Quality Assurance
Process Overview
QA Team Responsibilities

• Review and understand all possible use case flows (common and uncommon)
• Review and understand all possible business event triggers and rules (common and uncommon)
• Usability of new or changed user interfaces
• Security and permissions for role-based application(s)
• Error processing and logging initiated by user input errors and external failures
• Content and format of data into and out of the application (screens, files, reports, conversion)
• Interfaces with other applications to meet business requirements
• Basic performance requirements
Test Stages for Application Testing

<table>
<thead>
<tr>
<th>Test Stage</th>
<th>Integration</th>
<th>System &amp; Data Validation</th>
<th>UAT</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What</strong></td>
<td>Confirms that related units function properly when assembled together and interfaces between them have been implemented as designed</td>
<td>Confirms that all of the functional requirements and business rules are properly supported by the entire system and interfaces to external systems. Confirm that data has been properly loaded to new system database</td>
<td>End user acceptance of the system and confirmation that it is ready for production</td>
<td>Test minimum performance requirement for application</td>
</tr>
<tr>
<td><strong>Where</strong></td>
<td>Dev</td>
<td>QA</td>
<td>Staging</td>
<td></td>
</tr>
<tr>
<td><strong>Who</strong></td>
<td>Dev/Vendor</td>
<td>QA Testers</td>
<td>Users &amp; BA’s</td>
<td>TBD</td>
</tr>
</tbody>
</table>
# Test Activities

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Input</th>
<th>Activity</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Identify appropriate focus and strategy</td>
<td>Test Estimates, Test Plan, Test Work Plan</td>
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<tr>
<td></td>
<td></td>
<td>Agree with project team on goals that will direct test effort</td>
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<td></td>
<td></td>
<td>Explain how methodology, processes, and tools will be applied</td>
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<tr>
<td></td>
<td>Test Plan, Test Work Plan</td>
<td>Run Test Sets, Document Defects, Produce Metrics, Regression Test</td>
<td>Test Results, Defects, Test Metrics/Reports</td>
</tr>
<tr>
<td></td>
<td>Test Plan, Test Work Plan, Test Cases, Test Sets, Test Sets</td>
<td>Ensure that all exit criteria are met, Ensure application meets requirements, Maintain and improve test processes, tools, and deliverables</td>
<td>Execution Summary Report, Lessons Learned, Reusable Test Assets, Production Test Procedures, Regression Test Procedures</td>
</tr>
</tbody>
</table>

## Plan Test

- Identify appropriate focus and strategy
- Agree with project team on goals that will direct the test effort
- Explain how the methodology, processes, and tools will be applied

## Prepare Test

- Introduce reusability of the test artifacts
- Ensure traceability from entry criteria and between test artifacts
- Design tests

## Execute Test

- Run and evaluate test plans
- Report defects
- Achieve the objectives of the test plan
- Cover all business and functional requirements

## Complete Test

- Ensure that all exit criteria are met
- Ensure application meets requirements
- Maintain and improve the test processes, tools, and deliverables

## Execution Summary Report

- Lessons Learned
- Reusable Test Assets
- Production Test Procedures
- Regression Test Procedures
<table>
<thead>
<tr>
<th>Purpose</th>
<th>Review Entry Criteria</th>
<th>Estimate Work Effort</th>
<th>Create Work Plan</th>
<th>Define Test Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
<td>* Project Charter</td>
<td>* Project Charter</td>
<td>* Test Estimates</td>
<td>* Project Charter</td>
</tr>
<tr>
<td></td>
<td>* Use Cases</td>
<td>* Use Cases</td>
<td>* Project Plan</td>
<td>* Use Cases</td>
</tr>
<tr>
<td></td>
<td>* Business/Functional</td>
<td>* Business/Functional</td>
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<td>* Business/Functional</td>
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<tr>
<td></td>
<td>* Requirements</td>
<td>* Requirements</td>
<td></td>
<td>* Requirements</td>
</tr>
<tr>
<td></td>
<td>* Project Plan</td>
<td></td>
<td></td>
<td>* Project Plan</td>
</tr>
<tr>
<td>Activities</td>
<td>* Obtain a list of</td>
<td>* Compile estimation inputs</td>
<td>* Document high-level and low-level tasks</td>
<td>* Identify and prioritize objectives</td>
</tr>
<tr>
<td></td>
<td>deliverables and</td>
<td>* Calculate the amount of work effort for each high level activity</td>
<td>* Include planned start and end dates for tasks</td>
<td>* Define items in and out of scope</td>
</tr>
<tr>
<td></td>
<td>target completion</td>
<td>* Communicate</td>
<td>* Assign resources to tasks</td>
<td>* State items and assumptions</td>
</tr>
<tr>
<td></td>
<td>dates</td>
<td>estimates</td>
<td>* Indicate dependencies between tasks</td>
<td>* Identify environment reqts.</td>
</tr>
</tbody>
</table>
|          | * Confirm deliverables are stored in shared location with version control | | | * Outline test environme
|          | * Read deliverables   |                      |                  | * Outline test requsts. |
| Outputs |                       |                      |                  |                  |
|         | Test Estimates        | Test Work Plan       | Test Plan        |                  |
## Prepare Test

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Document Test Conditions</th>
<th>Create Test Cases</th>
<th>Create Test Sets</th>
</tr>
</thead>
</table>
| **Inputs** | * Complete list of testable items derived from reqts.  
* Ultimate measure which the system quality is evaluated | * Identify unique scenarios resulting in measurable value to the actors | * Provides a way to organize the test cases into end to end business processes |
| **Activities** | * Use Cases  
* Bus./Functional Reqts.  
* Design Specs.  
* Technical Specs | * Test Conditions | * Test Cases |
| * Document test conditions using techniques and tools  
* Identify list of items to input or verify  
* Identify the test conditions around each input/output | * Identify unique paths  
* Trace conditions to test cases  
* Enter inputs and expected outputs for each test condition  
* Prioritize test case | * Indicate the dependencies between test cases and execution order  
* Identify specific actors for the test sets  
* Identify critical test cases | |
| **Outputs** | * Test Conditions  
* Data Elements | * Test Cases | * Test Sets |
Prepare Test – **Highlights**

**Use Case/Requirements**
- Drives test process with actor/system interactions

**Test Conditions**
- Provides reference for use case logic from test perspective. Alternatively this can be created as Matrix in spreadsheet

**Test Cases**
- Associates entry criteria, inputs, outputs, and data for a use case scenario

**Test Sets**
- Organizes test cases by application area or end to end process of application(s)

- Derives test cases directly from use cases and requirements
- Establishes a rigorous and standard process to create tests
- Introduces reusability of the test artifacts to minimize the number of duplicate steps
- Ensures traceability from the entry criteria and between test artifacts
- Review of vendor test cases for reference and gap analysis
# Execute Test

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Execute Test Cases</th>
<th>Document Defects</th>
<th>Produce Metrics</th>
<th>Regression Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inputs</strong></td>
<td>* Test Plan&lt;br&gt; * Test Work Plan&lt;br&gt; * Test Cases&lt;br&gt; * Test Sets</td>
<td>* Test Cases&lt;br&gt; * Test Results</td>
<td>* Test Results&lt;br&gt; * Defects</td>
<td>* Confirm original functionality of application has not changed&lt;br&gt; * Ensure no more (new or old) defects are introduced&lt;br&gt; * Validate that changes or existing defects have been addressed</td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td>* Execute steps within a test case&lt;br&gt; * Document actual results&lt;br&gt; * Compare expected and actual results&lt;br&gt; * Update the status of the test case (pass/fail)</td>
<td>* Identify discrepancy between expected and actual results&lt;br&gt; * Document defect&lt;br&gt; * Communicate defect</td>
<td>* Define appropriate metrics&lt;br&gt; * Collect metrics&lt;br&gt; * Analyze collected metrics&lt;br&gt; * Report and communicate metrics</td>
<td>* Rerun a subset of test cases&lt;br&gt; * Update the latest status of the Test Cases (Test Sets)&lt;br&gt; * Update status of defects</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>Test Results</td>
<td>Defects</td>
<td>Test Metrics/Reports</td>
<td>Test Results</td>
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</tbody>
</table>

**Inputs**:
- Confirms original functionality of application has not changed
- Ensure no more (new or old) defects are introduced
- Validate that changes or existing defects have been addressed

**Outputs**:
- Test Results
- Defects
- Test Metrics/Reports
- Test Results
Documenting Defects

- The defect tracking life cycle is a critical aspect of Test Execution.
- TeamTrack tool will be used to document and track the status.
- Team members must document and update all defects accurately and thoroughly because it is the primary form of communication between team members, stakeholders, and leadership.
- Ideally all defects must at least have screenshots, test condition, test data and exact sequence of steps followed.
- Defects should be traceable to test case & test condition.
- All project team members must understand the flow of a defect, from the time it is identified until it is resolved.
- During test execution, daily defects meetings must be held.
## Complete Test

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Improve Test Assets</th>
<th>Prepare for Deployment</th>
</tr>
</thead>
</table>
| * Formally conclude testing  
* Allow testing to begin in the subsequent Stage | * Improve the test processes, tools, and deliverables for the future | * Build tests for production/UAT deployment certification and future regression testing |
| Inputs | * Test Plan  
* Test Work Plan  
* Test Results  
* Defects  
* Test Metrics | * Test Plan  
* Test Estimates  
* Test Cases  
* Test Sets  
* Defects  
* Test Metrics/Reports | * Test Cases  
* Test Sets |
| Activities | * Report final metrics  
* Prepare and share Test Sign-Off document | * Discuss lessons learned  
* Update processes, tools, and templates for future projects  
* Remove test assets that are no longer useful or practical to maintain  
* Ensure assets are up-to-date | * Identify which existing test cases will be reused for production/UAT certification and future regression testing |
| Outputs | Execution Summary Report | Lessons Learned | Production/UAT Test Procedures  
Regression Test Procedures |
Complete Test – Highlights

Examples of metrics produced:

The following metrics are typically used for test execution:
• Execution Coverage
• Condition Status
• On-Time Delivery

The following metrics are typically used for defect analysis:
• Summary
• Times Rejected
• Cancelled
• Trends
• Defect Age
• Defect by Area