SOFTWARE QUALITY ASSURANCE (SQA)

Chapter 2

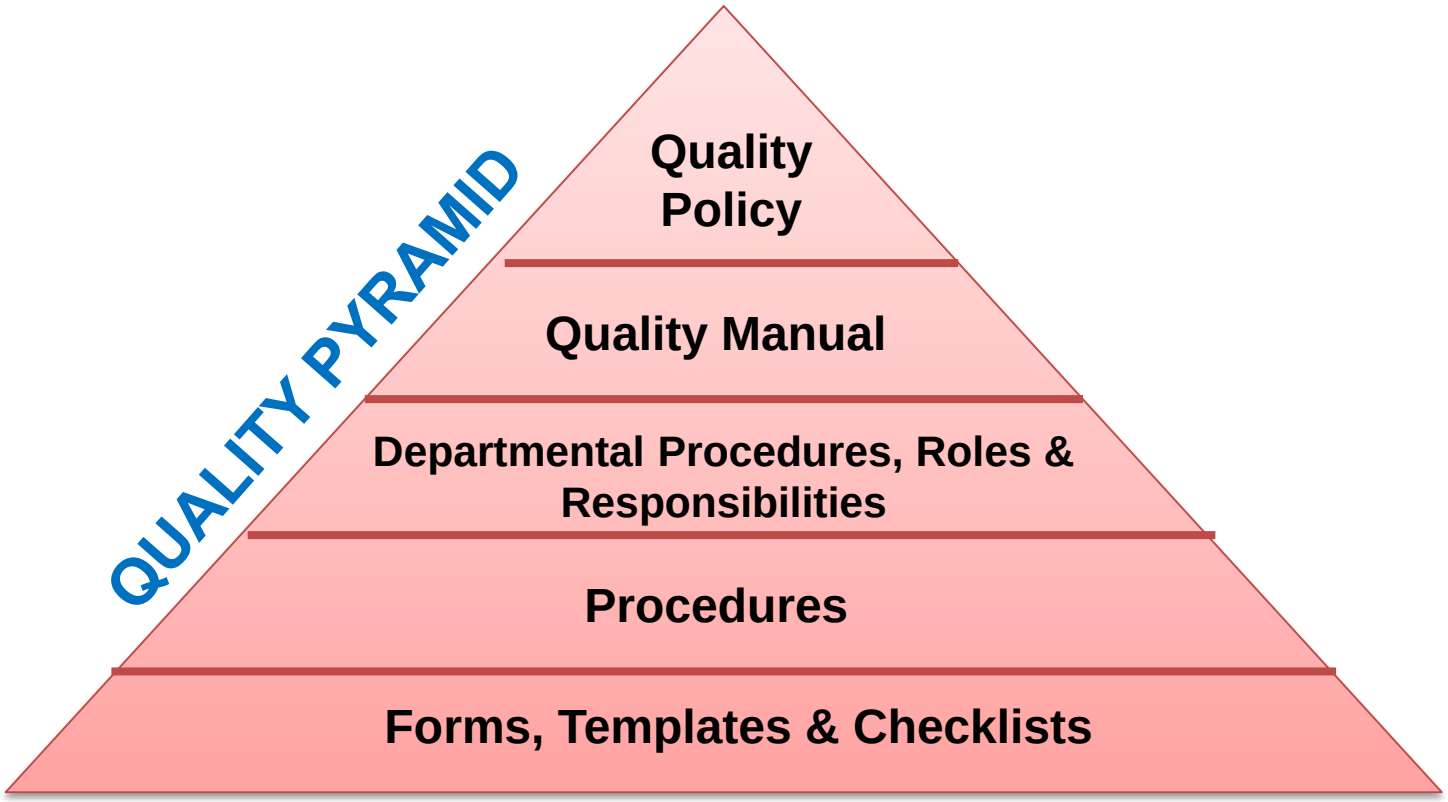
Objectives

- After completing this chapter, you shall be able to
  - ✓Explain what is QMS?
  - ✓Understand and define what is Quality policy
  - ✓Understand the expectations of QMS from relevant stakeholders in an organization
  - ✓Understand the QMS Evaluation activity

MANAGING SOFTWARE QUALITY IN AN ORGANIZATION

QMS in Organization

- What is QMS?
  - QMS is a set of procedures/processes, which as a whole form the basis for executing organization's product/service delivery mechanisms



QMS in Organization

- What is QMS?
  - QMS is a set of procedures. Procedures are at the heart of the quality system. They are the documents, which tell staff how to follow a quality system, day to day, in their work
  - QMS is management's means to establish a uniform and consistent approach to product realization/providing services

Components of a Quality Management Systems

QMS in Organization

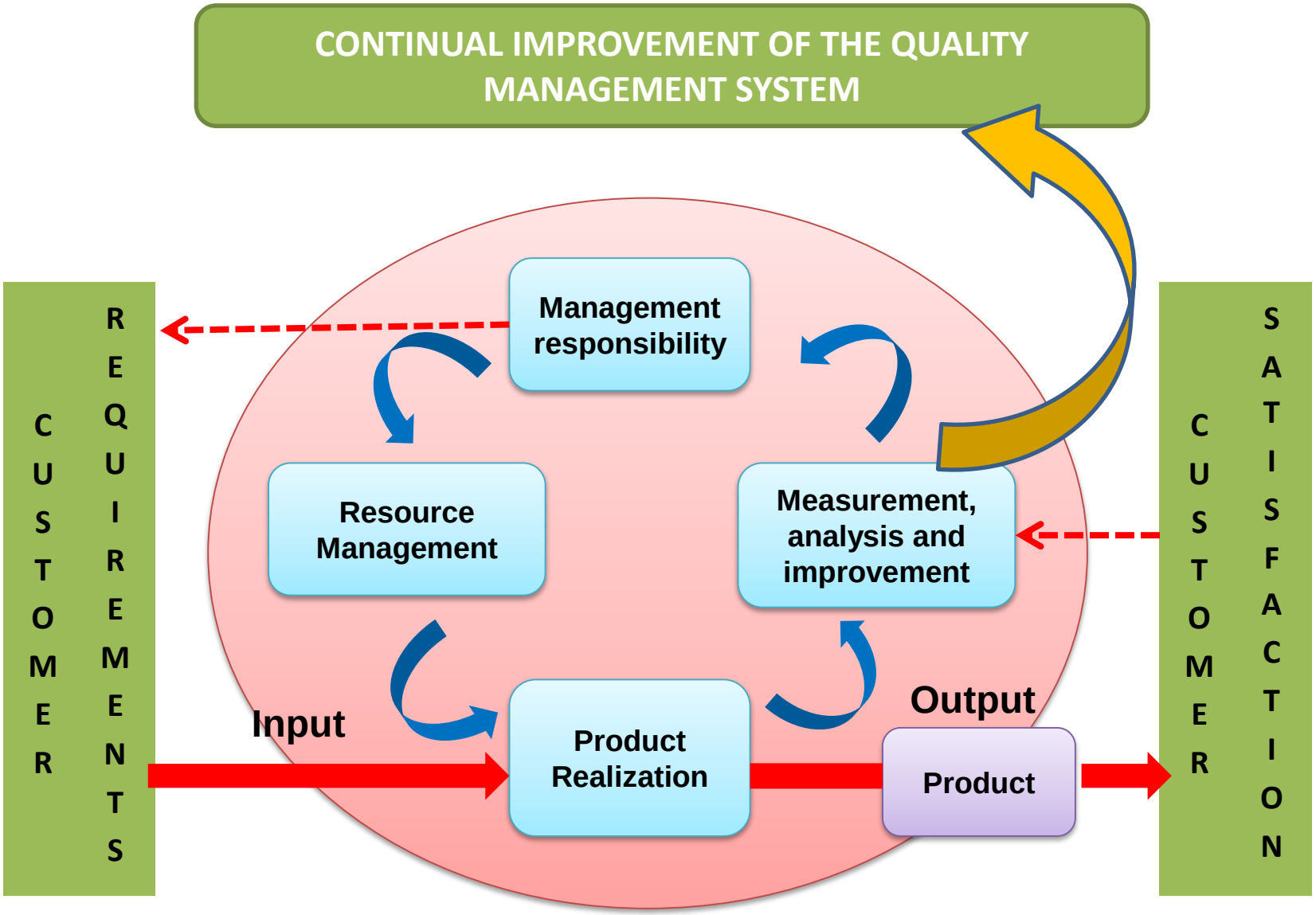
- To ensure that QMS is effective,
  - Software development organizations must keep the practices and tool they use under constant review and make changes in a controlled way
  - Organization's employees need to be properly trained in usage of the QMS
- QMS must ensure that the employees
  - Have the right skills to do their jobs in a professional way
  - Understand their responsibilities and how their work relates to others
- Successful QMS
  - gives great emphasis to early corrective action – cheaper for the software developer to correct errors early in development life cycle
  - Include ways to analyze records and errors to determine their causes and make action plans to prevent errors by eliminating their causes (Root Cause Analysis)

QMS in Organization

- QMS must assure customers and developers that software products and services developed by adhering to the QMS will be of good quality
- QMS should be auditable
  - Development process must be well documented
  - Quality records including suitable measurements must be generated throughout the software development process (example of Quality records: Project Plan review form, Test execution report, etc.)

QMS in Organization

- Processes needed for the QMS include
  - Processes for management activities
  - Provision of resources
  - Product realization
  - Measurement
- A defined process guide the software professionals in orderly way since there are many alternative ways to perform the various tasks involved in the software development lifecycle.



Model of a process-based quality management system

QMS in Organization

- The need for Process Standards and Definitions:
  - Process standardization helps to reduce the problem of training, review, and tool support
  - With standard processes/procedures and methods, each project experiences can contribute to overall process improvement
  - Process standards and definitions provide the basis for process and quality measurements
  - Since process definition takes time and effort to produce, it is impractical to produce new ones for each software development project

QMS in Organization

- Quality Policy
  - An **organization** expresses its **commitment** to Quality through an apex document known as the ‘Quality Policy’
  - A document that states the overall intentions and direction of an organization with regard to quality as formally expressed by top management
  - Quality policy should be a clear statement of the organization’s commitment to quality, and management’s expectation of the quality program
  - Quality Policy should be published and communicated to the employees so that it understood and implemented at all levels in the organization
- Quality Manual
  - Begins with a **Vision and Mission Statement** of the organization committing itself to quality. Next, **device a mechanism that helps deliver** the **solution with the commitment** made

QMS: Various Expectations

1) From the **Project Manager**
   - A QMS should provide facilities whereby a project manager can consider the vast **majority of possible risks**, which could affect a project
   - A QMS should specify **standards**, which will enable staff to report on their activities in a uniform way (formats for monthly status reporting.
   - A QMS should lay down **standards and procedures**, which ensure that **cost and expenditure records from earlier projects are kept** in an easily accessible form
   - A QMS should provide a way of **collecting and analyzing defect statistics** and **data on bugs**. This data can be used in analyzing staff performance; in predicting the pattern of errors in a product when it is released etc.
   - A QMS should contain a **standard project plan** which gives **details about the capabilities of the staff** who are to carry out the project task.

QMS: Various Expectations

2) From **Programmer/Developer**

- QMS should set **coding standards** which determine the way that a software program is to be constructed. Use of coding standards, guidelines make testing and debugging easier
- QMS should provide directions to developer **to store** away **test data and test outcomes** in files (UT). This way, re-programming become easier.
- QMS should **guide** the **developers** and the configuration manager towards **organizing** the entire software **project repository**

QMS: Various Expectations

3) From **Business Analyst**

- QMS should provide a **standard** for the **requirement specification**
- QMS should **provide** a number of **checklists**, which enable the analyst to ensure that features or issues associated with a software system that is to be developed are not forgotten. Such checklist are usually general.
- QMS should **provide a description** of the **processes** involved when an analyst liaisons with a customer

QMS: Various Expectations

4) From Senior Management

- QMS should provide senior managers with **reports of achievements against targets** for each of their projects
- QMS should provide direction on the setting up of **audit trail documentation**
- QMS should provide facilities whereby **reports on defects discovered** during development are issued regularly

QMS: Various Expectations

5) From Human Resource

- The standards for a project plan should insist that the skill level of the staff on the project is properly specified
- QMS should provide instructions on the activities carried out when the project has been completed

QMS: Various Expectations

6) From Customers

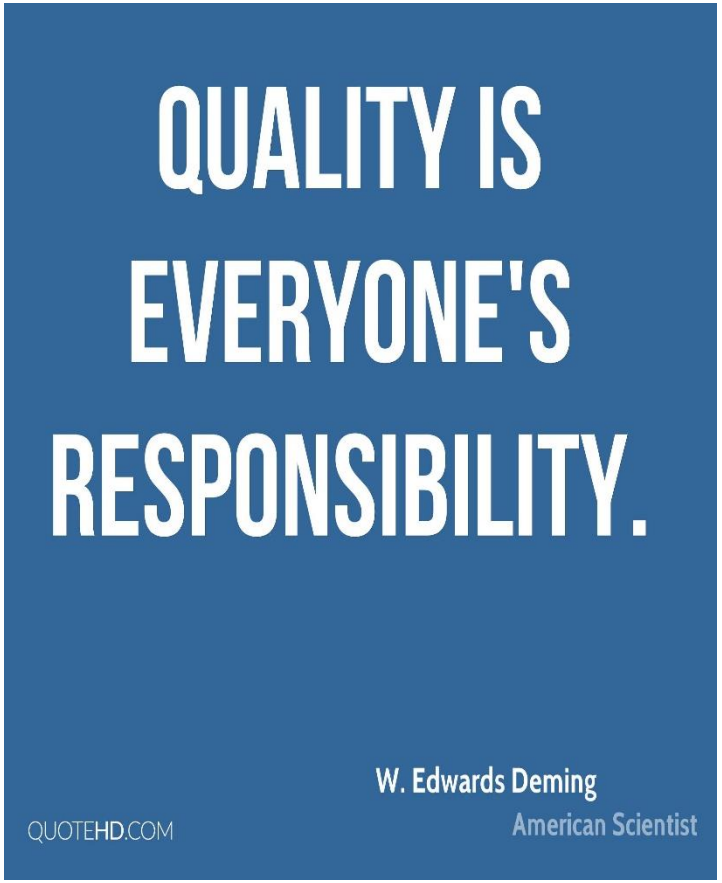
- QMS should provide directives which specify how progress meetings are to be organized
- QMS should provide guidelines about how facilities provided are to be extracted and used as quality controls for a project. This list of controls would be specified in the quality plan. This is often a contractual document or is at least signed off by the customer
- QMS should specify format of reports that are to be sent to the customer concerning progress and how to determine the frequency with which these reports are sent

QMS: Various Expectations

7) From Testers
   - QMS should ensure that the Requirement Specifications are constructed in such a way that system tests can be easily derived and related back to the functions they test
   - QMS should also ensure that procedures and checklists are in place to enable test data and test outcomes to be stored in a project repository
   - QMS should ensure that procedure exists to ensure that those responsible for test planning can check that adequate resources are available during the test phase

QMS Evaluation (Adequacy Audit)

- Quality Management System must get evaluated for its effectiveness
- Quality System Auditor shall visit client organization and evaluate its quality system for adequacy (Adequacy Audit)
- Before embarking upon the final audits by the third party auditing organization, it is important to know whether the company wishing to go for quality certification has an adequate quality system in place.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