
ISO 9000-3:2004

AQC 2004

Presentation Overview

- ◆ ISO 9000-3, What is New, What has Changed
- ◆ Structure of 9000-3
- ◆ How 9000-3 Relates to Other Standards
- ◆ Specific vs. Generic Guidance
- ◆ Guidance on Software Issues

ISO/IEC 9000-3:2004

- ◆ Provides Guidance for organizations in the application of ISO 9001:2000 to the
 - ◆ acquisition,
 - ◆ supply,
 - ◆ development,
 - ◆ operations, and maintenance of computer software and related software services.
- ◆ Does not add or change the requirements in ISO 9001
- ◆ Not intended for use as assessment criteria in QMS registration / certification

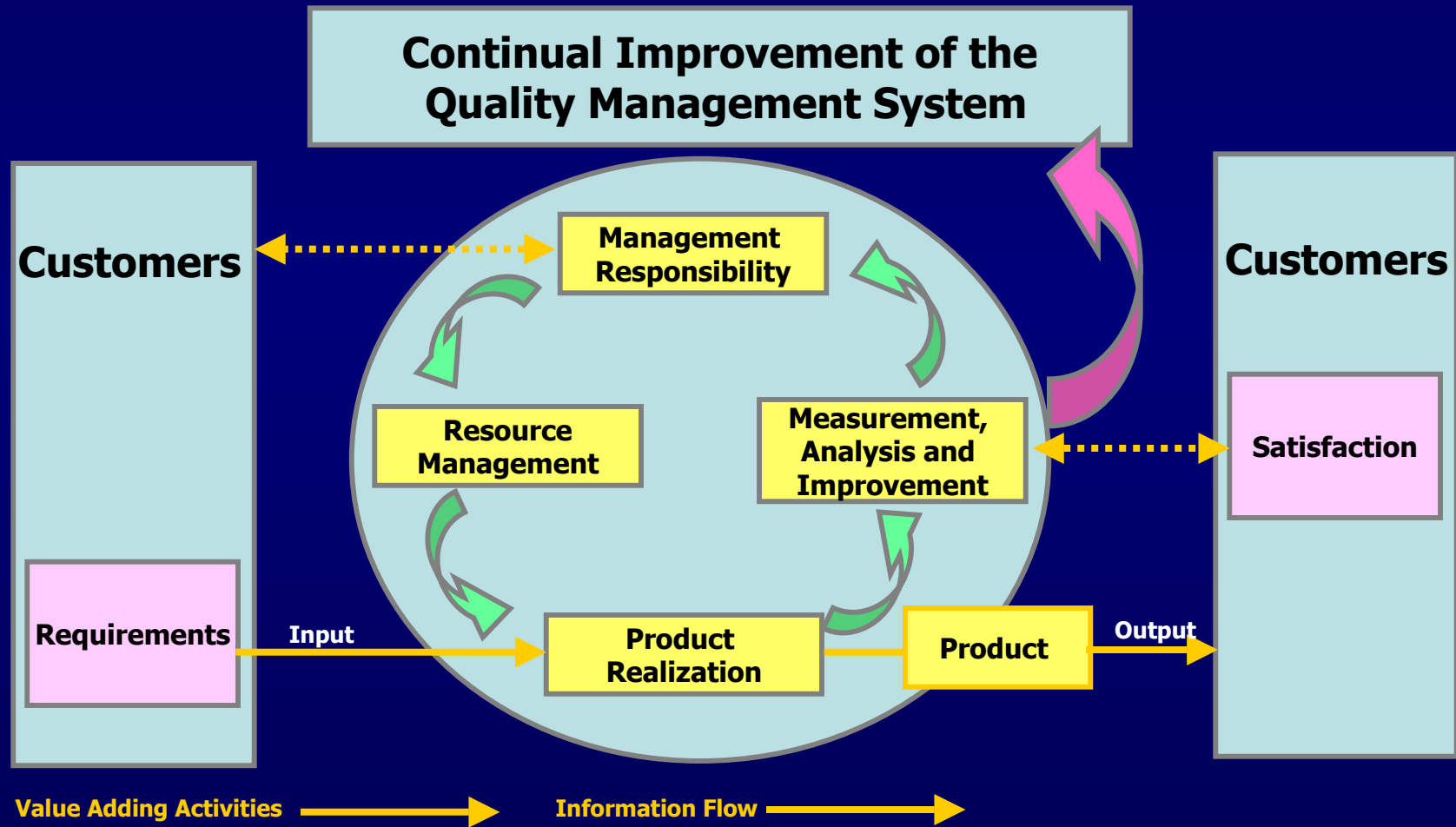
Application of 9000-3

- ◆ Is appropriate to software that is:
 - ◆ Produced as a result of a contract between 2 parties
 - ◆ A software product developed for commercial / retail use, such as
 - ◆ Computer games, office automation software, large scale ERP systems
 - ◆ Used to support the business and/or operational processes of an organization
 - ◆ Embedded in a hardware product and devices, or
 - ◆ Related to software services

ISO/IEC 9000-3 What is New

- ◆ Realignment to ISO 9001:2000
- ◆ Inclusion of direct references to software engineering standards
 - ◆ At standard level
 - ◆ At clause level
- ◆ Improved Guidance
 - ◆ Depth and breadth of detail

ISO 9001:2000



ISO/IEC 9000-3:2004 Structure

- ◆ Quality Management System

- ◆ Management Responsibility

- ◆ Resource Management

- ◆ *Structure of what is done*

- ◆ General Requirements
- ◆ Documentation Requirements

- ◆ *Those who see that it is done*

- ◆ Management Commitment
- ◆ Customer Focus
- ◆ Quality Policy
- ◆ Planning
- ◆ Responsibility, Authority and Communication
- ◆ Management Review

- ◆ *Resources, human and other, to do it*

- ◆ Provision of Resources
- ◆ Human Resources
- ◆ Infrastructure
- ◆ Work Environment

ISO/IEC 9000-3:2004 Structure

◆ Product Realization

◆ *Doing it, i.e., how the product is created from requirements through delivery*

- ◆ Planning of Product Realization
- ◆ Customer-related Processes
- ◆ Design and Development
- ◆ Purchasing
- ◆ Product and Service Provision
- ◆ Control of Monitoring and Measuring Devices

◆ Measurement, Analysis and Improvement

◆ *How you know that you did it, how you know what your customer thinks, and how you'll get better at doing it in the future*

- ◆ General
- ◆ Monitoring and Measurement
- ◆ Control of Non-conforming Product
- ◆ Analysis of Data
- ◆ Improvement

General QMS Documentation

◆ Lifecycle models

- ◆ to “define the sequence and interaction of processes,” though no specific lifecycle model is advocated.

◆ Quality and development planning

- ◆ (“based upon a lifecycle model”);

◆ Descriptions

- ◆ of “processes,” “procedural instructions and/or templates,” “tools, techniques, technologies, and methods.”

◆ Technical topics

- ◆ such as standards or guidance documents for: coding, design and development, testing.”

Management Review

“Beneficial” if the Management Representative
“has experience with software development”

- ◆ To provide input to reviews related to process performance and product conformity, one way to measure
 - ◆ Process performance “is to perform software process assessments”;
 - ◆ Product conformity “is to perform software product evaluation”

Resource Management

- ◆ Personnel shall be competent based on applicable education, training, skills and experience
- ◆ The “technologies employed in software development, operation, and maintenance should be continually monitored and evaluated... to determine requirements for updating staff skills
- ◆ Training may be formal courses, workshops, computer or web-based, or self-study, mentoring, or on-the-job
- ◆ Evaluation of training effectiveness may use product and process metrics to identify areas of performance improvement.

Product Realization

- ◆ Covers everything associated with creating the product:
 - ◆ Planning
 - ◆ Customer-related processes (requirements management, review, and customer communication),
 - ◆ Design and development (planning, reviews, verification and validation, control of changes),
 - ◆ Purchasing
 - ◆ Product servicing (including installation, operations, and maintenance)
 - ◆ “control of monitoring and measuring devices.”

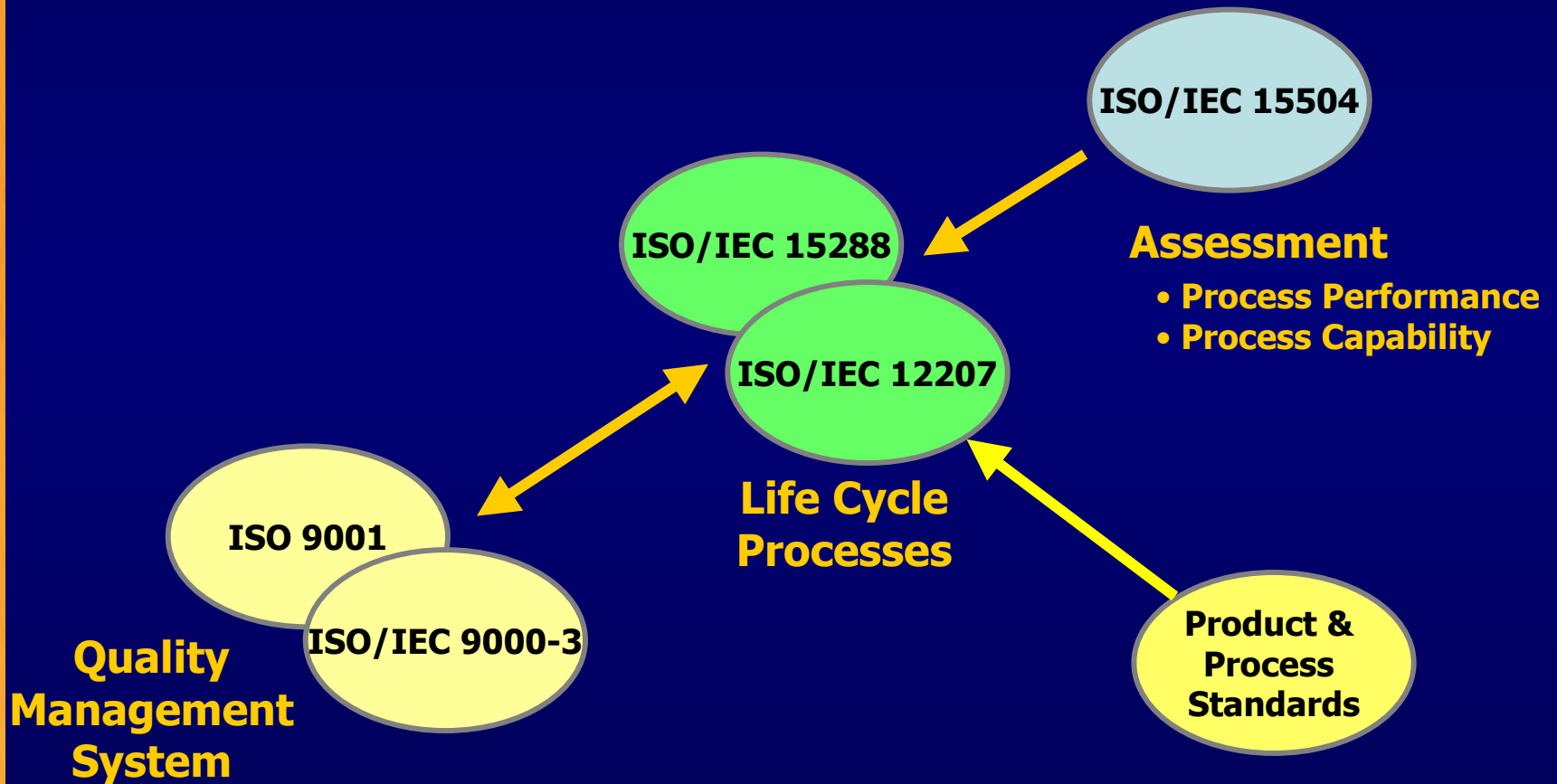
Measurement and Monitoring

- ◆ Client satisfaction (generic guidance)
 - ◆ Help desk call records
 - ◆ Quality in-use metrics
- ◆ Internal audits (generic guidance)
- ◆ Process measurement
 - ◆ Planned and actual duration, cost and quality levels
- ◆ Product measurement
 - ◆ Such as ISO/IEC 9126's "ilities", e.g.,
 - ◆ Functionality
 - ◆ Maintainability
 - ◆ Efficiency
 - ◆ Portability
 - ◆ Usability
 - ◆ Reliability

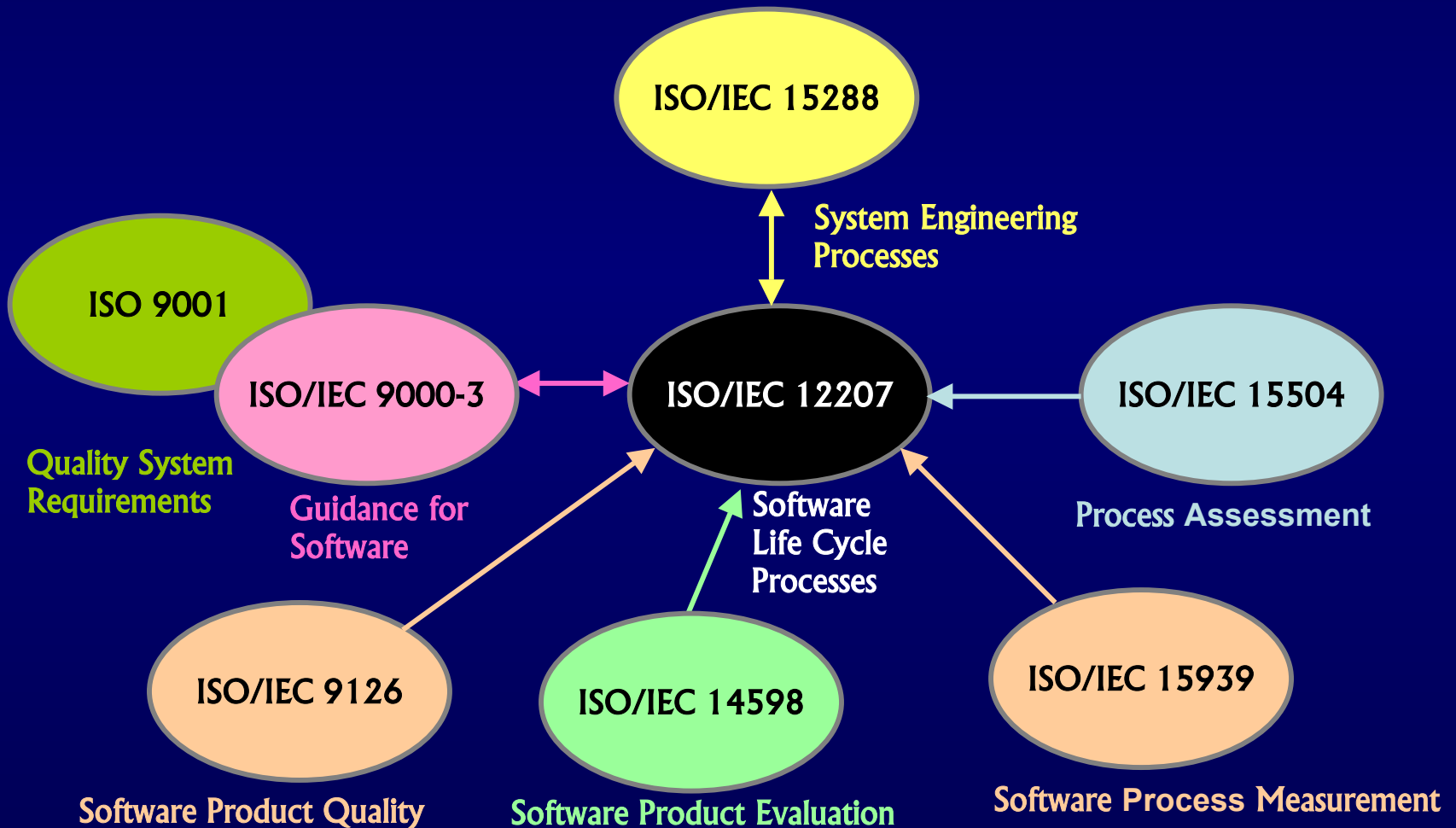
Relationship With Other Standards

- ◆ Provides links with 17 other software engineering standards
- ◆ Linkages provide detailed guidance in software life cycle processes and work products

Relationships Between Key ISO Standards Families



9000-3 & Key Software Standards



Guidance Provided

- ◆ Generic
 - ◆ Applicable to both software and non-software (Approximately 9% of content)
 - ◆ Identified in standard by use of Italics
 - ◆ Example
 - ◆ “testing tools and the environment to be used should be qualified, controlled and any limitations to testing recorded.”
- ◆ Specific
 - ◆ Explicit guidance statement (Approximately 25% of content)
 - ◆ Example
 - ◆ “...free software (such as open source development tools) should be considered as purchased.”
- ◆ Referenced
 - ◆ Reference to another standard or to a specific clause in another standard
 - ◆ Approximately 27% of content
- ◆ ISO 9001 Text
 - ◆ Approximately 39% of content

Guidance - Example

◆ Generic Example

- ◆ “testing tools and the environment to be used should be qualified, controlled and any limitations to testing recorded.”

◆ Specific Example

- ◆ “...free software (such as open source development tools) should be considered as purchased.”

Software Issues – COTS

◆ Acquiring COTS Software

- ◆ COTS may be included in “purchased product”, and therefore should be treated as such
- ◆ Where the organization does not have control over the design of the software it should assure that the COTS satisfies established acceptance criteria

◆ Developing / Maintaining COTS Software

- ◆ requirements may be established
 - ◆ iteratively through evolving releases,
 - ◆ with/through a limited number of customers,
 - ◆ anticipated market needs vs. agreed customer requirements.
- ◆ Organization may choose to specify requirements for purchase of COTS Software.

Software Issues - Viruses

◆ Virus Protection

- ◆ Protection from viruses should be considered where records are kept on electronic media.
- ◆ Planning should include identification of methods of control for virus protection
- ◆ Delivery of software should provide for appropriate level of software virus checking

Control of Records

◆ Conformity to Requirements

- ◆ “test results”, “problem reports”, “change requests”, documents marked with comments”, “audit and assessment reports”, and review and inspection records - such as design reviews, code inspections and walkthroughs.”

◆ Evidence of Effective Operation

- ◆ “changes to resources”, “estimates”, “how and why tools, methodologies, and suppliers were selected and qualified”, “software license agreements”, “minutes of meetings”, and “release records.”

Control of Documents

- ◆ No specific or generic guidance within 9000-3
- ◆ Handled within ISO/IEC 12207
 - ◆ Documentation Process [6.1]
 - ◆ Configuration Management Process [6.2]

12207 – Documentation

- ◆ A plan shall be produced that identifies all documents to be produced
- ◆ Defined method to develop, review, modify and approve documents
- ◆ Roles and responsibilities for document production, storage, distribution and maintenance
- ◆ Core information for each document, such as
 - ◆ Title, purpose, audience, schedule for intermediate and final versions
- ◆ Formatting, publishing and packaging requirements / standards
- ◆ Process for review and approval by qualified / authorized personnel
- ◆ Document masters/ originals shall be stored in accordance with retention, security, maintenance requirements / regulations
- ◆ Controls shall be established in accordance with the Configuration management process

12207 – Configuration Management

- ◆ As it would apply to documentation
 - ◆ Configuration Identification
 - ◆ Document identification scheme
 - ◆ Version and revision identification
 - ◆ Configuration Control
 - ◆ Process for approving and implementing changes to documents placed under CM control (i.e. Baselined Documents)
 - ◆ Configuration Status Accounting
 - ◆ Status reports of all documents

12207 – Configuration Management Cont'd

- ◆ As it would apply to documentation
 - ◆ Configuration Evaluation
 - ◆ Ensure CM controlled documents accurately satisfy their requirements
 - ◆ Ensure resulting software items accurately reflect their technical descriptions (i.e. specification documents)
 - ◆ Release Management & Delivery
 - ◆ release and delivery of documents shall be formally controlled
 - ◆ Handling and Storage of records and original/master documents

Software Issues - Customer / User Participation

- ◆ Customer Representative
 - ◆ To provide information in a timely manner
 - ◆ Act to resolve action items
 - ◆ Represent eventual end-users
 - ◆ Represent executive management
 - ◆ Authority to deal with contractual issues
 - ◆ Reviews requirements

Software Issues -Customer / User Participation

◆ Customer Communications

◆ During Development

- ◆ Joint reviews

- ◆ Product information

- ◆ Enquiries, contracts and amendments

◆ During Operations and Maintenance

- ◆ Product information

- ◆ Enquiries, contracts and amendments

- ◆ Customer feedback

Software Issues - Requirements

- ◆ Determination of Requirements
 - ◆ Defined method for development, agreement, and authorizing and tracking changes to requirements
 - ◆ Methods for evaluating prototypes or demonstrations
 - ◆ Develop requirements in close cooperation with customer / users
 - ◆ Obtain customer's approval
 - ◆ Method for traceability
 - ◆ Iterative development

Software Issues - Requirements Cont'd

- ◆ Project Quality Requirements
 - ◆ Product Quality Requirements
 - ◆ Process Quality Requirements
- ◆ Requirements Review
 - ◆ Organizational concerns
 - ◆ Feasibility of meeting and validating requirements and product characteristics
 - ◆ Technical Risks
 - ◆ Customer Representative

Benefits of ISO/IEC 9000-3

- ◆ Application of authoritative guidance
 - ◆ Reduces risk & consequence of failure
 - ◆ Promotes better communication and understanding between parties
 - ◆ improves visibility and traceability
- ◆ Is independent of:
 - ◆ the technology
 - ◆ the life cycle models
 - ◆ development processes
 - ◆ sequence of activities, and
 - ◆ organizational structures used by an organization

Related Standards

- ◆ ISO/IEC 12207
 - ◆ Software Life Cycle Processes
- ◆ ISO/IEC 9126
 - ◆ Software Quality Characteristics
- ◆ ISO/IEC 14598
 - ◆ Software Product Evaluation
- ◆ ISO/IEC 15939
 - ◆ Software Process Measurement Standard
- ◆ ISO/IEC TR 15504
 - ◆ Software Process Assessment Standard
- ◆ ISO/IEC 12119
 - ◆ Software Packages Quality Requirements and Testing
- ◆ ISO/IEC 15026
 - ◆ Systems and Software Integrity Levels
- ◆ ISO/IEC 15910
 - ◆ Software User Documentation Process
- ◆ ISO/IEC TR 14759
 - ◆ Mock-up and Prototypes
- ◆ ISO/IEC 6592
 - ◆ Guidelines for the Documentation of Computer based Application Systems
- ◆ ISO 10005
 - ◆ Guidelines for Quality Plans
- ◆ ISO 10007
 - ◆ Guidelines for Configuration Management
- ◆ ISO/IEC TR 15846
 - ◆ Software Life Cycle Processes – Configuration Management
- ◆ ISO/IEC TR 15271
 - ◆ Guide to ISO/IEC 12207 Software Life Cycle Processes
- ◆ ISO/IEC 14764
 - ◆ Software Maintenance
- ◆ ISO/IEC 14143
 - ◆ Software Functional Size Measurement
- ◆ ISO/IEC TR 16326
 - ◆ Software Project Management

Q&A

