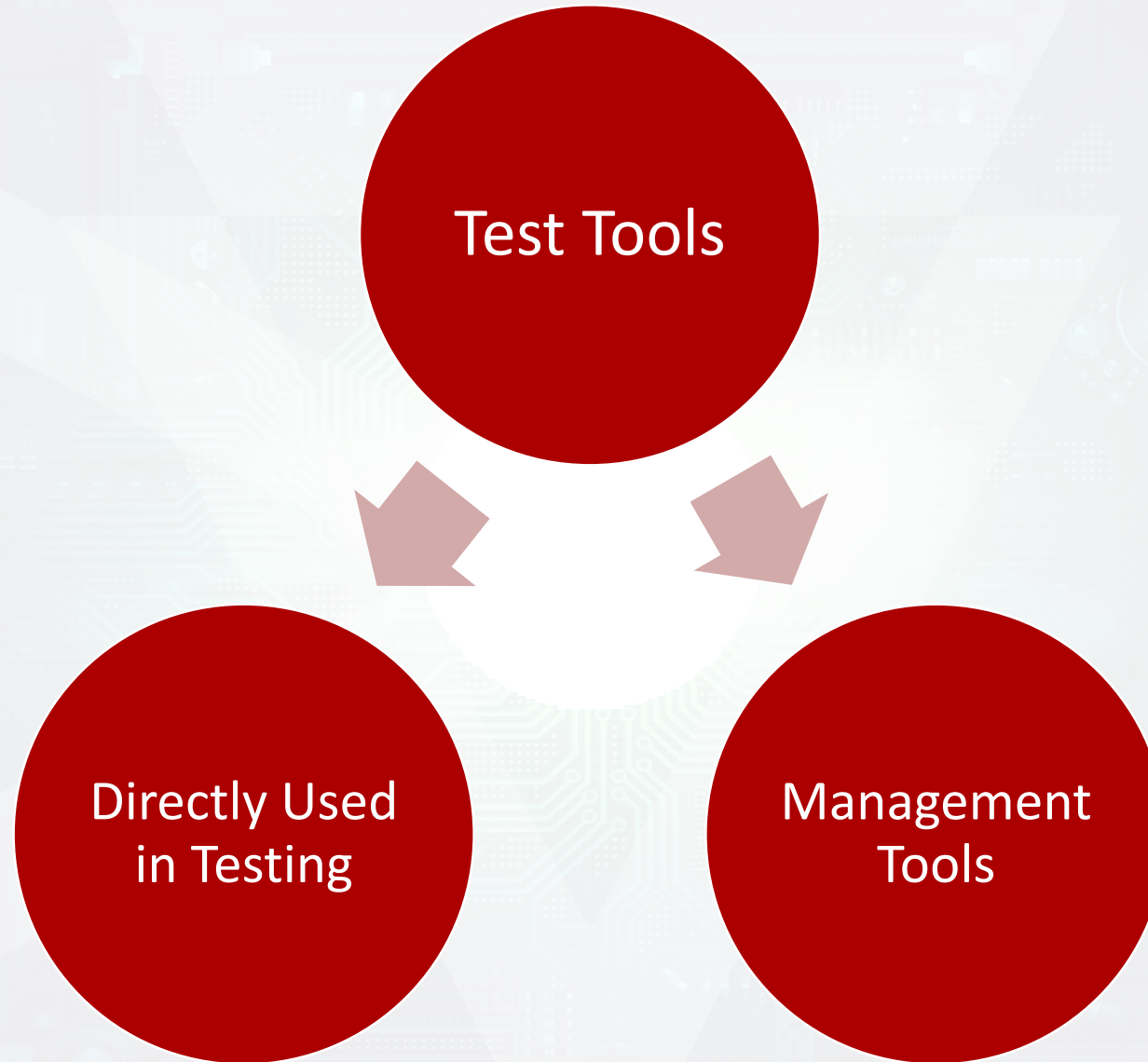


# Chapter 6

# Tool Support

# for Testing

# Test Tool Considerations



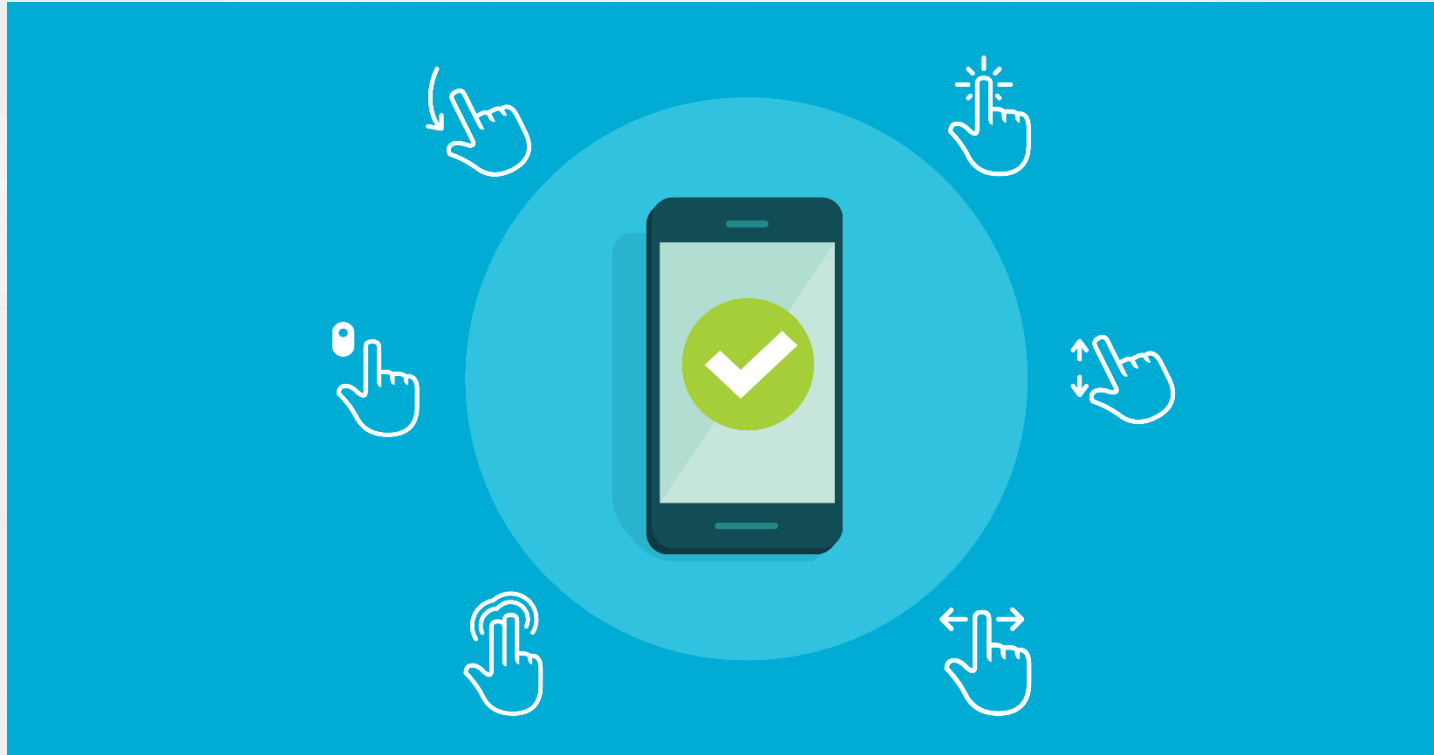


# Test Tools Purposes

- Improve the efficiency of test activities by **automating repetitive tasks** or tasks that require significant resources when done manually
- Improve the efficiency of test activities by **supporting manual test activities** throughout the test process
- Improve the quality of test activities by allowing for more consistent testing and a higher level of defect reproducibility
- Automate activities that cannot be executed manually
- Increase reliability of testing



# Intrusive Tools



- Intrusive Tools may affect the actual outcome of the test
- The consequence of using intrusive tools is called the probe effect

# Tool support for management of Testing

ALM Tools

Requirements  
Management  
Tools

Defect  
Management  
Tools

Configuration  
Management  
Tools

Continuous  
Integration  
Tools (D)



# Tool support for Static Testing



The diagram features a central white circle. To its left is a red circle containing the text 'Static Analysis Tools'. To its right is another red circle containing the text 'Review Tools'. The background is a light gray with a faint, stylized circuit board pattern.

Static Analysis  
Tools

Review  
Tools

# Tool support for Test Design & Implementation

Test  
Design  
Tools

Behavior-  
driven Tools  
(BDD)

Acceptance  
Test Driven  
Tools(ATDD)

Model-based  
Testing Tools

Test-data  
Preparation  
Tools

Test Driven  
Tools (D)



# Tool support for Test Execution & Logging

Test  
Execution  
Tools

Coverage  
Tools(T/D)

Unit Test  
Framework  
Tools(D)

Test  
Harnesses(D)

# Tool support for Performance Measurement & Dynamic Analysis

Monitoring  
Tools

Performance  
Testing Tools

Dynamic  
Analysis Tools  
(D)

# Tool Support for Specialized Testing Needs

Localization  
Testing

Accessibility  
Testing

Data  
conversion  
& Migration

Usability  
Testing

Portability  
Testing

Security  
Testing

Data Quality  
Assessment



# Benefits of Test Execution Tools (Automation)

- Reduction in repetitive manual work, thus saving time
- Greater consistency and repeatability
- More objective assessment
- Easier access to information about testing



# Risks of Test Execution Tools (Automation)

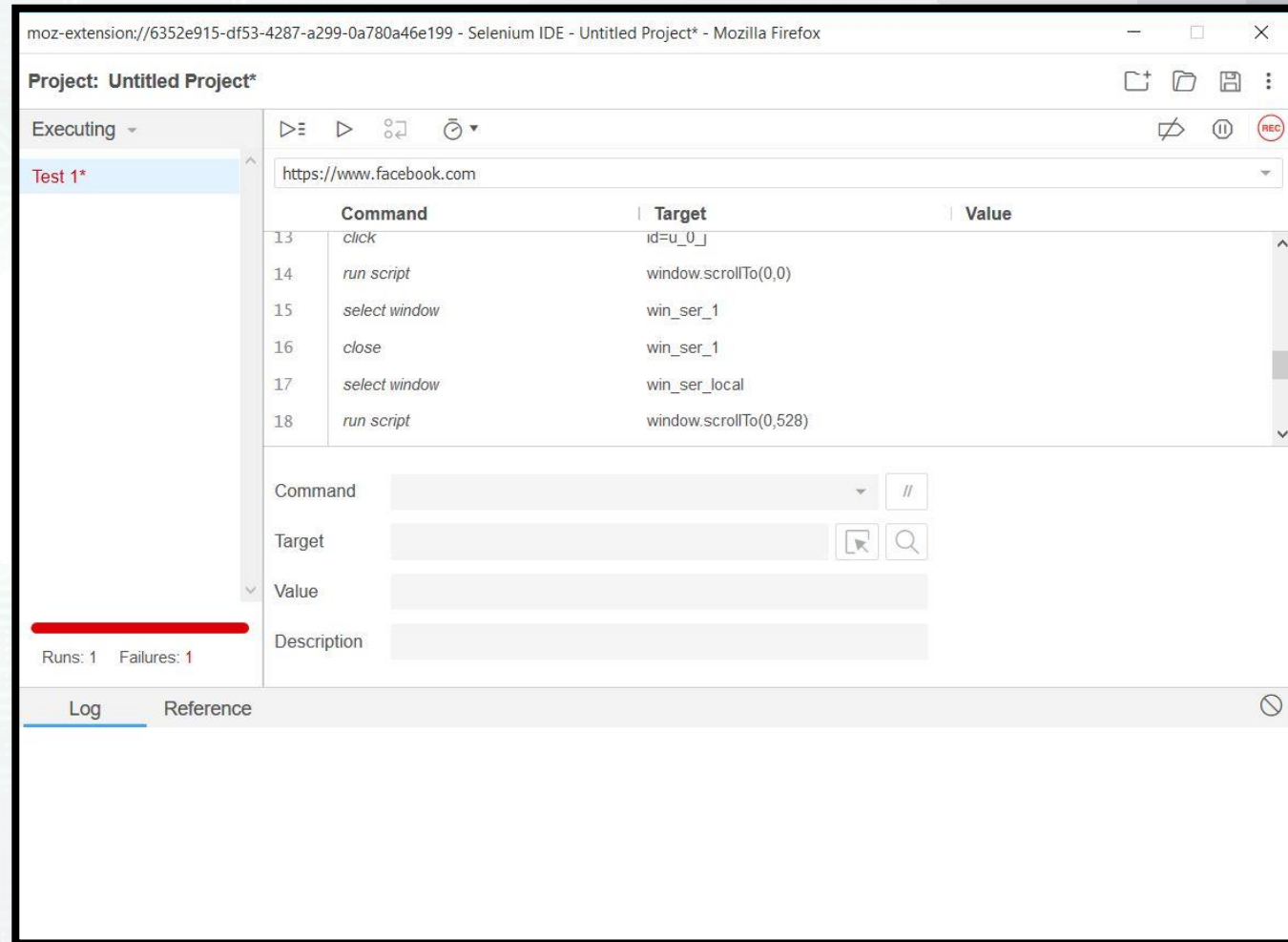
- Unrealistic expectations of the tool
- Underestimating time, cost, & effort for the initial introduction of a tool and also to achieve significant benefit from it
- The effort required to maintain the test assets generated by the tool may be under-estimated
- The tool may be relied on too much
- Relationships and interoperability issues between critical tools may be neglected
- Vendor problems (Retire or sell the tool/ poor response/go out of business)
- An open source project may be suspended
- A new platform or technology may not be supported by the tool





# Capture/Replay (Record/Playback) Tools

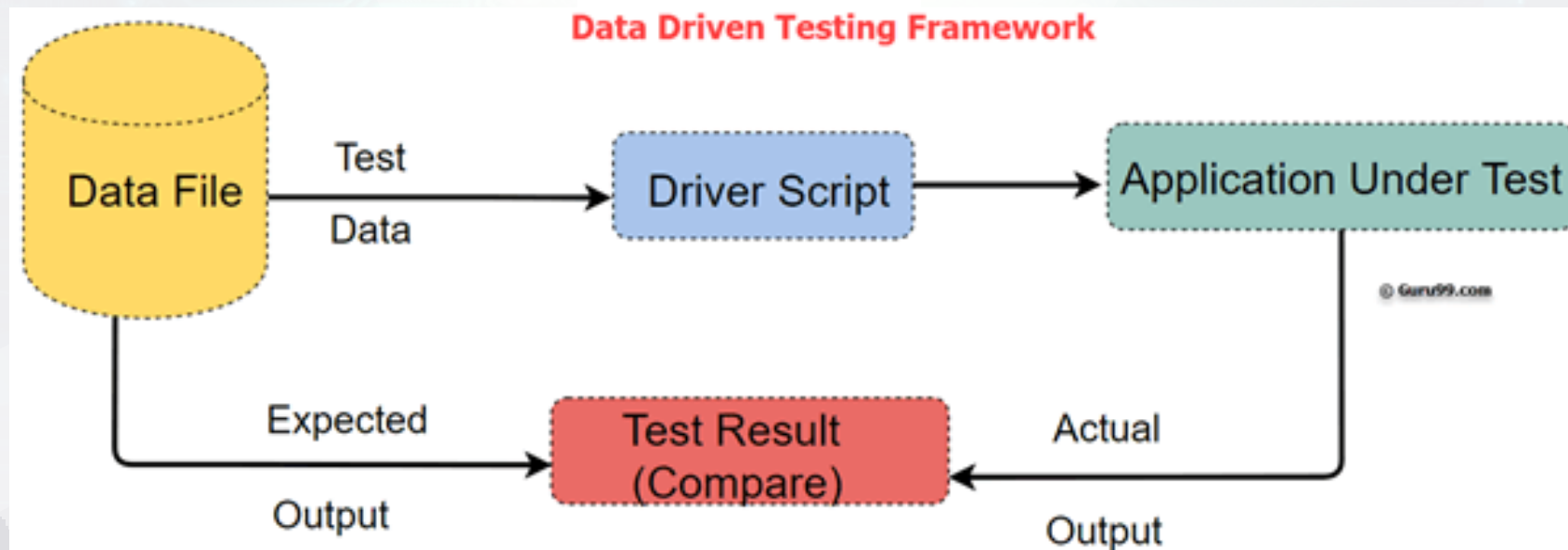
- Capturing tests by recording the actions of a manual tester seems attractive, but this approach does not scale to large numbers of test scripts.
- A captured script is a linear representation with specific data and actions as part of each script. This type of script may be unstable when unexpected events occur.
- The latest generation of these tools, which takes advantage of “smart” image capturing technology, has increased the usefulness of this class of tools, although the generated scripts still require ongoing maintenance as the system’s user interface evolves over time





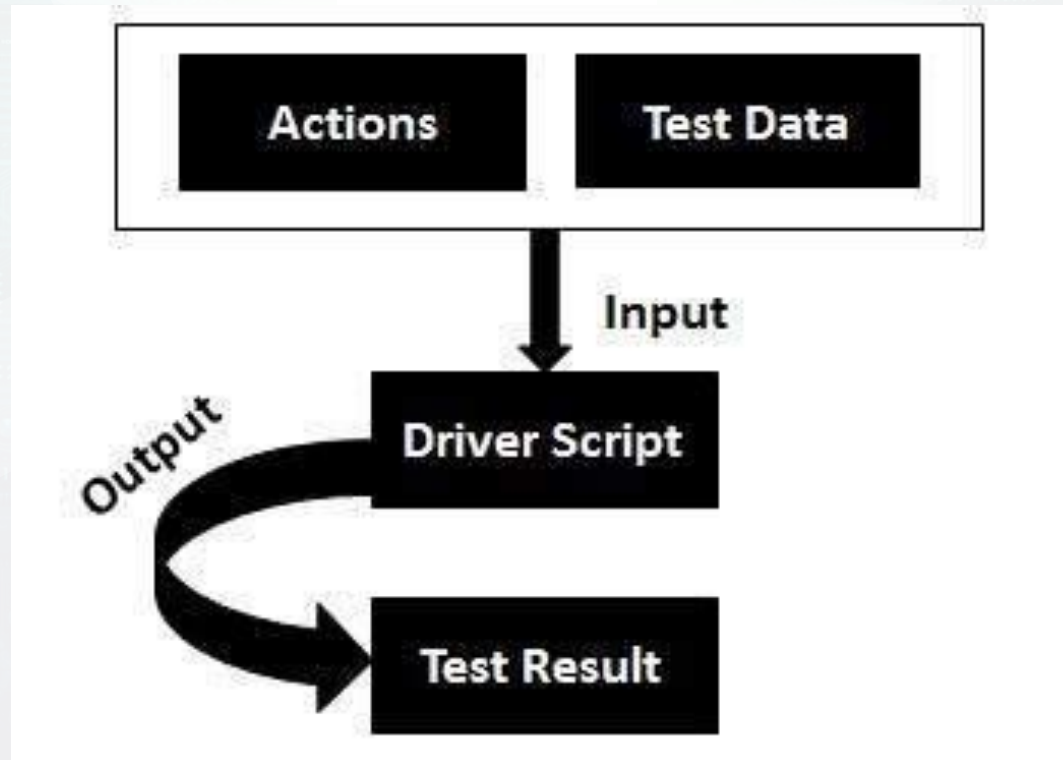
# Data-driven Testing

- A data-driven testing approach separates out the test inputs and expected results, usually into a spreadsheet, and uses a more generic test script that can read the input data and execute the same test script with different data.
- Testers who are not familiar with the scripting language can then create new test data for these predefined scripts



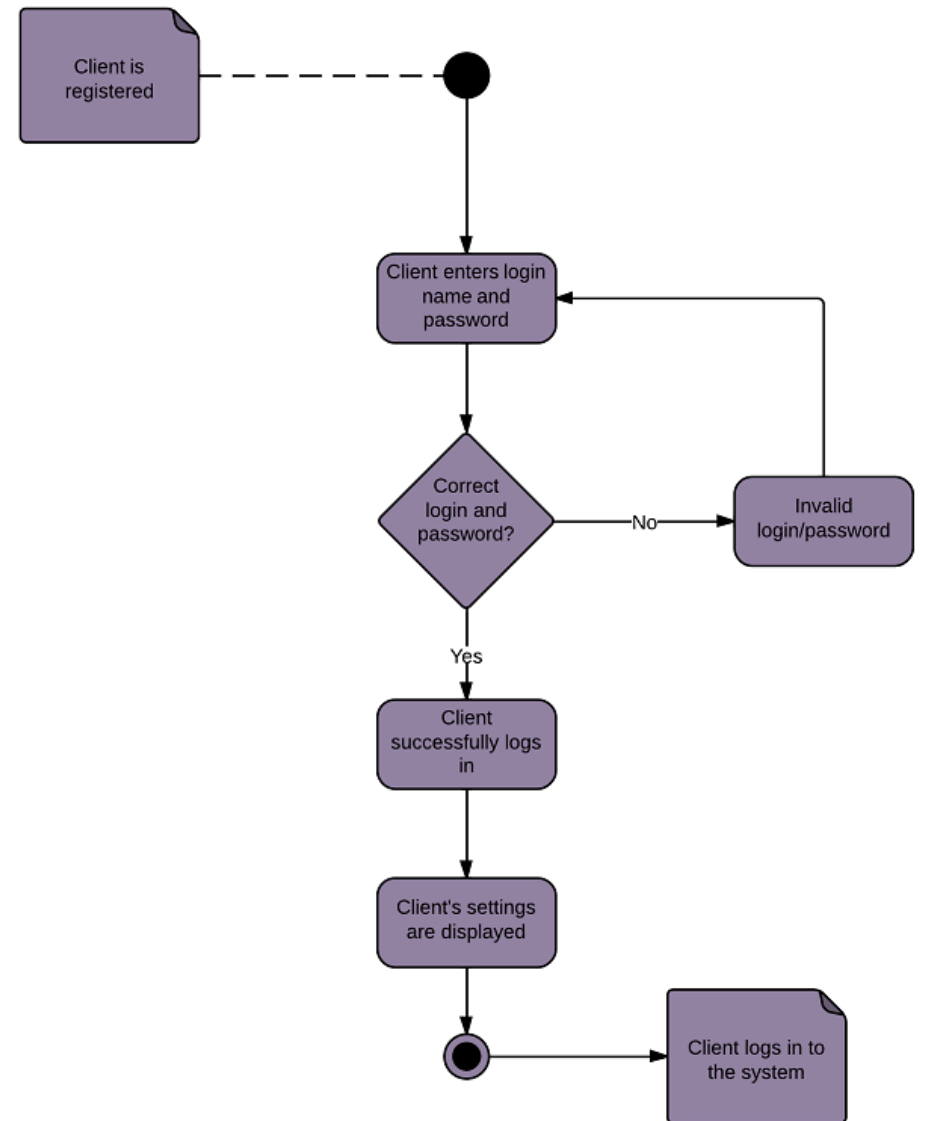
# Keyword-driven Testing

- In a keyword-driven testing approach, a generic script processes keywords describing the actions to be taken (also called action words), which then calls keyword scripts to process the associated test data
- Testers (even if they are not familiar with the scripting language) can then define tests using the keywords and associated data, which can be tailored to the application being tested.



# Model-based Testing

- Model-Based testing (MBT) tools enable a functional specification to be captured in the form of a model, such as an activity diagram.
- This task is generally performed by a system designer.
- The MBT tool interprets the model in order to create test case specifications which can then be saved in a test management tool and/or executed by a test execution tool





# Quiz Time

# Quiz Time

- Which one of the following is **MOST** likely to be a benefit of using test execution tools?
  - A. It is easy to create regression tests
  - B. It is easy to maintain version control of test assets
  - C. It is easy to design tests for security testing
  - D. It is easy to run regression tests

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# Quiz Time

- Which test tool is characterized by the classification below?

1. Tool support for management of testing and testware
2. Tool support for static testing.
3. Tool support for test execution and logging.
4. Tool support for performance measurement and dynamic analysis.

- A. Coverage tools.
- B. Configuration management tools.
- C. Review tools.
- D. Monitoring tools.

- a. 1A, 2B, 3D, 4C
- b. 1B, 2C, 3D, 4A
- c. 1A, 2C, 3D, 4B
- d. 1B, 2C, 3A, 4D.

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- a. 1A, 2B, 3D, 4C
- b. 1B, 2C, 3D, 4A
- c. 1A, 2C, 3D, 4B
- d. **1B, 2C, 3A, 4D.**

# Quiz Time

- Which of the following is an example of a tool that supports static testing?
  - A. A tool that assists with tracking the results of reviews
  - B. A defect tracking tool
  - C. A test automation tool
  - D. A tool that helps design test cases for security testing



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# Quiz Time

- What is the primary purpose of a test execution tool?
  - A. It runs automated test scripts to test the test object
  - B. It automatically records defects in the defect tracking system
  - C. It analyzes code to determine if there are any coding standard violations
  - D. It tracks test cases, defects and requirements traceability

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# Effective Use of Tools

# Considerations for Tool Selection

- **Assessment of the maturity of the organization, its strengths and weaknesses**
- **Identification of opportunities for an improved test process supported by tools**
- **Understanding of the technologies used by the test object(s), in order to select a tool that is compatible with that technology**
- **The build and continuous integration tools already in use within the organization, in order to ensure tool compatibility and integration**
- **Evaluation of the tool against clear requirements and objective criteria**





# Considerations for Tool Selection

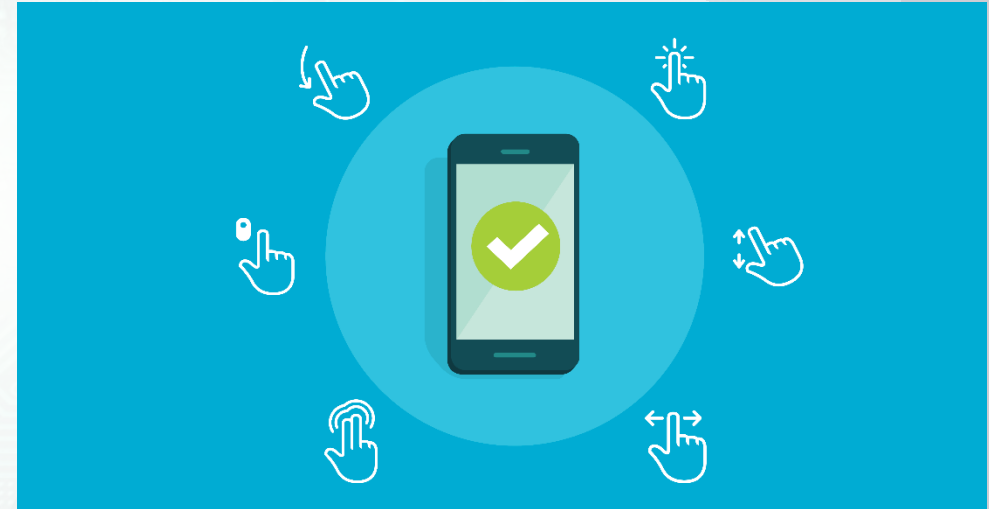
- **Consideration of whether or not the tool is available for a free trial period (and for how long)**
- **Evaluation of the vendor**
- **Identification of coaching, mentoring, & training needs**
- **Consideration of pros and cons of various licensing models (e.g., commercial or open source)**
- **Estimation of a cost-benefit ratio**
- **a proof-of-concept evaluation should be done**





# Pilot Project

- **introducing the selected tool into an organization generally starts with a pilot project, which has the following objectives:**
  - **Gaining knowledge about the tool**
  - **Evaluating how the tool fits with existing processes and practices**
  - **Deciding on standard ways of using, managing, storing, and maintaining the tool and the test assets**
  - **Assessing whether the benefits will be achieved at reasonable cost**
  - **Understanding the metrics that you wish the tool to collect and report, and configuring the tool to ensure these metrics can be captured and reported**



# Success Factors for Tools

- Rolling out the tool to the rest of the organization incrementally
- Adapting and improving processes to fit with the use of the tool
- Providing training, coaching, and mentoring for tool users
- Defining guidelines for the use of the tool
- Implementing a way to gather usage information from the actual use of the tool
- Monitoring tool use and benefits
- Providing support to the users of a given tool
- Gathering lessons learned from all users





# Quiz Time



# Quiz Time

- **Why is it important to define usage guidelines for a new tool?**
  - A. Because this is a proven success factor in tool deployment**
  - B. Because this will ensure the licensing restrictions are enforced**
  - C. Because management needs to understand the details of the tool usage**
  - D. Because this will provide the information needed for the cost/benefit analysis**

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# Quiz Time

- Which of the following are major objectives of a pilot project for a tool introduction?
  - A. Roll out, adapt, train, implement
  - B. Monitor, support, revise, implement
  - C. Learn, evaluate, decide, assess
  - D. Evaluate, adapt, monitor, support



# Quiz Time

- Which of the following are major objectives of a pilot project for a tool introduction?
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  - D. Evaluate, adapt, monitor, support

# Chapter 6 In the Exam

<b>Remember (1 Question)</b>	<b>Understand (1 Questions)</b>
<ul style="list-style-type: none"><li>• <b>Benefits &amp; risks of test automation</b></li><li>• <b>Considerations for test execution &amp; test management tools</b></li><li>• <b>Principles for tools selection</b></li><li>• <b>Pilot project</b></li><li>• <b>Success factors for tools</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Test Tools classification</b></li></ul>