

Root Cause Analysis Process

The purpose of Root Cause Analysis (RCA) is to analyze problems to identify the main causes, and to initiate actions to prevent similar problems from occurring. RCA can be applied on any problem; often it is done on defects that were found by customers or during test, major project disturbances, or findings from earlier (CMMI, risk or other) assessments.

Step 1: Preparation

Do the following steps for the RCA investigation assignment with the order of the RCA:

- Identify and isolate the problem to be investigated
- Find out what the significance of the problem: Is there a business case for RCA?
- Agree upon the expected results of the RCA meeting (report, presentation, etc)

An RCA investigates how the problem hindered the organization in reaching goals. Actions resulting from the RCA should contribute towards these goals. Check if the problem caused much damage, or happens frequently. If it happened only once, or with little to no effect, then don't spend time on it.

Do the next steps to prepare for the RCA session:

- Find out who has knowledge of the problem, and invite her/him to the RCA
- Find out who has authority to decide about and take action, and invite her/him to the RCA
- Plan the RCA session

Usually an RCA session needs 3-5 persons, and takes about ½ to 1 hour. For multiple problems, plan at least 15 min per problem, maximum of 3 problems per session. State the problem to be investigated and RCA approach in the invitation, and ask to think about the loss that occurred due to the problem.

Step 2: Meeting

Start the meeting with explaining how RCA is done. See the [RCA checklist](#).

Step 2.1: Define the Problem

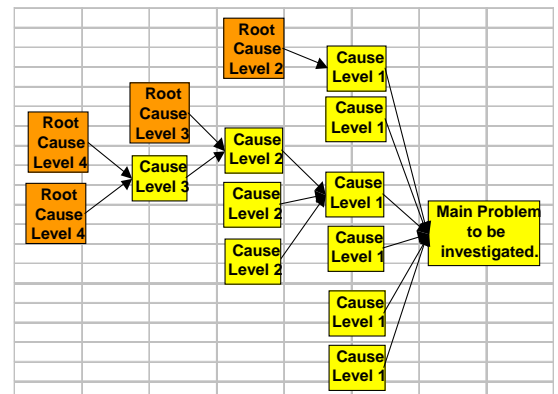
To get the problem view aligned of the meeting participants, ask the following questions:

- What is the problem? When did it happen? Where did it happen?
- What is the significance of the problem, and what has been the loss for the organization?

The purpose is to clarify the problem, and its context. The loss should be stated in man-hours that the organization has wasted due to the problem. Discuss the problem & loss, and write it on the flip over.

Step 2.2: Create a Cause and Effect Chart

The cause and effect chart is a horizontal tree diagram. Draw a box at the right side with the problem statement, and ask: Why did this happen? Collect answers (one answer per post it), and stick them on the flip over left to the problem statement. For every effect, try to find 2-5 causes. Take one item from the causes, and ask again why. Write answers on post its, and repeat the process. After 4 to 7 levels you either get to a situation where nobody knows the answer, or there is no need to go deeper. Don't stop too early, make sure you really understand the causes. At the end check the diagram on completeness, and clearness.



Step 2.3: Identify Effective Solutions

Effective solutions must fulfill three criteria:

- Prevent recurrence
- Be within control of the involved groups/persons
- Meet targets of the RCA investigation (acceptable, effective, good cost/benefit)

The approach to come up with solutions is as follows: Start on the right side of the chart, and challenge the causes and ask for solutions. Don't judge the solutions, but for now only attach them to the causes. Stimulate creativity, techniques can be to ask for the most radical solution (as if there are no limits) and then check why it shouldn't be possible, or ask for the first thing that comes to mind.

The next step is to check the solutions. Discard solutions that do not meet the three criteria above. Give special attention to meeting the targets that were endangered by the problems being investigated: Would these actions prevent endangering the targets in the future?

Also, be carefully with solutions in areas of:

- Punishment, reprimand, issue a warning
- Investigate, write a new procedure
- Ignore, say it won't happen again

These kinds of solutions do not solve the problem; instead they postpone finding a real solution. Be aware of solution killers, like "it will never work", "we've done that", "that's impossible". Challenge the issuer; ask him/her to explain, this might lead to additional causes.

For every solution, do two estimates:

- How much time is needed to do the action (in one project)?
- What are the savings (benefits) of this action, in man-hours?

These figures should be added on the post it. Together they give input for a cost/benefit decision.

Step 3: Report

Document all solutions in an RCA report, sent it to the participants for completion and checking of the content. After corrections, sent it to the orderer of the RCA with a request for a decision on actions that will be done. Preferably the action follow up meeting is arranged by the RCA session leader, to have a good handover between the session and the line and project organization.



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