

LINEAR QSM

Optimizing Software Testing



Benefits

Compared to Traditional Approaches
 Linear Q Delivers

- Significant Increase of Test Automation Coverage
- Decreased Time Required in Testing
- Lower Costs
- Consistent Outcomes Leverage Best Practices
- Improved Overall Quality
- Better Customer Service

„Test automation with minimal maintenance and structured test execution are key elements of Linear Q for optimizing test efficiency and for reducing test run-times.“

Wolfgang Platz | CEO, TRICENTIS

Current Situation and Potentials

The current economic instability as well as changes in the financial markets have led to enormous cost pressures on IT departments - and testing, too. Nevertheless, the quality of testing must not deteriorate. Many companies have sought to solve the cost problem by outsourcing their testing activities or by using test automation. Many of our customers report very unfavorable experiences with sourcing and automation. Linear Q is a method for optimizing the effectiveness and efficiency of software testing. It makes it possible to achieve maximum test quality at minimal cost. The following will explain the main features of this method and its advantages.

Effectiveness and Efficiency

The primary way most companies attempt to optimize test performance is by making test execution more cost-effective (= increased efficiency). But these efforts will not achieve much without also considering how to improve effectiveness. Linear Q is designed to enhance both parameters.

The Dilemma: Measuring Test Performance

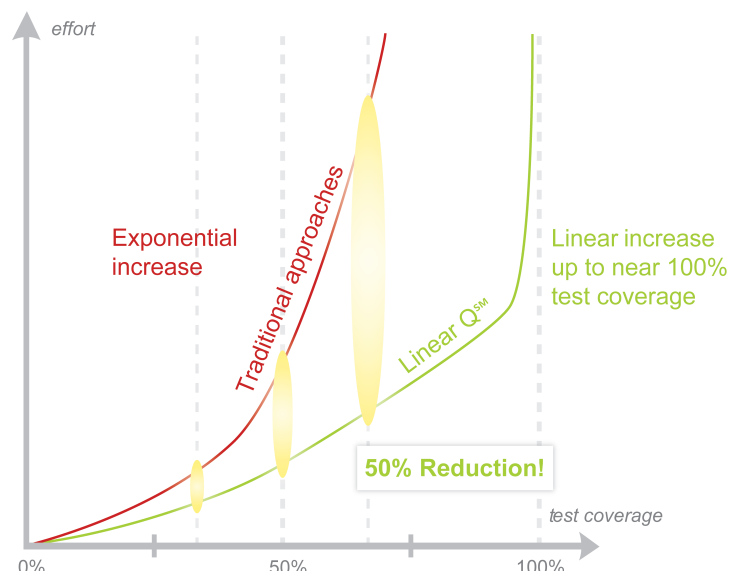
Using the test coverage that can be achieved within a specific run-time is a reasonable way to estimate test performance. Test coverage shows how much of the overall functionality of the system under test (SuT) the test covers. In practice, the different functions of the SuT vary in importance to users: generally, 80 % of the business is handled by 20 % of the functionality and vice versa (80:20 rule). Meaningful test coverage begins with risk weighting of the functions under test (risk-based testing approach, relative test coverage). Test cases must be created for these functions and they must also be assessed according to the risk covered by them. Before Linear Q, the testing industry did not have a reliable tool for measuring test coverage. This explains why test managers have tried to use large numbers of tests to show test performance since they couldn't specify test coverage. This has also led to the development of large test case portfolios with very little effect.

Linear Q – Overview

Linear Q is a comprehensive test approach that begins with a risk-based functional structure and ends with a final result that shows the test results in relation to the risk-based structure.

Key Elements of Linear Q:

- Methodical approach of [Linear Expansion](#) for defining optimized test cases
- Concept of "inner values" for determining each individual test case's contribution to the overall test
- Business-based test automation with minimal maintenance effort - implemented according to the Business Dynamic Steering concept
- Sourcing Patterns
- Possibility of reducing the business unit's testing to less than 10% of the total effort

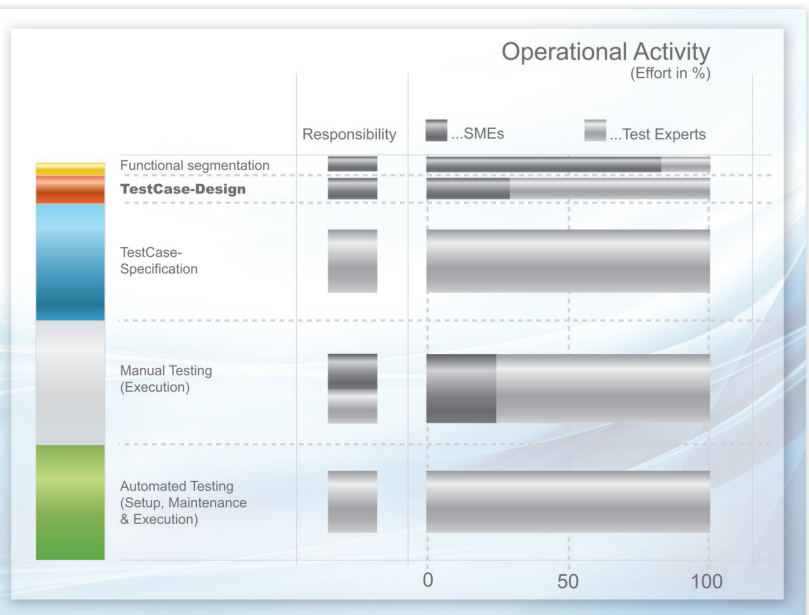


Measurable Results

The higher the targeted test performance is, the greater the potential savings with Linear Q will be:

- The use of Linear Q generally leads to savings of well above 50% already at a test coverage of 50%
- In practice, Linear Q is the only approach to offer more than 90% test coverage for complex systems at a reasonable expense

Responsibilities with LINEAR QSM



Methodical TestCase-Design with Linear Q

Linear Q gets its name from its key feature: a unique TestCase Design method. TRICENTIS has developed the Linear ExpansionSM method on the basis of established methodical concepts (creation of equivalence classes and boundary values, combinatorial principles). Methodical TestCase Design with Linear Q also provides the added benefit of supplying the data objects which are needed as the test data for complex processing operations.

Organizational Potentials

Linear Q uses a workshop format to create TestCase-Designs: subject matter experts (SME), such as business analysts from the different business units, create test cases together with a moderator and a test expert. These workshops not only lead to very effective test cases, but also serve as the most efficient way imaginable to transfer know-how to the test experts. These experts can then do most of the testing themselves without the further assistance of the SMEs.

- The phases for increasing effectiveness are the responsibility of the SMEs, but the test experts already make a decisive contribution to structuring the test with their domain knowledge
- Using Linear Q test experts can do most of the specification, maintenance and execution of tests on their own, but they need the SMEs help for the manual user acceptance testing
- All in all, considering the amount of effort needed for each phase, the operational testing activity of the SMEs can be reduced to well below 10% of the total effort

The Benefits of Linear Q

The new Linear Q test method offers its users great potential for increasing the effectiveness and efficiency of their software testing. The benchmark for measuring the optimizations discussed above is the test coverage that a test can achieve during a specific run-time.

Reference projects have shown a potential to save at least 50% of the costs compared to traditional approaches, when the test coverage needs to reach 50%. And the potential of Linear Q continues to grow as test coverage increases.

TOSCA TestsuiteTM The Basic Tool for Linear Q

[TOSCA TestsuiteTM](#) provides ideal support for the Linear Q method:

- The risk-based functional structure is built in the TOSCA Requirements AddIn. TOSCA offers a tool-supported, modern method for assessing the risk of each requirement
- The TestCase-Design AddIn provides automated combinatorial generation, including the Linear Expansion method
- TOSCA uses the concept of Business Dynamic Steering to solve the maintenance issue of automated software testing
- TOSCA makes defect tracking easy with integration to a wide variety of popular defect tracking tools
- Projecting the test results back on to the Requirements structure produces transparent reports based on test coverage

TRICENTIS®

Since 1997, TRICENTIS has provided knowledge and expertise covering all fields related to software testing and quality assurance. TOSCA TestsuiteTM was developed by TRICENTIS as an innovative and technically superior solution for test management, automation and risk assessment and is a leader in its field.

TRICENTIS is a Gartner Cool Vendor and is in the Visionary section of the "Gartner Magic Quadrant for Integrated Software Quality Suites".