

# Certified Tester

## Expert Level

### Modules Overview

Version 1.0, March 11<sup>th</sup> 2011

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International Software Testing Qualifications Board

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## Revision History

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0.2	January 1 <sup>st</sup> 2011	Review comments incorporated
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## 1. Introduction

This overview document is intended for anyone with an interest in the ISTQB Expert Level who wants a high-level introduction to its leading principles and an overview of the individual Expert Level modules.

Please note that the Rules and Recommendations relating to the Expert Level are described in a separate document [ISTQB-EL-Rules-and-Recs].

In this document each Expert Level module is described with the following information:

### **Module content:**

The syllabus content for each module is described in summary form.

### **Business outcomes:**

These provide an overview and statement of what can be expected from an expert in the particular subject area, (e.g. an expert test manager), and will particularly benefit businesses who are considering the development of specific Expert Level skills.

Traceability to the learning objectives for a specific Expert Level syllabus is shown in each module's Specific Exam Rules and Recommendations document.

## 1.1 The Testing Expert

Before going into the ISTQB Expert Level, we should define what it means to be a testing expert.

The testing expert:

*An expert is a person with the special skills and knowledge representing mastery of a particular testing subject. Being an expert means possessing and displaying special skills and knowledge derived from training and experience.*

A testing expert is one that has a broad understanding of testing in general, and an in depth understanding in a specific test area. An in depth understanding means sufficient knowledge of testing theory and practice to be able to influence the direction that an organization and/or project takes when creating, implementing and executing testing activities related to the specific area.

It is important to emphasize that an expert must embody both knowledge and the necessary skills to apply that knowledge in real-life situations.

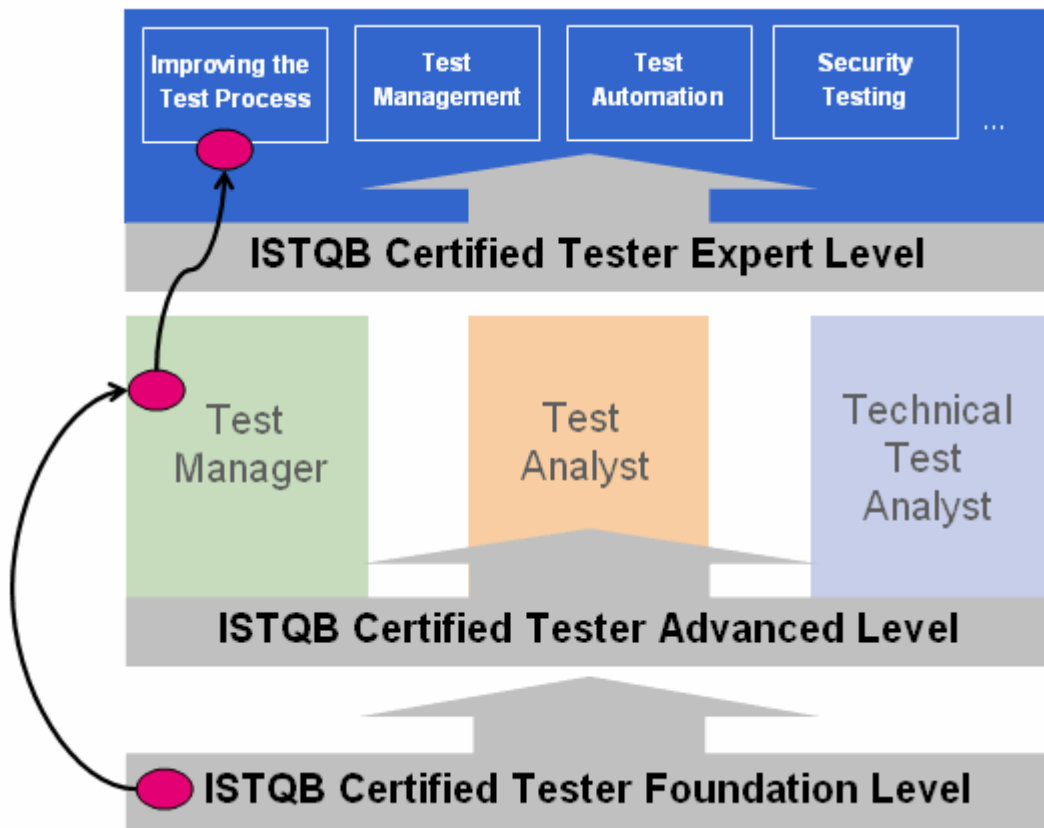
It is expected that in the future possessing an ISTQB Expert Level certificate will also allow those experts to use the Certified Tester Expert Level (CTEL) acronym.

## 1.2 Modular Expert Level

There is a common understanding that an expert is often an expert in only a certain area of testing. This requires an ISTQB multi-module Expert Level. There are a number of ways of organizing the Expert Level modules, e.g. domain-based, testing-based or level of technicality.

The Expert Level will follow a testing-based structure for the modules, e.g. test management, test automation, test process improvement.

The view of the Expert Level is depicted in the following figure:



The diagram shows one possible path through the three certification levels.

As at Foundation and at Advanced Level, syllabi are needed for Expert Level. With a modular Expert Level, a separate syllabus is needed for each module.

As with foundation and advanced the Expert Level syllabi will be supported by clear learning objectives (LO's). The following Expert Level modules are either released or being developed:

- Improving the testing process
- Test management
- Test automation

At the time of writing, work on the Security Testing module is ready to commence development work.

The following subjects are currently considered as potential candidates for future development (in alphabetic order):

- Agile testing
- Model-based testing
- Performance testing
- Static testing
- Test design techniques

Other subjects may be developed as the need arises. Additional sections will be added to this document as further modules become defined.

## 2. Overview of Expert Level Modules

### 2.1 Module: Improving the Test Process

#### 2.1.1 Content

The syllabus [ISTQB-ITP-Syllabus] starts with an introduction to the fundamental issues concerning improvement to the test process. Basic questions like “why improve testing?” and “what can be improved?” are considered and the different ways that stakeholder can view quality are described.

There are a number of different approaches which can be applied to improving the test process; overviews of these approaches are provided.

Model-based improvement is considered in depth by first examining fundamental aspects of using models and then describing and comparing a number of well known test improvement models of various types.

Analytical approaches to improving the test process, such as causal analysis, are covered in as much detail as the model-based approaches. Metrics play a significant role in analytical approaches so a number of these are covered, together with an approach to using metrics effectively e.g., the GQM-approach.

An expert in this field will be expected to select the right approach for a given situation. The factors to consider are covered and the relative benefits of each approach are compared.

The task of improving test processes is itself a process which can be described in several steps, including the setting of scope and objectives for improvement, assessing the current situation, analyzing results, performing solution analysis, suggesting improvements and priorities, creating an improvement plan, implementing the plan and gaining knowledge from each improvement cycle. The syllabus details each of these steps according to a standard process definition.

Different organization forms for implementing improvements to the test process are covered, including the impact of offshoring on those organizations. The typical roles to be found in these organizations are described and the wide range of different skills required for effectively performing those roles are detailed.

Management of change is essential in rolling out improvements to the test process into projects and organizations. In particular, the human factors in the change management process are covered in the syllabus. A wide range of different skills is covered including those needed for effective interviewing and for performing analysis.

The syllabus concludes with a detailed consideration of critical success factors.

#### 2.1.2 Business Outcomes

The expert test process improver is able to perform each of the following tasks:

- TP1 Lead programs for improving the test process within an organization or project and can identify and manage critical success factors
- TP2 Take appropriate business-driven decisions on how to approach improvement to the test process
- TP3 Assess the current status of a test process, propose step-wise improvements and show how these are linked to achieving business goals
- TP4 Set up a strategic policy for improving the test process and implement that policy
- TP5 Analyze specific problems with the test process and propose effective solutions

- TP6 Create a test improvement plan which meets business objectives
- TP7 Develop organizational concepts for improvement of the test process which include required roles, skills and organizational structure
- TP8 Establish a standard process for implementing improvement to the test process within an organization
- TP9 Manage the introduction of changes to the test process, including co-operation with the sponsors of improvements
- TP10 Understand and effectively manage the human issues associated with assessing the test process and implementing necessary changes

## 2.2 Module: Test Management

### 2.2.1 Content

The syllabus [ISTQB-TM-Syllabus] starts by considering the purpose of testing or the test mission, and the relation between the test policy, the test strategy and the test objectives. Test prioritization and various effort allocation techniques, including risk-based are considered in depth. The expert test manager is considered to be able to utilize and adapt all available methods to define and meet testing objectives. Furthermore, an expert test manager is expected to be able to design a specific method or approach to meet those objectives and to gain and maintain early management commitment.

Managing the test team and managing testing throughout the organization are addressed extensively and special attention is given to the various project management tasks that would apply at the expert test management level. The test managers' role in performing risk management (risk assessment workshops and risk mitigation management), reviews, assessments, quality gate evaluation, quality assurance and audits are covered in detail. How to report test results and how to interpret results by evaluation of exit criteria is elaborated upon. The metrics are described which are presented in an Key Performance Indicator (KPI) dashboard and play a crucial role in the management of the test process.

The expert test manager is expected to select or create, evaluate and improve the most appropriate approach for a given situation, which implies that several right approaches can occur simultaneously, of which no individual approach stands out significantly. It is up the expert test manager to find a suitable approach or combination of approaches which fit the organization in order to meet or exceed the given objectives.

Different ways to organize testing as well as different types of projects for test management, including vendor management, are covered. Typical test management topics such as incident management, test project evaluation and tools for reporting and test management are addressed in depth.

The syllabus concludes with an overview of special test management considerations for different domains and project factors.

### 2.2.2 Business Outcomes

The expert test manager is able to perform each of the following tasks:

- TM1 Lead the test management within an organization, project or program to identify and manage critical success factors with management commitment at CEO / Board level
- TM2 Take appropriate business-driven decisions on a test management strategy and implement organization wide commitment and compliance based on quality KPI's

- TM3 Assess the current status of the test management, propose step-wise improvements and show how these are linked to achieving business goals within the organizational context of test management (organization or project/program)
- TM4 Set up a strategic policy for the test management and the testing, and implement that policy in an organization
- TM5 Analyze specific problems with the test management and its alignment with other roles or management areas in the project/organization, and propose effective solutions
- TM6 Create a master test plan with matching governance dashboard to meet or exceed the business objectives of the organization or a project/program
- TM7 Develop innovative concepts for test management (project) organizations which include required roles, skills, methodologies (tools) and organizational structure
- TM8 Establish a standard process for implementing test management in an organization (project/program) with standardized delivery based on quality KPIs
- TM9 Lead an organization to improve the test management process and manage the introduction of changes
- TM10 Understand and effectively manage the human issues associated with test management, test-project management and implement necessary changes

## 2.3 Module: Test Automation

### 2.3.1 Content

The syllabus [ISTQB-TA-Syllabus] starts with a definition of test automation, the scope covered, and objectives. There are a number of different tools and technologies available to assist test projects in managing, executing, and reporting testing. Basic questions like “why would you use automation?”, “how would you use automation?”, and “when would you use automation?” are addressed.

Strategies for successful implementation of automated testing tools are covered extensively beginning with an assessment and evaluation of economic benefit. Discussion of automated frameworks and how they can aid in the development, deployment, and maintainability of automated scripts is covered along with specific planning activities surrounding implementation which affect staffing, tools, and schedule.

An expert in the field of test automation will have the understanding to know what tools should be applied during what phase of the testing lifecycle and which approach should be used to ensure a successful implementation for any given situation.

Tools covered in the Test Automation Module include, but are not limited to those used for functional testing, regression testing, and test management. Performance testing is covered briefly, as a future Expert Level Syllabus may be dedicated to Performance Testing exclusively. The analysis and recommendations are tool agnostic, as tools from different vendors have similar capability and complementary features.

Techniques, based on best practices including automation frameworks, are described to ensure the successful and efficient implementation of testing tools and the skills necessary to develop and maintain an automated test environment.

Secondary uses of test automation are also discussed. These include, but are not limited to: automated configuration management of test artifacts, automatic metrics gathering and test reporting, automated creation and management of test data sets, and automatic defect reporting.

The process of automating test scripts in order to create a sustainable regression test suite can be described in several steps. There are specific roles and responsibilities for test teams wishing to incorporate automation into the overall testing process.

The syllabus concludes with a detailed consideration of critical success factors.

### 2.3.2 *Business Outcomes*

The test automation expert is able to perform each of the following tasks:

- TA1 Analyze the need and application of automated testing tools within a testing project or organization
- TA2 Recommend the skills, tools, and schedule needed to successfully implement automated testing
- TA3 Guide the source selection and acquisition process for automated testing tools
- TA4 Provide proper guidance for how and when to best implement automated testing
- TA5 Create a test plan for automation that identifies scripts to automate and defines the requirements for an automated test lab environment
- TA6 Design and implement a sustainable test automation process using key success factors
- TA7 Establish coding and documentation standards for automated test scripts
- TA8 Adapt test automation to different test and development models and environments
- TA9 Measure the effectiveness of an automated test process through automated and manual metric collection and reporting of test results
- TA10 Manage and control test automation artifacts and a test lab environment

### 3. Abbreviations

Abbreviation	Meaning
GQM	Goal-Question-Metric
ISTQB	International Software Testing Qualifications Board
LO	Learning Objective

## 4. References

### 4.1 Trademarks

The following registered trademarks and service marks are used in this document:

ISTQB® is a registered trademark of the International Software Testing Qualifications Board

### 4.2 Documents and Web-Sites

<b><u>Identifier</u></b>	<b><u>Reference</u></b>
[ISTQB-EL-Rules-and-Recs]	ISTQB Expert Level Rules and Recommendations, Version 0.3, 5 <sup>th</sup> January 2011 (pending release approval)
[ISTQB-ITP-Syllabus]	ISTQB Expert Level Syllabus: Improving the Test Process, Version 1.0.2, 16 <sup>th</sup> April 2010. Available from [ISTQB-Web]
[ISTQB-TM-Syllabus]	ISTQB Expert Level Syllabus: Test Management. Currently under development.
[ISTQB-TA-Syllabus]	ISTQB Expert Level Syllabus: Test Automation. Currently under development.
[ISTQB-Web]	Web site of the International Software Testing Qualifications Board. Refer to this website for the latest ISTQB Glossary and syllabi. ( <a href="http://www.istqb.org">www.istqb.org</a> )