

6.6.3 System Testing

Software is integrated with other elements such as hardware, people, and database to form a computer-based system. This system is then checked for errors using system testing. **IEEE** defines system testing as '*a testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements.*'

In system testing, the system is tested against non-functional requirements such as accuracy, reliability, and speed. The main purpose is to validate and verify the functional design specifications and to check how integrated modules work together. The system testing also evaluates the system's interfaces to other applications and utilities as well as the operating environment.

During system testing, associations between objects (like fields), control and infrastructure, and the compatibility of the earlier released software versions with new versions are tested. System testing also tests some properties of the developed software, which are essential for users. These properties are listed below:

- **Usable:** Verifies that the developed software is easy to use and is understandable
- **Secure:** Verifies that access to important or sensitive data is restricted even for those individuals who have authority to use the software
- **Compatible:** Verifies that the developed software works correctly in conjunction with existing data, software and procedures
- **Documented:** Verifies that manuals that give information about the developed software are complete, accurate and understandable
- **Recoverable:** Verifies that there are adequate methods for recovery in case of failure.

System testing requires a series of tests to be conducted because software is only a component of computer-based system and finally it is to be integrated with other components such as information, people, and hardware. The test plan plays an important role in system testing as it describes the set of test cases to be executed, the order of performing different tests, and the required documentation for each test. During any test, if a defect or error is found, all the system tests that have already been executed must be re-executed after the repair has been made. This is required to ensure that the changes made during error correction do not lead to other problems.

While performing system testing, conformance tests and reviews can also be conducted to check the conformance of the application (in terms of interoperability, compliance, and portability) with corporate or industry standards.

System testing is considered to be complete when the outputs produced by the software and the outputs expected by the user are either in line or the difference between the two is within permissible range specified by the user. Various kinds of testing performed as a part of system testing (see Figure 6.18) are *recovery testing, security testing, stress testing, and performance testing.*

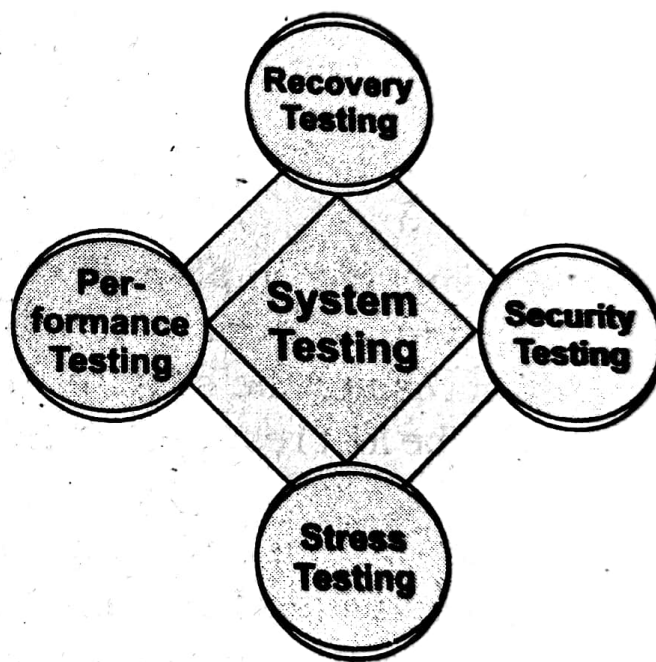


Figure 6.18 Types of System Testing