Contents

1 Quality assurance and standards

- Standards may be international, national, organizational or project based
- Product standards define characteristics that all components should exhibit e.g. a common programming style and how the software process should be enacted

1.1 Importance of standards

- Encapsulation of best practice **avoids repetition** of past mistakes
- Framework for quality assurance process it involves **checking standard compliance**
- **Provide continuity** new staff can understand the organisation by understand the standards applied

1.2 The benefits of using standards

- The ability to **apply methodologies and procedures** of the highest professional level.
- Better **mutual understanding** and coordination among development teams but especially between development and maintenance teams.
- **Greater cooperation** between the software developer and external participants in the project.
- Better understanding and cooperation between suppliers and customers, based on the adoption of standards as part of the contract

2 SQM classes

Characteristics	Quality Management Standards	Project Process Standards
The target unit	Management of software development and/or maintenance and the specific SQA units	A software development and/or maintenance project team
The main focus	Organization of SQA systems, infrastructure and requirements	Methodologies for carrying out software development and maintenance projects
Standard's objective	"What" to achieve	"How" to perform
Standard's goal	Assuring supplier's software quality and assessing its software process capability	Assuring the quality of a specific software project's products

2.1 Certification standards

- Enable a software development organization to demonstrate **consistent ability** to assure acceptable quality of its software products or maintenance services. Certification is granted by an **external body**
- Serve as an agreed-upon basis for customer and **supplier evaluation** of the suppliers quality management system. Accomplished by performance of a quality audit by the customer.
- Support the organization's efforts to improve its quality management system through compliance with the standards requirements.

2.2 Assessment standards

- Serve organizations as a **tool for self-assessment** of their ability to carry out software development projects.
- Serve for **improvement of development** and maintenance processes by application of the standard directions
- Help purchasing organizations **to determine the capabilities** of potential suppliers.
- Guide training of assessor by **delineating qualifications and training program curricula**. its quality management system through compliance with the standards requirements.

3 ISO 9000

International set of standards for quality management. Applicable to a range of organisations from manufacturing to service industries. **ISO 9001**:

- is the current standard to which organisations can be certified
- applicable to organisations which design, develop and maintain products
- is a generic model of the quality process that must be instantiated for each organisation

3.1 ISO 9001 Certification

Quality standards and procedures should be documented in an organisational quality manual. **External body** may certify that an organisations quality manual conforms to **ISO 9001** standards. Customers are, increasingly, demanding that suppliers are **ISO 9001** certified

3.2 ISO 9001 principles

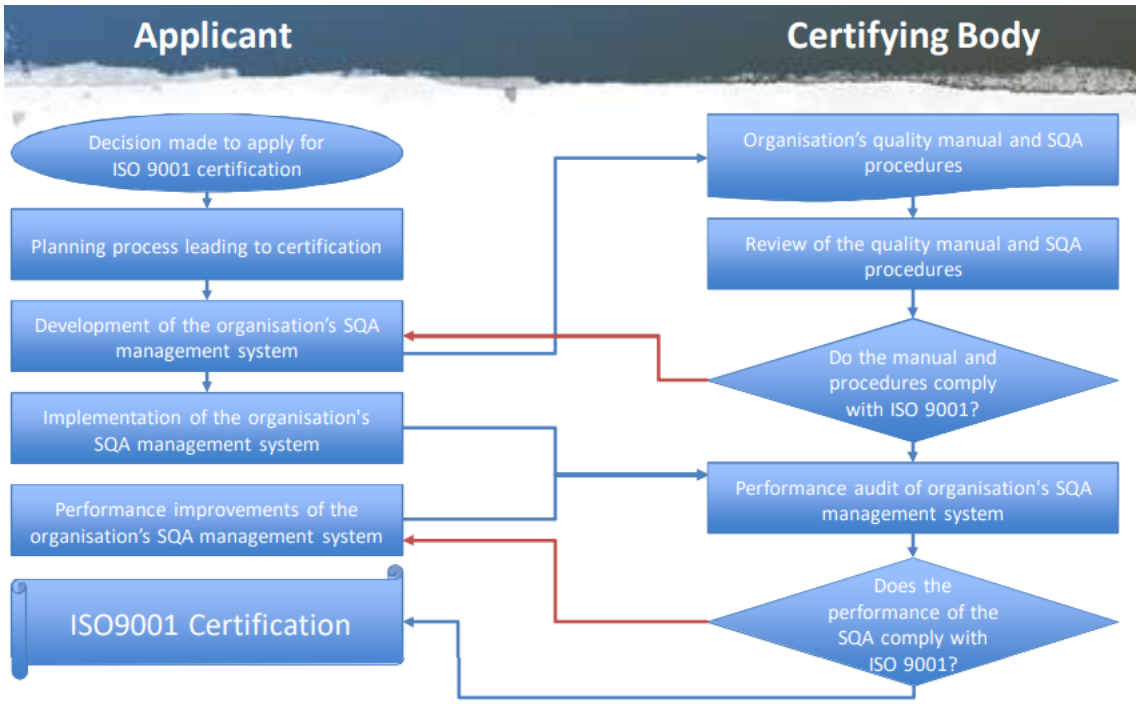
- Customer focus
  - Understand the needs of existing and future customers
  - Align organizational objectives with customer needs and expectations
  - Meet customer requirements
  - Measure customer satisfaction
  - Manage customer relationships
  - Aim to exceed customer expectations
- Leadership
  - Establish a vision and direction for the organization
  - Set challenging goals
  - Model organizational values
  - Establish trust
  - Equip and empower employees
  - Recognize employee contributions
- Involvement of people
  - Ensure that peoples abilities are used and valued
  - Make people accountable
  - Enable participation in continual improvement
  - Evaluate individual performance
  - Enable learning and knowledge sharing
  - Enable open discussion of problems and constraints
- Process approach
  - Manage activities as processes

  - Measure the capability of activities
  - Identify linkages between activities
  - Prioritize improvement opportunities
  - Deploy resources effectively
- Continual improvement
  - Improve organizational performance and capabilities
  - Align improvement activities
  - Empower people to make improvements
  - Measure improvement consistently
  - Celebrate improvements
- Factual approach to decision making
  - Ensure the accessibility of accurate and reliable data
  - Use appropriate methods to analyze data e Make decisions based on analysis
  - Balance data analysis with practical experienc
- Mutually supportive supplier relationships
  - Identify and select suppliers to manage costs, optimize resources, and create value
  - Establish relationships considering both the short and long term
  - Share expertise, resources, information, and plans with partners
  - Collaborate on improvement and development activities
  - Recognize supplier successes

3.3 ISO 9001 Requirements classification

Requirement Subjects	Requirement Subjects
Quality management system	1 General requirements 2 Documentation requirements
Management responsibilities	1 Management commitments 2 Customer focus 3 Quality policy 4 Planning 5 Responsibility, authority and communication 6 Management review
Resource management	1 Provision of resources 2 Human resources 3 Infrastructure 4 Work environment
Product realization	1 Planning of product realization 2 Customer-related processes 3 Design and development 4 Purchasing 5 Production and service provision 6 Control of monitoring and measuring devices
Measurement, analysis and improvement	1 General 2 Monitoring and measurement 3 Control of nonconforming product 4 Analysis of data 5 Improvement

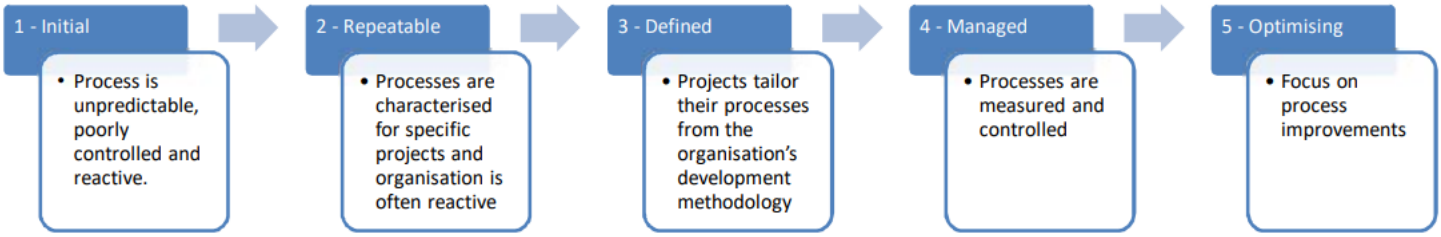
3.4 Certification Process



4 Capability Maturity Model (CMM)

- Quantitative management methods increases the organization's capability to control the quality and improve the productivity.
- Application of the five-level capability maturity model that enables to evaluate the achievements and determine the efforts needed to reach the next capability.
- Generic process areas that define the what not how enables the model's applicability to a wide range of implementation organizations:
  - Allows use of any life cycle model.
  - Allows use of any design methodology, development tool and programming language.
  - Does not specify any particular documentation standard.

4.1 Structure



Reference section

placeholder