

# Overcoming Testing Challenges in SAP Upgrade Projects



## Applies to:

SAP Upgrade Projects. For more information, visit the [Enterprise Resource Planning homepage](#).

## Summary

Testing in SAP Upgrade forms the crucial parameter which if not managed well may result in serious doubts over the acceptability of the upgraded SAP system by the “Business Users” in an Organisation. The article covers the inputs to plan and manage efficiently the Testing scope and effort in an Upgrade project.

**Author:** Deepak Kumar

**Company:** Infosys Technologies Limited, India

**Created on:** 10-Sep-2009

## Author Bio



Deepak Kumar is Principal Consultant in SAP Practice at Infosys Technologies Ltd. He has over 15 years of experience in Business, IT Consulting, SAP Implementation and Upgrade Projects. He can be reached at [Deepak\\_Kumar02@infosys.com](mailto:Deepak_Kumar02@infosys.com).

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## Overview

Organizations having SAP based business solution are involved in SAP upgrade project at one time or another. In the present times, many of them are involved or are planning upgrade to SAP ERP 6 which will form the stable version till 2017. The periodic improvements would be delivered through Enhancement packages which would be installed and activated as per the needs of the Organization.

The success of SAP Upgrade projects relies on efficient and comprehensive planning of Testing activities that start from the project kick-off itself and last till few weeks before the project go-live. Organizations involved in SAP Upgrade projects faces the dilemma over the testing of the upgraded and the uncoded SAP based business solution.

The question that each organizations faces is over the quantum of testing, how much to test, what should be the scope and the effort involved. It becomes important that optimum Testing approach be defined upfront for the SAP upgrade project and followed. Testing involves substantial effort and has a direct impact on project plan and the project budget. It forms the crucial parameter which if not managed well may result in serious doubts over the acceptability of the upgrade project by the business users. The article covers the inputs to plan and manage efficiently the Testing scope and effort in an Upgrade project.

## Sandbox Testing – Pyramid Approach

The objective of the Sandbox testing is to ascertain the potential scope of changes and issues in the upgraded & uncoded SAP system so that Testing Approach can be suitably framed/ revised for the project. This will also act as an input to the project effort planning and duration.

The scope preparation starts in parallel while Sandbox is being prepared and is finish when it is ready. This helps to initiate Sandbox Testing without any delay. The important aspect is to test the critical and important transactions of the business processes by the various functional teams to ascertain the extent of changes in the new system. A representative set of testing scope (also called “Top of the Pyramid”) covering the following is prepared based on the following factors:

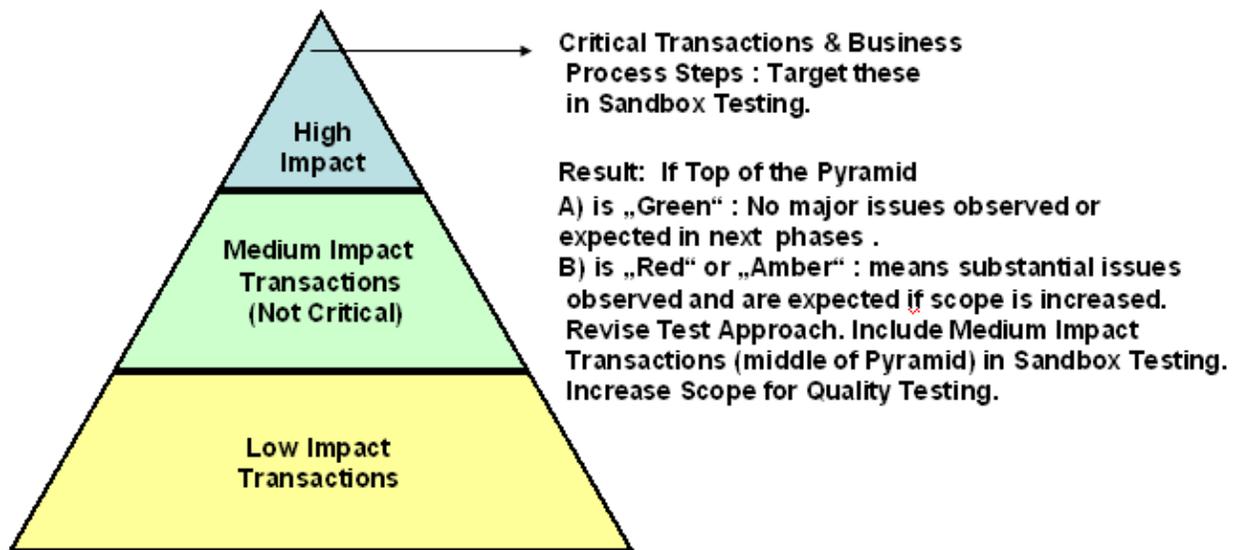
Critical SAP standard and custom transactions – to make sure that frequently used SAP standard and custom transactions are behaving as expected. Transaction usage statistics from last year or a given period provides important inputs. Additionally, less used but critical transactions e.g. Month end, Year end reporting transactions should also be covered.

Critical Reports in different languages – Both Custom developed and standard reports should be covered in different language that are used in the system

Representative set of Critical Interfaces – All the critical interfaces should be identified and their connectivity should be established with corresponding test system. It is also of importance that all kinds of interfaces are covered e.g. Inbound, Outbound, file based, Database Connects type are covered. A matrix of Business & IT Contacts for Interfaces should be maintained for faster contact and issue resolution

Representative set of Printouts in different languages – All the important printouts that go out to outside entities either electronically or in manual form should be covered. Printouts in different languages should be considered to assure the correctness on layout and characters in the output.

Complex enhancements e.g. Custom developed functionality, User exit etc should be included in the scope



### Representation of Pyramid Test Approach

If the number and nature of issues are high the testing scope should be suitably increased in the “Quality Testing” so as to increase the confidence in the quality and stability of the upgraded and uncoded SAP system. In this situation Sandbox Testing scope should also be revised to cover medium impact transactions so as to gain suitable confidence level on the new system behaviour.

The possible nature of issues encountered in Sandbox testing is as follows:

Nature of Issues	Causes	Corrections
Program Dumps	Unicode incompatibility, Reference SAP standard object is changed	Development Correction, SAP Notes
Wrong Characters in the Output (report, printouts)	Unicode incompatibility, Incorrect Vocabulary	Development Corrections, Vocabulary Corrections
Interfaces	Program errors, Legacy system compatibility, File systems errors, Connectivity errors	Development Corrections, Legacy System upgrade/corrections, Basis corrections
Impacted Objects	Changed technical components in new SAP version	Development Corrections,

The functional experts will perform the Sandbox testing of the identified critical transactions and log the issues encountered. The solution providing team i.e. Development, Authorization, Basis and in some cases the functional team (identification & application of OSS Notes) themselves provides the solution to the issues. The Issue log is monitored for faster resolution. It is analyzed by the project management for the possible impacts/corrective actions on subsequent project phases and deliverables.

If the types of issues points to dumps in transaction execution than issues are related to upgrade & unicode causes and requires relevant correction by the development team. High number of such issues will also mean that there is potential likelihood that more such issues would be observed if the scope of testing is expanded. This observation should be used by the project management to alter the testing scope in the upgraded and uncoded SAP Quality system.

The corrective transports will be applied to upgraded & unicoded SAP Development system as testing duration in Sandbox is of limited time and thereafter the changes/bug-fix will originate from new SAP Development System and will move to SAP Quality system of upgrade landscape. This regulation of changes follows the Transport strategy laid out in the Organisation.

The Sandbox testing documentation will involve a) Scope List b) Result List and c) Issue List. The Sandbox testing is performed in screening mode i.e it is not documented comprehensively in the actual test scripts that may be in use in the Organisation. This saves time for the functional teams as they can focus on performing testing and verify the system behaviour which is the main objective of the Sandbox testing.

### Testing in SAP Development System

In the upgraded & unicoded SAP Development system, no major testing activities are planned as it does not have the robust data to support the Testing and is not fully linked to the legacy systems. In most of the organization, SAP Development system is not or infrequently refreshed from the SAP Production system. The technical testing of the custom tools that are used by the development and the authorization team is performed. This is because these tools are present only in the SAP Development system.

### Testing in SAP Quality System

The bulk of the Testing activities in an upgrade project are performed in the SAP Quality system in the “Realisation Phase” of the project. The upgraded and unicoded SAP Quality System is created from copy of the SAP Production system and corrections so far from upgraded and unicoded SAP development system are applied to it through transports.

The Testing scope preparation poses the challenge to limit it to a manageable scope that should get completed in the allocated time and within planned effort. The “Risk Based Testing Approach” should be applied to meet this challenge.

### Risk Based Testing Approach

The SAP Upgrade project objective is to deliver the stable system to the Business. One way to achieve is to test the complete business processes and the underlying test scripts. This would mean increase in effort, cost and duration to finish the Testing. Limited functional resources in the organization complicate the situation as the current SAP Production system (old version) would also requires support from them.

On the other hand is to test the reduced or limited scope and still deliver a stable system to the Business with additional benefit of reducing the overall total cost of the project. This is called the “Risk based Testing Approach”. This means that the focus should be on prioritizing and testing the tasks & functions that are important to the functioning of the business solution. The following forms the important points to prepare the scope:

Frequently used Business process steps and underlying transactions

Critical rated Business transactions where failure is unacceptable

Technically complex transaction or business process steps

Regulatory Requirements

All Interfaces

Important printouts which are sent to outside entities including customers

Authorisation Testing

Include Impacted developments (Functional changes in existing objects due to Upgrade)

Other Priorities that may differ from Organisation to Organisation e.g. GxP scripts etc

The Testing scope is based on the prioritization factors as listed above and brings the benefits of manageable scope, streamlines functional efforts and reduced project timeline. It is possible that new risks may emerge during the testing. Project management and functional teams should address the same and stay on the course to finish the testing as per plan.

It is assumed in the “Risk based Testing Approach” that since critical features would be tested, the upgraded SAP system would be stable enough to enable the functioning of the Organization with low or minimum impact. The rest of the issues (low risk) would be dealt with by the project team either before go-live or in the post go-live support / Hypercare phase and would be solved in a short span of time.

Additionally, during the Quality Testing of the project, it is beneficial to invite the Business Users for 2-3 days and request them to perform day to day business transactions. Any issues reported would be fixed by the project team in this duration. This will further re-inforce the fact that day to day transaction are working as expected in the new upgraded and unicoded SAP system. This not only helps to get the business feedback early in the project cycle about the new system when there is sufficient time to react to the feedback in terms of corrective actions. It also helps in to smoothen the buy-in of the new system.

Another way to manage the Testing scope in SAP Quality system is to distribute some of the scope to be executed in Screening mode i.e. without documenting the test results formally in the test scripts. Such scope is managed and tracked through excel lists. It gives more time to functional teams to focus on testing and making sure that scenarios and transactions are working successfully without spending too much time on documentation.

Tip: Prepare the complete list of Interfaces and Print outs early in the Blueprint phase. This helps to have the sufficient time to establish the connectivity of partner systems with the upgraded and unicoded SAP Quality system.

Tip: Prepare the scope of Testing by the end of Blueprint Phase. This is a time consuming activity and follows iterative steps. Revise it based on the result of Sandbox testing, if required. Testing scope check should be done with respect to the planned Testing duration.

### Performance testing

The stress or performance testing may not be required as the new upgraded SAP system will be of the same hardware specifications as the non-upgraded one. The user base and the system usage by the business would stay the same as it was before the upgrade. It is recommended to size the new hardware for new upgraded SAP system with more (say 25%) processing power to offset any upgrade induced slowness and subsequent deployment of new functionalities that new system may bring in. Performance testing is time consuming activity and it should be evaluated by the project management if it is really required or not.

### Connectivity Testing

Since the new production SAP system would be based on the new hardware, it is beneficial to test the Interface connectivity for the few selected interfaces. Connectivity testing is performed by the Project team and highlights any potential issues that might be there when interface connectivity is maintained on the upgraded and unicoded SAP Production system. This helps to change the IP address, host name etc to the one corresponding to new hardware. It is advisable to use the alias name in the connectivity setting details of the interfaces which makes it independent of the IP addresses of the hardware.

### User Acceptance Testing

User Acceptance Testing will be performed in the SAP Quality system after the completion of the Quality Testing and corresponding issue resolutions by the project team. At this point, all interfaces are connected and critical business processes are tested to be working as expected. Business Users performs their day to day tasks and activities in the SAP system. Issues reported are fixed by the project team. Since this activity is 1 or 2 weeks before go-live certain low risk issues may be marked to be fixed in the post go-live phase. This helps project team to focus on cutover and go-live activities.

## Conclusion

It is important that Testing of upgraded and unicoded SAP system is planned diligently and relevant measures are taken to manage the scope, functional effort and project timeline. Representative Sandbox Testing indicates the quantum, nature of upgrade issues and provides early information on upgraded and unicoded SAP system behavior. It also gives the project team enough reaction time for relevant corrective actions. Test Approach should be suitably modified in light of the results from the Sandbox testing as initially the impact of Upgrade and Unicode may not be known in definite terms on the SAP system. The Testing scope and effort in the upgraded and unicoded SAP Quality system can be effectively managed using the "Risk Based Testing Approach". This will help project management to deliver a stable SAP Production system within the budget and timeline.

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