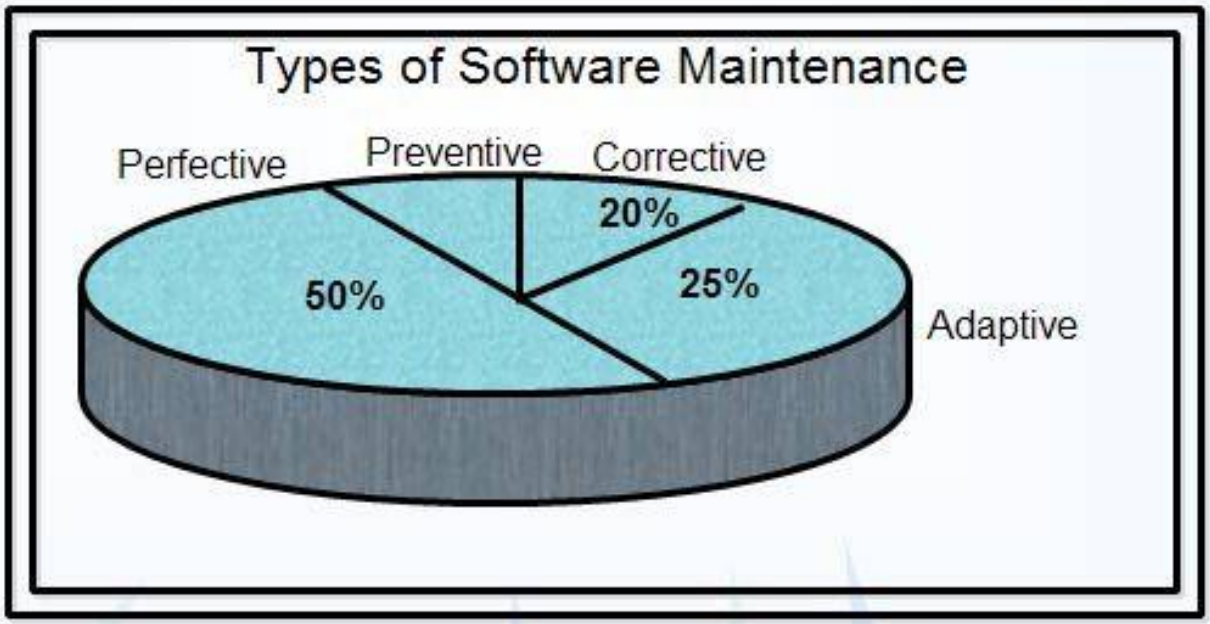
Maintenance - Definition

- Software maintenance is a part of Software Development Life Cycle.
- Its main purpose is to modify and update software application after delivery to correct faults and to improve performance.
- Software is a model of the real world. When the real world changes, the software requires alteration wherever possible.

Description

- Software maintenance is a vast activity which includes optimization, error correction, deletion of discarded features and enhancement of existing features.
- Since these changes are necessary, a mechanism must be created for estimation, controlling and making modifications.
- The essential part of software maintenance requires preparation of an accurate plan during the development cycle.
- Typically, maintenance takes up about 40-80% of the project cost, usually closer to the higher pole.
- Hence, a focus on maintenance definitely helps keep costs down.

Types of maintenance



Corrective Maintenance

- Corrective maintenance is concerned with fixing errors that are observed when the software is in use.
- Corrective maintenance deals with the repair of faults or defects found in day-today system functions.
- A defect can result due to errors in software design, logic and coding.
- Design errors occur when changes made to the software are incorrect, incomplete, wrongly communicated, or the change request is misunderstood.

Corrective Maintenance

- Logical errors result from invalid tests and conclusions, incorrect implementation of design specifications, faulty logic flow, or incomplete test of data.
- All these errors, referred to as residual errors, prevent the software from conforming to its agreed specifications.
- Note that the need for corrective maintenance is usually initiated by bug reports drawn by the users.

Corrective Maintenance

- In the event of a system failure due to an error, actions are taken to restore the operation of the software system.
- The approach in corrective maintenance is to locate the original specifications in order to determine what the system was originally designed to do.
- However, due to pressure from management, the maintenance team sometimes resorts to emergency fixes known as patching.
- Corrective maintenance accounts for 20% of all the maintenance activities.

Adaptive Maintenance

- Adaptive maintenance is the implementation of changes in a part of the system, which has been affected by a change that occurred in some other part of the system.
- Adaptive maintenance consists of adapting software to changes in the environment such as the hardware or the operating system.
- The term environment in this context refers to the conditions and the influences which act (from outside) on the system.
- For example, business rules, work patterns, and government policies have a significant impact on the software system.

Adaptive Maintenance

- For instance, a government policy to use a single 'European currency' will have a significant effect on the software system.
- An acceptance of this change will require banks in various member countries to make significant changes in their software systems to accommodate this currency.
- Adaptive maintenance accounts for 25% of all the maintenance activities.

Perfective Maintenance

- Perfective maintenance mainly deals with implementing new or changed user requirements.
- Perfective maintenance involves making functional enhancements to the system in addition to the activities to increase the system's performance even when the changes have not been suggested by faults.
- This includes enhancing both the function and efficiency of the code and changing the functionalities of the system as per the users' changing needs.

Perfective Maintenance

- Examples of perfective maintenance include modifying the payroll program to incorporate a new union settlement and adding a new report in the sales analysis system.
- Perfective maintenance accounts for 50%, that is, the largest of all the maintenance activities.

Preventive Maintenance

- Preventive maintenance involves performing activities to prevent the occurrence of errors.
- It tends to reduce the software complexity thereby improving program understandability and increasing software maintainability.
- It comprises documentation updating, code optimization, and code restructuring.
- Documentation updating involves modifying the documents affected by the changes in order to correspond to the present state of the system.
- Code optimization involves modifying the programs for faster execution or efficient use of storage space.
- Code restructuring involves transforming the program structure for reducing the complexity in source code and making it easier to understand.

Preventive Maintenance

- Preventive maintenance is limited to the maintenance organization only and no external requests are acquired for this type of maintenance.
- Preventive maintenance accounts for only 5% of all the maintenance activities.