

Adaptive Waterfall Methodology

ITS-E-P024, Issue 2.1



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1. PURPOSE

This methodology defines the process for development or enhancement activities performed using the Adaptive Waterfall Methodology at TechM. The methodology is to be used for execution of non agile projects.

2. SUITABILITY

The methodology is suitable for development or enhancement projects where requirements stability is high.

3. ACRONYMS AND DEFINITIONS

Term/ acronym	Explanation
DD	Design Document
ETVX	Entry, Task, Verification& Validation, Exit
PM	Project Manager
QMG	Quality Management Group
RDD	Requirement Definition Document
RTM	Requirements Traceability Matrix
SDD	System Specification Document
SME	Subject Mater Expert
SQA	Software Quality Analyst
TechM	Tech Mahindra Limited

Minor work package:-

Development / Enhancement work package where engineering effort including review and rework task is less then or equal to 30 person days.

Major work package

Development / Enhancement work package where engineering effort including review and rework task is greater then 30 person days.

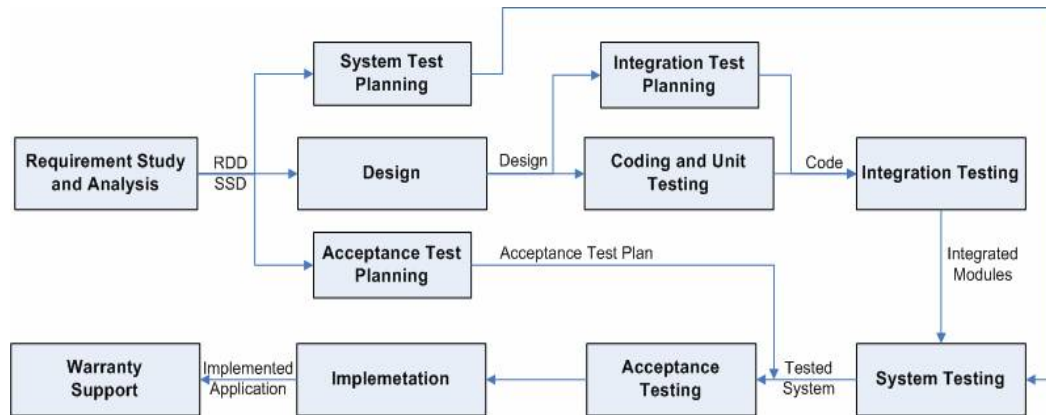
Requirements Traceability Matrix

Bi-directional 'Requirements Traceability Matrix' (RTM) is prepared to maintain traceability between customer requirements and software work products. It maps each Requirement element to development phase outputs. This tracing helps to ensure that none of the Requirement element is missed in any of the software work product.

4. METHODOLOGY OVERVIEW

This methodology has been prepared using the base of traditional waterfall methodology. This methodology covers the process by which user requirements are elicited and software satisfying these requirements is designed, built, tested and delivered to the customer. The Development Process is used when a new application is being developed or a major enhancement is being done to an existing application.

The methodology splits traditional phases of the waterfall model into smaller phases to allow parallel execution of some phases. For instance, System Test Planning can be executed in parallel with the Design phase, similarly, Integration Test Planning can execute in parallel with the Coding and Unit Testing phase.



The phases applicable in the Adaptive waterfall model are:

- Requirement Study and Analysis
- Design
- Coding and Unit Testing
- Integration Testing
- System Testing
- Acceptance Testing
- Implementation
- Warranty Support

Depending on the scope of the project, the Operational Process may contain some or all of the phases.

5. PHASE DESCRIPTIONS

This section describes the detailed activities to be followed in the various phases of the Adaptive Waterfall methodology in the Entry - Task - Validation & Verification - Exit (ETVX) model structure.

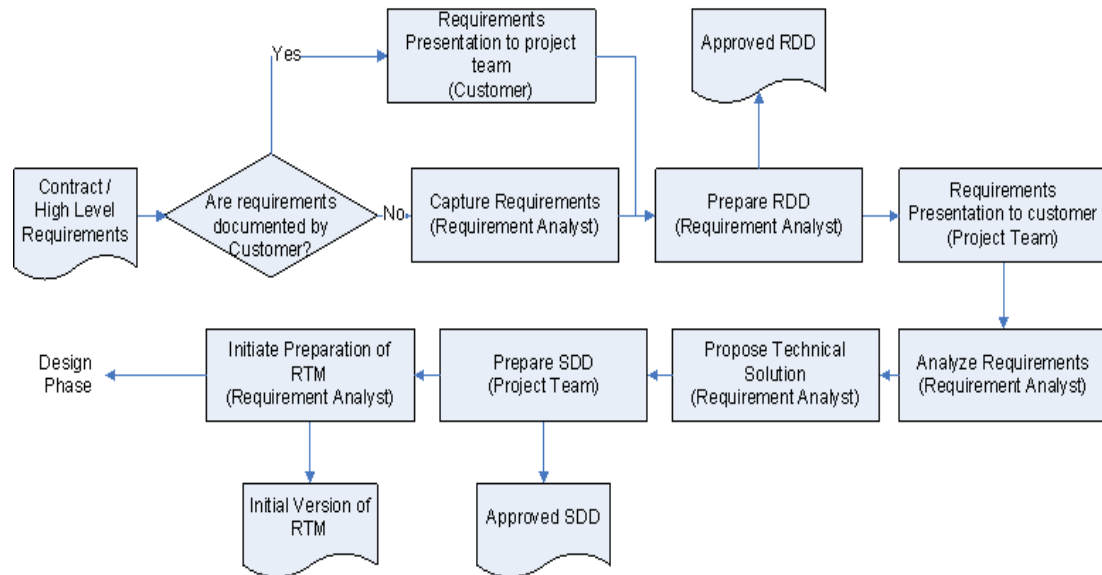
5.1. REQUIREMENT STUDY AND ANALYSIS PHASE

Requirements study and Analysis is the process by which we gather and understand the customer's requirements. In this stage of the project lifecycle, we interview the users of the proposed system to gather their business/functional requirements including external interfaces, analyze the requirements to derive a model of the application. Usually the customer already has some system (computerized or manual) to manage her/his business. In both cases we would have to understand the way business is being done currently. This is called current system study. If the business is totally new, there will be no current system study.

The activities in this phase are directed towards converting the customer needs into technical requirements. The phase covers activities directed towards the development of requirements.

The user requirements are arrived at based on the study of the inputs, existing systems, and discussions with users. These are analyzed to arrive at a technical solution for the system in terms of the desired system characteristics.

The diagram below refers to the flow of activities performed during the Requirement and Analysis phase.



5.1.1. Entry Criteria

- Project Manager (PM) has been assigned to the project
- Commitment review/ Concept Note review by GH has been completed
- Project has been defined in Spectrum/TIPS

5.1.2. Tasks

- PM to prepare detailed schedule for the phase covering review, rework schedule and team assignments
- PM builds the team and identifies tools for carrying out requirement study and analysis. In addition, PM ensures that the team is adequately trained.
- Requirement Analyst studies all the inputs provided by customer at the beginning of this phase to understand the customer requirements. After completion of this activity requirement analysts collect all the relevant information that will help understand the customer's requirements. The information can be classified as business, functional (implicit & explicit), interface, operating environment, performance, standards, security, statutory and regulatory, special requirements and post delivery requirements.
- Requirement Analyst communicates with the Customer to gather requirements using the identified requirements gathering technique. The analyst obtains requirements by asking questions or demonstrating similar systems to the Customer.
- Requirement Analyst analyzes requirements at minimum, with regard to completeness, correctness, consistency, feasibility, appropriateness to implement, clearly stated, and testability. While performing the analysis of the Security (confidentiality, integrity, and availability) requirements, the following factors may be considered:
 - Loss of sales, orders or contracts
 - Loss of tangible assets
 - Penalties, Legal Liabilities
 - Unforeseen cost,

- Depressed Share Price
- New ventures held up
- Loss of Management Control
- Breach of Operating standards
- Loss of Competitiveness
- Loss of confidence by key institutions
- Delayed delivery to customers
- Loss of customers
- Damage to Reputation
- Reduction in staff morale/productivity
- Project team prepares prototype , if required
- Requirement Analyst prepares the Requirement Definition Document (RDD) for the gathered requirements using the "Requirement Definition Document Template (ITS-E-T026)".
- In case requirements are documented by customer, project team requests the customer to provide a presentation on requirements to arrive at common understanding
- Acceptance Criteria for delivery of the requirements should be clearly understood and documented in the RDD
- Peer/Group review and SQA review of RDD is to be completed before release of it to the customer. SMEs to be involved in reviews if required
- After completion of review and SQA of RDD, it is sent for formal review with Customer. The document is baseline after completion of the Customer's review.
- Baseline document should be presented to the relevant stakeholders to arrive at common understanding of the requirements.
- Assigned project team member studies the gathered requirements to arrive at a technical solution and prepare System Specification Document (SSD) by using System Specification Document Template (ITS-E-T026A).
- Peer/Group review and SQA review of SDD is to be completed before release of it to the customer. SMEs to be involved in reviews if required
- PM sends the final baselined SSD to the Customer for approval. In case Customer provides review comments, SSD is baselined after incorporated the review comments.
- Requirement Analyst prepares RTM using the "Requirement Traceability Matrix Template (ITS-E-T026B) to maintain traceability between Customer requirements and software work products. Interfaces also need to be managed throughout the lifecycle and addressed in the RTM.
- Prepare preliminary version of the user /system documentation, if required
- Establish standards for Design phase.

5.1.3. Validation & Verification

- Peer/Group and SQA review of RDD
- Peer/Group and SQA review of SSD
- Peer review of RTM
- Quality Gate review by QMG

5.1.4. Measures

- Effort expended in phase including review and rework effort
- Schedule Adherence
- Defects

5.1.5. Participants

- Customer
- PM
- Requirement Analyst
- SQA
- Project Team

5.1.6. Exit Criteria

- Approved RDD
- Approved SSD
- RTM has been completed for the Requirement phase
- Application size document
- Review Record

5.1.7. Tailoring

- SQA review of RDD and SDD is optional for Minor work package
- PM can approve the RDD, if documented requirements from customer are available. If documented requirements from the customer are not available then Customer approval for RDD is essential.

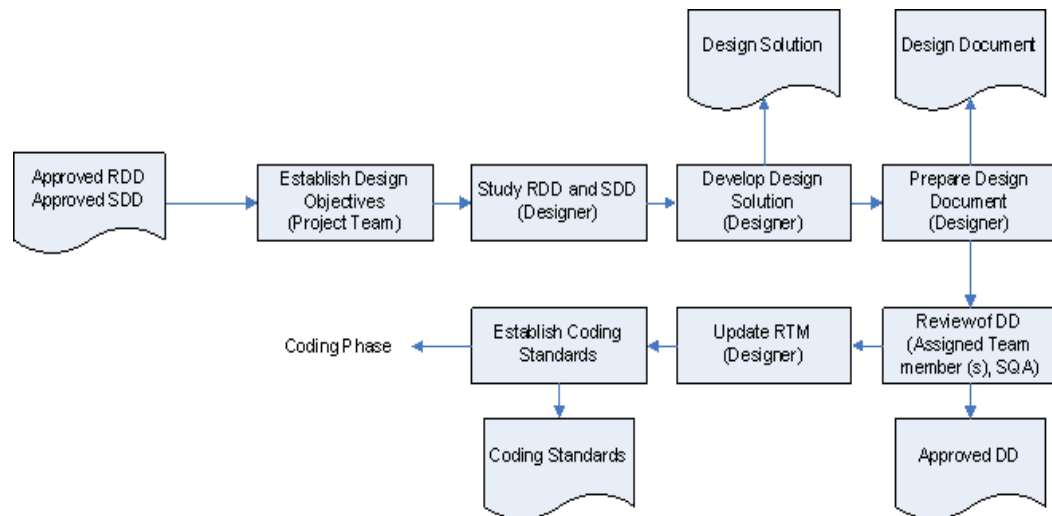
5.1.8. References

- Requirement Analysis Guidelines (ITS-E-G026)
- Requirement Definition Document Template (ITS-E-T026)
- Requirement Traceability Matrix Template (ITS-E-T026B)
- System Specification Document Template (ITS-E-T026A)
- Defect Log Form (ITS-E-T041A)
- QCR Form (ITS-E-F091)
- Guideline for Prototyping (ITS-E-G026B)
- Guideline for Requirements Gathering(ITS-E-G026A)
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.2. DESIGN PHASE

The activities in this phase are directed towards transformation of the system requirements into detailed design for a software product. [Phase](#) defines system architecture design, database/file design, interface design and program specifications for all modules, libraries, routines etc.

The diagram below refers to the flow of activities performed during the Design phase.



There are three main components to this solution - the functional architecture of the application, the database design (if there is a database in the system) and the operating environment in which the application will run

5.2.1. Entry Criteria

- Approved RDD
- Approved SSD

5.2.2. Tasks

- PM to prepare detailed schedule for the phase covering review, rework schedule and team assignments
- Project Team establishes and documents design objectives, constraints, and guidelines at minimum covering Usability, User Interface, Performance (Response time, Memory, Throughput), Reliability, Design directives, Storage etc.
- Designer thoroughly studies the RDD and SSD and resolves queries with stakeholders. For domain knowledge specific queries, Designer may seek help from a domain expert.
- Designer thoroughly examines the repository for projects similar in nature to look for reusable components. If the components are available in the repository, Designer analyzes the benefits obtained by using them.
- If third party software / open source / free ware are identified then the designer need to justify the usage of the components in the Design Document (ITS-E-T031) with appropriate approvals.
- Designer develops design solution that satisfies the set of requirements defined in the RDD and SSD. Multiple design solutions are built and evaluated to select the most appropriate design approach (using Decision Analysis and Resolution process).
- Designer prepares the Design Document (DD) for the identified design approach using the "Design Document Template (ITS-E-T031)".
- Peer/Group review and SQA review of DD is to be completed before baselining. SMEs to be involved in review if required.
- In case DD is provided by Customer, Project team reviews the DD and ensures closure of all the queries.

- If customer review of DD is defined in project's scope, DD is reviewed by customer and all defects/queries/issues logged by customer are tracked to closure
- Baseline document should be presented to the relevant stakeholders to arrive at common understanding of the design.
- Update 'Requirement Traceability Matrix' to map the Design Specifications to the Requirements
- Coding standards and code review checklist to be established in this activity. If required, code review checklist or coding standards are not available in BMS. Project team should define project specific standard and checklist. In case, Coding standards are supplied by the Customer, then customer supplied standards are followed after review and if these standards are not exhaustive these are updated with the help of available standards in the BMS.

Establish coding standards activity can be skipped in this phase but if it is skipped in this phase, it should be performed as a first activity of the Coding and unit testing phase.

5.2.3. Validation & Verification

- Peer/Group review and SQA review of DD
- Review of updated RTM
- Quality Gate review by QMG

5.2.4. Measures

- Effort expended in phase including review and rework effort
- Schedule Adherence
- Defects (Internal and Delivered Defects)

5.2.5. Participants

- Customer
- PM
- Designer
- SQA
- Project Team

5.2.6. Exit Criteria

- Approved DD
- Updated RTM

5.2.7. Tailoring

- SQA review of DD is optional for Minor work package
- If the design approach is decided/influenced by the customer, multiple design solutions and usage of DAR to choose the most appropriate solution may be optional.

5.2.8. References

- Design Document Template (ITS-E-T031)
- Test Plan Template (ITS-E-T005A)
- Design Review Checklist (ITS-E-L031)

- Decision Analysis Resolution Procedure (GOV-C-P011)
- Defect Log Template (ITS-E-F041A)
- QCR Form (ITS-E-F091)
- Guidelines for Database Sizing / Query Tuning / EMC Layout
- Guidelines for Application Design
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.3. CODING PHASE

The purpose of this phase is to convert the program specifications as specified in 'Detail Design' to program code using the chosen programming language

5.3.1. Entry Criteria

- Approved DD is available
- Unit Test Plan is available

5.3.2. Tasks

- Prepare detailed schedule for the phase.
- Prepare for coding: - Programmer studies inputs such as design document, requirements, coding standards, existing libraries etc. and ensures resolution of queries pertaining to these areas.
- Code the Programs:
 - Programmer codes the program based on design documents as per the project's coding standards
 - Programmer codes the relevant unit test scripts in the program
- Programmer should conduct the self-review using review checklist or code review tools (like Findbugs, Checkstyle) wherever possible and maintain evidence for the same
- Code is check-in to project's configuration library as per project's Configuration Management Plan
- Programmer should generate the relevant unit test reports which should be approved before the code is check-in to the project's configuration library.
- Perform Code review as per the "Review Procedure" using project's code review checklist.
- Ensure that all terms and conditions for the usage of any freeware/open-source software or 3rd party software are complied.
- Critical modules as identified in project's operational process are reviewed by SQA
- All review defects are logged and tracked to closure
- Update RTM: - Requirement Traceability Matrix' is updated with reference to the piece of code /file/object/module that satisfies each Requirements element.

5.3.3. Validation & Verification

- Review of the code
- SQA review of the critical code
- Review updated RTM
- Review of unit test report
- Quality Gate review by QMG

5.3.4. Measures

- Effort
- Defects (Internal and Delivered Defects)
- Schedule Adherence

5.3.5. Participants

- PM
- Programmer
- Reviewer
- SQA

5.3.6. Exit Criteria

- Review of source code has been completed

5.3.7. Tailoring

- None

5.3.8. References

- Defect Log Template (ITS-E-F041A)
- Code Review Checklists and Generic Secure Code Review Checklist
- Verification & Validation Guidelines (ITS-E-G041)
- Test Plan Template (ITS-E-T005A)
- Test Log Form (ITS-E-F041)
- QCR Form (ITS-E-F091)
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.4. UNIT TESTING PHASE

Purpose of unit testing is to perform verification at module level. In this phase important control paths are tested to uncover module level errors. This phase has been divided into two sub phases:-

- Unit Test Planning
- Unit Testing

5.4.1. Entry Criteria**Unit Test Planning sub phase**

- Approved Module design is available

Unit Testing sub phase

- Approved Unit Test plans are available
- Reviewed code of the module

5.4.2. Tasks**Unit Test Planning**

- Unit Test Planning can be initiated on completion of design of the module.
- Tester designs test cases based on the module design
- Test plans are reviewed and comments are tracked to closure.

- In order to ensure all requirements have been covered in unit test planning, Requirement traceability matrix is updated to map unit test cases with design and requirement elements.

Unit Testing

- Tester studies unit test plans and ensure resolution of all the queries
- Unit testing is performed using unit testing tools where ever applicable
- It is mandatory for projects using J2EE framework to use JUnit for unit testing
- If no unit testing tools used, tester prepares Stubs/ Drivers for module testing and conducts testing as per Unit Test Plan and record the results. If new test cases are used during testing, tester updates the Unit Test plan
- All defects identified during testing are logged and tracked to closure
- Tester prepares Test Results and handover the same to module lead/project lead

Note: - Depending upon the number of critical/showstopper defects the tester may suspend the execution of unit testing and resume it once the critical defects are fixed.

5.4.3. Validation & Verification

- Review of unit test plans
- Review updated RTM
- Quality Gate review by QMG

5.4.4. Measures

- Effort
- Defects
- Schedule Adherence

5.4.5. Participants

- PM
- Programmer
- Tester

5.4.6. Exit Criteria

- Unit Test Plan Review has been completed for Unit Test Planning sub phase
- Unit Testing Defects have been tracked to closure for Unit Testing sub phase

5.4.7. Tailoring

- None

5.4.8. References

- Guidelines for Testing Practices for Mobile Handsets (PM853E)
- Verification and Validation Guidelines (ITS-E-G041)
- Test Plan Template (ITS-E-T005A)
- Test Log Form (ITS-E-F041)
- Defect Log Template (ITS-E-F041A)
- QCR Form (ITS-E-F091)
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.5. INTEGRATION TESTING PHASE

Purpose of integration testing is to perform to uncover errors associated with interfacing of modules. Objective is to take unit tested components and build a program structure that has been dictated with design. This phase has been divided into two sub phases:-

- Integration Test Planning
- Integration Testing

5.5.1. Entry Criteria

Integration Test Planning sub phase

- Approved Interface design is available

Integration testing sub-phase

- Approved Integration Test plans are available
- Unit Tested modules are available

5.5.2. Tasks

Prepare Build

The build need to be prepared which will be used for integration testing.

Following items need to be addressed while preparing the build for IT.

- Identify product components to be integrated
- Identify the integration environment
- Verifications to be performed during the integration of the product components
- Identify alternative product-component integration sequence and document the rationale in selecting the best sequence
- Modify the integration sequence if needed

Integration Test Planning

- Integration Test Planning can be initiated on completion of interface design.
- Tester designs test plan based on the interface design (Section 8.6, 8.7 and 8.8 of Design document template)
- Test plans are reviewed and comments are tracked to closure.
- In order to ensure all requirements have been covered in Integration test planning, Requirement traceability matrix is updated to map integration test plans with design and requirement elements.

Integration Testing

- Tester studies integration test plans and ensure resolution of all the queries
- Test team defines test environment specifications based on:
 - Release planned & build deployment
 - No. of automation licenses needed
 - Hardware to be used for backup and recovery
 - Hardware /software configuration.

- Network characteristics in term of usage of protocols such as Ethernet or TCP/IP and use of leased lines, modems and internet connection.
 - Interfaces for integrated systems and other platforms
 - Verification procedures for integrated systems
 - USER IDs for accessing test environments
- Test Team establishes environment required to perform the integration testing.
 - Tester conduct integration testing as per Integration Test Plans and record the results
 - All defects identified during testing are logged and tracked to closure
 - Test team prepares Test Results and handover the same to module lead/project lead

Note: -

1) Depending upon the number of critical/showstopper defects the tester may suspend the execution of integration testing and resume it once the critical defects are fixed.

2) Tester need to ensure that each time a change is performed to fix the defects appropriate impact of the change has been studied and required regression testing has been performed.

5.5.3. Validation & Verification

- Review of Integration test plans
- Review updated RTM
- Quality Gate review by QMG

5.5.4. Measures

- Effort
- Defects
- Schedule Adherence

5.5.5. Participants

- PM
- Programmer
- Tester

5.5.6. Exit Criteria

Integration Test Planning sub-phase

- Approved integration Test plans are available

Integration Testing sub-phase

- Integrated System is available
- Integration test results have been reviewed and approved.

5.5.7. Tailoring

- Based on project requirements Integration Testing and System Testing phase can be merged into phase but in this case PM needs to ensure that all requirements of both phases has been taken care.

- Where customer given environments or products are required the projects will identify these items and usage while establishing the validation environment

5.5.8. References

- Guidelines for Testing Practices for Mobile Handsets (PM853E)
- Release Management Procedure (ITS-E-P025)
- Verification and Validation Guidelines (ITS-E-G041)
- Test Plan Template (ITS-E-T005A)
- Test Log Form (ITS-E-F041)
- Defect Log Template (ITS-E-F041A)
- QCR Form (ITS-E-F091)
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.6. SYSTEM TESTING PHASE

System testing is performed to verify that system elements have been properly integrated and performs required functions. System testing covers testing with respect to all aspects of the software like Functional Testing, Security Testing, Stress Testing, Performance Testing, Recovery Testing.

This phase has been divided into two sub phases:-

- System Test Planning
- System Testing

5.6.1. Entry Criteria

System Test Planning sub phase

- Approved RDD and SSD are available

System testing sub-phase

- Approved System Test plans are available
- Integrated system is available

5.6.2. Tasks

System Test Planning

- System Test Planning can be initiated on completion of Requirement Definition and System Specification.
- Tester designs test plan based on the project's RDD and SSD
- Test plans are reviewed and comments are tracked to closure.
- In order to ensure all requirements have been covered in system test planning, Requirement traceability matrix is updated to map system test plans with requirement elements.

System Testing

- Tester studies system test plans and ensure resolution of all the queries
- Test team defines test environment specifications based on:
 - Release planned & build deployment
 - No. of automation licenses needed

- Hardware to be used for backup and recovery
 - Hardware /software configuration.
 - Network characteristics in term of usage of protocols such as Ethernet or TCP/IP and use of leased lines, modems and internet connection.
 - Interfaces for integrated systems and other platforms
 - Verification procedures for integrated systems
 - USER IDs for accessing test environments
- Test Team establishes environment required to perform the system testing.
 - Tester conduct system testing as per System Test Plans and record the results
 - All defects identified during testing are logged and tracked to closure
 - Test team prepares Test Results and handover the same to module lead/project lead

Note: - Depending upon the number of critical/showstopper defects the tester may suspend the execution of integration testing and resume it once the critical defects are fixed.

5.6.3. Validation & Verification

- Review of system test plans
- Review updated RTM
- Quality Gate review by QMG

5.6.4. Measures

- Effort
- Defects
- Schedule Adherence

5.6.5. Participants

- PM
- Programmer
- Tester

5.6.6. Exit Criteria

System Test Planning sub-phase

- Approved System Test plans are available

System Testing sub-phase

- Tested System is released
- System test results have been reviewed and approved.

5.6.7. Tailoring

Based on project requirements Integration Testing and System Testing phase can be merged into phase but in this case PM needs to ensure that all requirements of both phases has been taken care.

5.6.8. References

- Guidelines for Testing Practices for Mobile Handsets (PM853E)
- Verification and Validation Guidelines (ITS-E-G041)
- Test Log Form (ITS-E-F041)

- Defect Log Template (ITS-E-F041A)
- Test Plan Template (ITS-E-T005A)
- QCR Form (ITS-E-F091)
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.7. ACCEPTANCE TESTING

Acceptance Testing is the phase in software life cycle during which a software product is integrated into its operational environment and tested in this environment to ensure that it performs as required.

Acceptance testing is generally performed at Customer site of project to verify whether the product meets the specified requirements.

5.7.1. Entry Criteria

- Tested system is available
- DD and RDD are available
- Acceptance Test Plan is available

5.7.2. Tasks

- Help Customer in conducting the Acceptance Testing
- If defects are reported by Customer after acceptance testing perform the following step:
 - Log and track the defects to closure
 - Perform System/Regression Testing
 - Deliver the patches/software to customer
- When results of Acceptance Testing satisfy the acceptance criteria, obtain Sign-off from the Customer(PM)

5.7.3. Validation & Verification

- Review the detailed plan for acceptance test phase
- Quality Gate review by QMG

5.7.4. Measures

- Defects
- Effort

5.7.5. Participants

- Customer
- Project Team

5.7.6. Exit Criteria

- Customer Acceptance Sign off has been received

5.7.7. Tailoring

- None

5.7.8. References

- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.8. DOCUMENTATION

Team Members performs the task of User documentation helpful in installing, operating, and managing software product. The initial user documentation begins with the Requirement Study and Analysis phase and is accomplished as the project moves along. However, the all the user documentation should be completed before entering the Implementation Phase.

All user documentation build as per contractual requirements should be reviewed before delivering it to the customer.

5.9. IMPLEMENTATION

The activities in this phase are directed towards the implementation of system at Customer end. The PM ensures that that Customer Acceptance Sign off has been obtained before starting the Implementation phase.

5.9.1. Entry Criteria

- Customer Acceptance Sign off

5.9.2. Tasks

- Based on the RDD, SSD, and DD, the team leader prepares the Implementation Plan which contains the following information:
 - H/w and S/w Environments
 - Customer Training
 - Installation Plan
 - Migration Plan - S/w as well as data
 - Roll-back and recovery plan
 - Operational procedures
 - Parallel runs / Pilot runs
 - Implementation Support strategy in terms of:
 - Operational support
 - Application support
 - System and database administration
- PM reviews the Implementation plan and obtains customer's approval.
- Project team provides implementation support as implementation plan
- After completion of Implementation activities, PM obtains sign off from the Customer.

5.9.3. Validation & Verification

- Review of Implementation Plan
- Quality Gate review by QMG

5.9.4. Measures

- Effort
- Defects

5.9.5. Participants

- Customer
- PM
- Designer

5.9.6. Exit Criteria

- Implemented System

- Sign off from the Customer

5.9.7. Tailoring

- None

5.9.8. References

- Implementation Plan Template (ITS-E-T051)
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

5.10. WARRANTY SUPPORT

In this phase the Customer runs the system with production data. The project team, as required by the Contract/Proposal, provides support.

5.10.1. Entry Criteria

- Implemented System
- Application is live on production environment

5.10.2. Tasks

- The Project Team assists the Customer by handling problems encountered during the warranty. The defects (if any) reported are handled after an impact analysis/study. The defects are closed suitably after thorough review and testing.

5.10.3. Validation & Verification

- The defects reported are closed
- Quality Gate review by QMG

5.10.4. Measures

- Defects
- Effort

5.10.5. Participants

- Customer
- PM
- Team Members

5.10.6. Exit Criteria

- Expiry of the warranty period
- Customer has signed off on the entire project

5.10.7. Tailoring

- None

5.10.8. References

- Warranty and Support Guidelines (ITS-S-G007A)
- Maintenance Request Form (ITS-E-F056)
- Quality Gate Checklist for Dev/Enh and Testing projects (QMG-N-L007)

6. DOCUMENT HISTORY

Version	Date	Author	Reviewed by	Approved by	Nature of changes
1.0	29-Sep-07	Simmi Dhamija	BMS improvement team	Ananthan G	First Issue
1.1	25-Jan-08	Vishnu Kumar Prasad	Simmi D	Ananthan G	The diagram in sec 5.1 and sec 5.2 has been interchanged
1.2	27-Mar-08	Amita R(QMG)	Elizabeth B (QMG)	Ananthan G	Following changes has been carried out as part of cmmiv1.2 gap (CR#434259) Sec 5.5.2: Prepare Build included Sec 5.5.7 Tailoring section updated. Note has been added in the following secs 5.4.2, 5.5.2,5.6.2
1.3	20-Jun-08	Elizabeth B (QMG)	Amita R (QMG)	Ananthan G	Following updates carried out based on the KPMG review comments: Added reference to interfaces being managed throughout the lifecycle (through RTM). Tailoring added on alternative design solutions. Added reference of guideline for prototyping and requirements gathering.
1.4	25-Jul-08	Vishnu Kumar Prasad A (QMG)	Simmi D (QMG), Ajit Kalle(IDU Head),Varsha R(QMG), DP Team(Revati D, Jitendra Bhole, Amit Oberoi)	Ananthan G	Updated the Task section of Requirements and Design Phase to include that baselined document should be presented to the team. Updated the coding phase task, to include relevant unit test scripts in the program
1.5	09 Sep 08	Vishnu Kumar Prasad A (QMG)	Varsha R (QMG),	Simmi D (SEPG H)	Unit testing phase task modified to include usage of JUnit
1.6	18 Sep 08	Vishnu Kumar Prasad (QMG)	Manish Daterao	Ananthan G	Task related to usage of 3 rd party

Version	Date	Author	Reviewed by	Approved by	Nature of changes
			(BSS)		software added in Coding and Design Phase tasks
1.7	24 Feb 09	Vishnu Kumar Prasad (QMG)	Vikas Pandey (QMG)	Simmi D	Sec 5.6.2 Under System testing tasks, Integration testing reference wrongly mentioned which is corrected
1.8	19 Jun 09	Vishnu Kumar Prasad (QMG)	Shrinivas Shahare	Simmi D	Usage of tools for review added in coding phase
1.9	27 Oct 09	Vishnu Kumar Prasad / Saurabh Varma	Jaidev Bhatia, Sarvanan Rajendran, Jyoti Bhat, Debeshi Datta	Simmi D	Presentation of requirements by customer added in requirements phase. Involving the SMEs in review added. Group Review for Design added. Reference to Generic Secure Code Review Checklist added.
2.0	04 Feb 10	Thiyagarajan L	Saurabh V	Simmi D	Conducting Quality gate check has been added as part of every phase and Quality gate checklist has been added as part of reference
2.1	25 March 15	Ashwini Akashe	Ashwini Chaudhari	Amitabh Shanker	Replaced the Modified word with Adaptive in section 1,4 ,5 & 7 also in the title of the procedure and footer.

7. ANNEXURE B: GUIDELINES FOR ENHANCEMENT PROJECTS

Enhancement projects are involved in carrying out identified enhancements as a part of periodic enhancement releases and or individual basis depending on priority and Customer preferences.

While using Adaptive waterfall methodology for enhancement requests, project needs to tailor Design and Testing phases, to incorporate the following activities:-

- Design Phase
 - Team need to identify the list of existing components which will get impacted due to the proposed change
 - Detailed impacts analysis of all the identified components to be performed before finalizing the design for the enhancement
- Testing

- Analysis to be performed to check impact and according regression testing to be planned and implemented.