

Introduction

- **Software maintenance is the last stage of software life cycle.**
- **After the product has been released, the maintenance phase keeps the software up to date with environment changes & changing user requirements.**
- **It consumes about 40-70% of the cost of the entire life cycle.**
- **Typically, the development cycle for a software product spans 1 or 2 years, while the maintenance phase spans 5 to 10 years.**

What is software maintenance

- **Software maintenance is a very broad activity that includes error corrections, enhancement of capabilities, deletion of obsolete capabilities, and optimization.**
- **As per IEEE, it is modification of software product after delivery to correct faults, to improve performance or other attributes or to adapt the product to a modified environment.**

Need for maintenance

- **Correct errors.**
- **Change is user requirement with time.**
- **Changing hardware and software environment.**
- **To improve system efficiency.**
- **To modify the components.**
- **To optimize the code to run faster.**

Aim of software maintenance

- **To correct errors.**
- **To enhance the software by changing it's function**
- **To update the software.**
- **To adapt software to cope with changes in the environment.**

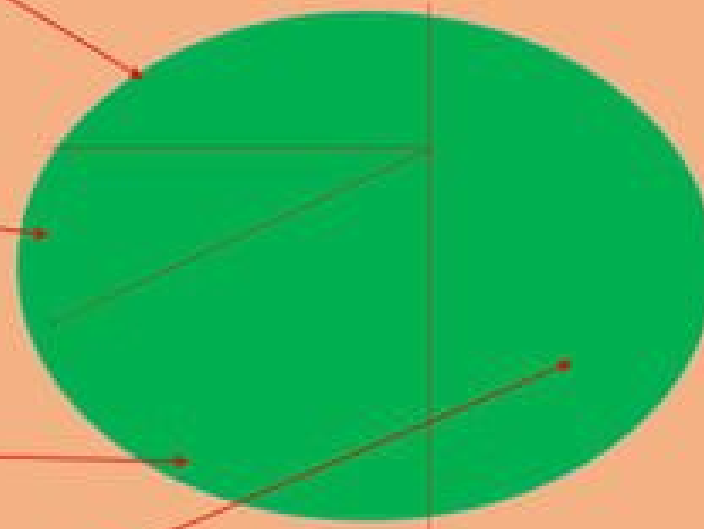
Software maintenance

- **Corrective(21%)**

Preventive(4%)

Adaptive(25%)

Perfective(50%)



Enhancing Maintainability During Development

- **Analysis activities** :The analysis phase of software development is concerned with determining customer requirements and constraints, and establishing feasibility of the product.
- **Standards and guidelines** :various types of standards and guidelines can be developed to enhance the maintainability of software.
- **Design activities** :Architectural design is concerned with developing the functional components, conceptual data structures and interconnection in a software system.

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- **Implementation activities** :Implementation, like design, should have the primary goal of producing software that is easy to understand and easy to modify.
- **Supporting documents** :There are two particularly important supporting documents that should be prepared during the software development cycle in order to ease maintenance activities.
- Every delivered software product should be accomplished by a test suite.

Managerial Aspects Of Software Maintenance

- **Change control board** : The change control board reviews and approves all change request.
- The board may deny a request, recommend a modified version of the change, or approve the change as submitted.
- **Change request summaries** : The status of change requests and software maintenance activities should be summarized on a weekly or monthly basis.

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- **Quality assurance activities** :The primary function of a quality assurance group during software maintenance is to ensure that software quality does not degrade as a result of maintenance activities.
- **Organizing maintenance programmers** :Software maintenance can be performed by the development team or by members of a separate organization.

Configuration Management

- **Configuration management is concerned with tracking and controlling of the work products that constitute a software product.**
- **During product development, the various milestone reviews result in formal acceptance of work products such as the project plan, the requirements specifications, the test plan, the user's manual, the design documentation, and the source code.**

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- **Configuration management data bases:** software tools to support configuration management include configuration management data bases and version control library systems.
- **Version control libraries :** A version control library may be part of a configuration management data base, or it may be used as a stand-alone tool.
- The Revision control system (RCS) is one example of a version control library system.