Software Engineering & Qualitätsmanagement

Quality Assurance in the Project

Quality is free

Phil Crosby

Quality costs

Costs

Quality costs

QA costs

Fault costs

Quality

QA costs
+ **Fault costs**
_____
= **Quality costs**

Quality assurance in the project
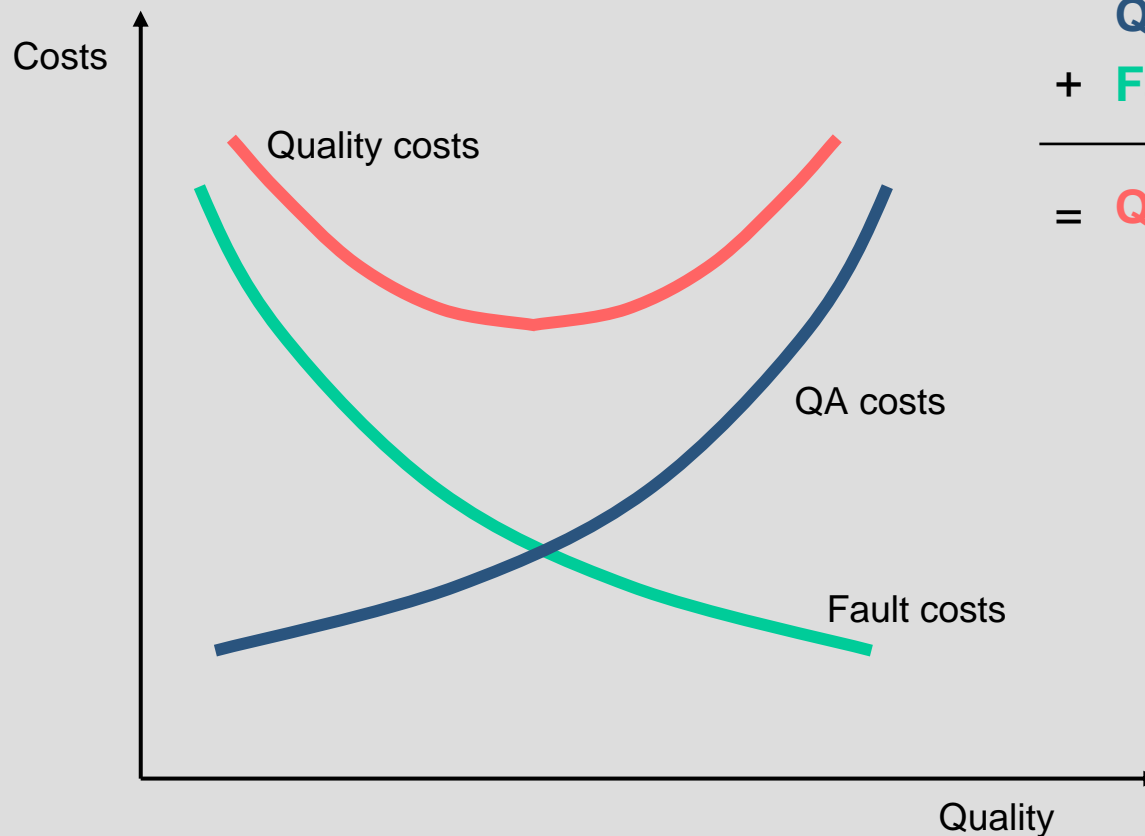
Quality costs

- Fault costs during development and in use e.g. fault diagnosis and repair. Cost because of use of an incorrect version of a module. Follow up cost because of fault in use.

- Quality assurance costs
  e.g. QA-planning, QA-manager, check of adherence to process, reviews and other QA measures, failure analysis, preventive actions
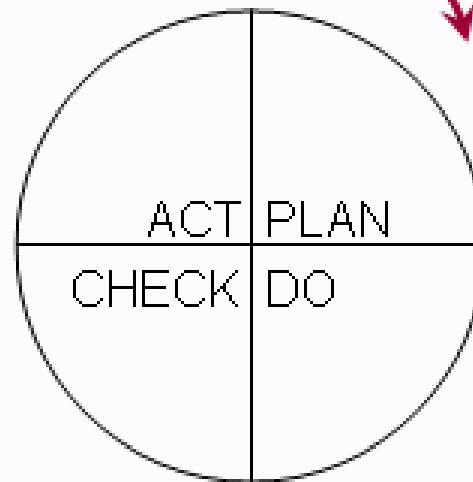
Continuous process improvement (Kaizen)

Precondition: Search causes not culprits
Everyone makes mistakes (an error can occur once bad it is the second time)

Deming Wheel

Initiate improvement

Check the result
Measure !!!

ACT | PLAN
CHECK | DO

Describe the process
Define improvement measures

Implement as described

Documented processes are the basis for a learning organisation

Quality assurance in the project

Required by Standards und Reference models as
   ISO 9001, CMMI, IEEE, ISO 12207

Project needs specialist for QA

   With knowledge of:
   - Development process
   - Review methods
   - Quality techniques
   - Controlling
   - Improvement process
   - Reference models

Quality assurance in the project

Quality requirements
From requirements specification or
    from application area

Development process

Planing of QA-measures
Project leader and QA-manager
documented in QA-Plan

Process tailoring

Execution and Documentation
Project team, QA-manager

Check
by QA-manager

QA-Plan

1. Introduction

2. Project overview

3. QA requirements

4. Development methode, tailoring

5. QA measures

6. Q-reporting and Q-records

7. Corrective and preventive measures

QA-Manager - Partner of the project manager

- **Method-Choach of the project**
  knows processes, checks compliance, advises when processes are poorly or not applied

- **Has overview over project**
  by quality assurance planning, participation in review (particularly project plan) and important project meetings

- **detects deviations from plan and process and can assess impact**

- **warns of impending problems (Q reports)**

This works only if QA-Manager is respected partner of the project manager (has potential to PM, is possibly his deputy)

Tasks of QA-Manager (1)

QA-Manager - Controlling

The QA manager monitors and checks

Adherence to processes*

Are plans appropriate / realistc

Is there functioning project controlling

*for example

Are all the tasks of risk management executed

Plays CM the defined role

Are all checks done

Quality assurance in the project

Tasks of QA-Manager (2)

QA-Manager - Reviews

- QA-Manager should be trained in review methods and often plays the role of facilitator (in this role he checks if errors detected in reviews are corrected)

- Checks if planned reviews are done

- Checks the quality of reviews

- Utilizes fault lists

Tasks of QA-Manager (3)

QA-Manager - Test

Checks at the beginning if test plan and test strategy are conform with quality requirements

Checks if tests are done as planned

Observes test metrics

Tasks of QA-Manager (4)

Evaluation of Q-data
   Example of Q-data: errors from reviews, code analysis, testing, usability inspections, ...
   Analysis with error lists, Pareto charts, statistics, Statistical Process Control (SPC)

Search for systematic errors

Give impetus to corrective / preventative activities eg:
   Training to prevent recurring (systematic) errors
   more or better reviews when there is bad error profile
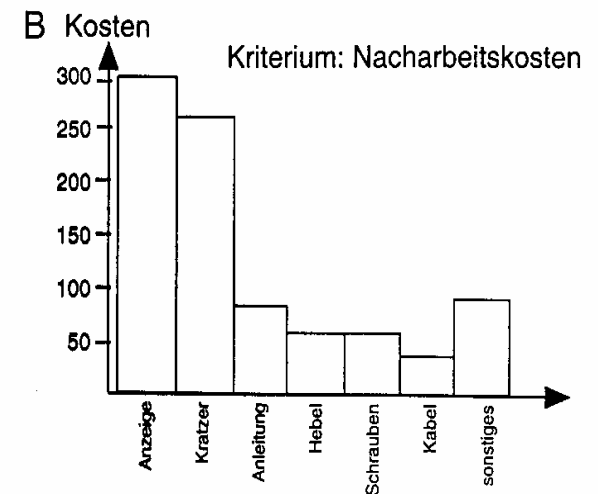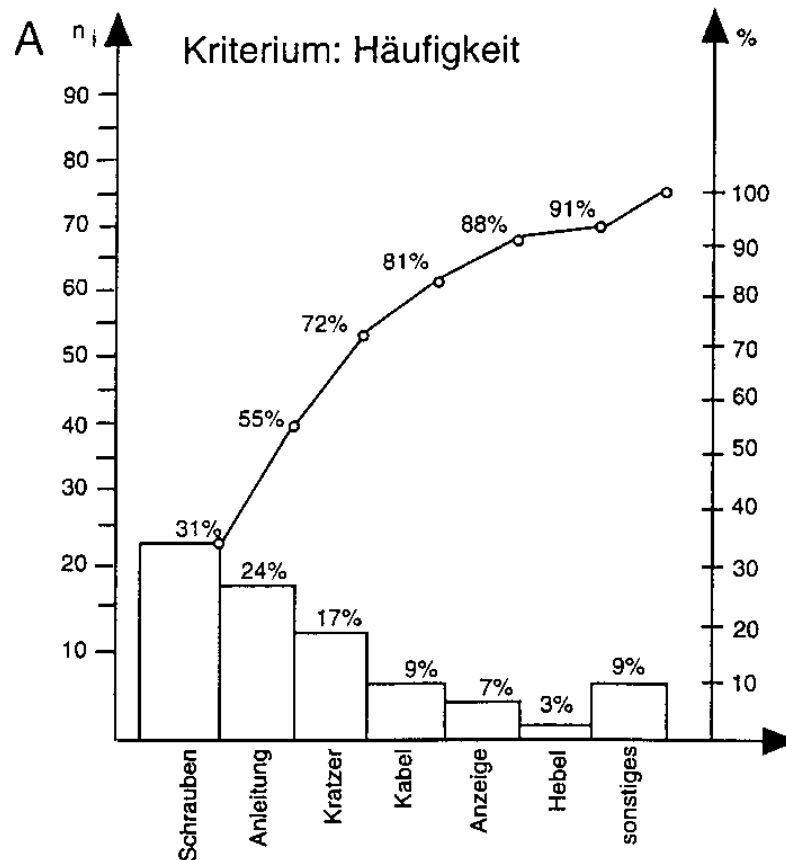   Feed back for process improvement to process owner

SQZ

Error list

- Errors are classified and quantified

Error type	Rev.1	Rev.2	Sum

Graphical representation in histogram

Pareto Diagramm

Pareto Diagram

Pareto Principle:

80% of the problems are caused by only 20% of causes

Pareto Diagram supports decision in which sequence the error causes have to be treated

Criteria can be:

frequency, cost, importance for customers, ...

Main problems are dealt with first.

SQZ

Quality assurance done with understanding improves

Quality of the development process
(adherance to effort plans and schedules,
better productivity)

and

Quality of the results

and thus ensures the economic success and
competitiveness