✔ Introduction

To assure the quality, one has to ensure quality. To ensure the quality it is necessary to make systematic controls at every stages and also take critical review of efforts and achievements of the company with respect to the quality of the product. For making systematic controls, co-opeartion of every employee is needed, since quality depends on every person working in the organization as already explained in spiral process of quality. Every employee's involvement is the most important in understanding the problems, finding solutions and implementing them. All these actions would lead to mentain and improve quality and reliability of the product. The software developer can assure the quality of the software product and can guarantee its performance with full confidence. Second quality assurance system thus helps to improve the quality of the products and hence the reputations of the firm and better customer relations. Software quality concerns are quite broad, including, for example, correctness, robustness, readability. There is no single monolithic measure of software quality and no general agreement about how to quantify definitely any of the key quality concerns. The actual level of quality achieved in practice is dictated by quality assessment tools and technologies and willingness to pay for applying them.

To meet the software quality challenges, research must first meet some substantial challenges. It is necessary to improve the current tools, technologies and their cost benefit characterizations. But researchers msut also take the lead in looking beyond past development putting to study the tools and technologies for building inherent quality into software. New analysis and design technologies will have to play a greater role in achieving and demonstrating the quality of software, increasingly reducing dependence upon after the fact testing technologies.

A software failure occurs when a piece of software does not perform as required and as expected. A software fault is a **malformation** whose execution causes a failure and an error is a flow in human reasoning and performance that leads to the creation of fault. When examined closely we see that a software failure is a deviation of the execution of a program from its intended behaviour.

Software process improvement is widely discussed in practice. But software product quality is not a major focus of most process assessment and evaluation activities. The small software process technology community seems uninterested in process based integration of testing and analysis although there is an important opportunity to do this. The use of formal methods has been growing steadily in recent years. In applications, where human life and national security are at stake formal methods have not uncommonly been applied often to good effect. Wider use of this technology have been observed increasingly in recent years.

✓ Software Quality Factors Specifications

To goal of this stage is to define the factors that contribute to the quality of the candidate system. Several factors determine the quality of a system.

1. **Correctness :** The extent to which a program meets system specifications and user objectives.
2. **Reliability :** The degree to which the system performs its intended functions over a time.
3. **Efficiency :** The amount of computer resources required by a program to perform a function.
4. **Usability :** The effort required to learn and operate a system.
5. **Maintainability :** The ease with which program errors are located and corrected.
6. **Testability :** The effort required to test a program to ensure its correct performance.
7. **Portability :** The ease of transporting a program from one hardware configuration to another.
8. **Accuracy :** The required precision in input editing, computations, and output.
9. **Error Tolerance :** Error detection and correction versus error avoidance.
10. **Expandability :** Ease of adding or epxanding the existing database.

✔ International Standard Organization (ISO)

The International standard organization is world wide federations of national standards bodies from some 100 countries. ISO is a non-governmental organization established in 1947.

ISO 9000 series of standards on quality system was formulated by international organization for standardization in order to meet the requirements of internationally uniform quality system. The European Nation Trade has reached an understanding that the post 1992 trade transactions would be dealt only with those companies who have registered ISO 9000 quality system.

The developed countries started producing their own standards for specifying the variety of products manufactured in 1972, BSI UK published BS 4891 and guide to quality systems.

It concerned the following :

1. Management involvement and objectives
2. Programming and planning
3. Principles of quaity control
4. Design and specification control
5. Purchasing control and vendor appraisal
6. Production control
7. Marketing and service quality function
8. Documentation
9. Defect and failure analysis
10. Non-conformance control

MIL standards were introduced in 1974. In 1975, BSI published BS 5179 in three parts drawn form the contents of defence standards OS-21 series. This standard was not written in mandatory terms but was used by the major purchased for evaluation and selection of their vendors.

International, standard organization (ISO) revised and issued BS : 5750 in 1987 as ISO 9000 series of standards on quality system. Since then many countries have produced their own standards in exact replicated of ISO 9000 series.

ISO 9000 quality standards stipulate certain management practices as guideline and minimum requirement for making quality of products and services conforming to the needs of customers. These are developed for facilitating international exchange of goods and services. All these systems are essentially self disciplined standards based on the principles of hormonization of specifications and continuous surveillance by third party.

ISO : 84201 IS : 13999	Vocabulary
ISO : 9001 CIS : (4000)	Selection and use of quality system standard

Non Contractual situation

ISO : 9004 CIS : 14004	Quality Management System Standard