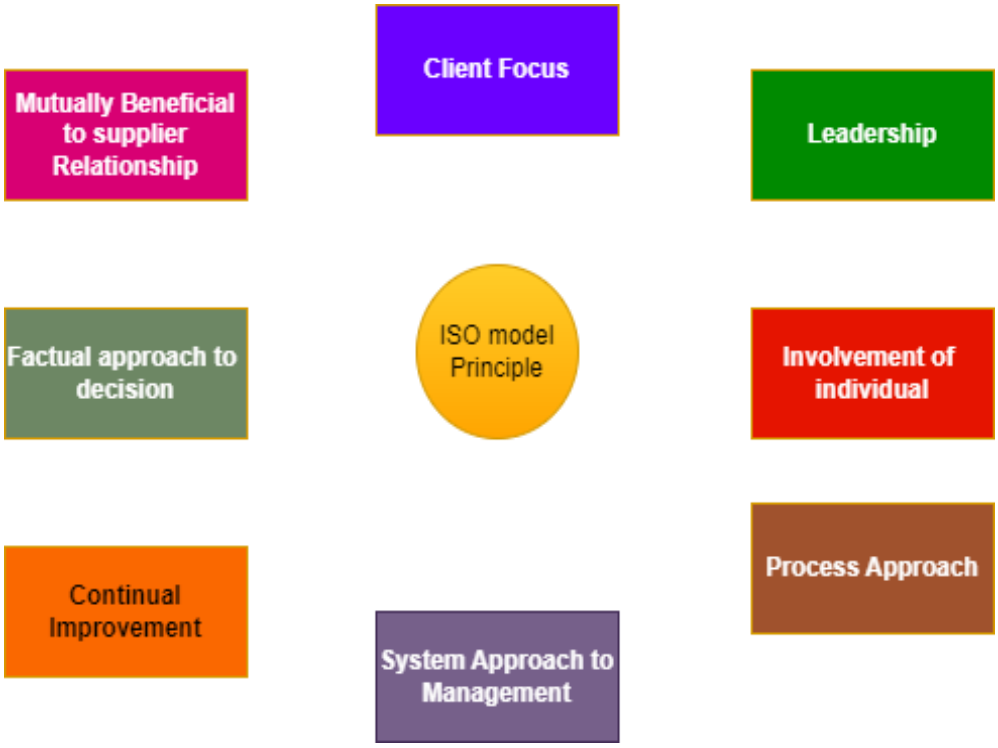
Software Process Improvement – ISO 9000

ISO 9000 is a family of quality management standards defined by the International Standards Organization and implemented by over half a million organizations around the world. Quality management refers to the practices performed by an organization in order to fulfill the customer's requirements (and any legal or regulatory requirements). The goal of quality management is to improve customer satisfaction, while at the same time continually improving the performance of the organization.

Every ISO 9000 standard defines a set of minimum "pass or fail" standards that are used to judge whether an organization is in compliance. ISO standards, like the CMM, have a certification process in which an organization's practices are assessed by a third-party assessor who audits the organization's compliance with the quality system, and whether that system is effective. The result of the audit is a set of recommendations for changes to be made, in order to bring the organization into compliance.

ISO 9000 is based on eight core principles:



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- **C:** Client Focus
- **L:** Leadership
- **I:** Involvement
- **M:** Mutually Beneficial Supplier Relationships
- **P:** Process Approach
- **S:** System Approach to Management
- **A:** Factual Approach to Decisions
- **F:** Continual Improvement
- **R:** Relationships (or Results)

1. **Client Focus: Organizations must focus on their customers by understanding current and future customer needs.**

   Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations. Key benefits include:

   a. Increased revenue and market share obtained through flexible and fast responses to market opportunities.
   b. Increased effectiveness in the use of the organization's resources to enhance customer satisfaction and Improved customer loyalty leading to repeat business.

2. **Leadership: Leaders within the organization must create and maintain an environment in which people can become involved and fulfill the organization's objectives**

   Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives. Key benefits include:

   a. People will understand and be motivated towards the organization's goals and objectives;
   b. Activities are evaluated, aligned and implemented in a unified way; and
   c. Miscommunication between levels of an organization will be minimized.

3. **Involvement of Individual: People at all levels are important to the organization.**

   People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit. Key benefits include:

   a. Motivated, committed and involved people within the organization;
   b. Innovation and creativity in furthering the organization's objectives;
   c. People being accountable for their own performance; and
   d. People eager to participate in and contribute to continual improvement.

4. **Process Approach: Activities and resources are best managed as a process.**

A desired result is achieved more efficiently when activities and related resources are managed as a process. Key benefits include:

a. Lower costs and shorter cycle times through effective use of resources;
b. Improved, consistent and predictable results; and
c. Focused and prioritized improvement opportunities

5. **System Approach to Management: Organizations have many interrelated processes, which must be understood and managed as a system.**

Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives. Key benefits include:

a. Integration and alignment of the processes that will best achieve the desired results;
b. Ability to focus effort on the key processes; and
c. Providing confidence to interested parties as to the consistency, effectiveness and efficiency of the organization.

6. **Continual Improvement: The organization should continually improve its performance.**

Continual improvement of the organization's overall performance should be a permanent objective of the organization. Key benefits include:

a. Performance advantage through improved organizational capabilities;
b. Alignment of improvement activities at all levels to an organization's strategic intent; and
c. Flexibility to react quickly to opportunities.

7. **Factual Approach to Decisions: Decisions should be well informed and based on real data and information.**

Effective decisions are based on the analysis of data and information. Key benefits include:

a. Informed decisions;
b. An increased ability to demonstrate the effectiveness of past

decisions through reference to factual records; and

c. Increased ability to review, challenge and change opinions and decisions.

8. **Mutually beneficial supplier relationships: An organization and its suppliers are in a mutually beneficial relationship**

   An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value. Key benefits include:

   a. Increased ability to create value for both parties;
   b. Flexibility and speed of joint responses to changing market or customer needs and expectations; and Optimization of costs and resources.

The ISO 9000-3 standard contains a set of guidelines that interprets ISO 9000 so that it can be applied to the development, supply, and maintenance of software. It is divided into sections that define standards for many areas of a software organization, including management practices, the quality system, contracts, document and data control, inspection, training, deployment, process control, and the design and development of the software.

Each of the sections contains standards for the day-to-day work that goes on in the organization. For example, within the software development and design section are standards for

software development, software design, design and development planning, organizational and technical interfaces and design review, verification, validation, and change control.

Each of these standards defines specific practices that must be implemented in the organization. For example, the software development requirements require that a project plan be developed. This plan must define the project, list its objectives, contain a project schedule, define the inputs and outputs, identify related plans and projects, identify project risks, and identify assumptions. These requirements should seem familiar: they are all part of the project plan.

Like the CMM, the ISO standards can be abused by an organization and reduced to bureaucracy and paper pushing. There is a great deal of pressure on many organizations to achieve an ISO 9000 certification at any cost, since they may be ineligible for certain contracts without it. However, when the standards are used properly, they can provide

good guidelines to a project manager looking to improve how her organization builds software.

References

https://www.iso.org/home.html

Applied Software Project Management – Chapter 12