



Causal Analysis – Quality Control Tool

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Abstract

Causal Analysis is a Quality Control tool that, if used effectively, can provide drastic improvements. As per PMBOK “Quality Control” is defined as

“Monitoring specific project results to determine if they comply with relevant Quality standards and identifying ways to eliminate causes of unsatisfied performance.”

The Causal Analysis approach is an effective tool for “Quality Control” and is used in many Software Development and Services engagements.

Introduction

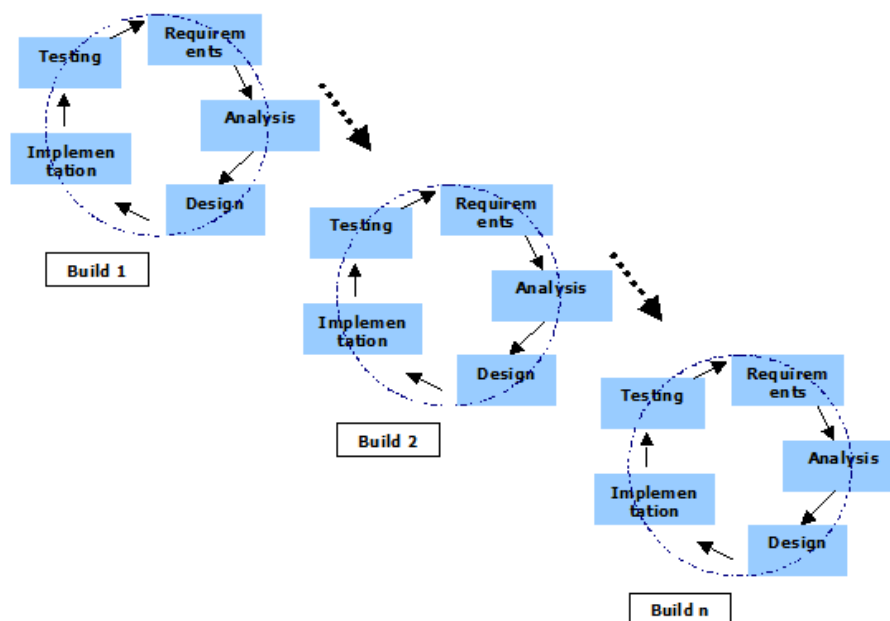
Quality can be defined in different ways.

- Quality is absence of defects
- Quality is the Degree to which a set of inherent characteristics fulfils requirements (Requirements – Need or expectation that is stated, generally implied or obligatory)

Each one of us is responsible for the Quality of individual work units / work products.

The basic principle of causal analysis is to find causes that you can treat rather than treating symptoms.

The scope of this white paper is to define the importance of Causal Analysis / Root Cause Analysis / Fishbone Analysis approach. This structured approach is explained using one of the case studies for a Software Product Development project which is executed using the Spiral Model (Refer Diagram 001)



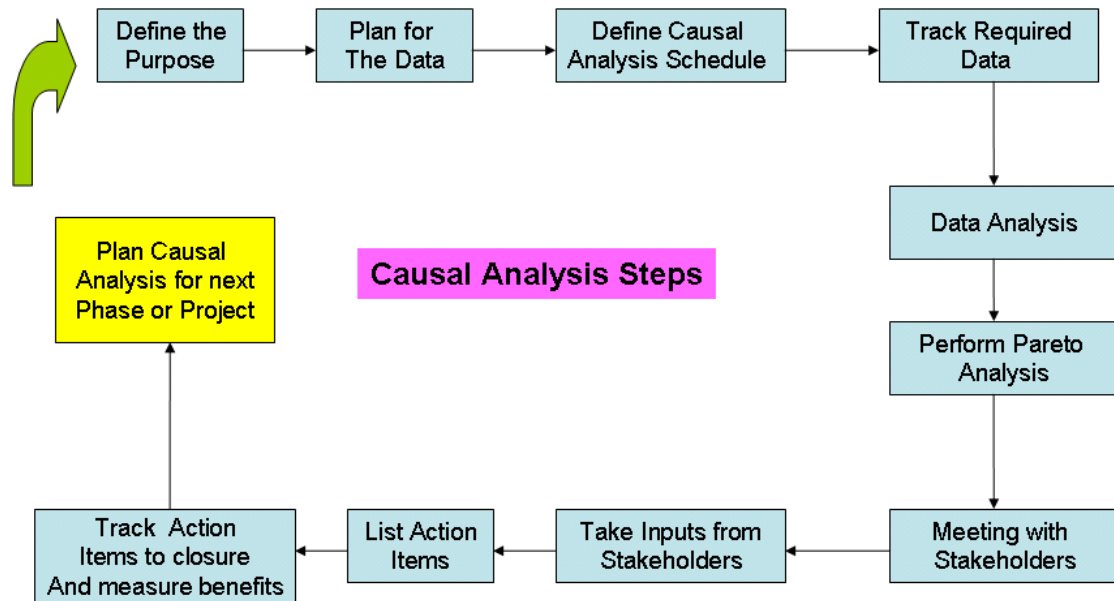
Spiral Model executed in multiple Phases (Builds) – Diagram 001

Scope of Causal Analysis

The scope of Causal Analysis is to provide quality improvements in:

- The next Phase of the current project
- New projects

Following are some of the steps for Causal analysis exercise:



Define the Purpose

We need to define the purpose for Causal Analysis. What is the objective of this exercise? This should be well defined when you start any project. For example – Some projects may have an objective to reduce System Testing defects for the next phase of a project or other projects would like to do this exercise to carry forward learnings for similar projects the organization may be executing in the future.

Plan for the data

The Project Manager or Project Leader should define the system to collect this data.

- How are you collecting “System Test Defects”? Is it using Excel or using an Issue Management tool?
- Can your system categorize defects as:
 - o Enhancements
 - o Bugs
 - o Continuous Improvements
- Are you tracking critical details like Severity, Found in Phase, Source Phase?
- Have you defined proper defect categories like
 - o Requirements Not clear
 - o Environmental (Stacks) Issues
 - o Functionality Missed out
 - o Functionality incorrect
 - o Process Non Conformance

- Unhandled Exceptions
- Is your Issue tracking system tracking required data (Maybe we can make defect category mandatory as we are planning to do Causal Analysis for defects)
- Providing the necessary training to team members to ensure correct data is entered in the system.

Define Causal Analysis Schedule

The Causal Analysis schedule should be well defined during the Planning Phase of the project.

Track required data

Make sure that you are tracking the required data in the system in the most efficient way.

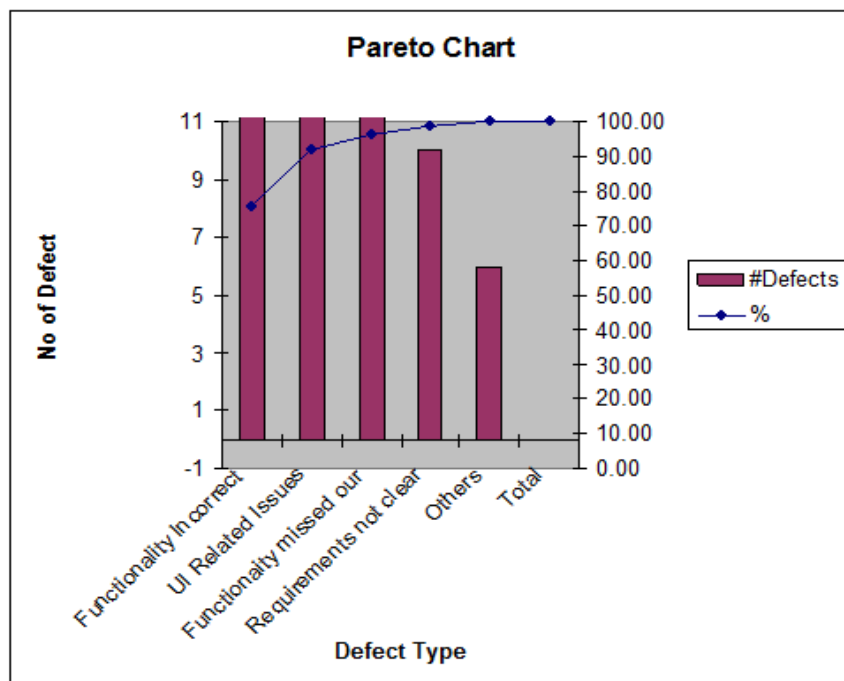
Data Analysis

As per Causal Analysis plan extract the required data from the system and put in the Causal Analysis format. For example for the above use case format can be:

| Issue Id | Defect Summary/Descriptio | Defect Type | Severity | Found In Phase | Source Phase | Cause Description |
|----------|---|-------------|----------|----------------|--------------------|--|
| 72403 | Unable to find existing BOM Templates via General Search. | Bug | Major | System Test | Code and Unit Test | Sort Ascending Sort Descending |
| 72636 | Labels Copied are not refreshed in the List | Bug | Minor | System Test | Code and Unit Test | (All) (Top 10...) (Custom...) |
| 72637 | Labels/Packaging/Trims - Delete Selected Not Working | Bug | Major | System Test | Code and Unit Test | Functionality Incorrect Functionality Missed out |
| 72679 | jsp page doesn't get displayed | Bug | Major | System Test | Code and Unit Test | Installer Problem Process Non Conformance Requirements not clear UI Related Issues Unhandled Exception |
| 72655 | Page is not displayed | Bug | Major | System Test | Code and Unit Test | Functionality Missed out |

Perform Pareto Analysis

This is done to find out major causes of problems.



Identify major Cause

This is a critical step where we will identify problems on which we would like to do Causal Analysis.

Meeting with Stakeholders

Call for a meeting with stakeholders who are involved in the project task / activity. For the “System Testing Defects” problem key stakeholders could be:

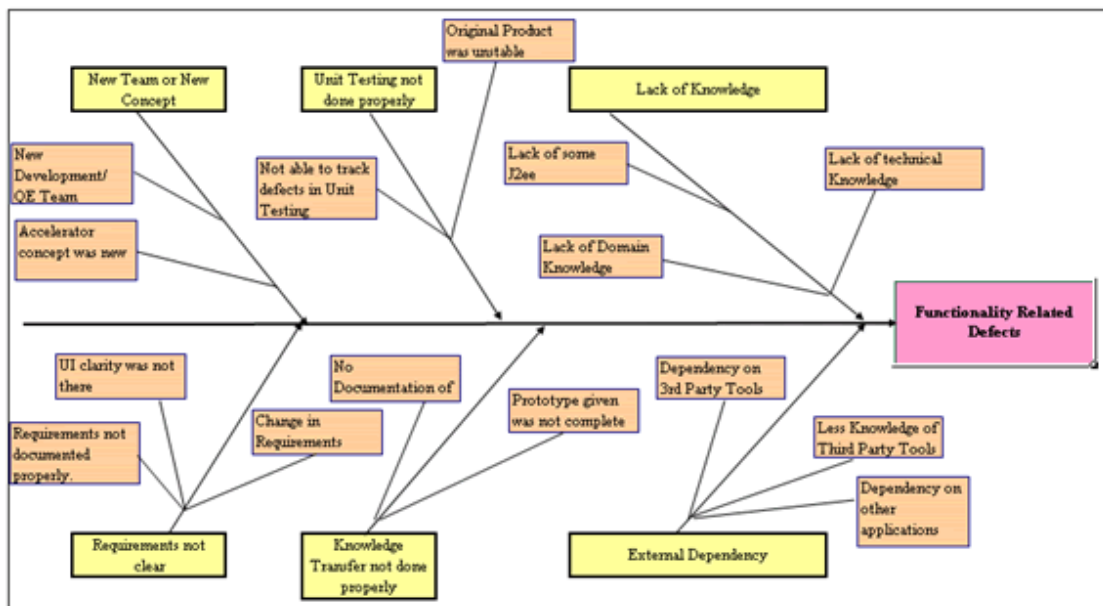
- Team which had done requirements
- Those involved in Design, Development, System Testing
- Project Lead
- Project Manager
- Quality team

Identify the co-ordinator who will drive this meeting. Define the co-ordinator role and ground rules such as:

- All ideas / issues should be listed
- Team should open up to discuss all issues.
- Co-ordinator should list the issue and should not support / defend any issue

Take inputs from Stakeholders

Obtain inputs from different Stakeholders and draw a Fishbone diagram



List Key Action Items

Based on the discussions and the Fishbone diagram prepare action plans with Action Items, Responsibility, Target Dates, Tangible/ Intangible benefits

Track Action Items to Closure and measure benefits

Based on the action plan measure tangible and non tangible benefits. For example for the above problem statement we can track benefits for the next phase of the project.

Plan Causal Analysis for next phase and project

Plan for Causal Analysis for the next phase of the project or for the new project and fine tune the plan.

Summary Benefits

Causal Analysis can provide, and has provided, substantial results in a number of projects. It is a relatively simple process to implement and will bring a focus on quality to any project team.

About the Author

Manoj Deshmukh has engaged in the management of several offshore and onshore projects as a Project / Delivery Manager/ Delivery Head. Manoj is a PMP certified Project Manager with around 13 years of experience in Engineering and Project Management. He has managed many projects / programs across the globe in US, UK, Europe, APAC. He has managed a number of different project types including Product Development / Services, T & M / Fixed Price.

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