# CMMI: Level 0 to Level 4 in Less Than Three Years

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# For Your Consideration

- **Current State**

- **What is Your Plan?**

- **How Often do You Inspect?**
  - **Templates versus Actual Documents**
  - **Project Checklists**
  - **Skill Assessments**
  - **Process Flow and Environment Schematics**

- **Continual Improvement and Repeatability**

# Current State

- ## What Do You Have Now?

  ✓ Standard Test Plans and Test Cases

  ✓ Required Upstream Documentation

  ✓ Required Test Documentation (Test Plan, Test Case Outline, Test Cases, Test Results/Summary/Release Notes, Test Metrics, Test Estimation Model, Traceability Matrix)

  ✓ Test tools

  ✓ Inputs/Outputs Checklist

  ✓ Resources: Skill Self-Assessment, Cross-Training

# Current State

- If it is not consistent and repeatable, should it be?

  - ✓ Project Pipeline / Resource Usage Report
  - ✓ Templates for Test Plans and Test Cases
  - ✓ Inputs/Outputs Checklist
  - ✓ Standard Templates for Upstream Documents
  - ✓ Resources: Skill Self-Assessment, Cross-Training
  - ✓ Environment Drawings
  - ✓ Process Flow Diagram (Water Fall, Agile, etc.)

**PHILOSOPHY:**

- Keep it simple
- Implement gradually

# Make a Plan

# **What Can You do Month One**:

- Project Plan
- Inventory

  ✓ Current projects to current resources

  ✓ Number of variations in test documentation

  - Test plan templates
  - Test case styles
  - Test summaries

# Make a Plan

**Current Projects / Resource Use:**

| PROJECT | RESOURCE | MONTH | MONTH | MONTH |
|---------|----------|-------|-------|-------|
| <NAME> | <NAME 1> | 1.0 | 1.0 | 1.0 |
| | <NAME 2> | | 1.0 | 1.0 |
| <NAME> | <NAME 1> | 0.5 | 0.5 | 0.0 |

| Resource | MONTH | MONTH | MONTH |
|----------|-------|-------|-------|
| <NAME 1> | 1.5 | 1.5 | 1.0 |
| <NAME 2> | 0.0 | 1.0 | 1.0 |
| <ETC.> | | | |

# Make a Plan

**Test Document Use:**

| Product | Type 1 | Type 2 | Type 3 |
|---|---|---|---|
| Test Plan | Carlo | Vasanth | Tho |
| Test Outline | Jerry | Carlo, Tho, Jean | Vasanth |
| Test Case Template | Carlo, Tho, Vasanth, Jerry | Jean | x |

✓ Standard Test Plans and Test Cases:

• Start with the document most used (primary).

• Have the secondary document users update variations to the primary.

• Meet as a group and come to consensus as to the final template.

## Make a Plan

# **What Can You do Month Four**:

- **Inventory**

  - ✓ Require all test plans, cases and summaries to be inspected/signed by test manager and peer prior to distribution outside of QA

  - ✓ Create checklist and require for all projects

  - ✓ Number of variations in upstream documents

    - Business Requirement / Commercial Requirements Specifications
    - Technical, Functional Specifications / Systems Requirements Specifications

# Make a Plan

**QA CHECKLIST**

Project Name: _____
Sharepoint location: _____

____        Review business requirements
____        Review functional specs
____        Review other documentation

____        Test Plan
____        Test Plan peer review
____        Test Plan review with stakeholders
____        Test Plan signoff

____        Test Case Matrix / Coverage

____        Performance Test Plan

____        Test Effort Estimation (use Estimation Model)

# Make a Plan

## **QA CHECKLIST**

____    Test Case creation in e-Manager
____    Test Case review with stakeholders

____    Target vs. Actual spreadsheet
____    Test Execution
____    Daily QA Status Reports (includes Exp vs. Actual)
____    Weekly QA Status Reports

____    Bug Triage Meetings
____    Code Review

____    Test Summary (project team, mgmt, app support)
____    Transition to UAT (provide necessary support)
____    Rollout support
____    Project Review with stakeholders

# Make a Plan

**Test Document Use:**

| Product | Type 1 | Type 2 | Type 3 |
|---|---|---|---|
| Bus Req | Carlo | Vasanth | Tho |
| Design Spec | Jerry | Carlo, Tho, Jean | Vasanth |
| Functional Spec | Carlo, Tho, Vasanth, Jerry | Jean | x |

✓ Number of variations in upstream documents:

• Identify patterns.

• Have the secondary document users update variations to the primary.

• Meet as a group and come to consensus as to the final template (Optional as QA can not always influence upstream templates).

## Make a Plan

# What Can You do Month Seven:

- Inventory

  ✓ Standardized Software Terms

  ✓ Resources:
    - Cross-Training
    - Skill Self-Assessment

  ✓ Process Drawings

# Glossary of Software Testing Terms

*A*

**Acceptance Testing:** Formal testing conducted to enable a user, customer, or other authorized entity to determine whether to accept a system or component. Normally performed to validate the software meets a set of agreed acceptance criteria.

**Accessibility Testing:** Verifying a product is accessible to the people having disabilities (visually impaired, hard of hearing etc.)

**Actual Outcome:** The actions that are produced when the object is tested under specific conditions.

**Ad hoc Testing:** Testing carried out in an unstructured and improvised fashion. Performed without clear expected results, ad hoc testing is most often used as a compliment to other types of testing. See also Monkey Testing.

**Alpha Testing:** Simulated or actual operational testing by potential users/customers or an independent test team at the developers' site. Alpha testing is often employed for off-the-shelf software as a form of internal acceptance testing, before the software goes to beta testing.

**Arc Testing:** See branch testing.

# Assigned Resources and Cross-Training

| Application | Prime | Second | Train Backup | Target |
|---|---|---|---|---|
| 4D | Carlo | None | Vince | Jan 29, 2010 |
| Act 1 | Tho | Carlo | Done | |
| CPC | Jerry | Pam | Done | |
| CTI | Pam | Tho | Done | |
| CTL | Vince | None | Jerry | Dec 23, 2090 |

# Self Assessment Skill Grid

| | Name | Name | Name | Name | Name | Name | Name |
|---|---|---|---|---|---|---|---|
| **Technical** | | | | | | | |
| WebServers | B | M/E | B | | M/E | M | M |
| WebLogic | B | M/E | | B | M/E | B | B |
| | | | | | | | |
| **Programming languages** | | | | | | | |
| JAVA | | B/M | | | M | M | |
| PERL | | B | B/M | | B/M | B/M | |
| C/C++ | B/M | B/M | M | | M | M | B |
| Unix Shell | M | B/M | M | | B/M | M/E | |
| SQL | M | M/E | M | B/M | M/E | E | M |
| | | | | | | | |
| **Automation Tools** | | | | | | | |
| Segue/Silk | | E | M/E | B | M/E | B | B |
| Load /Stress Tools (WebLoad) | | M/E | M | | B | B | |
| Hammer | | B | M/E | B | B | B | |
| Quick Test Pro | B | M/E | B | | B | B | |
| Quest/TOAD for Experts | M | M/E | B | B/M | E | M/E | M |
| Empirix e-Test | B | B | B | B | B | | B |

| | Name | Name | Name | Name | Name | Name | Name |
|---|---|---|---|---|---|---|---|
| **MS SQL** | | | | | | | |
| Actuate Reports | B/M | B/M | B | | E | B | B |
| Actuate Server | B/M | B/M | B | | E | B | B |
| CareSystems (CTI, NOVA) | B | B/M | E | M/E | M | B | M |
| Change/Data Summary | E | M | | | M/E | B | M/E |
| Consumer Marketing | | M | | | B | E | B |
| Control M | B | M/E | | | B/M | B/M | M |
| CPC | E | M/E | M | M/E | E | B | E |
| Direct Marketing/Data Warehouse | | M/E | | | B | E | M |
| IVR | M/E | M | M | B | B/M | B | M |
| Kronos | | B | | | | B | B |
| PeopleSoft | | M/E | B | B | M/E | B | M |
| Right Fax | | M/E | | B/M | M | B | M |
| Sales Automation (SIP) | | E | | B | B/M | B | M/E |
| SalesLogix (SLX) | | B/M | | B | | B/M | B |
| Systems Information Delivery (SID) | | B | | B | E | B | |

**B=Beginner    B/M = between the two   M = Moderate    M/E = between the two    E = Expert**

| Increased skill level since 2/19/07 | + 8 | +11 | +8 | +20 | +7 | +34 | +10 |
|---|---|---|---|---|---|---|---|

# Water Fall
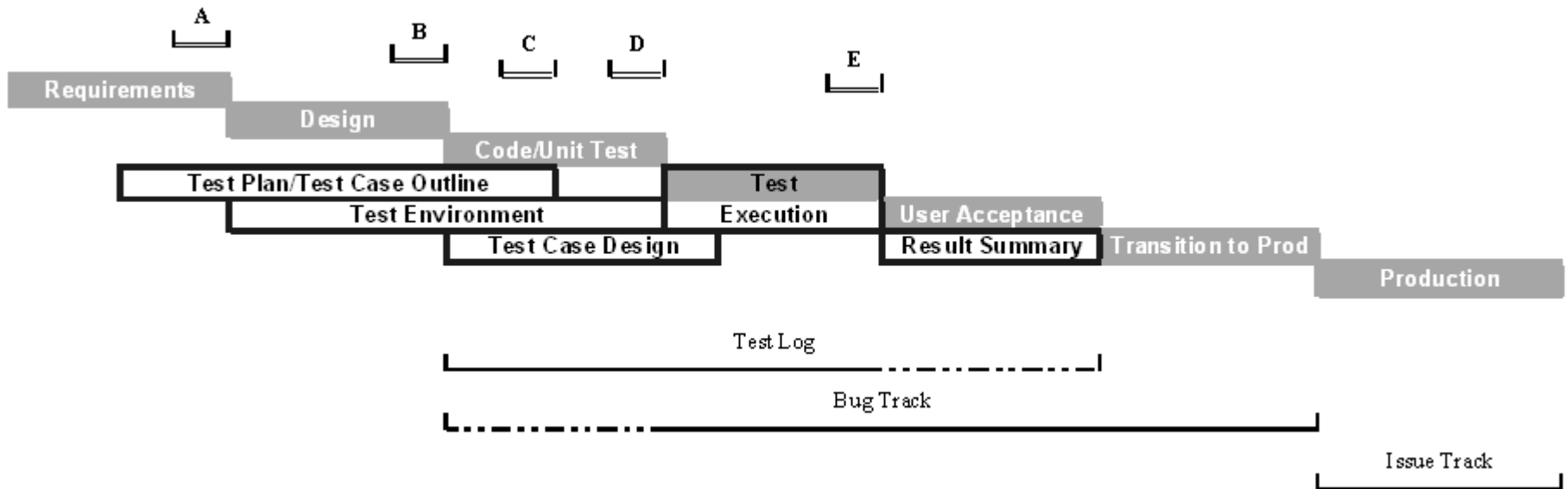
# Water Fall

| | |
|---|---|
| **A** | Business Requirements Walkthrough & Signoff |
| **B** | Development Spec. Walkthrough & Signoff |
| **C** | Test Plan Walkthrough & Signoff |
| **D** | Test Cases Walkthrough & Signoff |
| **E** | UAT Cases Walkthrough & Signoff |

For Each Project
    a) Test Plan (see Templets)
        i. Reviewed via Walkthrough & Signoff
          =   QA Lead
          =   QA Manager
          =   Business Lead
          =   Development Lead
          =   Director of Software Design
        ii. Complete (with Signoff) before testing starts

    b) Test Environment
        i. Setup
        ii. Data Prep
        iii. Bug Track Setup
          =   Bug Track opened, matched to project

    c) Test Cases
        i. Entered and Maintained in eManager
          =   With I.D. of Business/Development requirement
              numbers/reference
          =   With I.D. of Priority

d) Test Case Tracking/Metrics with target vs. actual execution report.
    i. Priority
    ii. Executed Pass/Fail
    iii. Bug Statistics

e) Bug Triage meeting with Business, Development, and QA

## Assess Plan

# What Can You do Months 8 - 12:

- ▪ Update Project Plan

- ▪ Inspect

  - ✓ Templates, Standards and Checklists

  - ✓ Resources:
    - Cross-Training
    - Skill Self-Assessment

  - ✓ Process Drawings

# Add to Plan

# What Can You do Months 13 - 18:

- Update Project Plan

- Improve

  - ✓ Templates, Standards and Checklists

  - ✓ Resources:
    - Cross-Training
    - Skill Self-Assessment

  - ✓ Process Drawings
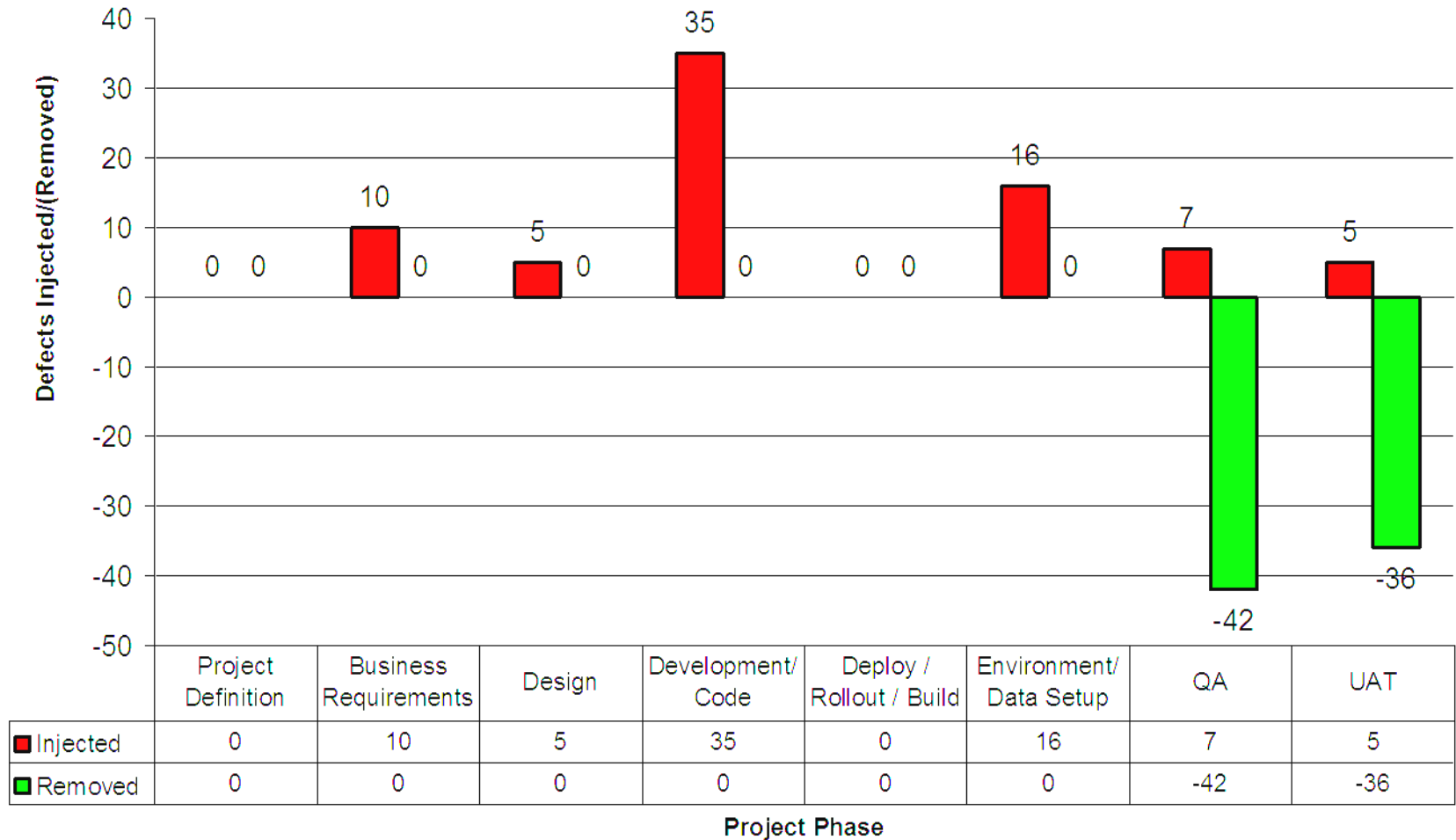
- Add

  - ✓ Test Metrics

# Improvements

Ask Why and So:

- Asking "WHY?" is only the beginning.  Asking "WHY?" and "SO?" seems inevitably to lead us to "why not," and this is how teams transition to being creative and innovative.

  - Why can't we do traceability between the Requirements and the Design documents?  Too Much Time to do?
  - So if we don't , then more time is spent later in the process and errors found require re-working all of the upstream documents.
  - Why not start with a small, new project and measure the improvement?

  Paraphrased from Stickyminds.com: Questions You Should Ask; Michele Sliger, posted December 30, 2008

# Bug Injection/Removal Points



PGA Project Defect Injection and Removal Summary for Closed, Future and Rejected Items 12/12/07

|  | Project Definition | Business Requirements | Design | Development/ Code | Deploy / Rollout / Build | Environment/ Data Setup | QA | UAT |
|---|---|---|---|---|---|---|---|---|
| Injected | 0 | 10 | 5 | 35 | 0 | 16 | 7 | 5 |
| Removed | 0 | 0 | 0 | 0 | 0 | 0 | -42 | -36 |

Project Phase

# Target versus Actual – Today's Sample

| Target Date | Test Cases Executed | | Test Cases Passed | | Test Cases Failed | | Retests | | Failure Rate (%) | | % Done | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Target | *Actual* | Target | *Actual* | Target | *Actual* | Pending ! | *Done** | Forecast | *Actual* | Target | *Actual* |
| **Smoke Test** | | | | | | | | | | | | |
| **12/29/08** | 10 | *2* | 5 | *0* | 5 | *2* | 2 | | 50% | *100%* | | |
| | | | | | | | | | | | | |
| *Running total* | 10 | *2* | 5 | *0* | 5 | *2* | 2 | *0* | 50% | *100%* | 17% | *3%* |
| | | | | | | | | | | | | |
| **Functional Testing - First Pass** | | | | | | | | | | | | |
| **12/30/08** | 11 | *0* | 6 | *0* | 5 | *0* | 2 | | 45% | *0%* | | |
| | | | | | | | | | | | | |
| *Running total* | 21 | *2* | 11 | *0* | 10 | *2* | 2 | *0* | 48% | *100%* | 36% | *3%* |
| | | | | | | | | | | | | |
| **Functional Testing - First Pass** | | | | | | | | | | | | |
| **12/31/08** | 12 | *0* | 7 | *0* | 5 | *0* | 2 | | 42% | *0%* | | |
| | | | | | | | | | | | | |
| *Running total* | 33 | *2* | 18 | *0* | 15 | *2* | 2 | *0* | 45% | *100%* | 57% | *3%* |

## Add to Plan

# What Can You do Months 19 - 36:

- Update Project Plan

- Improve

- Add

  ✓ Test Environment Diagram
  ✓ Test Traceability
  ✓ Test Estimation Model
  ✓ Others

# Test Environment Schematics
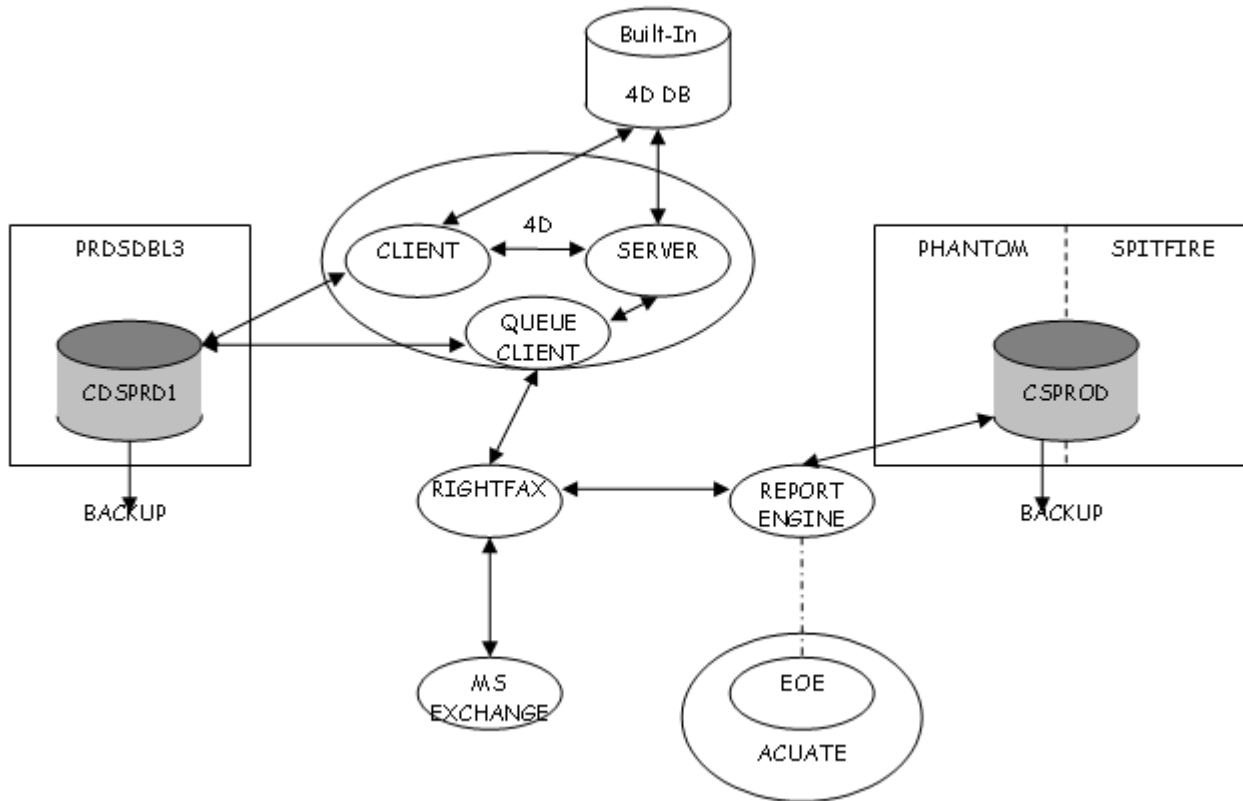
# Traceability Document to Document

| CRS Sect# | SRS Name | ES Sect# | Testing Type | | | Test Case # | Comment |
|---|---|---|---|---|---|---|---|
| | | | Unit | Sys Ver | Val | | |
| A4.5 | | | | x | x | 6.3 | |
| A4.6 | TS ES | 7.2.1 7.2.2 72. 3 | | x | x | 6.8.9, 6.8.10 | |

**PHILIPS**

| PROJECT : | | | | | Estimated On: | |
|---|---|---|---|---|---|---|
| NOTE: 1. Please enter details in cells highlighted in 'Light Green' only. 2. Choose appropriate columns based on th | | | | | | |
| Application/Module | Lead | App/Module 1 | | | Totals | |
| Resource | Onsite - R1 | Offshore - R3 | | | Columns | |
| QA Resource Rate/hr | 1 | 1 | | | | |
| (Integration Testing / Performace Testing / UAT & Deployment Support) Resource Rate/hour | 1 | 1 | | | | |
| Project Specific Regression Testing % | 0 | 0 | | | | |
| Expected Failure Rate % (Builds: 1, 2, 3) | 0 | 25 | 15 | 0 | | |
| Test Case Avg Execution Time (hours) (Easy - Moderate - Difficult) | 0 | 0.25 | 0.5 | 0.65 | | |
| Counts | | | | | | |
| New Test Cases Count | 0 | 0 | 0 | 0 | | |
| Reuse Existing Test Cases Count | 0 | 0 | 0 | 0 | | |
| Total Test Cases/(Module or Application) | 0 | 0 | | | 0.00 | |
| New Regression Test Cases Count | 0 | 0 | 0 | 0 | | |
| Existing Regression Test Cases Count | 0 | 0 | 0 | 0 | | |
| Integration Test Cases Count | 0 | 0 | 0 | 0 | | |
| UAT Test Cases Count (Some to be executed by QA) | 0 | 0 | | | | |
| QA Cycle Duration (Weeks) | 0 | 0 | | | | |
| | | | | | | |
| Test Cases Count Estimates | 0.00 | 0.00 | | | 0.00 | |
| Project Plan Estimates | 0.00 | 0.00 | | | 0.00 | |
| Test Effort Estimates | 0.00 | 0.00 | | | 0.00 | |
| Project Planning & Estimates | 0.00 | 0.00 | | | 0.00 | |
| App1 - Training & Exercise | 0.00 | 0.00 | | | 0.00 | |
| App2 -Training & Exercise | 0.00 | 0.00 | | | 0.00 | |
| App3 -Training & Exercise | 0.00 | 0.00 | | | 0.00 | |
| Total Training & Exercise | 0.00 | 0.00 | | | 0.00 | |

# OTHERS

- Test Environment Change Log
- Test Environment Usage Notifications
- Test Environment Issues/Maintenance Notifications
- Test Environment Stability Impact Tracking
- Production Rollout Validation Steps
- Test Automation Profiles
- Defect/Bug Management Flow Definition / Process Document
- UAT Support Plan
- Weekly Status Reports to Test Team
- Status Reports to Project Team (daily, weekly, as requested)