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1.What is DA

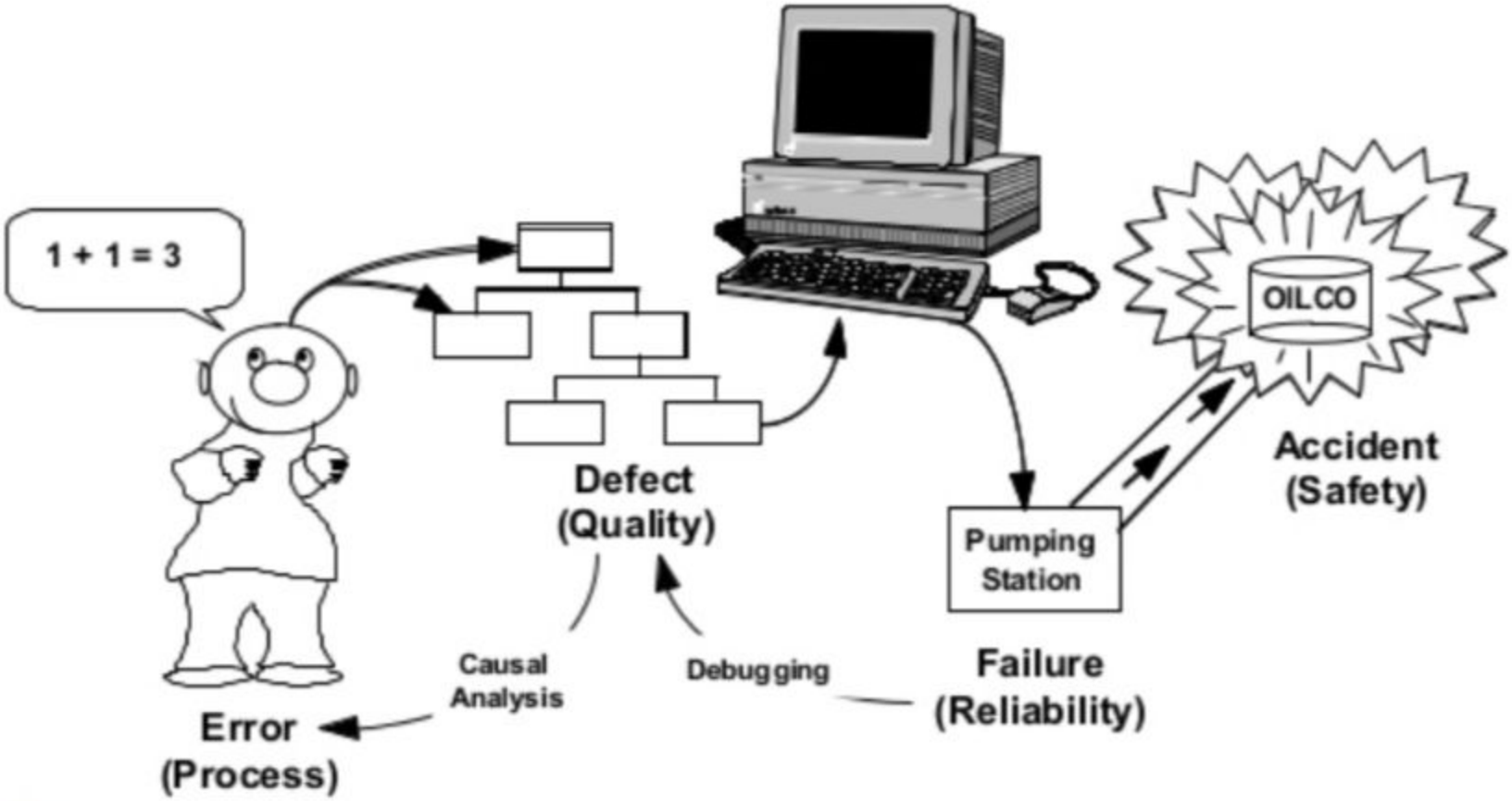
- Examination of information about problems
- Intent to identify causes of defects so that they can be prevented or detected earlier
- Many different approaches called defect analysis or root cause analysis – employ many different techniques

Software

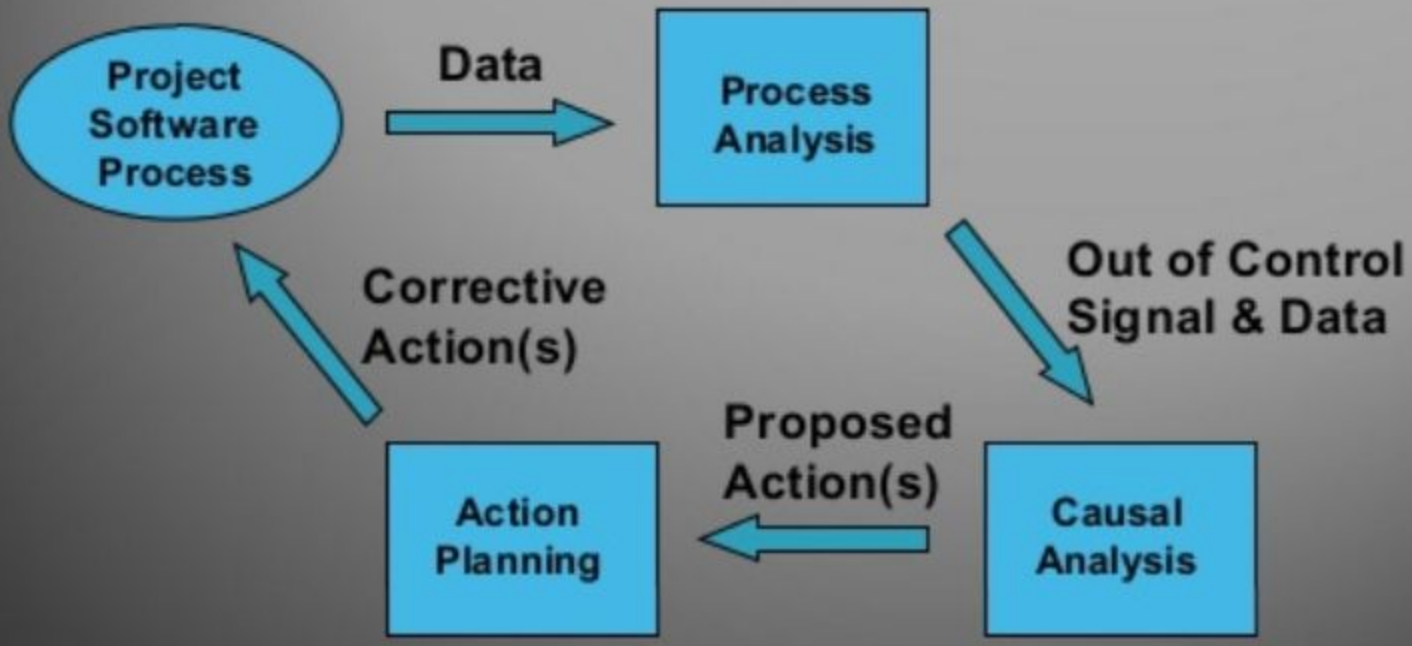
2.Definitions

- Error - a mistake made by a member of the software team
- Defect - a section of code or documentation that must be changed to correct a failure
- Failure - a situation in which the software fails to execute as intended
- Problem Report - usually documentation that a failure has occurred during testing or use. May also be used to document defects found in inspections and reviews.
- Software Defect can be defined as "Imperfections in software development process that would cause software to fail to meet the desired expectations".

3.The Defect Causal Chain



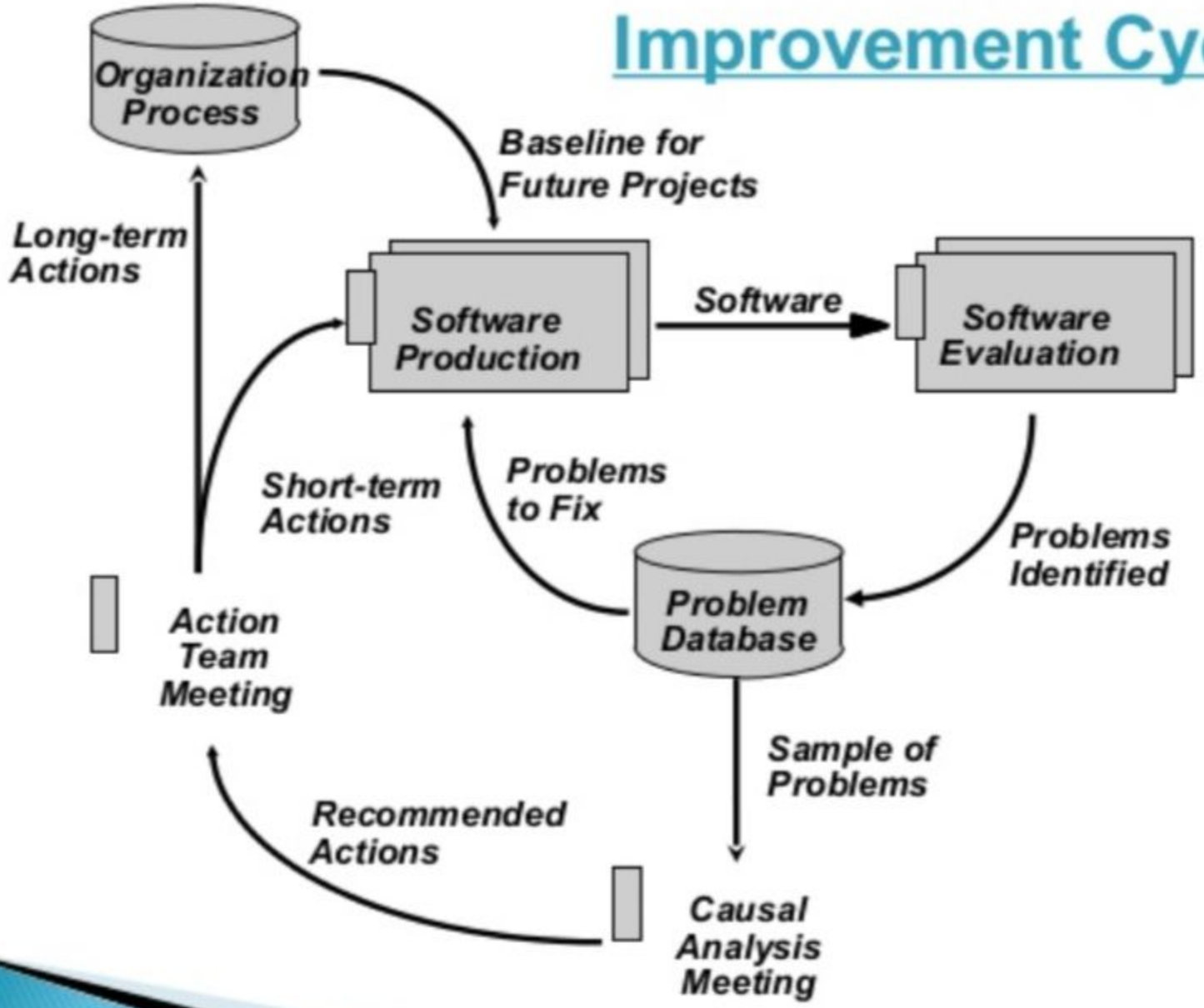
4.Corrective Action Cycle



5.Causal Analysis for Improvement

- Assigns responsibility for causal analysis of a process to the software team
- Bases analysis on a sample of problems rather than an exhaustive study of all problems
- The software team proposes actions to:
  - prevent problems
  - find problems earlier
- Assigns responsibility for implementing proposals to a management action team

Improvement Cycle



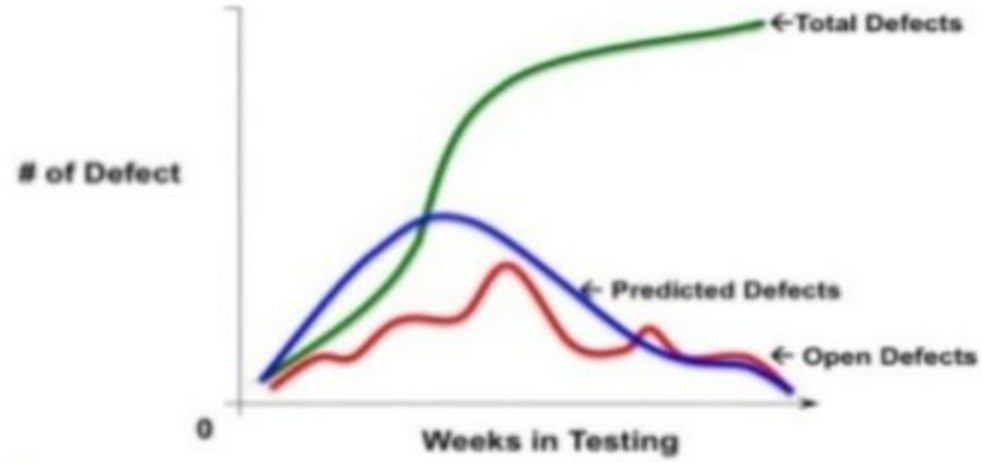
Defect Prevention

1.Defect Prevention Description

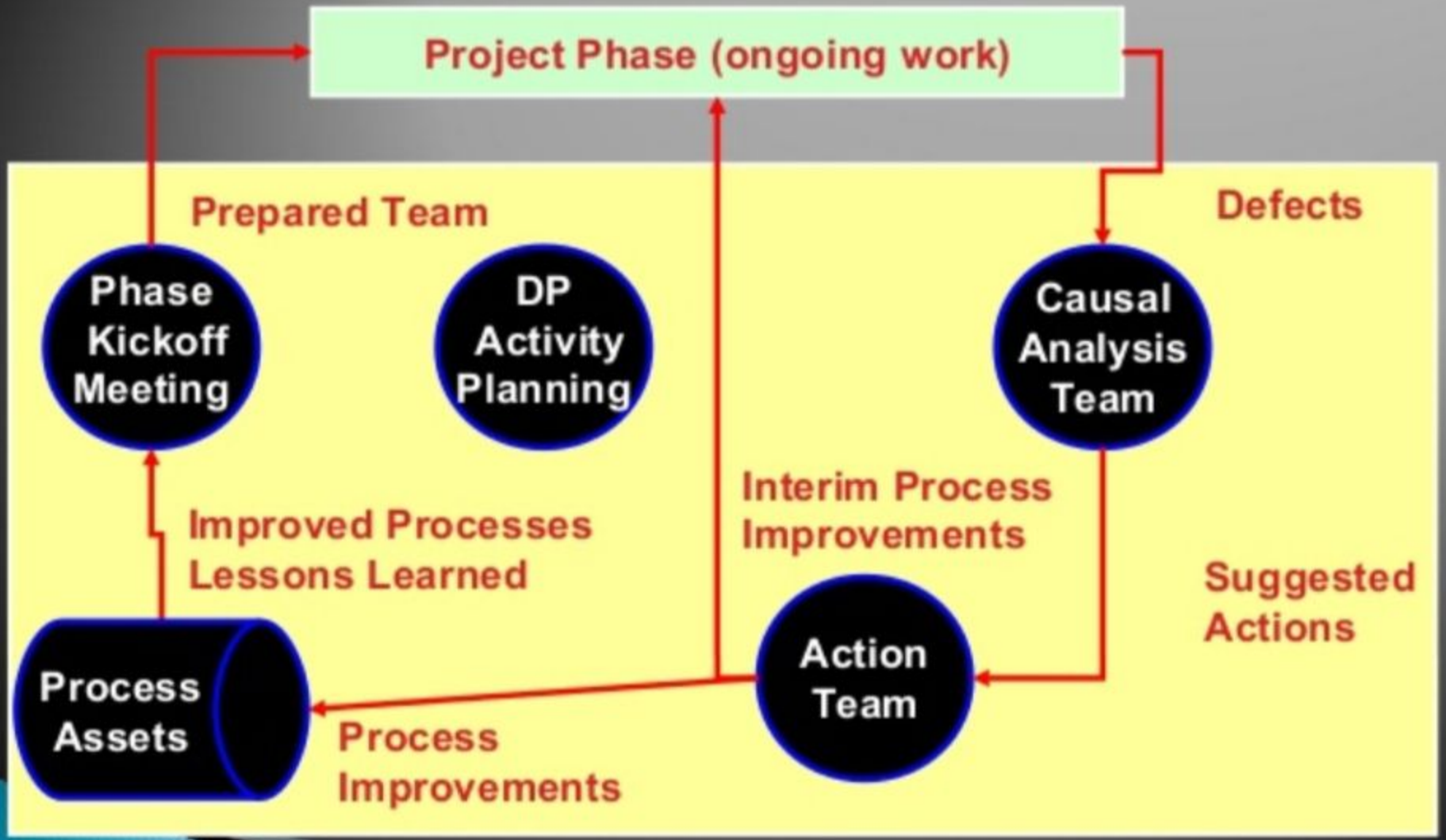
- Purpose
  - To identify the cause of defects and prevent them from recurring
- KPA goals
  - Defect prevention activities are planned
  - Common causes of defects are sought out and identified
  - Common causes of defects are prioritized and systematically eliminated

2.NEED FOR DEFECT PREVENTION

- Defect prevention is an important activity in any software project.
- In most software organizations, the project team focuses on defect detection and rework..
- It is therefore advisable to make measures that prevent the defect from being introduced in the product right from early stages of the project

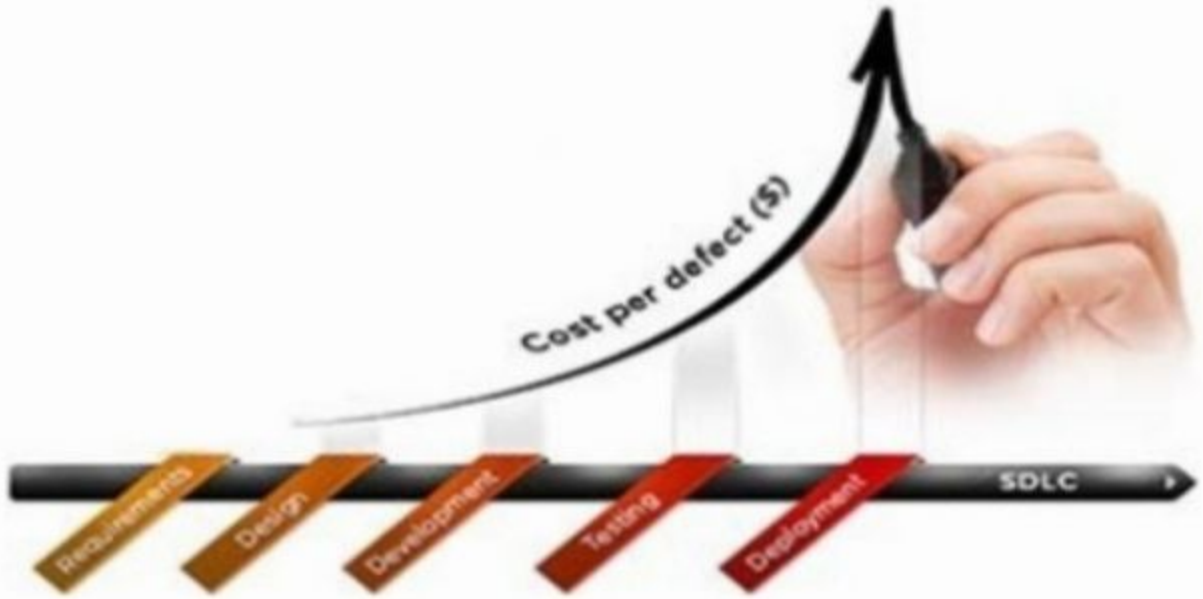


3.Project DP Process



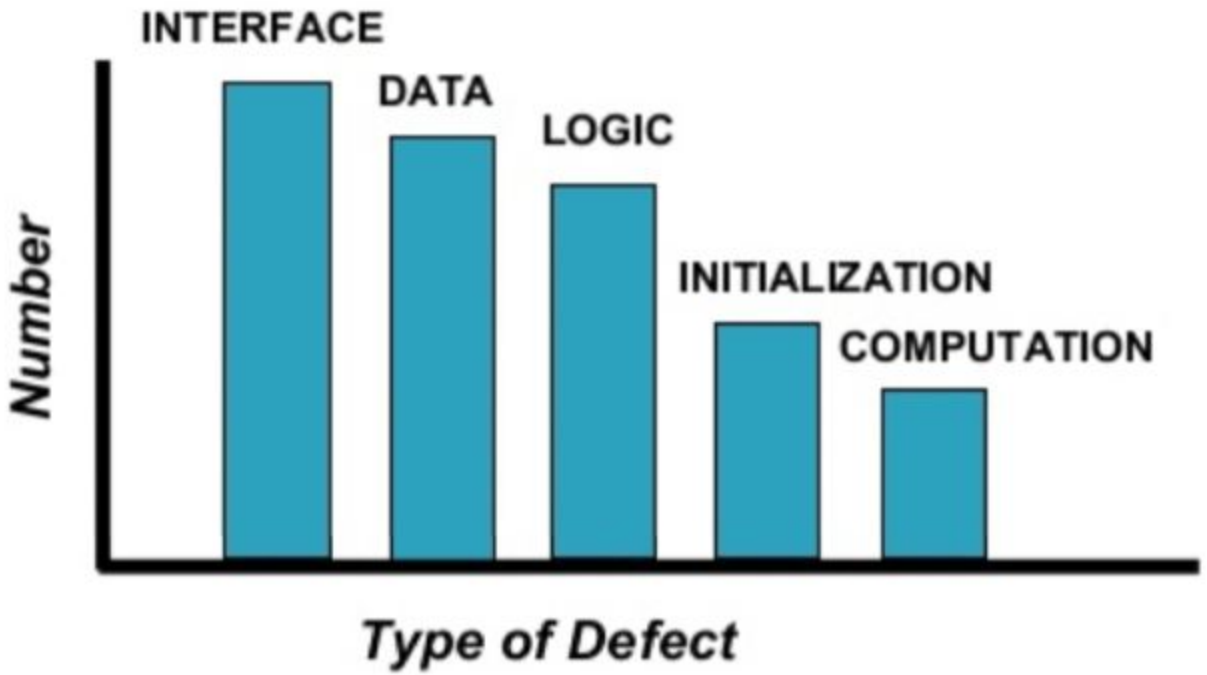
4.DP Planning

- Defines focus, composition, roles, and responsibilities of defect causal analysis team(s)
- Defines charter, composition, roles, and responsibility of action team(s)

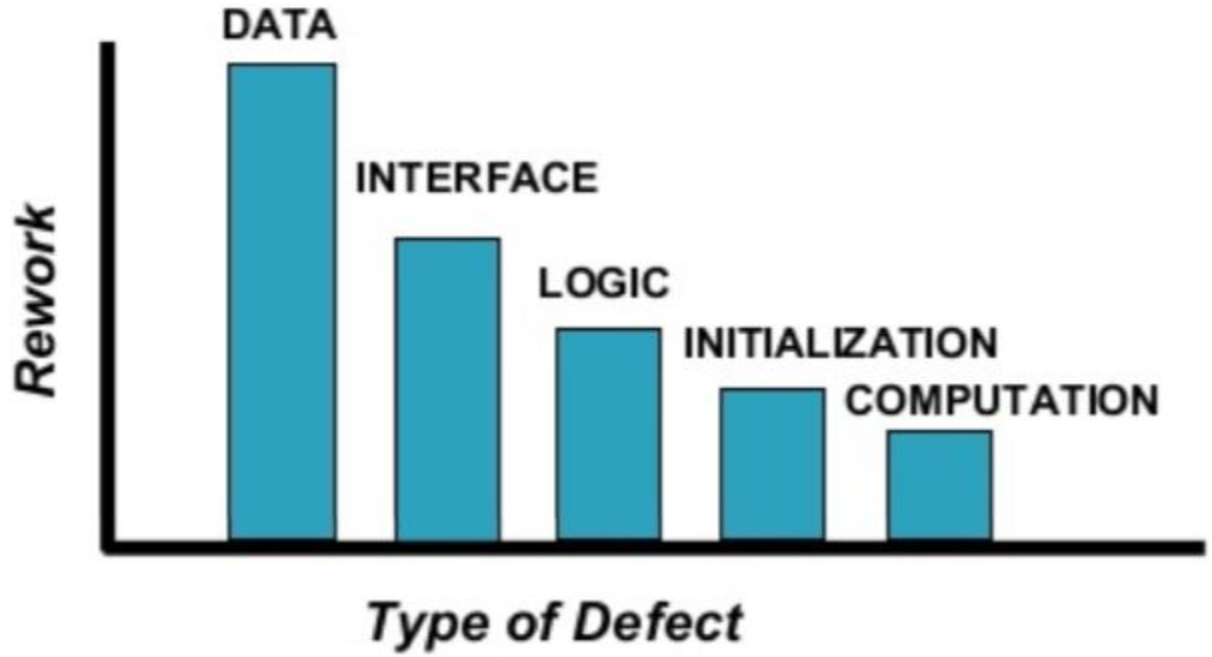


Defect Causal Analysis Procedure

1.Pareto Example (Quality)



2.Pareto Example (Cost)



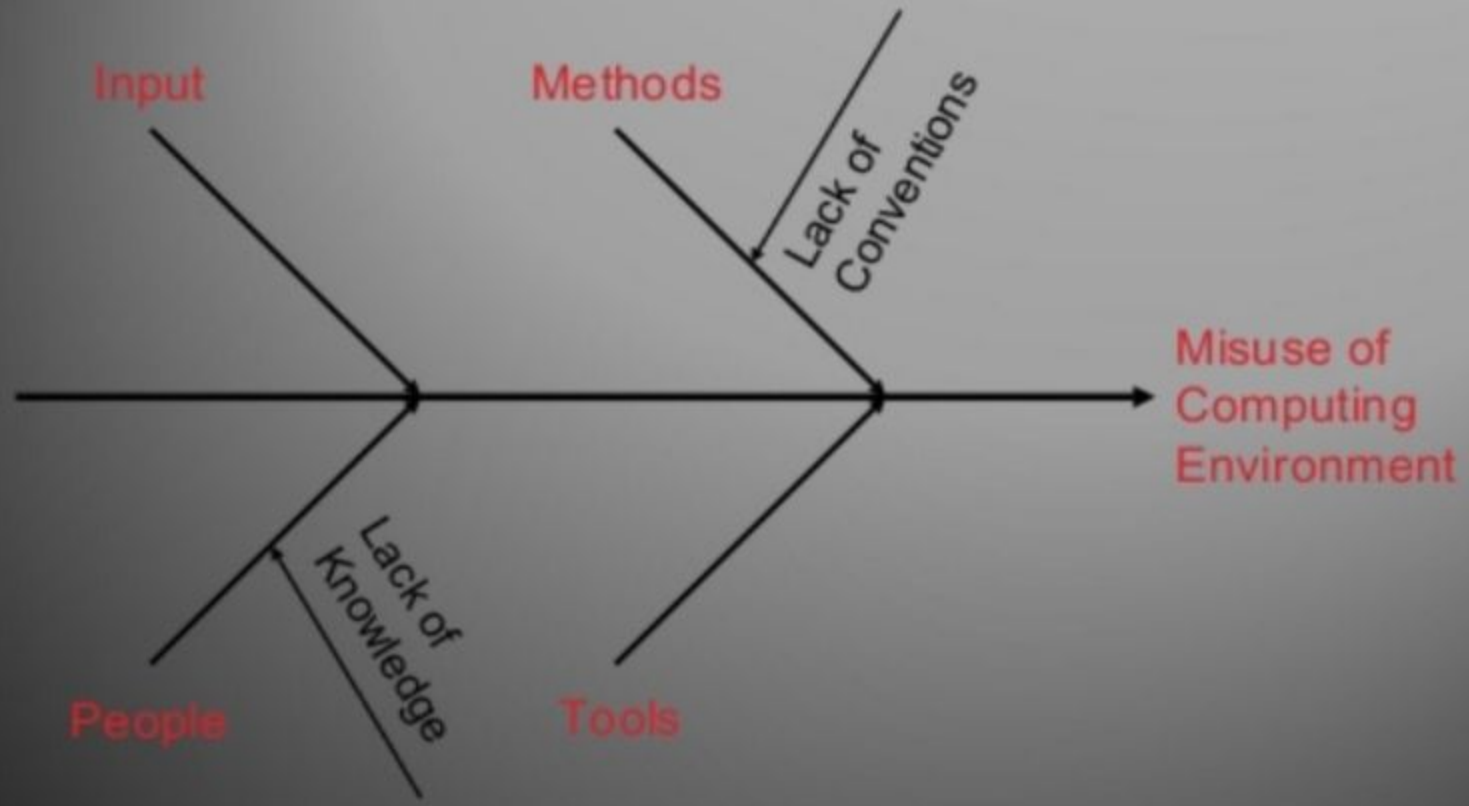
5.Cause-Effect Diagram

- Simple graphical technique
- Helps to sort and relate many factors
- Developed as a team (facilitated)
- Focus for discussion - not a definitive result
- Also called an Ishikawa or Fishbone Diagram

6.Diagramming Steps

- State problem (effect) - Use statement of Systematic Error - Draw main branch
- Insert headings for generic causes
  - methods
  - people
  - tools/environment
  - Input
- Highlight principal/operative causes(s) - circle

7.Cause-Effect Example



Action Team Activity

1.Action Team Organization

- Meets regularly to consider proposed actions
- Must include management - needs resources
- May include technical personnel
- Select and prioritize proposals
- Resolve conflicts and combine related proposals
- Plan and schedule implementation
- Allocate resources and assign responsibility
- Monitor progress and effectiveness
- Communicate actions and status to the teams