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Analysis of Conformation Testing Techniques and Its Contribution in Enhancing the Quality of Product.

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Abstract: - Conformance testing could be a testing methodology accustomed make sure that a product or service factory-made by a corporation or organization complies with a given set of rules and standards, conjointly named as compliance. Large, esteemed organizations like IEEE, W3C, et al. have outlined these rules or standards. personal firms that specialise in that exact field perform the compliance testing. The business ensures that agreement testing is completed before the merchandise or service is deployed to confirm that every one needs set forth for the project are met. kind testing, compliance testing, and different names also are used for it.

Keywords: - Different Types of Conformance testing, Advantages of Conformance testing, Disadvantages of Conformance testing.

Introduction: - [2]

When a software or product is developed, various types of testing is conducted to make sure that the developed product works as expected and is error free before delivering it to the end user. For conforming the quality of the product many types of testing like unit testing, integration testing, Functional testing, performance testing, security testing, etc are carried out to make sure that the product is working as per the requirements of the user and is error free. Performance testing is done to make sure that the product works fine under various load conditions and is able to handle system failure, security testing is done to make sure that the data and information is safe and cannot be hacked by the hacker. Functional testing is carried out to make sure that the functioning of the final product is as per the expected working mechanism of the product. Like wise each kind of testing serves a particular purpose. Similarly, conformance testing or compliance testing is done to make sure that the product meets all the defined standards and protocols to label the certificate of compliance to the product which will be helpful to promote the product in the market among the end users. The objective and goal of conformance testing is to make sure that the implementation process of the product is done as per the defines standards. In some cases, if the criteria or the requirement of the product is not specified then there will be no conformance testing but if some compliance standards are defined then it is the responsibility of the business to make sure that these are met by conducting the conformance testing before delivering the final product to the user. Following are the three main terms which are being used in conformance testing: -

1.   Conformity: -It is to make sure that the specified requirements of product, service or process is fulfilled.

2.   Assessment: - It is defined as an activity which identifies that the requirements are fulfilled either directly or indirectly.

3.   Conformity testing: - It is to confirm the evaluation by conducting the test.

Types of Conformance testing: - [3]

The conformance testing can be of following types. It can either be physical testing or the logical testing –
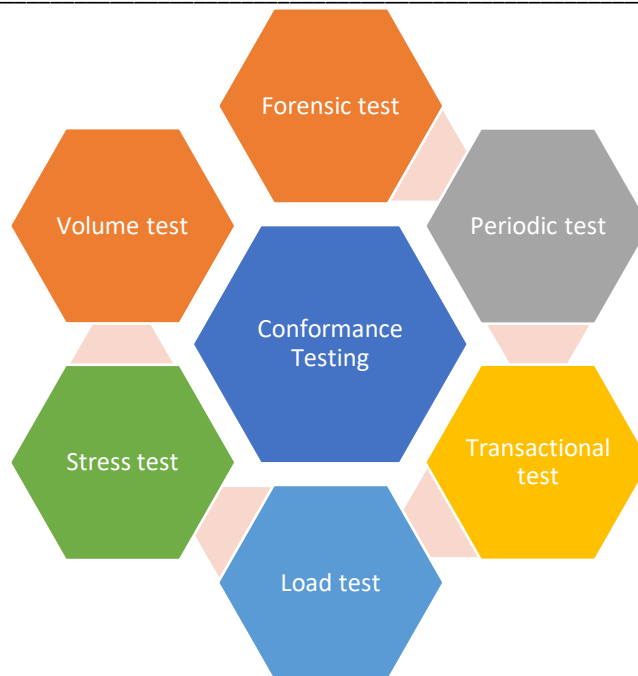
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Figure 1. Types of conformance testing.

1.   Forensic Test: -

•   This test is conducted to find unusual patterns which cannot be identified by the spot checking. This type of conformance test will identify the data and information available over the period of time and analyse it identify the patterns which are unusual.

•   Following can be the examples of forensic tests: -

a.   To analyse the portfolio, turn-over rate which is done to make sure that the portfolio managers are not manipulating security.

b.   To analyse the comparison of performance of similar accounts to identify the misallocation of investment opportunities, etc

2.   Periodic tests: -

•   These are the type of conformance testing which is used to be done at regular interval of time whose objective is to identify whether the product or system being tested is in compliance with the defined standards.

•   Its goal is to make sure that there is no violation and all the standards as well as legal standards are also met.

•   For example: - A month to month/quarterly catchphrase search of email and the quarterly survey of access people's exchange reports.

3.   Transactional: -

•   The goal of this type of testing is to make sure that there are no violations of the company's standards and the activity in question is in compliance with the policies and rules of the organisation.

•   Its major goal is to report any deviations of the actual transactions from the company's policies and standards.

•   For example: - checking individual exchanges submitted for pre-endorsement against any watch or limited records and investigating a client's venture rules before buying a security for that client's record.

4.   Load test: -

•   It is to make sure that the system or product is able to work perfectly under various load conditions without violating the defines rules and standards.

•   It is done to make sure even if the system or the product is under various load conditions then also it does not violate the compliance and can handle the failure or damage of the system as well.

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5.   Stress Testing: -

•   It is also somewhat similar to load testing; it will make sure that even if the product is being used by many users at the same time then also under such stress the system or product does not compromise the quality of the product.

•   It will make sure that under severe stress conditions also the defined compliance standards are met.

6.   Volume test: -

•   When the system or product is ready then this type of testing is done to identify that how much volume of data or user can it handle.

•   The other goal would be to identify whether for huge volume of data and information whether the system can still be in compliance with the company's standards or is it violating the standards.

Steps involved in Conformance Testing: - [4]
Conformance testing is done to makes sure that the final product is efficient and has enhanced performance skills which will help to avoid future risks related to the product. Following are the steps which are part of the compliance testing: -
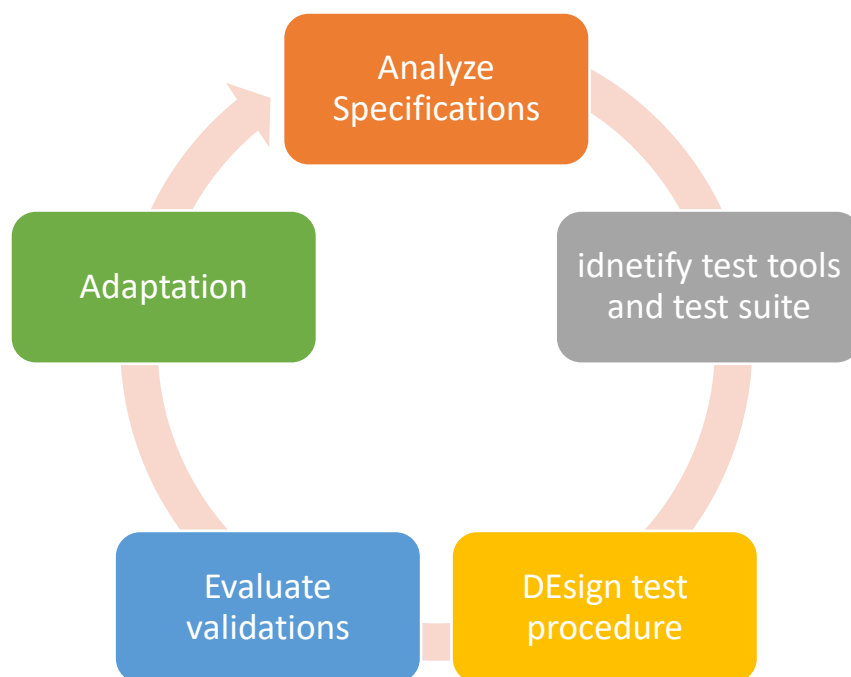

Figure 2 Steps involved in Conformance testing.

1.   Analyse Specifications and Standards: -

•   First of all, the defined set of specifications and rules and policies laid by the organisation for the particular service or product is analysed to understand it better.

•   If they are not analysed properly then the testers will not be able to test the compliance of the product developed.

•   The specifications consist of subset elements like profile, module and level.

•   Profile is related to the subset of specifications which is used to implement the capability of the system to meet the requirements.

•   Levels are the various layers of specifications which is classified under following three levels: -

a.   Level1 is linked to the basic specifications.

b.   Level2 represents level 1 along with new added features.

•   Modules represents the linked series of related requirements and specifications.

2.   Identify test tools and test suite: -

•   Once the specifications and requirements are analysed, then in this step certain testing tools are identified and testing strategy is planned.

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- The testers will select the testing tools which are capable of performing the tests automatically and takes less time to test the compliance of the product or the service.

3.   Design test procedures: -
- In this step, the testers will actual start designing the testing process. They will decide whether manual testing will be performed or automatic testing techniques will be followed.
- Also, they will write scripts for the automation testing process and consider implementing and writing test cases for all the possible scenarios.

4.   Evaluate Validations: -
- With the help of the test cases written in the previous step, the testers will validate whether the system or product under test is violating any particular policy or standards as defined by the organisation for that particular product.
- If any violations are determined then they are reported and the developer will make changes in the code to make sure that now the product is in compliance of all the defined rules and specifications.

5.   Adaptation: -
- The testers will also be given certain testing rules to be followed and when they have performed the conformance testing for the product and finds no fault then certification will be provided to the product which confirms that the system or product delivered is in compliance with all the defined set of rules and policies as well as standards as laid down by the company.

Advantages of Conformance Testing: - [5]
Following are the main advantages of Conformance Testing: -
1.   Quality product: - The major goal of conformance testing is to make sure that the delivered product is in compliance with the standards and policies which in turn helps to deliver high quality product to the end user who are satisfied to receive high quality product.

2.   Streamlining: -It provides many effective and efficient testing strategies which helps to stream line the software testing process.

3.   It also makes sure that there is proper implementation of the specifications as defined by the organisation for each product or service.

4.   It also helps to make sure that the product is portable and can have interoperability.

Challenges of Conformance Testing: -
Following is some of the limitations of the conformance testing: -
1.   It is challenging to design extensions, options and approaches in order to run the test successfully.
2.   It also difficult task to divide the specifications in to profiles, levels and modules.
3.   It challenging task to predefine the values.
4.   It is also essential to identify the class of the system along with appropriate testing methodology in order to perform efficiently the testing.

Conclusion:- Conformance testing is the trying method which ensures that the item or administration being made by the business or an association meets specific arrangement of rules and guidelines which is known as consistence. These principles or norms are characterized by enormous believed elements like IEEE, W3C and so on. The consistence testing is done by the confidential firms which has some expertise in that specific field. Before the arrangement of the item or administration, the organization ensure that the conformance testing is finished to ensure that every one of the compliances set for the venture have been met. It is otherwise called type testing, consistence testing and so on. It comprises of either coherent testing or actual testing to ensure that the item/administration meets every one of the specialized details, contract, and so forth. Different exercises associated with conformance testing are Surveillance, Inspection, Auditing, Certification, Accreditation. It is the obligation of the organization creating the items to ensure that before conveyance of the end result, conformance testing of the item is finished to ensure that it meets every one of

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the particulars and consistence as the merchant and the item providers will depend on the accreditation of the nature of the item to publicize them on the lookout.

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