ISTQB Advanced Level Test Automation Engineer

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Who I am

- **Rosie Sheldon**, Senior Trainer at TSG Training
- 20 years IT Experience, including 10 as a trainer
- Accredited trainer and on the ISTQB Accreditation Board

Want to know more?
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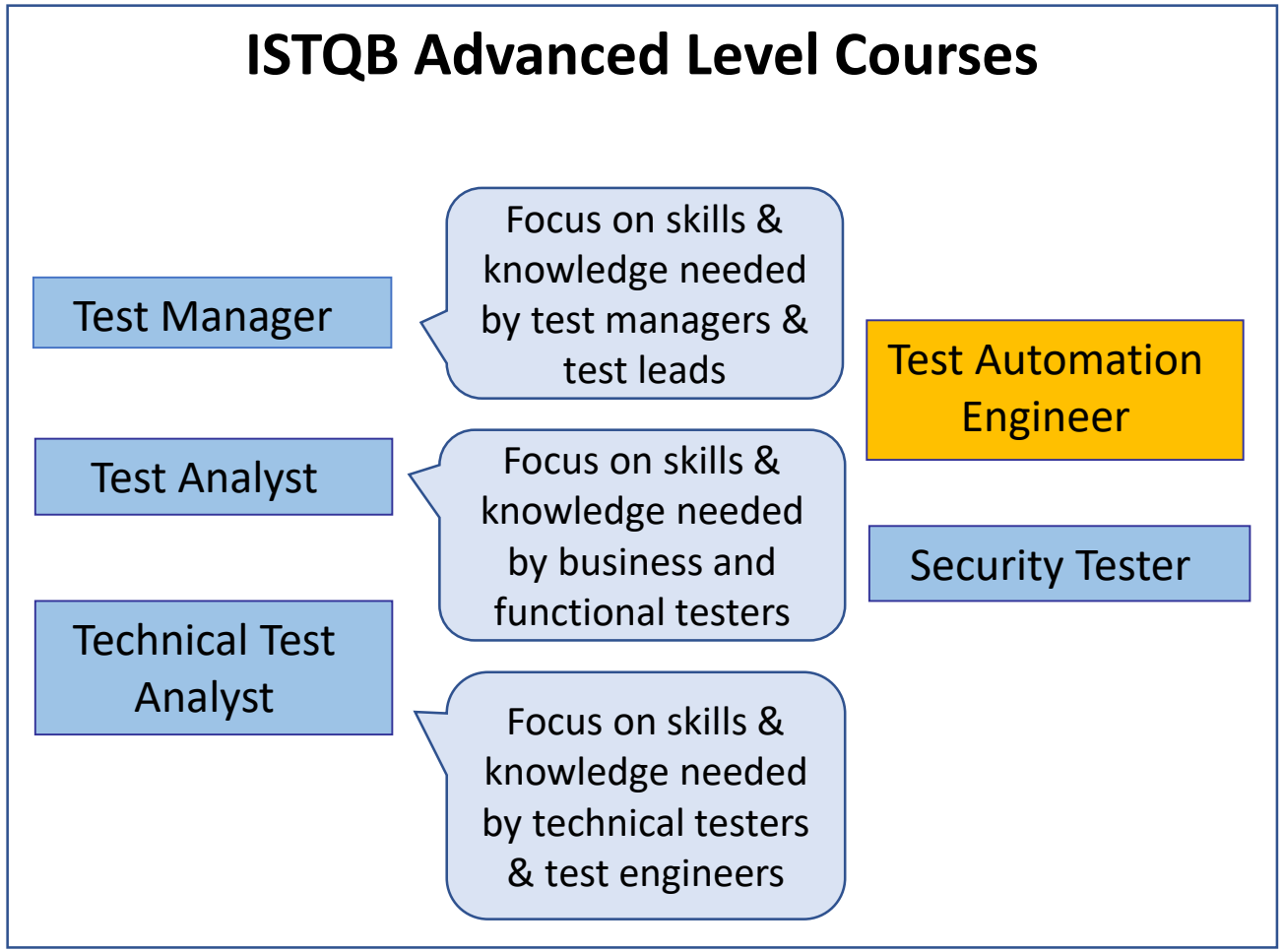
Or see our website: www.tsg-training.co.uk
The next Test Automation Engineer course is on
16 Dec 2019 and 27th Jan 2020 in London

Agenda

- Introduction and Objectives for Test Automation
- Preparing for Test Automation
- Test Automation Reporting and Metrics
- Transitioning Manual Testing to an Automated Environment
- Continuous Improvement

How does TAE fit with other Advanced Level courses?



Scope of TAE

Tasks of a test automation engineer (TAE) in:

- designing
- developing
- Maintaining test automation solutions

Concepts, methods, tools & processes for automating dynamic functional tests and their relationship to TM, CM, DM, software development processes and quality assurance

Methods described are generally applicable across variety of:

- SDLC
- types of software systems
- test types

The 8 key disciplines covered by the course

tsg Training

1. Objectives for Test Automation

2. Preparing for Test Automation

3. Generic Test Automation Architecture

4. Deployment Risks & Contingencies

5. Test Automation Reporting & Metrics

6. Transitioning Manual Testing to Automated Environment

7. Verifying the TAS

8. Continuous Improvement

Purpose of Test Automation

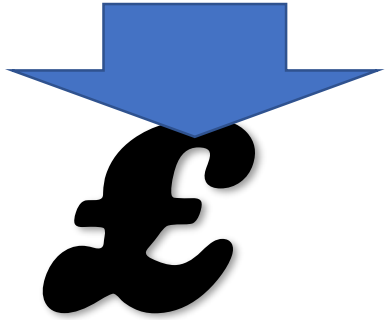
- Can be used for the following tasks:
  - control and set up test preconditions
  - execute test cases consistently and repeatedly on different versions of the SUT and/or environments
  - compare actual and expected outcomes

- A process of designing testware:
  - software
  - documentation
  - test cases
  - test environments
  - test data

- Testware for:
  - implementing automated test cases
  - monitoring and controlling the execution of automated tests
  - interpreting, reporting and logging the automated test results

Objectives

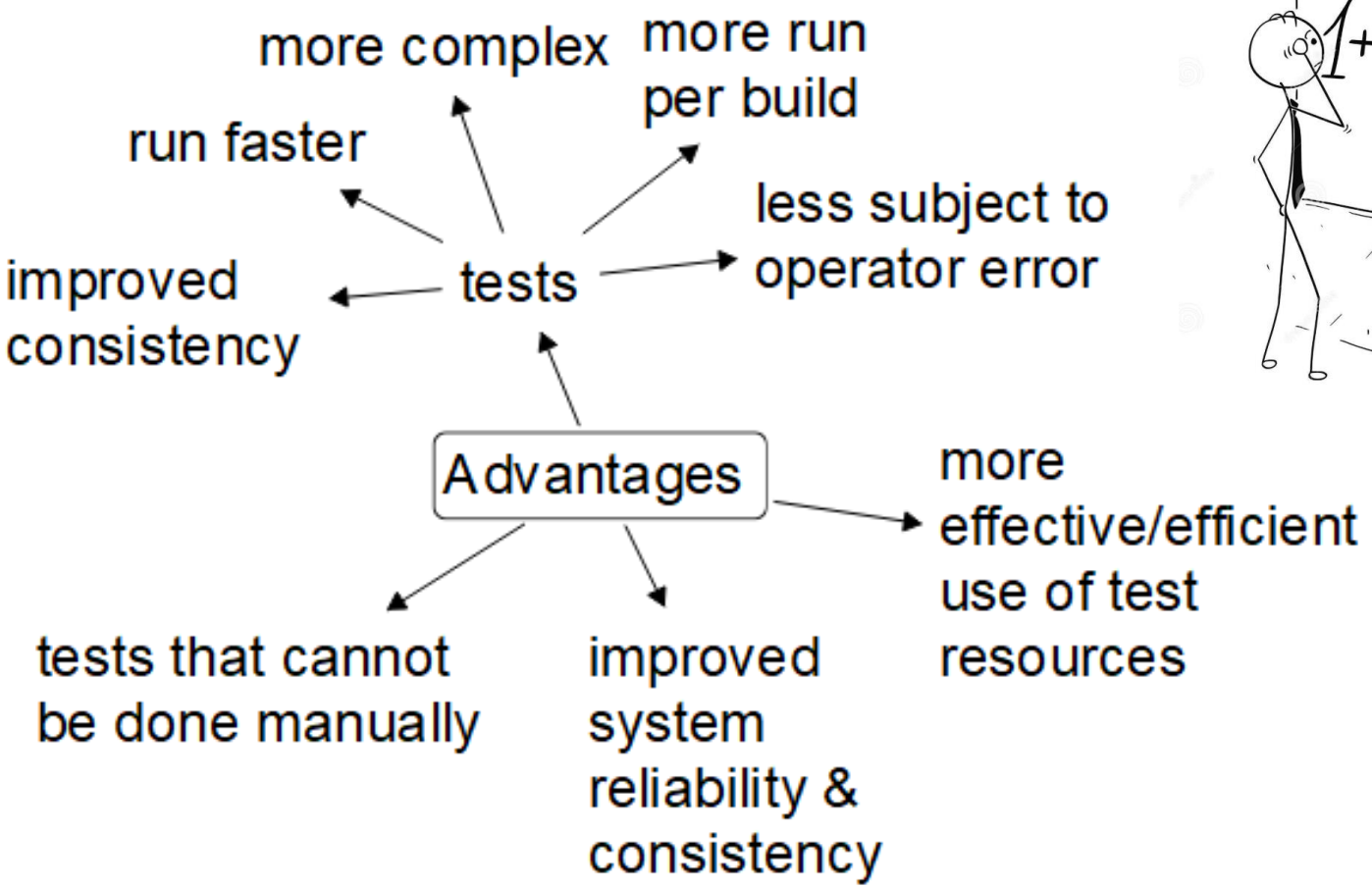
- Improve test efficiency
- Provide wider function coverage
- Reduce total test cost
- Perform tests that manual testers cannot
- Shorten test execution period
- Increase test frequency / reducing test cycle time

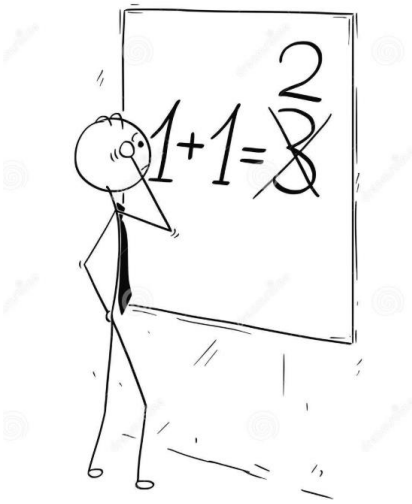


Limitations

- Not all manual tests can be automated
- Automation only checks:
  - machine-interpretable results
  - results verifiable by an automated test oracle
- Not a replacement for exploratory testing

Advantages


more complex
more run per build
run faster
less subject to operator error
improved consistency
tests
Advantages
more effective/efficient use of test resources
tests that cannot be done manually
improved system reliability & consistency


1+1=2
3

Disadvantages

- Disadvantages
  - additional costs
  - additional errors introduced by automation
  - possible increased tests complexity
  - TAS maintenance
  - initial investment
  - team needs development & automation skills
  - can distract from testing objectives

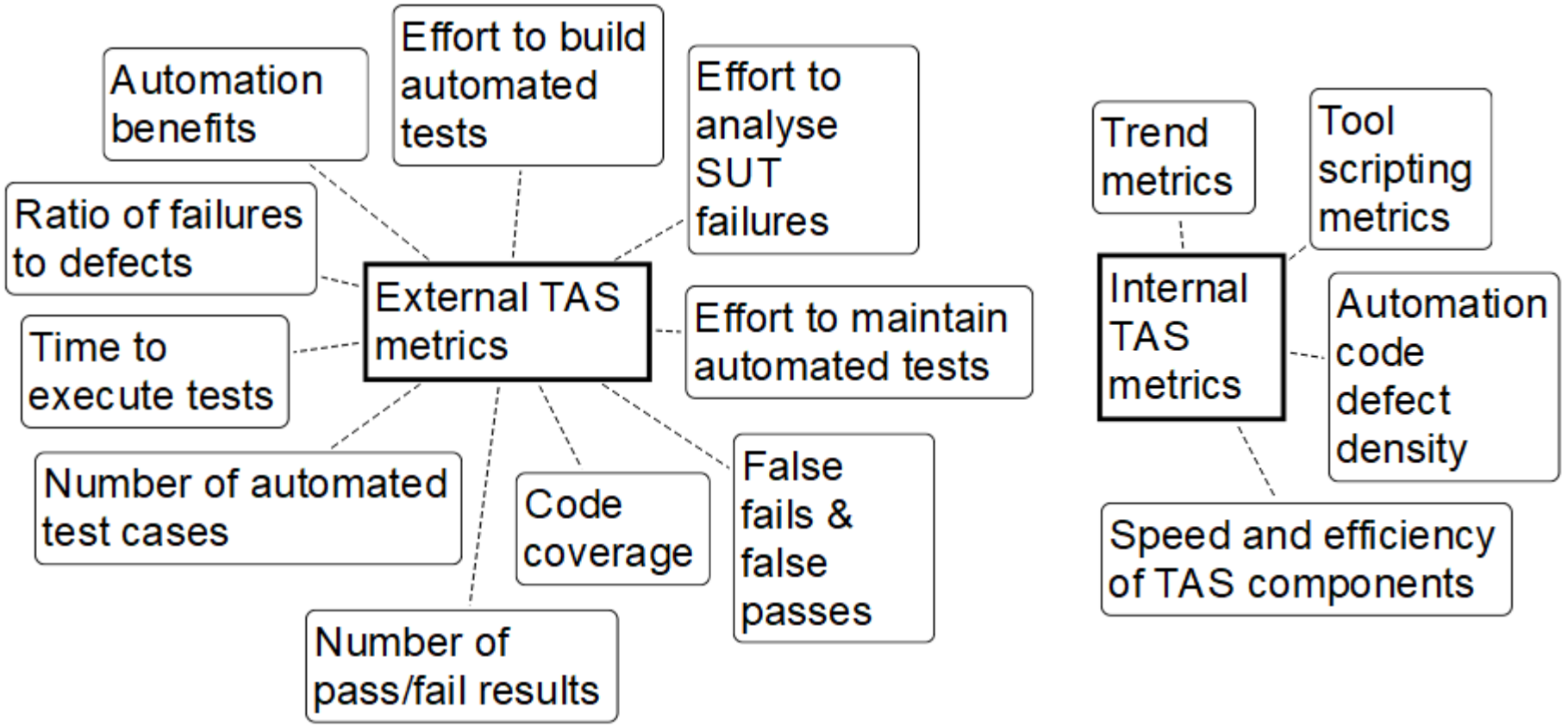
Success Factors in Test Automation

1. Test Automation Architecture (TAA)
2. SUT Testability
3. Test Automation Strategy
4. Test Automation Framework (TAF)

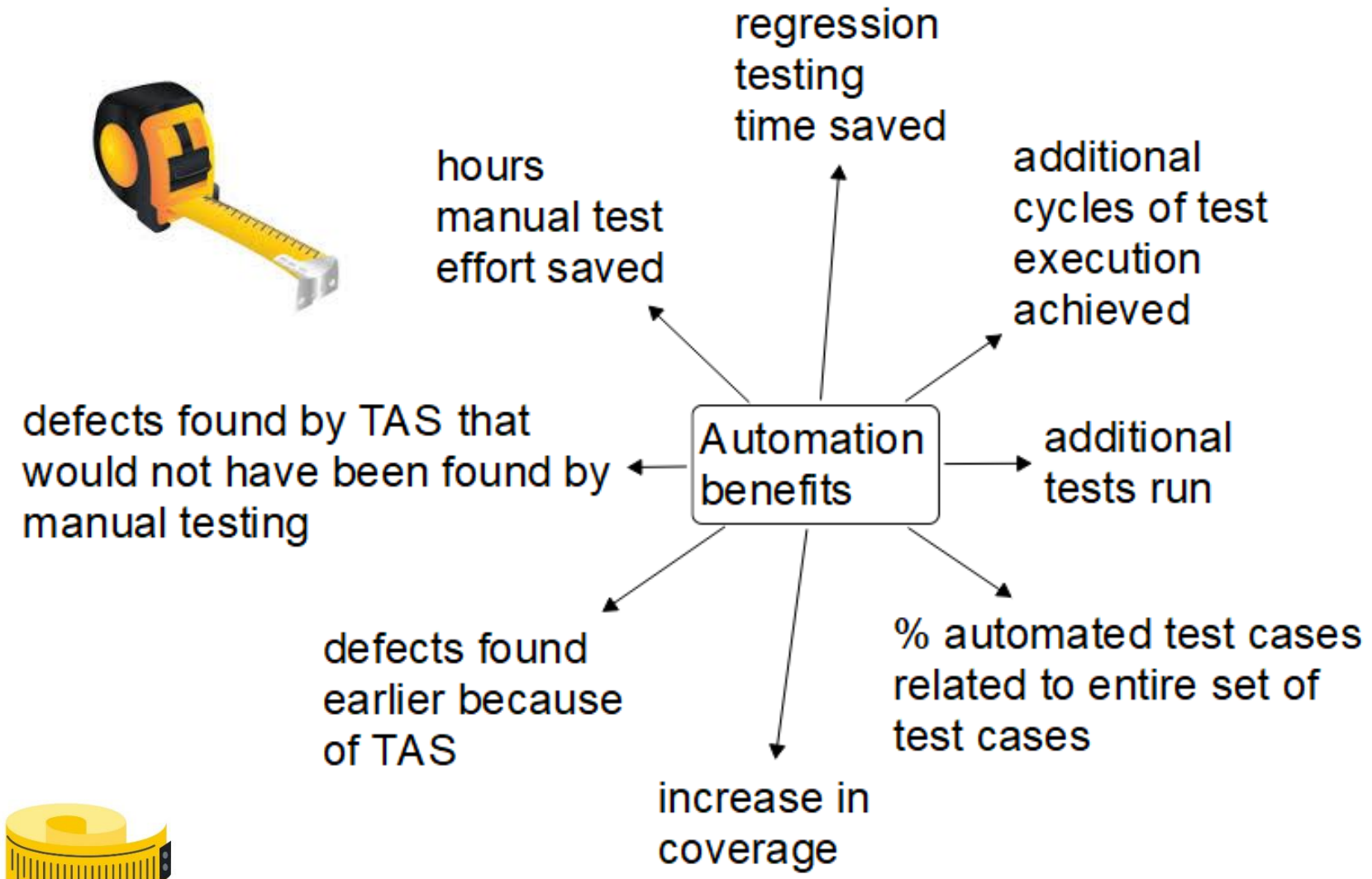
More success factors met, greater the likelihood of long term success

Selection of TAS Metrics

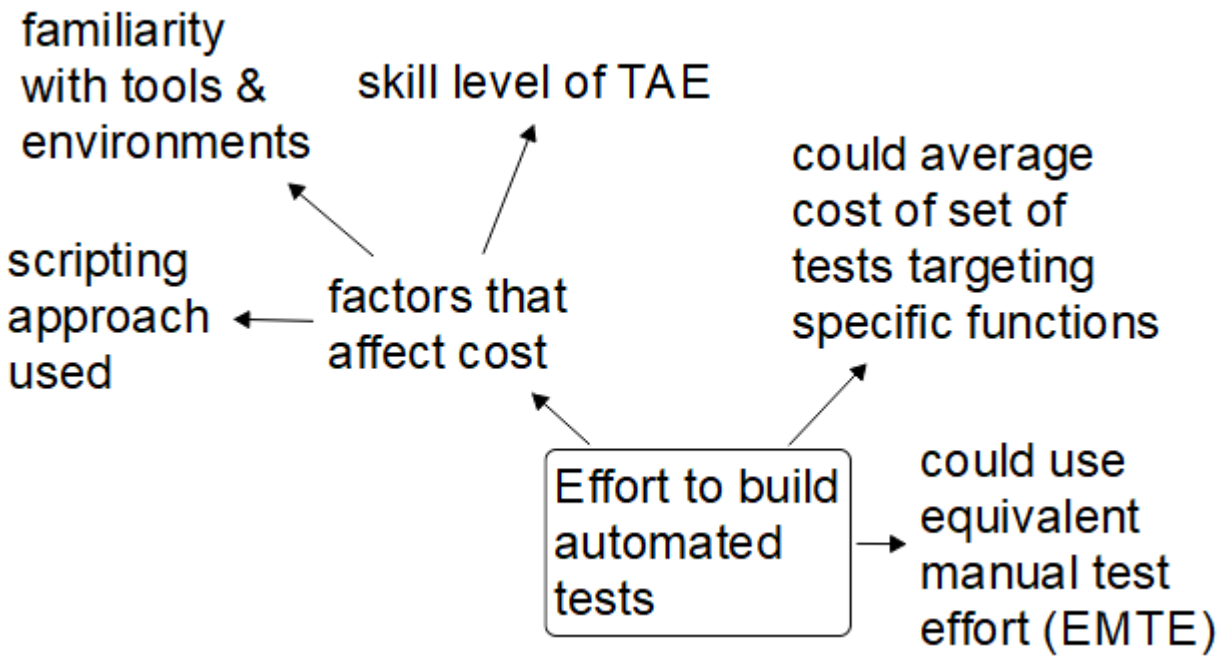
Section 5.1 (parts 1 and 2) LO 5.1.1 (K2) Classify metrics that can be used to monitor the test automation strategy & its effectiveness



Automation Benefits

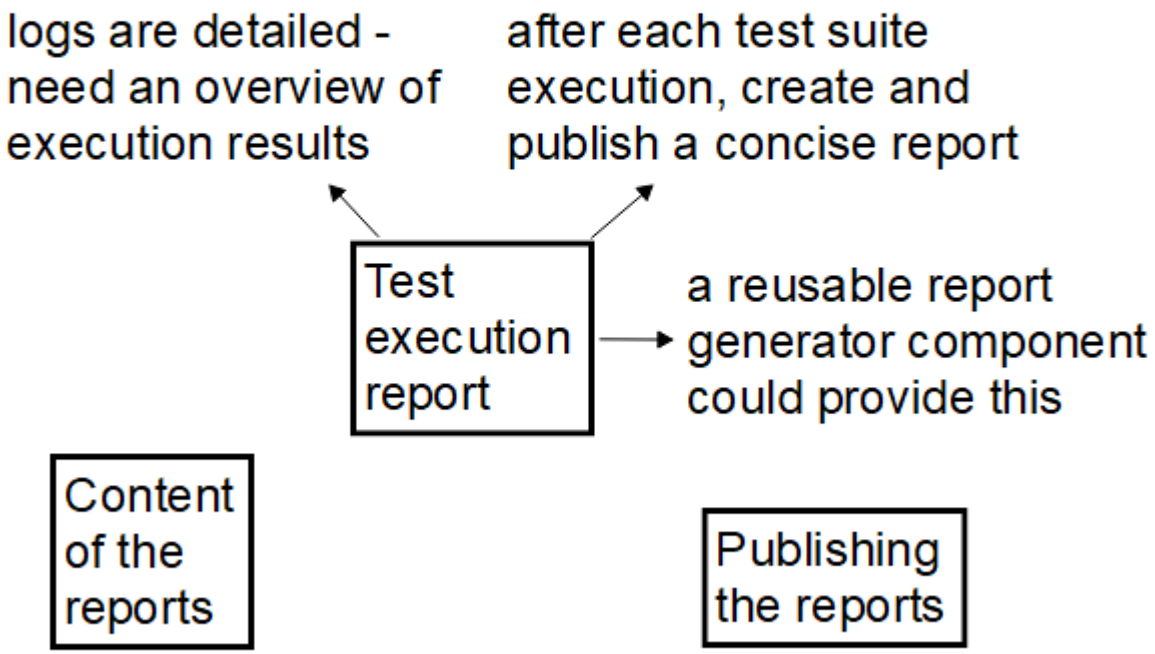


Effort to build automated tests



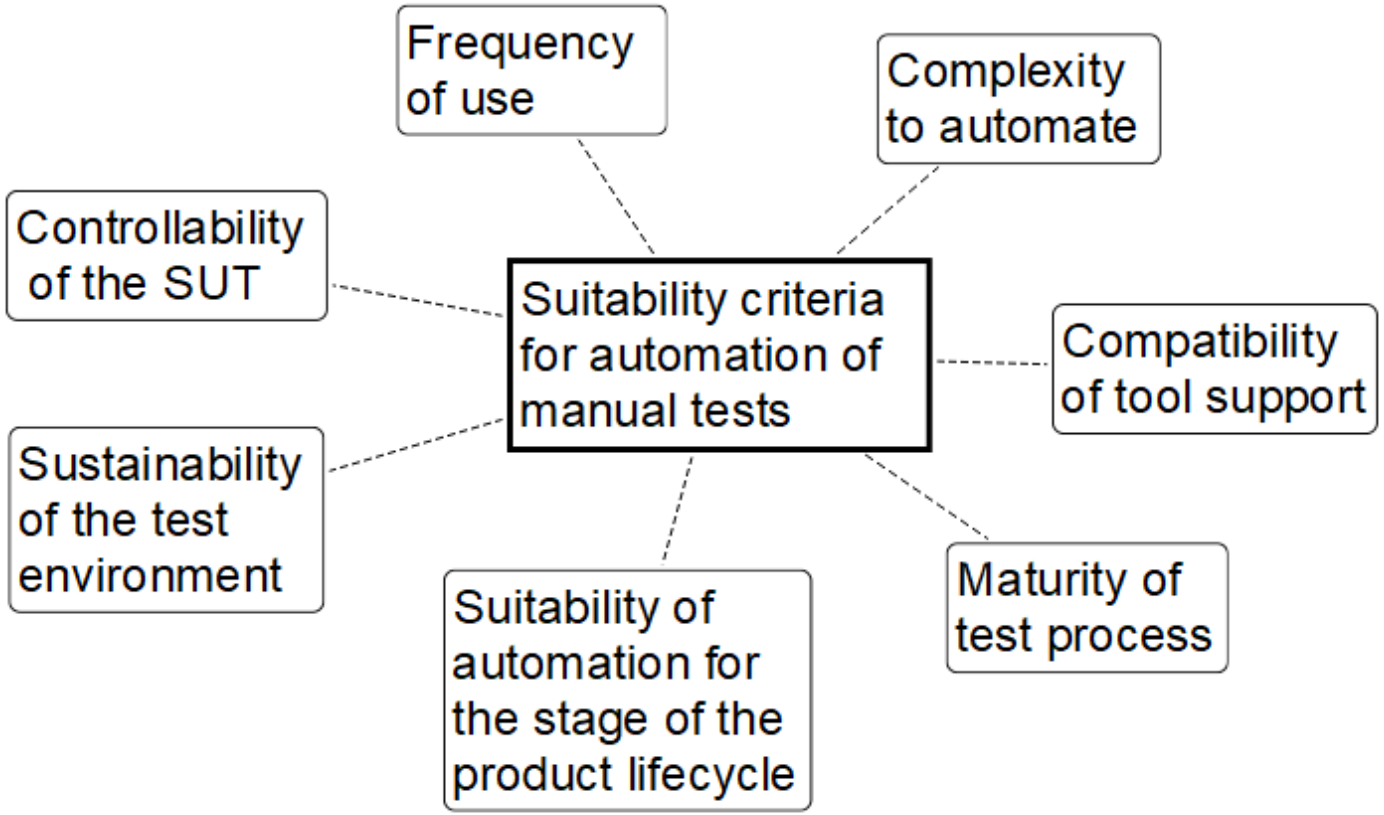
Test Automation Reporting

Section 5.4 LO 5.4.1 (K2) Explain how a test execution report is constructed & published



Transitioning Manual Testing to an Automated Environment

Section 6.1 (part 1/2) LO 6.1.1 (K3) Apply criteria for determining the suitability of tests



Suitability Criteria for Automation

Frequency of use

- How often will the test run?
  - more releases (and so more test cycles), the greater the benefit of automating tests
- Automated regression testing will provide high ROI and risk mitigation

Maturity of test process

- Automation brings a development process into existing test process
- So test process must be:
  - structured
  - disciplined
  - repeatable

Suitability Criteria for Automation

Complexity to automate

- Huge benefit from automating a complex system freeing tester from executing complex steps that are:

tedious

- Some test scripts may be difficult or not cost-effective to automate e.g.
  - SUT not compatible with existing TAS
  - the large number of systems included in test execution
  - interactions with external interfaces and/or proprietary systems
  - some aspects of usability testing
  - time needed to test automation scripts

Factors in transitioning from manual to automation testing

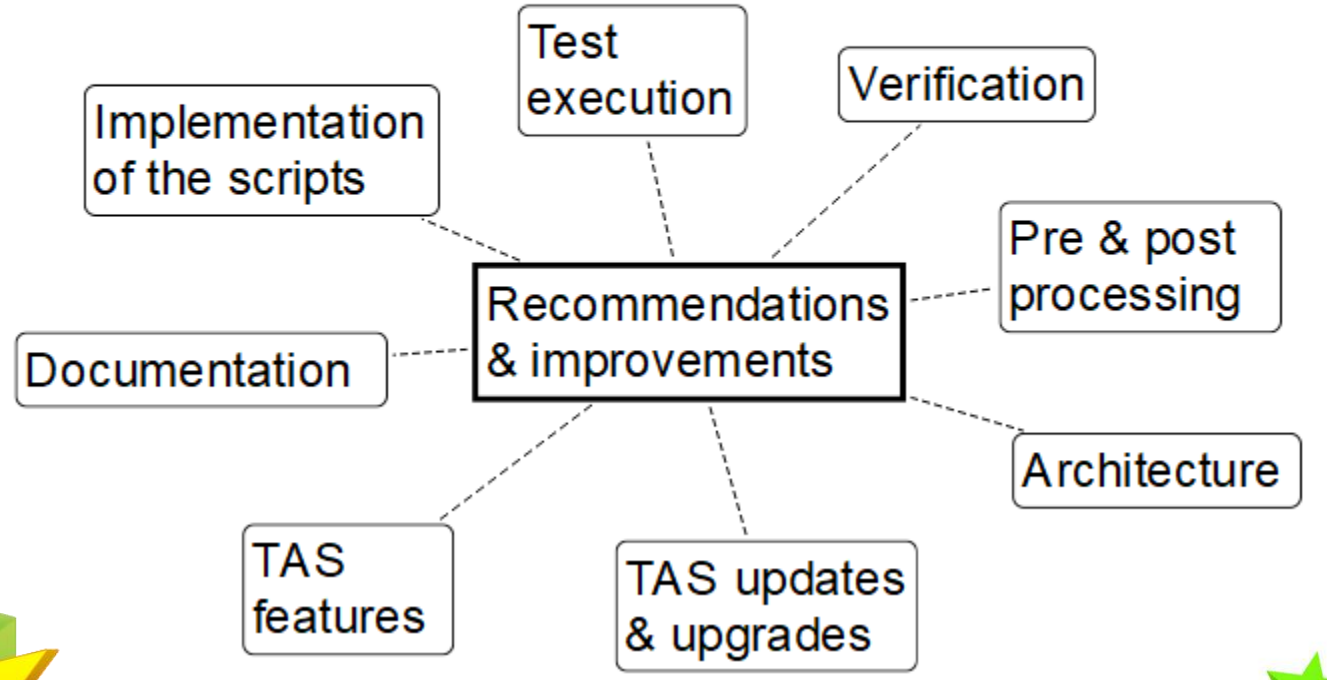
Education of test team for paradigm shift

- Effective testing comes from a broad mix of backgrounds
- With automation, test roles become more specialized
- Education will help reduce anxiety over roles changes
- Carefully managed, the shift toward automation will enable team to be ready to participate in the organizational and technical change

All of these are ways of helping your test automation succeed

Options for Improving Test Automation

Section 8.1 (parts 1 and 2) LO 8.1.1 (K4) Analyse the technical aspects of a deployed test automation solution & provide recommendations for improvement



Scripting

Assess test case / step / procedure overlap

- Create library functions from repeated test case / step / procedure for reuse – increases maintainability
- Consider parameterization when test steps similar but not identical

a typical approach in keyword-driven testing

Is the best wait mechanisms being used?

1. Hard-coded waits => test automation problems
2. Dynamic waiting by polling more flexible & efficient
   - waits only the needed time and no test time is wasted
   - if process takes longer, the polling continues until condition is true
     - so include a timeout mechanism!

3. Best to subscribe to SUT event mechanism
   - more reliable than options 1 & 2 but scripting language must support event subscription and SUT needs to offer events to test application
     - and include a timeout mechanism!

Summary

- Test Automation Engineers come in many varieties and focus on different areas
- The core 8 disciplines that relate to test automation are:
  - Objectives for Test Automation
  - Preparing for Test Automation
  - Generic Test Automation Architecture
  - Deployment Risks & Contingencies
  - Test Automation Reporting & Metrics
  - Transitioning Manual Testing to Automated Environment
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  - Continuous Improvement

Any Questions?

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What other courses might be applicable?

You or your team may also be interested in:

ISTQB Advanced Test Manager

ISTQB Advanced Test Analyst

ISTQB Advanced Security Tester

ISTQB Advanced Technical Tester

Scrum Master Pro

Selenium Webdriver

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