Test Management and Issue Tracking

Test Roles, Test Strategy and Approach, Entry and Exit Criteria, Planning, Design, Execution, Monitoring, Closure

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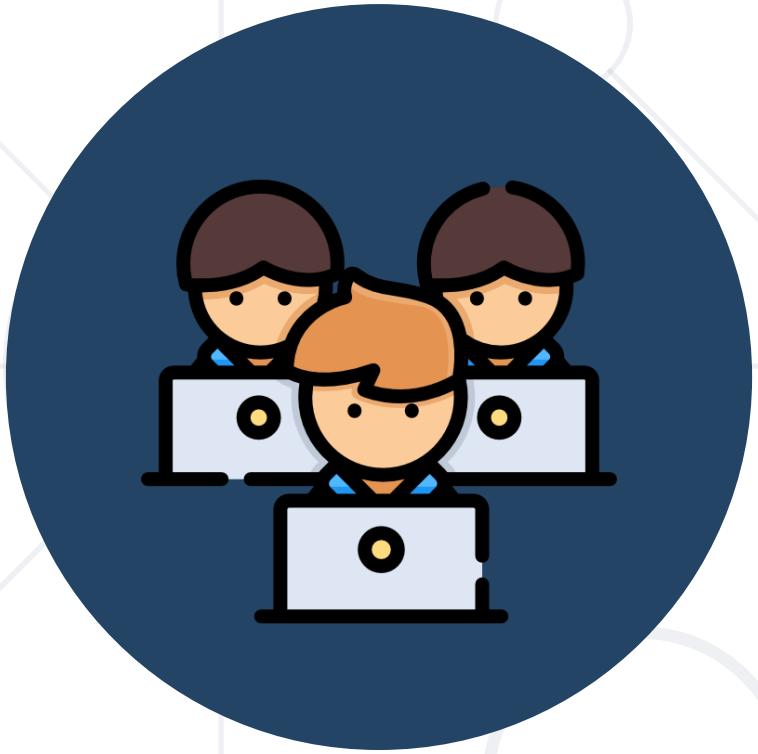

Roles and Responsibilities in Testing

Navigating the Testing Landscape

Roles in Testing

- Most **common roles** in testing are:
  - Test **Manager**
  - Test **Lead**
  - Test **Analyst**
  - Test **Engineer**
  - **Manual Tester**
- **Other roles** can be found, depending on the organization, e.g. **Test Coordinator**

Test Manager

- Responsible for **overseeing the testing process** and ensuring its successful execution
  - **Develops** the test strategy and test plans
  - Allocates resources, defines timelines, and **sets priorities**
  - **Coordinates** with stakeholders for clear communication and understanding of testing goals
  - **Monitors** the progress of testing activities and report on test metrics
  - **Manages** risks and issues related to testing
  - Provides **guidance** and **mentoring** to the test team
  - Ensures **compliance** to **testing standards** and best practices
  - **Collaborates** with project managers and stakeholders to align testing activities with project objectives

Test Lead

- **Manages** the **testing team** and plays a crucial role in coordinating and driving testing activities
  - **Assists** in developing the test strategy and test plans
  - **Assigns** tasks to test team members and **monitors** their progress
  - Conducts **regular team meetings** to discuss test progress, challenges, and solutions
  - Provides **guidance** and **support** to test analysts and engineers
  - **Reviews** test artifacts such as test cases, scripts, and data
  - **Coordinates** with the Test Manager to ensure appropriate resource allocation
  - **Collaborates** with other leads and managers to ensure testing integration and alignment with project activities
  - **Identifies** and **resolves** issues or roadblocks that may impact testing

Test Analyst

- Responsible for **analyzing requirements** and **designing** test scenarios and cases
  - **Reviews** system requirements and specifications to identify testable features
  - **Designs** test scenarios based on business and technical requirements
  - **Creates** and **executes** test cases, scripts, and data
  - **Identifies** defects, working with the development team to resolve them
  - **Participates** in test estimation and test strategy discussions
  - **Conducts** various types of testing
  - **Collaborates** with the Test Lead and Test Manager
  - **Provides input** for test automation opportunities and support automation efforts

Test Engineer

- Focuses on the technical aspects of testing, including test automation and test execution
  - **Develops** and **maintains** automated test scripts
  - **Collaborates** with the Test Analyst to identify test cases suitable for automation
  - **Sets up** and **configures** test environments and test data
  - **Executes** automated test scripts and analyze test results
  - **Debugs** and **troubleshoots** issues in the test automation framework
  - **Creates** and **maintains** test documentation, such as test plans and reports
  - **Collaborates** with the development team to ensure proper test coverage
  - Continuously **improves** test automation processes and frameworks
  - Stays **updated** with industry trends and best practices in test automation

Manual Tester

- Responsible for **executing tests manually** to ensure software quality
  - **Reviews** and **understands** software requirements and specifications
  - **Develops** test cases based on functional and technical specifications
  - **Executes** test cases manually to verify software functionality
  - **Identifies** and **reports** software defects using defect tracking tools
  - **Validates** and **verifies** bug fixes after they have been resolved
  - Performs **regression testing** to ensure existing functionalities are not impacted by changes
  - **Documents test results**, including defects and test execution status
  - **Collaborates** with the development team to resolve issues and improve software quality
  - **Provides feedback** and suggestions for improving test processes and test coverage

Test Management

Coordinating Activities

What is Test Management?

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- **Integral part** of the Software Testing Lifecycle (**STLC**)
- Encompasses the **planning**, **coordination**, and **control** of testing activities within SDLC
- **Ensures** that **testing** is **carried out effectively**, **efficiently**, and in alignment with **project objectives**
- Plays a **vital role** in delivering high-quality software and mitigating risks
- Provides the **framework and guidelines** for managing testing activities within each phase of the STLC
- Ensures that **testing objectives**, **strategies**, and **approaches** are **aligned** with the specific phase of the STLC

Key Components – Test Strategy

- **Test Strategy** sets the **overall direction**, **objectives**, and **scope** of the testing effort
- It defines the **approach to be followed**, considering factors such as test levels, techniques, and resource requirements
- The Test Strategy is **developed early** in the testing process, **aligning** with the **project's goals** and quality objectives
- It provides a **roadmap** for the testing team, ensuring that testing efforts are focused and effective
- The Test Strategy also takes into account factors like **risk assessment**, **timelines**, and stakeholder **expectations**

How to Prepare a Good Test Strategy

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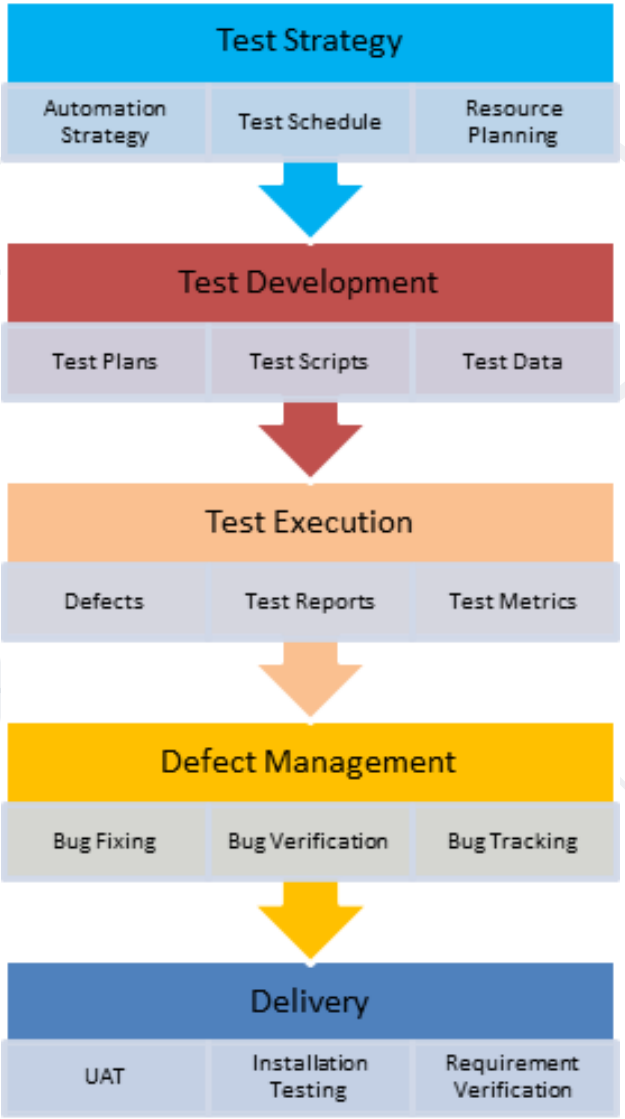
- Every organization has their unique priority and set of rules for software designing, so do not copy any organization blindly, include the following in your Test Strategy:
  - **Scope**
  - **Test Approach**
  - **Test Environment**
  - **Testing Tools**
  - **Release Control**
  - **Risk Analysis**

Sample Test Strategy Template



Key Components – Test Approach

- **Test Approach** is a **more detailed** document **derived from the Test Strategy**, providing **specific instructions** for executing testing activities within each phase
- **It defines:**
  - Process of testing
  - Testing levels
  - Roles and responsibilities of each team member
  - Types of Testing (Load testing, Security testing, Performance testing etc.)
  - Automation tools if applicable
  - Adding new defects, re-testing, Defect triage, Regression Testing and test sign off

Different Test Approaches

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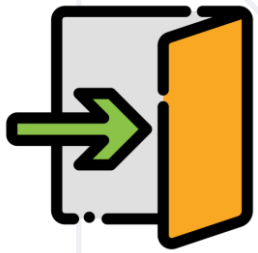
- **Analytical** - Focusing testing on the most critical functionality (risk based)
- **Model-based** - Stochastic or Monkey testing using random or statistical information (tool), Operational profiles
- **Methodical Testing approaches** - Failure based (error guessing and fault attack), Experience-based, Check-list based and Quality characteristic-based
- **Process- or standard-compliant Testing approach** - Industry-specific standards (e.g., medical, aviation), Various agile methodologies
- **Dynamic and heuristic approaches** - such as exploratory testing (more reactive approach than pre-planned approach), Execution and evaluation are concurrent tasks
- **Consultative approaches** - Test coverage is driven primarily by the advice and guidance of technology and/or business, Domain experts outside the test team
- **Regression-averse approach in Software Testing** - Includes reuse of existing test material, extensive automation of functional regression tests, and standard test suite

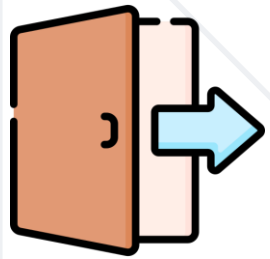
Key Components - Entry Criteria

- **Entry Criteria** define the **prerequisite** to be **achieved** before starting the testing activity
- The main focus is to check whether a tester can perform the testing tasks on the software without major obstacles
- Areas to look at while **defining** entry **criteria**
  - Testing **environment** setup and **availability**
  - Availability of all **testing tools**
  - Accessibility of the **testable code**
  - Availability of the **test data**



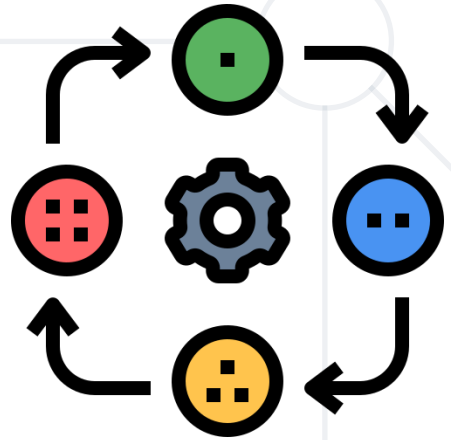
Key Components - Exit Criteria

- **Exit Criteria** define the conditions to be met before testing can be considered as **complete**
- Indicate that the software is up to the **required quality**
- Focus points for exit criteria are
  - Coverage of code, functionality, risk
  - Estimation of defect density or reliability measures
  - Cost or budget
  - Residual risks
  - Schedules like time for marketing



Key Components Recap

- Test Strategy sets the **overall direction**
- Test Approach offers **specific instructions**
- Entry Criteria establish **predefined conditions that must be met**
- Exit Criteria outline the **conditions that need to be fulfilled**
- Together these four, form the foundation for effective test management **throughout all phases** of the testing process



Test Planning and Estimation

Strategizing Testing Efforts

What is Test Planning and Estimation?

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- Test planning is the **process of defining the approach**, **scope**, and **objectives** of testing activities for a specific project or release
- It involves **creating** a **comprehensive test strategy** and **test plan** to guide the testing efforts
- **Importance**:
  - Sets the foundation for **effective** and **organized testing activities**
  - Ensures clear **understanding** of testing goals and objectives
  - Helps **identify risks**, challenges, and dependencies upfront
  - Facilitates **resource allocation** and **time management**

Key Activities in Planning and Estimation

- **Defining Testing Objectives**:
  - Identify goals and expectations, determine quality attributes to focus on, establish clear criteria for test completion
- **Test Scope and Coverage**:
  - Define boundaries and extent of testing, determine features, functions, and platforms to be tested, identify test environments and configurations
- **Test Strategy:**
  - Select appropriate test techniques, approaches, and levels, decide balance between manual and automated testing, outline test data and test environment requirements

Key Activities in Test Planning and Estimation (2)

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- **Test Schedule and Timeline:**
  - Define testing milestones and deliverables, allocate time for different testing activities, consider dependencies and interdependencies
- **Resource Planning:**
  - Identify and allocate testing resources, determine roles and responsibilities, assess training needs and skill availability
- **Risk Assessment and Mitigation:**
  - Identify potential risks and their impact on testing, develop risk mitigation strategies and contingency plans, prioritize risks based on likelihood and impact

Key Activities in Test Planning and Estimation (3)

- **Test Documentation:**
  - Create and maintain test plans, test cases, and test scripts, document test data, environments, and configurations, prepare guidelines and standards for testing activities
- **Communication and Collaboration:**
  - Establish clear communication among stakeholders, coordinate with development and other teams, conduct regular meetings for alignment and issue resolution

Test Design

From Requirements to Execution

What is Test Design?

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- The **process of creating test cases** and test **scenarios** based on the defined test objectives and requirements
- It involves **translating test conditions** into detailed test cases that validate specific functionalities and system behavior
- **Importance**:
  - Ensures **comprehensive test coverage**
  - Identifies **test conditions** and **test cases to** validate system behavior
  - Helps in **early detection** of defects
  - Enhances the **effectiveness** and **efficiency** of testing
  - Facilitates **traceability between requirements** and test **cases**

Key Activities in Test Design

- **Reviewing Requirements:**
  - Understand the system requirements, identify functional and non-functional aspects to be tested, clarify any ambiguities or inconsistencies
- **Identifying Test Conditions:**
  - Identify specific test conditions, determine inputs, expected outputs, and system states to be tested, positive and negative scenarios
- **Creating Test Cases and Test Suits:**
  - Develop test cases based on identified test conditions, define steps for each test case, include preconditions and expected results

Key Activities in Test Design (2)

- **Test Data Preparation:**
  - Create test data to support test cases, consider various data combinations and boundary conditions
- **Test Case Prioritization:**
  - Determine the order of test case execution, prioritize based on risk, business impact, or dependencies, consider critical functionalities or frequently used features
- **Test Case Optimization:**
  - Identify redundant or duplicate test cases, optimize test coverage while maintaining adequate coverage

Key Activities in Test Design (3)

- **Traceability:**
  - Between test cases and requirements, each requirement has corresponding test cases, tracking of test coverage and impact analysis
- **Documentation and Maintenance:**
  - Document test cases, test case repositories for future reference, update and revise test cases as necessary

Test Execution

Driving Quality Forward: Thorough Validation

What is Test Execution?

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- The phase where the planned test cases are executed, and the **actual testing takes place**
- It involves **running the test cases**, **capturing test results**, and comparing the **actual outcomes** with **expected results**
- **Importance**:
  - **Validates** the functionality and behavior of the software or system under test
  - **Identifies defects** and deviations from expected results
  - Enables **real-world simulation** to ensure software readiness
  - **Verifies** that the system meets the **desired quality** standards
  - **Provides feedback** on the overall product stability

Key Activities in Test Execution

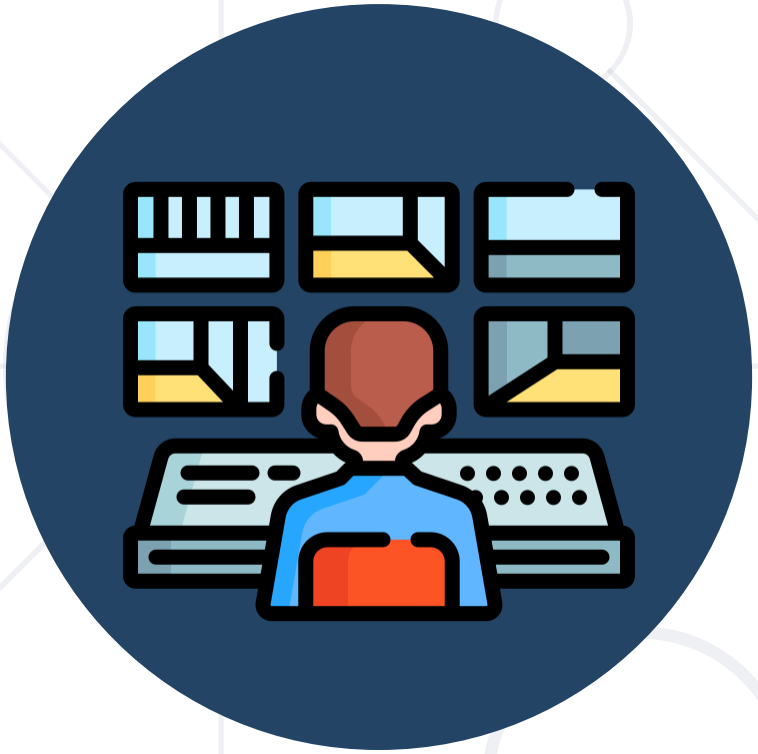
- **Test Environment Setup:**
  - Prepare the necessary test environment and configurations, install and configure the software or system under test
- **Test Case Execution:**
  - Run the test cases, follow the specified test steps and procedures, record the actual results and observations
- **Defect Logging:**
  - Log defects with detailed information, including steps to reproduce, observed behavior, and environment details

Key Activities in Defect Management

- **Defect Prioritization:**
  - Prioritize defects based on their severity, impact on the system, and business priorities
- **Defect Triage:**
  - Conduct defect triage meetings to review and prioritize reported defects, determine the appropriate course of action for each defect
- **Test Progress Monitoring:**
  - Track and monitor the overall progress of test execution, identify any gaps or missed areas, assess the test execution against the planned schedule

Key Activities in Test Execution (2)

- **Regression Testing:**
  - Perform regression tests, address any issues or defects identified during regression testing
- **Test Execution Documentation:**
  - Maintain test execution logs, update test case statuses to reflect their execution status, document any issues
- **Defect Resolution and Verification:**
  - Re-test and verify the fixed defects to ensure they have been resolved satisfactorily
- **Defect Closure:**
  - Close defects that have been successfully resolved and verified, proper documentation



Test Monitoring and Control

Keeping Testing on Track

What is Test Monitoring and Control?

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- Involves **overseeing** the **progress**, **quality**, and **effectiveness** of the testing activities throughout the testing lifecycle
- **Importance**:
  - Enables **effective tracking** and **control** of the testing process
  - Facilitates **timely decision-making** and **issue resolution**
  - Ensures **adherence** to **defined objectives** and **quality standards**

Key Activities in Test Monitoring and Control

- Involves **overseeing and managing** the testing activities throughout the software development lifecycle
- The focus is on **monitoring the progress**, **quality**, and **effectiveness** of testing
- Ensures **keeping up** with **defined objectives**, **timelines**, and **quality** standards
- Includes **tracking test execution**, **managing issues and risks**, **monitoring** the test environment, and communicating the testing status
- Enables **timely decision-making** and **issue resolution**
- Helps ensure that testing efforts align with project goals and quality standards

* This topic will be discussed in full in a separate lecture (14. Test Monitoring and Control) , delving into more detailed discussions and best practices

Test Closure

Wrapping Up the Testing Journey

What is Test Closure?

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- **Wrapping up** the testing activities and **documenting** the overall outcomes and lessons learned from the testing effort
- **Importance**:
  - Provides a **comprehensive summary** of the testing effort and its outcomes
  - Facilitates **decision-making** on the software's release readiness
  - Enables lessons learned and **continuous improvement** for future testing projects

Key Activities in Test Closure

- Test Completion Evaluation
- Test Closure Reporting
- Defect Analysis and Metrics
- Lessons Learned Documentation
- Post-Implementation Review
- Archiving and Documentation

* This topic will be discussed in full in a separate lecture (14. Test Monitoring and Control) , delving into more detailed discussions and best practices for effective Test Closure

Test Management Tools

TestRail

TestRail

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- **TestRail** is a **test management tool**
  - Centralized test management
  - Efficient test case organization
  - Effective test execution and tracking
  - Comprehensive reporting and metrics
  - Seamless integration with other tools (e.g., Jira)
  - Customizable to fit unique testing workflows
- TestRail **simplifies testing processes**, **enhances collaboration**, **provides valuable insights**, and improves overall **efficiency** and **effectiveness**

Functions

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- The **Primary Functions** of **TestRail**:
  - Document test cases with steps, expected results, screenshots, and much more
  - Organize test cases into test suites and sections
  - Assign test cases for execution and manage team workloads
  - Track the results of test runs in real-time
  - Review progress toward milestones
  - Generate reports on a variety of metrics
- TestRail supports every type of software testing
- Used to organize manual/script-based testing, schedule and report the results of exploratory testing, and integrate with the test automation tools
- Integrates with defect tracking tools out-of-the-box and includes an open API

TestRail Example

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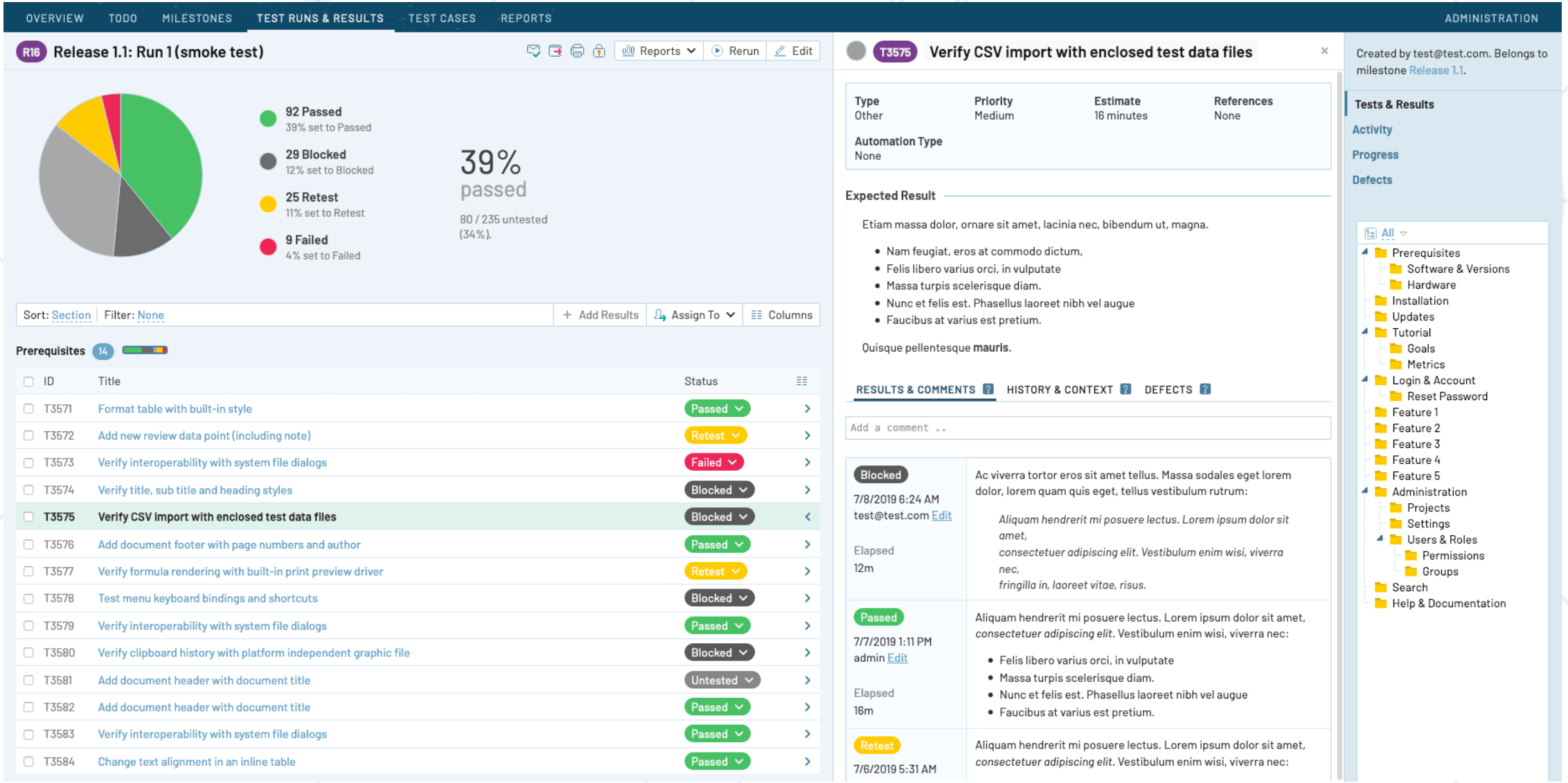


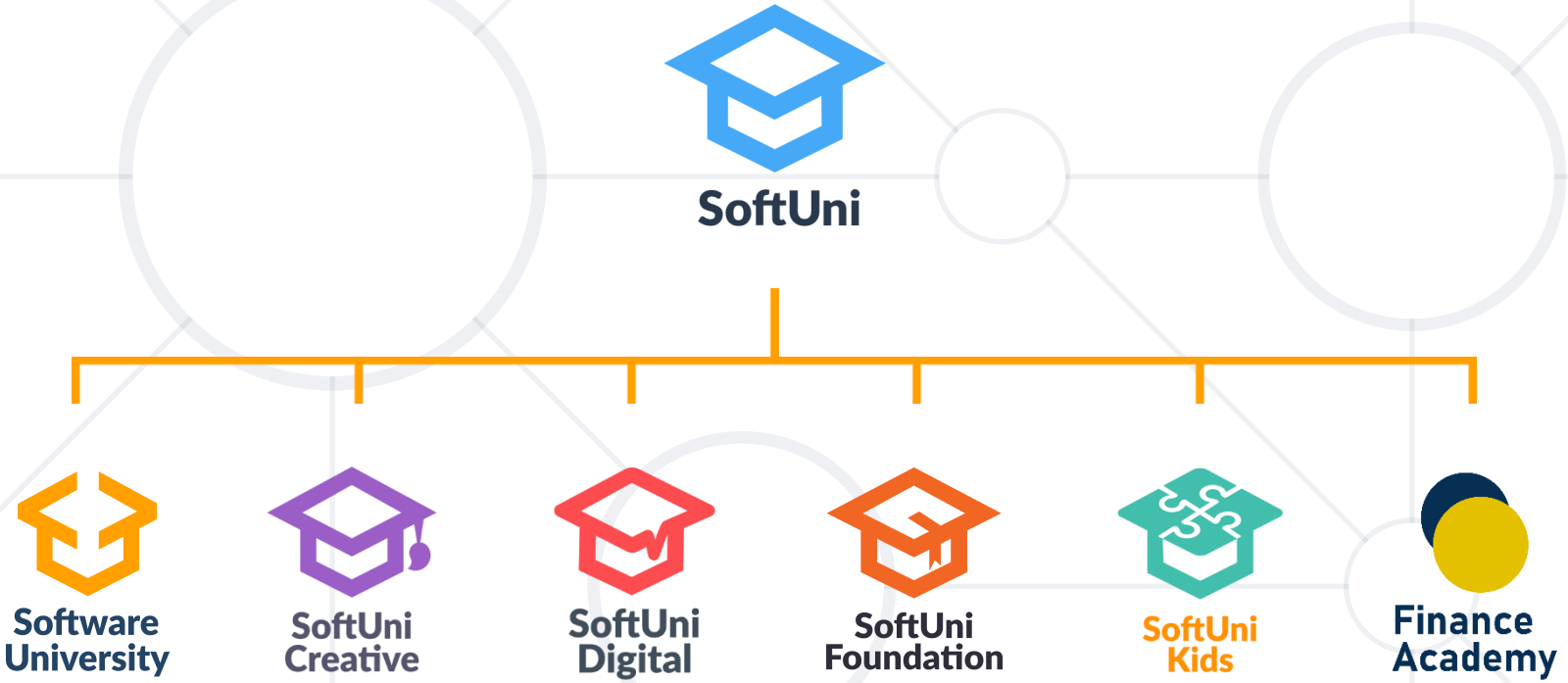
Test Management Tools

TestRail Demo & connect with Jira

Summary

- What **Roles** there are in Test Management? What are their **responsibilities**?
- Test Strategy, Test Approach, Entry and Exit Criteria – **key components** of Test Management
- Phases in Test Management
  - **Test Planning and Estimation**
  - **Test Design**
  - **Test Execution**
  - **Test Monitoring and Control**
  - **Test Closure**
- Test Management Tools – **TestRail + Jira**

Questions?



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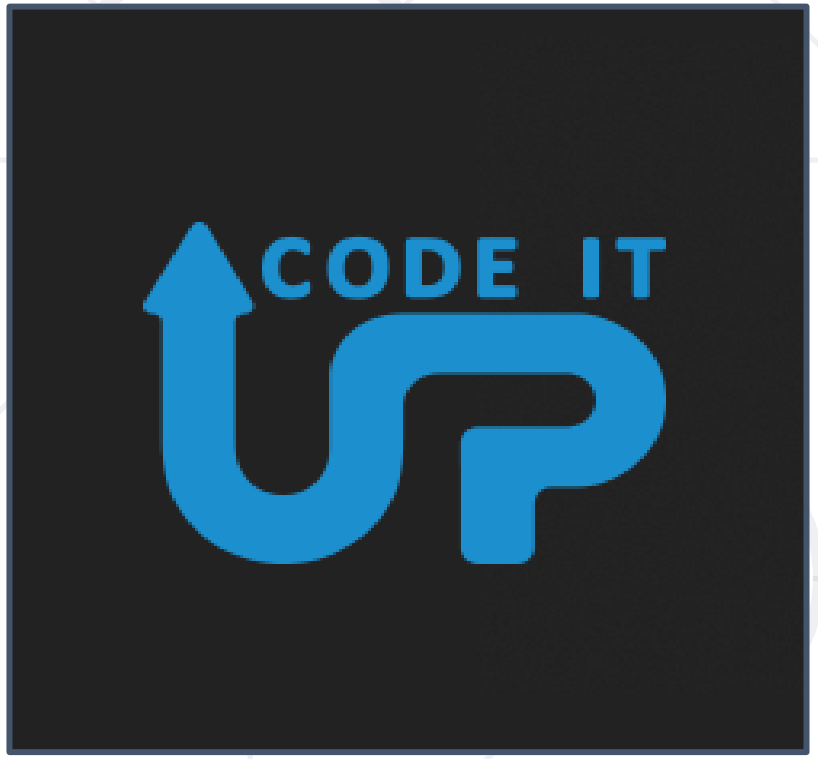

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