CS-320-T2824 Software Test Automation & QA

2-2 Journal: Dynamic and Static Testing

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* **What is static testing?**

Static testing is software testing in which the software is tested without code execution. In order to find errors, static testing typically uses requirement documents, manual review of code or other specification documents.

Static testing focuses on the cause of failures rather than the failure itself. Because testing is done early in the development cycle it usually reduces deployment times, development costs and usually has a high level of software quality. Reviewing is used to find and remove errors in documents before they are used in development. Static analysis is used to analyze for structural defects or programming weaknesses that could lead to defects.

* **What is dynamic testing?**

Dynamic testing is a type of software testing in which software analysis is performed by executing code. This includes checking the functional behavior, CPU and memory usage and the overall performance of the software.

Dynamic testing executes the software, inputs values, and validates the output falls within acceptable guidelines. Dynamic testing occurs at all levels of testing and can either be black or white box tests. To make it simple, the goal of dynamic testing is to make sure that when run, the software behaves the way it should, performs at an optimal level and provides the interaction in which it was created

* **What are the differences between static and dynamic testing?**

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| **Static Testing** | **Dynamic Testing** |
| No code is executed during testing | Code execution is a required |
| Checks code, requirement documents and design documents to find errors | Checks functional behavior of software, CPU and memory usage and overall performance of software |
| Primary focus is on the prevent of defects or errors | Is more reactive than static testing as it finds and then fixes defects or errors |
| Performed at the beginning of the development cycle and usually before compilation. | Usually performed at the latter parts of the development cycle and takes place after compilation |
| Provides 100% statement coverage | Accounts for less than 50% statement coverage |
| Conducts the verification process | Handles the validation process |
| Analysis techniques are structural and statement coverage | Analysis is centered around boundary value analysis and equivalence partitioning |
| Reduces development costs and quicker deployment | Often has longer deployment times and higher development costs |

* **Why is it important to use both static and dynamic testing?**

Because together they produce a complete testing package. Like most components in software development, they serve a single purpose without it, software development would suffer, and the result would be possible unfinished, defects prone and an unpolished piece of software. Static testing catches the early defects and typically the easier to resolve issues whereas dynamic testing catches errors later in the process. It addresses compilation errors which could be due to coding issues or setup. Together they make for a smoother development cycle and deployment.