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Lesson Proper for Week 10



SOFTWARE AND SYSTEMS INTEGRATION PLAN

The software and systems integration plan (SSIP) defines or references processes and procedures that are used to integrate defined work products, systems or subsystems, and hardware units into a software and systems integration environment. Defined integration processes and procedures include user definitions for software design/development, execution, test, evaluation, and reporting of results during integration activities. The SSIP includes software integration planning and coordination with other formal test activities; risk assessment, product evaluations, configuration management (CM); and other required support activities.

A software qualification test occurs where work products are integrated with systems and hardware configuration units associated with other assigned work products. The software qualification and testing verify activities and the responsibilities for assigned programs and project teams. The CMMI® model addresses process integration practices of the CMMI process framework. Process integration practices include:

- Documenting processes for integration activities
- Verifying and validating in integration environments
- Defining requirements for integration environment readiness criteria within the plan
- Guiding to ensure product integration is maintained throughout the project life cycle



The software/system integration facility (S/SIF) is the primary facility for hardware, software integration, and system-level testing. The facility supports software design and hardware equipment integration used to integrate and test integrated software with configured systems. The integration testing in this facility builds incremental delivery of software work products for checkout and use by customers.

Ø Facility Operations

Affected teams build, maintain, and upgrade facility operations for software design/development and tests to be conducted. The environment for software and hardware configurations is established to support early design and test equipment integration. To ensure systems integration facility operations are conducted, systems are integrated, and performance is measured. These activities are conducted for formal verification of system specification requirements. Detailed integration plans are used with plans and test procedures to execute integration testing in the facility.

Ø Facility Configuration

The facility is configured to support design and test operations. Detailed test equipment provides test plans and procedures to be defined for each test conducted. Drawings are documented to lay out the facility configuration and coordinate with hardware, electrical engineering, and hardware quality.



INTEGRATION SETUP

The integration setup of software and systems work product components occurs within the system, emphasizing interfaces and operations between components, including hardware, software, interfaces, and supporting functions. The work products are integrated and performed incrementally using the process of assembling components, testing, and verification and then assembling more components for setting up the integration activities.



FORMAL ENGINEERING BUILD

In current states of software design/development and qualification tests, programs and projects become increasingly complex. Formal software engineering builds and releasing of software consumes an ever-increasing amount of time and resources. Software build tools provide a way to automate entire builds, deployment, and quality assurance and release work products to the customer.



TEST TEAM



The test team is responsible for formal qualifications of a specified system requirement. The test team works inside the facilities' operations with other systems and software personnel. Test teams have always asked software designers/developers about the issues they see in terms that the designers/developers can understand. This can lead to bad feelings between the teams. The test teams and the designers/developers of software need to change their attitude toward each other.

Ø Documentation

The documentation software required for the formal qualification phase defines and documents the progression and interdependency of test artifacts. The documentation required is as follows:

- SSIP
- Integration and installation procedures
- Design documentation
- User and operation guides
- Test and analysis reports
- Compliance documentation or sheets
- Hardware drawings

The requirements verification documentation flow is shown in Figure 8.1.

Ø Roles and Assignments

The responsibility for the conduct of a system test and evaluation is the role assigned to the test conductor and test team organizations. The test team is responsible for preparation of internal processes, test plans, and procedures to ensure verifications meet system and software specification requirements.

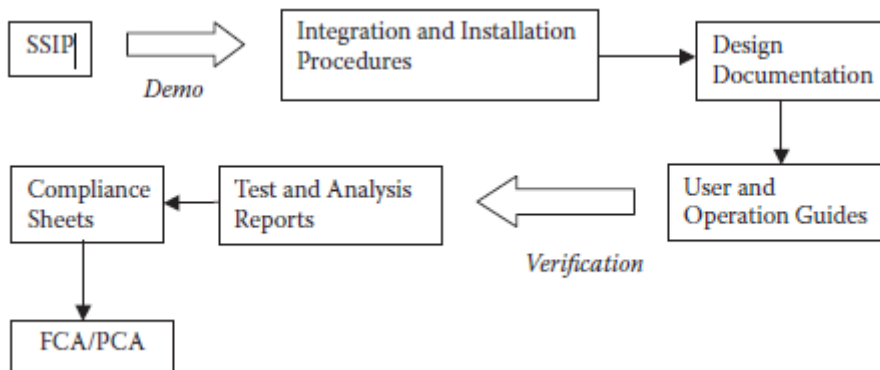


FIGURE 8.1: Verification documentation flow. FCA, functional configuration audit; PCA, physical configuration audit.



Ø Integration Test Processes

The integration test processes are internal activities conducted by test teams to develop test procedures and ensure acceptance testing has been completed at the end of formal qualification testing. A model for integration testing is provided in Figure 8.2.

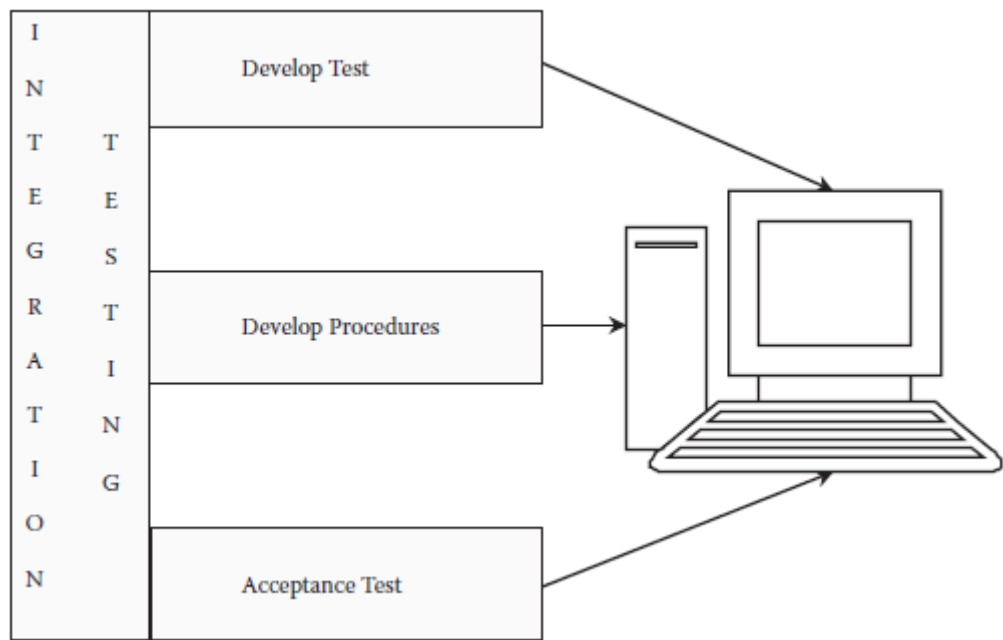


FIGURE 8.2: Model for integration testing.

Ø Problem Discovery

The verification method is used when performing an operation to discover problems and verifying visually; at some point during the test, redlines are applied to procedures. This involves direct observation while using the system in its intended modes and states. In general, demonstrations apply to simple, observable events using pass/fail criteria without test or measurement equipment. Any specification requirement that includes demonstration as a verification method requires verification that equipment units are working and operations or functional performance is in place. The hard copy or electronically released procedures record the pass/fail status and the marking of redline when conducting a test and operations.

Ø Problem Reports

The test team approach used to manage and coordinate program and project integration testing problems is documented in problem reports as test problems occur and are discovered. Reviews and monitoring team design and efforts are entered in electronic databases or documents written on hard copy. Metrics are gathered on team efforts to monitor progress, risk, and the resolution of design and test problems during integration testing. Senior, program, and project managers review the metrics to monitor progress for closure of problems reported during integration testing.





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