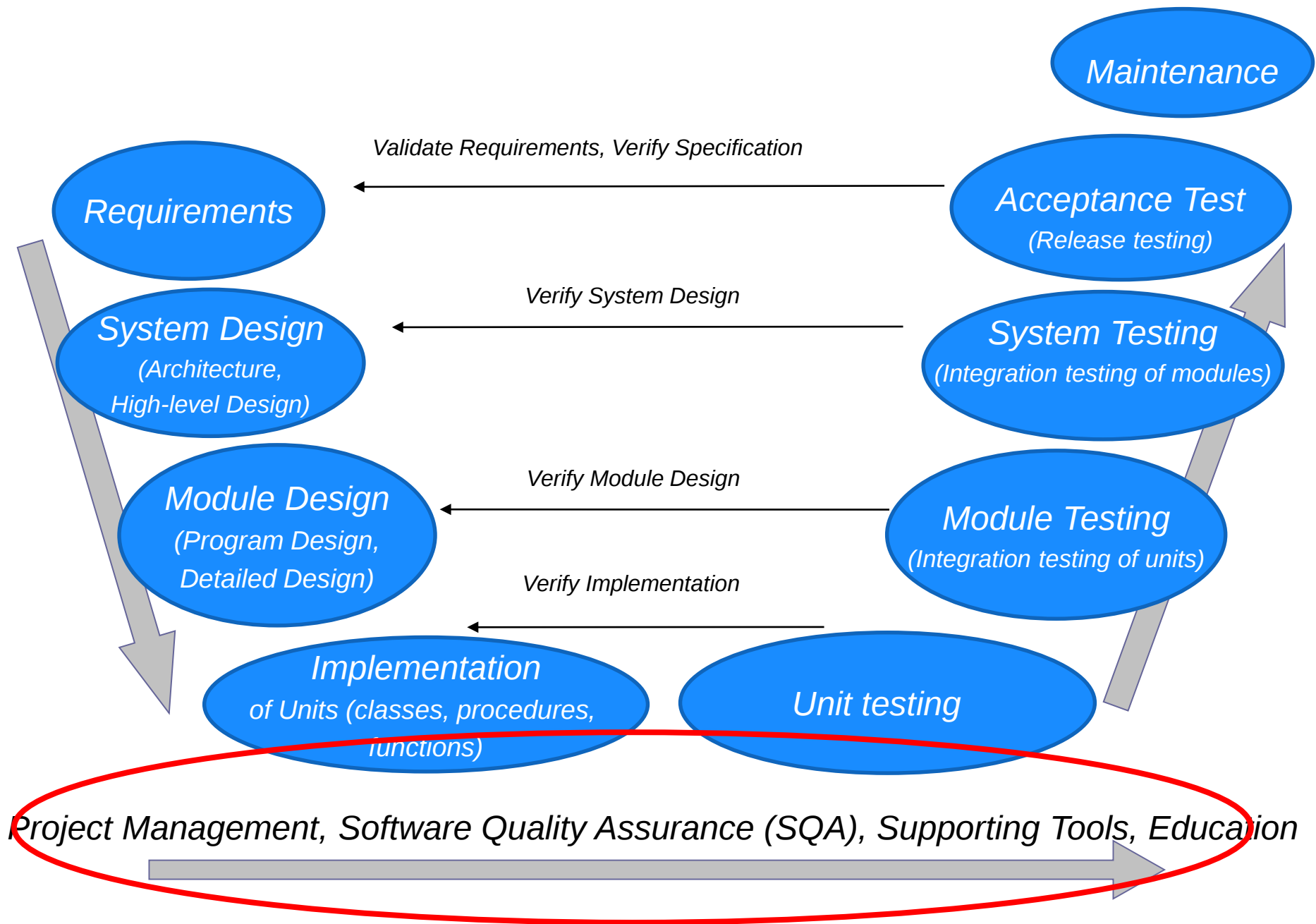


Software Quality Management

Kristian Sandahl

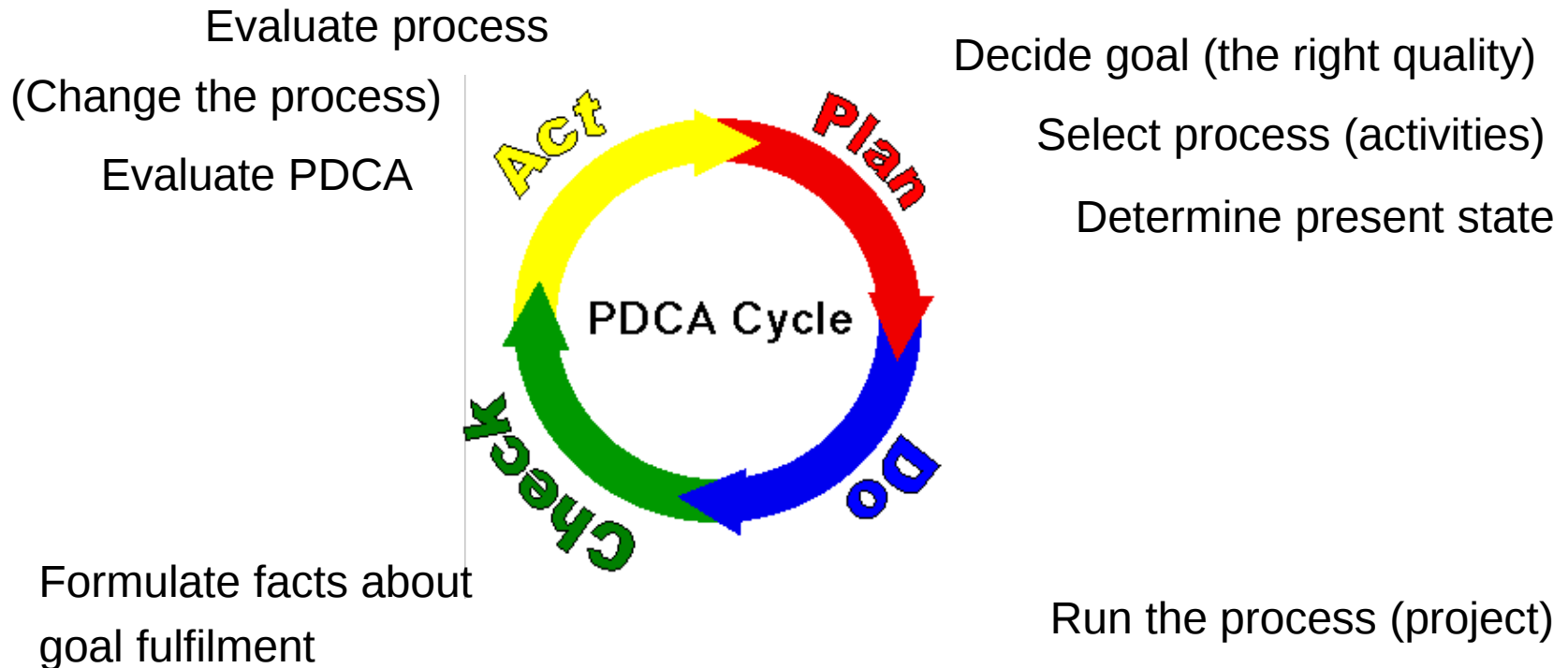


Views on quality

- Transcendent – something we learn to recognize
- Product-based – measurable variable
- Usage-based – in the eyes of the beholder
- Manufacturing-based – conformance to requirements
- Value-based – market sets the value

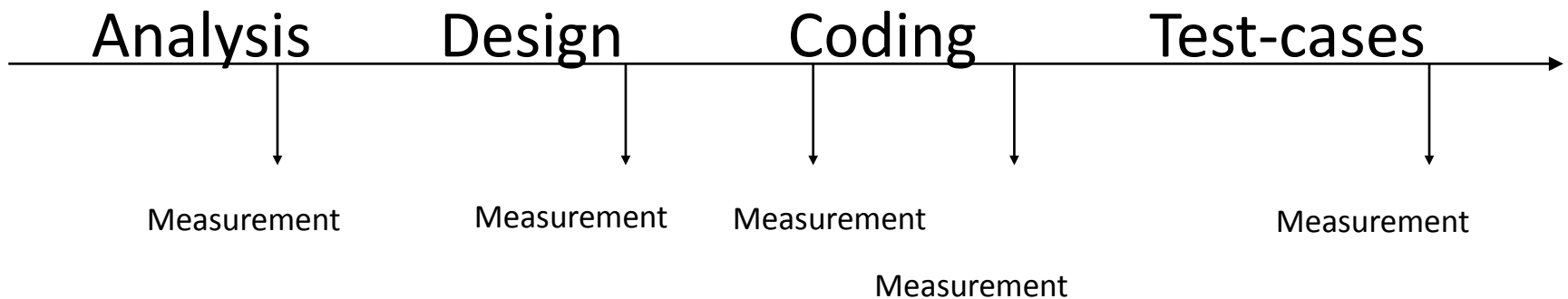
***Many opinions ⇒
Statistical
techniques***

The Shewhart cycle

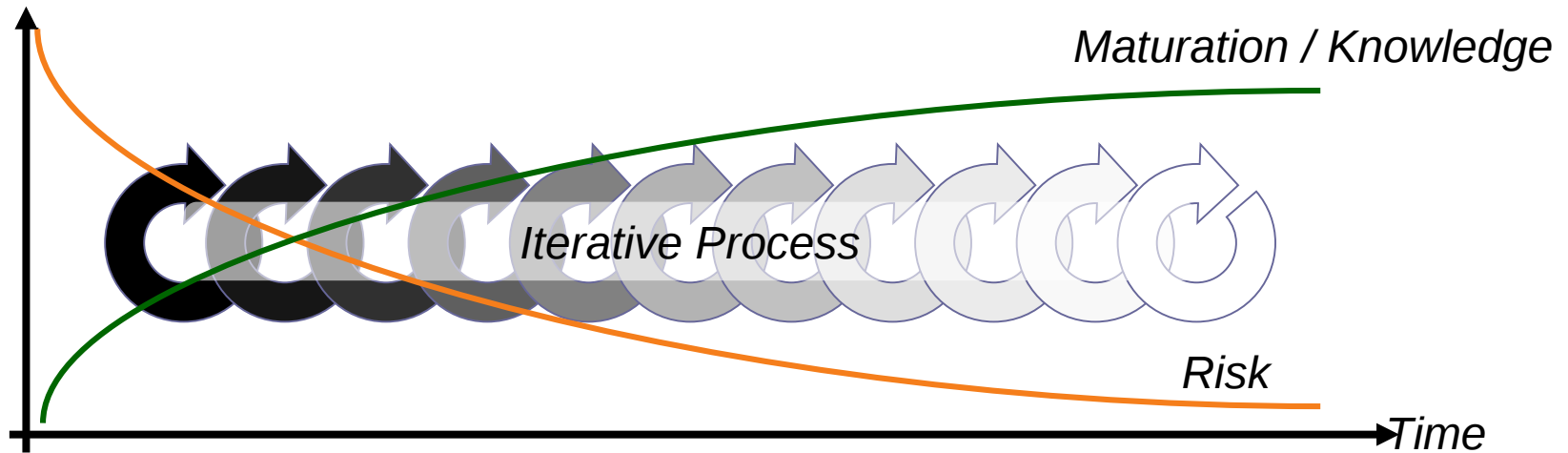


Levels of quality assurance

- Appraisal – eg. defect detection
- Assurance – eg. prediction of defects
- Control – adjust the process
- Improvement: reduce variation, increase precision



Remember Usability Engineering?



Evaluate goals of

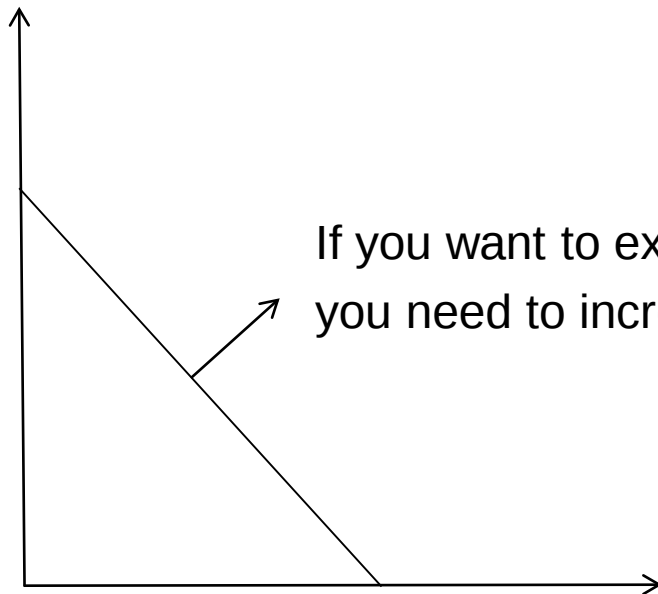
- Relevance
- Efficiency
- Attitude
- Learnability

Argument (originally Weinberg)

A mature organisation has:

- Inter-group communication and coordination
- Work accomplished according to plan
- Practices consistent with processes
- Processes updated as necessary
- Well defined roles/responsibilities
- Management formally commits

Criticality for user



If you want to expand here,
you need to increase maturity.

A mature organisation do things well, which does not necessarily mean doing something good.

CMMI for development, staged representation

CMMI = Capability Maturity Model Integration

1: Initial

2: Repeatable

3: Defined

4: Managed

5: Optimising

Life at level 1

The organisation is over-committed, processes are abandoned in crisis, and no repetition of success.

Success is totally dependent on heroes



Life at level 2

- Fewer surprises
- Processes are based on organizational policies
- **Process adherence** is evaluated
- Processes are established and followed even in crisis
- Projects ensure adequate competence and resources
- We know stakeholders' needs
- We can control changes
- The project is visible to managers and other stakeholders at mile-stones and toll-gates
- We can **repeat** a previous success
- Works well for individual projects

Life at level 3

- Tailoring processes from your **own standard** definitions
- Standard processes are **improved**
- Process descriptions are more complete, detailed and rigorous
- Opens for development (and creativity) of alternatives
- Works for a range of projects
- Originally the minimum level

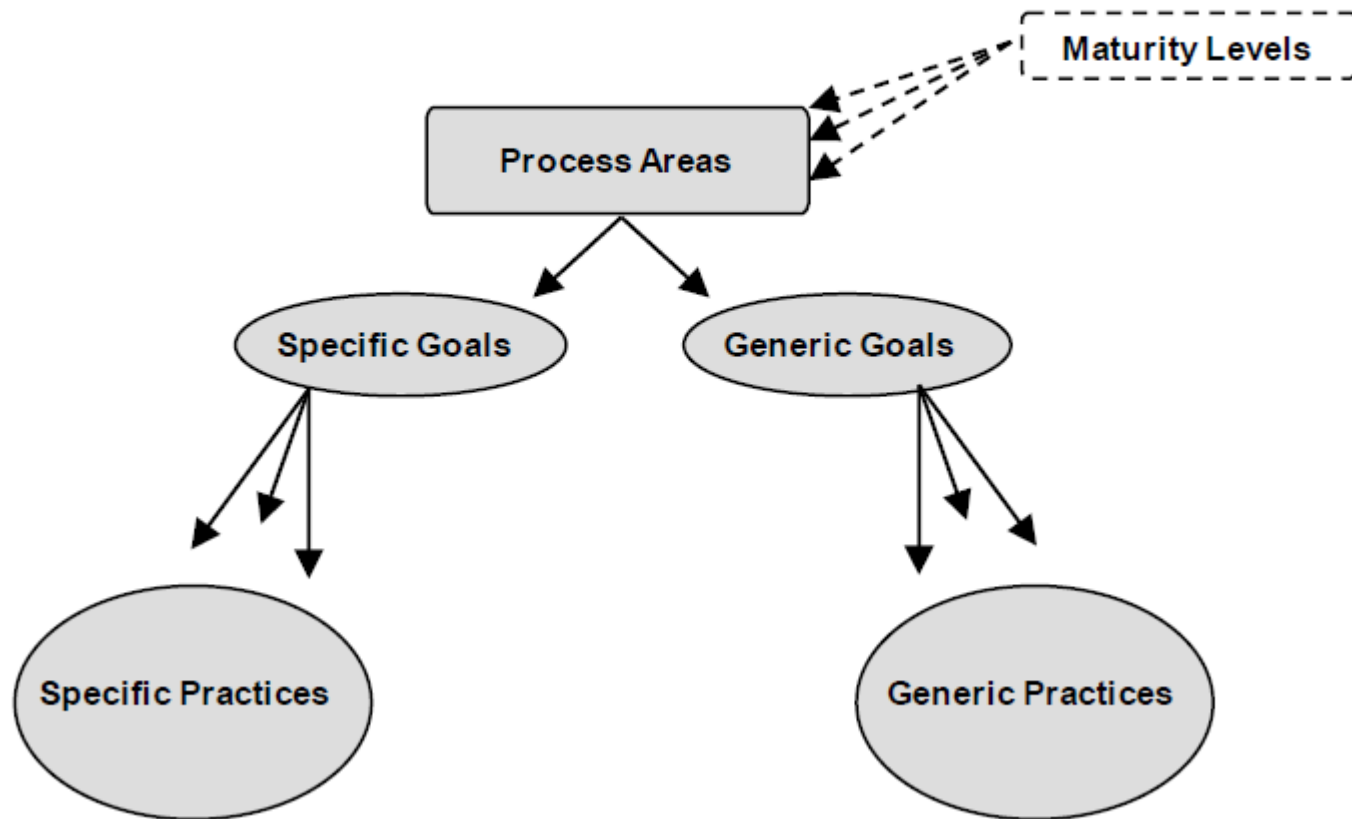
Life at level 4

- Quantitative analysis (statistics) of goals, products, processes
- Higher predictive capability
- Deviations are subject for Root Cause Analysis (RCA, 5Whys)
- Frequent measures

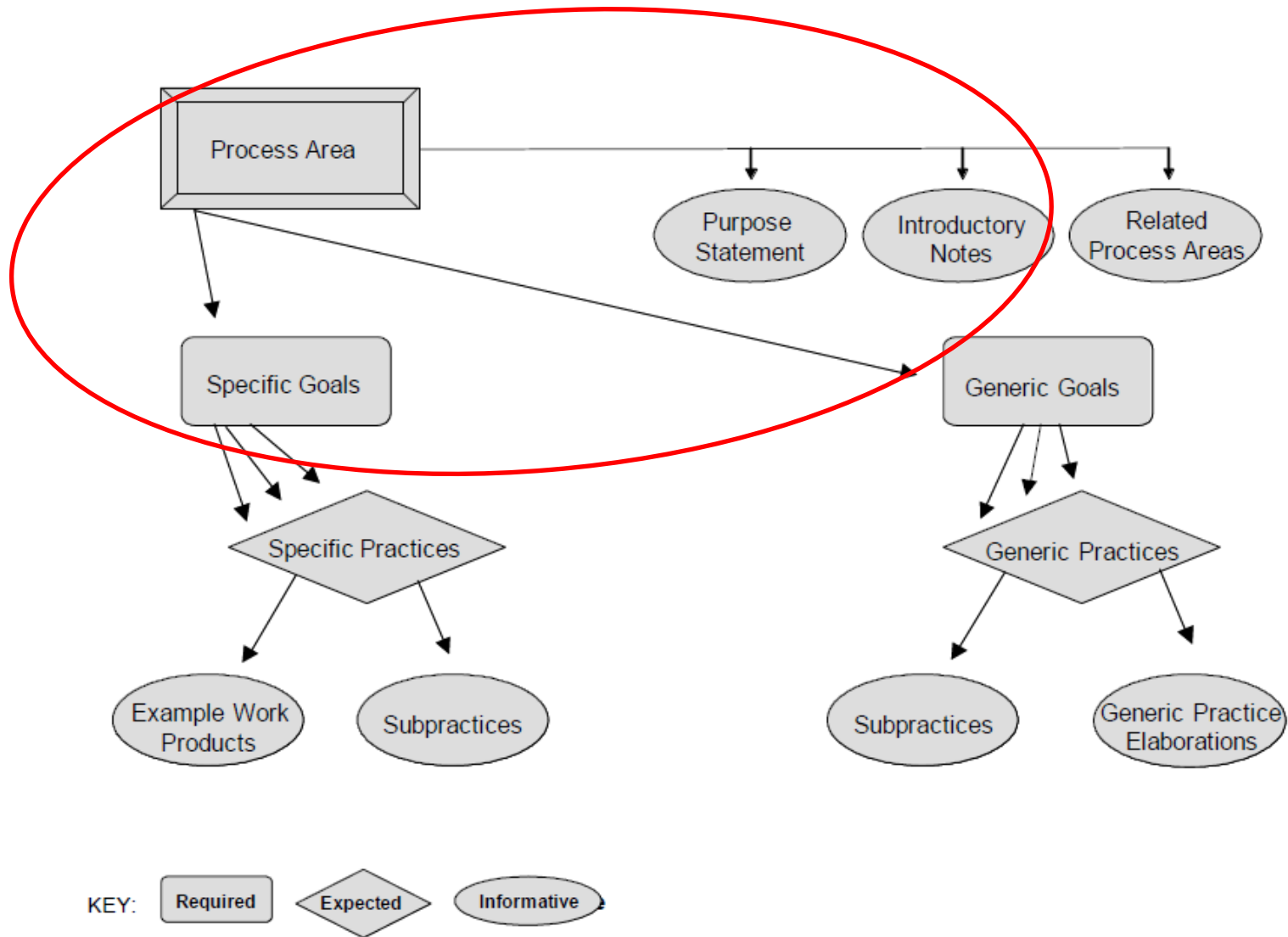
Life of level 5

- Everyone is committed to the continuous improvement of processes
- Innovation climate paired with an ability to evaluate new technology
- The outcome of improvements are evaluated at all relevant levels in the organisation
- You know your gaps in performance
- Challenge: Company culture, new markets
- Used by many sub-contractors for marketing purposes

Staged Representation

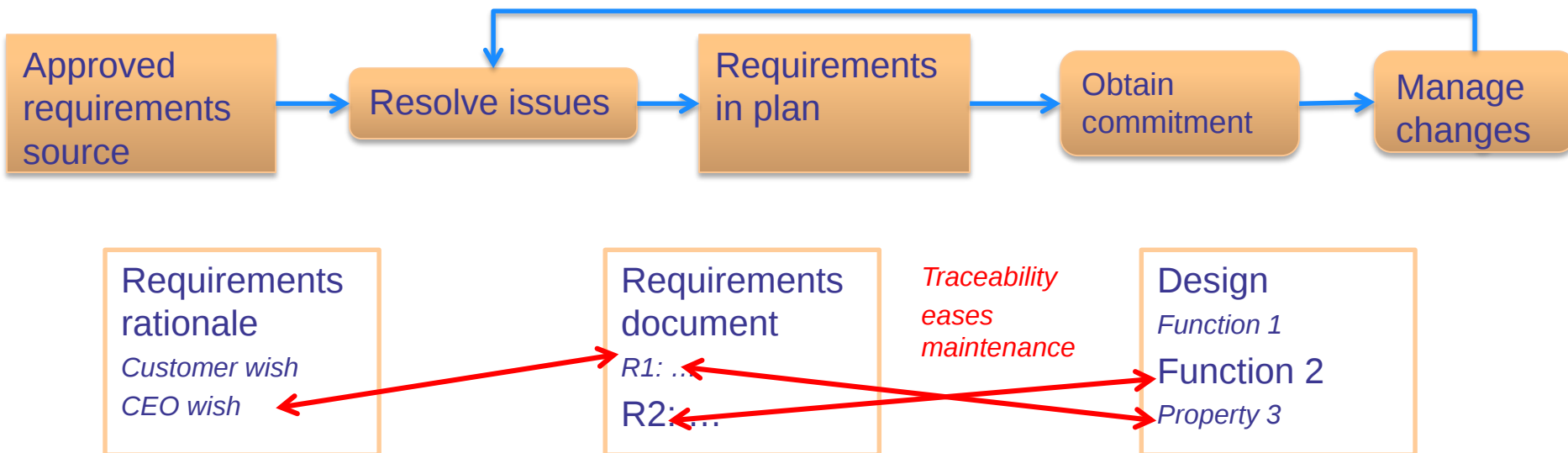


How are the Process Areas documented?



Example: Requirements Management (REQM)

- A Maturity Level 2 Process Area
- Purpose: Manage requirements, ensure alignment to project plan and work products.
- Introductory notes contain:



REQM Specific goal

Map this to your way of working

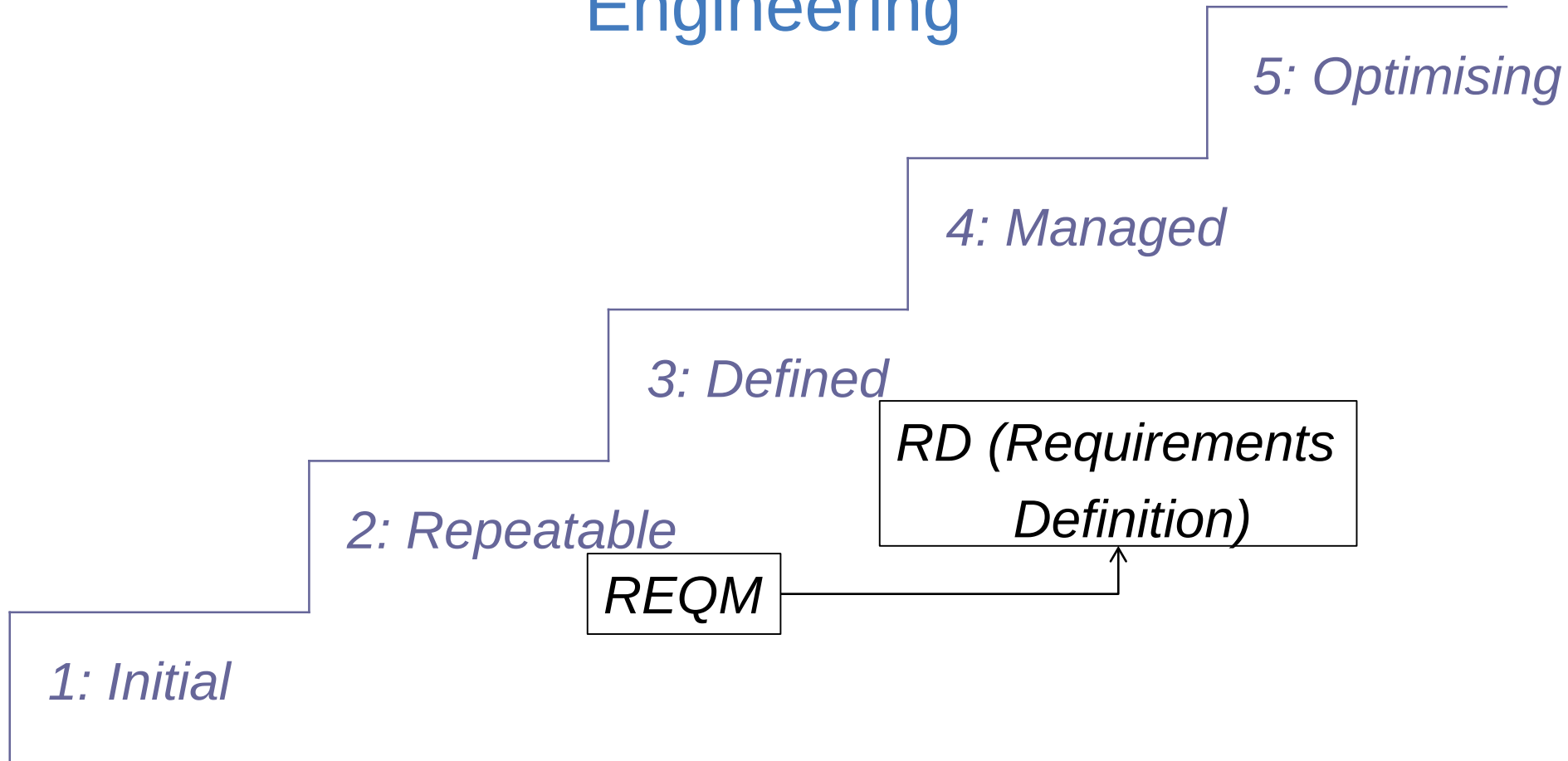
- SG1 Manage Requirements

Requirements are managed and inconsistencies with project plans and work products are identified

- SP 1.1 Understand Requirements
- SP 1.2 Obtain Commitment to Requirements
- SP 1.3 Manage Requirements Changes
- SP 1.4 Manage Bidirectional Traceability of Requirements
- SP 1.5 Ensure Alignment Between Project Work and Requirements

Use these to fulfill the goal

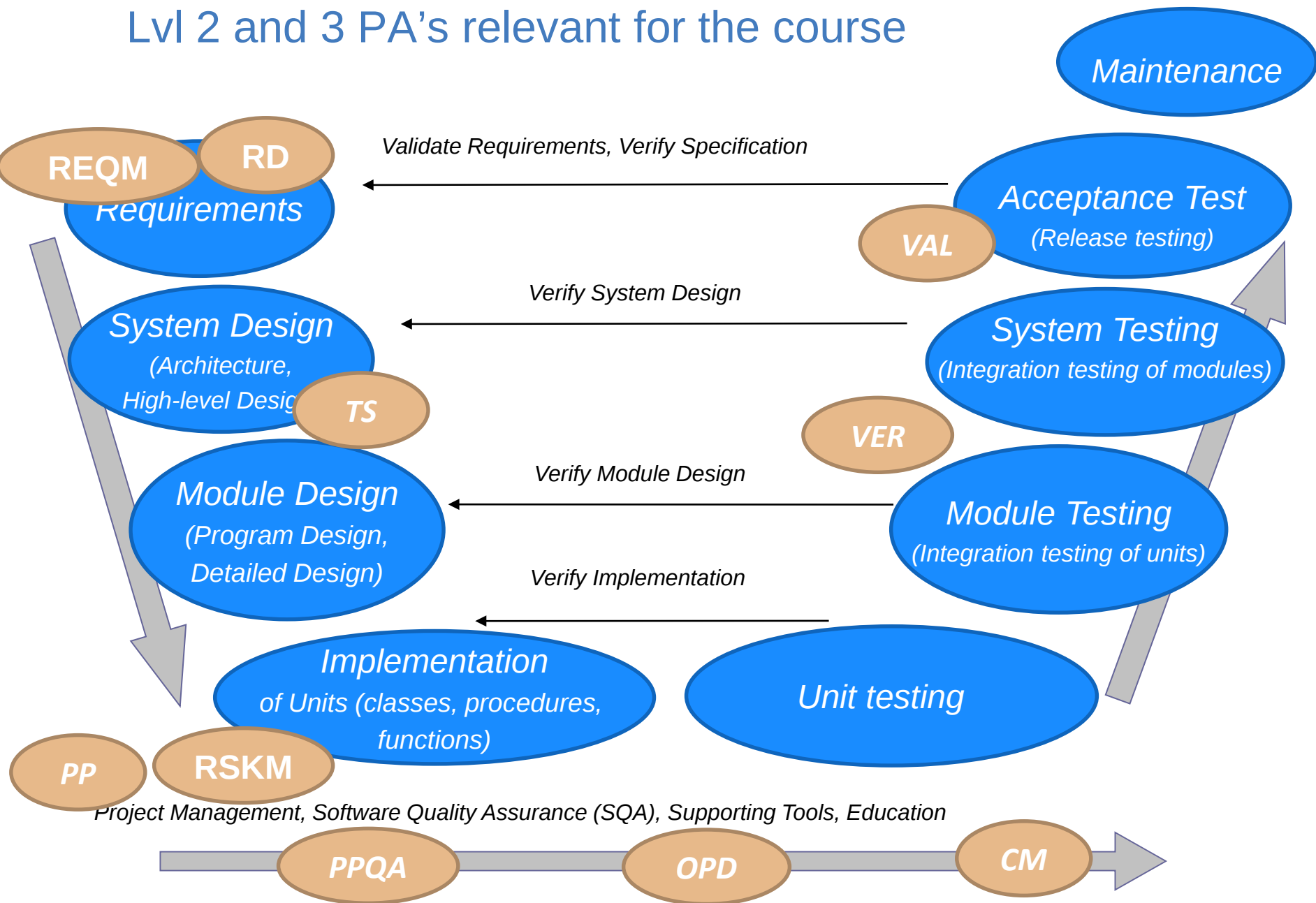
More Mature Requirements Engineering



Requirements Definition

- A Maturity level 3 Process Area
- Purpose: Elicit, analyze, and establish customer, product, and product components requirements
- This means:
 - Investigate the true needs of the customer
 - Formulate functional and non-functional requirements, on relevant product levels
 - Validate requirements

Lvl 2 and 3 PA's relevant for the course



ISO 9000-3

- ISO 9000-3 is guideline to apply ISO 9001 to software industry, which is built on the principles:
- *Principle 1* Customer focus
- *Principle 2* Leadership
- *Principle 3* Involvement of people
- *Principle 4* Process approach
- *Principle 5* System approach to management
- *Principle 6* Continual improvement
- *Principle 7* Factual approach to decision making
- *Principle 8* Mutually beneficial supplier relationships

- ISO = International Organization for Standardization
- The Swedish member: SIS = Swedish Standards Institute (sic!)

Total Quality Management

= *Some
Guidelines to
TQM*

- 
- What's get measured gets done
 - Importance of feed-back
 - Non-personal software
 - Creating a passion for quality
 - Live as you learn
 - Incentive system
 - Involve customers
 - Set prioritized goals
 - Quality is everybody's responsibility
 - Document how you will work with quality
 - Improve continuously

Short intro: <http://managementhelp.org/quality/tqm/tqm.htm>

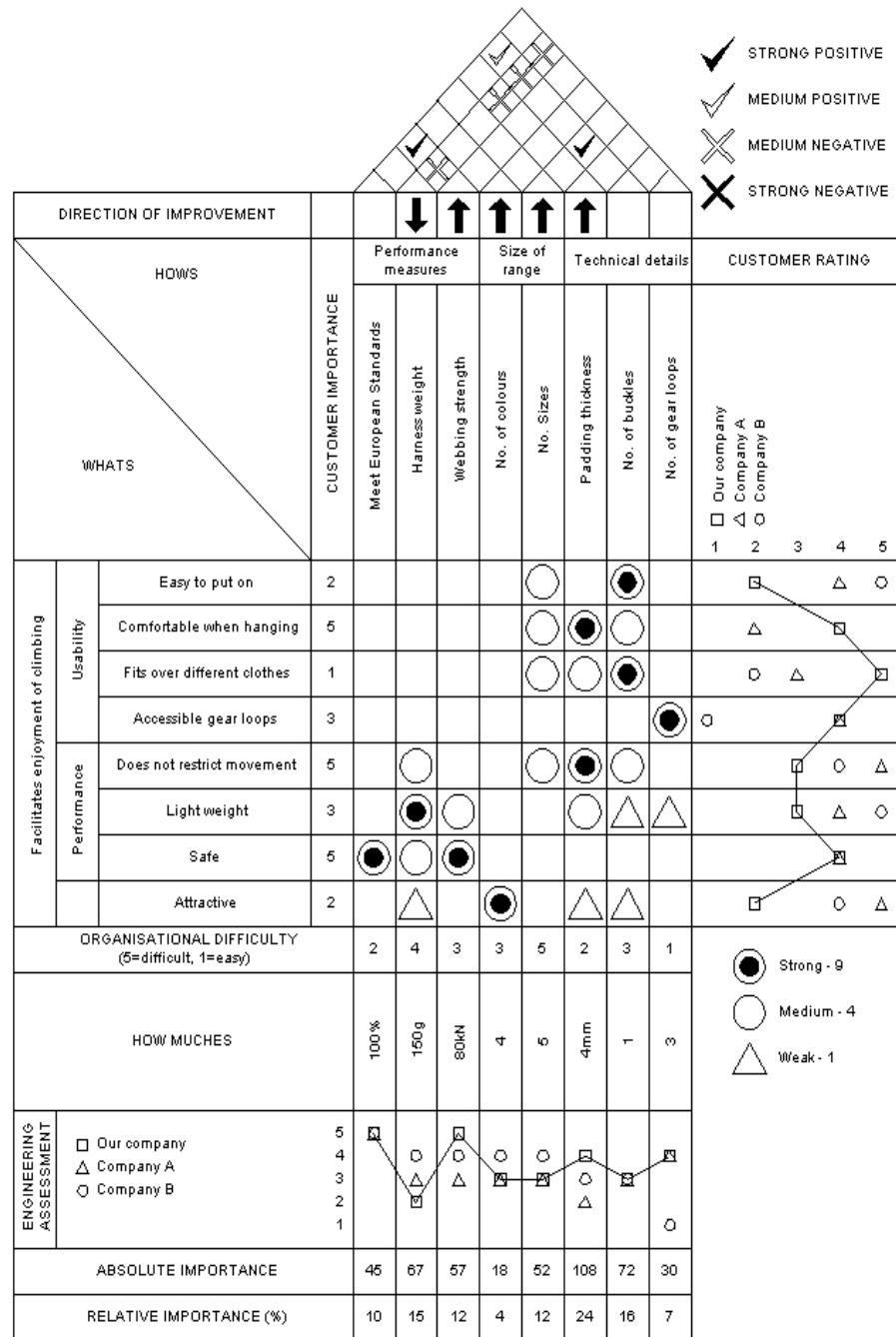
TickITplus



- An interpretation of ISO 9001 and other standards for software,
- a standard set of requirements on the competence and behavior of certification auditors,
- a standardized training course for certification auditors,
- a registration scheme for approved certification auditors,
- a system for accrediting certification bodies for conducting TickIT certifications,
- a logotype to be used on certificates to show TickIT certification.

<http://www.tickitplus.org/default.aspx>

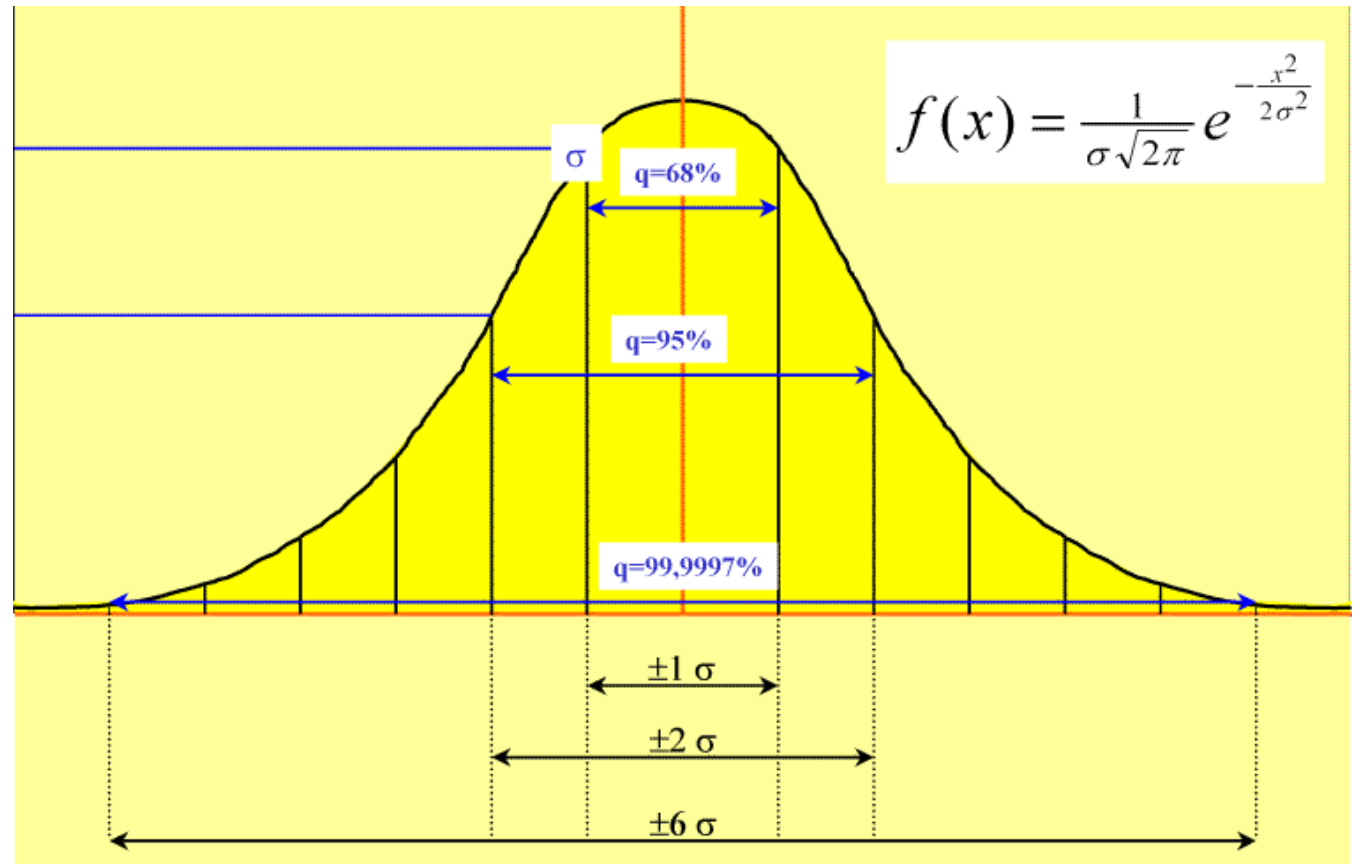
Quality Function Deployment



Six sigma

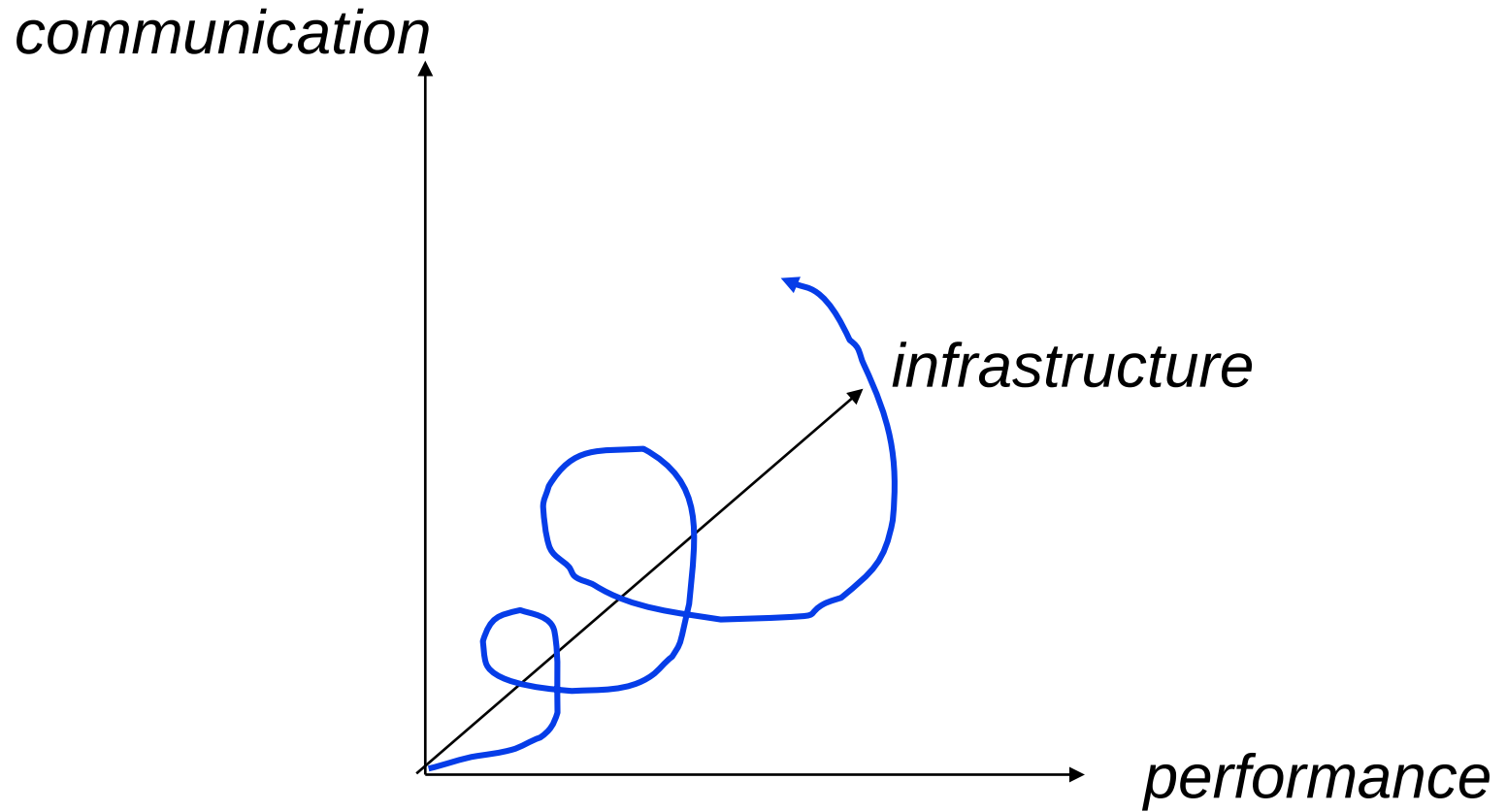
Goal: Reduce waste
Origin and application
in production industry.
Applicability in software
is debated.

My view:
Requires repetition
Requires sampling



<http://www.itil-itsm-world.com/sigma.htm>

Wisdom



www.liu.se