



Root Cause Analysis for Learning Professionals

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Root Cause Analysis for Learning Professionals

“For every problem, there is a cause, and Root Cause Analysis (RCA) tools are used to identify the cause.” ~Mark Doggett, 2005

Root Cause Analysis

- Detect the “root” of the issue
- Gather measurable data
 - Frequency, percentage, proportion, or time
- Identify solutions to prevent recurrence

Why Does the Gap Exist?

- Are the results known to everyone?
- Are incentives given for the desired performance?
- Is data, information, or feedback provided timely?
- Is appropriate support provided by the environment, resources, equipment, and tools?
- Do employees have the ability & time to perform?

Potential Areas of the Gap

- *Knowledge/Skills* – will training, job aid, or performance support tool help?
- *Resources* – are changed needed in the work process?
- *Process/Workflow* – is there a problem or weakness in the structure?
- *Information* – do we need to modify company objectives, management miscommunication, or documentation, or consequences of work done poorly?
- *Leadership* – is there a lack of or change in direction?
- *Motives* – is there a problem with expectations?
- *Feedback* – is there inadequate reinforcement?
- *Incentives* – are there sufficient rewards?
- *Capacity* – is this a hiring, selection, or promotion problem? Can the employee do the job?

RCA Steps

1. *Define the problem* – what is happening, what are the symptoms?
2. *Collect data* – how long has the problem existed, what is the impact?
3. *Identify possible contributing factors* – what conditions allow this to happen, are there related issues?
4. *Identify the root cause(s)* – why does each factor exist, what is the real reason for the problem?
5. *Recommend and implement solutions* – how can we prevent this from happening again, what are the risks?

Tools

- Brainstorming
- Flowcharts
- Fishbone Diagrams
- Human Performance Improvement Model
- Fault Tree Analysis
- 6 Sigma Methodologies
- Lean Methodology

Brainstorming

- The group agrees on the central question
- Each participant suggests one idea
- The facilitator records each suggestion
- The team then generates ideas from each proposal
- The group reviews for clarity or duplication
- When ideas are generated, creativity is encouraged. Judging and negativity are not permitted!

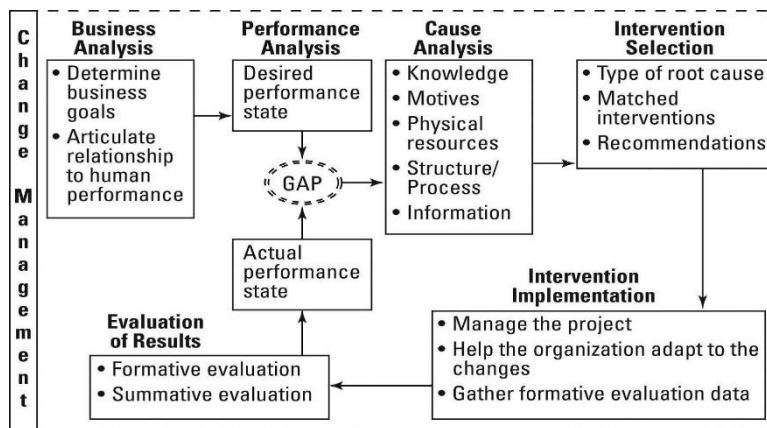
Flowcharts

- Use to understand the steps of a process
- Gain a better understanding of the factors relating to the process
- Can identify process-related failures

Ishikawa (Fishbone) Diagram/Cause and Effect Diagram

- Develop a clear statement that describes the performance gap
- Choose major cause categories
- Consider each performance category
- This approach may not directly lead to the root cause but may identify potential factors for further investigation

ATD's Human Performance Improvement Model



1. *Business Analysis* – examine the organization’s mission, vision, values, goals, and strategies
2. *Performance Analysis* – identify and clarify the problem or performance gap between the desired and actual performance
3. *Root Cause Analysis* – what factors are contributing to the performance gap?
4. *Solution Selection* – identify appropriate performance improvement solutions, recommend the one with the most significant business effect
5. *Solution Implementation* – recommend resources and timeframes to accomplish the action
6. *Evaluation of Results* – review throughout the process
 - *Formative evaluation* seeks to improve a solution (beta tests, comparing technical and production standards, using SMEs)
 - *Summative evaluation* determines the effect of the solution on the organization (business and performance goals), may be used to diagnose weaknesses
7. *Change Management* – manage change throughout the entire process!

Fault Tree Analysis

- A convenient process to logically think through the many ways a failure may occur
- Providing insights that can lead to product improvements or process controls
- Process:
 1. *Define the scope* – what is considered a failure?
 2. *Determine top level faults* – define the starting points for the analysis
 3. *Identify causes for the top level faults* – what events could cause the failure?
 4. *Determine next level of events* – are there precipitating events?
 5. *Identify root causes* – identify the underlying causes of the sequence of events leading to failure
 6. *Consider each probability* – add the actual or relative likelihood of occurrence for each event
 7. *Perform the analysis* – identify how to resolve or mitigate the paths to failure
 8. *Document dialog and action items* – include notes from discussions and record the action items

Six Sigma Methodologies

- DMAIC
 - *Define* – define the project goals and deliverables
 - *Measure* – determine the current performance, quantify the problem
 - *Analyze* – identify the root cause(s)
 - *Improve* – eliminate defects
 - *Control* – ensure future performance

- DMADV
 - *Define* – define the project goals and deliverables
 - *Measure* – determine the current performance, quantify the problem
 - *Analyze* – determine the root cause(s)
 - *Design* – select and prioritize alternatives
 - *Verify* – ensure the change is sustainable

Lean Methodology

1. *Define the value* – what is the specific need?
2. *Map the value stream* – what are the value-added steps of the process?
Eliminate waste?
3. *Create flow* – increase productivity without interruptions, delays, or bottlenecks
4. *Establish pull* – response time can be dramatically improved
5. *Seek perfection* – make process improvement part of the culture

Many More Tools Are Available!

- Matrix diagrams
 - L-shaped matrix
 - Activity network diagram
 - Prioritization matrix
 - Interrelationship diagrams
 - Affinity diagrams
- Pareto charts
- Run charts
- Check sheets
- Scatter diagrams
- Histograms

Use different tools for various situations, or a combination of tools for complex cases!

General Steps

1. Define the problem
2. Collect the data
3. Identify contributing factors
4. Identify the root cause(s)
5. Recommend/implement solutions

Step 1: Define the Problem

- State the issue in a non-biased, fact only statement
- Answer what, when, where

Step 2: Collect the Data

- Thoroughly analyze the situation or facts
- Is this the first occurrence?
- What is the impact?

Step 3: Identify Contributing Factors

- Dig deep, don't just report the obvious
- Drill down, break the problem into small detailed parts to better understand
- 5 Whys?
 1. Write down the problem
 2. Ask and answer: why does this happen?
 3. Turn each answer into the next *why* question
 4. Repeat for five iterations
 5. Keep track of the relationships between cause statements and the next level of *why*

Example: A business partner is unhappy

- *Why is the business partner unhappy?* – Because we didn't deliver on time.
- *Why didn't we deliver on time?* – The job took longer than anticipated.
- *Why did the job take longer than anticipated?* – We underestimated the complexity.
- *Why did we underestimate the complexity?* – We didn't identify the required stages.
- *Why didn't we identify the required stages?* – We were behind on other projects and didn't give this project enough attention.

- Is-Is Not Analysis

- To help isolate and identify the root cause
 - Determine what could be affected, but is not affected by the problem
 - Eliminate potential root causes to lead to the actual root cause
 - May not directly identify the root cause, but this information can be useful to narrow down the possibilities

Example: Sporadic failures of a part

Factors	Is	Is Not	Difference
Machine	2	1 or 3	Machine 2 not run on Shift 2
Shift	1	2	Not all machines run on Shift 2
Part Number	543-4	542-4	Material type
Materials	C1010 steel	High-strength steel	Only part 543-4 uses C1010 steel

Step 4: Identify the Root Cause(s)

- Ensure you are at the base of the issue
- Don't forget; there can be more than one cause!
- Consult team members, build consensus

Step 5: Make Recommendations/Implement Solutions

- What can you do *now* to prevent recurrence?
- How will the solution be implemented?
- Who will monitor it?
- Do you need a control mechanism?

Share Your Learning Experiences

- Discuss RCA results with a larger group
- Convey to team members cross-functionally
- Post RCA results in a common area where team members have easy access to review

Issues Logs

- Building blocks for your metrics
- Use cross-functional reporting tool

Example

Issue #	Issue Summary	Category	Sub Category	Status	Date	Projected Resolution Date	Owner	Root Cause Analysis	Proposed Fix/Status

Who Has Access to the Issues Log?

- Make issues log available on a shared drive
- Allow editing by any team member from any related department (HR, Payroll, Accounting)

Recommended Opportunities

- Impacts to pay due to a process failure
- Breaks in process, with no effect on pay
- Issues with automation, data collection, or system downtime

Owners

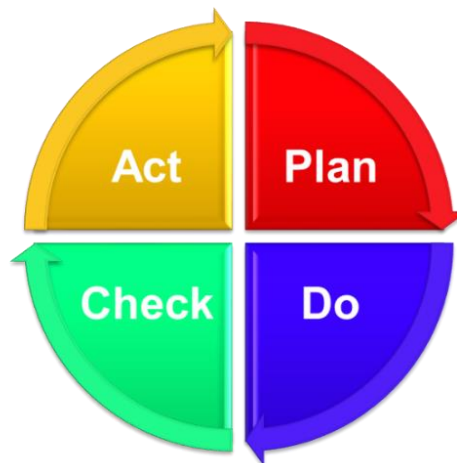
- Every issue must have an owner!

- Owner Responsibilities:
 - Investigate the issue
 - Perform RCA when required
 - Determine impact
 - Propose solutions

Review Results

- Meet regularly to review issues
 - Required attendance: HR, Payroll, HRIS, Management, etc.
 - Issue log review – the owner presents the issue, it's cause and resolution
- Keep a continuous log to allow a historical view

The PDCA Cycle



One Approach

- **Plan:** analyze what problem-solving approach will be used to address the problem
- **Do:** identify the level and type of support needed to form a diverse team which will investigate the issue and solve the problem
- **Check:** determine if containment actions are necessary, and if so, what type of activities are needed (e.g. inspections or recall)
- **Act:** perform containment actions (if required) and start the root cause analysis

Another Approach

- **Plan:** set goals to overcome obstacles
- **Do:** test various approaches to get results
- **Check:** regularly review progress, making adjustments as needed
- **Act:** implement what's working, and continually refine what isn't

Corrective Actions

- Use the PDCA process to take corrective actions
- Make sure your activities work correctly with long-term effectiveness
- Look for opportunities to implement the corrective measures as preventive actions for other processes

Performance Metrics

Overcoming the “Fear Factor”

- Fear of resistance and cynicism
- Fear of increased workload
- Fear of not performing as expected
- Fear that results will make you look bad

Fear of Resistance and Cynicism

- “We tried that before, and it didn’t work.”
- “You can’t measure what I do.”
- “Performance factors are outside our control.”

“We tried that before, and it didn’t work.”

- Explain your goals
 - Why are you initiating this measurement program
 - What will you do with the data?
- Emphasize the purpose is to understand the process better

“You can’t measure what I do.”

- Everything can be measured in some way
- Start with processes that are easy to quantify
- Get ideas from other projects or initiatives

“Performance factors are outside our control.”

- Yes, we don’t have control over everything that affects performance
 - We still must know how we are doing
 - To ensure we’re moving in the right direction

Counter Resistance and Calm Fears

- *Start small* – select a few critical measures at first
- *Make it worthwhile* – provide incentives
- *Don’t be punitive* – reinforce the goal is improvement
- *Include in job expectations* – add accountability to the annual review process

Fear of Increased Workload

- Start with just a few key measures
- Look for existing data sources
- Try a monthly sample

Fear of Looking Bad

- Establish definitions
- Identify data sources
- Test reliability and meaningfulness of the data
- Share early results
 - Initial results are merely a baseline to help track future performance

Stop the “Fear Factor”

- Initiate performance measures
 - Benefits will outweigh the costs
- Identify opportunities for improvement
- Make positive changes
- Demonstrate success

Continuous Improvement

The ongoing improvement of processes and services through incremental and breakthrough enhancements

Continuous Improvement Process (DMAIC)

- *Define* – define the project goals and deliverables
- *Measure* – determine the current performance, quantify the problem
- *Analyze* – identify the root cause(s)
- *Improve* – eliminate defects
- *Control* – ensure future performance

Opportunities for CIP

- Eliminate manual processes
- Implement process improvement initiatives
- Use scorecards (for requests for proposal and service level agreements)

Tools

- Root Cause Analysis
- Issues Log
- Performance Metrics
- Continuous Improvement

Resources

- *Root Cause Analysis: A Step-By-Step Guide to Using the Right Tool at the Right Time*, by Matthew A. Barsalou
- *The ATD Learning System: The Official Resource for CPLP® Study*
- *Performance Measurement: Overcoming the "Fear Factor"* – icma.org

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