

REMOTE TESTING SERVICES

1 INTRODUCTION

‘Software Testing’, a vital phase in the software development life cycle, plays a major role in certifying software to a quality standard. This is engineered by Quality Testers specialised in the area of testing using ‘best of breed’ software testing tools available in the market.

In March of 2002 it was reported that software bugs in Britain's national tax system resulted in more than 100,000 erroneous tax overcharges. The problem was partly attributed to the testing process and the strategy adopted in performing the same.

A sound testing approach/strategy is critical for any client-server or Web based application to fully warrant the certification of a stable and quality system.

1.1. Independent Testing Team

All IT project development plans include a number of testing steps, many of which are on the critical path of the project. Testing specialists, independent from the developers, should perform these tasks to gain the maximum risk mitigation.

Typically, these tasks include:

- Preparation of the overall Test Strategy and a Test Plan
- Test Automation Plan
- Configuration of the Test Environment
- Selection and installation of testing tools
- Training of testers (test tools training or users who have not tested before)
- Acceptance testing of a Build
- Systems testing
- Performance testing
- Security testing
- Usability testing
- User Acceptance Testing
- Integration testing
- Testing of the migration of data between builds

Genisys brings to its clients a risk-based proven methodology for creating a test strategy quickly, taking into account the project's schedule and budgetary constraints. The strategy also includes the implications of what testing has been left out (e.g., what risks are not covered).

We assign trained experienced resources such as test architects, test managers, tool specialists, security and performance specialists when required, as well as the more

traditional teams of systems testers and help for the user testing team. A managed testing approach ensures that the testing is done efficiently and effectively.

This document outlines the approach and the methodology for remote testing adopted at the Genisys offshore facility.

2 THE GENISYS SOLUTION

Genisys Software has extensive expertise in the testing of applications. Bearing in mind the customer requirement, we have listed relevant skill areas.

There are two different kinds of testing that can be performed

- Manual Testing: In reality, manual testing is always a part of any testing effort. Taking into account the time and budget requirements of the customer, manual testing would be adopted if required to meet the demands.
- Automated Testing: Automated testing can provide a good return on investment to the customer. Automated testing tools are used in gauging the quality of the software and also to address performance related issues. The scripts generated by automated testing are very useful for regression testing.

The following are the various techniques that can be adopted in the process of testing:

- Code reviews: In reality, a set of compliant code standards always make it easier to maintain systems and in the process would help any developer understand the code better. Code reviews are performed on a piece of code to determine its compliance to standards and suggest if there can be any improvements/better logic which might enhance the performance of the end product for the customer.
- Test Specification Development: Test specifications are developed to assist the testers in performing the desired tests on the software. Specifications are developed for all types of testing from Unit testing to Customer Acceptance Testing.
- Code Coverage Analysis: This kind of analysis provides a quantitative measure of code coverage, which is an indirect measure of quality. Code Coverage analysis can be performed by running the test specifications against the software program received. Outcome of this analysis would help understand which lines of code have been executed in the given test.
- Database Review: Database reviews are performed to gauge whether the database can be tuned to enhance the performance of the end product and thus make a difference in the performance of the product for the customer. Database design

review can also be performed to suggest any improvements that make a difference to the software/product.

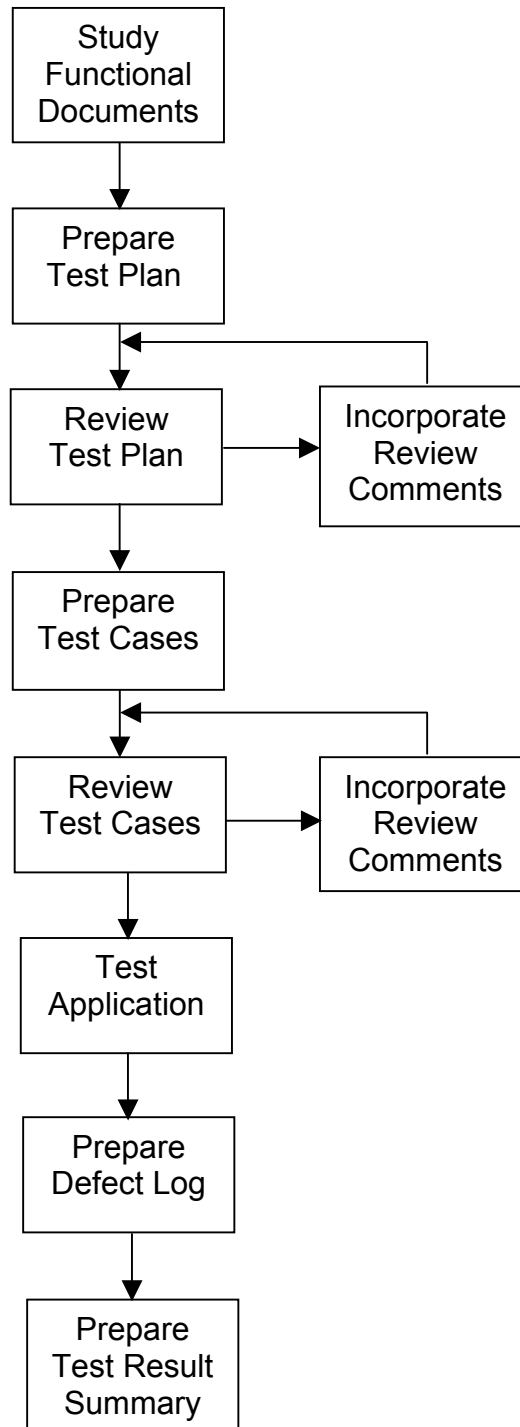
- Black-Box Testing/Functional Testing: Black-Box testing would be performed to check the compliance of the software with the functionality expected by the customer.
- Performance Analysis: Performance analysis is performed to gauge the performance of the product under extreme operating conditions. Load Testing can be performed to accurately gauge the scalability of the application.
- GUI Testing: GUI testing is performed to certify that the visual aspects of the software comply with the windows standard or a custom standard adopted in developing the software. This test is also performed to check the consistency of visual appearance across the product functionality.
- Regression Testing: This test is performed to make sure that the software program works to given standards after undergoing various modifications. Such a scenario often exists when performing tests for the customer as a particular piece of software might go through many iterations of modification on reported defects. On receiving the modified software, test scripts generated at the beginning can be executed on the modified program to make sure that the previously accepted functionalities continue to work, thus alleviating the process of testing.
- Customer Acceptance Testing: This test is performed by the customer who basically verifies that all the required functionality is incorporated within the delivered product. Genisys Software would facilitate this test phase from offshore using the test environment already created during the functional testing phases.

In addition to the above, we would also perform

- Benchmarking: Benchmarking is a highly respected practice in the business world. Benchmarking is performed to gauge the best practice and high performance software against the business operation needs. Benchmarking is often performed in choosing the best software that suits the business needs.

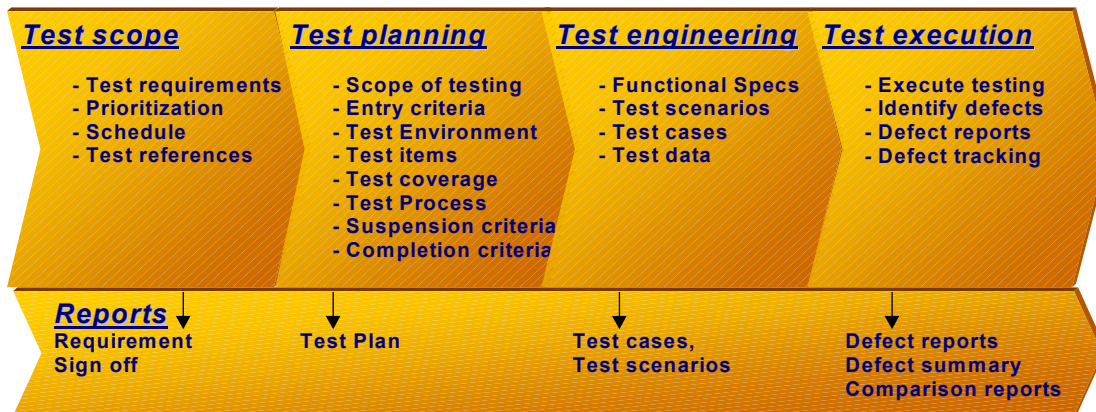
3 APPROACH TO TESTING

Genisys offshore facility adopts a structured approach for testing software products. The flow chart represents the process steps involved in a typical testing project.



4 TESTING EXECUTION METHODOLOGY

Operating Model & Testing Life Cycle



Test Scope

Activities in this phase include understanding of the application functionality, consolidating the test requirements, scheduling, gather test references. At the end of this phase, the testing requirement would be finalised and signed off.

Test Planning

This phase includes preparation of test plan outlining the scope of testing, entry criteria, test environment, test items, test coverage, testing process, suspension and completion criteria.

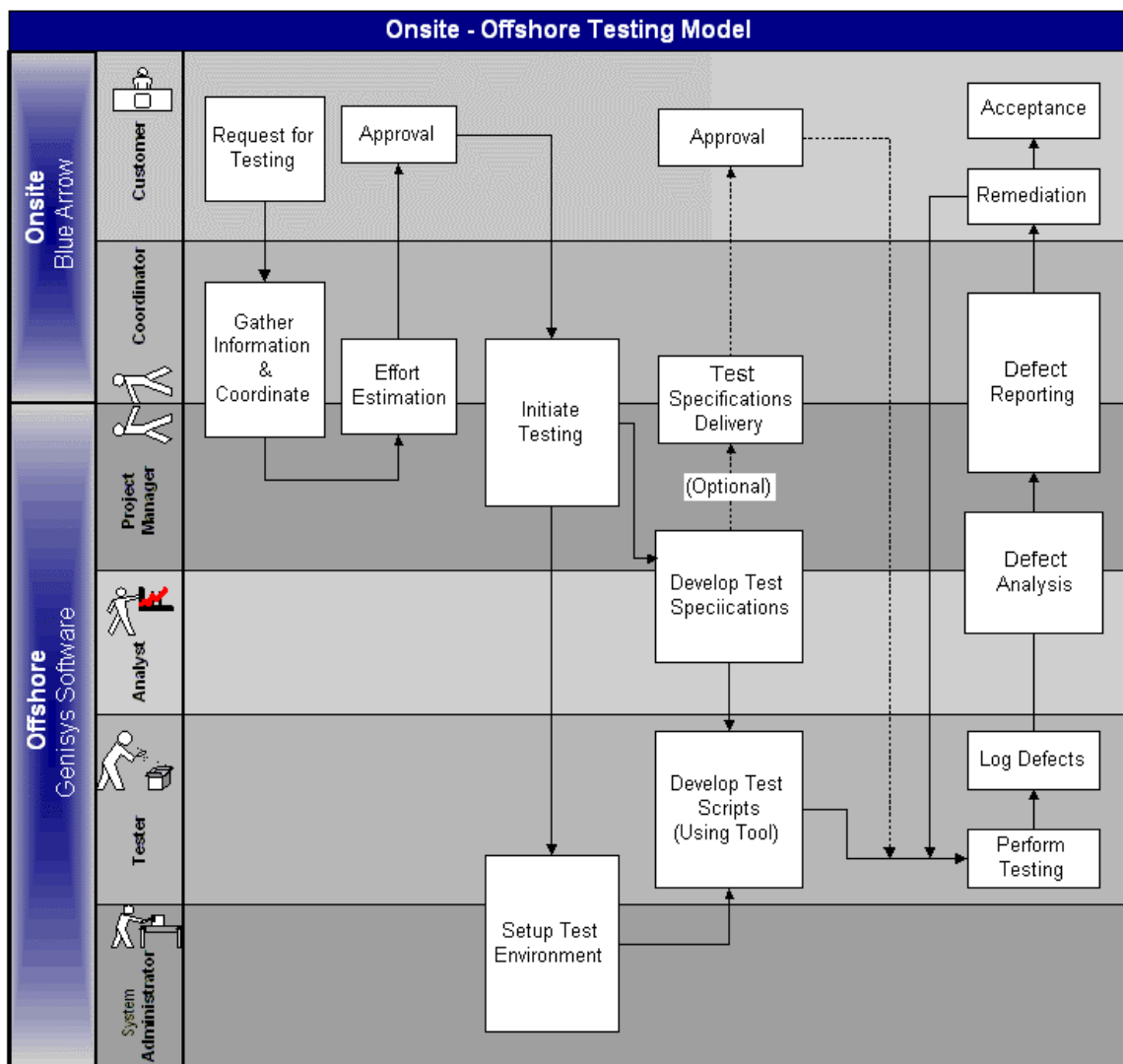
Test Engineering

As part of this phase the activities performed will include preparation of test cases based on the functional specifications, test scenarios and collation of test data.

Test Execution

This phase includes the execution of the test sets. Defects identified during the execution of the testing will be logged in the incident reports. The identified defects will be categorised depending on the severity as High, Medium and Low.

5 ONSITE-OFFSHORE TESTING MODEL



Roles and Responsibilities

- Onsite Coordinator: This is the critical link which acts as a liaison between the customer and the offshore team. The Coordinator reports to the customer directly thus easing the process of getting work done offshore, providing an immediately accessible audit log of work completed and the flexibility to react and preempt enforced changes and additions to the defined process.

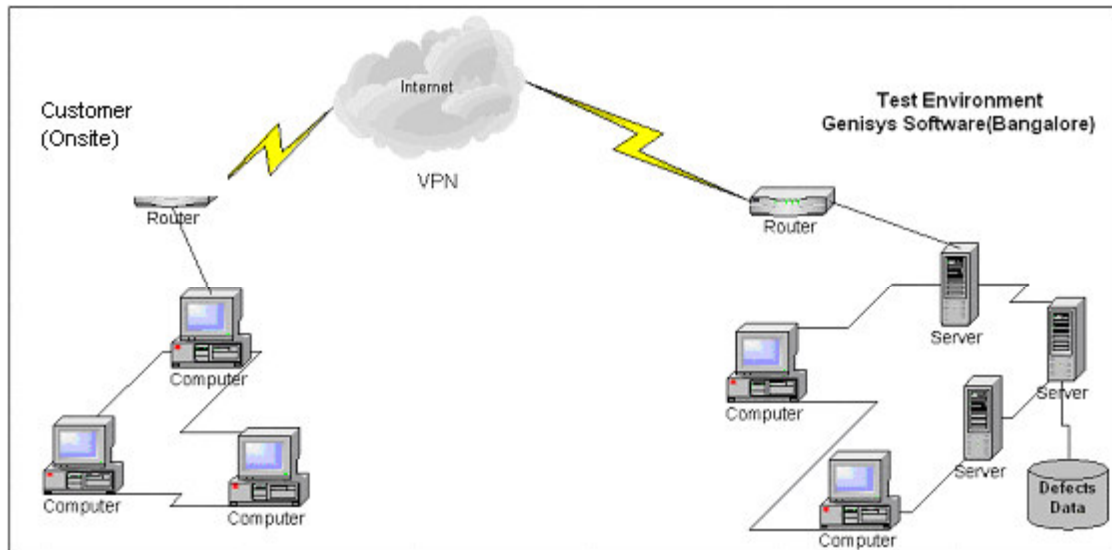
- Project Manager(PM): Responsible for the execution of testing process offshore. The PM works closely with the Coordinator in making the entire process a success. The PM is responsible for initiating and managing the testing process offshore and for the deliverables.
- Analyst: Responsible for complete understanding of the system and works closely with the PM and the testers for the smooth functioning of the process. The Analyst is also responsible for defect analysis and analysing the system performance for suggesting changes for improvement.
- Tester: Responsible for executing the test scripts/specifications against the software. The Tester is also responsible for setting up the test environment with the help of system administrators. Tester works closely with the Analyst in gauging the performance of the system.
- System Administrator: supports the testing team to dynamically build and collapse the required testing environments and manage other network related issues.

6 TESTING ENVIRONMENT

There are cases where software runs without any problem in a development environment but fails to perform in the deployment environment. It becomes very crucial to setup a test environment which is a replica of the deployment environment.

To execute the test cases successfully, the test environment would be setup, inline with the deployment environment in terms of software resources used by the customer.

Genisys would setup the test environment at its offshore centre in Bangalore in such a manner that it can be accessed onsite (if required) by the customer's team via a Virtual Private Network as depicted in the diagram below.



7 TESTING TOOLS

Appropriate testing tools would be adopted to automate the testing process. The Mercury Interactive suite of products would be used to accelerate and manage the testing process.

The following are tools/products which would be adopted in the testing process:

- WinRunner

WinRunner is an enterprise functional testing tool that verifies applications work as per the functionality expected. By capturing, verifying and replaying user interactions automatically, WinRunner identifies defects and ensures that business processes which span across multiple applications and databases, work flawlessly the first time, in production and remain reliable.

- LoadRunner

LoadRunner is a load testing tool that predicts system behavior and performance. It exercises an entire infrastructure by emulating thousands of users and employs real-time performance monitors to identify and isolate problems. By using LoadRunner, organisations can minimise test cycles, optimise performance and accelerate deployment.

- TestDirector

TestDirector is a web-based test management solution that globally coordinates testing across an organisation. By providing and integrating requirements management with test planning, test scheduling, test execution and defect tracking in a single application, TestDirector accelerates the testing process.

Genisys Software is a full partner with Mercury Interactive and maintains a specific 'practice' for MI tool implementations. However, we also have experience of other tools such as Compuware's QA Run, QA Load etc.

Though the largest group of testers at Genisys is trained and working on Mercury products, we do have the in-house experience on other tools such as Silktest, Rational Robot, Web Load and Rational Clearquest etc.

8 WHY GENISYS TESTING SERVICES?

- We have a long record of accomplishment in software testing. Our flexible approach to risk-based testing and test strategies allows us to define effective test strategies up-front.
- Amongst the software testing companies, we uniquely combine a leading-edge consultancy practice, with the provision of managed teams.
- We are flexible in responding to changing project plans in a dynamic project environment. Most projects are under extreme pressure to deliver to tight and often unrealistic schedules. We are pragmatic and are sensitive to the needs of management, users and developers.
- We have partnerships with the major test tool vendors and other specialist test resources such as for security testing and for remote portal-based performance testing.
- We are independent from the vendor or software developer's testing teams, e.g., 'we are not marking our own homework'.