How to create an Affinity Diagram

Step 1: Create Data Points (from Brainstorming)

Tips: Ensure to call out your point as you place it on the board to ensure no doubles are listed.

Don't try to arrange in any manner – just stick them up there!

Training Room Not used Efficiently

Too many books

Coffee stuff there

Too many markers

No 3-S

Too many chairs

Clipboards left

Discs scattered

Boxes in way

Old items remain

Too many boxes
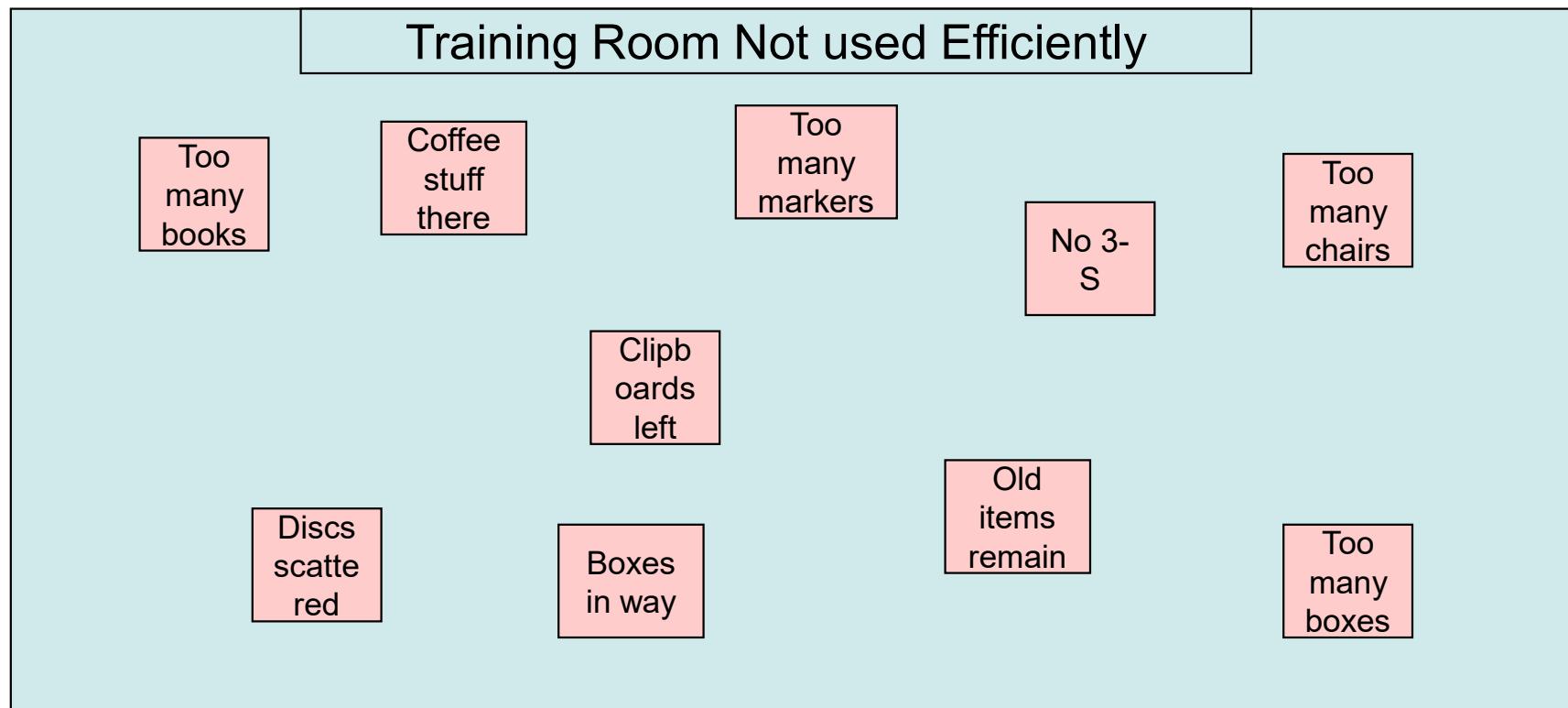
How to create an Affinity Diagram

Step 2: Organize Data Points into Categories

Tips: No one is to talk – just go up and move them around – prevents hogging…..

There may be differences of opinion, the facilitator can mitigate if needed.

Training Room Not used Efficiently

Too many books

Too many chairs

Too many markers

Too many boxes

Coffee stuff there

Clipb oards left

Old items remain

No 3-S

Discs scatte red

Boxes in way
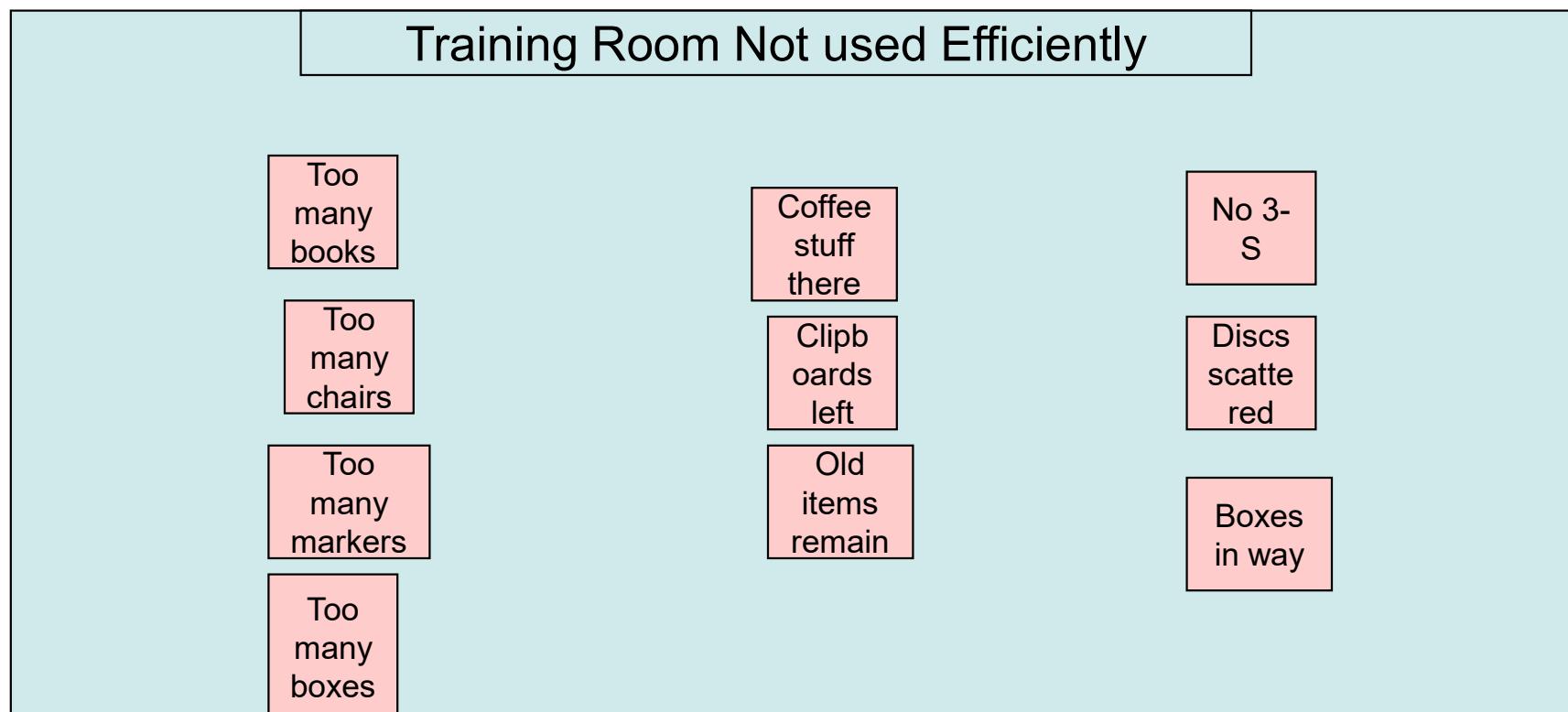
How to create an Affinity Diagram

Step 3: Name Categories

Tips: Everyone must agree on headings

Pick a specific heading that covers all in the category.

Training Room Not used Efficiently		
Have too many of various items	Unnecessary items in room	Items in room are unorganized
Too many books	Coffee stuff there	No 3-S
Too many chairs	Clipb oards left	Discs scatte red
Too many markers	Old items remain	Boxes in way
Too many boxes		
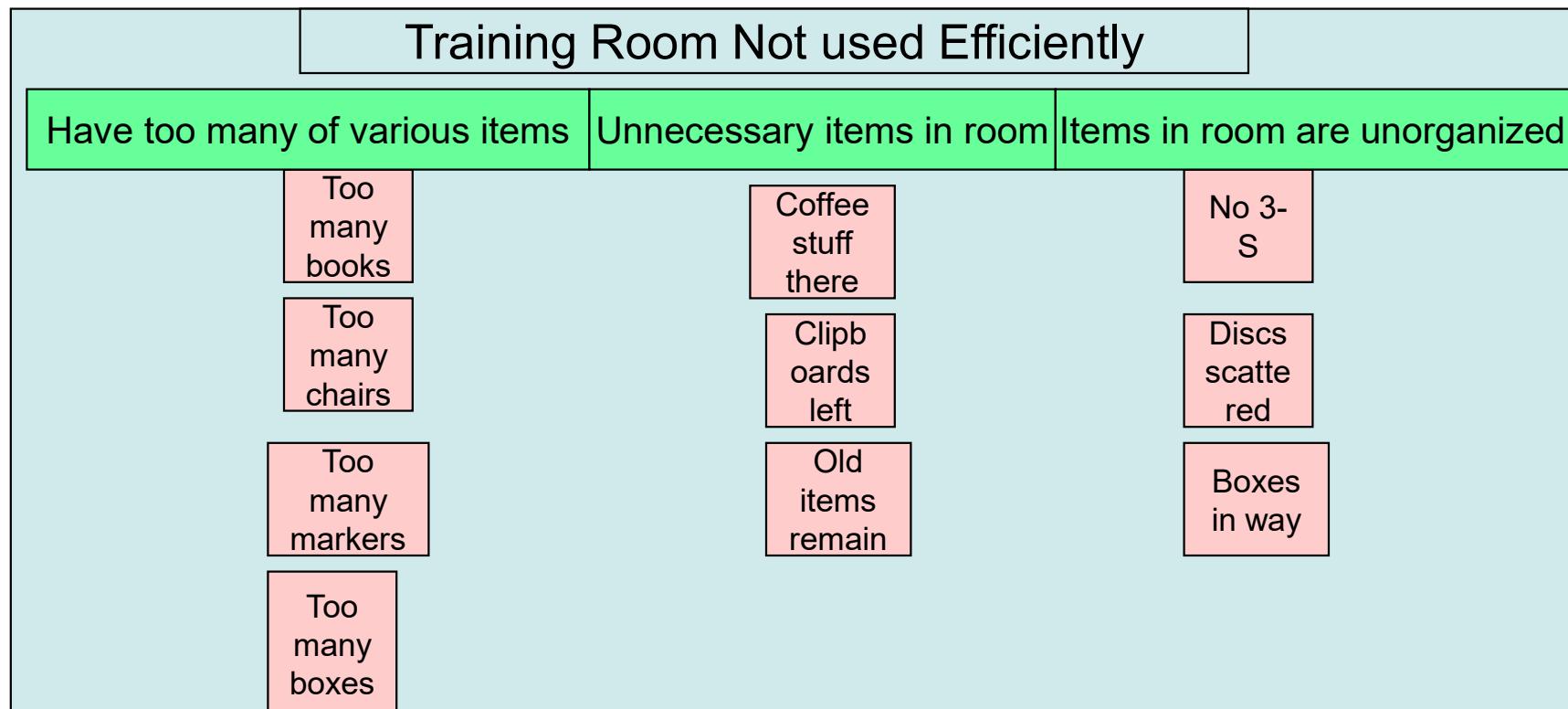
How to create an Affinity Diagram

Step 4: Finalize data points in each Category

Tips: Some points may apply to more than one category , so once headings are applied these are to go in most relevant one.

Make any last changes before finalizing the diagram.

Training Room Not used Efficiently		
Have too many of various items	Unnecessary items in room	Items in room are unorganized
Too many books	Coffee stuff there	No 3-S
Too many chairs	Clipb oards left	Discs scatte red
Too many markers	Old items remain	Boxes in way
Too many boxes		
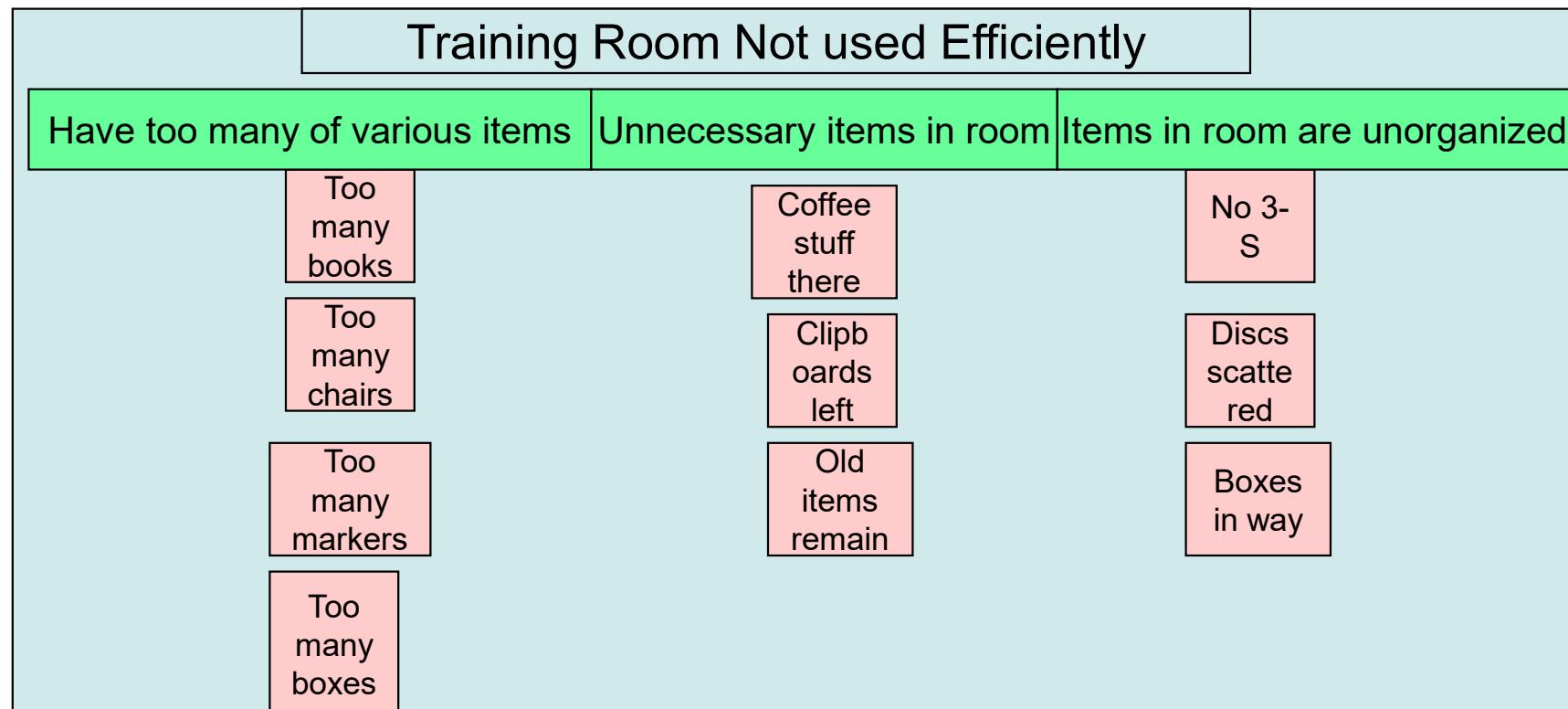
How to create an Affinity Diagram

End: Encompass each Category with a Rectangle

Tips: This finalizes your data points into categories.

YOUR DIAGRAM IS DONE!

Training Room Not used Efficiently		
Have too many of various items	Unnecessary items in room	Items in room are unorganized
Too many books	Coffee stuff there	No 3-S
Too many chairs	Clipboards left	Discs scattered
Too many markers	Old items remain	Boxes in way
Too many boxes		
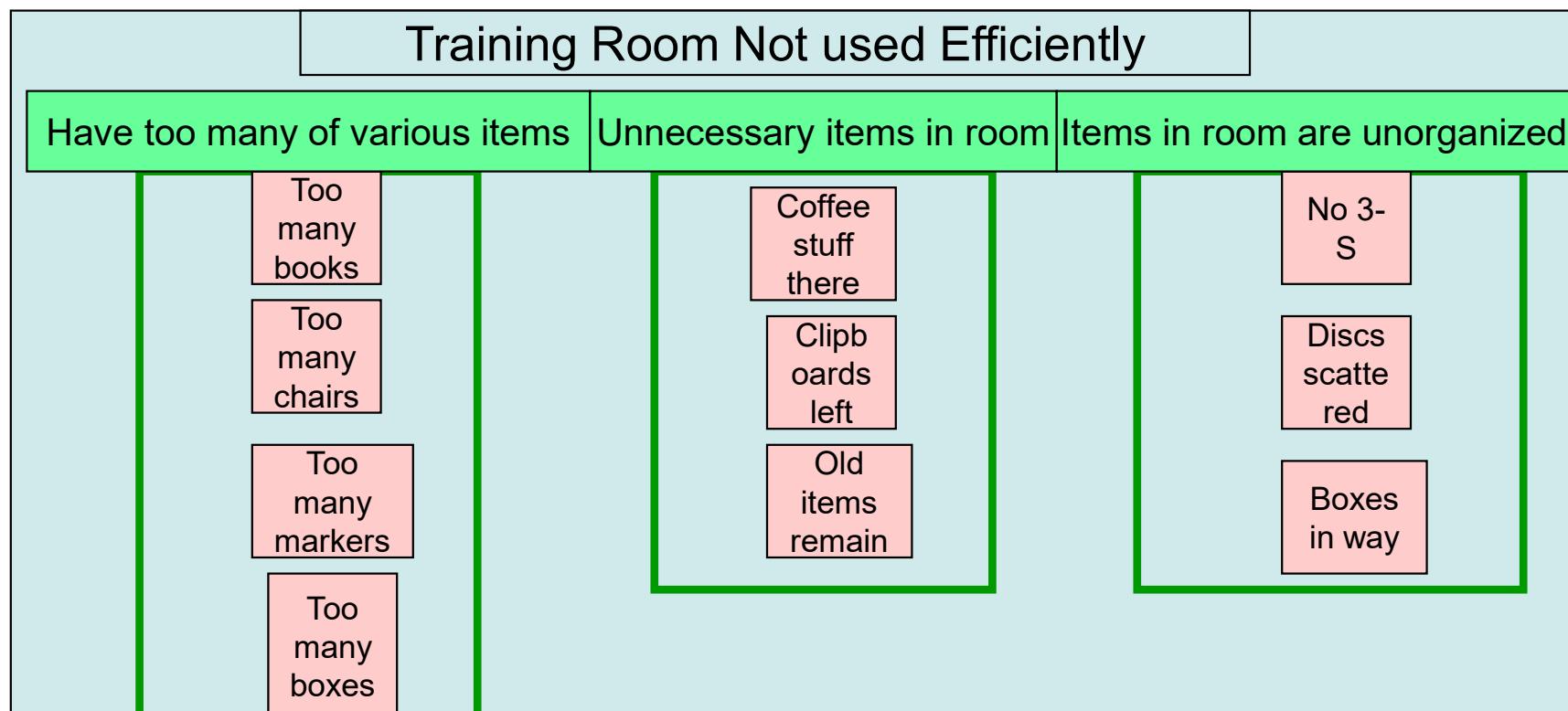
What is an Association or Relation Diagram?

An Association or Relations Diagram depicts how certain factors contribute to one or several problems.

Step 1: State one or more problems in boxes on the page / board.

Step 2: Ask "What causes this problem?" and "What factors contribute to this problem?"

Step 3: Note each cause or factor in a circle on the diagram / board.

Step 4: Link all causes and factors to the problems and other factors they contribute to. *(Matter of opinion – discuss as a group)*

Step 5: Follow diagram from end factors back to problem statement to determine if actual factors result in the problem.

Association or Relation Diagram

Start by noting some simple problems down. If listing more than one they should be related somehow.

Damaged parts in stock

Damaged parts shipped

Association or Relation Diagram

Note all factors you think lead to the problems chosen.

Pressed for time

No time to check

Damaged parts in stock

Damaged by FL

Receiving did not find

Transit damage

Box looks okay

Damage not easy to see

Damaged parts shipped
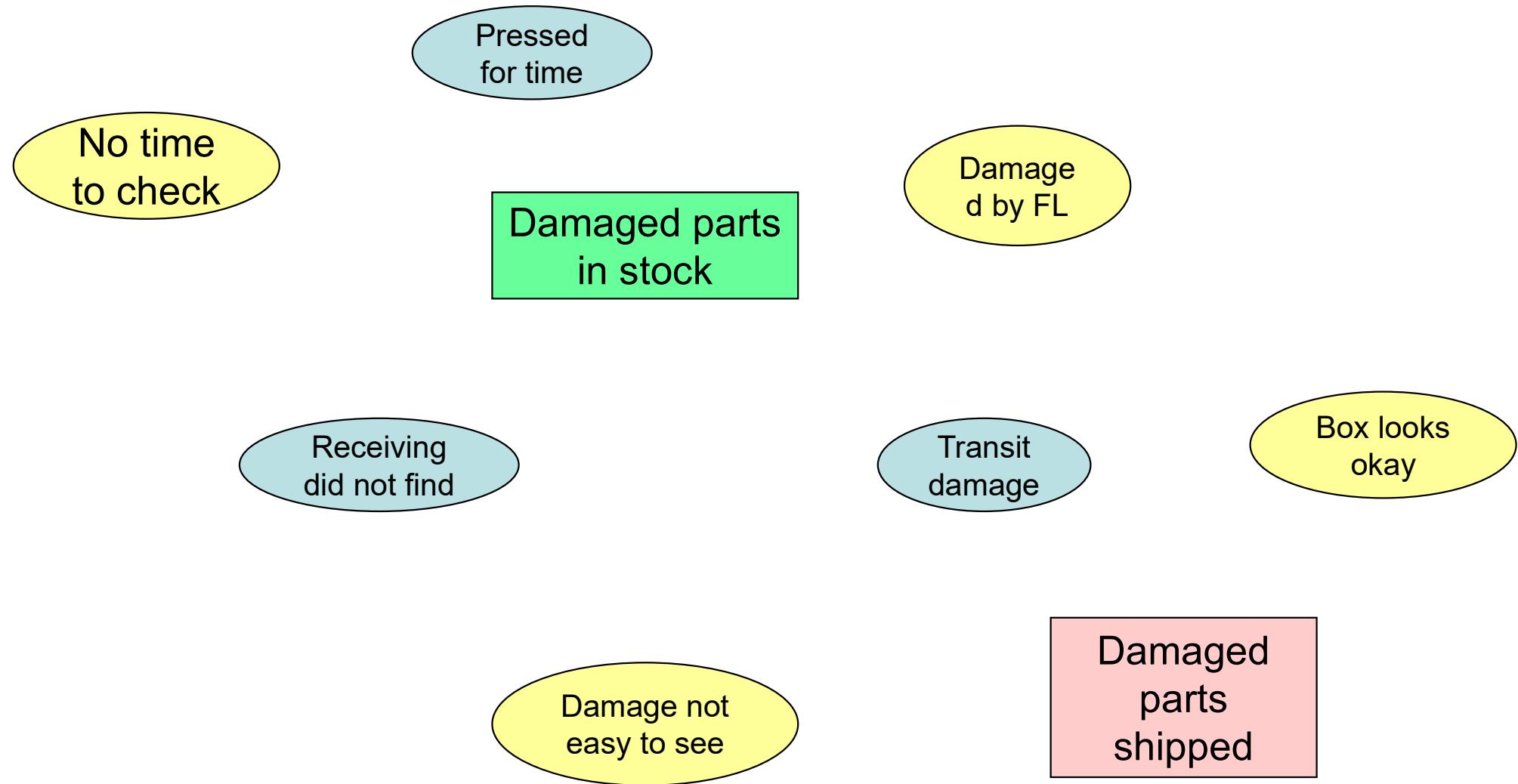
Start by simply noting them down – don't do any linking yet.

Association or Relation Diagram

Draw arrows to show how the factors create the problem.

Pressed for time

No time to check

Damaged parts in stock

Damaged by FL

Receiving did not find

Transit damage

Box looks okay but parts not

Damage not easy to see

Damaged parts shipped
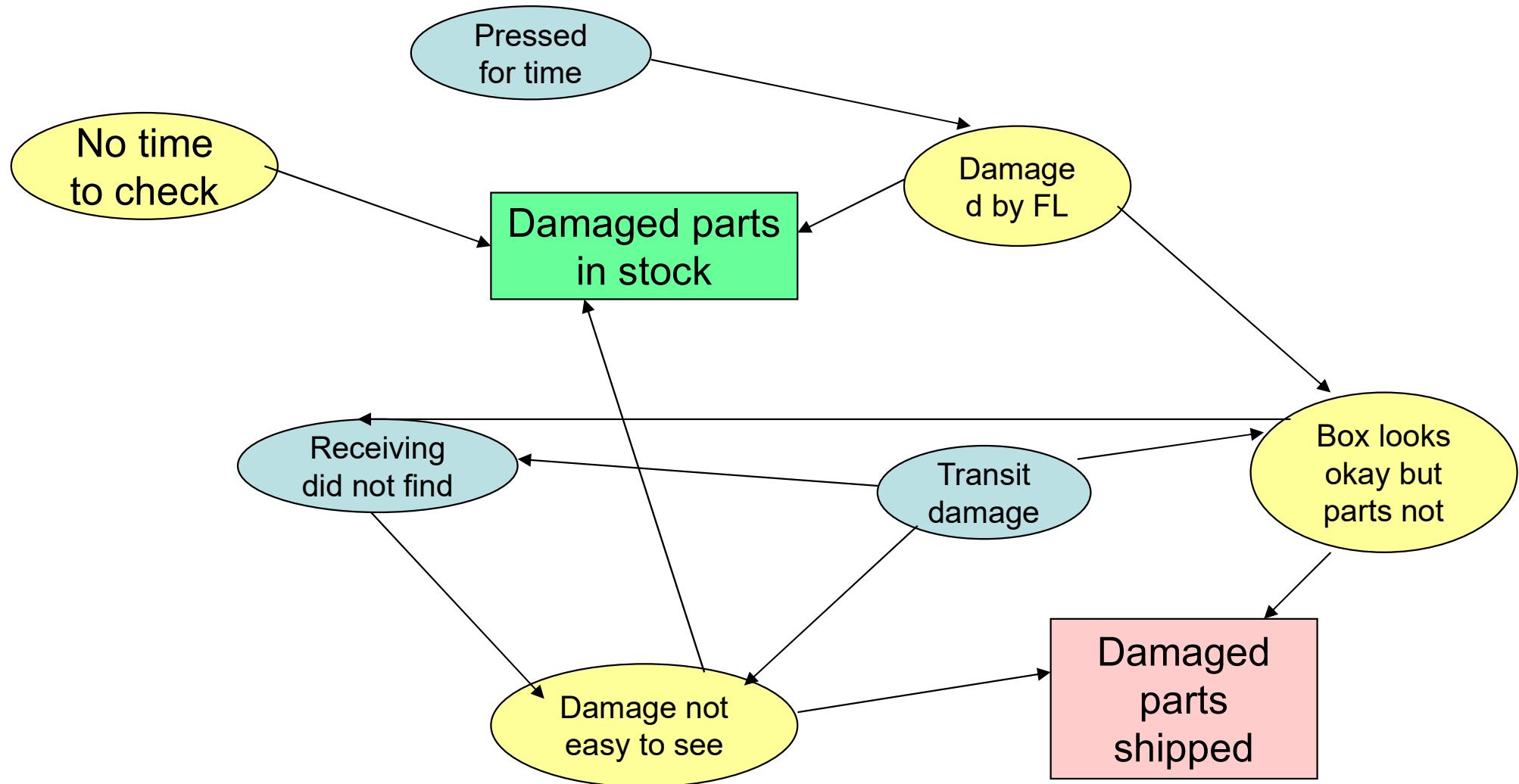
Link each factor to another or a problem – however you see fit.

What is a Systematic Diagram?

A Systematic diagram looks at how a problem can be solved. It helps determine the steps to take to countermeasure a problem working backwards from the problem to the first step in countermeasuring it.
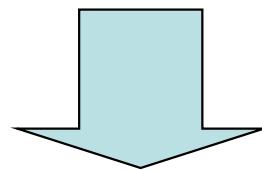
Determine concrete measures to solve problems

Systemic Diagrams

STEP #1 – Determine the problem you wish to solve

STEP #2 – Determine the first countermeasure

STEP #3 – Develop second and third countermeasures (stop developing when you have reached the final "how?")

STEP #4 – Walk through the steps from problem to final countermeasure to ensure it makes sense.

From left to right (Are the countermeasures effective to achieve the goal?)
From the opposite direction (Can the goal be achieved by implementing These countermeasures?)

STEP #5 – Complete the systematic diagram

Systemic Diagrams

Concept of Diagram:
Similar to a Tree Diagram

How? | How?

How?

Damages

How?

Misshipments

How?

How?

How?
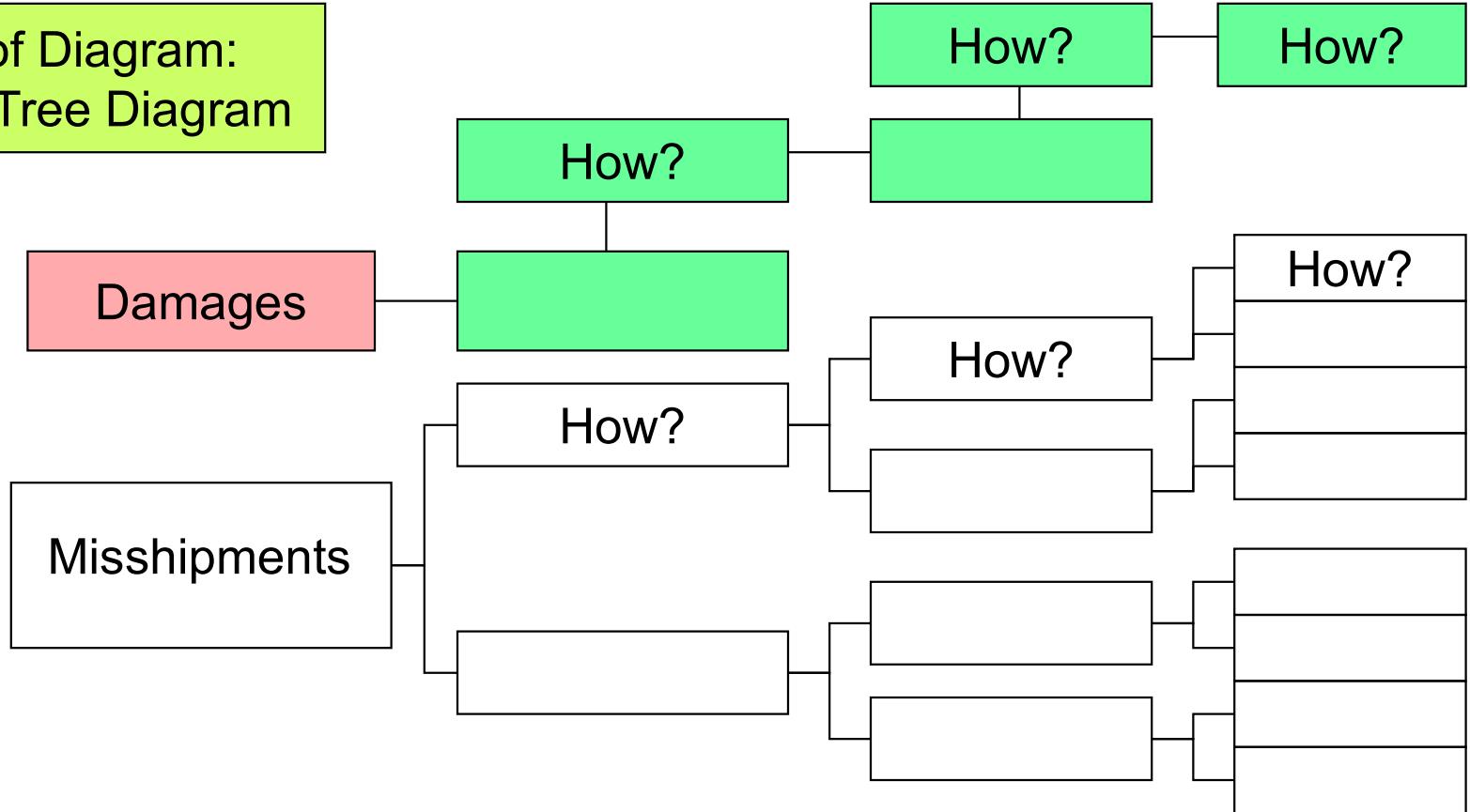
Place the problems you wish to solve on the left side of the diagram. As you move right you fill in the tasks required to solve the problem. Keep asking "How?" until you are at the first step in fixing the problem. (This is similar to a why why but with different intent– fixing problem vs. identifying root cause.)

Systemic Diagrams

Concept of Diagram:
Similar to a Tree Diagram

HOW?

HOW?

HOW?

Update SPOS

Change request

Train

HOW?

Remove forklift damages

Release SPOS

Find a programmer

Damages

Re-program AS 400

Find suppliers

Misshipments

Update Scanning programs

Buy better scanners

QCDMSE
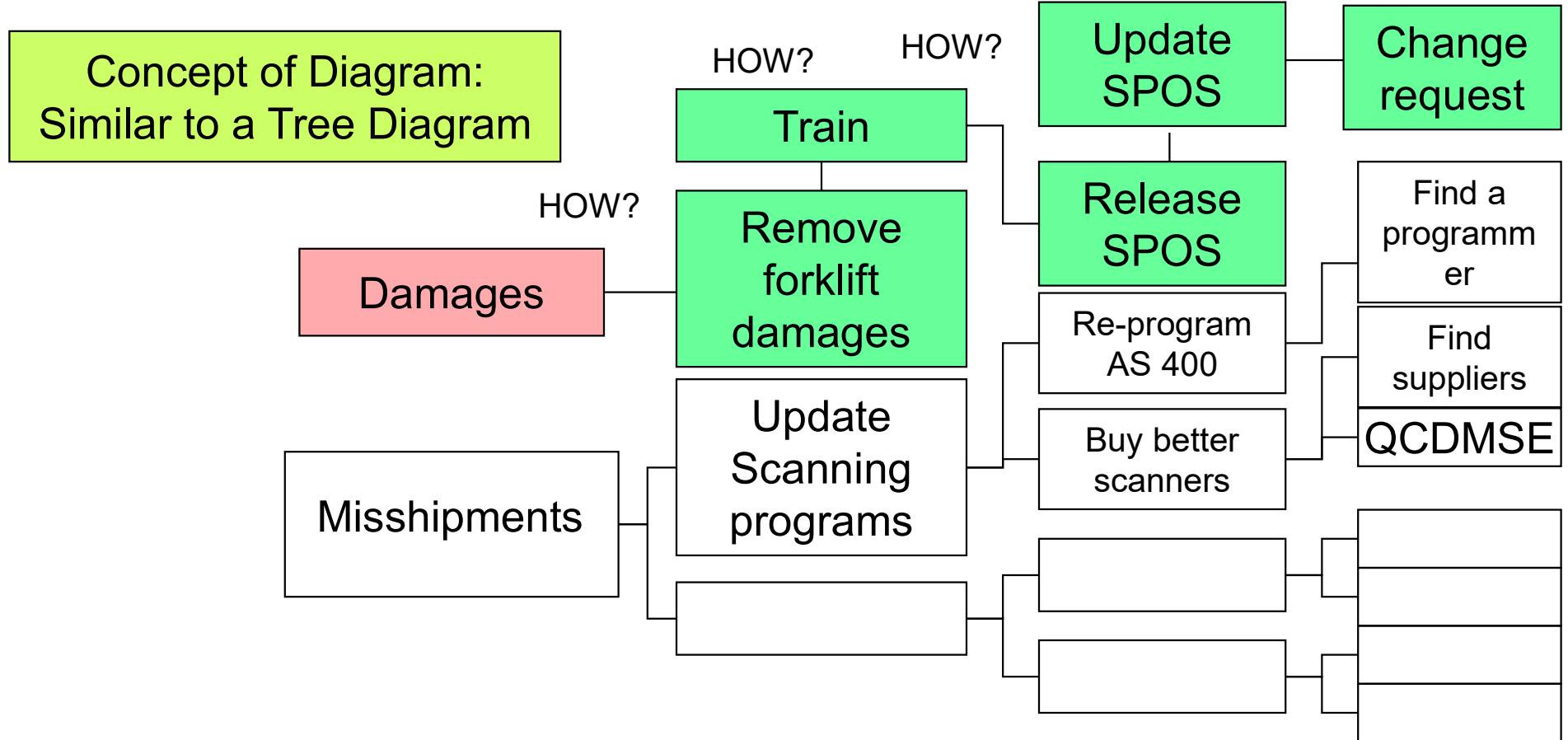
From here you can then put the tasks into a timeline or Gantt chart to track their completion.

What is a Matrix Diagram?
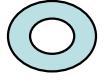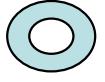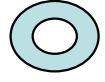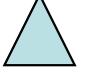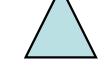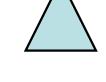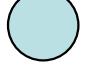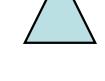
A Matrix = Rows vs Columns

Arrange factors in rows and columns. Then combine factors at intersecting points and look at whether or not there is any relationship.
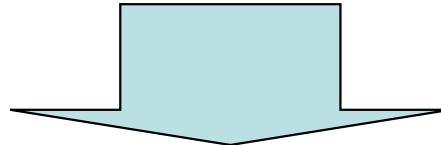
Ask: Do these two items have a relationship? If so, rate it as strong or weak.

Matrix Diagrams

Rank/order	Match-Up	Barrie	Alliston	Beeton	Tottenham	Everett
1	Barrie Bobcats	🙂	◎	◎	X	◎
2	Alliston Lions	△	🙂	◎	●	X
3	Beeton Bears	●	△	🙂	△	◎
4	Tottenham Tigers	X	△	X	🙂	X
5	Everett Egrets	X	●	△	●	🙂

◎ 4 and over More wins than losses

● 3 – 0 More wins than losses

△ 1 – 3 Losing record

X 4 and over Losing record

🙂 Same team…..

Matrix Diagrams

A B	B1	B2	B3	B4	B5	TT
A1		◯				1
A2		◯		◯	◯	3
A3				◯		1
A4	◯	◯	◯		◯	4
A5		◯				1
TT	1	4	1	2	2	

Lots of highly related items

A B	B1	B2	B3	B4	B5	TT
A1		△				1
A2		◎		◎	◎	15
A3				△		1
A4	◎	◯	△		△	10
A5						1
TT	5	10	1	6	6	

Most are only minor relationships….

There are many relevant intersecting Points.

There is a degree of relevancy.

Other Methods

Task	Duration	Start	MONTH: End	April 1	2	3	4	1	2	3	4	1	2	3	4
Team selection	15	4/5/2005	04/20/05	■		■									
Theme Selection	20	4/20/2005	05/10/05			■			■						
			01/00/00												
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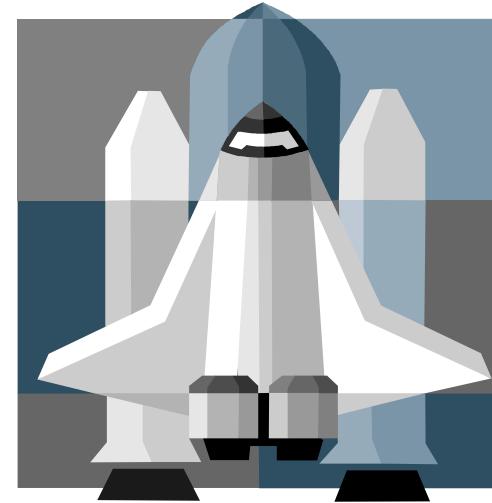
An arrow diagram is a form of a timeline. You list the tasks you want to complete on the left, and dates on the top. Then draw arrows noting start and finish dates for each task. (Similar to a Gantt Chart)

Other methods

PDPC Method

Process Decision Program Chart:

These are used to examine the different possible countermeasure plans or processes to determine the most effective / efficient method.

Basically, it shows all variations of the process or plan to give you a better idea of which to choose.
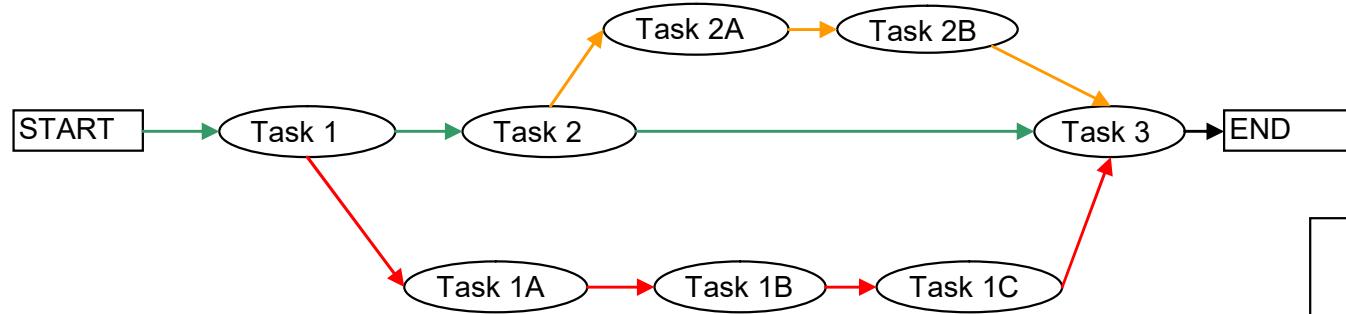
Red: Least efficient
Orange: Okay
Green: Most efficient

Other Methods

Matrix Data Analysis

This is very similar to the normal matrix diagram, except that weighted relevance values for each convergence are calculated vs. symbol for strong or weak relationship. (Can be either a fraction or decimal number.)

Damage Type vs. Importance of Where discovered

What part		Receiving	Assembly	Final Check	Shipping
		0.5	0.25	0.75	0.5
Rim damage	0.5	0.25	0.125	0.375	0.25
Tire damage	0.25	0.125	0.0625	0.1875	0.125
Valve damage	0.75	0.375	0.1875	0.5625	0.375
Assembly damage	1	0.5	0.25	0.75	0.5