

Assignment 2

(Ansari)
3/10/23 *(A+)*

Q.1 Explain in detail

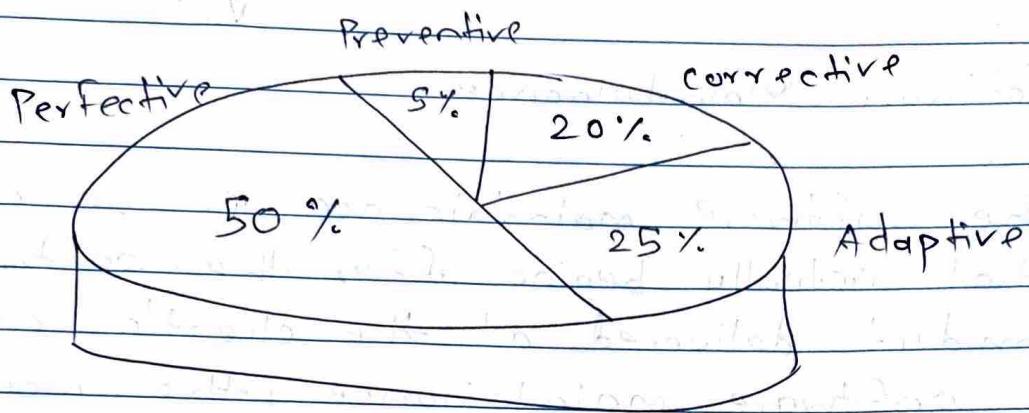
a) Software Maintenance

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The software maintenance is an activity that actually begins after the software product delivered at the client's end.

- In software maintenance, the modifications are carried out or the updates in the software are taken place.
 - In software maintenance phase no major changes are implemented.
 - In software maintenance, the changes are done in the existing program or the some small new functionality is added.
 - The modifiability means the ability of the software to be modified. The large number of definition of quality exists.
 - Maintainability is defined as the ability of the software system to be modified.
 - These modifications include: improvements, corrections, adaptability in changing environments and in changing requirements and other functional specifications.
 - There are four types of maintenance
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- 1) Corrective maintenance
 - 2) Adaptive maintenance
 - 3) Perfective maintenance

4) Preventive maintenance.



1) Corrective Maintenance

⇒ The corrective maintenance is the type of maintenance in which the errors are fixed when it is observed during the use of the software.

- In this the errors may be caused due to faculty software design, incorrect logic and improper coding.
- All these errors are called as residual errors and they prevent the final specification.

2) Adaptive Maintenance

⇒ The adaptive maintenance means the implementation of the modification in the system.

- The changes may be of hardware or the operating system environments.
- For e.g., business rules, work patterns.

3) Perfective Maintenance

- Perfective maintenance deals with the modified and changed user requirements.
- The functional enhancements are taken into consideration in perfective maintenance.
- In this, the function and efficiency of the code is continuously improved.
- For e.g.,
 - Modifying the payroll program to add new union settlement, Adding a new report in the sales analysis system.

4) Preventive Maintenance

- Preventive maintenance is used to prevent the possible errors to occur.
- Thus in this activity, the complexity is minimised and the quality of the program is enhanced.
- Adaptive maintenance normally used for 5% of all the maintenance activities and it is the smallest among all.

b) Re-Engineering

- The business level reengineering is done by business experts whereas the process of reengineering software level is done by software engineers and software developers.
- The demands on business functions and the information technology depends that support them are changing at rapid pace that puts huge amount of pressure on every organization.
- Both the business and software that supports the business must be reengineered to keep pace.
- Business process reengineering (BPR) defines business goals, identifies and evaluates existing business processes, and creates revised business processes that better meet current goals.
- All software reengineering process encompasses inventory analysis, document restructuring, reverse engineer, program and data restructuring and forward engineering.
- The intent of these activities is to create versions of existing programs that exhibit higher quality and better maintainability.

- A variety of reengineering work products are produced. The final output is the reengineered business process and/or the reengineered software that supports it.
- In order to ensure the correct approaches, use the same UML practices that are applied in every software engineering process, formal technical reviews access the analysis and design models, specialized reviews consider business applicability and compatibility, testing is applied to uncover errors in content, functionality and interoperability.

c)

Reverse Engineering

- The Reverse Engineering is the discipline of software engineering, where the knowledge and design information is extracted from the source code or it is reproduced.
- The reverse engineering is a process, where the system is analyzed at higher level of abstraction.
- It is also called as going backward through all the development cycles.
- Following are the important purpose of Reverse Engineering
 - Security auditing

- Enabling additional feature
- Used as learning tools
- Developing compatible products cheaper than those that are currently available in the market.

Following are the three important parameters to be considered for of a reverse engineering process.

1) Abstraction level

- ⇒ In the abstraction level of a reverse engineering process, the design information is extracted from the source code.
- ⇒ It is the highest level in the reverse engineering process.
- ⇒ It is always expected that the abstraction level for any reverse engineering process must be high.
- ⇒ When the level of abstraction is high, then it becomes easy for the software developer to understand the program.

2) Completeness

- ⇒ The completeness is nothing but the details available through the abstraction level of reverse engineering process.
- ⇒ For example, from the given source code it is very easy to develop the complete procedural design.

3) Directionality

⇒ The directionality of a reverse engineering process is a method of extracting information from the source code and making it available to the software developer.

- The software developer can use this information during the maintenance activity.
- Following diagram exhibits the reverse engineering process.

