



SNS COLLEGE OF ENGINEERING

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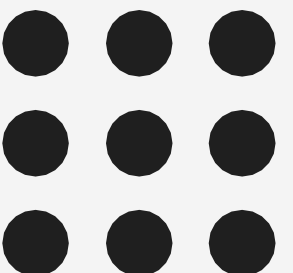
Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

Department of Artificial Intelligence and Data Science

23ITT203 Object Oriented Software Engineering

4/9/2025

**SOWMIYA R/AP/AI&DS/23ITT203 OBJECT ORIENTED SOFTWARE
ENGINEERING/SNSCE**





Integration Testing



Definition:

- Integration Testing is the process of testing where two or more modules of software are combined and tested together to verify the proper flow of data and functionality between them.
- It is done after Unit Testing (testing individual modules) and before System Testing.

Purpose of Integration Testing:

- To check how different modules work together.
- To detect errors in the interaction between integrated units.
- To verify correct data transfer between modules.
- To test combined functionalities.



Why Integration Testing is Important?



- In real-world applications, modules depend on each other.
- Even if individual modules work correctly, they may fail when integrated due to communication issues.
- Integration Testing ensures smooth working of combined modules.



Types of Integration Testing



- Big Bang Integration Testing
- Top-Down Integration Testing
- Bottom-Up Integration Testing
- Sandwich/Hybrid Integration Testing



Types of Integration Testing



1. Big Bang Integration Testing

→ In this type, all the modules are combined together at once and tested as a whole system.

Example:

In a Shopping App → Login, Search, Add to Cart, Payment — All modules are combined and tested together after development is completed.

Advantage:

Easy to implement.

Disadvantage:

Difficult to find the exact location of error if the test fails.



Types of Integration Testing



2. Top-Down Integration Testing

→ In this type, testing starts from the top-level (main) module and moves down to sub-modules step by step.

Example:

In a University Portal → Start testing from Dashboard → Then go to Student Module → Then Fee Payment Module.

Advantage:

Early detection of high-level design errors.

Disadvantage:

Need for temporary dummy modules (called Stubs) for unready lower modules.



Types of Integration Testing



3. Bottom-Up Integration Testing

→ In this type, testing starts from the lower-level modules and moves upward to the main module.

Example:

In an ATM System → First test Cash Dispense Module → Then PIN Verification Module → Then finally the Main Control Module.

Advantage:

Easy to identify errors in lower modules.

Disadvantage:

Need for temporary programs (called Drivers) for upper modules.



Types of Integration Testing



4. Sandwich/Hybrid Integration Testing

→ It is a combination of both Top-Down and Bottom-Up approaches.

Example:

In an Online Exam Portal → Test both Student Module (bottom level) and Admin Module (top level) at the same time, and then integrate them.

Advantage:

Benefits of both top-down and bottom-up methods.

Disadvantage:

Complex and time-consuming.



System Testing



4/9/2025



What is System Testing?



- System Testing is the type of software testing where the complete software (entire system) is tested as a single unit to check whether it meets the customer requirements or not.
- It is performed after Integration Testing is completed.

Purpose of System Testing:

- To check the complete working of software from start to end.
- To find defects in the entire system.
- To ensure the system works in real-time like how a user will use it.

Feature	System Testing
Purpose	Test entire software as a whole
Done After	Integration Testing
Testing Focus	Functionality, Performance, Security, User Experience
Example	Test full Railway Reservation System from Login to Ticket Booking



Features Tested in System Testing



- Functionality of all modules
- User Interface (UI)
- Performance Security
- Compatibility (Different devices or browsers)
- Overall User Experience



Example of System Testing



Example: Online Railway Reservation System

System Testing checks:

Can user register a new account?

Can user search for trains?

Can user book tickets and make payment?

Will user receive ticket confirmation on email or SMS?

Can user cancel the ticket and get refund?

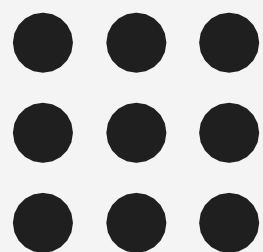
→ All these functions are tested together like how a real user will use it.



Types of Testing Performed in System Testing



- Functional Testing → Checking each feature works properly.
- Performance Testing → Checking speed and response time.
- Security Testing → Checking data is protected.
- Compatibility Testing → Checking in mobile, laptop, different browsers.
- Usability Testing → Checking user-friendly design.



4/9/2025