

An Introduction to Problem Solving

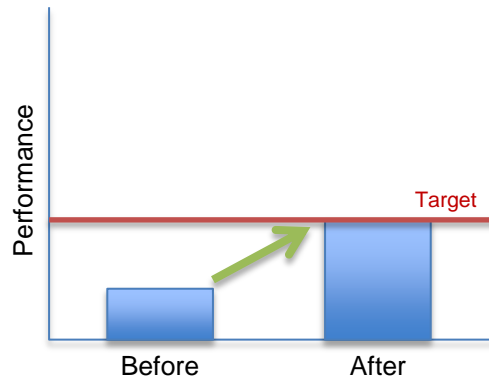
A structured approach to
problem solving & improvement

Problem solving

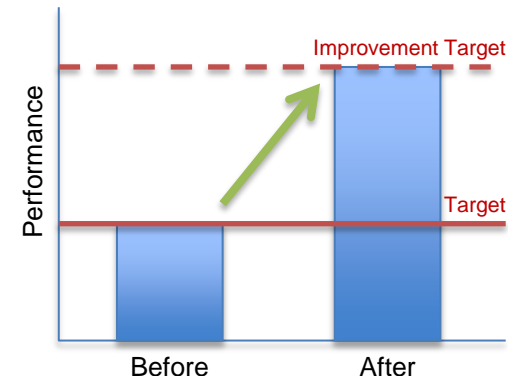
Not just for problems...



Problem Solving



Improvement Project



- The **processes** for problem solving & an improvement project are the **same**
 - The only difference is the current performance:

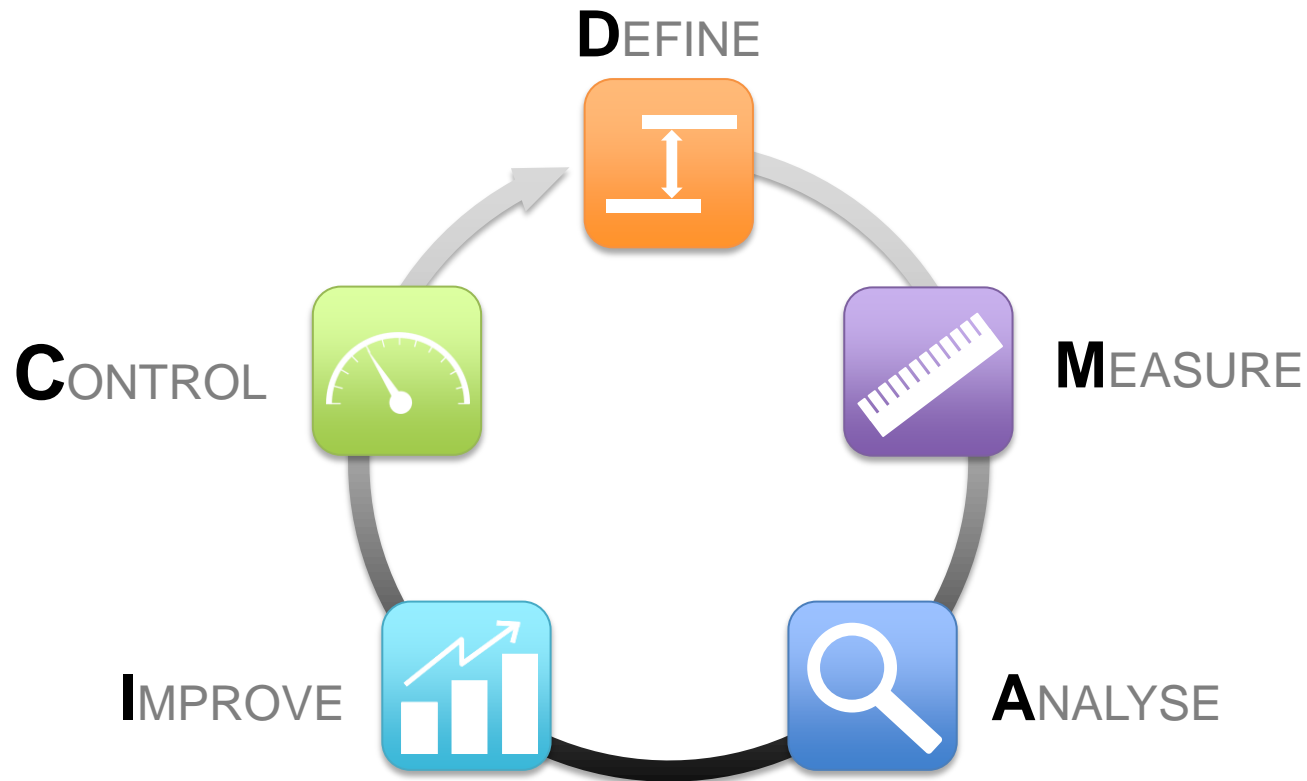
Problem Solving:	Current performance is not achieving current expectation
Improvement Project:	Current performance meets current expectation

Why structured problem solving?

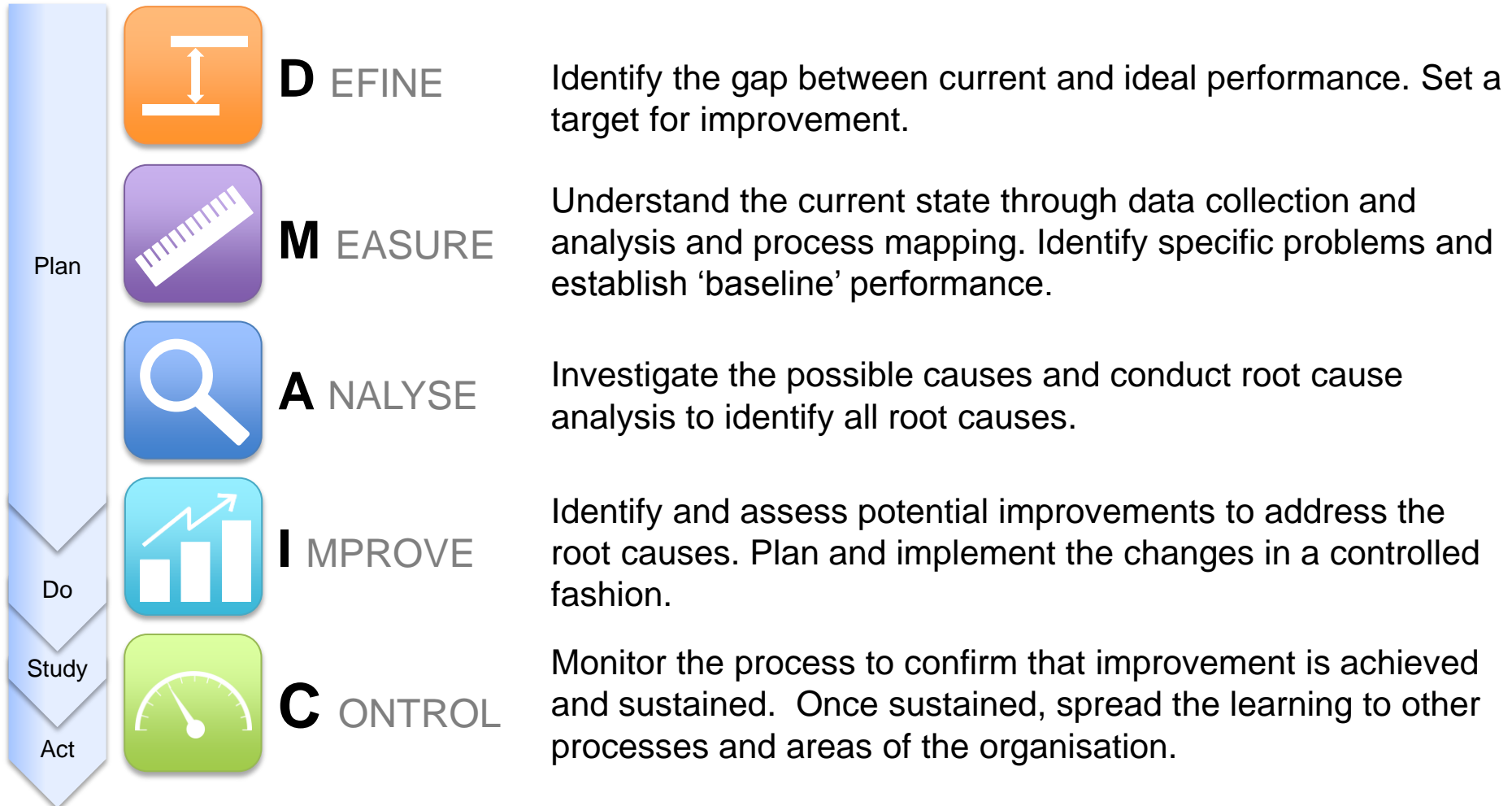


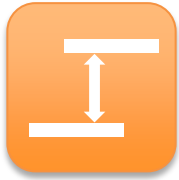
- To manage human instinct
 - Generally, people are inclined to fix problems
 - 'Fixing' without first understanding often leads to wasted effort & frustration
- To facilitate collaboration
 - A structured framework makes problem solving predictable
 - Staff can engage and collaborate because they know what to expect from the process
- To build individual and organisational capability
 - A structured approach allows individuals to learn quickly
 - Organisational improvement capability relies on individual problem solving capability
- To make problem solving more successful
 - Put simply, a structured approach to problem solving is far more effective than an ad-hoc approach

Key steps of problem solving



Key steps of problem solving

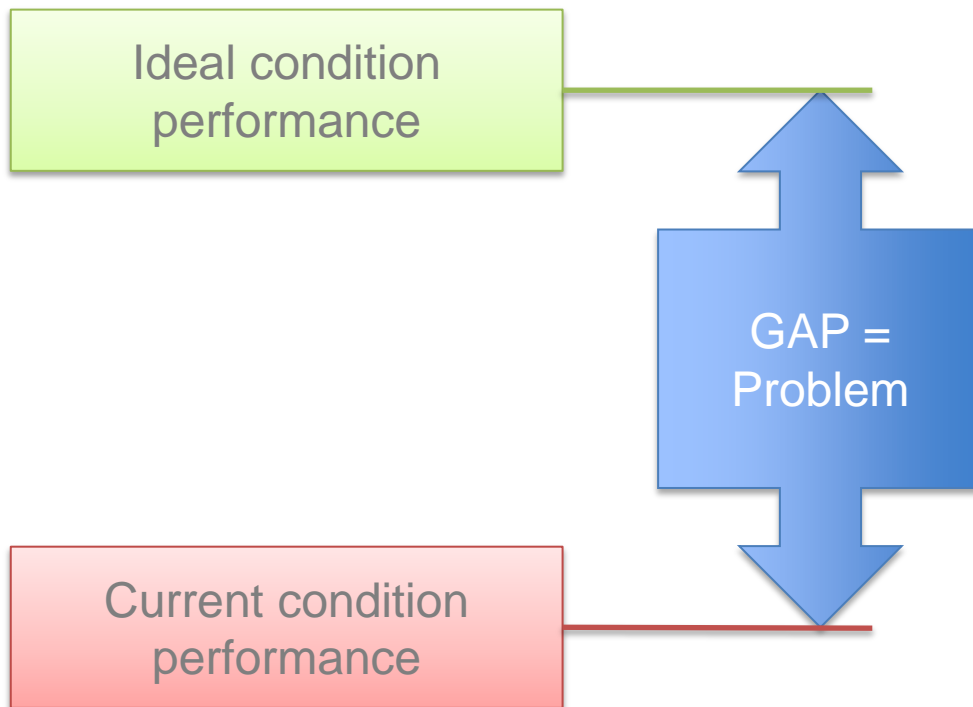




Define

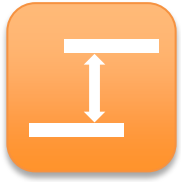


The definition of a problem is a gap between the current and the ideal conditions.



- The ideal condition should be aligned with organisational policy and direction
- The gap (problem) should be quantifiable

Note, while not ideal, in the initial absence of data required to quantify a problem, the process can proceed to the **Measure** phase where the appropriate data can be collected.



Define



- At this stage, a **target** for the project should be set.
- The target will **not** always be to **eliminate** the **GAP** – often the gap will be too big to achieve with one project
- The target should be **SMART**:

Specific

The scope should be clear

Measurable

The target should be objectively measurable

Appropriate

The ideal condition should be aligned to organisation direction

Realistic

The scope and target are realistic given the resource, time & authority available

Timebounded

Time for successful achievement is clear



Measure



There are two goals to the measure phase:

1. Understand the current process and performance
 - Establish a depth of knowledge of the process
 - Identify specific areas & problems for improvement focus

2. Establish 'baseline' performance with reliable data
 - Collect data to ensure that the impact of the future changes can be objectively assessed



Measure



4Ws & 1H of the **problem**:





WHAT?	<p>What specific problems are occurring?</p> <p>E.g. The main problem may be errors on paperwork. To understand what, you should understand what type of errors (spelling mistake, missing info, wrong info, etc.)</p>
WHEN?	<p>When do the problems occur (& when don't they occur)?</p> <p>E.g. The main problem may be errors on paperwork. To understand when, you should understand when they occur (days of the week, weeks of the month, are there any patterns, etc.)</p>
WHERE?	<p>Where are the problems originating or identified?</p> <p>E.g. The main problem may be errors on paperwork. To understand where, you should understand where they originate or are found (specific steps in a process, specific part of the building, etc.)</p>
WHO?	<p>Who is involved with the problems (& who is not)?</p> <p>E.g. The main problem may be errors on paperwork. To understand who, you should understand who is involved when the problems occur (specific departments, new/ old staff, etc.)</p>
HOW MUCH?	<p>Understand, in a quantifiable manner, how much the problem is affecting the organisation & it's customers</p>



Measure



TOOLBOX

-  Process Mapping
-  Check sheet
-  Pareto Analysis
-  Scatter diagram

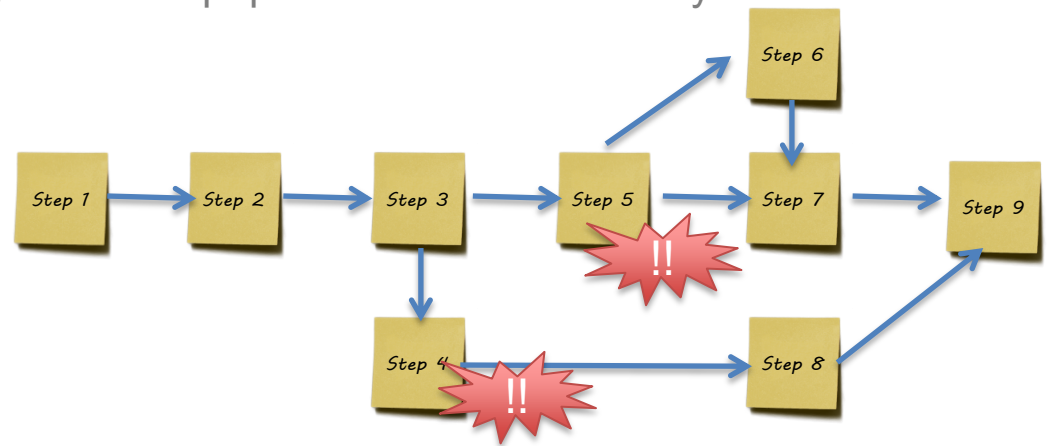


Measure



Process Mapping

- A process that is not understood cannot be improved
 - Understand process inputs and outputs
 - Understand process relationships, dependencies & bottlenecks
 - Identify what data is required to understand the process properly
- A process map is a step by step visualisation of the process
- Capture what actually happens - not what is supposed to happen!
- Keep it simple – post-it notes, butcher's paper & white boards are your friend!





Measure



Check Sheet

- Often the required data to properly understand the process will not be immediately available
- When sufficient data is not available it must be collected
- Checksheets are a quick and easy way to collect data

Type of Defect		Count		Score
Dirty				12
				42
				15
				30
				10
				8
				18
				24
				22
				181

Project: Admissions Process Redesign									
Location: ABC Hospital		Date: mm/dd/yyyy							
Name: Andy Kallengrude		Time							
		6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30
People in Line	25								
	20								
	15								
	10								
	5								
	0								
Total		8	7	23	29	20	22	6	5

- Design the Check sheet with the user in mind
- Collect as much detail as practically possible (4Ws, 1H)
- Respect those you are asking to collect the data – involve them and clearly explain the purpose



Measure

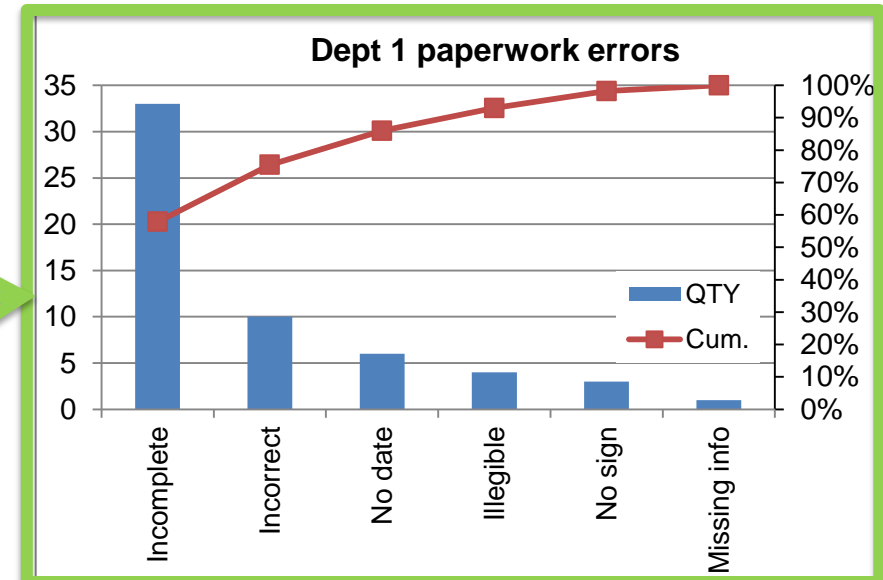
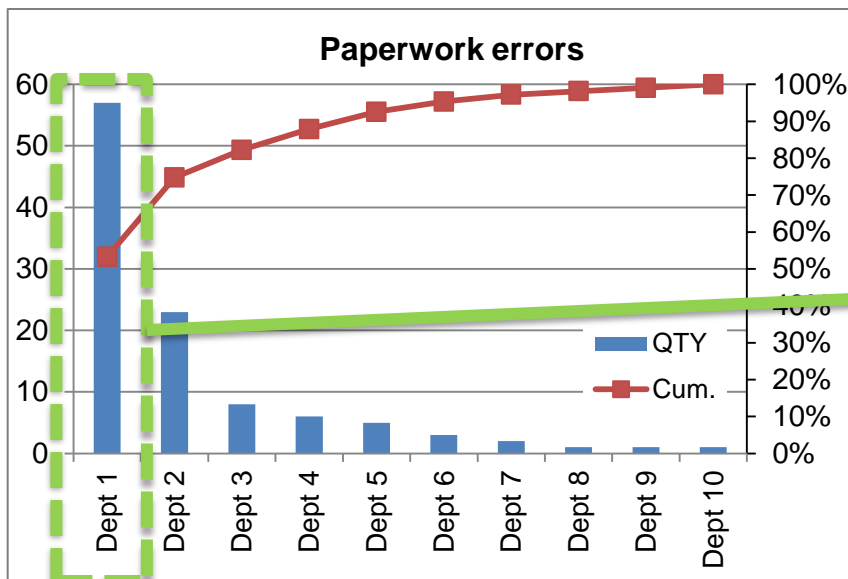


Pareto Analysis

- Commonly known as the 80:20 rule

80% of problems can be attributed to 20% of causes

- Pareto charts can help stratify data and focus efforts where the most problems are





Measure

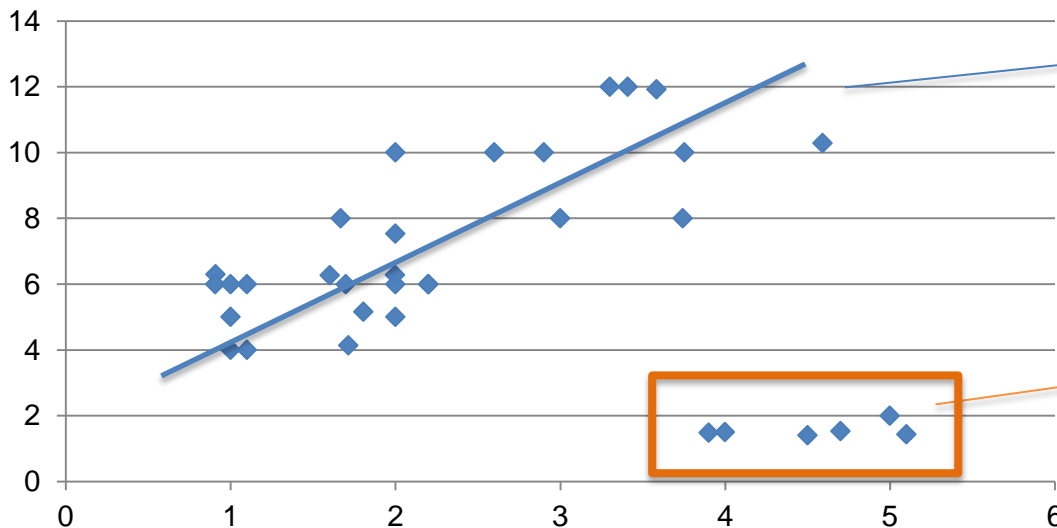


Scatter Diagram

- Scatter diagrams are used to identify relationships/ correlations

Note: Correlation does not infer causation

- Understanding relationships can help better understand the current state and identify abnormal conditions



Observed relationship

Abnormal cohort



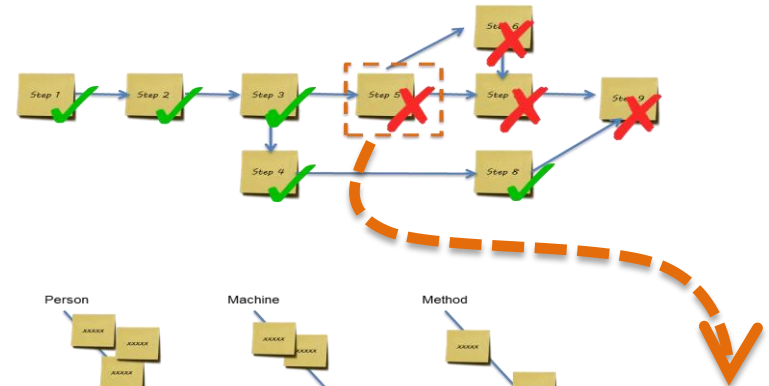
Analyse



The Analyse phase is a structured approach focussed on identifying the **Root Causes** of the problem

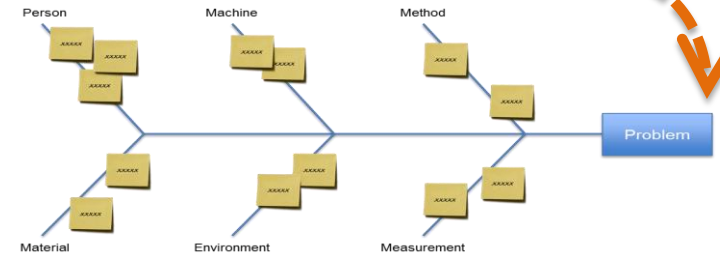
1. Point of Cause

WHERE?



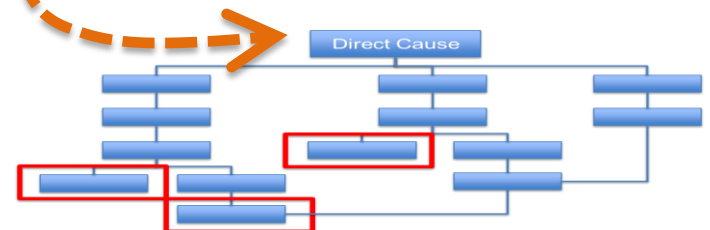
2. Direct Causes

WHAT?



3. Root Causes

WHY?








Analyse



TOOLBOX

-  Process Mapping – Point of Cause analysis
-  Fish bone diagram (Ishikawa diagram) – Possible causes
-  5-Why analysis – Root cause analysis

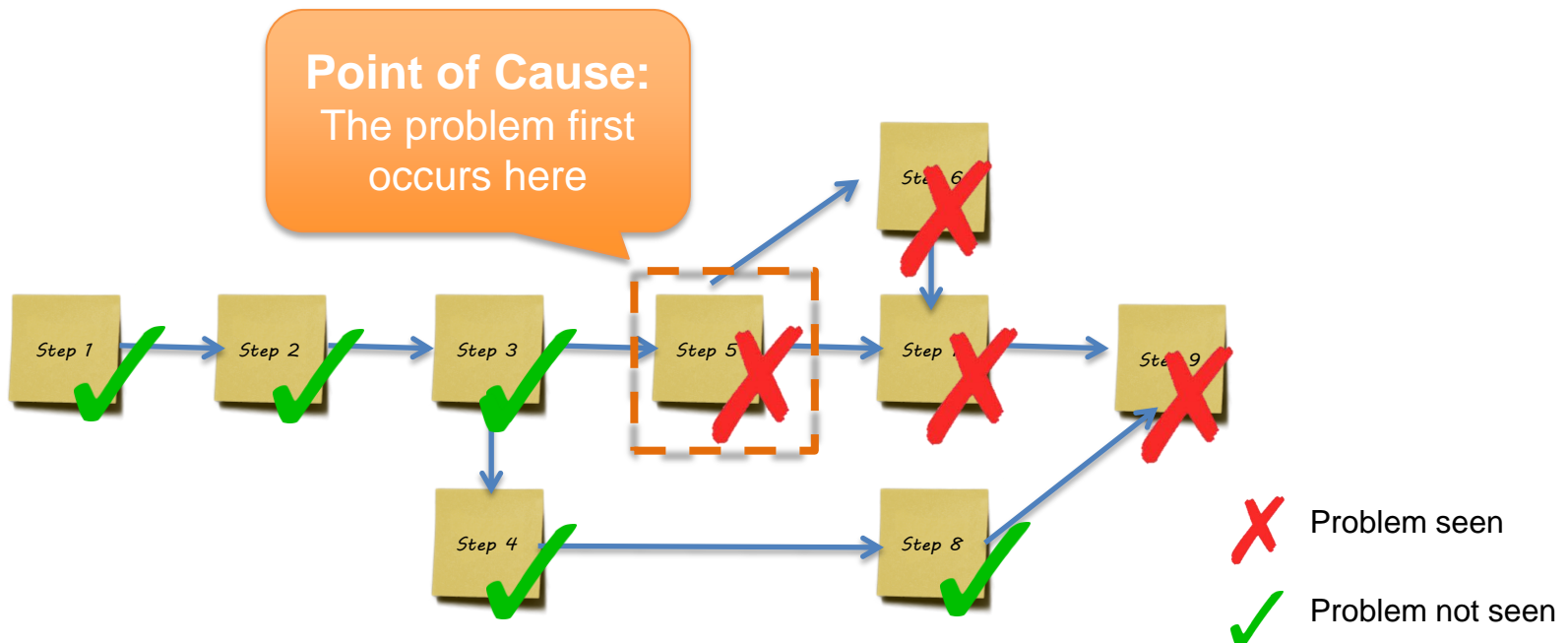


Analyse



Point of Cause

- The point of cause is where the problem is occurring
- If the Measure phase is completed correctly, this will be a simple task
- Use the process map and the collected data to isolate the problem





Analyse



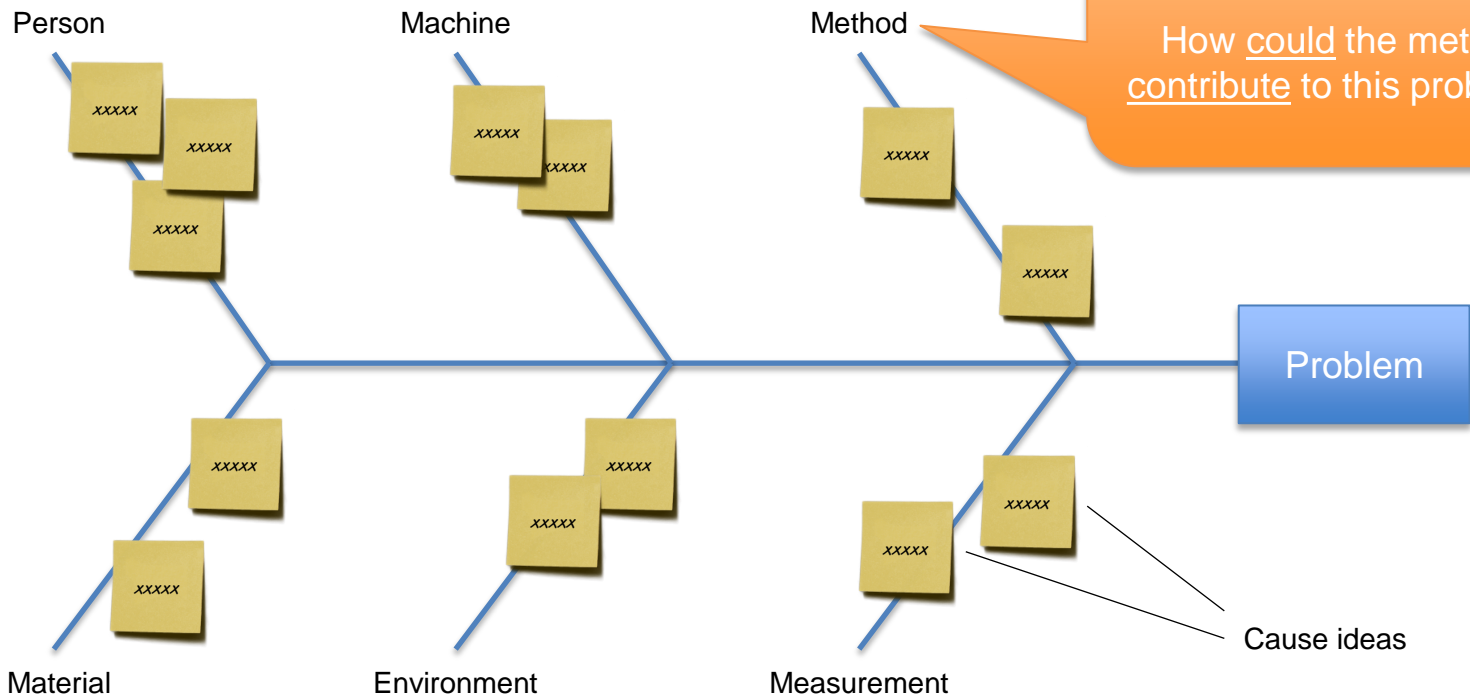
Cause & Effect

- Identifying all possible causes should be done as an open brainstorming session
- Unusual cause ideas should be welcomed
- Discussion, interaction and idea building should be encouraged
- Use a 'Fish-bone' diagram to frame the thinking



Analyse

Fish-bone diagram



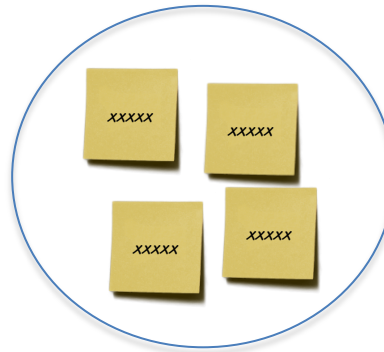
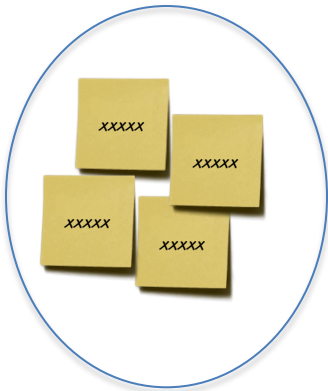


Analyse



Fish-bone diagram

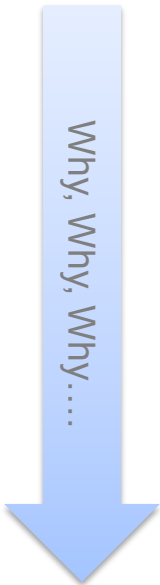
- Once the brainstorming is complete, group the ideas into common themes/ ideas
- Confirm or eliminate cause ideas using data and process observation



- The confirmed causes are called **Direct Causes**



- Once the **Direct Causes** are identified, its time to investigate the root cause
- Root cause analysis is conducted using **5-why analysis**





Analyse



When to stop asking “why?”

- It won't always take **5** 'whys' to reach the root cause
- Stop asking why if...
 - The causes start becoming more vague (rather than more specific)
 - The causes are outside of the scope of the project
 - The causes become a matter of individual personality

Common mis-conceptions

- X** 5-why analysis is linear (once answer to every why)
 - 5-why analysis is messy and branches out
 - Just answer the question “why?” - don't worry about what it looks like
- X** There is only 1 root cause to any problem
 - Most problems cannot be effectively eliminated by addressing only 1 root cause



Improve

The Improve phase involves identification, development and implementation of improvement actions for each root cause.

- 1. Identify possible improvements**
- 2. Assess potential improvements**
- 3. Implement agreed improvements**



Improve



TOOLBOX



How-How Diagram



Decision Matrix



Improve



Solution Development

- Multiple solutions for each Root Cause should be identified
- Solutions should be developed primarily by the staff from the area that will be affected
- For complex solutions, a **How-How Diagram** can help simplify and guide a team's thinking process



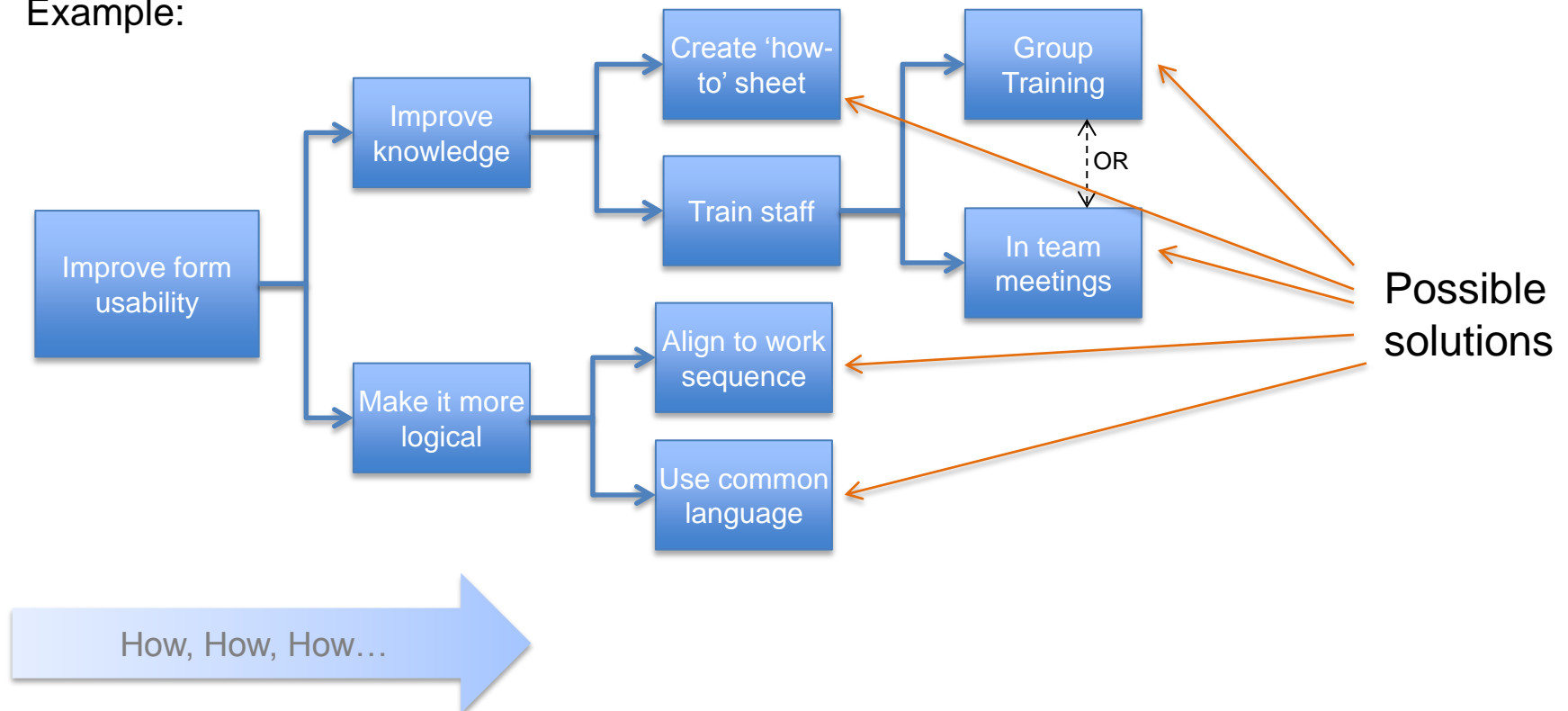
Improve



How-How Diagram

- By repeatedly asking “How?” you can explore the possible solutions

Example:





Improve



Assessing possible solutions

- Not all proposed solutions should be implemented
- Solutions should be assessed for effectiveness and cost

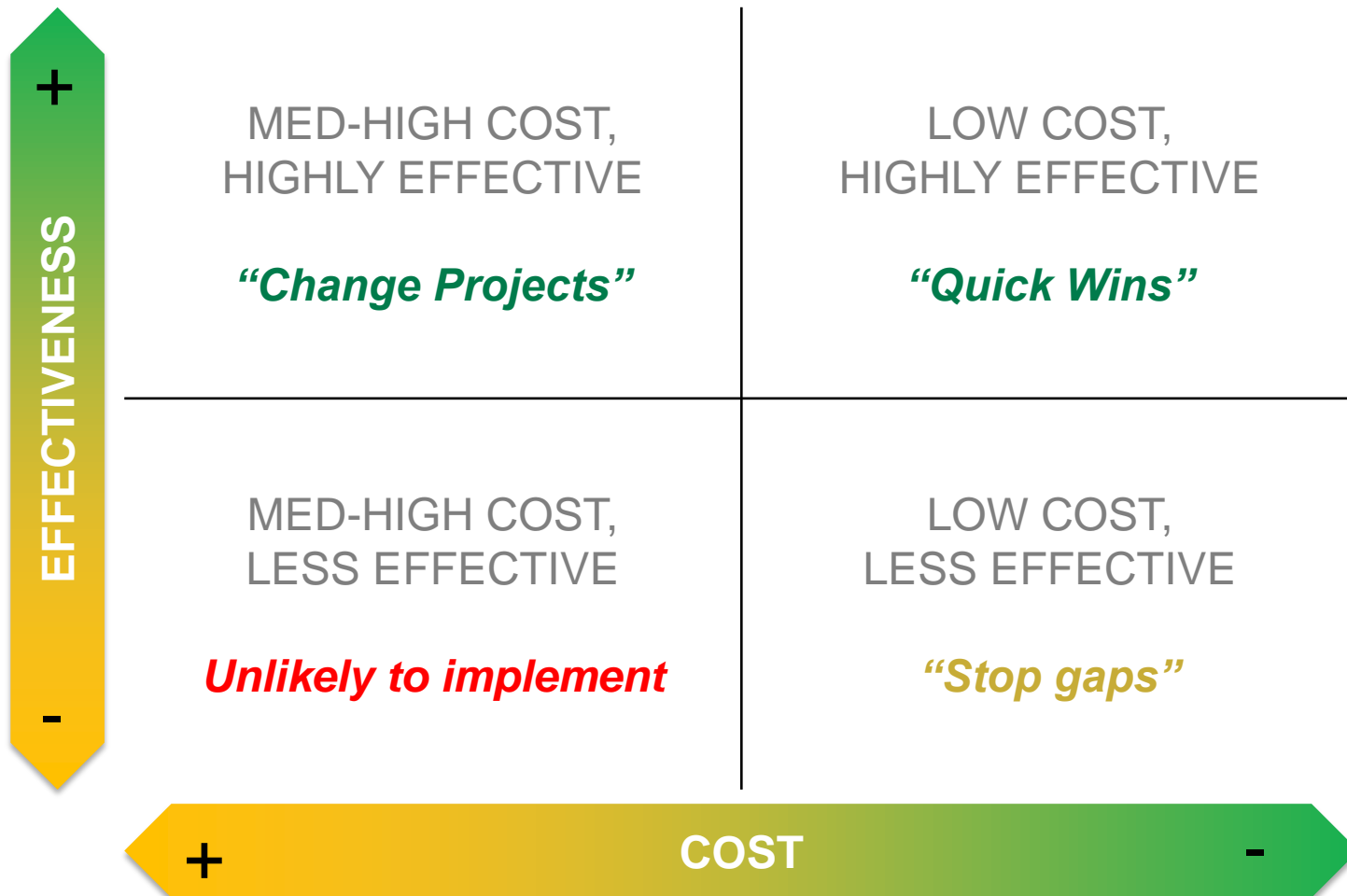
Effectiveness	Cost
Efficacy (assuming 100% adherence)	Efforts & cost to implement
Ability for solution to be sustained	Training costs
Suitability for all scenarios	Effort & cost to maintain



Improve



Decision Matrix





Improve



Solution Implementation

- Once solutions and improvements have been agreed and appropriately approved, they must be implemented in a controlled way
- The implementation process will vary for each change but should consider:
 - Implementation sequence & schedule
 - Communication of changes
 - Training (directly affected staff and potentially up and down stream stakeholders)
 - Update of standards (forms, training material, policies, etc.)



Control



The Control phase ensures that improvements are achieved, sustained and that the lesson's learnt are shared.

- 1. Monitor performance of the process**
- 2. Share the improvement and lesson's learnt**



Control



TOOLBOX

 Statistical Process Control (SPC) tools

 Run Chart

 Control Chart

 A3 reporting



Control



Statistical Process Control (SPC)

- SPC is an approach to performance monitoring that primarily uses data
- Some level of SPC should be conducted during and after the implementation of change in a process
- SPC will allow you to:
 - Monitor the effectiveness of the changes
 - Objectively measure success
 - Monitor performance to ensure there are no unintended consequences to the changes (e.g. quality, leadtime, etc.)



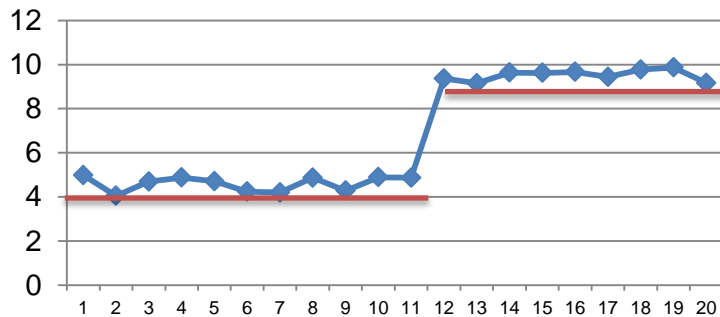
Control



Statistical Process Control (SPC)

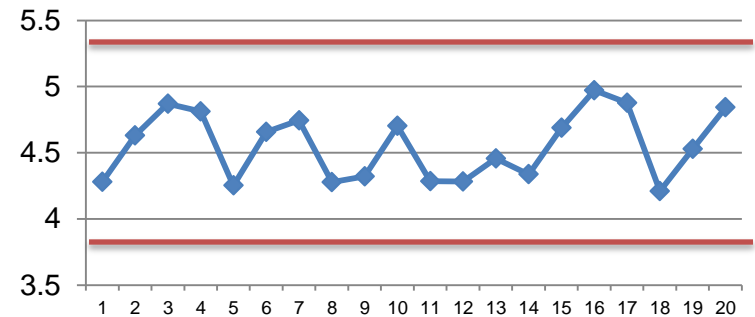
- There are many SPC tools but the basic tools that will be used most often are:

1. Run Charts



- Monitor change over time
- Used to monitor the impact of discrete changes (assuming different implementation timing)

2. Control Charts



- As the name suggests, used to ensure the process is 'in control'
- Often used to monitor peripheral processes to ensure no detrimental impact after change
- Can be used to monitor variation reduction projects



Control



Statistical Process Control (SPC)

- The cadence of review should reflect the importance and volatility of the data being measured
- High frequency of checking early until actions are proven
- Not all actions will work first time – be prepared to check and adjust



Control



Sharing the learning

- The process of successfully addressing a problem or implementing an improvement is something that should be celebrated, shared and spread.
- Problems and solutions are rarely unique to individual departments, units, wards, etc.
- **A3 reporting** provides a vehicle for sharing success



Control



A3 reporting

- The purpose of an A3 report is to **tell a story** that is easy to understand

EXAMPLE		Author/ sign off
1. DEFINE: Initial Problem	4. ANALYSE: CAUSE & EFFECT	
2. MEASURE: Current Condition		
3. ANALYSE: Point of Cause	5. ANALYSE: ROOT CAUSE	
	6. IMPROVE: IMPROVEMENT ACTIONS	
	7. CONTROL: RESULTS	

- Space is limited – focus on what's important
- The amount of space should align with the length of time spent on each phase – typically most on MEASURE & ANALYSE
- Tell a story – anyone should be able to read and understand it



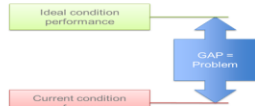
Control



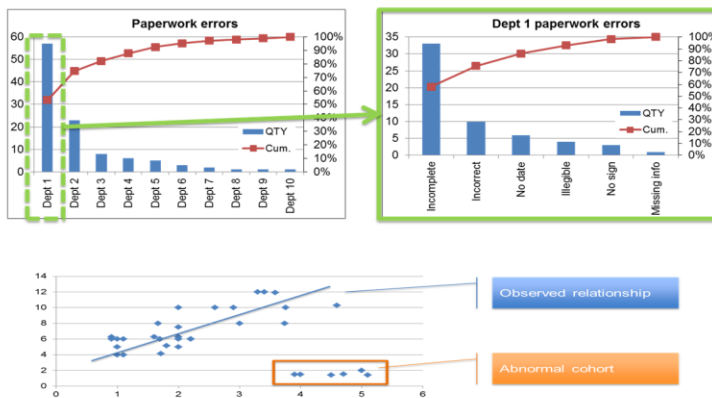
Author/ sign off

PROBLEM SOLVING REPORT

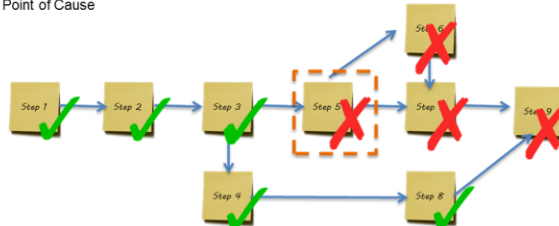
1. DEFINE: Initial Problem



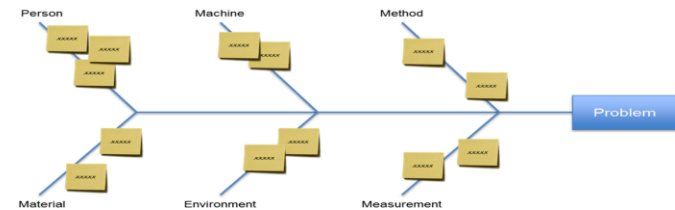
2. MEASURE: Current Condition



3. ANALYSE: Point of Cause



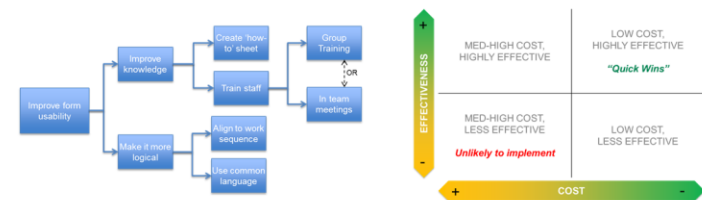
4. ANALYSE: CAUSE & EFFECT



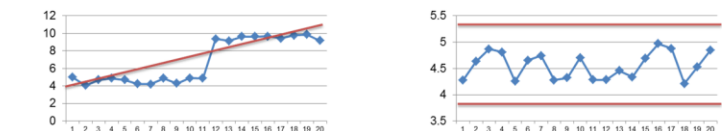
5. ANALYSE: ROOT CAUSE



6. IMPROVE: IMPROVEMENT ACTIONS



7. CONTROL: RESULTS





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