

QUALITY ENGINEERING TRANSFORMATION

QA evolution: from manual testing to **AI-driven** quality engineering

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AGENDA

What we will cover

01

Testing fundamentals

Understanding the purpose and goals of software testing



02

The evolution journey

From manual processes to intelligent automation

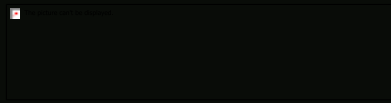


03

The AI revolution

How artificial intelligence transforms quality engineering



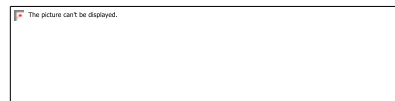


01



Testing fundamentals

Understanding the purpose and goals of software testing



What is testing & what is the test goal



WHAT IS TESTING

Verification & validation

Testing is checking whether a product does what it is supposed to do, **safely and correctly**.

It ensures the software meets requirements and performs as expected under various conditions.

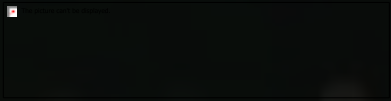


THE TEST GOAL

Beyond finding bugs

The goal is not only to find bugs, but also to **improve quality, reliability, performance, security, and user experience**.

Testing is a quality enabler across the entire product lifecycle.



02



The evolution journey

From manual processes to intelligent automation



Traditional QA: the manual testing era (1950–1999)

1950 — 1999

Waterfall Model

Requirement → Development → Testing → Release

TESTER ROLE

- ▶ Test case creation from requirements
- ▶ Manual execution of test cases
- ▶ Defect reporting and tracking
- ▶ Regression testing cycles
- ▶ Test evidence preparation

KEY CHALLENGES

- ▶ Slow release cycles
- ▶ Repetitive regression work
- ▶ Human errors in execution
- ▶ Limited test coverage
- ▶ Quality found late in lifecycle



The automation era (2000–2024)

2000 — 2024

From "Test Executor" to "Automation Engineer"

Key tools: QTP/UFT · Selenium · Cucumber · JMeter · SOAP UI · Appium

BENEFITS

- ▶ Faster regression cycles
- ▶ Continuous testing in CI/CD
- ▶ Better test coverage
- ▶ Repeatable, consistent results

CHALLENGES

- ▶ Automation maintenance overhead
- ▶ Flaky tests and false positives
- ▶ Script dependency on UI stability
- ▶ High effort for test creation



03

The AI revolution

How artificial intelligence is transforming quality engineering



Quality engineering with AI (QEA)

FROM 2025

BEFORE AI

- Manual requirement analysis
- Automation & performance
- Shift left testing
- SDET practices



GENERATIVE AI

- Creates test cases
- Generates automation scripts
- Summarizes requirements
- Creates test data

AGENTIC AI

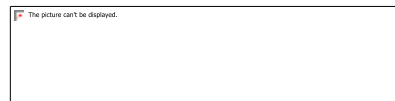
- Understands goals
- Plans testing activities
- Executes actions
- Learns from feedback

ENGINEERING BENEFITS

- Faster validation · Higher coverage · Early defect prediction

AI CAPABILITIES

- Self-healing automation · Intelligent optimization



Future era: autonomous quality engineering



01

Self-healing automation

- Detect UI changes automatically
- Update scripts without human intervention
- Maintain test suites autonomously



02

Predictive quality

- AI predicts defect probability before release
- Feature-level risk scoring
- Shift from reactive to proactive quality



03

Autonomous testing agents

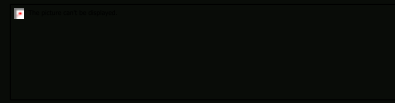
- Read requirements and create tests
- Execute tests and analyze failures
- Raise defects and suggest fixes



04

Continuous quality intelligence

- Quality monitors the entire pipeline
- From development to production
- Continuous quality feedback loops



"QA is no longer a gatekeeper at the end of development. QA is your quality knowledge partner throughout the product lifecycle."

Q & A

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