

Advanced Level Agile Test Leadership at Scale (CTAL-ATLaS) Syllabus

v0.4

International Software Testing Qualifications Board



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0 Introduction

0.1 Purpose of this Syllabus

This syllabus forms the basis for the International Software Testing Qualification Board *for Agile Test Leadership at Scale* at the Advanced Level. The ISTQB[®] provides this syllabus as follows:

1. To Member Boards, to translate into their local language and to accredit training providers. Member Boards may adapt the syllabus to their particular language needs and modify the references to adapt to their local publications.
2. To certification bodies, to derive examination questions in their local language adapted to the learning objectives for this syllabus.
3. To training providers, to produce courseware and determine appropriate teaching methods.
4. To certification candidates, to prepare for the certification exam (either as part of a training course or independently).
5. To the international software and systems engineering community, to advance the profession of software and systems testing, and as a basis for books and articles.

0.2 The Agile Test Leadership at Scale Certification (ATLaS)

The Advanced Level Agile Test Leadership at Scale qualification is aimed at people who work in an organization that is pursuing agility at scale or business agility and already have a basic understanding of agile and agile testing.

This includes people in roles such as test manager, head of testing, quality coach, test analyst, technical test analyst, test automation engineer, quality engineer, quality assurance, member of an agile team, member of a leader group of multiple agile teams, IT director, project manager, release train engineer, scrum master, product owner, and management consultant.

0.2.1 Connection to Other Certifications in the ISTQB[®] Scheme

The Advanced Level Agile Test Leadership at Scale builds on the qualifications in Foundation Level Certified Tester and Foundation Level Agile Tester. Certified Tester provides the basic knowledge and competencies in software testing. Agile Tester expands on Certified Tester and explains how testing in an agile team is performed.

As Agile Test Leadership at Scale focuses on the organizational level, it supplements the Advanced Level Agile Technical Tester focusing on technical practices. It also supplements Advanced Level Test Management, which focuses on projects and not on organizational aspects. In addition, Advanced Level Test Management covers traditional approaches and hybrid approaches.

0.3 Examinable Learning Objectives and Cognitive Level of Knowledge

Learning objectives (LOs) support the business outcomes and are used to create the Advanced Level Agile Test Leadership at Scale exams.

In general, all contents of this syllabus are examinable at a K1 level, except for the Introduction and Appendices. That is, the candidate may be asked to recognize, remember, or recall a keyword or

concept mentioned in any of the chapters. The specific LOs levels are shown at the beginning of each chapter, and classified as follows:

- K1: Remember
- K2: Understand
- K3: Apply
- K4: Analyze

Further details about cognitive level of knowledge are given in **Appendix A**.

All terms listed as keywords just below chapter headings shall be remembered (K1), even if not explicitly mentioned in the learning objectives.

0.4 Hands-On Objectives

LOs and hands-on objectives (HOs) focus on practical skills and competencies. However, HOs are not examined by the multiple-choice exam questions. It is expected that HOs are covered either as part of an accredited training or as self-study.

The specific HOs levels are shown at the beginning of each chapter, and classified as follows:

- H0: This can include a live demo of an exercise or recorded video. Since this is not performed by the trainee, it is not strictly an exercise.
- H1: Guided exercise. The trainees follow a sequence of steps performed by the trainer.
- H2: Exercise with hints. The trainee is given an exercise with relevant hints to enable the exercise to be solved within the given timeframe.
- H3: Unguided exercises without hints.

Training material owners and people who self-study can find additional guidance on how to include practical elements to fulfill HOs in the ATLaS Accreditation Guidelines.

0.5 The Advanced Level Agile Test Leadership at Scale Certification Exam

The Agile Test Leadership at Scale certification is created incrementally. Each increment is made available on the ISTQB® website so the contents can be used for training and learning. However, the certification exam will be released once the release increments correspond to a two-day training course. Therefore, the detailed description of the certification exam will be added with the last increment.

The Advanced Level Agile Test Leadership at Scale Certificate exam will be based on this syllabus and the Advanced Level Agile Test Leadership at Scale body of knowledge (BOK). Answers to exam questions may require the use of material based on more than one section of this syllabus and body of knowledge. Standards and books are included as references, but their content is not examinable, beyond what is summarized in the syllabus or body of knowledge from such standards and books.

Entry Requirement Note: The ISTQB® Foundation Level certificate and Foundation Level Agile Tester shall be obtained before taking the Advanced Level Agile Test Leadership at Scale certification exam.

0.6 Accreditation

An ISTQB® Member Board or its agent may accredit training providers whose course material follows this syllabus and the body of knowledge. Training providers should obtain accreditation guidelines from the Member Board or its agent that performs the accreditation. An accredited course is recognized as conforming to this syllabus and the body of knowledge, and is allowed to have an ISTQB® exam as part of the course.

Training providers are encouraged to use the contents of this certification in other contexts and to build the training material incrementally. Feedback from such activities will be considered before the full certification is released.

The accreditation guidelines for Advanced Level Agile Test Leadership at Scale follow the general Accreditation Guidelines published by the Processes Management and Compliance Working Group.

0.7 Level of Detail

The level of detail in this syllabus allows internationally consistent courses and exams. In order to achieve this goal, the syllabus consists of:

- *General instructional objectives* describing the intention of the Advanced Level Agile Test Leadership at Scale Level
- *A list of keywords* that students must be able to recall
- LOs for each knowledge area, describing the cognitive learning outcome to be achieved
- A description of the key concepts, including references to sources such as accepted literature or standards

The syllabus content is not a description of the entire knowledge area of testing in agile organizations; it reflects the level of detail to be covered in Advanced Level Agile Test Leadership at Scale training courses.

0.8 How this Syllabus is Organized

There are currently five *planned* chapters with examinable content. The top-level heading for each chapter specifies the time for the chapter; timing is not provided below chapter level. *For accredited training courses, this chapter requires a minimum of 1 hour of instruction.* The five planned chapters are:

- Chapter 1: 60 minutes, Quality Assistance
- Chapter 2: 120 minutes, Improve Quality and Flow in a Value-Driven Organization
- Chapter 3: 195 minutes, Continuous Improvement of Quality and Testing (to come)
- Chapter 4: x minutes, Agile Test Strategy at Scale (draft title)
- Chapter 5: x minutes, Agile Test Process at Scale (draft title)

0.9 Business Context

Organizations strive to improve their business agility to provide valuable products and services in a changing world. A key way to improve business agility is to transform the culture and mindset by using different principles, frameworks, disciplines, and methodologies such as agile, lean, and DevOps, which we here cover with the term “business agility.” One common principle in these frameworks and disciplines is the focus on delivering value with the quality that customers demand, i.e., customer-focused. Therefore, the term value-driven is used to describe organizations that strive to achieve business agility regardless of their various ways of working.

Agile started as a way to improve how software was delivered iteratively. It focused on a small delivery team that could release software in shorter iterations than the traditional software development lifecycles. As the popularity of the agile methods grew, it became apparent that at times there was a need for several delivery teams to collaborate in order to develop larger and more complex systems. Therefore, new frameworks were created in order to scale agile from individual agile delivery teams to multiple delivery teams contributing to the value of the solution. This move from focusing on individual delivery teams to multiple teams is called “agile at scale” or “scaled agile.” This also requires that testing approaches are scaled.

Scaling agile is not necessarily the same as business agility, which includes the entire enterprise, but in order to achieve business agility an organization could benefit from adopting agile at scale.

With business agility there is an even greater need for accelerated quality. This is not achievable if all responsibility for quality remains in the individual teams or specific roles such as testers. Therefore, test management moves to quality management and organizations need to adopt quality assistance across the organization as well as within delivery teams. This changes the role of quality assurance and test professionals to be closer to agile test leadership and to fostering a quality culture and mindset.

0.10 Business Outcome

The business outcome (BO) describes the benefit that a certified person should be able to deliver using the knowledge and competencies covered in the syllabus. The knowledge and competencies are described in the LOs for each chapter.

0.10.1 BO 1 Foster a Value-driven Quality Mindset and Culture

A person who has gained the qualifications in this syllabus can build and sustain a quality and testing culture in a value-driven organization or in an organization transitioning to a value-driven culture.

An example of a measurable key result for the business outcome is:

- Provide quality assistance to **x** colleagues, who do not have a background in testing or other quality management activities

(replace x with your own target).

1 Quality Assistance – 60 minutes

Keywords

Agile test leader, Agile test team leader, Built-in quality, Quality assistance, Quality assurance, Quality coaching, Quality control, Quality management, Test management

Learning Objectives for Chapter 1:

1.1 What Is Quality Assistance?

ATLaS-1.1.1 (K2) Understand quality assistance as an approach to quality and test management

1.2 Skills for Quality Assistance

ATLaS-1.2.1 (K2) Give examples for the change leadership, quality coaching, facilitation, and training skills required for quality assistance

ATLaS-HO-1.2.1 (H2) Given a quality-related problem, provide quality assistance using one or a combination of the four important skills (change leadership, quality coaching, facilitation, and training)

1.1 What is Quality Assistance?

Quality assistance is an approach to quality management that is crucial to developing and sustaining a value-driven organization.

The certification covers how quality assistance as an approach that fits with known software testing concepts such as test management, quality control, and quality assurance.

Quality assistance is the approach test management should embrace to help in adopting and fostering a transformation to business agility. A quality assistance approach to test management is significantly different from an approach based on a traditional mindset and approach (Gartner, 2018). Some important differences are as follows:

- Optimizes for flow and value delivery
- Focuses on prevention, automation, and observability
- Encourages built-in quality practices continuously
- Supports self-empowered teams by enabling others to take responsibility for quality- and testing-related activities
- Embeds testing throughout the organization instead of sustaining testing silos
- Requires agile test leaders and agile test team leaders that serve instead of test managers that control
- Has agile test leaders and agile test team leaders helping everyone in the organization collaborate through community of practice events

It is important to understand that test management as a discipline is still needed as part of quality assistance in value-driven organizations.

1.2 Skills for Quality Assistance

One of the important aspects of quality assistance is to enable everyone in the organization to contribute to and take a shared responsibility for quality. The certification introduces change leadership, quality coaching, facilitation, and training as important skills for agile test leaders and agile test team leaders to succeed with quality assistance.

Change leadership is critical as part of a successful organizational change. It is important that quality assistance aligns with the change programs in an organization, especially programs to improve business agility. Change leadership includes human aspects, which affects people's capacity to deal with change as well as fostering a culture of continuous improvement.

Quality coaching is a skill using a set of activities focused on helping the agile organization deal with quality-related topics. It is a collaborative dialog that promotes reflection in teams or with a single person. Conditions for effective quality coaching are also covered as part of this certification.

Facilitation is a skill in quality assistance that encourages people to use their knowledge and skills to reach a desired outcome. Facilitation is important to engage everyone and to build a shared responsibility for quality.

Training is a skill to help people build their skills. A variety of methods are introduced to cater for different needs and purposes. In order to scale the training it is important to engage the relevant organizational departments that support employees' skill growth and career development.

Since each of the above skills are disciplines in their own right, it is important to see them as part of a continuous learning pathway. There are other skills that can be used to serve the organization, such as mentoring or consulting, but these are out of scope for this certification.

How to use the four skills is elaborated in future chapters, see syllabus outline in **section 0.8, How this Syllabus is Organized**.

2 Improve Quality and Flow in a Value-Driven Organization – 120 minutes

Keywords

Effectiveness, Efficiency

Learning Objectives for Chapter 2:

2.1 Facilitate Value Stream Mapping

ATLaS-2.1.1 (K2) Understand value stream as a concept

ATLaS-2.1.2 (K3) Apply value stream mapping as an agile test leader to understand and visualize working flows

2.2 Analyze a Value Stream from a Quality and Testing Perspective

ATLaS-2.2.1 (K4) Analyze a value stream to identify waste and other quality and testing issues using basic metrics

2.1 Facilitate Value Stream Mapping

Agile test leaders and agile test team leaders will need to be able to facilitate and contribute to value stream mapping activities. Their focus is to optimize quality and testing processes to improve flow and realize value for the customers in a more effective and efficient way.

2.1.1 What is a Value Stream

A value stream is a concept that originates in lean. Value streams are groups or collections of working steps, including the people and systems that they operate, as well as the information and the materials used in the working steps. In value-driven organizations, quality and testing roles help optimizing the whole value stream, not just testing.

There are two typical types of value streams: operational and development. Operational value streams are all the steps and people required to bring a product from order to delivery (Lean Enterprise Institute, 2014). Development value streams take a product from concept to market launch (Lean Enterprise Institute, 2014). Key aspects of value streams are to understand the lean concepts of flow (which resonates with stream) and waste (non-value-adding activities).

2.1.2 Value Stream Mapping (VSM)

Value stream mapping is a technique for visualizing and analyzing the steps in a value stream. To map a value stream can give a shared understanding of how, how much, and how fast the value stream is able to deliver value in order to fulfill the customer demand. This certification covers basic visualization techniques, typical steps in value stream mapping, and practical examples where value stream mapping could be used to map the current state of operation (current state map). A current state map can evolve to a desired state (future state map) if quality management approaches foster that.

It is also important to understand typical challenges when introducing value stream mapping in an organization.

2.2 Analyze a Value Stream from a Quality and Testing Perspective

Optimizing a value stream focuses on the flow of value and on quality. Therefore, value stream analysis can be a powerful tool for anyone who takes a quality assistance approach to quality and testing.

2.2.1 Metrics for Analyzing a Value Stream

To help analyze value streams, a few basic flow and quality metrics are introduced, such as:

- Lead time
- Wait time
- Processing time
- Flow efficiency
- Percent complete and accurate
- Phase Containment Efficiency (PCE)

These metrics can be visualized in a value stream map. As data collection can be a challenge, it is important to observe and discuss with the people doing the work throughout the value stream.

2.2.2 Identify Non-Value-Adding Activities (Waste)

Agile test leaders and agile test team leaders should be able to identify non-value-adding activities, which in lean are categorized in eight different types of waste:

- Transport
- Inventory
- Motion
- Waiting
- Overproduction
- Over-processing
- Correction
- Non-utilized talent

Metrics may give a good indication of poor effectiveness and efficiency and therefore where to look for waste.

Value stream mapping, analysis, and improvement is an iterative process. Value stream mapping relies on learning to see working flows and empowering people to act differently regarding quality issues. Therefore, agile test leaders and agile test team leaders can contribute in many different ways to achieve quality goals.

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4 Further Reading

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5 Appendix A – Cognitive Levels of Knowledge

The following describes what each cognitive level means.

Level 1: Remember (K1)

The candidate will recognize, remember, and recall a term or concept.

Keywords: Identify, Remember, Retrieve, Recall, Recognize, Know

Level 2: Understand (K2)

The candidate can select the reasons or explanations for statements related to the topic, and can summarize, compare, classify, categorize, and give examples for the testing concept.

Keywords: Summarize, Generalize, Abstract, Classify, Compare, Map, Contrast, Exemplify, Interpret, Translate, Represent, Infer, Conclude, Categorize, Construct models

Level 3: Apply (K3)

The candidate can select the correct application of a concept or technique and apply it to a given context.

Keywords: Implement, Execute, Use, Follow a procedure, Apply a procedure

Level 4: Analyze (K4)

The candidate can separate information related to a procedure or technique into its constituent parts for better understanding, and can distinguish between facts and inferences. Typical application is to analyze a document, software, or project situation and propose appropriate actions to solve a problem or task.

Keywords: Analyze, Organize, Find coherence, Integrate, Outline, Parse, Structure, Attribute, Deconstruct, Differentiate, Discriminate, Distinguish, Focus, Select

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6 Appendix B – Glossary

6.1 General Terms

Term Name	Definition
business agility	The ability to compete and thrive by quickly responding to market changes and emerging opportunities with innovative business solutions to deliver value to its customers.
change leadership	The ability to positively influence and motivate others to engage in the organizational change through the leader's own personal advocacy and drive.
change management	A structured approach to implementing change in an organization. This may encompass addressing training needs, appointing change agents, providing support for people across the organization, and setting specific success criteria.
delivery team	Agile team or scrum team responsible for defining, building, testing, and releasing systems.
flow	The way value is delivered to the customer.
observability	A measure of how well internal states of a system can be inferred from knowledge of its external outputs.
shift left	An approach to ensure built-in quality as early as possible in the development lifecycle process.
swarming	A behavior whereby team members with available capacity and appropriate skills collectively work on an item to finish what has already been started before moving ahead to begin work on new items.
value-driven	An approach that strives to optimize the value delivered to customers by constantly learning and improving and thereby remaining relevant and competitive.
value stream	All the steps (both value add and non-value add) in processes essential to the main flows that the customer is willing to pay for in order to produce that product or service.
value stream mapping	A technique to visualize, understand, analyze, and optimize a value stream.
working step	An activity needed to move along the value stream toward a new increment of the solution

6.2 Testing/Quality Terms

NOTE: Testing/quality terms will be removed from the syllabus when the whole syllabus is launched and moved to the normal glossary application. They have been added here until such time for reference and completeness of the glossary.

Term Name	Definition
agile test leader	A leadership role that serves agile teams, championing testing and quality at the organizational level.
agile test team leader	A role that is responsible for maintaining solution quality within an agile delivery team.
built-in quality	A set of practices to ensure that each solution meets quality standards throughout each increment of development, focusing on constructive quality assurance as a shared responsibility.
effectiveness	Extent to which correct and complete goals are achieved.
efficiency	The degree to which resources are expended in relation to results achieved.
quality assistance	An approach to quality management that focuses on a quality culture throughout an organization.
quality assurance	Activities focused on providing confidence that quality requirements will be fulfilled.
quality coaching	The activities focused on helping the agile organization identify, understand, and deal with quality management, business value, flow, and customer collaboration.
quality control	A set of activities designed to evaluate the quality of a component or system.
quality culture	An organizational value system that results in an environment to establish and continually improve quality.
quality debt	The cost of deferred quality assurance activities.
quality management	Coordinated activities to direct and control an organization with regard to quality that include establishing a quality policy and quality objectives, quality planning, quality control, quality assurance, and quality improvement.
test management	The planning, scheduling, estimating, monitoring, reporting, control, and completion of test activities.