

Overview of Software Testing Services

Our Focus

Test and Data Services specialises in software testing. This single-minded commitment to be the best in one specific field has made us the leader in the South African software testing market. Over the next few pages the company will showcase the services that transformed it into the market leader.

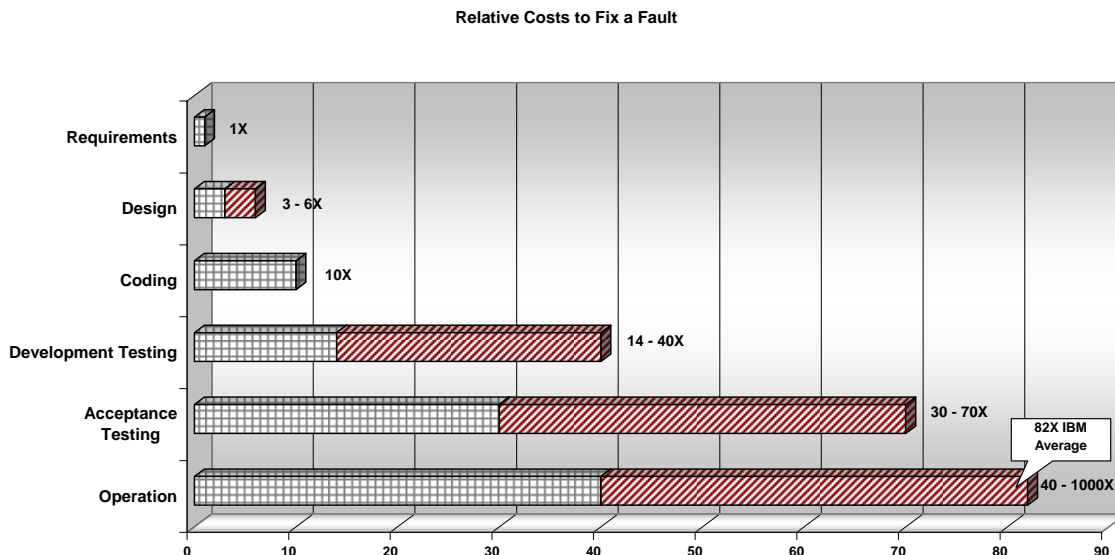
Why Test Software?

Software is written by human beings who make mistakes. These mistakes manifest themselves in the software as faults – it is the role of software testing to identify these faults, before the cost of repairing them escalates or the client’s reputation is affected. Software testing mitigates several risks for the client’s organisation.

Cost Effective Software Testing

It has been shown that the sooner a fault is found and fixed the less it costs to remove. Organisations that do not test, or only test in the late phases of the development life cycle, spend a significant percentage of development budgets on rework. Effective testing, started early in the software development life cycle, will result in significantly reduced development costs.

In his book, Software Engineering Economics, Boehm describes one of the most significant studies made on the cost of fixing faults at each stage of the software development life cycle. The table below shows the findings of this study.



This means that a fault found during the coding process typically costs 10 times more to fix than one found and fixed at the requirements development stage.

The Benefits of Testing Software

By testing early in the software development life cycle, the multiplication of costly problems that harm projects is significantly reduced. This translates into significant benefits such as:

- reduced development costs
- reduced risk to mission critical systems
- reduced risk of financial loss
- reduced risk of legal liabilities
- improved client satisfaction
- improved project delivery dates
- improved reliability of systems
- improved working conditions

Consequently it has been shown that the correct application of software testing consistently saves time and money.

Software Testing Disciplines

Test and Data Services' expertise includes the following testing disciplines:

Testing Discipline	Description
Manual Testing	Manual testing is the most common form of testing and provides a cost effective solution for delivering quality software.
Test Automation	The manual testing process can be automated by using tools designed to test other software. It holds important benefits such as allowing repetitive tests to be performed quickly, reliably, and at any time of the day or night.
Performance Testing	Performance testing determines how a system will cope when it is placed under pressure. It simulates loads that the system will be experiencing once it has been commissioned.
Security Testing	Security testing identifies areas where software is exposed to abuse by unauthorised parties.
Usability Testing	Usability testing evaluates whether systems are easy to learn and use. Implementing usability allows people to complete tasks faster, and more accurately, with less training and technical support.
Web Testing	The specific challenges of the web environment have made it necessary to develop techniques that address the technical complexities encountered on websites and in web applications.

Other Testing Disciplines

This service offering is continuously expanding. Should you have a need for a specialist discipline that is not mentioned here, please call our offices and talk to one of our consultants.

Our Testing Services

Test and Data Services offers three primary services:

- Testing Implementation Solutions
- Consulting
- Training

Testing Implementation Solutions

The cost-saving benefits of software testing have become increasingly evident over the past few years. This grows ever more evident as more effective software testing techniques are developed. However, these developments have also increased the challenges and complexities of managing software testing personnel.

To address this need Test and Data Services has moved beyond the simplistic and often ineffective labour broker service and offers a solution that ensures that software testing solutions are managed and implemented effectively, whilst managing skilled staff. In keeping with international trends, it addresses this need for testing services in different ways:

- by outsourcing:
 - on-site
 - off-site (i.e. via testing bureau services)
- through the fixed deliverables option

Outsourcing

Why outsource?

Over the past few years, the business environment has grown increasingly competitive. One of the many changes that this has ushered in, is a tendency among businesses to focus on their core competence and outsource the rest. This holds several significant advantages in that the company's focus is not diluted by having to manage non-core functions.

Since software testing is Test and Data Services' core focus, the company encourages staff to develop their testing and related skills. This knowledge allows testers to operate more effectively. Test and Data Services also has the necessary skills to manage a testing operation at optimum efficiency and we are able to provide all levels of testing staff for growing teams.

Outsourcing Alternatives

On-site Outsourced Software Testing

A subtle but very important benefit of on-site outsourced testing lies in the reduced risk of conflicting priorities. As the outsourced testing team is managed by Test and Data Services, the team only focuses on the company's testing needs, and potential conflicts of interest elsewhere in the client company do not influence their recommendations.

Off-site Outsourced Software Testing - Bureau Services

Software testing can also be done off-site at Test and Data Services' Testing Bureau; provided that specialised equipment, such as a mainframe, is not required. The full spectrum of the company's services, including specialist services such as usability testing and test automation, can be made available to the client. This holds several important advantages.

- Customers are relieved of managing testing staff.
- The service is *cheaper* since Test and Data Services is able to apply a balanced combination of consultants, management, and junior resources.
- The *standard* of service is consistently high since senior consultants are in the Bureau to oversee the work being undertaken.
- Costs related to *office space* are removed.

Using the Software Testing Bureau is a simple process. Consider the following example of a customer requiring a full testing solution to their PC-based program.

- The program is given to the Bureau staff on a disk together with the relevant documentation.
- The Bureau staff members construct the relevant testing documentation.

- The testing documentation is given to the customer for approval and sign-off.
- The Bureau staff then test the program and communicate a list of faults to the customer.
- In addition, the allocated Bureau tester can meet with the customer representative on a regular basis. This often takes the form of 'Defect logging meetings' with developers.

Outsource Costing Alternatives

The costing of software testing services can be done on a time and materials basis or it can be offered on a fixed-cost basis.

In addition to the outsourcing services offered by Test and Data Services, direct staffing solutions are also available. Test and Data Services' extensive experience of managing people in the software testing field - which includes skills building, competence evaluation, optimal team composition, and appropriate placement - can be used to the customer's advantage.

The Fixed Deliverables Option

Ultimately, all software testing is done with a specific objective in mind. To this end, Test and Data Services provides a shortcut to success: The Fixed Deliverables Option. This option makes Test and Data Services accountable for achieving the end result and relieves the client of the burden of managing software testers to achieve that result. So instead of engaging Test and Data Services for a fixed time, the company is instead engaged to deliver a fixed result.

Test and Data Services has shown time and again that the Fixed Deliverables Option is less expensive than using permanent staff for the following reasons:

- costs related to replacing unsuitable staff are eliminated
- testing training and retrenchment costs are eliminated
- management, administration, and labour costs are reduced

Test and Data Services is committed to ensuring the continuity of service should a particular person become unavailable. These personnel changes are managed and overlapped at Test and Data Services' expense. Test and Data Services is a substantial company with considerable resources and delivering results is the responsibility of the company, not specific key individuals. This provides the client with peace of mind that the job will be done regardless of the individuals involved.

What Makes a Test and Data Services Solution Different?

The Virtual Competence Programme

One of the company's most effective tools has been the Virtual Competence Programme. This programme gives people in the employ of Test and Data Services access to a team of senior consultants at no expense to the client. These consultants provide Test and Data Services staff with advice that saves them time and makes their efforts significantly more effective.

Test and Data Services also assigns a member of its management team to interface with each of its staff. These managers:

- help staff deal with difficulty in the work place
- improve the contribution each resource is making
- deal with issues that could divert the resource's attention away from his or her work
- take responsibility for their performance

This ensures that, when the company deploys a resource at a client site, both the technical needs and the professional issues are addressed.

Extensive Training

Test and Data Services invests a significant portion of its financial resources into developing its staff. The company's staff members are motivated to grow professionally and they are encouraged to make full use of the wide range of software testing courses that the company offers.

Staff Competence Levels

The company originally categorised staff according to their experience, however, the software testing specialisation is particularly vulnerable to discrepancies between a person's skill and their experience.

Test and Data Services has determined a reliable way of assessing people's actual testing abilities and has graded them accordingly.

Testers

- execute test cases and record test results
- apply basic testing techniques (e.g. boundary value analysis and equivalence class partitioning)
- log faults
- review fault logs

Junior Test Analysts – can perform all the Testers tasks as well as:

- apply intermediate testing techniques (e.g. path flow analysis and decision logic tables)
- review test cases and make recommendations on optimising them
- track faults and prepare metrics on faults

Test Analysts – can perform all the Testers and the Junior Test Analysts tasks as well as:

- apply advanced testing techniques such as inspections and error models
- develop and refine test cases and test procedures
- prepare management reports (e.g. the test summary report)
- ensure proper test prioritisation according to risk-based techniques
- create and review test plans
- assist in the implementation of testing methodologies

Test Managers

Test Managers are able to operate as Test Analysts, even though their main focus is to:

- develop, create and implement Master test plans / phase test plans
- ensure that the agreed testing standards are adhered to
- liaise with the project managers and development teams in order to identify and implement the testing needs
- maintain continuity of system knowledge over all testing projects or areas
- plan the test environment
- use test management techniques to calculate the amount of time it will take to test for that particular project
- develop and oversee the rollout of the test methodology for each project
- manage the testing staff, which includes:
 - ensuring that the testing staff are effectively utilised
 - distributing and monitoring the quality of work
 - ensuring that adequate testing resources are available as needed
 - fault analysis and management

Whilst the skills categories listed apply to normal functional testing, they are also relevant to **specialist testing disciplines** such as:

- Software Test Automation
- Usability Testing

- Security Testing
- Performance Testing, and
- Web Testing

However, specialist testers would possess certain additional skills relevant to their specific area. For example, the additional skills of the test automation team would include:

Junior Test Automation Engineer

- creating capture-playback scripts using test automation tools
- conducting automated tests and preparing appropriate reports
- adapting test cases for use in a test automation environment

Test Automation Engineer

- designing, developing, and executing reusable and maintainable automated scripts
- conducting automated tests and preparing appropriate reports
- maintaining test automation scripts
- developing test procedures and cases based upon system requirements

Test Automation Specialist

- designing and developing advanced reusable and maintainable automated scripts (these scripts are easier and more cost effective to maintain)
- setting up test automation environments
- trouble shooting
- identifying and implementing the appropriate software test automation methodology in the client's environment
- evaluating and selecting test automation tools that are ideal for the client's environment

Consulting

Clients often need guidance in addressing specific software testing issues or difficulties. To meet this need, Test and Data Services employs a team of highly skilled software testing consultants. Their service extends from simple one-off tasks such as assisting staff in implementing a software testing technique, to complex undertakings such as implementing a software testing methodology.

One of the company's most popular consulting services is the *Test Process Improvement (TPI®)* survey. This is a fixed price consulting service that evaluates the client's current software testing processes against a reference framework of the world's best practices. The outcome of this evaluation is a report that states the maturity of the client's current test process and then proposes the steps required to optimise the client company's software testing initiative.

Software testing consulting activities can provide other deliverables such as:

- managed transfer of knowledge into organisations
- provision of specialists for the resolution of highly specific issues
- staff certification, assessments, and skills / capability audits
- cost reduction investigations
- external technical assessments (usability, automation, performance, security)
- quality assurance programmes
- capacity-building programmes
- solution proposals
- interventions in specific problematic situations to achieve original goals
- assistance in managing the capability of the organisation into a desired state of maturity

Test and Data Services' consulting area typically operates according to predefined delivery periods, costs, and deliverables.

The benefits of consulting assistance include:

- more predictable test processes, i.e. test processes that
 - are more appropriately structured
 - produce more repeatable results, and
 - are improvable
- better performance and higher probability of project successes
- improvements that are self-sustaining because they are process-based and not applied to specific problem cases - this results in long-term benefits as opposed to a short-term solutions result, and proportionate large-scale value is gained over time
- an integrated enterprise-wide success, as opposed to isolated outstanding results from specific areas of involvement

The company's consulting service covers the full ambit of testing disciplines mentioned earlier in this brochure.

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Software Testing Training

Test and Data Services presents courses at several well-established training facilities throughout South Africa and internationally. Training can be arranged at the client's premises depending on adequate facilities and candidate numbers. The company's commitment to education does not stop with these training courses. Once back in the work environment, the company's consultants are available to assist the student to apply these principles should the need arise.

Test and Data Services offers a wide selection of software testing courses. These range from beginners courses to specialist courses (such as International certification, test automation and usability). The courses also vary in duration from one to five days. The courses currently offered are:

Software Testing Courses	International Certification Courses
<ul style="list-style-type: none"> • Practical Software Testing • Software Testing Overview for Developers • Software Testing Overview for Managers • Practical Software Testing Advanced • Business Analysis and Requirements Engineering • Software Test Automation Architecture • Practical Automation Scripting for Testers • Practical Automation Scripting for Testers Advanced • Mechanising Automated Testing • Performance Testing Fundamentals • Security Testing Fundamentals • Agile Testing • Practical Usability Testing • Basic Practical SQL for Testers • User Acceptance Testing • Introduction to LEAN Culture and Techniques in IT and Testing • Productive Teams for IT and Testing 	<p>Test and Data Services is fully accredited to train the following courses:</p> <ul style="list-style-type: none"> • ISTQB/ISEB Foundation Certificate in Software Testing • ISEB Intermediate Certificate in Software Testing • ISEB Practitioner Certificate in Test Analysis • ISEB Practitioner Certificate in Test Management • ISTQB Advanced Core Module • ISTQB Advanced Test Manager Module • ISTQB Advanced Test Analyst Module • ISTQB Advanced Technical Test Analyst Module

Further information about our training courses can be downloaded from www.testdata.co.za.

Test Focus Magazine

Test and Data Services publishes the Test Focus Magazine, South Africa's only professional publication devoted exclusively to the theory and practice of the software testing Industry.

Contact

Further information on our training or services can be downloaded from www.testdata.co.za or contact us at the telephone numbers below.

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