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What is a Root Cause ?

- Root causes are underlying causes.
- The more specific we can be about why an event occurred, the easier it is to arrive at recommendations that will prevent recurrence.
- The root cause is “the evil at the bottom” that sets in motion the entire cause-and-effect chain resulting in the problem(s)



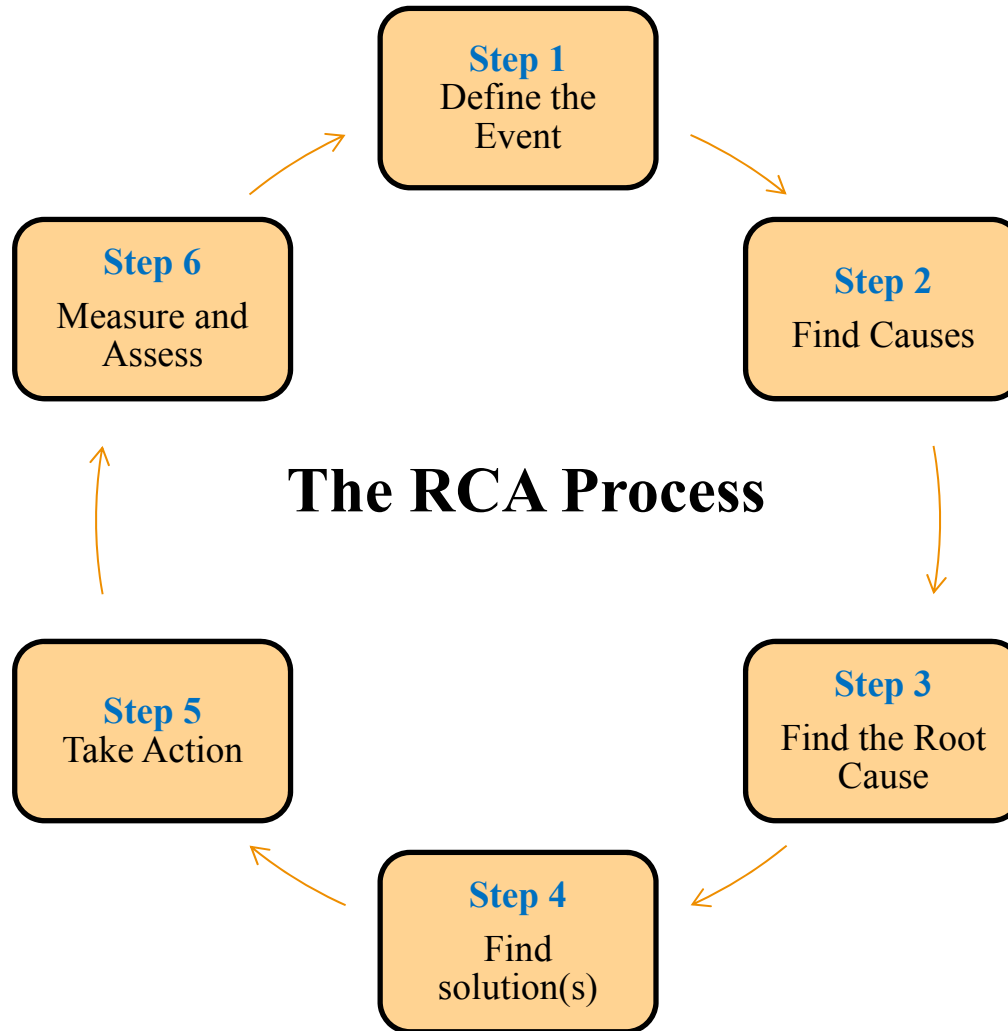
Practice of Root Cause Analysis (RCA)

- Perfunctory, tedious, form-driven, post-adverse event exercise performed to satisfy a bureaucratic requirement...

OR

- Motivating, fulfilling, creative exercise initiated because an astute and responsive employee discovered vulnerability in a practice and called together a team to change the process...





Step 1 – Define the event

- Problem definition / scope / starting point
 - What happened?
 - When did it happen?
 - Who was involved?
 - Has it happened before? If so, how often?
 - What were consequences?
- Identify the RCA Team
- Make sure that all members have the same understanding of the problem



Step 1 - Tools

- Interview
 - When you want to gather verbal information
 - Interview guide is helpful
- Survey
 - Can be useful when you want to structure input, gather information from a large or geographically dislocated group – such as users or customers, or when you want to allow anonymity.



Step 2 – Find Causes

- Identify all the potential causes that could have led to or contributed to the occurrence of the event.
- Make sure you have input from all stakeholders who might have knowledge about the event and its causes

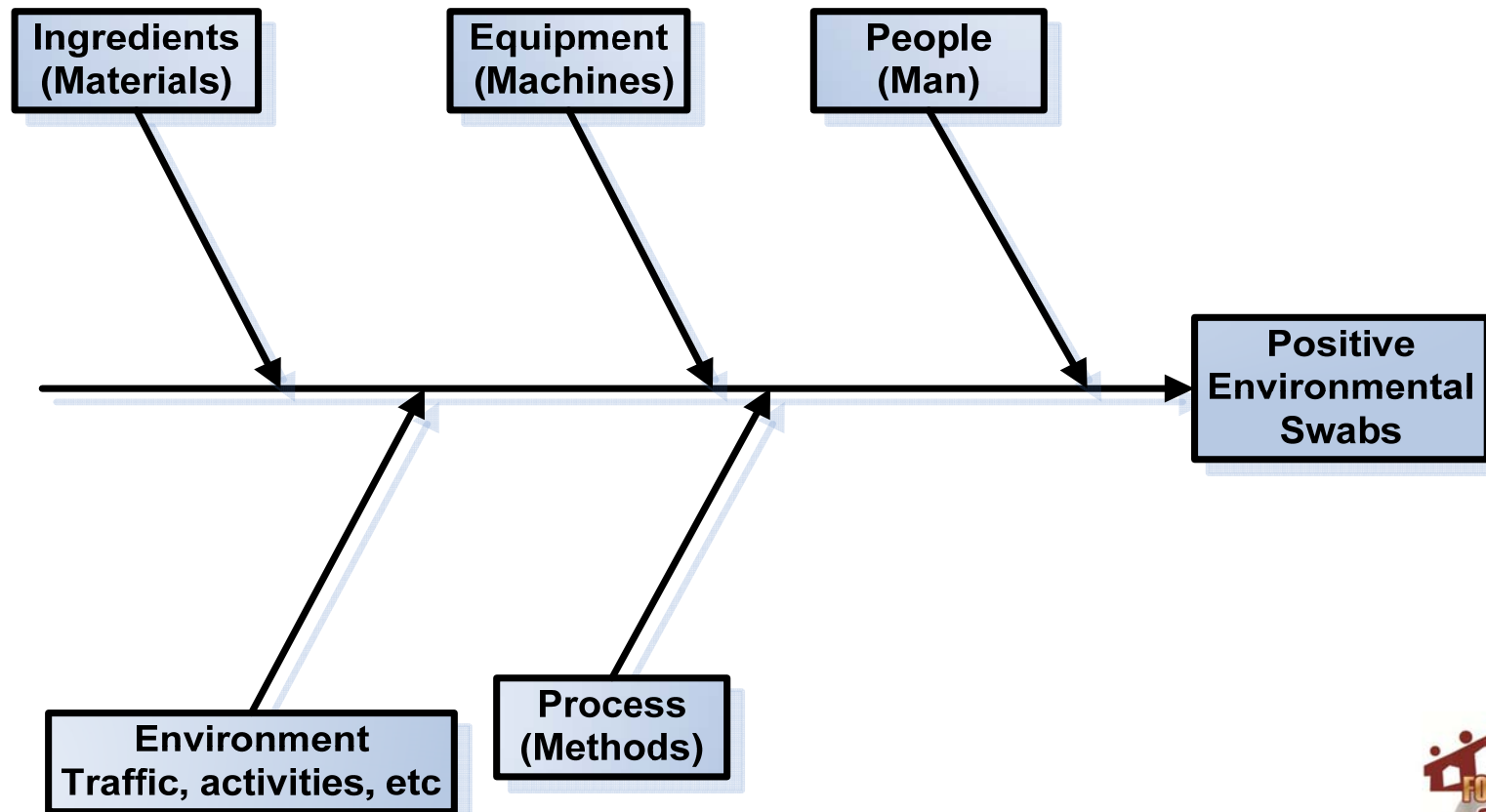


Step 2 - Tools

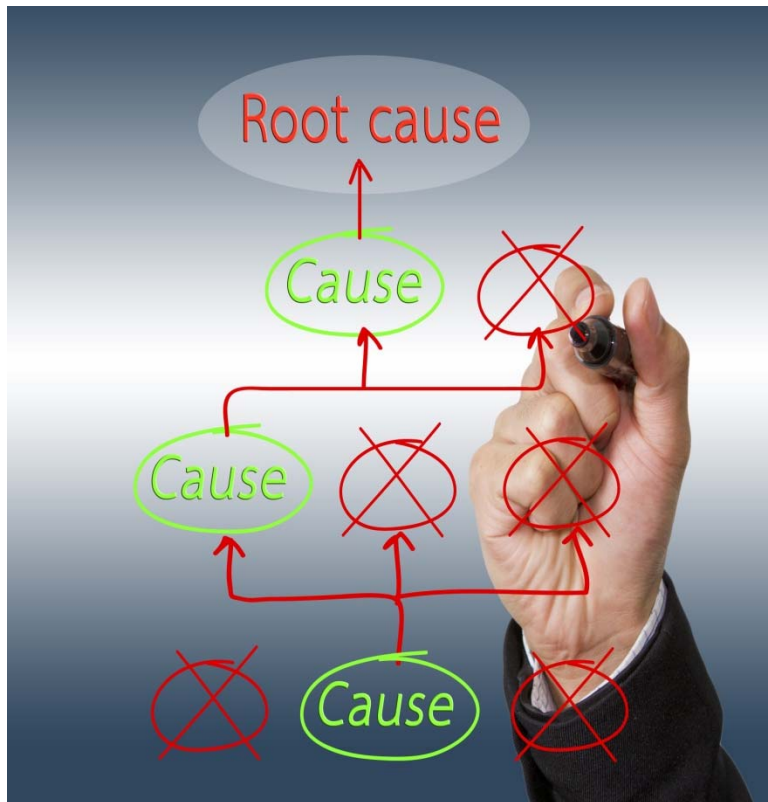
- Map the sequence of activities within which the event took place
- High-level mapping of the context of the event (what else was happening?)
- Brainstorm possible causes
- Use a fishbone (Ishikawa) diagram
- Often, some combination of tools is used



Example of Fishbone Diagram



Step 3 – Find the Root Cause



- Analyze the information gathered in previous step and pare down to actual root cause.
- Stay the course; take care not to declare success too early
- Drill down beyond individual blame and address the conditions that allowed the event to occur

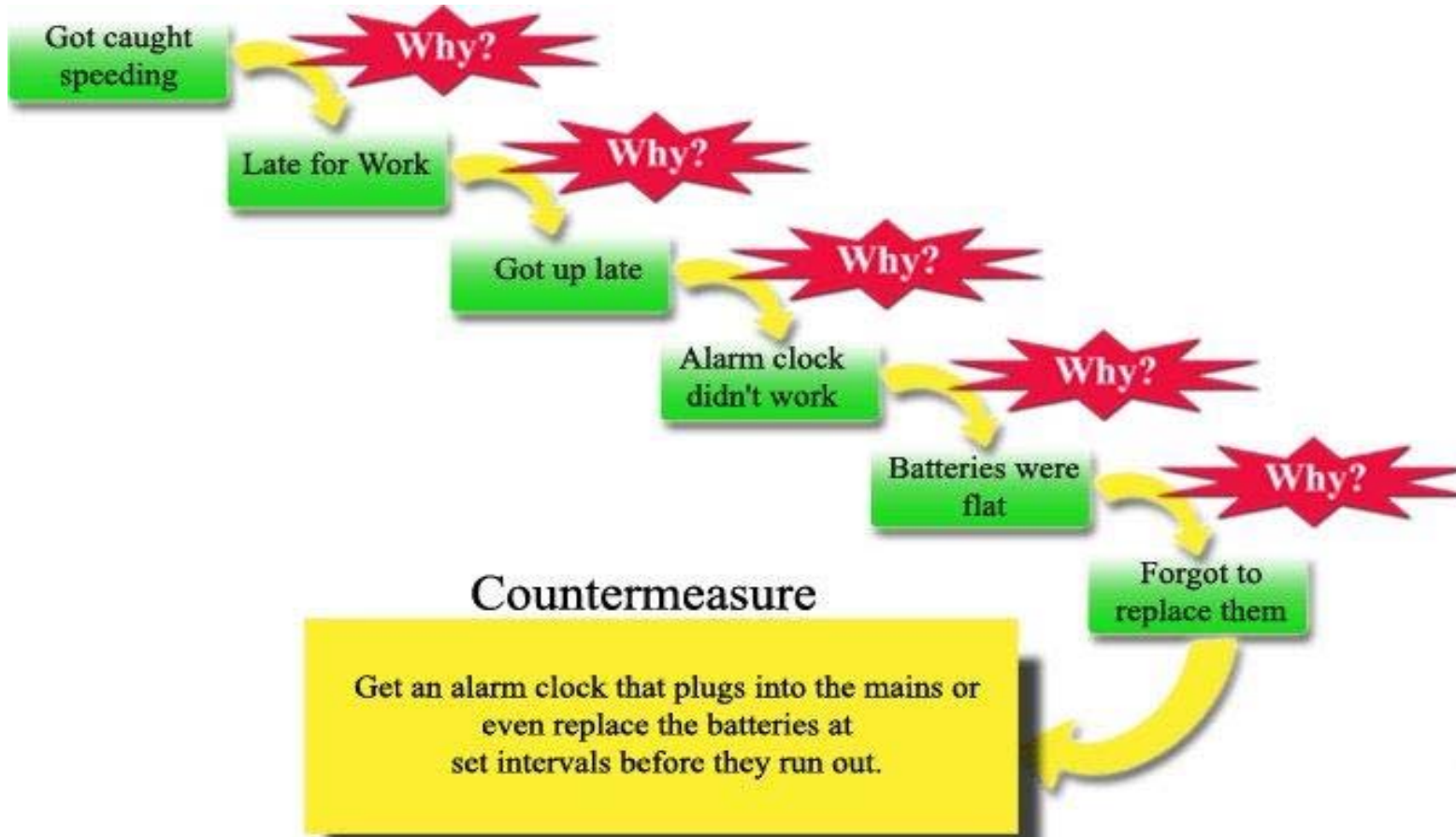


Fundamental Tools for Step 3

- 5 Why's
- Fault Trees
- Pareto Analysis
- Scatter Diagrams
- Histograms



5 Whys Example



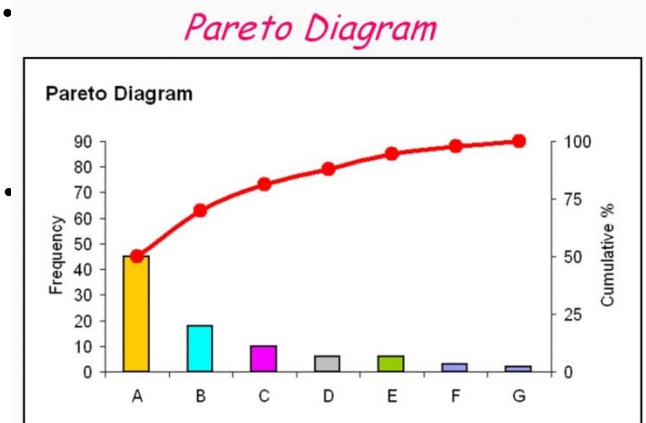
Fault Trees

- Widely used method in system reliability, maintainability and safety analysis
- The main purpose of the fault tree analysis is to help identify potential causes of system failures before the failures actually occur
- It can also be used to evaluate the probability of the top event using analytical or statistical methods



When to Use a Pareto Chart

- When analyzing data about the frequency of problems or causes in a process.
- When there are many problems or causes and you want to focus on the most significant.
- When analyzing broad causes by looking at their specific components.
- When communicating with others about your data.



Scatter Charts



- When trying to identify potential root causes of problems.
- After brainstorming causes and effects using a fishbone diagram, to determine objectively whether a particular cause and effect are related.
- When determining whether two effects that appear to be related both occur with the same cause.
- When testing for autocorrelation before constructing a control chart.



Step 4 – Find Solutions

- Purpose is to design a workable solution to eliminate the root cause
- Keep up the momentum
- Involve those with ideas about process solutions
- Involve those who will be affected – increases probability of successful implementation



- Explore the root cause -
 - What part does it play in the bigger picture?
 - Which stakeholders play a part in the root cause?
- Identify one or more solutions in a structured way
 - Bring in Subject Matter Experts if needed
- Specify/describe the solutions
 - Make sure conclusions are well documented – so that you can understand them later if needed



Step 5 – Take Action

- Analyze the setting (the climate for change)
- Decide how to organize the implementation effort
- Develop a plan
- Communicate the plan
- Execute the plan



Are we done yet?



Not quite

Step 6 – Measure and Assess

- Has the solution been successfully implemented?
- Is there evidence that the solution has eliminated the root cause and will prevent the event from reoccurring?
- If not, is there a need to recycle the Root Cause Analysis process or simply develop a new solution?



Summary

- Make sure “event” is clearly defined
- Involve stakeholders
- Don’t declare success too soon
- Fewer but more meaningful corrective action activities that emphasize eliminating root cause
- Keep good records of the process – they may provide valuable lessons, good training tools



ANY
QUESTIONS

