Triesten Testing Services Model

1.Triesten–Differentiating Factors

Process Maturity and Quality Assurance Processes: Our engineering processes are certified by ISO 9001:2000 for "Design, Development, Testing and Maintenance of Software Projects" .

We have expanded our relationships with existing customers, thereby providing a strong base for continuous growth. What makes us different?

- -A learning organization, with an attitude to learn & unlearn
- -Innovative solutions
- -Multiple delivery models: Onsite, Offshore and Blended model
- -Robust communication infrastructure
- -Proven offshore delivery capabilities
- -Partnership approach
- -Skilled resources
- -Advanced development environments
- -Customer centric approach
- -Knowledge repository
- -Lowest attrition rate
- -Competitive pricing

Triesten believes that strong software engineering practices and standards are essential and foundation for systematic project deliveries.

2.Key Challenges in Today's IT

The challenging complexity of today's business requirements, applications, a combined increase in competitive pressure, costs of critical application failure and downtime maintenance have sparked the need for a structured QA processes and high level of measurable testing methods and techniques. In addition, it also requires seamless integration of process, people and technology to ensure delivery of reliable and defect free products/applications.

To meet the day-to-day IT operational challenges and to maintain market edge, what is needed is a comprehensive set of services that can help customers to optimize their IT investments, improve performance and achieve a robust and reliable business performance (ROI).

3.Triesten Testing Centre of Excellence

Triesten's testing centre of excellence is uniquely placed with domain & technology expertise, and highly skilled resources to provide QA testing services. Triesten testing centre caters all your testing needs. Our services include:

Integrated Functional Testing
Test Automation Consulting

Integrated Functional Testing: Functional testing ensures that the application meets the functional requirements and performs as expected by the business. It calls for a clear definition of business criticality, identification of end-to-end functionality, and identification of internal interfaces. Test routines are carefully designed to ensure that an appropriate level of functional test coverage is achieved.

Client Benefits: Clients can take advantage of Triesten's competence in independent functional testing by adaptable framework. In addition, they quickly benefit from fewer testing cycles with predictable and repeatable results. Overall, they will enjoy lower test costs because resources are better utilized. Clients also gain access to a deep pool of highly skilled resources for peak test demands.

Test Automation Consulting: Triesten expertise in automated testing proves that it would be possible to dramatically cut test cycles by integrating the appropriate tools with the right processes. We are consistently able to offer test cycles that can be 90 percent faster than traditional manual testing methods.

Client Benefits: A significant business benefit of our test-automation offering is it accelerates iterative development & reducing the test life cycle, permitting them to release more software products version quite often.

Test Process Consulting: Triesten test process consulting services allows companies to identify and plan to adopt best-practice processes and technologies to improve their application testing operations. We help to map out vision and objectives for the testing function, using convergence analysis to identify gaps and to provide short- and long-term improvements. Then we can develop an implementation road map, and if required, we will partner with clients to pilot best-practices in projects and implement new testing practices / processes.

Client Benefits: Clients who have used our test process consulting services report three key wins:

1. Higher system quality – fewer post-production defects
2. Increased predictability in estimating test efforts and execution
3. Greater efficiency and resource utilization
4. Quick turnaround time on setting up the test processes

Performance Testing: Triesten is rapidly winning a reputation as a key provider of performance-testing services. We give clients an accurate picture of how well their applications will meet expected service level agreements in terms of response time, uptime, reliability and much more.

We always begin our performance-testing projects with a thorough requirements analysis. We take care to address the application's performance environment. Then we work on detailed workload models and create authentic scenarios for volume test, stress test, as well as load, spike, and endurance tests.

We analyze the overall performance from end-to-end perspective, at architectural levels under different load types that can test HTTP/S servers, FTP servers, SNMP, Databases and Web Services (XML-RPC).

How does the application's performance vary by load?
What is the mean time between failures in a given environment?
How does the application usage at given point of time?

What are the peak performance criteria?
What are all the application's peak performance operational limits?
How do we benchmark the maximum loads of concurrent users?
What are the benchmark analysis parameters?

These are just a few of the questions that we ask when we begin to develop a strategy for performance evaluation. The performance has been monitored via collection of metrics and benchmarking practices.

Client Benefits: Clients receive a detailed analytical report of the application's performance under a wide range of circumstances. Triesten performance testing capabilities allow them to:

Catch performance bottlenecks prior to production release
Identify gaps in non-functional requirements definition
Ensure that the system is scalable to meet future business demand

Triesten can quickly build up real-time measurable business results early on the development lifecycle of a product / project. We focus on framework-driven Test Automation (FURPS+) Functionality, Usability, Reliability, Performance & and Scalability.

Other key areas of performance testing include, but not limited to portability, installation, compatibility, Load and Stress Testing, using industry standard and open source tools. We have capabilities in security & network testing. We benchmark functionality, migration, performance, security and compliance to internal or industry standards.

4.Test Engineering Life Cycle

Our proven services balance the costs and risks of technology development while improving overall quality and competitiveness. We apply an end-to-end, top-to-bottom approach to enhance a solution's capabilities, and more importantly bring world-class quality assurance methodologies, tools and facilities to improve its robustness. We offer customers the flexibility to choose a model most suitable to their business need – Onsite Testing, Offshore Testing, Onsite-Offsite Testing, Dedicated Domain and Test Centers.

We involve QA activities in every phase of Software Development Life Cycle and well-defined processes in order to make sure that we meet timelines with quality service.

5.Test Process and Methodology

Testing Methodology

Triesten testing services add real value for clients because they're based on a proven methodology. The methodology helps ensure that testing starts right at the beginning of the product / project development cycle. It also lays down a path for constantly improving test activities – reducing execution time and effort, giving greater predictability and repeatability, and improving coverage and traceability.

Triesten incorporates a systematic methodology. This has evolved from the best practices observed in a wide variety of successful testing projects. The methodology minimizes project risk and enables us to streamline testing delivery to achieve customer satisfaction.

Step 1 – Proposal for Engagement

In this step we define the terms of reference, customer expectations, project scope & commitments and the overall project framework.

Step 2 – Knowledge Transfer

Here our domain experts/business analysts will ensure that the critical activity of knowledge transfer—both domain-specific as well as project-specific knowledge— happens smoothly and with the least possible effort.

Step 3 – Test Strategy & Planning

This step runs in parallel to the software development activity and the team works on producing the test strategy, plan, test environment, test cases, traceability, test scripts, test data and execution plan. Parallel preparation helps improve delivery time.

Step 4 – Test Execution

The actual execution of testing happens based on the test start and completion criteria. Experienced teams of test professionals facilitate flawless and timely completion.

Step 5 – Defect Management

This step involves defect management and tracking of defects systematically to closure. Test logs, defect summaries, status reports and defect analyses are produced. The entire process is automated.

Step 6 – Test Automation

Selecting and deploying appropriate tools for automating regression testing and performance testing. Test execution productivity is considerably enhanced by automation tools and results in reduction of test life cycle and effort.

Step 7 – Test Maintenance

This step implements a process and a stable framework for handling ongoing release testing requirements in terms of change management, enhancements, change requests and defect fixes etc.

Client Benefits: We map our methodology to that of our clients to ensure that key deliverables are in expected format and that our test teams adhere to the client specific process. Triesten will closely work with client's team to identify potential process improvements based on our own experience and industry best practices.

Step 8 – Business Acceptance Testing

Triesten wants to demonstrate its ability and commitment to deliver a complete, transparent and cost effective business acceptance process. Triesten seeks to execute the Business Acceptance Testing (BAT) in effective partnership to maximize the benefits for both parties. BAT is carried out by Triesten domain and testing experts with client data in real time application environment. As the Business Acceptance Partner we are able to:

- Leverage client specific business and testing knowledge.
- Offer global coverage of our broad business testing competence and skilled business analysts.
- Realize productivity improvements leading to further reductions in costs and cycle time.
- Deliver from day one a turnkey implementation of the business acceptance testing services and with that reduce implementation costs.
- Implement a delivery organization with a high degree of scalability to adapt to changing requirements in the most flexible way.

Client Benefits: Important features of the BAT Solution are:

- It is effectively supported by deploying relevant business knowledge in the test teams.
- It contains well documented processes and procedures that are supported by a knowledge web portal.
- The operational model is flexible in size and location to easily adapt to changing conditions.
- Transparent management reporting including performance measurement and metrics to support quality management and quality improvement.

6.Key Metrics

The following are some of the key metrics, which are collected as part of the process for statistical process control:

- post release defects
- in-process defects
- severity-1 bugs per build
- severity-1 bugs per test iteration
- successful builds
- test iteration cycles
- test cases executed
- bugs detected
- bugs fixed
- Estimated & Actual effort per test cycle
- Estimated & Actual no. of resources

% of test coverage

Product quality metrics – as defined by customer which maps to performance requirements

7.Verification & Validation Methods

Component and API Testing

Validating the reliability of independent components.
Validating the stability of the independent and integrated components.
Testing of API calls (method/functions) in isolation or sequence to vary the order in which the functionality is exercised and expose failures.

Integration testing.

Interfaces between system modules / components are verified as part of integration testing

Functionality Testing

For each subsystem, separately and for the entire integrated system functionality and individual component performance has been verified.

System Testing

Functionality testing
Performance (response time for various system functions)
Load testing
Scalability testing
Reliability (availability, crash recovery and error handling)

Compatibility & Installation Testing

It is performed across a variety of OS, browsers, databases, servers and hardware, different versions, configurations and display resolutions etc.
The scope of the testing is performed to ensure that all installed features and options are functioning properly.
Performance, scalability and reliability testing is conducted only when the complete integrated system is available.

Domain & Compliance Testing:

Online Business Management systems
Enterprise solutions
Regulatory compliance
Application management
Data warehousing & Mining
Packaged applications
Re-engineering or Conversion

There are many advantages in using Domain & Compliance testing. They include more effective Knowledge transfer, improved testing results and a reduction in cycle times.

8.Infrastructure

Dedicated Manual & Automation Lab

World class infrastructure with dedicated manual and automated test
Lab Testing tools – QTP, Load runner, Jira and Quality Centre

Quality Test Professional (QTP)	Functional testing
Load Runner	Performance testing
Quality Centre	Test Management
JIRA/QC	Defects / Issue Management

Expertise on QTP

Triesten Testing team has successfully implemented various automation frameworks against different technologies.

Triesten has also developed a framework which can be used in different environments. This framework uses various library files developed at Triesten to present the client with an interface which accepts input test data from XLS files and logs the results into XLS or word files effectively behaving as a completely automated Test Management Tool.

Our Automation framework also involves checking flow of data from user application (developed in Java, .Net) to backend databases such as Oracle, SQL Server and MySql on Linux, Sun Solaris and Windows Operating Systems.

Success Story: By above mentioned framework Triesten has recorded and enhanced 350 functional and regression test cases by using Quick Test Professional.

Manual execution of these 350 functional test cases required about 14 days. Automation of these test cases drastically reduced the time required for entire test execution cycle (including result analysis) to 2 days, simultaneously isolating the testing process from manual errors and maintaining reliability and consistency.
These automation scripts are also used by clients during UATs which has resulted in reduction of testing cycles thus giving faster releases.

Expertise on Quality Center

Triesten Testing team has successfully implemented the entire test management process using Quality Center features. All automated scripts were directly integrated with Quality Center to plan and execute the tests. Thus reducing manual efforts and reduction in cost and time. Requirements and defect management were done using Quality Center.

Expertise on Performance Tools

We carry exhaustive Performance testing with almost all performance and load automation tools, which involves:

> Creation of load scripts with virtual users for identifying scalability issues that would impact real time users in production.
> Test Optimization Consultancy along with test data services provisioning.
> Scripting, Executing, Reporting, Analyzing the reports as well as data creation and virtual user creation.
> Verification of the results through automation.

9.QA Team & Skill Matrix

Triesten testing services organization already fields a highly skilled software testing professionals who are wholly dedicated to careers in testing and quality assurance—and the team is growing fast. Each of our test experts has deep domain expertise and a clear understanding of business priorities.

A group of certified test professionals (Certified Software Test Engineer (CSTE), Certified Software Quality Analyst (CSQA), Certified Process Analyst, Certified CMMI Specialists, Certified Compliance Specialists,) are available in specialized area of process, quality and testing. Here is a Snap shot of testing resources available.

QA Organization Profiles:

#	Skill Matrix
1	Junior Test Engineer
2	Senior Test Engineer
3	Test Lead
4	Test Manager

5	Test Process Consultant
6	QA & Compliance Auditor
7	Process Specialist

10.Best Practices on Quality Augmentation

Root Cause Analysis

We conduct effective RCA which takes the problem-solver through the following stages:

Collection of information that surrounds the problem and collection will be as objective as possible.
Analysis of the information Uncovering the root cause(s)

We incorporate methods using information available, but certainly are not limited to, the following:

Events & Causal factor analysis

Change analysis
Barrier analysis
MORT (Management oversight & risk tree)
HPE (Human performance evaluation)

We challenge the root cause(s) that will resolve the problem either permanently, or minimize its recurrence by applying statistical methods.

11.Reliability Modeling

Triesten says "Reliability as —The ability of a system or component to perform its required functions under stated conditions for a specified period of time."

Using the above definition, Triesten promises to serve clients a reliable product comprised of three best activities:

Error prevention
Fault detection and removal
Measurements to maximize reliability, specifically measures that support the first two activities

However, successful modeling has been done to predict error rates and reliability

12.Acronyms and Abbrevations

BAT	Business Acceptance Testing
CMMI	Capability Maturity Model – Integration
CSQA	Certified Software Quality Analyst
CSTE	Certified Software Test Engineer
HPE	Human Performance Evaluation
JIRA	Issue / Defect Management & Tracking Tool
MORT	Management Oversight and Risk Tree
QA	Quality Assurance
QC	Quality Center
QTP	Quality Test Professional
RCA	Root Cause Analysis
ROI	Return On Investment
SIT	System Integration Testing

ST	System Testing
TC	Test Cases
TELC	Test Engineering Life Cycle
TP	Test Plan
UAT	User Acceptance Testing
UT	Unit Testing