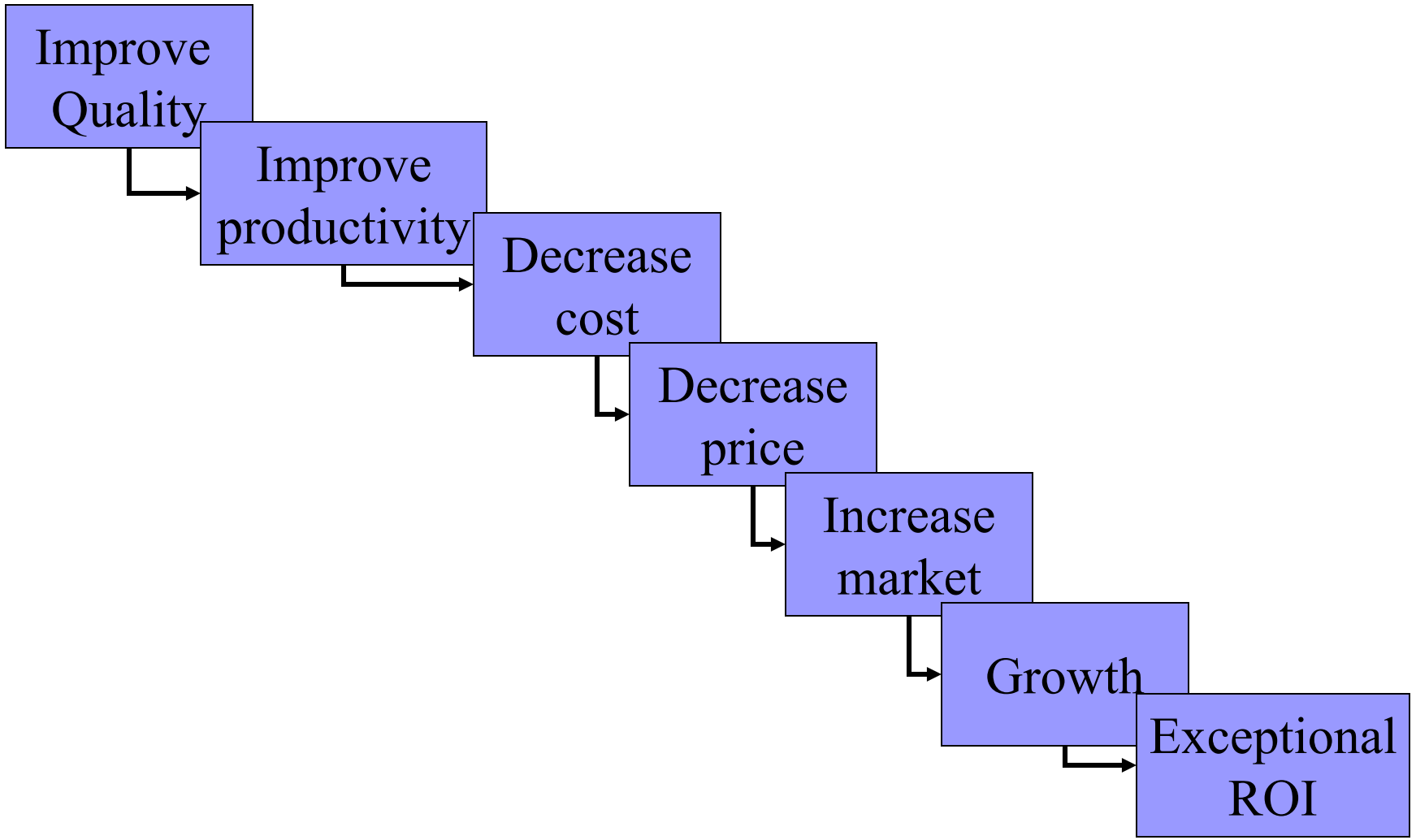
Introduction

Why quality

- Because, Quality is
  - a competitive issue
  - essential for survival
  - essential for global marketing
  - cost-effective
  - retaining customers and increase profits
  - the hall mark of the world class business

Deming's chain reaction



What is Quality ?

- Quality is

  the totality of features and characteristics of a product that bear on its ability to meet stated or implied needs

- Quality equal to customer satisfaction

Quality characteristics & features (ISO/IEC 9126)

- Functionality
- Reliability
- Usability
- Efficiency
- Maintainability
- Portability

Can be objective or subjective

Quality and SW development process

- Q-SW requires Q-Process
  - use best SW Engineering practices
  - be supported by appropriate tools
  - skilled staff with clear tasks and responsibilities
  - emphasize defect prevention
  - clear SOP with evidence that it has been followed (c.f: CMM)
  - use past experiences to improve performance

Quality and support

- Support is as important as the product itself
- It may include
  - user documentation, including on line help
  - packaging & distribution arrangement
  - training
  - help desk assistance
  - error reporting and correction
  - enhancement

ISO-9000 Series

Published by ISO, adopted by CEN, used by 137 countries

- 9001 : Quality system
- 9000- 3 : guidelines for applying 9001 to the development, supply and maintenance of SW
- 9004 : Quality management and quality system elements
- 9004- 2 : guidelines for services
- 9004- 4 : guidelines for quality improvement

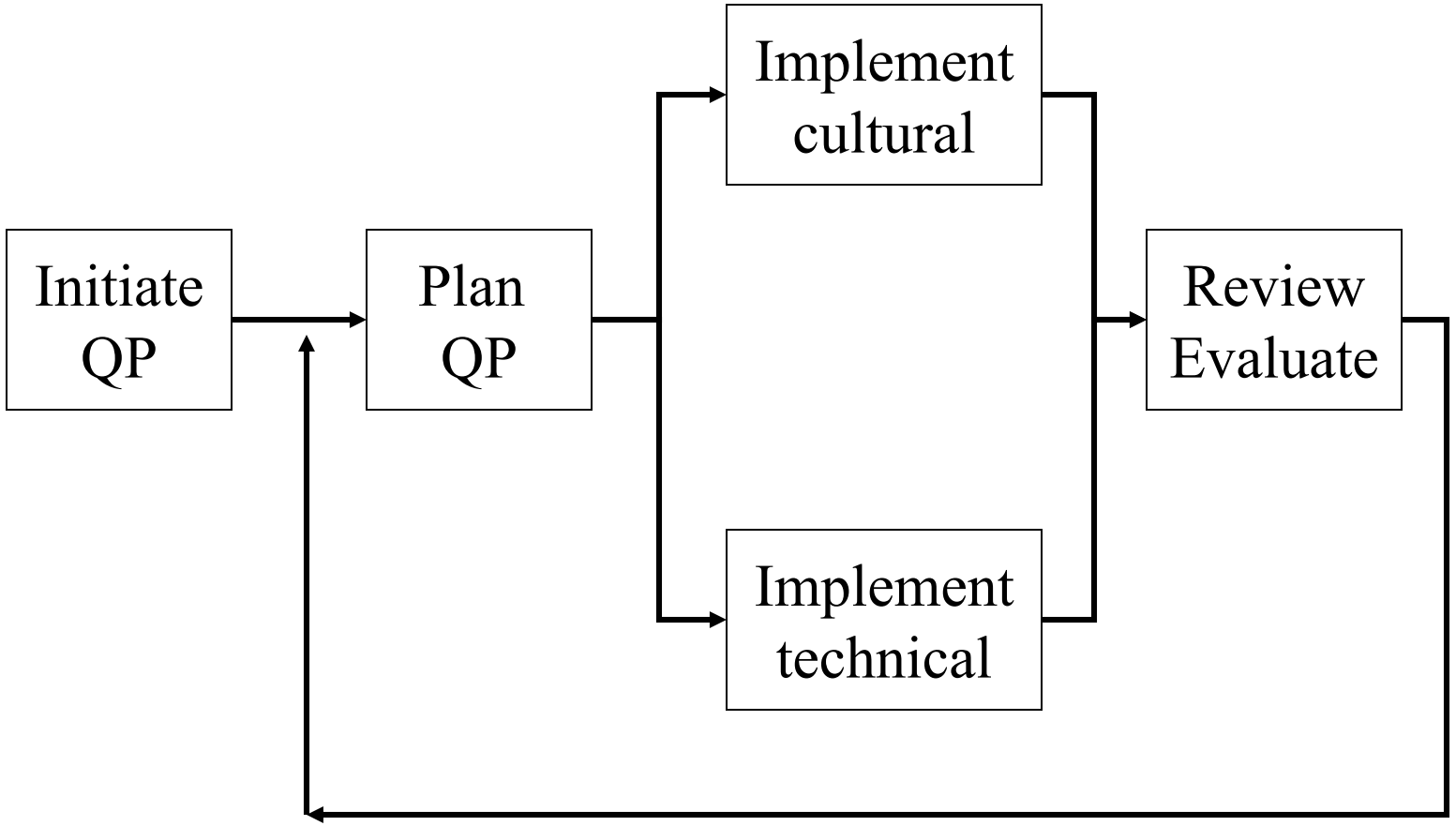
Quality Organization

- Characterized by the following culture:
  - Dedication to customer satisfaction
  - emphasis on continuous improvement
  - treating suppliers as business partners
  - communication and team work
  - empowering employees
  - commitment by top management
- commonly known as TQM

Implementing a Quality System

- Technical aspects
  - developing standard and procedures
  - selecting tools and methods
  - training staff
- Cultural aspects
  - involvement and commitment
  - never-ending improvement

Steps of actions



Initiate a Quality Program

- Prepare a quality policy
  - a clear statement of the organization's commitment to quality and management expectation of the QP
  - the policy must be shared by all members of org. and be implemented at all levels
  - strong commitment from highest level
  - explicit link between quality and cost

Quality support organization

- Comprises:
  - a steering committee (SC)
  - a quality improvement team (QIT)
- SC function
  - set strategic direction and longer term goals
  - establish QIT and oversee its performance
  - authorize and approve budget for the QP
  - provide high-level support for the QP

Quality support organization (2)

- QIT: establish and sustain the QP
  - assessing the organization's needs
  - designing quality system
  - planing and monitoring the implementation
  - communicating the programme to staff
  - support the cultural programme
  - preparing and reviewing procedures and std.
  - Selecting methods and tools
  - establish a programme to measure process, products, and services

Planning Stage

- Includes the following steps
  - assess the organization (identify SW of the org)
  - design the quality system
  - plan the implementation
- yardstick for good practices
  - ISO 9000
  - CMM
  - others: Bootstrap, STD, Trillium

Designing a QS

- Develop the objective
  - typical examples of objectives
    - reduce defects found in testing & operation
    - improve productivity
    - reduce development timescales
    - improve accuracy of estimating and scheduling
    - achieve certification
- Develop the Quality Manual (QM)
  - summarizing how the QS works

Designing a QS

- The Quality Manual explicates
  - what must be done
  - who is to do it
  - when it is to be done
  - how it is to be done
- QM is a top reference regarding how the org. does its business

Designing a QS (2)

- Typically the QM contains
  - the quality policy and objectives
  - organization structure (who manage, perform and verify works affecting quality)
  - description of lifecycle model
  - overview of the QS
  - relationship of the QS with standards
  - reference to detail procedures and standards

Implementation Plan

- The QIT must develop a comprehensive project plan detailing
  - schedules
  - activities
  - milestones
  - deliverables
  - required resources

  for implementing the QS

Implementation Plan (2)

- Typical tasks to be undertaken are:
  - Implementing a cultural program
  - adopting a lifecycle model
  - designing a document control system
  - developing and documenting procedures for each lifecycle phase and for support activities
  - defining and implementing measurement program
  - reviewing and if necessary revising QM
  - quality audit, management review, ISO assessment

Review and Evaluate

- A QS is dynamic; each component of the system must be reviewed regularly
  - organization structure and responsibilities
  - procedures and standards
  - methods and tools
  - resources
- Technique:
  - Quality Audit, Project Review, etc.

Quality Certification

- Issues around certification
  - Competition
  - Equalization of standards
  - Mutual recognition
- Parties involved
  - National Accreditation bodies
  - Quality Association
  - National Standard Bodies

Certification around the world

- UK: NACCB, TickIT
- Europe: EOTC
- US: RAB
- Australia/NZ : JAS-ANZ; QSA
- Japan: JAB
- Singapore: SISIR
- Korea: NCA

SEI-CMM

- Maturity level categorized into 5 levels
  - Initial: process is ad hoc
  - Repeatable: basic process is established
  - Defined: process are documented, standardized and integrated
  - Managed: detailed measures of process and product are collected
  - Optimizing: continuous process improvement