Certified Tester
Agile Test Leadership at Scale
(CT-ATLaS)
Syllabus

v2.0

International Software Testing Qualifications Board

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Revision History

Version	Date	Remarks
v2.0	2023/09/29	Added chapter 4 and 5 Minor updates to chapter 1, 2 and 3.
v1.0	2022/05/13	Release version

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Acknowledgements

0 Introduction

0.1 Purpose of this Syllabus

This syllabus outlines the scope of the Agile Test Leadership at Scale certification.

Together with the ATLaS body of knowledge the syllabus forms the basis for the International Software Testing Qualification for Agile Test Leadership at Scale. 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

The ISTQB® Agile Test Leadership at Scale (CT-ATLaS) certification focuses on organizing and improving quality and testing across multiple teams in an agile organization. It also covers how to approach quality and testing at a strategic level in order to achieve higher business agility in an organization.

The CT-ATLaS qualification is aimed at people who work in organizations that are pursuing agility at scale or business agility and already have a basic understanding of Agile software development and agile testing.

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

0.3 Career Path for Testers

The ISTQB® scheme provides support for testing professionals at all stages of their careers offering both breadth and depth of knowledge.

The 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 is performed in an agile team.

As CT-ATLaS focuses on the organizational level, it supplements the Advanced Level Agile Technical Tester which focuses 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.

Individuals who achieve the ISTQB® CT-ATLaS certification may also be interested in the other Core Advanced Level certifications Test Management and Test Analyst, and the Specialist certifications especially Test Automation Engineer, AI Testing and Model-Based Tester.

0.4 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 software development 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 software development 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 (also called a team of agile teams). 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. Delivery teams often consist of people from different organizations that work together to provide the overall 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.

0.5 Business Outcomes

This section lists the Business Outcomes expected of a candidate who has achieved the CT-ATLaS certification.

An ATLaS Certified Test Leader can…

ATLaS-BO1	Foster a value-driven quality mindset and culture
ATLaS-BO2	Co-create and implement an organizational test strategy that develops quality and testing capabilities
ATLaS-BO3	Continuously improve test processes at an organizational level addressing test challenges in the context of agile at scale product development

0.5.1 BO 1 Foster a Value-Driven Quality Mindset and Culture

A person who has gained the qualification in this syllabus can in a value-driven organization build and sustain a quality and testing culture or in an organization which is not value-driven contribute to the transition 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 quality management

(replace x with your own target).

0.5.2 BO 2 Co-create and implement an organizational test strategy that develops quality and testing capabilities

In a value-driven organization, it is still crucial to have a strategy for building the required quality and testing capabilities to deliver customer and business value.

Examples of measurable key results for the business outcome are:

- x % improvement in reaching business benefits

- x % reduction in production failures or customer complaints (a customer is whoever consumes your product or service)

- x% increase in quality improvement experiments inspired by the organizational test strategy

- x% increase in improvement feedback

(replace x with your own target).

0.5.3 BO3 Continuously improve test processes at an organizational level addressing test challenges in the context of agile at scale product development

A value-driven organization strive to deliver value to its customers often. It challenges traditional ways of organizing, performing and leading testing both internally and externally.

Examples of measurable key results for the business outcome are:

- x % reduction in lead time for developing and evaluating a Minimum Viable Products (MVP) or Minimum Marketable Features (MMF)

- Number of test types which can be performed in a team's iteration or team of teams' iteration instead of being postponed to final release testing

(replace x with your own target).

0.6 Examinable Learning Objectives and Cognitive Level of Knowledge

Learning objectives support the business outcomes and are used to create the CT-ATLaS exams.

In general, all content 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 learning objectives levels are shown at the beginning of each chapter, and classified as follows:

- K1: Remember

- K2: Understand

- K3: Apply

- K4: Analyze

Further details and examples of learning objectives 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.

0.7 Non-Examinable 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. HOs are listed at the beginning of each chapter together with the LOs. The level of an HO is 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 fulfil HOs in the ATLaS Accreditation Guidelines.

0.8 The Agile Test Leadership at Scale Certificate Exam

The CT-ATLaS Certificate exam will be based on both this syllabus and the body of knowledge. Answers to exam questions may require the use of material based on more than one section of this syllabus. All sections of the syllabus are examinable, except for the Introduction and Appendices. Standards and books are included as references, but their content is not examinable, beyond what is summarized in this syllabus and the CT-ATLaS body of knowledge from such standards and books.

Refer to the Exam Structures and Rules document to understand the general exam rules.

Refer to the page for CT-ATLaS in the Exam Structure Table document for details about how a CT-ATLaS exam is composed.

The entry criteria for taking the CT-ATLaS exam are:

- either the ISTQB® Foundation Level certificate v4.0

- or a version older than v4.0 of the ISTQB® Foundation Level certificate and the ISTQB® Agile Tester Foundation Level certificate

When the ISTQB® Agile Tester Foundation Level no longer is available, the ISTQB® Foundation Level certificate v4.0 will become the only entry criterion.

It is strongly recommended that candidates also:

- Have at least three years of experience working in an agile team or an agile organization

- Are familiar with at least one agile scaling framework

- Take a course that has been accredited to ISTQB standards (by one of the ISTQB-recognized Member Boards).

0.9 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.

The accreditation guidelines for CT-ATLaS follow the general Accreditation Guidelines published by the Processes Management and Compliance Working Group.

0.10 Handling of Standards

There may be standards referenced in the CT-ATLaS Syllabus (e.g., IEEE, ISO, etc.). The purpose of these references is to provide a framework (as in the references to ISO 25010 regarding quality characteristics) or to provide a source of additional information if desired by the reader. Please note that the syllabus is using the standard documents as reference. The standards documents are not intended for examination. Refer to section 6 Bibliography for more information on Standards.

0.11 Level of Detail

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

- General instructional objectives describing the intention of the Agile Test Leadership at Scale

- A list of terms that students must be able to recall

- Learning objectives 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 software testing; it reflects the level of detail to be covered in CT-ATLaS training courses.

0.12 How this Syllabus is Organized

There are five 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, the syllabus requires a minimum of* 11.5 hours of instruction divided over at least two days. The minimum training time distributed across the five chapters as follows:

- Chapter 1: 60 minutes, Quality Assurance

  o ISTQB's definition of quality assistance and how it relates to different quality and testing concepts.

  o Essential skills to foster a quality mindset and culture.

- Chapter 2: 120 minutes, Improve Quality and Flow in a Value-Driven Organization

  o Value stream mapping.

  o Identifying waste as defined in lean methodology.

- Chapter 3: 150 minutes, Continuous Improvement of Quality and Testing

  o Improvement as experiments and learning cycles.

- Chapter 4: 165 minutes, Organizational Test Strategy in a Value-Driven Organization

  o Important DevOps practices influencing an organization test strategy.

- o   Aligning test strategy with business and technology strategies.
    - o   Collaborative creation and implementation of an organizational test strategy
- Chapter 5: 195 minutes, Test Process in a Value-Driven Organization
    - o   Challenging test processes.
    - o   Organizing test processes.

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, shift left

Non-testing Keywords

change leadership, observability, value-driven

Learning Objectives for Chapter 1:

1.1 What Is Quality Assistance

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

1.2 Skills for Quality Assistance

ATLaS-1.2.1 (K2) Give examples of 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 more 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 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 a traditional mindset and traditional approach (Gartner Research, 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 (shift left and shift right)

- Supports self-empowered teams by enabling others to take responsibility for quality and test-related activities

- Embeds testing throughout the organization instead of sustaining testing silos

- Requires agile test leaders and agile test team leaders that serve, rather than 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 share 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 crucial to 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. 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 subsequent chapters (see syllabus outline in section *0.12 How this Syllabus is Organized*).

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

Keywords

effectiveness, efficiency

Non-testing Keywords

flow, value stream, value stream mapping, working step

Learning Objectives for Chapter 2:

2.1 Facilitate Value Stream Mapping

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

ATLaS-2.1.2 (K3) Apply value stream mapping as an agile test leader to understand and visualize work 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 (VSM) activities. Their focus is to optimize quality and test 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 management. 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 to optimize 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, no date). Development value streams take a product from concept to market launch (Lean Enterprise Institute, no date). Key aspects of value streams are to understand the lean concepts of flow and of waste (non-value-adding activities).

2.1.2 Value Stream Mapping

Value stream mapping is a technique for visualizing and analyzing the steps in a value stream. Mapping 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 fulfil 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 fostered by quality management approaches.

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 (LT)

- Wait time (sometimes called delay time)

- Processing time (PT)

- Flow efficiency (sometimes called process cycle efficiency or activity ratio)

- Percent complete and accurate (%C&A)

- 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 the work being done and discuss with the people doing it what quality metrics can be collected.

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 as eight different types of waste:

- Transport

- Inventory

- Motion

- Waiting

- Overproduction

- Over-processing

- Correction

- Non-utilized talent

Metrics can give a good indication of poor effectiveness and inefficiency 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 work 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.

3 Continuous Improvement of Quality and Testing – 150 minutes

Keywords

root cause analysis, agile test team leader, causal loop diagram

Non-testing Keywords

systems thinking

Learning Objectives for Chapter 3:

3.1 Structured Problem-Solving Approach for Quality and Testing Activities

ATLaS-3.1.1   (K3) Apply a Plan-Do-Check-Act cycle to address a quality problem

ATLaS-3.1.2   (K2) Explain how to embed Plan-Do-Check-Act in the organization

3.2 Systems Thinking and Analysis of Root Causes

ATLaS-3.2.1   (K2) Explain how systems thinking and root cause analysis support a quality assistance approach

ATLaS-3.2.2   (K3) Apply causal loop diagram to identify root causes

3.1 Structured Problem-Solving Approach for Quality and Testing Activities

Problem-solving in a value-driven organization may need to span multiple agile teams and sometimes even multiple value streams, as discussed in Chapter 2. This requires a problem-solving approach that both aligns with lean and agile practices and takes a holistic view. Therefore, agile test leaders and agile test team leaders need to be able to understand and use theories and techniques from systems thinking to identify root causes in complex environments.

3.1.1 Plan-Do-Check-Act Cycle

The Plan-Do-Check-Act (PDCA) cycle is a practical problem-solving and continuous improvement approach created by W. Edwards Deming. A fundamental principle of PDCA is iteration and seeing improvement efforts as experiments.

An agile test leader can foster the opportunities for improvements across agile teams by facilitating PDCA cycles. This usually starts with a gap analysis, e.g., creating a current state value stream map and then proposing improvements to move toward a future state value stream map.

It is important to understand the benefits of PDCA cycles and to be able to conduct each step. This includes overcoming potential challenges of using PDCA.

There are other variations of PDCA (e.g., Plan-Do-Study-Act), and other improvement models (e.g., IDEAL). These variations are not covered in this certification. See ISTQB Expert Level Improving the Testing Process for more details on test process improvement (ISTQB®, 2011).

3.1.2   Embedding PDCA in the Organization

PDCA can be used for local experiments and broader improvement initiatives to improvefor . Only doing improvements locally will not scale. It is therefore important that knowledge and methods are shared in order to foster organizational learning.

Based on agile scaling frameworks, it is important to understand the typical organizational settings that support PDCA cycles for software development and testing, e.g., multi-team retrospectives and organizational and product level improvement boards.

Running PDCA in the context of business agility requires opportunities for shared understanding of problems. To succeed with implementing and embedding PDCA in the organization, it is important to address potential challenges such as creating a secure environment where people feel safe to reveal errors. It is also important that people are open to put in place improvements based on shared ideas.

It is part of the management responsibility of an agile test leader to promote such behavior in a value-driven organization, and address root causes if such behavior does not happen.

3.2 System Thinking and Analysis of Root Causes

Systems thinking and root cause analysis are important disciplines that provide many different techniques to analyze complex problems. An agile test leader needs to participate in and facilitate analysis of complex problems to help the organization grow and optimize its value streams.

3.2.1 Systems Thinking

Some of the agile scaling frameworks include systems thinking as one of their key principles, therefore you need to understand some common characteristics of systems thinking (Stave, et al., 2007) and the techniques that can be used (The LeSS Company B.V., no date).

3.2.2 Root Causes

When multiple agile teams need to collaborate in order to implement a system or a solution, some of the quality assurance (QA) and test activities will span multiple teams and the responsibility for delivering a working solution is shared between the teams. If a single team tries to fix a problem the solution may cause new problems for the other agile teams.

In a value stream, bottlenecks are a root cause for waste. Some typical bottlenecks in development value streams are:

- Environment creation
- Code deployment
- System testing
- Software architecture

It requires a flexible set of root cause analysis techniques to discover many potentially relevant root causes using systems thinking. If not used, there is a risk of concluding too quickly that there is just one single root cause. A basic root cause analysis technique in lean is "Five Whys." Causal loop diagram (CLD) is a method that can help if the feedback structure of human interaction or of the technical system needs to be identified.

3.2.3 Causal Loop Diagram

The benefit of a CLD is that it can reveal the non-obvious causes and effects and their interconnectedness in a broader system.

A CLD consists of four basic elements: variables; the causal links between variables; a plus or minus sign on the links; and loop markers. There are different notations used in CLDs. This certification covers a basic notation.

To create a CLD it is important to have a group of people with different perspectives of the problem or system at hand. The main steps that are repeated as the discussion evolves are:

1. Define variables.
2. Define causal relationships between variables.
3. Describe what effect one variable has on another.
4. Add other factors that affect the system (e.g., delays and goals).
5. Identify and describe reinforcing and balancing causal loops.
6. Identify possible interventions to resolve the problem.

4 Organizational Test Strategy in a Value-Driven Organization – 165 minutes (K4)

Keywords

organizational test strategy, shift right, testing in production, testing capability, quality capability

Non-testing Keywords

definition of done, DevOps infinite loop, community of practice (CoP), chaos engineering, hypothesis-driven development, tailoring-up, tailoring-down

Learning Objectives for Chapter 4:

4.1 Establish an Organizational Test Strategy

ATLaS-4.1.1 (K2) Explain practices supporting DevOps and why to include them in the organizational test strategy

ATLaS-4.1.2 (K2) Exemplify how an organizational test strategy is created and implemented in a value-driven organization

ATLaS-4.1.3 (K3) Implement assessment techniques to validate that testing aligns with business and technical needs

4.2 Fit Agile Test Leadership into a Value-Driven Organization

ATLaS-4.2.1 (K4) Analyze how agile test leadership fits in an organization using an agile scaling framework

4.1 Establish an Organizational Test Strategy

When organizations transition to a value-driven approach, it is important that the organizational test strategy, if the organization has one, is revised. This is not just from a content perspective but also on how the organizational test strategy is defined, updated and implemented.

4.1.1 Important DevOps Practices

Value-driven organizations use DevOps as an approach to deliver value faster throughout all of the steps in their value streams. Hence an organizational test strategy needs to include practices supporting DevOps in order to accelerate the flow in value streams and be more responsive to stakeholder needs in an ever-changing environment. Organizations need to decide on the relative importance of the various practices.

A generic DevOps infinite loop, a common visualization of the development and operations stages, consists of six stages: operate, monitor, explore, code, integrate and release.

DevOps supports trends such as shift right that are neither common in traditional development nor test approaches . An organizational test strategy needs to incorporate activities such as building relationships across the organization, monitoring, and testing in production. All system environments in DevOps are designed for resilience, which helps enable testing in production.

Additional aspects that help to build quality into the DevOps process include:

- Operating in DevOps
    - Use of feature toggles
    - Automated control and management of test and production environments used during a release stage
    - Testing in production
    - Canary releases
- Monitoring in DevOps
- Exploring in DevOps
    - Hypothesis-driven development used for creating a minimum viable product (MVP) during exploration
- Coding and integrating in DevOps
- Releasing in DevOps
    - Self-service environment management
    - Blue/green deployment strategy and chaos engineering

For organizations in which DevOps is not a mature capability the organizational test strategy should outline improvement goals and strategies to contribute to higher DevOps maturity.

4.1.2   Create and Implement an Organizational Test Strategy

Test strategies exist at different levels: organizational, product and operational. This certification focuses on test strategy at an organizational level.

Value-driven organizations can reuse elements from existing test strategies. Some traditional test strategies like consultative, regression-averse and model-based approaches are particularly relevant and inspiring in this context.

When creating an organizational test strategy, agile test leaders can draw inspiration from the definitions of done (DoD) of agile teams (The LeSS Company B.V., no date). Similarly, an organizational test strategy may define essential elements that all teams must include in their DoD as a minimum.

Just like a DoD the organizational test strategy should be a lightweight, user-friendly and a "living" artefact.

An organizational test strategy should be developed and adapted by interested stakeholders collaborating within a communitiy of practice (CoP), especially if the community is topic-based rather than role-based.

Tailoring an organizational test strategy may follow a tailoring-down or a tailoring-up approach.

To avoid the organizational test strategy becoming shelf-ware agile test leaders need to encourage teams to implement experiments in order to validate practices from the organizational test strategy.

In order to involve all interested stakeholders, agile test leaders need to actively lead the implementation using change leadership. One model for leading change on an individual level is called ADKAR (Prosci, no date).

4.1.3   Validate Alignment of Testing with Business and Technical Needs

Another important aspect of implementing the organizational test strategy is to be able to assess whether or not it helps the organization to deliver on the organizational business and technical strategies.

In value-driven organizations quality and testing should be embedded in the organization and the assessment of testing should take place in the context of product development as a whole and not only in a testing context. Quality and testing practices are naturally covered in assessments focusing on DevOps or organizational agility.

An agile test leader can propose to use a suitable maturity model to assess an organization's capabilities or the competencies of an organizational unit or a single team. Maturity models that also cover quality and testing are for example DevOps, team agility and organizational agility maturity models.. For more details about maturity models focusing on test process improvement see Expert Level Improving the Testing Process (ISTQB®, 2011).

Assessments at the organizational level have several disadvantages that risk disempowering and disengaging the teams responsible for the assessed capabilities. Self-assessments, either facilitated or fully self-managed, are more suitable for a value-driven organization. Which approach to use depends on the organizational scope of the assessment, maturity of the teams and the culture of the organization, especially related to psychological safety.

It is also important to consider what to measure. Maturity models that take a holistic view usually measure three areas: outcomes in terms of business value, outputs in terms of delivery and performance and maturity in terms of people and processes.

Depending on the purpose of the assessment, the method used and the maturity of the organization an assessment can be conducted in different manners. An agile test leader can conduct the typical steps in a facilitated self-assessment which includes planning, conducting and concluding the self-assessment.

4.2 Fit Agile Test Leadership in a Value-Driven Organization

Using the skills described in section *1.2 Skills for Quality Assistance* an agile test leader helps the organization fit quality and testing in the organization. It requires changes by everyone in the organization including the agile test leader.

4.2.1 Organizational, Product and Operational Level

Organizations require certain quality and testing capabilities in order to deliver quality products and services. Agile test leaders should ensure that the organizational test strategy describing these capabilities is aligned with and supports the business strategy. The agile test leader can also evaluate the current quality and testing capabilities, question ineffective or inefficient practices and facilitate a possible adjustment of the organizational test strategy.

Organizational level improvements often go beyond what even teams of agile teams can achieve on their own because they require a coordinated effort and significant funding. The agile test leader can support such large initiatives by providing business stakeholders with a business case to justify investments and metrics that measure success.

In a value-driven organization, budget allocation often includes a broad set of stakeholders with different perspectives (SAFe®, 2023). The agile test leader may contribute to this process by analyzing trade-offs related to quality and testing.

On a product level the scale is smaller than the entire organization but larger than a single team. Here the agile test leader can:

- be a practice leader within the testing community of practice (CoP)
- help teams to identify waste using value stream mapping (VSM)
- guide teams to capture product quality in their definitions of "ready" and "done"
- teach teams systems thinking to reduce the risk of local optimization
- facilitate multi-team retrospectives and process improvement
- help teams with continuous improvement of their quality capabilities
- provide QA and testing expertise to agile teams by leading a specialized service group
- help to find a good balance between decentralized and centralized testing

On an operational level, the agile test leader can coach teams of agile teams in test related subjects (test techniques and tools, metrics, test effort estimation, risk-based testing, pairing, peer reviews, test-first practices, design for testability).

The agile test leader can also support teams of agile teams from within a specialized service group providing test related services (refactoring of a test automation framework, integration of tests into CI/CD, management of test infrastructure and tools, end-to-end and non-functional testing).

4.2.2 Transition from Traditional Test Management to Agile Test Leadership at Scale

During a transition from "traditional" test management to agile test leadership at scale a test manager has to adopt new responsibilities, uphold some old responsibilities and beware of anti-patterns.

New responsibilities which arise from an agile test leader role are using value stream mapping and systems thinking, involving various disciplines along the entire value stream and speaking up in case of dysfunctions.

At the organizational level an agile test leader needs to influence strategic decisions such as identifying, establishing and sustaining testing skills and capabilities, allocating budget for funding them and identifying practices to be consolidated and centralized in order to create synergies.

Responsibilities to be continued are empowering agile (test) teams by coaching, offering training, fostering CoPs and suggesting test process improvements, providing guidance on testing and quality, representing testing within the organization and being an escalation point for impediments.

Anti-patterns are to be avoided and result from any behavior which would undermine the idea of self-organized and responsible agile teams such as a "command and control" type management behavior.

5   Test Processes in a Value-Driven Organization – 195 minutes (K4)

Keywords

organizational test strategy, hypothesis testing

Non-testing Keywords

DevOps infinite loop, hypothesis-driven development, lagging indicator, leading indicator

Learning Objectives for Chapter 5:

5.1 Test Processes

ATLaS-5.1.1   (K2) Exemplify challenges specific to testing in the context of agile at scale product development

ATLaS-5.1.2   (K2) Exemplify agile at scale practices that help coordinate test efforts across agile and non-agile teams

ATLaS-5.1.3   (K2) Define a set of test and flow related metrics to establish transparency for stakeholders

ATLaS-5.1.4   (K4) Structure challenging test activities and test processes to fit business agility using a quality assistance approach

ATLaS-5.1.5   (K4) Analyze which test activities should be performed by stream-aligned teams and which should be performed by specialized service teams

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5.1 Test Processes

There are test processes which are challenging to enable in an agile process. This section covers typical challenging processes and provides suggestions on how to organize them to avoid or successfully address problems.

5.1.1 Testing Challenges in Agile at Scale Product Development

When scaling the agile product development in a value-driven organization some issues arise that are not present in a classic organization. Some typical challenges are:

- Agile teams cannot test the full solution independently and when the responsibility for performing cross-team test activities becomes ambiguous this can result in testing being neglected. See section *5.1.2* for more information.

  Coordinating and synchronizing test efforts across agile and non-agile teams both internally and externally to enable the delivery of one common solution. See section 5.1.2 for more information.

- Changing the mindset throughout the organization to allow testers to move into early product development when forming hypothesis and exploring user needs.

- Establishing transparency for stakeholders across self-organized teams using classic test metrics. See section *5.1.3* for more information.

- Slicing up test activities to fit them into an iteration and avoid pushing test efforts forward, which can result in not being able to finish all activities before a release. See section *5.1.4* for more information.

- Determining if certain types of testing should be organized in one or multiple teams and determining when to switch between the two concepts. See section *5.1.5* for more information.

5.1.2 Coordinate Test Efforts across Agile and Non-agile Teams

If QA and testing are treated as separate activities, it becomes more challenging to establish a shared understanding and responsibility for them, identify and minimize dependencies between teams, and enable teams to prioritize tasks effectively.

Coordination of tests between teams can be challenging, particularly if some teams are non-agile, in agile transition or from a third party. The following proven agile practices are examples of how to coordinate testing across agile and non-agile teams.

- One backlog / cross-team refinement

- Big room planning (e.g., PI planning)

- Scrum of Scrums

- Demo of integrated and tested product increments

- Retrospective / inspect & adapt

- Impediments and risk boards

- Debt handling

- Technical enablers (SAFe®, 2023)

5.1.3 Test and Flow Related Metrics

To assess the effectiveness and efficiency of value delivery across the organization, it is necessary to align on a set of metrics. Subsequently, all teams across the value stream should regularly measure and share their results.

Classic testing metrics focus on coverage, product quality and effectiveness of testing, but not on the flow of value. Agile test leaders and agile test team leaders should also use other types of metrics that help measure the full value stream. As mentioned in section *4.1.3*, metrics cover three aspects:

- Outcomes in terms of business value.

- Outputs in terms of delivery and performance

- Maturity in terms of people and processes

Outcomes in terms of business value:

Organizations often focus on the things which increase the value for the organization itself when measuring outcomes in terms of business value. However, cost reductions which increase value for the organization, do not necessarily result in added value for the customers and can decrease value for customers. If the organization is not ready to define and measure business value it is better to start with delivery and performance metrics.

Outputs in terms of delivery and performance:

To help organizations accelerate delivery and performance, there are four key metrics (Portman, 2020):

- Deployment frequency

- Lead time for changes

- Change failure rate

- Time to restore a service

Maturity in terms of people and processes:

These aspects are often overlooked as they can be difficult to measure. It includes culture, leadership and employee engagement and how well processes align with agile principles and agile thinking.

When selecting which metrics to use it is helpful to think about leading and lagging indicators. The advantage of leading indicators is that they give early feedback as well as indicate if the expected results will be achieved. Lagging indicators measure the actual results.

Regardless of the types of metrics which the organization starts with it is important that agile test leaders and agile test team leaders focus on the same metrics.

5.1.4 Structure Challenging Test Activities and Test Processes

Test activities and test processes need to be structured so they fit into agile at scale. Agile Tester (ISTQB®, 2014), recommends converting test levels into test activities. This approach, however, is typically not sufficient when scaling. Quality assistance can help to address challenges of structuring test

activities because it facilitates a culture of continuous learning and helps to spread both testing and technological knowledge between teams.

Structuring test activities

Except for component testing, test activities can be difficult to fit into iterations because establishing the infrastructure takes more time and a coordinated effort.

Such test activities can be clustered based on their purpose:

- Testing functional integration is traditionally performed in test levels such as system testing, system integration testing and acceptance testing.

- Testing technical integration is based on architecture design and interface specifications. One challenge is to accompany emerging technologies such as asynchronous architectures (often called microservices). If microservices were very well encapsulated, agile teams could successfully test technical integration with a big-bang approach, because there would hardly be a need for troubleshooting across teams in order to isolate defects. In practice, technical integration testing involves quite a bit of troubleshooting which can be harder with asynchronous architectures.

- Testing non-functional quality characteristics such as performance efficiency, reliability, security and accessibility.

Some of these test activities may be performed outside iterations but agile teams need to retain ownership of and responsibility for testing. Teams should prefer testing within iterations because deferring tests to a separate level weakens their definition of done. To support the teams handling some of these activities within a sprint, test automation can play an important role.

Handling deployment and release cycles

If deployments and releases are not synchronized between agile teams there will be a wasteful number of extra configurations to be tested. Therefore, all teams should work on the same rhythm and together plan what to implement and test in collaboration in each iteration. To counter the risk that this aligned plan could be derailed by delays within individual teams, dependencies between teams should be reduced. Agile test leaders and agile test team leaders should be familiar with common approaches for reducing dependencies.

Managing organizational risk

Planning risks for cross-team testing should be managed using typical agile procedures. A shared risk board enhances visibility, and agile practices such as big room planning, synchronization meetings and reviews can be used for risk mitigation.

Establishing working agreements with non-agile teams or functions

Value-driven organizations often have non-agile or less agile units.

These units may lack the ability to make frequent deliveries, respond quickly to feedback and to regularly inspect and adapt their processes. Therefore, a successful collaboration will require working agreements.

Coordination of agile and non-agile teams has been described in section *5.1.2*.

Alignment with vendors, suppliers or partners may be particularly challenging. Agile test leaders can participate in the tender process and help describe the parts of the request for proposal related to quality and testing.

For existing vendors, suppliers or partners, a strategic initiative may be required in order to modify contracts or even choose other vendors, suppliers or partners.

5.1.5 Test Activities Performed by Stream-aligned Teams and Specialized Teams

An agile test leader or agile test team leader needs to organize test activities in different manners depending on the type of activities and the complexity of the solution and organization. Teams can be classified as stream-aligned, complicated-subsystem, enabling or platform (SAFe®, 2023). How a team is organized impacts what testing activities are effective and how the team collaborates with other teams.

Agile test leaders and agile test team leaders must understand how the different types of teams interact and support each other.

Test activities in different types of teams:

Test activities which are typically performed by a **stream-aligned team** are:

- Traditional test activities related to feature development

- Hypothesis testing

- Test activities due to technological changes at the corporate level or general organizational risks

Test activities which are typically performed by a **platform team** as a service are:

- Services to reduce the number of tasks which a stream-aligned team needs to handle

- Shared test tools and other test infrastructure

- Shared common components for testing purposes

Test activities which are typically performed by **a complicated-subsystem team** through collaboration are:

- Help with providing special types of testing which are too complicated to be dealt with by a stream-aligned team or platform team.

- Help with testing special sub-systems which are too complicated to be dealt with by a stream-aligned team or platform team.

Test activities which are typically performed by an **enabling team** in a consultative manner:

- Temporary test activities which often require specialized knowledge and skills which the other teams do not have or have not yet fully mastered

- Research and experiment with new methods and tools for improving testing on behalf of the other teams

Analyzing team structure related to test activities

Depending on the test activity and the knowledge and competencies of the existing teams, different team structures could be useful. Some of the common aspects to consider are:

- Non-functional testing

    o Having a platform team or enabling team could be helpful

- The need for independent testing
    - Not necessarily obtained by formal organizational boundaries
- The structure and complexity of the technical solutions
    - Platform teams, complicated-subsystem teams and enabling teams may become more relevant
- Collaboration with non-agile teams and functions.
    - Treat them as enabling teams providing knowledge
    - Platform teams which enhance self-service options
    - Make interdependencies as visible as possible

How to manage test activities when some of the teams are agile and others are less agile is covered in section *5.1.4 Structure Challenging Test Activities and Test Processes*.

6 Bibliography

Gartner Research. 2018. DevOps and cloud speed are driving the end of QA as we know it. *Gartner.* [Online] Gartner Research, 08 13, 2018. [Cited: 07 22, 2023.] https://www.gartner.com/en/documents/3886463.

ISTQB®. 2011. Improving the Testing Process - Expert Level. *ISTQB.* [Online] 2011. [Cited: 07 22, 2023.] https://istqb-main-web-prod.s3.amazonaws.com/media/documents/ISTQB-CTEL-ITP_Syllabus_v1.0_2011.pdf.

The LeSS Company B.V. no date. Systems Thinking. *LeSS.* [Online] The LeSS Company B.V., no date. [Cited: 07 22, 2023.] https://less.works/less/principles/systems-thinking#SystemsThinking.

Lean Enterprise Institute. no date. Lexicon Terms. *Lean Enterprise Institute.* [Online] Lean Enterprise Institute, Incorporated, no date. [Cited: 07 22, 2023.] https://www.lean.org/explore-lean/lexicon-terms.

Stave, Krystyna and Hopper, Megan. 2007. What constitutes systems thinking: A proposed taxonomy. *ResearchGate.* [Online] 01 2007. [Cited: 07 22, 2023.] https://www.researchgate.net/publication/255592974_What_Constitutes_Systems_Thinking_A_Proposed_Taxonomy.

Prosci. no date. The Prosci ADKAR model. *Prosci.* [Online] Prosci Inc., no date. [Cited: 07 22, 2023.] https://www.prosci.com/methodology/adkar.

SAFe®. 2023. Organizing Agile Teams and ARTs: Team Topologies at Scale. *Scaled Agile Framework.* [Online] Scaled Agile, 04 17, 2023. [Cited: 07 22, 2023.] https://scaledagileframework.com/organizing-agile-teams-and-arts-team-topologies-at-scale.

—. 2023. Lean Budgets. *Scaled Agile Framework.* [Online] Scaled Agile, 03 07, 2023. [Cited: 07 22, 2023.] https://scaledagileframework.com/lean-budgets.

—. 2023. Enablers. *Scaled Agile Framework.* [Online] Scaled Agile, 01 13, 2023. [Cited: 07 22, 2023.] https://scaledagileframework.com/enablers.

Portman, Dina Graves. 2020. Are you an Elite DevOps performer? Find out with the Four Keys Project. *Google Cloud.* [Online] Google, 09 23, 2020. [Cited: 07 22, 2022.] https://cloud.google.com/blog/products/devops-sre/using-the-four-keys-to-measure-your-devops-performance.

The LeSS Company B.V. no date. Definition of Done. *LeSS.* [Online] The LeSS Company B.V., no date. [Cited: 07 22, 2023.] https://less.works/less/framework/definition-of-done.

ISTQB®. 2014. Agile Tester - Foundation Level. *ISTQB.* [Online] 2014. [Cited: 07 22, 2023.] https://istqb-main-web-prod.s3.amazonaws.com/media/documents/ISTQB_CTFL_Syllabus-v4.0.pdf.

7   Further Reading

Skelton, Matthew and Pais, Manuel. 2019. *Team Topologies: Organizing Business and Technology Teams for Fast Flow.* Portland : IT Revolution Press, 2019. 978-1-942-78881-2.

Cagan, Marty. 2018. *Inspired: How to Create Tech Products Customers Love.* New Jersey : Wiley, 2018. 978-1-119-38750-3.

TMMI Foundation. 2019. TMMi Documents. *TMMi Foundation.* [Online] 1.4, 12 24, 2019. [Cited: 08 09, 2023.] https://www.tmmi.org/tm6/wp-content/uploads/2020/01/TMMi-in-the-Agile-world-V1.4.pdf.

8 Appendix A – Learning Objectives/Cognitive Level of Knowledge

The following learning objectives are defined as applying to this syllabus. Each topic in the syllabus will be examined according to the learning objective for it.

The learning objectives begin with an action verb corresponding to its cognitive level of knowledge as listed below.

Level 1: Remember (K1)

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

Action verbs: Recall, recognize.

Examples
Recall the concepts of the test pyramid.
Recognize the typical objectives of testing.

Level 2: Understand (K2)

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

Action verbs: Classify, compare, differentiate, distinguish, explain, give examples, interpret, summarize

Examples	Notes
Classify test tools according to their purpose and the test activities they support.	
Compare the different test levels.	Can be used to look for similarities, differences or both.
Differentiate testing from debugging.	Looks for differences between concepts.
Distinguish between project and product risks.	Allows two (or more) concepts to be separately classified.
Explain the impact of context on the test process.	
Give examples of why testing is necessary.	
Infer the root cause of defects from a given profile of failures.	

Examples	Notes
Summarize the activities of the work product review process.	

Level 3: Apply (K3)

The candidate can carry out a procedure when confronted with a familiar task, or select the correct procedure and apply it to a given context.

Action verbs: Apply, implement, prepare, use

Examples	Notes
Apply boundary value analysis to derive test cases from given requirements.	Should refer to a procedure / technique / process etc.
Implement metrics collection methods to support technical and management requirements.	
Prepare installability tests for mobile apps.	
Use traceability to monitor test progress for completeness and consistency with the test objectives, test strategy, and test plan.	Could be used in a LO that wants the candidate to be able to use a technique or procedure. Similar to 'apply'.

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.

Action verbs: Analyze, deconstruct, outline, prioritize, select.

Examples	Notes
Analyze a given project situation to determine which black-box or experience-based test techniques should be applied to achieve specific goals.	Examinable only in combination with a measurable goal of the analysis. Should be of form 'Analyze xxxx to xxxx' (or similar).
Prioritize test cases in a given test suite for execution based on the related product risks.	

Examples	Notes
Select the appropriate test levels and test types to verify a given set of requirements.	Needed where the selection requires analysis.

Reference

(For the cognitive levels of learning objectives)

Anderson, L. W. and Krathwohl, D. R. (eds) (2001) A Taxonomy for Learning, Teaching, and

Assessing: A Revision of Bloom's Taxonomy of Educational Objectives, Allyn & Bacon

9   *Appendix B* – Business Outcomes traceability matrix with Learning Objectives

This section lists the traceability between CT-ATLaS Business Outcomes and CT-ATLaS Learning Objectives.

Business Outcomes: CT-ATLaS		BO1	BO2	BO3
K2	The candidate can select the reasons or explanations for statements related to the topic, and can summarize, compare, classify and give examples for the testing concept.	5	2	3
K3	The candidate can carry out a procedure when confronted with a familiar task, or select the correct procedure and apply it to a given context.	3	1	0
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.	1	1	2
H2	Exercise with hints. The trainee is given an exercise with relevant hints to enable the exercise to be solved within the given timeframe.	1	0	0

Unique LO	Learning Objective	K-Level/ HO-Level	BO1	BO2	BO3
1	Quality Assistance				
1.1	What is Quality Assistance				

Unique LO	Learning Objective	K-Level/ HO-Level	BO1	BO2	BO3
ATLaS-1.1.1	Explain quality assistance as an approach to quality and test management	K2	X		
1.2	Skills for Quality Assistance				
ATLaS-1.2.1	Give examples of the change leadership, quality coaching, facilitation, and training skills required for quality assistance	K2	X		
ATLaS-HO-1.2.1	Given a quality-related problem, provide quality assistance using one or more of the four important skills (change leadership, quality coaching, facilitation, and training)	H2	X		
2	Improve Quality and Flow in a Value-Driven Organization				
2.1	Facilitate Value Stream Mapping				
ATLaS-2.1.1	Explain value stream as a concept	K2	X		
ATLaS-2.1.2	Apply value stream mapping as an agile test leader to understand and visualize work flows	K3	X		
2.2	Analyze a Value Stream from a Quality and Testing Perspective				
ATLaS-2.2.1	Analyze a value stream to identify waste and other quality and testing issues using basic metrics	K4	X		
3	Continuous Improvement of Quality and Testing				

Unique LO	Learning Objective	K-Level/ HO-Level	BO1	BO2	BO3
3.1	Structured Problem-Solving Approach for Quality and Testing Activities				
ATLaS-3.1.1	Apply a Plan-Do-Check-Act cycle to address a quality problem	K3	X		
ATLaS-3.1.2	Explain how to embed Plan-Do-Check-Act in the organization	K2	X		
3.2	Systems Thinking and Analysis of Root Causes				
ATLaS-3.2.1	Explain how systems thinking and root cause analysis support a quality assistance approach	K2	X		
ATLaS-3.2.2	Apply causal loop diagram to identify root causes	K3	X		
4	Organizational Test Strategy in a Value-Driven Organization				
4.1	Establish an Organizational Test Strategy				
ATLaS-4.1.1	Explain practices supporting DevOps and why to include them in the organizational test strategy	K2		X	
ATLaS-4.1.2	Exemplify how an organizational test strategy is created and implemented in a value-driven organization	K2		X	
ATLaS-4.1.3	Implement assessment techniques to validate that testing aligns with business and technical needs	K3		X	

Unique LO	Learning Objective	K-Level/ HO-Level	BO1	BO2	BO3
4.2	Fit Agile Test Leadership into a Value-Driven Organization				
ATLaS-4.2.1	Analyze how agile test leadership fits in an organization using an agile scaling framework	K4		X	
5	Test Processes in a Value-Driven Organization				
5.1	Test Processes				
ATLaS-5.1.1	Exemplify challenges specific to testing in the context of agile at scale product development	K2			X
ATLaS-5.1.2	Exemplify agile at scale practices that help coordinate test efforts across agile and non-agile teams	K2			X
ATLaS-5.1.3	Define a set of test and flow related metrics to establish transparency for stakeholders	K2			X
ATLaS-5.1.4	Structure challenging test activities and test processes to fit business agility using a quality assistance approach	K4			X
ATLaS-5.1.5	Analyze which test activities should be performed by stream-aligned teams and which should be performed by specialized service teams	K4			X

10 Appendix C – Release Notes

Version 2.0 of the Agile Test Leadership at Scale (ATLaS) was approved for release by the ISTQB®
General Assembly on September 29, 2023 and launched on October 4, 2023.

All Member Boards in ISTQB® are allowed to provide ATLaS as described in chapter 0 Introduction.

The Member Boards which currently providing ATLaS v1.0 MVP in English must retire v1.0 MVP and only
use v2.0 no later than October 4, 2024 (12 months after the launch date).

The Member Boards which currently provide exams in ATLaS v1.0 MVP in English must ensure that all
exam questions are valid in relation to ATLaS v2.0 no later than April 4, 2024 (6 months after the launch
date).

What has been released

The following artifacts are included:

- Syllabus
- Body of Knowledge
- Sample Exam Questions
- Sample Exam Answers
- Exam Structure Table
- Keywords in Glossary

Overview of Major Changes

Two new chapters have been added:

- Organizational Test Strategy in a Value-Driven Organization
- Test Processes in a Value-Driven Organization

Chapter 1:

Aligned relationship between QA, QC, test management with CTFL 4.0

Chapter 3:

Removed Bendek from embedding PDCA in the organization

With the changes in version 2.0 ATLaS is now a 2-day course with a 40-question exam.

11   Appendix D – Non Testing Domain Specific Terms

For common terms related to business agility, see the following well-accepted resources available on the Internet for definitions:

https://www.scaledagileframework.com/glossary/

https://less.works/less/framework/index

https://www.scrum.org/resources/what-is-scrum

http://www.scrumalliance.org/

Readers are encouraged to check these sites if they find unfamiliar agile-related terms in this document. These links were active at the time of release of this document.

Term Name	Definition
A/B testing	A marketing experiment where you split your audience to test variations on a campaign and determine which performs better.
ADKAR	An approach to change management that provides a framework for effectively managing change within an organization with the outcomes of Awareness, Desire, Knowledge, Ability and Reinforcement.
agile scaling framework	A set of organizational and workflow patterns for implementing agile practices at an enterprise scale.
anti pattern	A commonly used practice that aims to solve a recurring problem but often results in negative consequences.
blue/green deployment	A deployment strategy where you create two separate, but identical environments, the blue is running the current application version and the green is running the new application version.
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 customers.
canary release	A deployment strategy whereby changes are initially released to a small subset of users.
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.

Term Name	Definition
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.
chaos engineering	A process of testing a system to ensure that it can withstand unexpected disruptions.
CI/CD	Continuous integration / Continuous deployment
community of practice (CoP)	A group of people who share a common concern (or set of problems) and come together in order to reach a set of goals.
definition of ready	A set of criteria that must be met for the team to start production development work.
definition of done	A set of criteria that must be met for the team to have a potentially releasable product.
delivery team	Agile team and/or lean team responsible for defining, building, testing, and releasing systems.
DevOps infinite loop	A graphical visualization of the four DevOps development and operations stages comprising operate, explore, build and release.
feature toggle	A mechanism that allows code to be turned "on" or "off" remotely without
flow	The way value is delivered to the customer.
hypothesis-driven development	A prototype approach that allows product designers to develop, test, and rebuild a product until it's acceptable by the users.
observability	A measure of how well internal states of a system can be inferred from knowledge of its external outputs.
lagging indicator	A measure to confirm the expected outcomes after the outcomes have been accomplished.
leading indicator	A measure that allows prediction of outcomes before the outcomes are fully accomplished.
lean thinking	A way of thinking about creating needed value with fewer resources and less waste.
LeSS	Large Scaled Scrum
microservice	An approach to developing a single application as a suite of small services, each running in its own process that are independently

Term Name	Definition
MMF	Minimum marketable feature , an early version of the solution used to evaluate the primary business hypothesis.
MVP	Minimum viable product, an early version of the solution used to evaluate the primary business hypothesis.
SAFe®	Scaled Agile Framework®
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.
systems thinking	A set of skills used to improve identification, understanding, predicting behaviors, and modifying systems in order to produce desired effects.
tailoring-down	An approach to creating a test strategy with a large number of suggested practices and work products which the agile teams can then
tailoring-up	An approach to creating a test strategy which starts with a minimal set of mandatory practices and work products which the agile teams can then add optional elements based on the team's or product's context and needs.
technical debt	The deferred cost of work not done at an earlier point in the product life cycle.
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 a 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.

12   Index

All terms are defined in the ISTQB® Glossary (http://glossary.istqb.org/) or in *11* Appendix D – Non Testing Domain Specific Terms.