

2010

SPIG Product Suite Handbook V1.2

Software Process Improvement Guide

Processes used to develop software products are a key factor of their quality. Despite this fact, the cost of applying rigorous software processes inhibits the small and medium software firms to use them. SECC initiated a program to help Small and Medium Enterprises (SMEs) raise the quality of their products by using modern software development processes and practices.

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Acronyms

The following table contains the frequently used acronyms:

<i>CCB</i>	<i>Change Control Board</i>
<i>CI</i>	<i>Configuration Item</i>
<i>CM</i>	<i>Configuration Management</i>
<i>CMMI</i>	<i>Capability Maturity Model Integration</i>
<i>CR</i>	<i>Change Request</i>
<i>FCA</i>	<i>Functional Configuration Audit</i>
<i>FI</i>	<i>Formal Inspection</i>
<i>LCM</i>	<i>Life Cycle Model</i>
<i>MOM</i>	<i>Minutes of Meeting</i>
<i>PCA</i>	<i>Physical Configuration Audit</i>
<i>PD</i>	<i>Product Development</i>
<i>PM</i>	<i>Project Management</i>
<i>PMP</i>	<i>Project Management Plan</i>
<i>PR</i>	<i>Peer Review</i>
<i>QA</i>	<i>Quality Assurance</i>
<i>RFP</i>	<i>Request for Proposal</i>
<i>RTM</i>	<i>Requirements Traceability Matrix</i>
<i>SDLC</i>	<i>Software Development Life Cycle</i>
<i>SMEs</i>	<i>Small and Medium Enterprises</i>
<i>SOW</i>	<i>Statement Of Work</i>
<i>SPI</i>	<i>Software Process Improvement</i>
<i>SRS</i>	<i>Software Requirements Specifications</i>
<i>WBS</i>	<i>Work breakdown Structure</i>
<i>V & V</i>	<i>Verification and Validation</i>

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INTRODUCTION

Introduction

1

A fundamental factor that greatly ensures the production of a quality software product is the use of successful functional processes. Despite this fact, the cost of applying rigorous software processes inhibits the small and medium software firms to use them. The Software Engineering Competence Centre (SECC) initiated a program to help Small and Medium Enterprises (SMEs) raise the quality of their products by using modern software development processes and practices at affordable cost.

The aim of the Software Process Improvement (SPI) program is to develop an adaptable model of excellence in software development based on the related international standards. It is aspired that the contained set of adapted models will help its target users, namely SMEs in software development, in setting up their professional standards to match the acceptable international levels, which will ultimately help them advance towards international accreditation.

In a workshop, held in September 2003 and attended by industry experts, Motorola and SECC embarked on discussions to produce a cost-effective solution to apply the software process methodologies in SMEs. The hurdles identified during this workshop in SMEs' products were: exceeding budget, delivery delay and quality related problems. The workshop concluded that these bottlenecks are due to the absence of formal methodology for gathering requirements, following up on projects, and applying quality assurance techniques. The workshop participants also noted that many SMEs do not have proper mechanisms for software configuration management.

At that time, the Software Engineering Institute's (SEI) Capability Maturity Model for Software (CMM®) was in use by SECC to improve and assess the large enterprises capability for software engineering. The workshop decision was to use five Key Process Areas (KPAs) from SW-CMM® Level 2 and two KPAs from Level 3: Requirements Management, Project Planning, Project Tracking, Quality Assurance, Configuration Management, Software Product Engineering, and Peer Reviews.

Based on the outcome of this workshop, SECC embarked on a project to develop a Software Process Improvement Guide (SPIG) to provide a comprehensive validated characterization for the boundaries of a typical software process improvement. The first version of the guide, released on December 2004, included the seven most essential processes drawn from the SW-CMM® Levels 2 and 3 which are seen by experts as necessary for professional starters.

The SPIG v1.0 included tailored processes, procedures and guidelines for each of the selected KPAs. The emphasis on fundamental practices included in the selected processes, establish a strong relationship between the guide and its target users. The practices described within the guide are validated by general consensus, performed among practitioners, and are the source of standards and related documents. The two major standards references were the IEEE and SW-CMM®. Although the SPIG was built on the basis of SW-CMM, it was important to note that implementing this guide does not automatically lead to achieving a certain level of the CMM framework.

The Software Engineering Competence Centre (SECC), in collaboration with the Industry Modernization Centre (IMC), started a project to help twenty Egyptian companies (all SMEs) in improving their processes in software development. The project contains two consequent phases. The first phase is the pilot one, and includes four companies. During the pilot phase, SECC received many improvement proposals from companies and the consultation team. All these proposals have been studied, evaluated, and used as triggers to produce the second version of the SPIG (v1.1), which was applied in fifty plus companies. The feedback was collected, evaluated and used to produce the current version (v.1.2) of the guide.

In addition, the Software Engineering Institute's (SEI) Capability Maturity Model Integration (CMMI[®] for Development v1.2) has been followed while producing the following version of the SPIG. Six process areas from CMMI Maturity Level 2 have been used: Requirements Management (RQEM); Project Planning (PP); Project Monitoring and Control (PMC); Process and Product Quality Assurance (PPQA); Configuration Management (CM); and to some extent, Measurement and Analysis (MA). Six process areas from CMMI Maturity Level 3 have been used to some extent: Requirements Development (RD); Technical Solution (TS); Product Integration (PI); Verification (VER); Validation (VAL); and Risk Management (RSKM). Again, it is important to note that implementing this guide does not automatically lead to achieve a certain level in the CMMI framework.

It is duly noted here that the guide does not attempt, nor claims, to impose any regulatory conditions regarding the organizational practices of software development. It is essentially meant to help and guide its intended users in setting their professional standards. It provides them the basis for getting started and tailoring the guide to their own needs and capabilities, while maintaining international certification standards.

SPIG Objectives

This guide attempts to achieve the following objectives:-

- Help small and medium-sized Egyptian software enterprises to effectively improve their software development process.
- Allow SME software organizations to establish a solid software process with low budget and a few numbers of resources.
- Provide a set of policies and procedures that can be easily tailored to fit a company's specific requirements.
- Establish a tailored process for SMEs from the very start of their lifecycle and at the same time supporting the quality and improvement activities that accompanies the organization growth

It should be noted that this work is meant to serve as a guide to the Software Process Improvement of SMEs engaged in the software industry. Furthermore, this guide is not static. The SPIG should develop and evolve, as the companies that adopt it grow and mature. Nevertheless, the SPIG is a valuable element of the software process improvement infrastructure. It is aspired that the handbook as part of the "SPIG product Suite" will provide a baseline for its users. It is also hoped that they will find this work useful in guiding them towards a professional track and provide initial resources needed in their lifelong career development as software engineering professionals.

Intended Users

The SPIG is oriented towards a variety of users within the various managerial and technical levels of a software company. It aims to serve public and private organizations in need of a consistent view of the various aspects of software development processes from project managers to requirements engineers to software development teams, quality assurance and configuration management personnel. A separate chapter is dedicated to each group. It also addresses top managers and owners of starting businesses who are responsible for setting organizational policies regarding professional certification and licensing.

Since the SPIG is a general excellence model, it may or may not match every company's nature, business lines and organizational structure. There are many standards and generalized roles were assumed in designing the SPIG's processes and their elements. We can claim with a high level of confidence that these roles exist in any software development firm. The only difference will appear in the names of jobs or titles. In addition, some of dependent roles may be combined, merged or performed by a single person due to resource limitation.

The following list, alphabetically ordered, contains the assumed main roles in this version of the SPIG. These roles may be performed by any title or job position in the organization.

No	Role	Description
1	AN	Analyst
2	CC	Configuration Controller
3	CU	Customer
4	DES	Designer
5	DEV	Developer
6	MC	Measurement Coordinator
7	PM	Project Manager
8	QAM	Quality Assurance Manager
9	QAR	Quality Assurance Representative
10	SM	Senior Manager
11	TE	Tester
12	TL	Team Leader
13	TM	Testing Manager
14	TT	Testing Team
15	TW	Technical Writer

The following list, alphabetically ordered, contains the assumed supportive roles in this version of the SPIG. These roles may be performed by anyone holding a role from the above main roles table.

No	Role	Description
1	APP	As per the process
2	AU	Author (<i>In peer review process</i>)
3	CCB	Configuration Control Board
4	ICC	Independent Configuration Controller
5	RL	Review Lead (<i>In peer review process</i>)
6	PR	Peer Reviewer (<i>In peer review process</i>)
7	RS	Relevant Stakeholder

Roles Hierarchy

SPIG roles can be arranged in an assumed four level hierarchy. The highest level represents the “Senior Management Level” and contains only the “Senior Manager (SM)” role. The second level is the “Middle Management Level” and contains “Project Manager (PM)”, “QA Manager (QAM)” and “Testing Manager (TM)” roles. The third level is the “Senior Technical Level” and contains the “Analyst (AN)”, “Designer (DES)”, “Team Leader (TL)”, “QA Representative (QAR)” and “Tester (TES)” roles. The final level is the “Technical Team Level” and contains the “Developer (DEV)”, “Measurements Coordinator”, “Configuration Controller (CC)” and “Technical Writer (TW)”. Figure-1 illustrates this hierarchy.

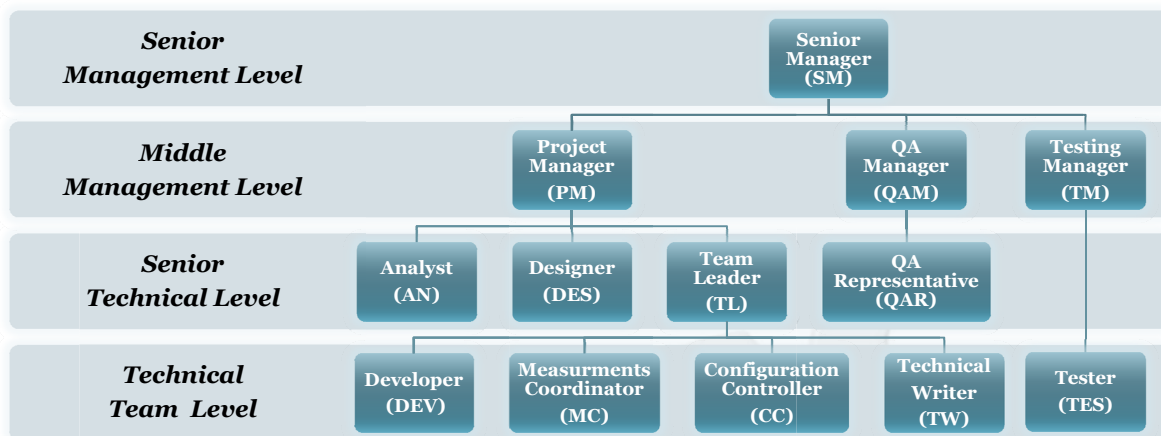


Figure 1: SPIG Roles Hierarchy

Change Control Board Roles

SPIG utilizes two levels of “Change Control Board (CCB)”. The higher level deals with change requests that require changes in agreed upon requirements, delivery dates or project cost. This level should include the customer (or at least a customer representative) and the senior manager. The lower level deals with only technical changes requests that do not touch any of the requirements, delivery dates or project cost. This later level requires neither the customer nor the senior manager. The higher level in this CCB can be the project manager. The following table contains a suggested list of all roles that can participate in the CCB and when they should participate.

No	Role	Description	When To Participate
1	AN	Analyst	CRs related to customer requirements
2	CC	Configuration Controller	CRs that may affect the CM system
3	CU	Customer	CRs that may affect requirements or delivery dates
4	DES	Designer	CRs the may affect the design
5	PM	Project Manager	All CRs
6	SM	Senior Manager	CRs that may affect the cost, schedule or quality
7	TE	Tester	CRs that may affect test plans and cases
8	TL	Team Leader	All CRs

General Polices

Some general polices, plus the specific polices in each process, guide the enactment and conductivity of all processes in the SPIG. These polices exist to provide a minimum level of requirements for performing each process. The following list contains all common polices.

- Ensure that all activities are planned and executed according to predefined and documented plan.
- Provide adequate resources and funding for performing all activities.
- Assign responsibilities for carrying out all activities.
- Ensure that all participants receive required and adequate training.
- All outcomes should be under the adequate level of configuration management.
- Plan to involve all related stakeholders.
- All activities should be monitored and corrective actions taken when needed.
- Each project should objectively evaluate the process adherence to its description using reviews and audits and accordingly addressing non-compliances.
- Each project should review the activities, status, and results with higher level management and resolve issues.

Processes Structure

Each process in the guide is designed to be a logical group of basic building elements called procedures. The procedure is a standalone working unit that has its own purpose and performance criteria. For any procedure to be followed there are certain entry criteria that should be met before performed, and well defined exit criteria that should be met before completing the procedure. The existence of entry and exist criteria does not imply or refer to waterfall-like development life cycle. Entry/Exist criteria help project team identify their readiness to start working in a grouped set of activities and validate their claim that the work have been done completely.

Process Map Structure

In addition to procedures' full description in this handbook; there is a process map that ties all major process elements together. The map is divided vertically into four swim lanes that represent the major project life cycle phases: initiation, planning, execution and monitoring and control, and the last one is the closure phase. On the other hand, horizontally, the map is divided to five swim lanes. The first one is for project management process that represents the umbrella for all other procedures. The last one is for configuration management that represents the operation infrastructure for all other procedures. In between, there are the remaining processes that are the product development process, the peer review process and the quality assurance process.

The location of each procedure represents it relation to certain process (i.e. project management, product development...etc) and project phase (i.e. initiation, planning...etc). In addition, the order from left to right represents the natural sequence of performing these procedures. This order will be used to list the procedures in each chapter. The product development process is the heart of SPIG processes and contains all technical and

engineering procedures from planning to requirements elicitation to delivering the product and obtaining acceptance from the customer.

The peer review process can be found just under the product development process. It is close to the product development process because it plays the roles of both the safety and early quality gates to the developed work products. Its target is to rapidly remove defects before remaining in the system for long time, which dramatically impacts the defect removal cost.

Finally, you can find the quality assurance process placed in between the peer review process and the configuration management process. The target and main purpose of this process is to discover the deviations, in processes and work products based on the agreed upon quality management system and standards.

The following section lists all procedures in each phase grouped by SPIG processes:

Initiation Phase

This phase contains a few numbers of procedures that exist only in the project management, product development and configuration management processes.

No	SPIG Process	SPIG Procedures in this Phase
1	Project Management Process	▪ Initiation Procedure
2	Product Development Process	▪ Requirements Planning Procedure ▪ Requirements Elicitation Procedure
3	Peer Review Process	None
4	Quality Assurance Process	None
5	Configuration Management Process	▪ Establishment of CM Environment Procedure

Planning Phase

This phase contains many procedures that focus on planning the project activities in the product development process and all the other supportive functions.

No	SPIG Process	SPIG Procedures in this Phase
1	Project Management Process	▪ Estimation Procedure ▪ Risk Planning Procedure ▪ Planning Consolidation Procedure
2	Product Development Process	▪ Development Planning Procedure ▪ Requirements Analysis Procedure
3	Peer Review Process	▪ PR Planning Procedure ▪ Execution Procedure ▪ Rework Procedure ▪ Follow-up Procedure
4	Quality Assurance Process	▪ QA Planning Procedure ▪ Execution Procedure ▪ Rework Procedure ▪ Follow-up Procedure
5	Configuration Management Process	▪ CM Planning Procedure ▪ Functional Configuration Audit Procedure ▪ Physical Configuration Audit Procedure ▪ Baselining Procedure ▪ Maintaining CM Environment Procedure

Execution, Monitoring and Control Phase

This phase contains the highest number of procedures among all the other phases and most of the project work is performed in this phase.

No	SPIG Process	SPIG Procedures in this Phase
1	Project Management Process	<ul style="list-style-type: none"> Execution, Monitoring and Control Procedure
2	Product Development Process	<ul style="list-style-type: none"> Development Planning Procedure Requirements Development Procedure Requirements Validation Procedure Requirements Acceptance Procedure Requirements Management Procedure Acceptance Test Preparation Procedure System Test Preparation Procedure Architecture Design Procedure Integration Test Preparation Procedure Detailed Design Procedure Component test Preparation Procedure Implementation Procedure Component test Execution Procedure Integration Test Execution Procedure System Test Execution Procedure Product Releasing Procedure Acceptance Test Execution Procedure
3	Peer Review Process	<ul style="list-style-type: none"> Execution Procedure Rework Procedure Follow-up Procedure
4	Quality Assurance Process	<ul style="list-style-type: none"> Execution Procedure Follow-up Procedure
5	Configuration Management Process	<ul style="list-style-type: none"> CM Planning Procedure Maintaining CM Environment Procedure Functional Configuration Audit Procedure Physical Configuration Audit Procedure Baselining Procedure Change Control Procedure

Closure Phase

This phase is the shortest phase. It contains only one procedure in the project management process and utilizes another one from the configuration management process.

No	SPIG Process	SPIG Procedures in this Phase
1	Project Management Process	<ul style="list-style-type: none"> Closure Procedure
2	Product Development Process	None
3	Peer Review Process	None
4	Quality Assurance Process	None
5	Configuration Management Process	<ul style="list-style-type: none"> Maintaining CM Environment Procedure

Processes Work Products

The following section lists all work products in each phase grouped by SPIG processes:

Initiation Phase

This phase contains a few numbers of work products that result only from the project management and configuration management processes.

No	SPIG Process	SPIG Work Products in this Phase
1	Project Management Process	<ul style="list-style-type: none"> Statement of work Partial Project Management Plan
2	Product Development Process	<ul style="list-style-type: none"> Requirements Elicitation Plan Requirements Management DB
3	Peer Review Process	None
4	Quality Assurance Process	None
5	Configuration Management Process	<ul style="list-style-type: none"> Configuration Management Environment

Planning Phase

This phase contains many work products that are related to planning the project activities in the product development process and all the other supportive functions.

No	SPIG Process	SPIG Work Products in this Phase
1	Project Management Process	<ul style="list-style-type: none"> Project Management Plan Size Estimation Effort Estimation Cost Estimation Project Schedule Risk Management Plan Minutes of Meetings
2	Product Development Process	<ul style="list-style-type: none"> Product Development Plan Requirements Traceability Matrix
3	Peer Review Process	<ul style="list-style-type: none"> Peer Review Plan Peer Review Checklists Defects Summary Reports
4	Quality Assurance Process	<ul style="list-style-type: none"> Quality Assurance Plan QA Work Products Audit Checklists
5	Configuration Management Process	<ul style="list-style-type: none"> Configuration Management Plan Functional Configuration Audit Reports Physical Configuration Audit Reports Baseline Release Reports

Execution, Monitoring and Control Phase

This phase contains the highest number of procedures and most of the project work is performed in this phase.

No	SPIG Process	SPIG Work Products in this Phase
1	Project Management Process	<ul style="list-style-type: none"> Issue Tracking Log Project Schedule Minutes of Meetings

		<ul style="list-style-type: none"> ▪ Risks Management Database
2	Product Development Process	<ul style="list-style-type: none"> ▪ Software Requirements Specification ▪ Architecture Design ▪ Detailed Design ▪ Reused Component Specification ▪ Test Plan ▪ Test Procedures ▪ Test Cases ▪ Product Release Report ▪ System Installation Plan ▪ Defects Summary Report
3	Peer Review Process	<ul style="list-style-type: none"> ▪ Peer Review Checklists ▪ Defects Summary Reports
4	Quality Assurance Process	<ul style="list-style-type: none"> ▪ Quality Assurance Audit Reports ▪ Quality Assurance Status Reports ▪ Quality Assurance Escalation Reports
5	Configuration Management Process	<ul style="list-style-type: none"> ▪ Functional Configuration Audit Reports ▪ Physical Configuration Audit Reports ▪ Baseline Release Reports ▪ Change Requests ▪ Change Requests Log ▪ Status Accounting Reports

Closure Phase

This phase contains only work products from one procedure in the project management process, along with the results from one procedure in the configuration management process.

No	SPIG Process	SPIG Work Products in this Phase
1	Project Management Process	<ul style="list-style-type: none"> ▪ Project Closure Report
2	Product Development Process	None
3	Peer Review Process	None
4	Quality Assurance Process	None
5	Configuration Management Process	<ul style="list-style-type: none"> ▪ Configuration Management Environment

Work Products vs. Templates

The following section lists all work products in SPIG and their relation to the actual templates grouped by SPIG processes. The Template name will be mentioned next two of the activities in each procedure, while the work product name will be used in the inputs and outputs of each procedure.

Project Management Process

No	SPIG Work Products	SPIG Templates
1	Statement of Work	PM Statement of Work Template
2	Project Management Plan	PM Project Management Plan Template
3	Project Size, Effort & Cost Estimates	PM Estimation Template
4	Project Schedule	PM Schedule Template
5	Project Risks Database	PM Risk Management Template

6	Minutes of Meetings	PM MOM Template
7	Project Issues Database	PM Issue Tracker Template
8	Project Closure Report	PM Project Closure Report Template

Product Development Process

No	SPIG Work Products	SPIG Templates
1	Requirements Elicitation Plan	PD Requirements Elicitation Plan Template
2	<ul style="list-style-type: none"> ▪ Candidate Requirements Database ▪ Requirements Traceability Matrix 	PD Requirements Management Template
3	Product Development Plan	PD Product Development Plan Template
4	Software Requirements Specification	PD Software Requirements Specification Template
5	Architecture Design	PD Architecture Design Template
6	Detailed Design	PD Detailed Design Template
7	Source Code	None
8	System Documentations	None
9	Test Plan	PD Test Plan Template
10	Test Procedures	PD Test Procedure Template
11	Test Cases	PD Test Case Template
12	Test Defects Log	PD Defects Summary Report Template
13	Product Release Note	PD Product Release Template
14	System Installation Plan	PD System Installation Template

Peer Review Process

No	SPIG Work Products	SPIG Templates
1	Peer Review Plan	PR Review Plan Template
2	Peer Review Checklist	PR Review Checklist Template
3	Peer Review Defects Log	PR Defects Summary Report Template

Quality Assurance Process

No	SPIG Work Products	SPIG Templates
1	Quality Assurance Plan	QA Quality Assurance Plan Template
2	QA Work Product Audit Checklist	QA Work Product Audit Checklist Template
3	QA Audit Report	QA Audit Report Template
4	QA Escalation Report	QA Escalation Report Template

Configuration Management Process

No	SPIG Work Products	SPIG Templates
1	Configuration Management Plan	CM Configuration Management Plan Template
2	Functional Configuration Audit Report	CM Functional Configuration Audit Report Template
3	Physical Configuration Audit Report	CM Physical Configuration Audit Report Template
4	Baseline Release Report	CM Baseline Release Report Template

5	Status Accounting Report	CM Status Accounting Report Template
6	Change Request	CM Change Request Template
7	Change Requests Log	CM Change Log Template

Roles Participation in the Processes

The following section lists all the main roles participating in each phase, grouped by SPIG processes:

Initiation Phase

This phase contains a few numbers of roles whose owners participate in its procedures, existing only in the project management and configuration management processes.

No	SPIG Process	SPIG main roles in this phase
1	Project Management Process	<ul style="list-style-type: none">▪ Project Manager▪ Team Leader
2	Product Development Process	<ul style="list-style-type: none">▪ Project Manager▪ Analyst
3	Peer Review Process	None
4	Quality Assurance Process	None
5	Configuration Management Process	<ul style="list-style-type: none">▪ Project Manager▪ Configuration Controller

Planning Phase

This phase contains all the roles that should participate in the planning of the project activities in the product development process and all other supportive functions.

No	SPIG Process	SPIG main roles in this phase
1	Project Management Process	<ul style="list-style-type: none">▪ Project Manager
2	Product Development Process	<ul style="list-style-type: none">▪ Project Manager▪ Team Leader▪ Analyst▪ Designer▪ Test Manager
3	Peer Review Process	<ul style="list-style-type: none">▪ Project Manager
4	Quality Assurance Process	<ul style="list-style-type: none">▪ Project Manager▪ Quality Assurance Manager▪ Quality Assurance Representative
5	Configuration Management Process	<ul style="list-style-type: none">▪ Project Manager▪ Configuration Controller

Execution, Monitoring and Control Phase

This phase contains the highest number of procedures among all the other phases and most of the project work is performed in this phase.

No	SPIG Process	SPIG main roles in this phase
1	Project Management Process	<ul style="list-style-type: none">▪ Senior Manager▪ Project Manager

2	Product Development Process	<ul style="list-style-type: none"> ▪ Customer ▪ Project Manager ▪ Test Manager ▪ Team Leader ▪ Analyst ▪ Designer ▪ Developer ▪ Tester ▪ Testing Team ▪ Technical Writer
3	Peer Review Process	<ul style="list-style-type: none"> ▪ None
4	Quality Assurance Process	<ul style="list-style-type: none"> ▪ Project Manager ▪ Quality Assurance Representative
5	Configuration Management Process	<ul style="list-style-type: none"> ▪ Project Manager ▪ Configuration Controller

Closure Phase

This phase is the shortest phase and contains the smallest number of participants.

No	SPIG Process	SPIG main roles in this phase
1	Project Management Process	<ul style="list-style-type: none"> ▪ Senior Manager ▪ Project Manager
2	Product Development Process	<ul style="list-style-type: none"> ▪ None
3	Peer Review Process	<ul style="list-style-type: none"> ▪ None
4	Quality Assurance Process	<ul style="list-style-type: none"> ▪ None
5	Configuration Management Process	<ul style="list-style-type: none"> ▪ Project Manager ▪ Configuration Controller

Guide Structure

This version of the SPIG contains five chapters, besides the introduction and additional two appendixes as follows:

Chapter 2: Project Management Process

This chapter depicts the project planning, estimation, risk planning, and project monitoring and control with detailed description of the process elements and how these elements interact.

Chapter 3: Product Development Process

This chapter describes the process encompassing requirements management, analysis, development planning, design, implementation, testing and product releasing. The process elements and the interaction between them during software development life cycle are also described in detail.

Chapter 4: Peer Review Process

This chapter describes the process encompassing planning for the peer reviews to be conducted on different work products, conducting different types of peer reviews, correction and follow-up on the review errors and findings

Chapter 5: Quality Assurance Process

The chapter contains detailed description of the quality assurance process describing how the QA team can enforce and monitor the other processes mentioned in this guide, in a disciplined and structured manner.

Chapter 6: Configuration Management Process

This chapter describes how to build and maintain CM environment, conducting different types of configuration audits, baselining and controlling change during the project in a disciplined manner.

Appendix A:

This appendix contains a complete list of all processes' templates and forms. They are grouped by processes and listed according to the logical order of use within each process order.

Appendix B:

This appendix contains all QA checklists that can be used to audit the procedures in all processes. Checklists are listed according to the order of their associate procedures.

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PROJECT MANAGEMENT

Project Management Process

Main Topics:

- ✓ *How to initiate a new software development project*
- ✓ *How to estimate project size, effort and budget*
- ✓ *How to plan for risk management*
- ✓ *How to align supportive plans into a single project plan*
- ✓ *How to execute, monitor and control project work*
- ✓ *How to successfully close the project*

PM

Process

The purpose of the project management process is to establish and maintain plans that define project activities. They provide adequate visibility into actual progress so that management can take effective actions when the software project performance deviates significantly from the plans. This process provides step-by-step information guidance on implementing the project management processes in projects.

The project management process in the SPIG provides an umbrella to all projects' activities. The project manager, acting as the main role in this process, should have full feasibility and control on both projects' activities and progress. There are many procedures under this process and they are divided into four major phases: initiation phase, planning phase, execution, monitoring and control phase, and finally, closure phase.

All these phases are quite simple encompassing only one procedure. The only exception is the planning phase which contains three procedures working in harmony to estimate project parameters, plan for project risk management and align the main project management plan with all other supportive plans such as quality assurance plan, configuration management plan, peer review plan and product development plan.

The project management practices and activities mentioned in this process should be considered as a good start point for the project management horizon. Each company/ project can insert whatever additional activities required. Moreover, some of the mentioned techniques and methods can be substituted by other ones if needed. For example, the company may choose other estimation methodologies other than SPIG mentioned ones, which can add more value to its projects.

Process Context

The project management process is the maestro in the SPIG. It contains all the required activities that can guide the planning, monitoring, controlling and execution of all other procedures within the whole project life cycle. The project management process seeks the support from peer review, quality assurance and configuration management processes to manage the development efforts.

Goals

Performing this process will achieve the following set of goals:-

- **Goal 1:** Project activities and commitments are planned and documented.
- **Goal 2:** Software estimates are documented for use in planning and monitoring the project.
- **Goal 3:** Affected groups and individuals agree to their commitments related to the project.
- **Goal 4:** Tracking actual results and performance against the project plans and performing analysis to variances.
- **Goal 5:** Taking and managing corrective actions are to closure when actual results and performance significantly deviate from the plans.
- **Goal 6:** The affected groups and individuals agree to changes to the project's commitments.
- **Goal 7:** Project experiences are collected and documented for future project estimations.

Policies

The set of policies that guide this process can be summed up in the following points:-

- The documented and consented proposal and/or signed contract should be treated as the statement of work and used as a basis for planning. The Project Manager should use all available data to perform estimation and planning activities.
- The Project Manager should be responsible for planning the project.
- The Project Manager should negotiate commitments with the customer and affected groups in the organization.
- The project management plan should contain the details required for effective execution of the plan and for monitoring and control. The plan shall be compatible with the project's process.
- The project management plan shall be reviewed by management and relevant stakeholders. It should also be reviewed for consistency with other project related plans.
- Affected groups review the software project's software size estimates, effort and cost estimates, schedules, and any other commitments.
- The Project Manager shall initiate all activities identified in the Project Management Plan, including assigning work to team members and coordinating with persons and groups within and outside the project as required.
- The Project Manager should monitor project progress with respect to the Project Management Plan. The gathered information should be reported and/or shared with relevant stakeholders.
- The Project Manager should be kept informed with the software project's status and issues.
- The Project Manager should identify issues that need to be addressed by corrective actions.
- Corrective actions should be planned and executed with the involvement of relevant stakeholders and should be tracked to closure.

- Corrective actions should be taken when the project results significantly deviate from the project plan, either by adjusting performance or by adjusting the plan.
- Changes to the project's commitments should be effected with the involvement and consent of the affected groups.
- Senior management should review all software project commitment changes and all software project commitments made to individuals and groups external to the organization.
- A project closure report should be prepared upon the project completion and/or at the end of each phase.

Procedures Overview

The process is broken down into six constituent process elements (procedures) to the detail needed to understand and describe the process. Each of these procedures is described in detail later in this chapter.

Initiation

The purpose of this procedure is to initiate the project and identify the higher level of information needed for the project management plan. It should be based on the information provided from the Statement of Work (SOW) document or any other equivalent documentation from the pre-sales phase. In this phase, the standards by which project's work products are to be developed will be identified. The Life Cycle Model (LCM) for software development and the tools to be used on the project will also be acknowledged.

Estimation

The purpose of this procedure is to identify project estimates, including size, effort, and cost. These estimates are used to develop and define project's schedule, team organization and non-human resources.

Risk Planning

The purpose of this procedure is to identify project's risks, assess and assign priority to each risk, and finally plan for mitigation and contingencies.

Planning Consolidation

The purpose of this procedure is to consolidate the project master plan with the product development plan, quality assurance plan, configuration management plan, peer review plan and estimation data. Upon consolidation, the procedure defines the tracking activities during project execution and the responsibilities and assignments for those activities. Obtaining commitment from project team and senior management has the same importance as the project plan itself. These commitments are acquired from all relevant stakeholders in this procedure.

Execution, Monitoring and Control

The purpose of this procedure is to monitor, collect and analyze all project data. The aim of the monitoring activities is to determine whether the project is on track or not, take corrective actions when the project deviates significantly from the

Project Management Plan and finally, communicate the project status with management, project team and customer.

Closure

The purpose of the project closure procedure is to ensure a graceful exit for the project. It aims at collecting closure acceptance from customer, discuss closure conditions content with project team and senior, and record the experience gained in practice in order to guide the enactment of other projects in the future. The project closure procedure may involve releasing resources and data analysis to suggest process improvements and learned lessons.

Assumptions and Constraints

The following is a list of assumptions that will be used during performing this process and any associated constraints:

- A project Manager is assigned by the organization.
- Roles and reporting relationships should be clear.
- All Managers are experienced and trained.
- Project team members, including the project manager are trained on project management processes and use them appropriately.
- Required supporting tools are available

Associated Risks

The set of risks which may impact the implementation of the process constitute the invalid assumptions. The following list shows the most expected risks:

- The Project Manager does not have prior experience in project management
- Un-specified project goal
- Lack of resources to execute project plans
- Lack of management support
- The contract contains a lot of issues and constraints
- Lack of top or senior management commitment to provide resources
- Improper definition of roles and responsibilities in the organization and project charters
- Unrealistic commitments taken during pre-sales activities
- Improper implementation of the related process

Relation to Other Processes

The project management process holds the following relations with other processes:

- The Project Management Process will plan, monitor, control and measure all activities in the Product Development Process.
- The Peer Review Process will provide a clear methodology for reviewing all critical artifacts during the performing of the process.

Project Management Process

- The Quality Assurance Process will audit all critical process activities and work products.
- The Configuration Management Process will provide the infrastructure for performing all the activities. In addition, it will provide a consistent change management cycle for all changes.

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Initiation Procedure

Purpose

The purpose of this procedure is to initiate the project and identify the higher level information needed for the project management plan. It should be based on the information provided from the Statement of Work (SOW) document or any other equivalent documentation from the pre-sales phase. In this phase, the standards by which project's work products are to be developed will be identified. The Life Cycle Model (LCM) for software development and the tools to be used on the project will also be identified.

Definitions

No	Term	Definition
1	Statement Of Work (SOW) (or Project Initiation Documents)	SOW, or any substitute documents, should contain at least information about the project description, objectives and scope, project contacts, assumptions, project deliverable(s), initial estimated effort and cost. Also initial project resources, project technology and tools, initial estimated expenses, customer supplied products/services, acceptance criteria, dependency and constraint, and payment schedule and references
2	Life Cycle Model (LCM)	Software Life Cycle Model is a description of the sequence of activities carried out in a software project, and the relative order of these activities.
3	Request For Proposal (RFP)	Publication of a request for information related to any required product by a prospective purchaser.
4	Project Management Plan (PMP)	A document that contains all details of project planning related items

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Project Manager assignment announced	Company specific phase (<i>can be pre-sales</i>)
2	Project ID identified	Company specific phase (<i>can be pre-sales</i>)

Inputs

No	Input	Output of the following procedure
1	Request For Proposal (RFP)	Pre-Sales Phase
2	Proposal (and Pre-Sales Documents)	Pre-Sales Phase
3	Contract	Pre-Sales Phase
4	Project Manager's Assignment Letter	Company Specific Phase (<i>This letter depends on the organizational hierarchy and business methodology.</i>)
5	Statement Of Work (SOW)	Pre-Sales Phase

Project Management Process

	(or Project Initiation Documents)	
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Activities

No	Role	Activity	Form/Template
1	PM	Analyze SOW or project initiation documents and contract, proposal from the sales department to understand the project.	
2	PM	Identify the project purpose and scope	PM Project Management Plan
3	PM	Identify project objectives	PM Project Management Plan
4	PM	Determine project assumptions	PM Project Management Plan
5	PM	Determine the target environment	PM Project Management Plan
6	PM	Identify project's work products	PM Project Management Plan
7	PM, TL	Identify projects and products standards such as process standards, standard templates and development standards	PM Project Management Plan
8	PM, TL	Analyze project parameter and select LCM and define the high level WBS (<i>work break down structure</i>), including project management activities	PM Project Management Plan
9	PM	Prepare initial schedule	PM Schedule
10	PM	Call the configuration management process for establishing the CM environment (CM Establishing CM Environment Procedure) to store and add the outputs.	

Outputs

No	Output	Inputs to the following procedure
1	Partial PMP	PD Requirements Planning Procedure PM Estimation Procedure PD Planning Procedure PR Planning Procedure QA Planning Procedure CM Planning Procedure
2	Approved Initial Schedule	PD Requirements Planning Procedure PM Estimation Procedure PD Planning Procedure PR Planning Procedure QA Planning Procedure CM Planning Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Partial PMP Approval	PD Requirements Planning Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Project Management Plan (PMP)

Estimation Procedure

Purpose

The purpose of this procedure is to identify project estimates including size, effort, and cost. These estimates are used to develop and define project's schedule, project's team organization and non-human resources.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Software Development Plan Approval	PD Planning Procedure
2	Review Plan Approval	PR Planning Procedure
3	Review Checklists Approval	PR Planning Procedure
4	QA Plan Approval	QA Planning Procedure
5	Audit Checklists Approval	QA Planning Procedure
6	Configuration Management Plan Approval	CM Planning Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Software Development Plan	PD Planning Procedure
2	Approved Review Plan	PR Planning Procedure
3	Approved Review Checklists	PR Planning Procedure
4	Approved QA Plan	QA Planning Procedure
5	Approved CM Plan	CM Planning Procedure
6	Approved Candidate Requirements	PD Requirements Elicitation Procedure
7	Approved Clear Traceable Requirements	PD Requirements Analysis Procedure
8	Partial PMP	PM Initiation Procedure
9	Historical Data (if available)	(Data from functionally-similar completed projects)

Activities

No	Role	Activity	Form/Template
1	PM	Select the suitable estimation method.	PM Estimation
2	PM	Complete the required information in the selected tab for the related method.	PM Estimation
3	PM	Calculate the project estimated size	PM Estimation

Project Management Process

4	PM	Calculate the project estimated effort	
5	PM	Calculate the project estimated cost	PM Estimation
6	PM	Documentation assumptions, constraints, conditions and references.	PM Estimation
7	PM	Translate the effort into schedule plan.	PM Schedule
8	PM	Estimate project human and non-human resources.	PM Project Plan
9	PM	Review the initial estimation.	PM Estimation

Outputs

No	Output	Inputs to the following procedure
1	Partial PMP	PM Risk Planning Procedure
2	Approved Size Estimation Parameters	PM Risk Planning Procedure
3	Approved Effort Estimation	PM Risk Planning Procedure
4	Approved Cost Estimation	PM Risk Planning Procedure
5	Approved Schedule Estimation	PM Risk Planning Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Size Estimation Parameters Approval	PM Risk Planning Procedure
2	Effort Estimation Approval	PM Risk Planning Procedure
3	Cost Estimation Approval	PM Risk Planning Procedure
4	Schedule Approval	PM Risk Planning Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Size Estimation Parameters
- Effort Estimation
- Cost Estimation

Fully Controlled CIs

- None

Managed CIs

- Project Estimations
- Project Schedule

Risk Planning Procedure

Purpose

The purpose of this procedure is to identify project's risks, assess and assign priority to each risk, and finally plan for mitigation and contingencies.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Size Estimation Parameters Approval	PM Estimation Procedure
2	Effort Estimation Approval	PM Estimation Procedure
3	Cost Estimation Approval	PM Estimation Procedure
4	Schedule Estimation Approval	PM Estimation Procedure

Inputs

No	Input	Output of the following procedure
1	Partial PMP	PM Estimation Procedure
2	Approved Software Development Plan	PD Planning Procedure
3	Approved Review Plan	PR Planning Procedure
4	Approved QA Plan	QA Planning Procedure
5	Approved CM Plan	CM Planning Procedure
6	Approved Candidate Requirements	PD Requirements Elicitation Procedure
7	Approved Size Estimation Parameters	PM Estimation Procedure
8	Approved Effort Estimation	PM Estimation Procedure
9	Approved Cost Estimation	PM Estimation Procedure
10	Approved Schedule Estimation	PM Estimation Procedure
11	Historical Data (if available)	(Data from functionally-similar completed projects)

Activities

No	Role	Activity	Form/Template
1	PM	Review all available information to understand the project nature.	
2	PM	Assign a unique risk identifier and define risks description.	PM Risk Management
3	PM	Determine the category of each risk.	PM Risk Management
4	PM	Assess the impact of each risk.	PM Risk Management
5	PM	Assess the probability of each risk.	PM Risk Management

6	PM	Assign a responsible person for each risk.	PM Risk Management
7	PM	Plan for risk mitigation for all risks.	PM Risk Management
8	PM	Plan for risk contingency for highly scored risks.	PM Risk Management
9	PM	Identify the frequency of tracking each risk.	PM Risk Management
10	PM	Review the initial risk plan.	

Outputs

No	Output	Inputs to the following procedure
1	Approved Risk Management Plan	PM Planning Consolidation Procedure

Exit Criteria (OR)

No	Criteria	Entry criteria to the following procedure
1	Risk Management Plan Approval	PM Planning Consolidation Procedure
2	Estimation Rework	PM Estimation Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Risk Management Plan

Fully Controlled CIs

- None

Managed CIs

- Risk Management Plan

Planning Consolidation Procedure

Purpose

The purpose of this procedure is to consolidate the project master plan with the product development plan, quality assurance plan, and configuration management plan, peer reviewing plan and estimation data. Upon consolidation, the procedure defines the tracking activities during project execution and the responsibilities and assignments for these activities. Obtaining commitment from project team and senior management has the same importance as the project plan itself. These commitments are taken from all relevant stakeholders in this procedure.

Definitions

None

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	Risk Management Plan Approval	PM Risk Planning Procedure

Inputs

No	Input	Output of the following procedure
1	Partial PMP	PM Estimation Procedure
2	Approved Product Development Plan	PD Planning Procedure
3	Approved Review Plan	PR Planning Procedure
4	Approved QA Plan	QA Planning Procedure
5	Approved CM Plan	CM Planning Procedure
6	Approved Candidate Requirements	PD Requirements Elicitation Procedure
7	Approved Size Estimation Parameters	PM Estimation Procedure
8	Approved Effort Estimation	PM Estimation Procedure
9	Approved Cost Estimation	PM Estimation Procedure
10	Approved Schedule Estimation	PM Estimation Procedure
11	Approved Risk Management Plan	PM Risk Planning Procedure

Activities

No	Role	Activity	Form/Template
1	PM	Review and consolidate sub-plans and estimation data, and ensure alignments.	
2	PM	Plan stakeholder involvement and update schedule as needed.	
3	PM	Plan for project monitoring and control.	
4	PM	Plan for project measurement.	

5	PM	Define the re-planning criteria.	
6	PM	Review PMP and close defects.	
7	PM	Approve PMP from senior management.	
8	PM	Conduct kick-off meeting (KOM) in attendance of all relevant stakeholders to collect comments and obtain commitments from all parties.	PM MOM
9	PM	Affect any required updates and acquire approvals.	
10	APP	Conduct functional configuration audit according to the CM Functional Configuration Audit Procedure.	
11	APP	Conduct physical configuration audit according to the CM Physical Configuration Audit Procedure.	
12	APP	Baseline planning outputs as per the CM Baseline Procedure	

Outputs

No	Output	Inputs to the following procedure
1	Baselined PMP	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
2	Baselined Product Development Plan	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
3	Baselined Review Plan	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
4	Baselined Review Checklists	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
5	Baselined QA Plan	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
6	Baselined Audit Checklists	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
7	Baselined CM Plan	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
8	Baselined CIs List	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
9	Baselined Candidate Requirements	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
10	Baselined Size Estimation Parameters	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
11	Baselined Effort Estimation	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
12	Baselined Cost Estimation	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
13	Baselined Schedule Estimation	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
14	Baselined Risk Management Plan	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
15	SM approvals	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Baselined Project Management Plan	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure
2	SM approval	PM Execution, Monitoring and Control Procedure PD Requirements Analysis Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Project Management Plan (*including all sub-plans and associated work product*)

Fully Controlled CIs

- None

Managed CIs

- MOMs
- Project Management Plan (*including all sub-plans and associated work product*)

Execution, Monitoring and Control Procedure

Purpose

The purpose of this procedure is to monitor, collect and analyze all project data. The aim of the monitoring activities is to determine whether the project is on track or not, take corrective actions when the project deviates significantly from the Project Management Plan and finally, communicate the project status with management, team and customer.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Baselined Project Management Plan	PM Planning Consolidation Procedure
2	Customer and SM approval	PM Planning Consolidation Procedure

Inputs

No	Input	Output of the following procedure
1	Baselined PMP	PM Planning Consolidation Procedure
2	Baselined Software Development Plan	PM Planning Consolidation Procedure
3	Baselined Review Plan	PM Planning Consolidation Procedure
4	Baselined Review Checklists	PM Planning Consolidation Procedure
5	Baselined QA Plan	PM Planning Consolidation Procedure
6	Baselined Audit Checklists	PM Planning Consolidation Procedure
7	Baselined CM Plan	PM Planning Consolidation Procedure
8	Baselined CIs List	PM Planning Consolidation Procedure
9	Baselined Candidate Requirements	PM Planning Consolidation Procedure
10	Baselined Size Estimation Parameters	PM Planning Consolidation Procedure
11	Baselined Effort Estimation	PM Planning Consolidation Procedure
12	Baselined Cost Estimation	PM Planning Consolidation Procedure
13	Baselined Schedule Estimation	PM Planning Consolidation Procedure
14	Baselined Risk Management Plan	PM Planning Consolidation Procedure
15	Customer and SM approvals	PM Planning Consolidation Procedure

Activities

No	Role	Activity	Form/Template
1	PM	Notify the responsible team members to	

Project Management Process

2

		execute the planned activities.	
2	PM	Track the execution of all planned activities and tasks.	PM Schedule
3	PM	Collect project progress data, detail activity report as per the frequency defined in PMP from all team members.	PM Schedule
4	PM	Revisit re-planning criteria	PM Project Management Plan
5	PM	Track project schedule according to the collected data.	PM Schedule
6	PM	Track project risks according to the collected data.	PM Risk Management
7	PM	Prepare the project tracking report according to the frequency defined in PMP and project schedule.	PM Schedule/ Project Tracking Report
8	PM, RS	Prepare and conduct a milestone review meeting involving all stakeholders (internally and/or externally) for discussing the project status and track the go/ no go decisions.	PM MOM
9	PM, SM	Prepare and conduct a milestone review meeting involving all senior manager(s) for discussing the project status and track the go/ no go decisions.	PM MOM
10	PM	Take and track the suitable corrective actions and assign responsibilities for executing any corrective actions.	PM Issue Tracking
11	SM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Tracking Reports	PM Project Closure Procedure
2	Approved Corrective Actions	PM Project Closure Procedure
3	Approved Risk Management Actions	PM Project Closure Procedure
4	Approved Go/No Go Decisions	PM Project Closure Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Tracking Reports Approval	PM Project Closure Procedure
2	Corrective Actions Approval	PM Project Closure Procedure
3	Risk Management Actions Approval	PM Project Closure Procedure
4	Go/No Go Decisions Approval	PM Project Closure Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Size Variance: Actual size versus estimated size
- Effort Variance: Actual effort versus estimated effort
- Cost Variance: Actual cost versus estimated cost
- Schedule Variance: Actual schedule versus estimated schedule

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- MOMs
- Tracking Reports
- Project Schedule
- Project Risk Management Database
- Project Issue Tracking Database

Closure Procedure

Purpose

The purpose of the project closure procedure is to ensure a graceful exit for the project. It aims at collecting closure acceptance from customer, discussing closure conditions content with project team and senior, and record the experience gained in practice, in order to guide the enactment of other projects in the future. The project closure procedure may involve data analysis to suggest process improvements and learned lessons.

Definitions

None

Entry Criteria (1 OR “2 AND 3 AND 4 AND 5 AND 6”)

No	Criteria	Exit criteria of the following procedure
1	No Go Decisions Approval	PM Execution, Monitoring and Control Procedure
2	Tracking Reports Approval	PM Execution, Monitoring and Control Procedure
3	Corrective Actions Approval	PM Execution, Monitoring and Control Procedure
4	Risk Management Actions Approval	PM Execution, Monitoring and Control Procedure
5	Acceptance Test Defect Summary Report Approval	PD Acceptance Test Execution Procedure
6	Formal Acceptance Approval	PD Acceptance Test Execution Procedure

Inputs

No	Input	output of the following procedure
1	Approved Tracking Reports	PM Execution, Monitoring and Control Procedure
2	Approved Corrective Actions	PM Execution, Monitoring and Control Procedure
3	Approved Risk Management Actions	PM Execution, Monitoring and Control Procedure
4	Approved Go/No Go Decisions	PM Execution, Monitoring and Control Procedure
5	Approved Acceptance Test Defect Summary Report	PD Acceptance Test Execution Procedure
6	Customer Formal Acceptance	PD Acceptance Test Execution Procedure

Activities

No	Role	Activity	Form/Template
1	PM	Prepare the project closure report using the latest tracking report and milestone review.	PM Project Closure Report
2	PM	Identify learned lessons.	PM Project Closure Report

3	PM, RS	Conduct meeting to analyze process data to extract experience gained in current process enactment.	PM MOM
4	PM, RS	Propose process modifications if needed and suggest modifications for the process forms and scripts.	PM MOM
5	PM, RS	Prepares and conduct meetings for discussing the project closure using the project closure report.	PM MOM
6	PM	Release all project resources	
7	SM, PM	Meet with senior management to review the project management report and obtain approval on project closure	PM MOM

Outputs

No	Output	Inputs to the following procedure
1	Approved Closure Report	Calling the CM Maintaining CM Environment Procedure
2	MOMs	Calling the CM Maintaining CM Environment Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Final Senior Management Approval	Calling the CM Maintaining CM Environment Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Project Closure Report

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PRODUCT DEVELOPMENT

Product Development Process

Main Topics:

- ✓ *How to elicit, analyze, develop, manage and validate project requirements*
- ✓ *How to plan for software development work*
- ✓ *How to design solution architecture, solution detailed design and implement them*
- ✓ *How to plan, design and execute different levels of software project testing*
- ✓ *How to plan and release the product*
- ✓ *How to successfully get customer acceptance*

PD Process

Customer requirements are the basis initially for the design as well as the entire product development process. The development of requirements includes planning for elicitation, elicitation, analysis, specification development, validation, and communication with the customer for acquiring acceptance. Design decisions, subsequent corrective actions, and feedback from each phase of the product's life cycle are analyzed for impact on requirements. At that stage, Management is required to keep track of the proposed changes against the agree-upon set of requirements. The involvement of relevant stakeholders in requirements development, analysis and Management gives them visibility into the evolution of requirements, and hence the product itself.

The clear and consistent requirements will be used as basis for development planning, product design and acceptance test planning. The product architecture is developed as a high level design, and then the detailed design is performed to provide all the information needed to produce, code, or otherwise implement the design as a product or product component. Testing activities can be applied to all aspects of the product. Testing methods can be applied to work products, as well as to the whole product and product components.

Testing can be applied in different levels and in different product life cycle phases. Component testing should be conducted on individual components, integration testing for all product components together, system testing on the whole system before delivering to the customer and finally acceptance testing on customer side. Formal releasing mechanism should be followed before the delivering and acceptance tests undertaken to provide clear visibility on the delivered product.

Process Context

The product development process is the heart of the SPIG and it contains all engineering activities that have the ability to transfer customer requirements into the final delivered product through successive procedures. These procedures compose the whole software development life cycle (SLDC). The product development process works under the supervision of the project management process and with support from peer review, quality assurance and configuration management processes.

Goals

Performing this program will achieve the following set of goals:-

- **Goal 1:** Requirements are Management and tracked to all product components during all project phases.
- **Goal 2:** Stakeholders' needs, expectations, constraints, and interfaces are elicited, analyzed, and stated as clear requirements, which are refined and elaborated to develop validated requirements specifications.
- **Goal 3:** Product architecture is selected and clearly defined, to be used for developing product-component detailed designs.
- **Goal 4:** Product components, and associated support documentation, are implemented from their designs.
- **Goal 5:** Preparation for testing, in all types and product life cycle phases, is conducted, and then product or product components are tested to ensure that they are suitable for use in their intended operating environment.
- **Goal 6:** Preparation for product releasing is conducted, which lead to the delivery of complete tested system to the customer for acceptance.

Policies

The set of policies that guide this process are as follows:-

- Eliciting the requirements from the customers, users and even the organization.
- Ensure that the elicited requirements are comprehensive and consistent.
- Ensure that the developed software specifications correctly express the requirements and will result in the intended functionality of the software.
- Ensure that all requirements management activates for the projects developed within the project management's authority are enacted in accordance to this policy.
- Ensure that the requirement documents are included in the project's configuration management activities.
- Documenting required changes to existing software via proper change management cycle.
- Designating project personnel to enact the requirements management activities, and ensure these personnel are qualified and properly trained to pursue their allocated responsibilities.
- Providing the acceptance criteria for evaluating the final product and verifying that the approved requirements are integrated in the new product release.
- The software product is traceable to the Software Requirements Specification (SRS) which should be considered as the starting point.
- The software development plan should address the software product activities as early as possible in SDLC and testing activities should start as early as possible.
- Members of the software engineering technical staff should receive the required training/orientation to perform their technical assignments.

Procedures Overview

The product development process consists of a large number of procedures that work in harmony during the project life cycle to reach the goals of the process and the project. The interaction between these procedures is carried out through four different channels; direct leading, required rework, calling, and conducting changes during the save channel. Following is a list of the procedures in the product development process.

Requirements Planning

The objective of the requirements planning procedure is to guide the enactment of the requirements elicitation process. The procedure involves establishing an agreement among the project's stakeholders on specific responsibilities and their accountability and the timeframe for completing the process tasks.

Requirements Elicitation

The objective of the elicitation procedure is to discover and capture candidate software requirements (both functional and non-functional) by communicating with the customer and/or end users and others who have stake in the system development. There are several techniques to elicit requirements, including brainstorming, interviews, questionnaires and focus groups.

Requirements Analysis

The objective of the analysis procedure is to further understand the requirements set by the customer. This will help in resolving conflicts and inconsistencies and ensuring that the requirements meet the quality attributes and reflect the customer needs. The procedure also involves negotiation among stakeholders to agree on a set of requirements. Tasks associated with this procedure will likely be repeated several times until an agreement is reached.

Requirements Development

The objective of the requirements development procedure is to transform identified requirements into a formal software requirement specification document. The result of the formalization procedure is a document, Software Requirements Specifications (SRS), which is used to communicate requirements among all stakeholders.

Requirements Validation

The objective of the validation procedure is to ensure that the developed SRS reflects the customer requirements. The process involves communicating SRS to all stakeholders and facilitating agreement among them.

Requirements Acceptance

The objective of the acceptance process is to confirm that the baseline requirements reflect the project's acceptance criteria. This procedure can also be used as a milestone to report progress to the customer and senior management.

Requirements Management

The objective of the requirements Management process is to ensure that all requirements are traceable and under control. The procedure mainly involves Management and maintaining the requirements database in addition to the requirements traceability. This procedure is needed when any changes to the approved SRS occur. The change may be a modification in an old requirement or a new one.

Development Planning

The objective of this process is to establish a reasonable plan for performing development activities. It ensures the involvement in the project from the initial stages, which accordingly will provide a strong infrastructure for the project's success. Product development team will share the planning of the project with the other stakeholders. Selecting the appropriate software development life cycle is an important step. The project deliverables and estimation of the product size and effort will be shared with other team members.

Architecture Designing

The objective of the design process is to develop a coherent, well-organized representation of the software product that meets the customer's requirements and satisfies the predefined quality criteria. The process comprises the architectural design that will be followed by the detailed design in the next procedure. The architectural design provides the infrastructure for the detailed one. The importance of software design can be defined by the following phrase: Quality design is the place where quality is fostered in software engineering. It is an iterative process through which requirements are translated into a 'blueprint' for constructing the software.

Detailed Designing

Architectural design and detailed design are usually carried out in sequence, as the detailed design largely depends on the architectural one. Detailed design provides the basis for the product implementation.

Implementation

The objective of the implementation procedure is the transformation of the detailed design representation into a programming language realization by applying the appropriate coding standard and the development of the required product documentation to support the coded product.

The code will be grouped into units (dictated by the selected language and design information). All units shall be transformed into executable code to be debugged. Incorrect code and other product component will be re-worked until run free of errors.

Component testing Preparation and Execution

The component test is a procedure used to validate that a particular module of source code is working properly. The procedure is to write test cases for all functions and methods so that whenever a change causes a regression, it can be quickly identified and fixed. Ideally, each test case is separate from the others.

This type of testing is mostly done by the developer/tester and not by end-users. The goal of component testing is to isolate each part of the program and prove that the individual parts are correct.

Integration Testing Preparation and Execution

Integration testing is the phase of software testing in which individual software modules are combined and tested as a group. It follows component testing and precedes system testing. Integration testing takes 'modules' as its input. These modules have been checked out by component testing. Integration test groups them in larger aggregates, applies tests defined in an Integration test plan to those aggregates, and delivers it as an integrated system that is ready for system testing.

System Testing Preparation and Execution

System testing is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing is the first occasion that the entire system can be tested against the functional and non-functional requirement. System testing is intended to test up to and beyond the bounds defined in the software/hardware requirements specifications.

Acceptance Testing Preparation and Execution

The acceptance test is jointly performed by users or sponsors with manufacturers or producers through black-box testing (that is, testers do not need to know anything about the internal workings of the system). The results will determine the acceptance of the system. Acceptance tests generally take the form of a suite of tests designed to be executed on the completed system. Each individual test, known as a case, exercises a particular operating condition of the user's environment or feature of the system, and will result in a pass or fail Boolean outcome. The objective of this procedure is to provide confidence that the delivered system meets the business requirements of both sponsors and users.

Product Releasing

A software release refers to the creation and availability of a new version of a software product. Each time a software program has major changes, the project team should decide on how to distribute the changes or the changed system to the customer. Release procedure is a procedure concerned with the compilation, assembly and delivery of source code and any related documentation into finished products or other software components.

Assumptions and Constraints

Following is a list of assumptions that will be used during performing this process and any associated constraints:

- Project team members, including the project manager are trained on project management processes and use them appropriately.
- The complete program cycle has to be considered, as this process is implemented in coordination with other processes in the program.

- The lack of early involvement of the software product engineering team in the software life cycle affects the efficiency of the planning, design and development decision. This may accordingly affect the quality of the final product.

Associated Risks

The set of risks which may impact the implementation of the process constitute the invalid assumptions. The following list shows the most expected risks:

- Requirements gathering and elicitation are not planned.
- Suitable stakeholders are not involved in the elicitation phase.
- Requirements are not documented or well analyzed.
- Inexperience and lack of training of the requirements engineering team.
- Development team does not understand the user's working environment.
- Difficulty in defining requirements. This could be attributed to inability of users to decide what they want, or difficulties related to the nature of the system.
- Requirements specifications are not well defined and not well validated.
- Requirements and their changes are not accepted by customer and senior management.
- High level and detailed designs are not clearly defined.
- Tests are not well prepared and not executed across the required levels.
- Released products are not completely tracked and identified.

Relation to Other Processes

The product development process holds the following relations with other processes:

- The Project Management Process will plan, monitor, control and measure all activities in the Product Development Process.
- The Peer Review Process will provide a clear methodology for reviewing all critical artifacts during the performing of the process.
- The Quality Assurance Process will audit all critical process activities and work products.
- The Configuration Management Process will provide the infrastructure for performing all the activities. In addition, it will provide a consistent change management cycle for all changes.

Requirements Planning Procedure

Purpose

The objective of the requirements planning procedure is to guide the enactment of the requirements elicitation process. The procedure involves establishing an agreement among the project's stakeholders on specific responsibilities, their accountability and the time frame for completing the process tasks.

Definitions

No	Term	Definition
1	Requirements Gathering	The basic activity addresses the receipt of requirements that a customer and/or stakeholder provide(s) to define what is needed or desired. These requirements may or may not be stated in technical terms.
2	Requirements Elicitation	Eliciting goes beyond gathering requirements by proactively identifying additional requirements not explicitly provided by customers.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Partial PMP Approval	PM Initiation Procedure
2	Rework from Requirements Elicitation	PD Requirements Elicitation Procedure
3	Rework from Requirements Analysis	PD Requirements Analysis Procedure
4	Calling From Requirements Administration	PD Requirements Administration Procedure

Inputs

No	Input	Output of the following procedure
1	Request For Proposal (RFP)	Pre-Sales Phase
2	Proposal (and Pre-Sales Documents)	Pre-Sales Phase
3	Statement Of Work (SOW) (or Project Initiation Documents)	Pre-Sales Phase
4	Partial PMP	PM Initiation Procedure
5	Related Regulations/Standards	Contract (<i>if applicable</i>)

Activities

No	Role	Activity	Form/Template
1	PM	Assign a person to engineer and manage requirements for the project.	

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2	AN	Review the given 'problem description' to gain understanding of the required product.	
3	AN	Identify the individuals and/or groups with a stake in the success of the project.	PD Requirements Elicitation Plan
4	AN	Identify acceptance criteria and document acceptance criteria for requirements elicitation procedures.	PD Requirements Elicitation Plan
5	AN	Develop a plan for requirements elicitation and document it.	PD Requirements Elicitation Plan
6	AN, PM	Risk assessment should start at this point; risks to the project development should be identified and assessed.	PM Risk Management
7	AN, PM	Review the plan to reach consensus on its contents to ensure that they have (<i>or can acquire</i>) required resources to deploy the plan.	PM Risk Management
8	PM, AN	Communicate the plan to the customer and supply needed updates.	
9	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Requirements Elicitation Plan	PD Requirements Elicitation Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Requirements Elicitation Plan Approval	PD Requirements Elicitation Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Requirements Elicitation Plan

Fully Controlled CIs

- None

Managed CIs

- Requirements Elicitation Plan
- Risks Database

- MOMs
- Communication with customer (*such as e-mails*)
- Approvals (*such as e-mails*)

SECC

Requirements Elicitation Procedure

Purpose

The objective of the elicitation procedure is to discover and capture candidate software requirements (both functional and non-functional) by communicating with the customer and/or end users and other stakeholders in the system development. There are several techniques to elicit requirements, including brainstorming, interviews, questionnaires and focus groups.

Definitions

No	Term	Definition
1	Functional Requirements	Functional requirements define the internal workings of the software. That is, the calculations, technical details, data manipulation, data processing, and other specific functionality that show how the required behavior is to be satisfied. They are supported by non-functional requirements, which impose constraints on the design or implementation (such as performance requirements, quality standards, or design constraints).
2	Non-Functional Requirements	Non-functional requirements are requirements which specify criteria that can be used to judge the operation of a system, rather than specific behaviors. This should be contrasted with functional requirements that specify specific behavior or functions. Typical non-functional requirements are reliability, scalability, and cost. Other terms for non-functional requirements are 'Quality attributes' and 'Quality of service requirements'.
3	Candidate Requirements	It is the requirements directly resulting from the elicitation efforts. These requirements were not analyzed, developed or validated in the analysis stage so far, and may not be so accurate. It may contain some inconsistencies, redundancies or missing parts

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Requirements Elicitation Plan Approval	PD Requirements Planning Procedure
2	Rework from Requirements Analysis	PD Requirements Analysis Procedure
3	Calling From Requirements Administration	PD Requirements Administration Procedure

Product Development Process

Inputs

No	Input	Output of the following procedure
1	Approved Requirements Elicitation Plan	PD Requirements Planning Procedure

Activities

No	Role	Activity	Form/Template
1	AN	Acquire the application domain knowledge, knowledge about the target organization and specific problem knowledge.	
2	AN	Identify candidate functional requirements. Each requirement is captured along with its rationale (if possible). The requirements may be arbitrary broken down into sub-groups to facilitate collection.	
3	AN	Recording functional requirements in the requirements database and procedures to establish traceability are activated at this point.	PD Requirements Management
4	AN	Identify candidate non-functional requirements. Each requirement is captured along with its rationale (if possible). The requirements may be arbitrary broken down into sub-groups to facilitate collection.	
5	AN	Recording non-functional requirements in the requirements database and procedures to establish traceability are activated at this point.	PD Requirements Management
6	AN	Repeat the previous two steps for any other types of requirements.	
7	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Candidate Requirements	PD Requirements Analysis Procedure PD Planning Procedure PR Planning Procedure QA Planning Procedure CM Planning Procedure

Exit Criteria (OR)

No	Criteria	Entry criteria to the following procedure
1	Candidate Requirements Approval	PD Requirements Analysis Procedure PD Planning Procedure PR Planning Procedure

		QA Planning Procedure CM Planning Procedure
2	Requirements Planning Rework	PD Requirements Planning Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Size of requirements, which can be measured through one of the following methods:
 - Number of use cases
 - Number of functional requirements
 - Number of non-functional requirements

Subjects for Review

- Candidate Requirements

Fully Controlled CIs

- None

Managed CIs

- MOMs
- Requirements Database
- Approvals (*such as e-mails*)

Requirements Analysis Procedure

Purpose

The purpose of the analysis procedure is to further understand the requirements set by the costumer. This will help in resolving conflicts and inconsistencies and ensuring that they meet the required quality attributes and reflect the customer needs. The procedure also involves negotiation among stakeholders to agree on a set of requirements. Tasks associated with this procedure will likely be repeated several times until an agreement is reached.

Definitions

No	Term	Definition
1	Requirements Traceability	Traceability is the ability to chronologically interrelate the uniquely identifiable entities in a meaningful way. It refers to the ability to link requirements back to stakeholders' rationales and forward to corresponding design artifacts, code, and test cases. Traceability supports many software engineering activities, such as change impact analysis, compliance verification of code, regression test selection, and requirements validation

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Candidate Requirements Approval	PD Requirements Analysis Procedure
2	Calling From Requirements Administration	PD Requirements Administration Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Candidate Requirements	PD Requirements Elicitation Procedure

Activities

No	Role	Activity	Form/Template
1	AN	Examine requirements to classify the difficulties and risks.	PD Requirements Management
2	AN	Assess risks and prioritize requirements.	PD Requirements Management
3	AN	Review and identify traceability to ensure that each requirement is traced back to at least an identified high-level requirement or a stated need in the problem description.	PD Requirements Management
4	AN	Negotiate conflicts with stakeholders to resolve them and ensure the identified	PD Requirements Management

Product Development Process

		requirements are complete, correct and reflect the customer needs.	
5	AN	Communicate with customer and resolve any pending issues.	PD Requirements Management
6	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Clear Traceable Requirements	PM Estimation Procedure

Exit Criteria (OR)

No	Criteria	Entry criteria to the following procedure
1	Clear Traceable Requirements Approval	PM Estimation Procedure
2	Requirements Elicitation Rework	PD Requirements Elicitation Procedure
3	Requirements Planning Rework	PD Requirements Planning Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- MOMs
- Requirements Database
- Communication with customer (*such as e-mails*)
- Approvals (*such as e-mails*)

Development Planning Procedure

Purpose

The objective of this procedure is to establish a reasonable plan for performing development activities. It ensures the involvement in the project from the initial stages, which accordingly will provide a strong infrastructure for the project's success. Product development team will share the planning of the project with the other stakeholders. Selecting the appropriate software development life cycle is an important step. The project deliverables and estimation of the product size and effort will be shared with other team members.

Definitions

No	Term	Definition
1	Software Development Life Cycle	The Software Development Life Cycle (SDLC) is a framework for understanding and developing information systems and software successfully. Businesses can acquire software in many ways, from simply purchasing it off the shelf, to designing a system tailored to the business needs. There are many versions of the life cycle; each has its own strengths and weaknesses.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Candidate Requirements Approval	PD Requirements Elicitation Procedure
2	Rework from project plan finalization	PM Planning Consolidation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Candidate Requirements	PD Requirements Elicitation Procedure
2	Partial PMP	PM Initiation Procedure

Activities

No	Role	Activity	Form/Template
1	PM, TL	Define a list of product deliverables concerning product development activities for each phase of the SDLC.	PD Software Development Plan
2	PM, TL & DES	Identify the suitable software engineering methods, environment and tools to be used.	PD Software Development Plan
3	PM, TL	Identify the required documentation, such as training manuals or user help.	PD Software Development Plan
4	PM,	Identify initial test types and levels (unit,	PD Software Development

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	TL & TM	integration, acceptance, regression testing, etc).	Plan
5	PM, TL	Identify training needs if new technologies or tools are to be used.	PD Software Development Plan
6	PM, TL, DES & TM	Identify the associated risks with the determined roles, responsibilities, methods, environments, tools, documentation and training needs.	PD Software Development Plan
7	PM	Approve the outputs	PD Software Development Plan

Outputs

No	Output	Inputs to the following procedure
1	Approved Product Development Plan	PM Estimation Procedure PM Risk Planning Procedure PM Planning Consolidation Procedure PD Acceptance Test Preparation Procedure PD Architecture Design Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Product Development Plan Approval	PM Estimation Procedure PM Risk Planning Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Software Development Plan (*as a part of PMP*).

Fully Controlled CIs

- None

Managed CIs

- MOMs
- Approvals (*such as e-mails*)
- Software Development Plan

Requirements Development Procedure

Purpose

The objective of the requirements development procedure is to transform identified requirements into a formal software requirement specification document. The result of the formalization procedure is a document, Software Requirements Specifications (SRS), which is used to communicate requirements among all stakeholders.

Definitions

No	Term	Definition
1	Software Requirement Specification	A Software Requirements Specification (SRS) is a complete description of the system behavior to be developed. It includes a set of user cases that describe all of the interactions that the users will encounter with the software. In addition to user cases, SRS contains functional and nonfunctional requirements.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Clear Traceable Requirements Approval	PD Requirements Analysis Procedure
2	Rework From Requirements Validation	PD Requirements Validation Procedure
3	Calling From Requirements Management	PD Requirements Management Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Clear Traceable Requirements	PD Requirements Analysis Procedure

Activities

No	Role	Activity	Form/Template
1	AN	Review the available traceable requirements to gain understanding of the requirements	PD Software Requirements Specification
2	AN	Develop and document precise functional requirements	PD Software Requirements Specification
3	AN	Develop and document precise non-functional requirements	PD Software Requirements Specification
4	AN	Develop and document any further related customer specifications	PD Software Requirements Specification
5	AN	Develop and document precise user interface	PD Software Requirements Specification

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6	AN	Develop and document precise software interface	PD Software Requirements Specification
7	AN	Develop and document precise hardware interface	PD Software Requirements Specification
8	AN	Develop and document precise list of associated product documentation and training material	PD Software Requirements Specification
9	AN	Develop and document precise remaining customer requirements such as delivery dates and evolution support	PD Software Requirements Specification
10	AN	Develop and document precise acceptance criteria	PD Software Requirements Specification
11	AN	Develop and document precise methods for validation and verifications	PD Software Requirements Specification
12	AN	Develop and document precise (if needed) organizational requirements such as business and cost requirements	PD Software Requirements Specification
13	AN	Develop and document any other required information	PD Software Requirements Specification
14	AN	Update the traceability matrix and document the traceability and dependency between all requirements.	PD Requirements Management
15	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Updated RTM	PD Requirements Validation Procedure
2	Approved SRS	PD Requirements Validation Procedure

Exit Criteria (“1 AND 2” OR 3 OR 4)

No	Criteria	Entry criteria to the following procedure
1	Software Development Plan Approval	PM Estimation Procedure PM Risk Planning Procedure
2	SRS Approval	PD Requirements Validation Procedure
3	Requirements Analysis Rework	PD Requirements Analysis Procedure
4	Requirements Elicitation Rework	PD Requirements Elicitation Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Software Requirements Specifications (SRS)
- Requirements Traceability Matrix (RTM)

Fully Controlled CIs

- Software Requirements Specifications (SRS)
- Requirements Traceability Matrix (RTM)

Managed CIs

- Approvals (*such as e-mails*)

SECC

Requirements Validation Procedure

Purpose

The objective of the validation procedure is to ensure that the developed SRS reflects the customer requirements. The process involves communicating the SRS to all stakeholders and facilitating agreement among them.

Definitions

No	Term	Definition
1	Requirements Validation	Requirements validation is the activity ensuring that the requirements are capable of guiding a development, and thus resulting in successful final validation.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	SRS Approval	PD Requirements Development Procedure
2	Calling From Requirements Management	PD Requirements Management Procedure

Inputs

No	Input	Output of the following procedure
1	Updated RTM	PD Requirements Development Procedure
2	Approved SRS	PD Requirements Development Procedure

Activities

No	Role	Activity	Form/Template
1	TT, CUS	Assess SRS to ensure that it meets the required qualities. For example, SRS should be complete, unambiguous, consistent, etc.	
2	TT, CUS	Confirm traceability, ensuring that all formalized requirements are traceable to higher requirements.	
3	TT, CUS	Document findings in a deficiency report	PD Defect Summary Report
4	TM	Assess the reported defects to classify and assign priorities to rectify.	PD Defect Summary Report
5	TM	Delegate defects that have to be corrected are a developer mission to solve.	PD Defect Summary Report
6	AN	Correct the delegated defects in SRS and report the type of the defect.	PD Software Requirements Specification
7	AN	Update the RTM	PD Requirements Management
8	TM	Close the corrected defect.	PD Defect Summary Report
9	APP	Conduct functional configuration audit	As per the process

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		according to CM Functional Configuration Audit Procedure.	
10	APP	Conduct Physical configuration audit according to CM Physical Configuration Audit Procedure.	As per the process
11	APP	Baseline all project outputs according to CM Baselining Procedure	As per the process
12	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Baselined SRS and RTM	PD Requirements Acceptance Procedure PD Architecture Design Procedure PD System Test Preparation Procedure PD Acceptance Test Preparation Procedure PD Implementation Procedure PD Requirements Management Procedure

Exit Criteria (OR)

No	Criteria	Entry criteria to the following procedure
1	Requirements Baselined	PD Requirements Acceptance Procedure PD Architecture Design Procedure PD System Test Preparation Procedure PD Acceptance Test Preparation Procedure
2	Requirements Development Rework	PD Requirements Development Procedure
3	Requirements Analysis Rework	PD Requirements Analysis Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Defects Date

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Defects Summary Reports
- Approvals (*such as e-mails*)

Requirements Acceptance Procedure

Purpose

The objective of the acceptance procedure is to confirm that the baseline requirements reflect the project's acceptance criteria. This procedure can also be used as a milestone to report progress to the customer and senior management.

Definitions

None

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Requirements Baselined	PD Requirements Validation Procedure
2	Calling From Requirements Management	PD Requirements Management Procedure

Inputs

No	Input	Output of the following procedure
1	Baselined SRS and RTM	PD Requirements Validation Procedure
2	Measurement Data	PM Execution, Monitoring and Control Procedure

Activities

No	Role	Activity	Form/Template
1	PM, AN	Present baselined requirements, SRS and associated measurements to senior management to provide evidence and visibility to the current state of the project requirements.	Formal Presentation or E-Mail
2	PM, AN	Obtain customer approval of the baselined requirements.	Formal Presentation or E-Mail
3	AN	Go through the formal change management process and requirements management process, if any modifications are needed.	As Per The Process
4	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Accepted Baselined Requirements	PM Execution, Monitoring and Control Procedure

Exit Criteria (OR)

No	Criteria	Entry criteria to the following procedure
1	Customer and Senior Management Acceptance	PM Execution, Monitoring and Control Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Approvals (*such as e-mails*)

SECC

Requirements Management Procedure

Purpose

The objective of the requirements management process is to ensure that all requirements are traceable and under control. The procedure mainly involves Management and maintaining the requirements database in addition to the requirements traceability. This procedure is needed when any changes to the approved SRS occur. The change may be a modification in an old requirement or a new one.

Definitions

None

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	Change Request Approval	CM Change Control Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Change Request	CM Change Control Procedure
2	Requirements Database	PD Requirements Elicitation Procedure
3	Baselined RTM	PD Requirements Validation Procedure
4	Approved Baselined SRS	PD Requirements Validation Procedure

Activities

No	Role	Activity	Form/Template
1	APP	Use PD Requirements Planning Procedure to plan for another round of elicitation of the new or updated requirements. <i>(if needed)</i>	As Per The Process
2	APP	Use PD Requirements Elicitation Procedure for elicitation of the new or updated requirements. <i>(if needed)</i>	As Per The Process
3	APP	Use PD Requirements Analysis Procedure to analyze the new or updated requirements. <i>(if needed)</i>	As Per The Process
4	APP	Use PD Requirements Development Procedure to update the SRS to reflect the new or updated requirements. <i>(if needed)</i>	As Per The Process
5	APP	Use PD Requirements Validation Procedure to validate the new or updated requirements. <i>(if needed)</i>	As Per The Process
6	APP	Use PD Requirements Acceptance Procedure to obtain acceptance on the new or updated requirements. <i>(if needed)</i>	As Per The Process
7	APP	Close the change request.	As Per The Process

Product Development Process

8	PM	Approve the outputs	
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Outputs

No	Output	Inputs to the following procedure
1	Approved Closed Change Request	PM Execution, Monitoring and Control Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Closed Change Request Approval	PM Execution, Monitoring and Control Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Approvals (*such as e-mails*)

Acceptance Test Preparation Procedure

Purpose

Testing process is a category of V & V, which takes part during the software life cycle. The testing process can be represented in three phases. Test preparation phase, test execution phase and test analysis phase. These phases are applicable for all types of testing (integration, system and acceptance and component testing). Hence, the purpose of this procedure is to prepare the acceptance test plan, acceptance test procedures and acceptance test cases.

Definitions

No	Term	Definition
1	Acceptance Test	The Acceptance Test is jointly performed by users or sponsors with manufacturers or producers through black-box testing (that is, the testers do not need to know anything about the internal workings of the system). The results will determine the acceptance of the system. Acceptance tests generally take the form of a suite of tests designed to be run on the completed system. Each individual test, known as a case, exercises a particular operating condition of the user's environment or feature of the system, and will result in a pass or fail Boolean outcome. The objective of this procedure is to provide confidence that the delivered system meets the business requirements of both sponsors and users.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Requirements Baselined	PD Requirements Validation Procedure
2	Rework From Integration Test	PD Integration Test Preparation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Software Development Plan	PD Planning Procedure
2	Baselined SRS and RTM	PD Requirements Validation Procedure

Activities

No	Role	Activity	Form/Template
1	TT	Review software development plan, SRS, RTM to gain more understanding of the required product.	
2	TT	Determine items to be tested in the	PD Test Plan

		acceptance test.	
3	TT	Determine features to be tested in the acceptance test.	PD Test Plan
4	TT	Determine testing approach for the acceptance test.	PD Test Plan
5	TT	Determine pass and fail criteria for the acceptance test.	PD Test Plan
6	TT	Determine suspension and resuming criteria for the acceptance test.	PD Test Plan
7	TT	Determine test deliverables from the acceptance test.	PD Test Plan
8	TT	Determine testing tasks in the acceptance test.	PD Test Plan
9	TT	Describe the testing environment for the acceptance test.	PD Test Plan
10	TT	Assign roles and responsibilities for the acceptance test.	PD Test Plan
11	TT	Identify training needs needed for the acceptance test.	PD Test Plan
12	TT	Identify associated risks with the acceptance test.	PD Test Plan
13	TT	Develop all possible associated test procedures for acceptance test.	PD Test Procedure
14	TT	Develop all possible associated test cases for acceptance test.	PD Test Cases
15	TT	Update the RTM	PD Requirements Management
16	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Acceptance Test Plan	PD Acceptance Test Execution Procedure
2	Approved Acceptance Test Procedures	PD Acceptance Test Execution Procedure
3	Approved Acceptance Test Cases	PD Acceptance Test Execution Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Acceptance Test Plan Approval	PD Acceptance Test Execution Procedure
2	Acceptance Test Procedures Approval	PD Acceptance Test Execution Procedure
3	Acceptance Test Cases Approval	PD Acceptance Test Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Test Plan
- Test Procedures
- Test Cases

Fully Controlled CIs

- Test Plan
- Test Procedures
- Test Cases

Managed CIs

- Approvals (*such as e-mails*)

SECC

System Test Preparation Procedure

Purpose

Testing process is a category of V & V, which takes part during the software life cycle. The testing process can be represented in three phases. Test preparation phase, test execution phase and test analysis phase. These phases are applicable for all types of testing (integration, system and acceptance and component testing). Hence, the purpose of this procedure is to prepare the system test plan, system test procedures and system test cases.

Definitions

No	Term	Definition
1	System Test	System Testing is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing is the first occasion that the entire system can be tested against the functional and non-functional requirement. System testing is intended to test up to and beyond the bounds defined in the software/hardware requirements specifications.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Requirements Baselined	PD Requirements Validation Procedure
2	Rework From Integration Test	PD Integration Test Preparation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Software Development Plan	PD Planning Procedure
2	Baselined SRS and RTM	PD Requirements Validation Procedure

Activities

No	Role	Activity	Form/Template
1	TT	Review software development plan, SRS, RTM to gain more understanding of the required product.	
2	TT	Determine items to be tested in the system test.	PD Test Plan
3	TT	Determine features to be tested in the system test.	PD Test Plan
4	TT	Determine testing approach for the system test.	PD Test Plan
5	TT	Determine pass and fail criteria for the	PD Test Plan

Product Development Process

		system test.	
6	TT	Determine suspension and resuming criteria for the system test.	PD Test Plan
7	TT	Determine test deliverables from the system test.	PD Test Plan
8	TT	Determine testing tasks in the system test.	PD Test Plan
9	TT	Describe the testing environment for the system test.	PD Test Plan
10	TT	Assign roles and responsibilities for the system test.	PD Test Plan
11	TT	Identify training needs needed for the system test.	PD Test Plan
12	TT	Identify associated risks with the system test.	PD Test Plan
13	TT	Develop all possible associated test procedures for system testing.	PD Test Procedure
14	TT	Develop all possible associated test cases for system testing.	PD Test Cases
15	TT	Update the RTM	PD Requirements Management
16	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved System Test Plan	PD System Test Execution Procedure
2	Approved System Test Procedures	PD System Test Execution Procedure
3	Approved System Test Cases	PD System Test Execution Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	System Test Plan Approval	PD System Test Execution Procedure
2	System Test Procedures Approval	PD System Test Execution Procedure
3	System Test Cases Approval	PD System Test Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Test Plan
- Test Procedures
- Test Cases

Fully Controlled CIs

- Test Plan
- Test Procedures
- Test Cases

Managed CIs

- Approvals (*such as e-mails*)

SECC

Architecture Design Procedure

Purpose

The objective of the design process is to develop a coherent, well-organized representation of the software product that meets the customer's requirements and satisfies the predefined quality criteria. The process comprises the architectural design that will be followed by the detailed design in the next procedure. The architectural design provides the infrastructure for the detailed one. The importance of software design can be defined by the following phrase, 'Quality design is the place where quality is fostered in software engineering'. It is an iterative process through which requirements are translated into a 'blueprint' for constructing the software.

Definitions

No	Term	Definition
1	Software Architecture	Software architecture is a representation of a software system, as well as the process and discipline for effectively implementing the design(s) for such a system. It is a representation because it is used to convey the information content of the related elements comprising a system, the relationships among those elements, and the rules governing those relationships.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Requirements Baselined	PD Requirements Validation Procedure
2	Rework From Detailed Design	PD Detailed Design Procedure
3	Rework From Integration Test	PD Integration Test Preparation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Software Development Plan	PD Planning Procedure
2	Baselined SRS and RTM	PD Requirements Validation Procedure
3	Reused Components Specifications	Reuse library (<i>if exists</i>).

Activities

No	Role	Activity	Form/Template
1	DES	Determine the system overview and context.	PD Architectural Design
2	DES	Determine the high level system	PD Architectural Design

Product Development Process

3

		architecture.	
3	DES	Perform architectural design by transforming the software requirements and system architecture into candidates high-level design architectures. This design contains components.	PD Architectural Design
4	DES	Determine the attributes of each component, such as description, type, purpose, function and dependencies.	PD Architectural Design
5	DES	Evaluate candidates' high-level architectural design and select the suitable one.	PD Architectural Design
6	DES	Check and review the reusable components library and select the reused components.	
7	DES	Identify design parameters such as data, relationships, constraints, and all the internal interfaces among components.	PD Architectural Design
8	DES	Update the RTM.	PD Requirements Management
9	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Architectural Approved High-Level Design	PD Detailed Design Procedure PD Integration Test Execution Procedure PD Implementation Procedure
2	Updated RTM	PD Implementation Procedure PD Integration Test Execution Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Architectural High-Level Design Approval	PD Detailed Design Procedure PD Integration Test Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- High-Level Design Architecture
- Requirements Traceability Matrix (RTM)

Fully Controlled CIs

- High-Level Design Architecture

- Requirements Traceability Matrix (RTM)

Managed CIs

- Approvals (*such as e-mails*)

SECC

Integration Test Preparation Procedure

Purpose

Testing process is a category of V & V, which takes part during the software life cycle. The testing process can be represented in three phases. Test preparation phase, test execution phase and test analysis phase. These phases are applicable for all types of testing (integration, system and acceptance and component testing). Hence, the purpose of this procedure is to prepare the integration test plan, integration test procedures and integration test cases.

Definitions

No	Term	Definition
1	Integration Test	Integration testing is the phase of software testing in which individual software modules are combined and tested as a group. It follows component testing and precedes system testing. Integration testing takes 'modules' as its input. These modules have been checked out by component testing. Integration test groups them in larger aggregates, applies tests defined in an Integration Test Plan to those aggregates, and delivers as its output the integrated system ready for system testing.

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	Product Architecture Design Approval	PD Architecture Design Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Product Architecture Design	PD Architecture Design Procedure

Activities

No	Role	Activity	Form/Template
1	TT	Review Software Development Plan, SRS, RTM to gain more understanding of the required product.	
2	TT	Determine items to be tested in the integration test.	PD Test Plan
3	TT	Determine features to be tested in the integration test.	PD Test Plan
4	TT	Determine testing approach for the integration test.	PD Test Plan
5	TT	Determine pass and fail criteria for the integration test.	PD Test Plan

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6	TT	Determine suspension and resuming criteria for the integration test.	PD Test Plan
7	TT	Determine test deliverables from the integration test.	PD Test Plan
8	TT	Determine testing tasks in the integration test.	PD Test Plan
9	TT	Describe the testing environment for the integration test.	PD Test Plan
10	TT	Assign roles and responsibilities for the integration test.	PD Test Plan
11	TT	Identify training needs needed for the integration test.	PD Test Plan
12	TT	Identify associated risks with the integration test.	PD Test Plan
13	TT	Develop all possible associated test procedures for integration test.	PD Test Procedure
14	TT	Develop all possible associated test cases for integration test.	PD Test Cases
15	TT	Update the RTM	PD Requirements Management
16	PM	Approve the outputs	

Outputs

No	Output	Inputs To The Following Procedure
1	Approved Integration Test Plan	PD Integration Test Execution Procedure
2	Approved Integration Test Procedures	PD Integration Test Execution Procedure
3	Approved Integration Test Cases	PD Integration Test Execution Procedure

Exit Criteria (“1 AND 2 AND 3” OR 4 OR 5 Or 6)

No	Criteria	Entry Criteria To The Following Procedure
1	Integration Test Plan Approval	PD Integration Test Execution Procedure
2	Integration Test Procedures Approval	PD Integration Test Execution Procedure
3	Integration Test Cases Approval	PD Integration Test Execution Procedure
4	Architecture Design Rework	PD Architecture Design Procedure
5	System Test Preparation Rework	PD System Test Preparation Procedure
6	Acceptance Test Preparation Rework	PD Acceptance Test Preparation Procedure

Metrics

- Planned schedule and effort

- Actual schedule and effort

Subjects for Review

- Test Plan
- Test Procedures
- Test Cases

Fully Controlled CIs

- Test Plan
- Test Procedures
- Test Cases

Managed CIs

- Approvals (*such as e-mails*)

SECC

Detailed Design Procedure

Purpose

Architectural design and detailed design are usually carried out in sequence, as the detailed design largely depends on the architectural one. Detailed design provides the basis for the product implementation.

Definitions

None

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	High-Level Architectural Design Approval	PD Architecture Design Procedure

Inputs

No	Input	Output of the following procedure
1	Approved High-Level Architectural Design	PD Architecture Design Procedure
2	Updated RTM	PD Requirements Validation Procedure
3	Baselined SRS	PD Requirements Validation Procedure
4	Reused Components Specifications	Reuse library (<i>if exist</i>)

Activities

No	Role	Activity	Form/Template
1	DES	Determine the components' overview and context.	PD Detailed Design
2	DES	Determine the required standards and conventions.	PD Detailed Design
3	DES	Design the detailed attributes of each component such as description, type, purpose, function and dependencies.	PD Detailed Design
4	DES	Check and review the reusable components library and select the reused components.	PD Detailed Design
5	DES	Identify design parameters such as data, relationships, constraints, and all the internal interfaces (among components).	PD Detailed Design
6	DES	Update and modify the High-Level Architectural Design.	PD Detailed Design
7	DES	Update the RTM.	PD Requirements Management
8	APP	Conduct functional configuration audit according to CM Functional Configuration Audit Procedure.	As per the process
9	APP	Conduct physical configuration audit	As per the process

Product Development Process

		according to CM Physical Configuration Audit Procedure.	
10	APP	Baseline all planning outputs according to CM Baselining Procedure.	As per the process
11	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Baselined High-Level Design Architecture	PD Implementation Procedure PD Component test Execution Procedure
2	Baselined Detailed Design	PD Implementation Procedure PD Component test Execution Procedure
3	Baselined RTM	PD Implementation Procedure PD Component test Execution Procedure

Exit Criteria (OR)

No	Criteria	Entry Criteria To The Following Procedure
1	Design Baselined	PD Implementation Procedure PD Component test Execution Procedure
2	Architecture Design Rework	PD Architecture Design Procedure
3	Development Planning Rework	PD Development Planning Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- High-Level Architecture Design
- Detailed Design
- Requirements Traceability Matrix (RTM)

Fully Controlled CIs

- High-Level Architecture Design
- Detailed Design
- Requirements Traceability Matrix (RTM)

Managed CIs

- Approvals (*such as e-mails*)

Component Test Preparation Procedure

Purpose

Testing process is a category of V & V, which takes part during the software life cycle. The testing process can be represented in three phases. Test preparation phase, test execution phase and test analysis phase. These phases are applicable for all types of testing (integration, system and acceptance and component testing). Hence, the purpose of this procedure is to prepare the component test plan, component test procedures and component test cases.

Definitions

No	Term	Definition
1	Component test	The component test is a procedure used to validate that a particular component/module of source code is working properly. The procedure is to write test cases for all functions and methods so that whenever a change causes a regression, it can be quickly identified and fixed. Ideally, each test case is separate from the others. This type of testing is mostly done by the developer/tester and not by end-users. The goal of component testing is to isolate each component/module of the program and prove that the individual parts are correct.

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	Baselined Design	PE Detailed Design Procedure

Inputs

No	Input	Output of the following procedure
1	Baselined Detailed Design	PD Detailed Design Procedure

Activities

No	Role	Activity	Form/Template
1	DEV /TT	Review software development plan, SRS, RTM to gain more understanding of the required product.	PD Test Plan
2	DEV /TT	Determine items to be tested in the component test.	PD Test Plan
3	DEV /TT	Determine features to be tested in the component test.	PD Test Plan
4	DEV /TT	Determine testing approach for the component test.	PD Test Plan
5	DEV /TT	Determine pass and fail criteria for the component test.	PD Test Plan
6	DEV	Determine suspension and resuming	PD Test Plan

Product Development Process

	/TT	criteria for the component test.	
7	DEV /TT	Determine test deliverables from the component test.	PD Test Plan
8	DEV /TT	Determine testing tasks in the component test.	PD Test Plan
9	DEV /TT	Describe the testing environment for the component test.	PD Test Plan
10	DEV /TT	Assign roles and responsibilities for the component test.	PD Test Plan
11	DEV /TT	Identify training needs required for the component test.	PD Test Plan
12	DEV /TT	Identify associated risks with the component test.	PD Test Plan
13	DEV /TT	Develop all possible associated test procedures for component test.	PD Test Plan
14	DEV /TT	Develop all possible associated test cases for component test.	PD Test Plan
15	DEV /TT	Update the RTM	PD Requirements Management
16	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Component test Plan	PD Component test Execution Procedure
2	Approved Component test Procedures	PD Component test Execution Procedure
3	Approved Component test Cases	PD Component test Execution Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Component test Plan Approval	PD Component test Execution Procedure
2	Component test Procedures Approval	PD Component test Execution Procedure
3	Component test Cases Approval	PD Component test Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Test Plan
- Test Procedures

- Test Cases

Fully Controlled CIs

- Test Plan
- Test Procedures
- Test Cases

Managed CIs

- Approvals (*such as e-mails*)

SECC

Implementation Procedure

Purpose

The objective of the implementation procedure is the transformation of the detailed design representation into a programming language realization. This is achieved by applying the appropriate coding standard and developing the required product documentation to support the coded product. The code will be grouped into executable units (dictated by the selected language and design information). All units shall be transformed into executable code to be debugged. Incorrect code and other product component will be re-worked until run free of errors.

Definitions

No	Term	Definition
1	Product Documentation	Product documentation is a written text that accompanies computer software. It either explains how it operates or how to use it.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Design Baselined	PD Detailed Design Procedure
2	Rework From Component test Execution	PD Component test Execution Procedure

Inputs

No	Input	Output of the following procedure
1	Baselined High-Level Architectural Design	PD Architecture Design Procedure
2	Baselined Detailed Design	PD Detailed Design Procedure
3	Updated RTM	PD Detailed Design Procedure
4	Baselined SRS	PD Requirements Validation Procedure

Activities

No	Role	Activity	Form/Template
1	TL, DEV	Read SRS, RTM, High-Level Architectural Design and Detailed Design to gain understanding.	
2	TL, DEV	Create and debug an executable code and database according to coding standard.	
3	DEV	Unit test the executable code according to unit testing practices or tools used in the organization	
4	TL, DEV	Ensure that all product components are compatible and ready for integration including code units, database, DLL etc.	
5	TL,	Review and check the readiness of	

Product Development Process

	DEV	components to be identified as reusable and add them to reusable library.	
6	TL, DEV	Perform initial integration of all product components.	
7	TW	Create the required product documentation.	
8	TL, DEV	Update the RTM.	
9	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Executable Product Components	PD Component test Execution Procedure
2	Approved Initial Integrated Product	PD Component test Execution Procedure
3	Approved Required System Documentation	PD Component test Execution Procedure PD Product Release Procedure CM Functional Configuration Audit Procedure
4	Updated RTM	PD Component test Execution Procedure
5	Identified Reusable Components	PD Component test Execution Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Product and Product Components Approval	PD Component test Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Code, code components, database...etc.
- System Documentation
- Requirements Traceability Matrix (RTM)

Fully Controlled CIs

- Code, code components, database...etc.
- Initial Integrated Product
- System Documentation
- Requirements Traceability Matrix (RTM)

Managed CIs

- Approvals (*such as e-mails*)

Component test Execution Procedure

Purpose

This is the procedure in which the actual component test takes place. Concurrently to the component testing activities, errors are corrected and have to be re-tested. In order to effectively coordinate development and testing activities, a defined procedure for error reporting and tracking is required. Based on a comparison of the actual results with the expected results, and according to the pass/fail rate, determination should be made and recorded in a defect log. The defect tracking enables defect reporting against discovered problems in the software, and managing and tracking the status of while defects from creation to closure.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Product and Product Components Approval	PD Implementation Procedure
2	Component test Plan Approval	PD Component test Preparation Procedure
3	Component test Procedures Approval	PD Component test Preparation Procedure
4	Component test Cases Approval	PD Component test Preparation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Executable Product Components	PD Implementation Procedure
2	Approved Initial Integrated Product	PD Implementation Procedure
3	Approved Component test Plan	PD Component test Preparation Procedure
4	Approved Component test Procedures	PD Component test Preparation Procedure
5	Approved Component test Cases	PD Component test Preparation Procedure

Activities

No	Role	Activity	Form/Template
1	DEV /TT	Review the component test plan, component test procedure and component test cases to gain more understanding of the planned component test.	
2	DEV	Execute component test plan, procedures	

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	/TT	and test cases.	
3	DEV /TT	Report discovered unit defects and all its parameters in detail.	PD Defect Summary Report
4	DEV /TT	Assess the reported unit defects to classify and determine priorities to it.	PD Defect Summary Report
5	DEV /TT	Delegate the unit defects that have to be corrected to a developer to solve.	
6	DEV /TT	Correct the delegated unit defects and report the type of the defect.	
7	DEV /TT	Retest all defects that resulted from the component test trying to reproduce the defects, check resolving, and report if new defects found.	
8	DEV /TT	Close the corrected unit defect.	PD Defect Summary Report
9	APP	Conduct functional configuration audit according to CM Functional Configuration Audit Procedure.	As per the process
10	APP	Conduct Physical configuration audit according to CM Physical Configuration Audit Procedure.	As per the process
11	APP	Baseline all planning outputs according to the CM Baselining Procedure.	As per the process
12	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Component test Defect Summary Report	PD Integration Test Execution Procedure CM Functional Configuration Audit Procedure PD Product Release Procedure
2	Baselined Corrected Executable Product Components	PD Integration Test Execution Procedure

Exit Criteria (“1 AND 2” OR 3)

No	Criteria	Entry criteria to the following procedure
1	Component test Defect Summary Report Approval	PD Integration Test Execution Procedure
2	Product and Product Components Baselined	PD Integration Test Execution Procedure
3	Implementation Rework	PD Implementation Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Defects Date

Subjects for Review

- None

Fully Controlled CIs

- Product components
- System Documentation

Managed CIs

- Approvals (*such as e-mails*)

SECC

Integration Test Execution Procedure

Purpose

This is the procedure in which the actual integration test takes place. Concurrently to the integration testing activities, errors are corrected and have to be re-tested. In order to effectively coordinate development and testing activities a defined procedure for error report and tracking is required. Based on a comparison of the actual results with the expected results, and according to the pass/fail rate, determination should be made and recorded in a defect log. The defect tracking enables defect reporting against discovered problems in the software, while managing and tracking the status of the defects from creation to closure.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Component test Defect Summary Report Approval	PD Component test Execution Procedure
2	Product and Product Components Baselined	PD Component test Execution Procedure
3	Integration Test Plan Approval	PD Integration Test Preparation Procedure
4	Integration Test Procedures Approval	PD Integration Test Preparation Procedure
5	Integration Test Cases Approval	PD Integration Test Preparation Procedure

Inputs

No	Input	Output of the following procedure
1	Baselined Corrected Executable Product Components	PD Integration Test Execution Procedure
2	Approved Integration Test Plan	PD Integration Test Preparation Procedure
3	Approved Integration Test Procedures	PD Integration Test Preparation Procedure
4	Approved Integration Test Cases	PD Integration Test Preparation Procedure

Activities

No	Role	Activity	Form/Template
1	TT	Review the integration test plan, integration test procedure and integration test cases to gain more understanding of the planned integration test.	

2	TE	Execute integration test plan, procedures and test cases.	
3	TE	Report discovered integration defects and all its parameters in detail.	PD Defect Summary Report
4	TE	Assess the reported integration defects to classify and determine priorities.	PD Defect Summary Report
5	PM/ TL/ TM	Delegate the resulted defects that have to be corrected to a developer to solve.	
6	DEV	Correct the delegated integration defects and report the type of the defect.	
7	TE	Retest the integration defect to try to reproduce the defect and report if new defects found.	
8	TM	Close the corrected integration defect.	PD Defect Summary Report
9	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Integration Test Defect Summary Report	PD Product Release Procedure CM Functional Configuration Audit Procedure PD Product Release Procedure
2	Approved Integrated Product	PD System Test Execution Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Integration Test Defect Summary Report Approval	PD System Test Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Defects data

Subjects for Review

- None

Fully Controlled CIs

- Product components
- System Documentation

Managed CIs

- Approvals (*such as e-mails*)

System Test Execution Procedure

Purpose

This is the procedure in which the actual system test takes place. Concurrently to the system testing activities, errors are corrected and have to be re-tested. In order to effectively coordinate development and testing activities a defined procedure for error report and tracking is required. Based on a comparison of the actual results with the expected results, and according to the pass/fail rate, determination should be made and recorded in a defect log. The defect tracking enables defect reporting against discovered problems in the software, while managing and tracking the status of the defects from creation to closure.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Integration Test Defect Summary Report Approval	PD Integration Test Execution Procedure
2	System Test Plan Approval	PD System Test Preparation Procedure
3	System Test Procedures Approval	PD System Test Preparation Procedure
4	System Test Cases Approval	PD System Test Preparation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Integrated Product	PD Integration Test Execution Procedure
2	Approved System Test Plan	PD System Test Preparation Procedure
3	Approved System Test Procedures	PD System Test Preparation Procedure
4	Approved System Test Cases	PD System Test Preparation Procedure

Activities

No	Role	Activity	Form/Template
1	TT	Review the system test plan, system test procedure and system test cases to gain more understanding of the planned system test.	
2	TE	Execute system test plan, procedures and test cases.	
3	TE	Report discovered system defects and all its parameters in detail.	PD Defect Summary Report
4	PM/	Assess the reported system defects to	PD Defect Summary Report

Product Development Process

	TM	classify and determine priorities.	
5	PM/ TL/ TM	Delegate the system defects that have to be corrected to a developer to solve.	
6	DEV	Correct the delegated system defects and report the type of the defect.	
7	TE	Retest the system defect to try to reproduce the defect and report if new defects found.	
8	TM	Close the corrected system defect.	PD Defect Summary Report
9	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved System Test Defect Summary Report	PD Product Release Process CM Functional Configuration Audit Procedure PD Product Release Procedure
2	Approved System	PD Product Release Process PD Product Release Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	System Test Defect Summary Report Approval	PD Product Release Process

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Defects Date

Subjects for Review

- None

Fully Controlled CIs

- Product components
- System Documentation

Managed CIs

- Approvals (*such as e-mails*)

Product Releasing Procedure

Purpose

Software releasing refers to the creation and availability of a new version of a software product. Each time a software product has major changes, the project team should decide on how to distribute the changes or the changed system to the customer. Release procedure is the procedure concerned with the compilation, assembly and delivery of source code and any related documentation into finished products or other software components.

Definitions

None

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	System Test Defect Summary Report Approval	PD System Test Execution Process

Inputs

No	Input	Output of the following procedure
1	Approved System Test Defect Summary Report	PD System Test Execution Procedure
2	Approved Integration Test Defect Summary Report	PD Integration Test Execution Procedure
3	Approved Component test Defect Summary Report	PD Component test Execution Procedure
4	Approved System	PD System Test Execution Procedure
5	Baselined Required Product Documentation	PD Implementation Procedure

Activities

No	Role	Activity	Form/Template
1	TT	Review and analyze all test results including system, integration and component tests to ensure that the planned quality levels have been met.	
2	TL, TR	Review the integrity between product documentation and the product to be released, while evaluating any updated issues.	
3	APP	Conduct functional configuration audit according to CM Functional Configuration Audit Procedure.	As per the process
4	APP	Conduct functional configuration audit according to CM Functional Configuration Audit Procedure.	As per the process
5	TL	Prepare installation procedure to install at	PD System Installation Plan

Product Development Process

		the customer site.	
6	TL	Plan for installation and conduct all required arrangements with the customer.	PD System Installation Plan
7	TL	Produce the release note for this version.	PD Product Release
8	APP	Baseline the software part of the system according to CM Baselining Procedure.	As per the process
9	PM, TL	Install and deliver a running system at the customer site.	
10	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Internally Approved Delivered System	PD Acceptance Test Execution Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Delivered System Internal Approval	PD Acceptance Test Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Installation Procedure
- Installation Plan

Fully Controlled CIs

- Release Note

Managed CIs

- MOMs
- System Installation Plan
- Approvals (*such as e-mails*)

Acceptance Test Execution Procedure

Purpose

This is the procedure in which the actual acceptance test takes place. Concurrently to the acceptance testing activities, errors are corrected and have to be re-tested. In order to effectively coordinate development and testing activities a defined procedure for error report and tracking is required. Based on a comparison of the actual results with the expected results, and according to the pass/fail rate, determination should be made and recorded in a defect log. The defect tracking enables defect reporting against discovered problems in the software, while managing and tracking the status of the defects from creation to closure.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Delivered System Internal Approval	PD Product Release Procedure
2	Acceptance Test Plan Approval	PD Acceptance Test Preparation Procedure
3	Acceptance Test Procedures Approval	PD Acceptance Test Preparation Procedure
4	Acceptance Test Cases Approval	PD Acceptance Test Preparation Procedure

Inputs

No	Input	Output of the following procedure
1	Internally Approved Delivered System	PD Product Release Procedure
2	Approved Acceptance Test Plan	PD Acceptance Test Preparation Procedure
3	Approved Acceptance Test Procedures	PD Acceptance Test Preparation Procedure
4	Approved Acceptance Test Cases	PD Acceptance Test Preparation Procedure

Activities

No	Role	Activity	Form/Template
1	TT, CU	Review the acceptance test plan, acceptance test procedure and acceptance test cases to gain more understanding of the planned acceptance test.	
2	TT, CU	Execute acceptance test plan, procedures and test cases.	
3	TT,	Report discovered acceptance defects and	PD Defect Summary Report

	CU	all its parameters in detail.	
4	TT, CU	Assess the reported acceptance defects to classify and determine priorities.	
5	PM/ TL/ TM	Delegate the acceptance defects that have to be corrected are a developer to solve.	
6	DEV	Correct the delegated acceptance defects and report the type of the defect.	
7	TE	Retest the acceptance defect to try to reproduce the defect and report if new defects found.	
8	TT, CU	Close the corrected acceptance defect.	PD Defect Summary Report
9	PM	Obtain customer formal acceptance.	
10	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Acceptance Test Defect Summary Report	PM Project Closure Procedure
2	Customer Formal Acceptance	PM Project Closure Procedure

Exit Criteria (AND)

No	Criteria	Inputs to the following procedure
1	Acceptance Test Defect Summary Report Approval	PM Project Closure Procedure
2	Formal Acceptance Approval	PM Project Closure Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Defects Data

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- MOMs
- Customers Acceptance and/or Approvals (*such as e-mails*)

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PEER REVIEW

Peer Review Process

Main Topics:

- ✓ *How to plan for reviewing the project work products*
- ✓ *How to conduct peer review on critical work products*
- ✓ *How to correct the discovered defects*
- ✓ *How to follow-up and track detected defects to closure*

PR Process

Peer review goals are to detect and remove defects from work products early in the development cycle. Peer reviews involve a methodical examination of work products by the author's peers to identify defects and areas where changes are needed. It is necessary to ensure that peer review provisions are embedded in product and product component requirements, designs, developmental plans, and schedules. Verification includes inspection, testing, analysis, and demonstration of work products. The specific products that will undergo a peer review are identified and selected in the project's plan. The requirements to be satisfied by each selected work product should be determined from the beginning.

Identifying the peer review procedures and criteria is very important to ensure that the work products meet their requirements which should be aligned with the selected work products, and requirements methods. Some preparation activities should be conducted before the peer review, according to the available resources, procedures and criteria. The preparation activities should include, identifying who will be invited to participate in the peer review of each work product; identifying the key reviewers who must participate in the peer review; preparing and updating any materials that will be used during the peer review process.

The peer review and its preparations such as checklists, review criteria, and scheduling are structured and performed incrementally as work products are being developed. The focus of the peer review should be on the work product in review not on the person who produced it. Issues arising during the peer review should be communicated to the primary developer of the work product for correction. In addition, follow-up activities should be performed to ensure the resolution of all, or at least major, raised issues and comments during the review. Some statistical measures may help in the process, such as the average number of defects per unit size, number of reviewers, review effort. These statistical measures may be extended to measure review efficiency and yield.

Process Context

The peer review process is the early safety and technical quality gate for both the interim and the final delivered products. The peer review process is preformed as soon as the critical work products appeared and before its approval, in order catch serious defects as soon as possible.

Goals

Performing this process will achieve the following set of goals:-

- **Goal 1:** Peer reviews are planned, scheduled and monitored.
- **Goal 2:** Defects are identified, reworked and removed during the peer review process.

Policies

The set of policies that guide this process are as follows:-

- Plan for all peer reviews and document these plans
- Identify and remove defects in the work products
- Perform peer reviews according to a documented procedure

Procedures Overview

The major objective of peer review is to detect defects, omissions, and contradictions in work products. Its aim is to improve the product, consider alternative implementations and exchange new techniques and style variations to the participants.

Planning

The planning phase enables the identification of the work products to be reviewed. It establishes the method to be used to perform the review and identifies the requirements to be satisfied by each selected work product.

Execution

The execution of peer review involves scheduling, preparing, and executing peer review meetings.

Rework

The reworking procedure will give the author the opportunity to rework the work product and resolve all raised issues in the review meeting. This procedure is optional.

Follow-up

In the follow-up procedure, corrections of all defects planned for rework are verified. The performers confirm that all open issues have been resolved, and all redline errors have been corrected, thus the review is closed.

Assumptions and Constraints

Following is a list of assumptions that will be used during performing this process and any associated constraints:

- Peer review planning, quality assurance and configuration management activities follow the related processes and procedures.
- The peer review plan is an integral part of the software project management plan.
- Peer review could be applied for software project on both technical work products (such as requirements, design, code, test cases, etc.) and non-technical work products (such as plans, estimations, reports, etc.).

Associated Risks

The set of risks which may impact the implementation of the process constitute the invalid assumptions. The following list shows the most expected risks:

- Participants do not understand the review process.
- The review process is not followed.
- The right people do not participate in the review process.
- Review meetings drift into problem solving.

Relation to Other Processes

The peer review process has the following relations with other processes:

- The Project Management Process will plan, monitor, control and measure all activities in the Peer Review Process.
- The Configuration Management Process will provide the infrastructure for performing all the activities. In addition, it will provide a consistent change management cycle for all changes.
- The Quality Assurance Process will audit all critical process's activities and work products.
- Peer review is a proven mechanism for effective defect removal. The peer review and testing processes areas may appear to be similar, but they address different issues. Testing, as a part of the product development process, demonstrates that the product, as provided (or as it will be provided), will fulfill its intended use. On the other hand, peer review addresses whether the work product properly reflects the specified requirements. In other words, peer review ensures that 'you built it right', whereas testing ensures that 'you built the right thing'.
- Selection of the peer review methods typically begins with involvement in the definition of product and product component requirements, as a part of the Product Development Process, to ensure that these requirements are verifiable. Re-verification should be addressed by the peer review methods to ensure that rework performed on work products does not cause unintended defects.

Planning Procedure

Purpose

The planning phase enables the identification of the work products to be reviewed. It establishes the method to be used to perform the review and identifies the requirements to be satisfied by each selected work product.

Definitions

None

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Candidate Requirements Approval	PD Requirements Elicitation Procedure
2	Rework from project plan finalization	PM Planning Consolidation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Candidate Requirements	PD Requirements Elicitation Procedure
2	Partial PMP	PM Initiation Procedure

Activities

No	Role	Activity	Form/Template
1	PM	Identify work product to be reviewed.	PR Review Planning
2	PM	Identify the method of review.	PR Review Planning
3	PM	Identify the requirements and criteria to be satisfied by each selected work product.	PR Review Planning
4	PM, PR	Identify the peer review schedule and the staff who participate in review.	PR Review Planning
5	RL, AU	Schedule the follow-up meeting for the work product.	
6	PM, PR	Establish and maintain checklists to ensure that work products are reviewed consistently.	PR Checklist
7	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Review Plan	PM Estimation Procedure PM Risk Planning Procedure PM Planning Consolidation Procedure PR Execution Procedure
2	Approved Review Checklists	PR Execution Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Review Plan Approval	PR Execution Procedure
2	Review Checklists Approval	PR Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Number of planned work products to be reviewed with walk through
- Number of planned work products to be reviewed with formal inspection

Subjects for Review

- Peer Review Plan (*as a part of PMP*).
- Peer Review Checklists (*as a part of PMP*).

Fully Controlled CIs

- None

Managed CIs

- Peer Review Plan
- Peer Review Checklists
- Approvals (*such as e-mails*)

Execution Procedure

Purpose

The execution phase involves the preparation and execution of the peer reviews. Walkthroughs and Formal Inspections are among the known peer review types which can be executed for software work products.

Definitions

No	Term	Definition
1	Walkthrough	Walkthroughs are the least formal of peer reviews. At a minimum, the product author and one peer are required to conduct a Walkthrough. Additional peers may be assigned depending on the size of the product being reviewed. A peer is defined as someone, besides the principal work product author, who is trained, experienced, and knowledgeable of the work product being reviewed
2	Formal Inspection	Formal Inspection (FI) is a structured formal peer review. The purpose of an FI is to identify and classify product defects. The product author's peers conduct FIs. An FI team typically has three to six members. A moderator leads the process. Defect resolution is mandatory, and rework may be formally verified by re-inspection or informally reviewed. Defect data is systematically collected and stored in a peer review database.

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Review Plan Approval	PR Planning Procedure
2	Review Checklists Approval	PR Planning Procedure
3	The availability of the work products to be reviewed	The calling procedure that has a work product to be reviewed

Inputs

No	Input	Output of the following procedure
1	Approved Review Plan	PR Planning Procedure
2	Approved Review Checklists	PR Planning Procedure
3	Work product to be reviewed	The calling procedure that has a work product to be reviewed

Activities

No	Role	Activity	Form/Template
1	PM	Prepare for the review according to the used method.	

2	RL	lead, manage, and coordinate the review session	
3	PR	Follow the guidance outlined in the approved review checklist	PR Reviewing checklist
4	PR	Review the work product and raise issues.	PR Defect Summary Report
5	AU, PR	Answer raised questions in any phase, and negotiate the identified defects with the reviewer	
6	AU, PR	Conduct root-cause analysis brainstorming meeting. (Optional)	
7	PR	Classify and record defects found in work product	PR Defect Summary Report
8	PR	Decide if the work product should be re-inspected.	
9	PR, PM	Record preparation and execution phase metrics	PR Defect Summary Report
10	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Defect Summary Report	PR Reworking Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Defect Summary Report Approval	PR Reworking Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Number of planned work products reviewed with walk through
- Number of planned work products reviewed with formal inspection
- Identified defects by severity
- Identified defects by type

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Defect Summary Report
- Approvals (*such as e-mails*)

Rework Procedure

Purpose

The rework procedure is conducted to correct all defects and resolve all open issues. This procedure is mandatory.

Definitions

None

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	Defect Summary Report Approval	PR Execution Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Defect Summary Report	PR Execution Procedure

Activities

No	Role	Activity	Form/Template
1	AU	Estimate due dates for resolution of open issues.	PR Defect Summary Report
2	PM	Plan and schedule the rework based on the author's estimates	
3	AU	Follow the guidance outlined in the approved review checklist	PR Reviewing checklist
4	AU	Correct defects identified in the work product.	PR Defect Summary Report
5	PR	Verify the work product after the correction of the defects	PR Defect Summary Report
6	PM, AU	Resolve all open issues for the work product and close the defect status.	PR Defect Summary Report
7	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Updated Work Product	PR Follow-up Procedure CM Functional Configuration Audit Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Updated Work Product Approval	PR Follow-up Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- None

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Follow-up Procedure

Purpose

In the follow-up procedure, corrections of all defects planned for rework are verified. The performers confirm that all open issues have been resolved, and all redline errors have been corrected. Thus the review is closed. This procedure may be mandatory or optional depending on the method of review implemented.

Definitions

None

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Updated Work Product Approval	PR Reworking Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Updated Work Product	PR Reworking Procedure
2	Approved Defect Summary Report	PR Execution Procedure
3	Approved Review Plan	PR Planning Procedure

Activities

No	Role	Activity	Form/Template
1	RL	Follow the guidance outlined in the approved review checklist	Review checklist
2	RL	Schedule the follow-up meeting with the author of the work product.	
3	RL	Verify that all defects planned for rework have been corrected.	
4	RL	Verify that all open issues planned for resolution have been resolved.	
5	RL	Log remaining open issues or defects (<i>if any</i>) and update the defect summary report	Defect Summary report
6	PM, PR	Close the review	
7	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Defect Summary Report	The calling procedure that sent the work product to be reviewed.

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Defect Summary Report Approval	The calling procedure that sent the work product to be reviewed.

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Identified defects by status

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Defect Summary Report
- Approvals (*such as e-mails*)

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QUALITY ASSURANCE

Quality Assurance Process

Main Topics:

- ✓ *How to plan for conducting QA Audits*
- ✓ *How to conduct QA Audits*
- ✓ *How to follow-up and track detected non-compliances to closure*

QA Process

The QA process area provides management to all levels (senior management and project management) with appropriate visibility into the activities implemented in the project, and the work products being produced throughout the project life cycle. The QA process evaluates the execution of a project's activities to help the management in ensuring that these activities are performed according to the organization's applicable processes and standards.

Within the QA process, objective - and may be independent - reviews and audits are conducted and reported accordingly. Deviations from standards are identified and reported as non-compliance issues. Evaluation objectivity is critical to the success of QA processes. This can be achieved by ensuring the independence of the QA individuals and using pre-defined criteria for evaluation.

An independent reporting channel to the appropriate level of management must be available so that non-compliance issues can be escalated as necessary. When local resolution of non-compliance issues cannot be obtained, the process indicates the use of escalation mechanism to ensure resolution of issues. In open culture environments, independence may be waived and QA activities can be performed by project team members. In this case, the efficiency of auditing activities should be evaluated regularly and the used criteria should be solid enough to help team members identifying non-compliances issues.

QA auditing should not be confused with either peer reviews or configuration management audits. The peer reviews focus is identifying logic problems in a single work product under the review. On the other hand, configuration management audits focus is finding problems in configuration management system and logic problems across successive work products.

Process Context

The quality assurance process is the quality gate that ensure conformance to process and work products standards for both the interim and the final delivered products. The quality assurance process is performed as planned to the critical work products before, and may be after, its approval in order to catch serious non-compliances as soon as possible.

Goals

Performing this process will achieve the following set of goals:-

- **Goal 1:** The adherence of the performed activities and associated work products to the applicable project process descriptions, procedures and standards is objectively evaluated.
- **Goal 2:** Non-compliance issues are objectively tracked and communicated and resolution is ensured.

Policies

The set of policies that guide this process are as follows:-

- QA in the organization is the responsibility of the Quality Assurance Manager (QAM) who is directly reporting to the Senior Manager.
- Providing each project with a QA Representative (QAR) who is assigned by and reporting directly to the QAM.
- Reporting the results of the evaluation to the Project Manager and QAM, and as required to the Senior Manager who should have periodical reviews with QAM.
- Actions to resolve the identified issues should be tracked to closure.

Procedures Overview

The quality assurance process consists of a small number of procedures that work in harmony during the project life cycle to reach the goals of the process and the project. The interaction between these procedures is carried out through four different ways, namely direct leading, required rework, calling, and conducting changes during save channel. Following is a list of the procedures in the Quality Assurance process.

Planning

The objective of this procedure is to establish a reasonable plan for performing QA auditing activities on the project level. It ensures the involvement in the project from the initial stages, which accordingly will provide a strong infrastructure for the project's success.

Execution

The objective of this procedure is to execute the QA auditing activities on the project level according to the QA plan. Auditing and evaluating project processes and work products are done to ensure adherence to applicable process description, standards and procedures as per the project's processes. Auditing ensures that all issues and/or deviations detected during audit processes are communicated to relevant stakeholders and that the corrective actions are identified and documented.

Follow-up

The objective of this procedure is to ensure the closure of all NCs appearing in the QA audit according to the agreed corrective actions. Otherwise, referring the non-closed NCs to the senior management to take the required and suitable action.

Assumptions and Constraints

Following is a list of assumptions that will be used during performing this process and any associated constraints:

- The QA department and/or function are established in the organization.
- Adequate fund is provided to execute QA activities to the projects.
- The QA representative is a competent, trained person and has an adequate experience in the project domain.
- Audit checklist templates are properly understood and implemented.

Associated Risks

The set of risks which may impact the implementation of the process constitute the invalid assumptions. The following list shows the most expected risks:

- Any violation of the pre-mentioned assumptions and constraints.
- Lack of top management or senior manager commitment to resolving issues and non-compliances.
- Improper definition of roles and responsibilities in the organization and project charters.
- Improper implementation of the related process.

Relation to Other Processes

The project management process has the following relations with other processes:

- The Project Management Process will plan, monitor, control and measure all activities in the Quality Assurance Process.
- The Peer Review Process will provide a clear methodology for reviewing all critical artifacts during the performing of the process.
- The Configuration Management Process will provide the infrastructure for performing all the activities. In addition, it will provide a consistent change management cycle for all changes.

Planning Procedure

Purpose

The objective of this procedure is to establish a reasonable plan for performing QA auditing activities on the project level, and to be augmented in the project from the initial stages. This will provide a strong infrastructure for the project's success.

Definitions

None

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Candidate Requirements Approval	PD Requirements Elicitation Procedure
2	Rework from project plan finalization	PM Planning Consolidation Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Candidate Requirements	PD Requirements Elicitation Procedure
2	Partial PMP	PM Initiation Procedure

Activities

No	Role	Activity	Form/Template
1	PM	Request to assign QAR for the project.	
2	QAM	Assign QAR from the QA team to the project.	
3	QAM	Notify SM, PM and QAR on the assignment.	
4	QAR	Reviewing all available projects' documents to understand project nature.	
5	PM, QAR	Define the purpose of all QA activities and relate with project success criteria.	QA Quality Assurance Plan
6	PM, QAR	Determine the scope of the QA audits and activities.	QA Quality Assurance Plan
7	PM, QAR	Determine the processes to be audited.	QA Quality Assurance Plan
8	PM, QAR	Determine the work products to be audited.	QA Quality Assurance Plan
9	PM, QAR	Determine the standards that will be used as a basis for auditing.	QA Quality Assurance Plan
10	QAR	Develop auditing checklists for the identified work products.	QA Work Product Audit Checklist
11	PM, QAR	Determine the QA organization and structures.	QA Quality Assurance Plan

Quality Assurance Process

12	PM, QAR	Determine roles and responsibilities.	QA Quality Assurance Plan
13	PM, QAR	Determine escalation mechanism.	QA Quality Assurance Plan
14	PM	Determine training needs.	QA Quality Assurance Plan
15	QAR	Determine the required non-human resources.	QA Quality Assurance Plan
16	QAR	Determine the reporting mechanism and frequency.	QA Quality Assurance Plan
17	QAR	Consolidate and finalize the QA Plan.	QA Quality Assurance Plan
18	PM	Review the initial QA plan.	
19	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Quality Assurance Plan	PM Estimation Procedure PM Risk Planning Procedure PM Planning Consolidation Procedure QA Execution Procedure
2	Approved Audit Checklists	PM Estimation Procedure QA Execution Procedure PM Risk Planning Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	QA Plan Approval	PM Estimation Procedure QA Execution Procedure
2	Audit Checklists Approval	PM Estimation Procedure QA Execution Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- Quality Assurance Plan (*as a part of PMP*).
- QA checklists (*as a part of PMP*)

Fully Controlled CIs

- None

Managed CIs

- Quality Assurance Plan
- QA checklists

Execution Procedure

Purpose

The objective of this procedure is to execute the QA auditing activities on the project level according to the QA plan. Auditing and evaluating project processes and work products are performed to ensure the adherence to applicable process description, standards and procedures as per the project's processes. Auditing ensures that all issues and/or deviations detected during audit process are communicated to relevant stakeholders and that the corrective actions are identified and documented.

Definitions

None

Entry Criteria (1 AND 2 AND 3) OR (2 AND 4)

No	Criteria	Exit criteria of the following procedure
1	QA Plan Approval	QA Planning Procedure
2	Audit Checklists Approval	QA Planning Procedure
3	Conducting QA audit calling	PM Execution, Monitoring and Control Procedure
4	Request for audit	The calling procedure that has a need for instant audit

Inputs

No	Input	Output of the following procedure
1	Approved Quality Assurance Plan	QA Planning Procedure
2	Approved Audit Checklists	QA Planning Procedure

Activities

No	Role	Activity	Form/Template
1	QAR, AU	Conduct the process and work products audit session using the agreed upon audit criteria.	
2	QAR	Document the audit findings.	QA Audit Report
3	QAR	Communicate the findings to the processes' owners, work products' authors and PM.	
4	QAR	Determine the suitable corrective action, preventive action (optional) and closure criteria to resolve the deviation.	QA Audit Report
5	QAR	Prepare the QA audit report to enable the NCs follow-up.	QA Audit Report

Outputs

No	Output	Inputs to the following procedure
1	Approved Corrective Actions	QA Follow-up Procedure
2	Approved Audit Report	QA Follow-up Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Corrective Actions Approval	QA Follow-up Procedure
2	Audit Report Approval	QA Follow-up Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Audit Reports
- Non-compliances Reports

Follow-up Procedure

Purpose

The objective of this procedure is to ensure the closure of all NCs appeared in the QA audit according to the agreed upon corrective actions. Otherwise escalate the non-closed NCs to the senior management to take the required and suitable action.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Corrective Actions Approval	QA Execution Procedure
2	Audit Report Approval	QA Execution Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Corrective Actions	QA Execution Procedure
2	Approved Audit Report	QA Execution Procedure

Activities

No	Role	Activity	Form/Template
1	AU	Implement the approved corrective action.	
2	AU	Release new or revised work product.	
3	AU	Communicate the corrective action and its impact to the relevant stakeholders.	
4	AU	Inform QAR about the readiness to verify the implementation of the corrective actions.	
5	QAR	Track the planned closure dates for all corrective actions and follow-up for unresolved NCs.	
6	QAR	Schedule follow-up audit after the implementation of the corrective actions.	
7	QAR	Check the corrective actions implementation.	
8	QAR	Escalate unresolved issues according to the pre-defined escalation mechanism.	QA Escalation Report
9	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Closed NCs	PM Execution, Monitoring and Control Procedure

2	Approved Escalation Reports	PM Execution, Monitoring and Control Procedure
---	-----------------------------	--

Exit Criteria (AND)

No	Criteria	PM Execution
1	Closed NCs Approval	PM Execution, Monitoring and Control Procedure
2	Escalation Reports Approval	PM Execution, Monitoring and Control Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Actual percentage of closed NCs
- Actual percentage of escalated NCs

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Escalation reports

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CONFIGURATION MANAGEMENT

Configuration Management Process

Main Topics:

- ✓ *How to plan for managing configuration of project work products*
 - ✓ *How to manage and maintain the configuration management environment*
 - ✓ *How to conduct both physical and functional configuration management*
 - ✓ *How to baseline project work products*
 - ✓ *How to manage the changes in the project*
-

CM Process

Configuration Management (CM) is about uniquely identifying, controlling storage, controlling changes, and reporting status of software products, product components and selected intermediate work products during the system's life cycle. CM encompasses the everyday tasks within a software organization, whether development or maintenance, to establish and maintain the integrity of work products in a project throughout the project life cycle. CM involves identifying the configuration of developed work products, hence assuring the reliability of products delivered to customers by systematically controlling changes to the identified work products.

The existence of a configuration management environment is the most important part of the configuration management system. This environment should support the automation of configuration management activities as much as possible. The automation ability can be limited to just version controlling or can be extended to include branching, merging, auditing, and integrity check.

All configuration management activities as well as the configuration management repository structure should be planned, tracked, maintained and audited. Configuration management audits focus on the physical and logical integrity between interim and final work products through the whole project life cycle. This type of audits shouldn't be confused with audits performed by the quality assurance function. The target of the last one is to check the conformance to organizational quality standards and indentifying deviations. Finally, a secure change management mechanism should be followed to maintain this integrity when a change request is proposed.

Process Context

The configuration management process provides a safe infrastructure to the whole project and the software development life cycle. All emerging work products are stored in the configuration management environment and controlled under the appropriate level. In addition, it provides a controlled environment to mange project changes.

Goals

Performing this process will achieve the following set of goals:-

- **Goal 1:** Baselines of identified work products are established and properly maintained.
- **Goal 2:** Changes to work products under configuration management are tracked and controlled.
- **Goal 3:** Integrity of baselines is established and maintained.

Policies

The set of policies that guide this process are as follows:-

- Establishing and maintaining baselines for identified work products.
- Ensuring the tracking and control of changes to all baselined items.
- Ensuring and maintaining integrity of all baselined items.
- Providing accurate status and configuration data to relevant stakeholders.

Procedures Overview

The configuration management process consists of five procedures, namely planning for configuration management, performing configuration identification, performing change control, performing status accounting, and performing configuration audits. With the exception of the planning procedure, all CM procedures are repeated continuously while the process is being executed and they extend throughout the project life cycle. CM is a supporting process, the interaction between its procedures and other project activities is carried out by either direct lead-in or calling. Following is a list of the procedures in the CM process:-

Planning

The objective of the CM planning procedure is to develop the required guidance for the deployment of the configuration management procedures. This procedure involves the identification of the project configuration controller, developing the CM plan and ensuring its integration with the overall project plan.

Establishing CM Environment

The purpose of this procedure is to establish the configuration management system, including the storage media, system, and the tools for accessing the configuration system. The procedure will produce the required infrastructure for the overall development project.

Maintaining CM Environment

The purpose of this procedure is to maintain the configuration management system, including the storage media, system, and the tools for accessing the configuration system. The procedure will produce the required infrastructure for the overall development project.

Functional Configuration Audit

The purpose of this procedure is to guide the performance of the functional audit activities on the configuration management system including the storage media, system, and the tools for accessing the configuration system. The procedure, when performed, ensures the logical consistency between the contents of the configuration management system and approves the readiness for performing the baselining. This audit is not related to the quality assurance audit. The quality assurance audit is just seeking the compliance with predefined standards, while this audit is seeking the integrity and compliance to the requirements specification.

Physical Configuration Audit

The purpose of this procedure is to guide the physical audit activities on the configuration management system including the storage media, system, and the tools for accessing the configuration system. The procedure, when performed, ensures the physical existence and consistency between the contents of the configuration management system and approves the readiness for performing the baselining. This procedure is not only performed before the baselining, as in the functional audit case, but also can be done in any time to ensure the required level of integrity.

Baselining

The purpose of this procedure is to produce baselines from the identified CIs. The procedure, when performed, ensures the existence and existence's announcement of the baselines that will be considered as a starting point for further development phases in the product development life cycle. The quality of the baseline is completely dependent on the functional and physical audits done before the baselining.

Change Control

The purpose of this procedure is to guide the performing of save changes to any stable work product. The change control procedure starts by raising a change request, then be being evaluated, implemented and verified. The impact of these changes should be estimated and then evaluated at the end of the project at the project closure phase.

Assumptions and Constraints

Following is a list of assumptions that will be used during performing this process and any associated constraints:

- Low level of formality could be adopted.
- Software products can be compiled and linked manually.

Associated Risks

The set of risks which may impact the implementation of the process include the invalid assumptions in addition to the following list which shows the most expected risks:-

- Lack of management support.
- Loss of interest by project team members due to process formality.
- Process being viewed as a bureaucratic overhead to the project.
- Using a CM tool with less features and sophistication than required.
- The change control becomes a bottleneck controlling the development process beyond the planned role for the CC.
- Delegation of CM activities to whoever is available.
- Use of decentralized CM repositories. A key concept behind the CM is to share information; using decentralized model might challenge the correct deployment of that key concept.

Relation to Other Processes

The project management process has the following relations with other processes:

- The Project Management Process will plan, monitor, control and measure all activities in the Configuration Management Process.
- The configuration management process will provide the infrastructure to all procedures in the Product Development Process.
- The Peer Review Process will provide a clear methodology for reviewing all critical artifacts during the performing of the process.
- The Quality Assurance Process will audit all critical process's activities and work products.

Planning Procedure

Purpose

The objective of the CM planning procedure is to develop required guidance for the deployment of the configuration management procedures. This procedure involves the identification of the project configuration controller, developing the CM plan and ensuring its integration with the overall project plan.

Definitions

No	Term	Definition
1	Configuration Item (CI)	An aggregation of work products that is designated for configuration management and treated as a single entity in the configuration management process.
2	Fully Controlled CI	A configuration item that is placed under formal configuration control using baselines that can only be changed as part of the formal change control procedure including the CCB approvals.
3	Managed CI	A configuration item that is not subject to formal change management. Managed CIs are controlled by simply tracking changes made without formal CCB approval, may (may not) be part of baselines, and need not be audited in the configuration audits.
4	Baseline	The configuration information formally designated at a specific time during a product's or product component's life. Configuration baselines, plus approved changes from those baselines, constitute the current configuration information. Usually, the baseline term describes how different CIs are related to each other and how this CIs are related to project's milestones.
5	Configuration Management Audit	An audit conducted to verify that a configuration item conforms to a specified standard or requirement.

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Candidate Requirements Approval	PD Requirements Elicitation Procedure
2	Rework from project plan finalization	PM Planning Consolidation Procedure

Configuration Management Process

Inputs

No	Input	Output of the following procedure
1	Approved Candidate Requirements	PD Requirements Elicitation Procedure
2	Partial PMP	PM Initiation Procedure

Activities

No	Role	Activity	Form/Template
1	PM	Identify a Configuration Controller (CC).	
2	PM, CC	Determine the configuration control board.	CM Configuration Management Plan
3	CC	Determine and describe the detailed CM environment.	CM Configuration Management Plan
4	CC	Determine the detailed project repository structure.	CM Configuration Management Plan
5	CC	Determine the configuration items and their appropriate level of control.	CM CIs List
6	CC	Determine the naming conventions.	CM Configuration Management Plan
7	PM, CC	Determine the types of baselines during the project and baselining criteria.	CM Configuration Management Plan
8	PM, CC	Determine the relation between project milestones and major baselines.	CM Configuration Management Plan
9	PM, CC	Determine the change management evaluation mechanism.	CM Configuration Management Plan
10	PM, CC	Determine the change decision-taking mechanism.	CM Configuration Management Plan
11	PM, CC	Determine the types of the CM audits that will be conducted in the project.	CM Configuration Management Plan
12	CC	Determine the relation between the baselines and CM audits.	CM Configuration Management Plan
13	PM, CC	Determine the data to be included under the data management plan.	CM Configuration Management Plan
14	CC	Determine the access control permissions.	CM Configuration Management Plan
15	PM, CC	Determine data retention rules.	CM Configuration Management Plan
16	PM, CC	Determine backups and recovery policies, data and plan.	CM Configuration Management Plan
17	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Configuration Management Plan	PM Estimation Procedure PM Risk Planning Procedure PM Planning Consolidation Procedure CM Functional Configuration Audit Procedure CM Physical Configuration Audit Procedure

Configuration Management Process

		CM Maintaining CM Environment Procedure
2	Approved CIs List	PM Estimation Procedure CM Functional Configuration Audit Procedure CM Physical Configuration Audit Procedure CM Maintaining CM Environment Procedure PM Risk Planning Procedure

Exit Criteria (AND)

No	Criteria	Entry criteria to the following procedure
1	Configuration Management Plan Approval	PM Estimation Procedure CM Functional Configuration Audit Procedure CM Physical Configuration Audit Procedure CM Maintaining CM Environment Procedure
2	CIs List Approval	PM Estimation Procedure CM Functional Configuration Audit Procedure CM Physical Configuration Audit Procedure CM Maintaining CM Environment Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Number of CIs.

Subjects for Review

- Configuration Management Plan (*as a part of PMP*)
- CIs list (*as a part of PMP*)

Fully Controlled CIs

- None

Managed CIs

- Configuration Management Plan
- CIs list
- Approvals (*such as e-mails*)

Establishing CM Environment Procedure

Purpose

The purpose of this procedure is to establish the configuration management system, including the storage media, system, and the tools for accessing the configuration system. The procedure, when performed, produces the required infrastructure for the overall development project.

Definitions

None

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	Calling From Project Initiation	PM Initiation Procedure

Inputs

No	Input	Output of the following procedure
1	Partial PMP	PM Initiation Procedure

Activities

No	Role	Activity	Form/Template
1	CC	Prepare, or ensure the existence of, the required hardware and devices for the CM environment.	
2	CC	Install, or ensure the existence of, the CM system and access tools for all types of environments.	
3	CC	Create the initial project repository structure.	
4	CC	Establish the initial access rights and mechanisms to satisfy the required access and security levels.	
5	PM	Review the established environment.	
6	RS	Add, retrieve, and update CIs.	
7	RS	Add, retrieve, and update records.	
8	PM	Collect measurements as per the identified metrics below.	
9	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved CM Environment	CM Maintaining CM Environment Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	CM Environment Approval	CM Maintaining CM Environment Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Approvals (*such as e-mails*)

SECC

Maintaining CM Environment Procedure

Purpose

The purpose of this procedure is to maintain the configuration management system, including the storage media, system, and the tools for accessing the configuration system. The procedure, when performed, produces the required infrastructure for the overall development project.

Definitions

None

Entry Criteria

No	Criteria	Exit criteria of the following procedure
1	CM Environment Approval	CM Establishing CM Environment Procedure

Inputs

No	Input	Output of the following procedure
1	Approved CM Environment	CM Establishing CM Environment Procedure
2	Approved CIs List	CM Planning Procedure

Activities

No	Role	Activity	Form/Template
1	CC	Check that the hardware and devices for the CM environment are working correctly.	
2	CC	Check the CM system and access tools for all types of environments.	
3	RS	Add, retrieve, and update CIs.	
4	RS	Add, retrieve, and update records.	
5	CC	Generate the required reports on the CM environment according to the CM plan.	
6	CC	Create backups according to the CM plan.	
7	PM, CC	Test the backups by simulating the recovery steps according to the CM plan.	
8	CC	Maintain data retention and archives according to the CM plan.	
9	RS	Repeat any required previous activities as needed and according to the CM plan, up to the end of the closure phase.	
10	PM, CC	Remove all access rights, except for the CC. Close the CM environment and keep archives.	
11	PM	Approve the outputs	

Configuration Management Process

Outputs

No	Output	Inputs to the following procedure
1	Approved CM Reports	PM Execution, Monitoring and Control Procedure
2	Approved Tested Backups	PM Execution, Monitoring and Control Procedure
3	Closed CM Environment	Project End

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Closed CM Environment Approval	Project End

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Approvals (*such as e-mails*)

Functional Configuration Audit Procedure

Purpose

The purpose of this procedure is to guide the performance of the functional audit activities on the configuration management system, including the storage media, system, and the tools for accessing the configuration system. The procedure, when performed, ensures the logical consistency between the contents of the configuration management system and approves the readiness for performing the baselining. This audit is not related to the quality assurance audit. The quality assurance audit is just seeking the compliance with predefined standards, while the functional configuration audit is seeking the integrity with the requirements specification.

Definitions

No	Term	Definition
1	Functional Configuration Audit (FCA)	The objective of a Functional Configuration Audit is to provide an independent evaluation of the configuration items' actual functionality and to prove its consistency with the requirement specifications. This audit is held prior to baselining to verify that all requirements specified in the Software Requirements Specification (SRS) have been met.

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	CM Environment Approval	CM Establishing CM Environment Procedure
2	Request for Audit	The calling procedure that has a need for instant audit

Inputs

No	Input	Output of the following procedure
1	Approved Configuration Management Plan	CM Planning Procedure
2	Approved CM Environment	CM Establishing CM Environment Procedure
3	Current version of the CI list	Continuously updated during working in the CM Maintaining CM Environment Procedure
4	Current version of the RTM	Continuously updated during working in the PD Process Procedures
5	Approved Updated Work Products	PR Reworking Procedure
6	Approved Component test Defect Summary Report (If Reached)	PD Component test Execution Procedure
7	Approved Integration Test Defect Summary Report (If Reached)	PD Integration Test Execution Procedure

Configuration Management Process

8	Approved System Test Defect Summary Report (If Reached)	PD System Test Execution Procedure
9	Approved Closed NCs	QA Follow-up Procedure
10	Approved Escalation Reports	QA Follow-up Procedure
11	Approved Closed CRs	CM Change Management Procedure
12	Approved Required System Documentation	PD Implementation Procedure

Activities

No	Role	Activity	Form/Template
1	CCB	Determine the configuration items to be audited.	CM Functional Configuration Audit Report
2	CCB	Check the consistency of the RTM, and document NCs	CM Functional Configuration Audit Report
3	CCB	Check the consistency and the integrity of the information of all related work products related to each other according to the RTM.	CM Functional Configuration Audit Report
4	CCB	Review the results of all peer reviews to ensure that all major, minor defects or both, have been corrected according to the baselining criteria in the CM plan.	CM Functional Configuration Audit Report
5	CCB	Review the results of all executed test types, if reached in the project life cycle, to ensure that the all major, minor defects or both, have been corrected according to the baselining criteria in the CM plan .	CM Functional Configuration Audit Report
6	CCB	Review the results of all QA audits to ensure that the all major, minor NCs or both, have been tracked to closure according to the baselining criteria in the CM plan.	CM Functional Configuration Audit Report
7	CCB	Review the implementation of all approved CRs to ensure that they have been done correctly in all impacted CIs.	CM Functional Configuration Audit Report
8	CCB	Review all related system documentation to ensure that it reflects the current system status.	CM Functional Configuration Audit Report
9	CCB	Determine the suitable corrective actions, preventive actions (optional) and closure criteria to resolve all NCs.	CM Functional Configuration Audit Report
10	CCB	Track all NCs to closure and verify the closure.	CM Functional Configuration Audit Report
11	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Closed NCs	CM Baselining Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Closed NCs Approval	CM Baselining Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Functional Configuration Audit Report
- Approvals (*such as e-mails*)

Physical Configuration Audit Procedure

Purpose

The purpose of this procedure is to guide the performance of the physical audit activities in the configuration management system, including the storage media, system, and the tools for accessing the configuration system. The procedure, when performed, ensures the physical existence and consistency between the contents of the configuration management system and approves the readiness for performing the baselining. This procedure is not only performed before the baselining, as in the functional audit case, but also can be done in any time to ensure the required level of integrity.

Definitions

No	Term	Definition
1	Physical Configuration Audit (PCA)	The objective of the Physical Configuration Audit is to provide an independent evaluation of the configuration items to confirm that these components are consistent with each other and matching their specifications.

Entry Criteria (1 AND 2) OR (1 AND 3)

No	Criteria	Exit criteria of the following procedure
1	Approved CM Environment	CM Establishing CM Environment Procedure
2	Request for audit	The calling procedure that has a need for instant audit

Inputs

No	Input	Output of the following procedure
1	Approved configuration management plan	CM Planning Procedure
2	Approved CM environment	CM Establishing CM Environment Procedure
3	Current version of the CI List	Continuously updated during working in the CM Maintaining CM Environment Procedure
4	Approved Closed CRs	CM Change Management Procedure
5	Approved Baselines	CM Baselining Procedure
6	Approved Tested Backups	Continuously created during working in the CM Maintaining CM Environment Procedure

Activities

No	Role	Activity	Form/Template
1	ICC	Determine the configuration items to be audited.	CM Physical Configuration Audit Report
2	ICC	Ensure that only current and approved CIs versions are in use.	CM Physical Configuration Audit Report

Configuration Management Process

3	ICC	Check the structure of the CM repository against the planned structure in the CM plan.	CM Physical Configuration Audit Report
4	ICC	Check that all names are matching the naming conventions defined in the CM plan.	CM Physical Configuration Audit Report
5	ICC	Check the integrity of the configuration items and its attributes according to the CM plan.	CM Physical Configuration Audit Report
6	ICC	Check the existence and correctness of access rights and security roles.	CM Physical Configuration Audit Report
7	ICC	Check the integrity of the data recorded for status accounting purposes in the document revision histories.	CM Physical Configuration Audit Report
8	ICC	Check that all previous baselines (if any) meet the required baselining criteria according to the CM plan.	CM Physical Configuration Audit Report
9	ICC	Check the existence and correctness of all backups.	CM Physical Configuration Audit Report
10	CC, ICC	Determine the suitable corrective actions, preventive actions (optional) and closure criteria to resolve all NCs.	CM Physical Configuration Audit Report
11	CC, ICC	Track all NCs to closure.	CM Physical Configuration Audit Report
12	PM	Approve the outputs	

Outputs

No	Output	Inputs to the following procedure
1	Approved Closed NCs	CM Baselining Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Closed NCs Approval	CM Baselining Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Physical Configuration Audit Report
- Approvals (*such as e-mails*)

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Baselining Procedure

Purpose

The purpose of this procedure is to produce baselines from the identified CIs. The procedure, when performed, ensures the existence and the announcement of the baselines that will be considered as a starting point for further development phases in the product development life cycle. The quality of the baseline is completely dependent on the functional and physical audits performed before the baselining.

Definitions

None

Entry Criteria (AND)

No	Criteria	Exit criteria of the following procedure
1	Closed NCs Approval	CM Functional Configuration Audit Procedure
2	Closed NCs Approval	CM Physical Configuration Audit Procedure
3	Conducting baselining calling	PM Execution, Monitoring and Control Procedure

Inputs

No	Input	Output of the following procedure
1	Approved Closed NCs	CM Functional Configuration Audit Procedure
	Approved Closed NCs	CM Physical Configuration Audit Procedure

Activities

No	Role	Activity	Form/Template
1	CC	Create the baseline release report and ensure that the baseline is correctly defined in terms of the items and their corresponding versions.	CM Baseline Release Report
2	CCB	Review the release report.	
3	CC	Incorporate CCB comments.	
4	CC, PM	Prepare & review the configuration status accounting report	CM Baseline Release Report
5	CCB	Confirm readiness of all fully controlled CIs for baselining.	
6	CC	Create the baseline.	
7	CC	Archive the baseline and CM environment according to the archiving mechanism in the CM plan.	
8	CC	Announce the baseline and its content to all relevant stakeholders.	
9	PM	Approve the outputs	

Configuration Management Process

Outputs

No	Output	Inputs to the following procedure
1	Approved Baseline	PM Execution, Monitoring and Control Procedure
2	CM Status Accounting Report	PM Execution, Monitoring and Control Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Baseline Approval	PM Execution, Monitoring and Control Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Baselining announcements
- Approvals (*such as e-mails*)

Change Control Procedure

Purpose

The purpose of this procedure is to guide the performance of saving changes to any stable work product. The change control procedure starts by raising a change request. Consequently, the change request is evaluated, implemented and verified. The impact of these changes should be estimated and finally evaluated at the end of the project during the project closure phase.

Definitions

None

Entry Criteria (OR)

No	Criteria	Exit criteria of the following procedure
1	Need to make a change from customer.	Customer needs.
2	Need to make a change in an approved work product.	Stakeholder needs that emerged during the implementation of any procedure.
3	Need to make a change in a baselined work product.	Stakeholder needs that emerged during the implementation of any procedure.

Inputs

None

Activities

No	Role	Activity	Form/Template
1	RS	Propose the change through creation and documentation of a change request.	CM Change Request
2	CCB	Analyze change request.	
3	CCB	Study the impact of the required changes and identify all impacted and affected CIs.	CM Change Request
4	CCB	Estimate the associated change in project size, effort, schedule, cost and quality.	CM Change Request
5	CCB	Evaluate the change to make the go/no-go decision (approve/reject).	CM Change Request
6	CC	Record the CR in the change log.	CM Change Log
7		If the CR is rejected, go to Step 11.	CM Change Request
8	CCB	If the CR is approved, plan for implementing the change and update project size and schedule (<i>this activity may call other procedures</i>).	
9	RS	Implement change according to the plan (<i>this activity may call other procedures</i>).	
10	CCB	Verify the implementation of the CR by reviewing the status of all impacted CIs.	CM Change Request
11	CCB	Close the change if the result of the CR verification is accepted.	CM Change Request CM Change Log
12	PM	Approve the outputs	

Configuration Management Process

Outputs

No	Output	Inputs to the following procedure
1	Approved Closed Change	PM Execution, Monitoring and Control Procedure
2	Change Log	CM Functional Configuration Audit Procedure PM Execution, Monitoring and Control Procedure

Exit Criteria

No	Criteria	Entry criteria to the following procedure
1	Approved Closed Change	PM Execution, Monitoring and Control Procedure

Metrics

- Planned schedule and effort
- Actual schedule and effort
- Number of raised CRs
- Percentage of approved CRs
- Percentage of rejected CRs

Subjects for Review

- None

Fully Controlled CIs

- None

Managed CIs

- Change requests
- Approvals (*such as e-mails*)

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APPENDIX A:

TEMPLATES

Appendix A: Processes Templates

PM: Statement of Work Template

1. Project General Information

Project Name	
Project ID	
Client Name	
Client ID	
Start Date	
End date	
Project Manager	
Prepared By	

2. Project Contact Person

Name	
Role	
Phone	
E-mail	

3. Project Description

<Insert Text Here>

4. Project objectives

<Insert Text Here>

5. Project scope

<Insert Text Here>

6. Assumptions

<Insert Text Here>

7. Project deliverables

No	Component Name	Description	Delivery Date

8. Project Technology and Tools

<Insert Text Here>

9. Project Resources

No	Resource	Quantity

10. Estimated Effort and Cost

No	Activity/Tack	Effort	Cost

11. Estimated Expenses

<Insert Text Here>

12. Customer Supplied Products/Services

No	Product/Service	Time	Cost (Optional)

13. Major Identified Risks

No	Risk	Type	Comment

14. Acceptance Criteria

<Insert Text Here>

15. Dependency and Constraints

<Insert Text Here>

16. Payment Schedule

No	Phase	Date	Percentage

17. References

<Insert Text Here>

18. Authorization

No	Authorization <ABC>	Authorization <XYZ>
1	Name:	Name:
2	Title:	Title:
3	Address:	Address:
4	FAX:	FAX:
5	Date:	Date:
6	Signature:	Signature:

SECC

PM: Project Management Plan Template

1. Introduction

1.1. Project General Information

Project Name	
Project ID	
Client Name	
Client ID	
Start Date	
End date	
Project Manager	
Prepared By	

1.2. Project Contact Person

Name	
Role	
Phone	
E-mail	

1.3. Project Purpose

<Insert Text Here>

1.4. Scope

<Insert Text Here>

1.5. Objectives

<Insert Text Here>

1.6. Definitions, Acronyms, and Abbreviations

<Insert Text Here>

1.7. References

<Insert Text Here>

2. Project Parameters

2.1. Assumptions

<Insert Text Here>

2.2. Target Environment

<Insert Text Here>

Appendix A

2.3. Standards

<Insert Text Here>

2.4. Life Cycle Model

<Insert Text Here>

3. Project Organization

3.1. Suppliers

No	Supplier	Contact Person	Supplied Product

3.2. Customers(Internal/External)

No	Customer	Contact Person	Delivered Product

3.3. Skills Needed

Skills Needed	Roles/Stakeholders						
	R/S1	R/S2	R/S3	R/S4	R/S5	R/Sn

3.4. Human Resources / Project Team

No	Name	Role	% Allocated to Project	Reporting To

3.5. Training Needed

Training Needed	Resources/Stakeholders						
	R/S1	R/S2	R/S3	R/S4	R/S5	R/Sn

3.6. Non-Human Resources / Computer Resources

No	Resource Category	Resource Description	Status	Critical (Y/N)	Requested by (Name)	Needed by (date)

1. Project Communication

1.1. Stakeholder Involvement Matrix

Milestone	Internal Stakeholders				External Stakeholders				
	S1	S2	...	Sn	S1	S2	S3	...	Sn

1.2. Project Monitor and Control

No.	Approach	Attendees / Recipients	Items	Frequency

1.3. Project Re-planning Criteria

<Insert Text Here>

2. Project Work Products

<Insert Text Here>

3. Project Estimations

3.1. Size, Effort and Cost Estimation

<Insert Text Here>

3.2. Project Milestones

<Insert Text Here>

3.3. Project Schedule

<Insert Text Here>

4. Risk Management Plan

<Insert Text Here>

5. Supporting Plans

5.1. Configuration Management Plan

<Insert Hyperlink Here>

5.2. Quality Assurance Plan

<Insert Hyperlink Here>

5.3. Product Engineering Plan

<Insert Hyperlink Here>

Appendix A

5.4. Reviews Plan

<Insert Hyperlink Here>

6. Metrics Plan

No	Metric	Frequency	Collected and Reported through

7. Internal Approvals

No	Senior Management	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

8. Customer Approvals Signatures

No	Customer Authorized Signature	Customer Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECRET

PM: Estimation Template

This is a Microsoft Excel template and can be found in templates folder under the project management process area folder on the SPIG Product Suite CD.

PM: Risk Management Template

This is a Microsoft Excel template and can be found in templates folder under the project management process area folder on the SPIG Product Suite CD.

PM: Schedule Template

This is a Microsoft Project excel and can be found in templates folder under the project management process area folder on the SPIG Product Suite CD.

PM: Issue Tracking Template

This is a Microsoft Excel template and can be found in templates folder under the project management process area folder on the SPIG Product Suite CD.

PM: Minutes of Meeting Template

This is a Microsoft Excel template and can be found in templates folder under the project management process area folder on the SPIG Product Suite CD.

PM: Project Closure Report Template

1. Project General Information

Project Name	
Project ID	
Client Name	
Client ID	
Start Date	
End date	
Project Manager	
Prepared By	

2. Project Technical Information

Project Description	
Application Area Description	
Platform/Technology Description	
Project Type	
Project Overall Evaluation	
Used Tools	

3. Quality Assessment

Total no. of Defects	
Average no. of Defects per Requirement	
Average no. of Defects per Designed Module	
Average no. of Defects per Coded Module	
Percentage of Passed Test Cases	

4. Lessons Learnt

Phase/Attribute	Lesson Learnt

5. Reasons for Closure

6. Process Improvement Proposals

7. Project Metrics

Project Metrics	Estimated	Actual	Variance	Assessment
Actual versus Estimated Project Size				
Actual versus Estimated Project Effort				
Actual versus Estimated Project Cost				
Actual versus Estimated Project Resources				
Actual versus Estimated Project Schedule				

Risks	Opened	Closed	Occurred	Assessment
No. of Risks				

Requirements	Elicited	Changed	%	Assessment
No. of Requirements				

Defects	Total	Closed	Opened	Assessment
No. of PR Defects				
No. of UT Defects				
No. of IT Defects				
No. of ST Defects				
No. of AT Defects				

Change Request	Total	Closed	Rejected	Assessment
No. of CRs in Design Stage				
No. of CRs in Implementation Stage				
No. of CRs in Testing Stage				

Non-Compliances	Total	Closed	Opened	Assessment
No. of QA Audits NCs				
No. of FCA Audits NCs				
No. of PCA Audits NCs				

Appendix A

Taken Baselines	Total	Planned	Checked	Assessment
No. of Baselines				

8. Approvals

No	Senior Management	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

PD: Requirements Elicitation Plan Template

1. Introduction

1.1. Project General Information

Project Name	
Project ID	
Client Name	
Client ID	
Start Date	
End Date	
Project Manager	
Prepared By	

1.2. Project Contact Person

Name	
Role	
Phone	
E-mail	

2. Scope

<Insert Text Here>

3. Objectives

<Insert Text Here>

4. Involved Stakeholders

<Insert Text Here>

5. Elicitation Techniques

<Insert Text Here>

6. Estimated Activities & Times

No	Activity/Task	Effort	Time

7. Acceptance Criteria for Elicited Requirements

<Insert Text Here>

8. Approvals

No	Senior Management	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

PD: Requirements Management DB Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

PD: Requirements Traceability Matrix Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

SECC

PD: Development Plan Template

1. Introduction

1.1. Supporting Documents

<Insert Text Here>

1.2. Glossary

<Insert Text Here>

1.3. Source Control

<Insert Text Here>

1.4. Defect Tracking

<Insert Text Here>

1.5. Design Method

<Insert Text Here>

1.6. Implementation

<Insert Text Here>

1.6.1. Code Creation

<Insert Text Here>

1.6.2. Code Reviews

<Insert Text Here>

1.6.3. Component testing

<Insert Text Here>

2. Development Environment and Tools

2.1. Development Platform

<Insert Text Here>

2.2. Target Platform (At Customer Side)

<Insert Text Here>

2.3. Requirements and Design Tools

<Insert Text Here>

2.4. Coding Tools

<Insert Text Here>

3. Test Types and Levels

<Insert Text Here>

4. Software Documentation

<Insert Text Here>

5. Training Needs

<Insert Text Here>

6. Technical Risks

<Insert Text Here>

7. Approvals

No	Team Leader	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

PD: Software Requirements Specifications Template

1. Introduction

1.1. Document Overview

<Insert Text Here>

1.2. Scope of the Software

<Insert Text Here>

1.3. Definitions, Acronyms and Abbreviations

<Insert Text Here>

1.4. References

<Insert Text Here>

1.5. Outstanding Issues

<Insert Text Here>

2. System Specifications

2.1. User Requirements

2.1.1. Summary

<Insert Text Here>

2.1.2. Functional Requirements

<Insert Text Here>

2.1.3. Non-Functional Requirements

<Insert Text Here>

2.1.4. Customer Related Specifications

<Insert Text Here>

2.1.5. User Interface (UI)

<Insert Text Here>

2.1.6. Software Interface

<Insert Text Here>

2.1.7. Hardware Interface

<Insert Text Here>

2.1.8. Documentation and Training material

<Insert Text Here>

2.1.9. Evolution Support

<Insert Text Here>

2.1.10. Delivery Dates

<Insert Text Here>

2.2. Acceptance Criteria

<Insert Text Here>

2.3. Verification and Validation Methods Matrix

<Insert Text Here>

2.4. Development Organization Requirements

2.4.1. Business Requirements

<Insert Text Here>

2.4.2. Cost Requirements

<Insert Text Here>

2.4.3. Relationship to Future Products

<Insert Text Here>

2.4.4. Special Considerations

<Insert Text Here>

2.4.5. Development Hardware requirements

<Insert Text Here>

2.4.6. Development Software Environment

<Insert Text Here>

2.4.7. Characteristics of the Proposed Software

<Insert Text Here>

2.4.8. Success Criteria

<Insert Text Here>

3. Supporting Information

3.1. Appendices

<Insert Text Here>

Appendix A

4. Approvals

No	Team Leader	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

PD: Defects Summary Report Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

SECC

PD: Architecture Design Template

1. Introduction

1.1. Purpose of the Document

<Insert Text Here>

1.2. Scope of the Software

<Insert Text Here>

1.3. Definitions, Acronyms and Abbreviations

<Insert Text Here>

1.4. References

<Insert Text Here>

2. System Overview

<Insert Text Here>

3. System Context

<Insert Text Here>

4. System Design

4.1. Design Method

<Insert Text Here>

4.2. Decomposition Description

<Insert Text Here>

5. Components Description

5.1. Component Identifier

5.1.1. Type

<Insert Text Here>

5.1.2. Purpose

<Insert Text Here>

5.1.3. Function

<Insert Text Here>

5.1.4. Subordinate

<Insert Text Here>

5.1.5. Dependencies

<Insert Text Here>

6. Approvals

No	Designer	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

PD: Detailed Design Template

1. Introduction

1.1. Purpose of the Document

<Insert Text Here>

1.2. Scope of the Software

<Insert Text Here>

1.3. Definitions, Acronyms and Abbreviations

<Insert Text Here>

1.4. References

<Insert Text Here>

2. Project Standards

<Insert Text Here>

2.1. Design Standards

<Insert Text Here>

2.2. Documentation Standards

<Insert Text Here>

2.3. Naming Conventions

<Insert Text Here>

2.4. Programming Standards

<Insert Text Here>

3. Components Design Specifications

3.1. Component Identifier

3.1.1. Type

<Insert Text Here>

3.1.2. Purpose

<Insert Text Here>

3.1.3. Function

<Insert Text Here>

3.1.4. Subordinate

<Insert Text Here>

3.1.5. Dependencies

<Insert Text Here>

3.1.6. Interface

<Insert Text Here>

3.1.7. Resources

<Insert Text Here>

3.1.8. Data

<Insert Text Here>

4. Approvals

No	Designer	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

PD: Test Plan Template

1. Introduction

<Insert Text Here>

2. Test levels

<Insert Text Here>

2.1. Component test

<Insert Text Here>

2.2. Integration Test

<Insert Text Here>

2.3. System Test

<Insert Text Here>

2.4. Acceptance Test

<Insert Text Here>

3. Test Items

<Insert Text Here>

4. Features to be Tested/Features Not to be Tested

<Insert Text Here>

5. Approach

<Insert Text Here>

6. Pass/Fail Criteria

<Insert Text Here>

7. Suspension/Resuming Criteria

<Insert Text Here>

8. Test Deliverables

<Insert Text Here>

9. Testing Tasks

<Insert Text Here>

10. Test Environment

<Insert Text Here>

11. Staffing and Training Needs

<Insert Text Here>

12. Risks and Contingences

<Insert Text Here>

13. Approvals

No	Test Manager	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

PD: Test Procedure Template

1. Purpose

<Insert Text Here>

2. Test Procedure Identifier

<Insert Text Here>

3. Special Requirements

<Insert Text Here>

4. Input Specifications

<Insert Text Here>

5. Output Specifications

<Insert Text Here>

6. Environmental Needs

<Insert Text Here>

7. Procedure Steps

<Insert Text Here>

8. Approvals

No	Tester	Test Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

PD: Test Cases Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

SECC

PD: System Installation Plan Template

1. Introduction

1.1. Purpose of the Document

<Insert Text Here>

1.2. Scope of the Software

<Insert Text Here>

1.3. Definitions, Acronyms and Abbreviations

<Insert Text Here>

1.4. References

<Insert Text Here>

2. System Requirements

2.1. Hardware Requirements

<Insert Text Here>

2.2. Software Requirements

<Insert Text Here>

2.3. Other Requirements

<Insert Text Here>

3. Installation Procedure

<Insert Text Here>

4. Roles and Responsibilities

<Insert Text Here>

5. Required Facilities

<Insert Text Here>

6. Installation Risks

<Insert Text Here>

7. Approvals

No	Team Leader	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

PD: Product Release Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

PR: Review Plan Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

PR: Review Checklist Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

PR: Defects Summary Report Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

SECC

QA: Quality Assurance Plan Template

1. Introduction

1.1. Purpose of The Document

<Insert Text Here>

1.2. Scope of The Plan

<Insert Text Here>

1.3. Definitions, Acronyms and Abbreviations

<Insert Text Here>

1.4. References

<Insert Text Here>

1.5. Assumptions and Limitations

<Insert Text Here>

2. QA Auditing Targets and Standards

2.1. Processes to be Audited

<Insert Text Here>

2.2. Work Products to be Audited

<Insert Text Here>

2.3. Audit Standards

<Insert Text Here>

3. Management and Organizations

<Insert Text Here>

3.1. Escalation Mechanism

<Insert Text Here>

3.2. Training Needs

<Insert Text Here>

3.3. Non-Human Recourses

<Insert Text Here>

4. Reporting

<Insert Text Here>

5. Approvals

No	QA Representative	QA Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

QA: Work Product Audit Checklist Template

1. <Product Name>'s audit Checklist

The <Work product Name> will be audited, taking the following readiness criteria into consideration.

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	

SECC

QA: Non-Compliances Report Template

1. Report General Information

Project Name	
Project ID	
Reporting Date:	
Non-compliances Reported By	
Non-compliances Accepted By	

2. Non-Compliances Description

No.	Non-Compliance	Process/Work product	Severity	Corrective Action

3. Approvals

No	Author/ Process Owner	QA Representative
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

Appendix A

QA: Status Report Template

1. Project General Information

Project Name	
Project ID	
Client Name:	
Client ID:	
Period Start Date:	
Period End Date:	

2. Statistics

No	Activity/Task	Value	Remarks
1	Number of Open Non-compliances (opening balance) at the start of the period.		
2	Number of non-compliances issued (during the period).		
3	Number of non-compliances closed (during the period).		
4	Number of Open non-compliances (Closing Balance) at the end of the period.		
5	Number of Open non-compliances overdue (open for more than 30 days).		

3. Additional Information

<Insert Text Here>

4. Approvals

No	Author/ Process Owner	QA Representative
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

QA: Escalation Report Template

1. Project General Information

Project Name	
Project ID	
Client Name:	
Client ID:	
Period Start Date:	
Period End Date:	

2. Pending Non-Compliances (Still Opened)

No	Non-Compliance	Corrective Action Needed	Agreed Upon completion Date

3. Non-Compliances that Requires Higher Authority

No	Non-Compliance	Corrective Action required	New Audit Date

4. Cause of Delay (Optional)

No	Non-Compliance	Cause of Delay

5. Approvals

No	Author/ Process Owner	QA Representative
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

CM: Configuration Management Plan Template

1. Introduction

1.1. Purpose of the Document

<Insert Text Here>

1.2. Scope of the Software

<Insert Text Here>

1.3. Definitions, Acronyms and Abbreviations

<Insert Text Here>

1.4. References

<Insert Text Here>

1.5. Assumptions and Limitations

<Insert Text Here>

2. Management and Organization

2.1. Change Control Board (CCB)

<Insert Text Here>

2.2. Configuration Management Environment

<Insert Text Here>

3. Configuration Identification

3.1. Fully Controlled CIs and their Attributes

<Insert Text Here>

3.2. Managed CIs and their Attributes

<Insert Text Here>

3.3. Naming Conventions

<Insert Text Here>

4. Baselining

4.1. Types of Baselines

<Insert Text Here>

4.2. Baseline Criteria

<Insert Text Here>

4.3. Baseline and Projects Milestones

<Insert Text Here>

5. Change Management and Control**5.1. Change Evaluation Mechanism**

<Insert Text Here>

5.2. Decision Making Mechanism

<Insert Text Here>

6. Configuration Audits**6.1. Audits' Types**

<Insert Text Here>

6.2. Audits and Baselines Relation

<Insert Text Here>

7. Data Management**7.1. Data Identification**

<Insert Text Here>

7.2. Access Control

<Insert Text Here>

7.3. Project Retention

<Insert Text Here>

7.4. Backup and Recovery

<Insert Text Here>

8. Approvals

No	Configuration Controller	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

CM: Functional Configuration Audit Report Template

1. Audit General Information

Project Name	
Project ID	
Audit Start Date	
Audit End Date	

2. Summary of CIs Status

No.	Configuration Item	Audit Date	Correctness	Remarks

3. Summary of Good Practices

No	Configuration Item	Description of Good Practice

4. Summary of CIs Non-Compliances

No	Configuration Item	NC	Owner	Corrective Action	Due Date	Closure Date

5. Approvals

No	Change Control Board (CCB) Head	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

CM: Physical Configuration Audit Report Template

1. Audit General Information

Project Name	
Project ID	
Audit Start Date	
Audit End Date	

2. Summary of CIs Status

No.	Configuration Item	Audit Date	Correctness	Remarks

3. Summary of CM Repository Status

No.	Repository Element	Audit Date	Correctness	Remarks

4. Summary of CM Baselines Status

No.	Baseline	Audit Date	Correctness	Remarks

5. Summary of Good Practices

No	Configuration Item/Repository	Description of Good Practice

6. Summary of CIs Non-Compliances

No	Configuration Item	NC	Owner	Corrective Action	Due Date	Closure Date

7. Summary of CM Repository Non-Compliances

No	Configuration Item	NC	Owner	Corrective Action	Due Date	Closure Date

Appendix A

8. Summary of Baselines Non-Compliances

No	Configuration Item	NC	Owner	Corrective Action	Due Date	Closure Date

9. Approvals

No	Independent Configuration Controller	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

CM: Baseline Release Report Template

1. Baseline General Information

Project Name	
Project ID	
Baseline Date	
Baseline ID	

2. Statistics

No	Configuration Item/Repository	Version	Last Approved Date

3. Additional Information

<Insert Text Here>

4. Approvals

No	Configuration Controller	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

CM: Status Accounting Report Template

1. Audit General Information

Project Name	
Project ID	
Report Date	

2. Summary of CIs Status

No.	Configuration Item	Description	CI Physical Location	Status

3. Summary of CM Repository Status

No.	CM Activity	Life Cycle Phase	Planned Date	Status

4. Summary of CM Baselines Status

No.	Baseline ID	Description	Physical Location	Baseline Date

5. Summary of CM Backups Status

No.	Backup ID	Description	Physical Location	Backup Date

6. Summary of CM Releases Status

No.	Release ID	Description	Physical Location	Release Date

7. CM Statistics

No of Fully Controlled CIs under control	
No of Change Requests Received	
No of Change Requests Approved	
No of Change Requests Closed	
No of Change Requests under Implementation	

8. Approvals

No	Configuration Controller	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

SECC

Appendix A

CM: Change Request Template

1. Change Request General Information

Project Name	
Project ID	
Change ID	
Requested By	
Request Date	
Change Description	

2. Analysis

Change Type	Bug Fix [] Enhancement [] New Feature []
Analysis Date	
Descriptive Impact Analysis	
Impacted CIs	
Estimated Change in Size	
Estimated Change in Effort	
Estimated Change in Cost	

3. Decision

CCB Decision	Approved [] Rejected [] Postponed []
Decision Date	
Decision Rationale	
Priority	High [] Medium [] Low []

4. Implementation Verification

CCB Decision	Closed [] Opened []
Verifying Date	
Verification Comments	

5. Project Closure Evaluation

CCB Decision	Good Impact on the Project [] Bad Impact on the Project []
Evaluation Date	
Rationale	

6. Approvals

No	Configuration Controller	Project Manager
1	Name:	Name:
2	Date:	Date:
3	Signature:	Signature:

CM: Change Log Template

This is a Microsoft Excel template and can be found in templates folder under the product development process area folder on the SPIG Product Suite CD.

SECC

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APPENDIX B:

CHECKLISTS

Appendix B: Process Audit Checklist Templates

PM: Initiation Procedure's Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the project purpose and scope identified?				
2	Are the project objectives identified?				
3	Are the project assumptions identified?				
4	Is the project target environment identified?				
5	Are the project's work products identified?				
6	Are the project and product standards identified?				
7	Is the life cycle model selected?				

PM: Estimation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the project size estimated?				
2	Is the project effort estimated?				
3	Are the assumptions, constraints, conditions and references documented?				
4	Is the project cost estimated?				
5	Are the project human and non-human resources identified?				

PM: Risk Planning Procedure's Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the category of each risk identified?				
2	Is the impact of each risk identified?				

3	Is the probability of each risk estimated?				
4	Is there an assigned person for each risk?				
5	Are there risk mitigation plans for all risks?				
6	Are there risk contingency plans for high score risks?				
7	Is the frequency of tracking each risk identified?				

PM: Planning Consolidation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all correct stakeholders involved?				
2	Are all sub-plans created, reviewed and aligned?				
3	Is there a plan for project monitoring and control correct?				
4	Are the re-planning criteria defined?				
5	Is the PMP approved by senior management?				
6	Has the Kick-off Meeting (KOM) been conducted with relevant stakeholders?				
7	Has the functional configuration audit been conducted?				
8	Has the physical configuration audit been conducted?				
9	Are all plans baselined?				

PM: Execution, Monitoring and Control Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the execution of all planned activities and tasks tracked?				
2	Are all the project's progress data and detailed activity reports collected?				
3	Is the project schedule tracked?				

Appendix B

4	Are the project risks tracked?				
5	Are the project's tracking reports prepared according to the frequency defined in the PMP and project schedule?				
6	Are the milestone review meetings conducted according to the frequency defined in the PMP and project schedule?				
7	Are suitable corrective actions taken?				

PM: Closure Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the lessons learned identified?				
2	Has process data analysis meeting been conducted?				
3	Have the project closure discussion meetings been conducted?				
4	Is the project closure report created and approved?				

PD: Requirements Planning Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the individuals and/or groups with a stake in the success of the project identified?				
2	Are the acceptance criteria identified?				
3	Is the plan for requirements elicitation correct?				
4	Is the plan communicated to the customer?				

PD: Requirements Elicitation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are candidate functional requirements correctly documented?				
2	Are candidate non-functional requirements correctly documented?				

PD: Development Planning Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are required standards identified?				
2	Is the list of product deliverables identified?				
3	Are the suitable software engineering methods, environment and tools identified?				
4	Are the required documentation identified?				
5	Are test types and levels identified?				
6	Are training needs identified?				
7	Are associated risks identified?				

PD: Requirements Analysis Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all requirements examined?				
2	Are requirements prioritized?				
3	Is traceability identified?				
4	Are conflicts with stakeholders resolved?				

Appendix B

PD: Requirements Development Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are clear and precise requirements specifications formalized?				
2	Is the traceability matrix updated?				

PD: Requirements Validation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the SRS assessed to ensure that the SRS meets its required qualities?				
2	Is the traceability confirmed?				
3	Are findings and deficiencies documented?				
4	Are all defects corrected?				

PD: Requirements Acceptance Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are baselined requirements, SRS and associated measurements presented to senior management?				
2	Is customer approval of the baselined requirements obtained?				
3	Is the formal change management process followed for all change requests?				

PD: Requirements Management Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the PD Requirements Planning Procedure used to plan for another round of elicitation of the new or updated requirements?				
2	Is the PD Requirements Elicitation Procedure used for elicitation of the new or updated requirements?				
3	Is the PD Requirements Analysis Procedure used to analyze the new or updated requirements?				
4	Is the PD Requirements Development Procedure used to update the SRS to reflect the new or updated requirements?				
5	Is the PD Requirements Validation Procedure used to validate the new or updated requirements?				
6	Is the PD Requirements Acceptance Procedure used to obtain acceptance on the new or updated requirements?				

PD: Acceptance Test Preparation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are items to be tested in the acceptance test determined?				
2	Are features to be tested in the acceptance test determined?				
3	Are testing approaches for the acceptance test determined?				
4	Are pass and fail criteria in the acceptance test determined?				
5	Are suspension and resuming criteria in the acceptance test determined?				
6	Are test deliverables from the acceptance test determined?				
7	Are testing tasks in the acceptance test determined?				
8	Is the testing environment for the				

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	acceptance test determined?				
9	Are all roles and responsibilities for the acceptance test assigned?				
10	Are training needs needed for the acceptance test identified?				
11	Are associated risks with the acceptance test identified?				
12	Are all possible associated test procedures for acceptance test determined?				
13	Are all possible associated test cases for acceptance test determined?				

PD: System Test Preparation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are items to be tested in the system test determined?				
2	Are features to be tested in the system test determined?				
3	Are testing approaches for the system test determined?				
4	Are pass and fail criteria in the system test determined?				
5	Are suspension and resuming criteria in the system test determined?				
6	Are test deliverables from the system test determined?				
7	Are testing tasks in the system test determined?				
8	Is the testing environment for the system test determined?				
9	Are all roles and responsibilities for the system test assigned?				
10	Are training needs needed for the system test identified?				
11	Are associated risks with the system test identified?				
12	Are all possible associated test procedures for system test determined?				
13	Are all possible associated test cases for system test determined?				

PD: Architecture Design Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the system overview and context identified?				
2	Is the high level system architecture determined?				
3	Are the attributes of each component identified?				
4	Are candidates high-level design architectures evaluated and the suitable one selected?				
5	Are design parameters identified?				
6	Is RTM updated?				

PD: Integration Test Preparation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are items to be tested in the integration test determined?				
2	Are features to be tested in the integration test determined?				
3	Are testing approaches for the integration test determined?				
4	Are pass and fail criteria in the integration test determined?				
5	Are suspension and resuming criteria in the integration test determined?				
6	Are test deliverables from the integration test determined?				
7	Are testing tasks in the integration test determined?				
8	Is the testing environment for the integration test determined?				
9	Are all roles and responsibilities for the integration test assigned?				
10	Are training needs needed for the integration test identified?				
11	Are associated risks with the integration test identified?				
12	Are all possible associated test procedures for integration test determined?				

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13	Are all possible associated test cases for integration test determined?				
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PD: Detailed Design Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the required standards and conventions determined?				
2	Are detailed attributes of each component determined?				
3	Are design parameters determined?				
4	Is the RTM updated?				
5	Has the functional configuration audit been conducted?				
6	Has the physical configuration audit been conducted?				
7	Are all design outputs baselined?				

PD: Component test Preparation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are items to be tested in the component test determined?				
2	Are features to be tested in the component test determined?				
3	Are testing approaches for the component test determined?				
4	Are pass and fail criteria in the component test determined?				
5	Are suspension and resuming criteria in the component test determined?				
6	Are test deliverables from the component test determined?				
7	Are testing tasks in the component test determined?				
8	Is the testing environment for the component test determined?				
9	Are all roles and responsibilities for the component test assigned?				
10	Are training needs needed for the component test identified?				
11	Are associated risks with the				

	component test identified?				
12	Are all possible associated test procedures for component test determined?				
13	Are all possible associated test cases for component test determined?				

PD: Implementation Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the readiness of items identified as reusable components checked. Are these items added to the reusable library?				
2	Is the initial integration of the executable components and database performed?				
3	Is the required system documentation created?				
4	Is the RTM updated?				

PD: Component test Execution Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all component test plan, procedures and test cases executed?				
2	Are all discovered unit defects and all its parameters reported in detail?				
3	Are all the unit defects corrected and defect type reported?				
4	Are all defects closed?				
5	Is the functional configuration audit conducted?				
6	Is the physical configuration audit conducted?				
7	Are all outputs baselined?				

PD: Integration Test Execution Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

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No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the interaction test plan, procedures and test cases executed?				
2	Are all discovered integration defects and all its parameters reported in detail?				
3	Are all the integration defects corrected and defect type reported?				
4	Are all defects closed?				

PD: System Test Execution Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all system test plan, procedures and test cases executed?				
2	Are all discovered system defects and all its parameters reported in detail?				
3	Are all the system defects corrected and defect type reported?				
4	Are all defects closed?				

PD: Product Releasing Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all test results including system, integration and component test reviewed and analyzed?				
2	Is the integrity between product documentation and the product to be released reviewed?				
3	Is functional configuration audit conducted?				
4	Is physical configuration audit conducted?				
5	Is the installation procedure to be installed in customer site prepared?				
6	Is the release note prepared?				
7	Are all outputs baselined?				
8	Is the system delivered at customer				

site?				
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PD: Acceptance Test Execution Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all acceptance test plan, procedures and test cases executed?				
2	Are all discovered acceptance defects and all its parameters reported in detail?				
3	Are all the acceptance defects corrected and defect type reported?				
4	Are all defects closed?				
5	Is the customer formal acceptance obtained?				

PR: Planning Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all work products to be reviewed identified?				
2	Are the methods of review identified?				
3	Are the requirements and criteria to be satisfied by each selected work product identified?				
4	Are the peer review schedule and the staff who participate in review selected?				
5	Are checklists, ensuring that work product is reviewed, consistently established and maintained?				

PR: Execution Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the preparation for the review conducted?				
2	Are all issues raised?				

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3	Are all defects found in work product recorded?				
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PR: Rework Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all due dates for resolution of open issues estimated?				
2	Are all defects identified in the work product corrected?				
3	Are all open issues for the work product closed?				

PR: Follow-up Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the follow-up meetings scheduled?				
2	Does the plan for closing all defects exist?				
3	Is the closure of all open issues verified?				

QA: Planning Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is a QAR assigned to the team of the project?				
2	Is the scope of the QA audits and activities determined?				
3	Are processes to be audited determined?				
4	Are the work products to be audited determined?				
5	Are standards to be used as basis for audit determined?				
6	Are the work product auditing checklists determined?				
7	Are the roles and responsibilities identified?				
8	Is the escalation mechanism determined?				

9	Are the training needs determined?				
10	Are the required non-human resources determined?				
11	Are the reporting mechanism and its frequency determined?				

QA: Execution Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all processes and work products audit sessions conducted?				
2	Are the audit findings documented?				
3	Are the findings communicated to the processes' owners, work products' authors and PM?				
4	Are possible root causes investigated?				
5	Are suitable corrective action and closure criteria determined?				

QA: Follow-up Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are all the approved corrective actions implemented?				
2	Is the new / revised work product released?				
3	Are the corrective actions and its impact communicated to the relevant stakeholders?				
4	Are the NC closure dates planned?				
5	Are the corrective actions implemented?				
6	Are unresolved issues escalated?				

CM: Planning Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the change control board determined?				

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2	Are the roles and responsibilities determined?				
3	Are the training needs determined?				
4	Are the detailed CM environment designed?				
5	Are the required non-human resources identified?				
6	Is the detailed project repository structure determined?				
7	Are all the configuration items determined and their control levels identified?				
8	Are the naming conventions determined?				
9	Are all types of baselines during the project and baselining criteria determined?				
10	Are milestones and major baselines determined?				
11	Is the change management evaluation mechanism determined?				
12	Is the change decision-taking mechanism determined?				
13	Are types of the CM audits that will be conducted in the project determined?				
14	Is the reporting mechanism and its frequency determined?				
15	Is the data to be managed under the data management plan determined?				
16	Are access control permissions determined?				
17	Are data retention rules determined?				
18	Are backups and recovery policies, data and plan determined?				

CM: Maintaining CM Environment Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the CM system, hardware and access tools checked?				
2	Are required reports on the CM environment generated?				
3	Are all backups taken according to the CM plan?				
4	Are all backups tested?				
5	Are data retention and archives taken				

	according to the CM plan?				
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CM: Functional Configuration Audit Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are configuration items to be audited determined?				
2	Are the consistency of the RTM and document NCs checked?				
3	Is the consistency and the integrity of the information of all related work products related to each other according to the RTM checked?				
4	Are the results of all peer reviews checked?				
5	Are the results of all executed test types, if reached in the project life cycle, reviewed?				
6	Are the results of all QA audits reviewed?				
7	Are all CRs reviewed?				
8	Are all related system documentation reviewed to ensure that it reflects the current system status?				
9	Are suitable corrective actions and closure criteria to resolve all NCs determined?				
10	Are all NCs tracked to closure and verified?				

CM: Physical Configuration Audit Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are the configuration items to be audited determined?				
2	Is the structure of the CM repository checked against the planned structure in the CM plan?				
3	Are all names matching the naming conventions?				
4	Is the integrity of the configuration				

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	items and its attributes checked according to the CM plan?				
5	Is the existence and correctness of access rights and security roles checked?				
6	Is the integrity of the data recorded for status accounting purposes in the document revision histories checked?				
7	Are all previous baselines checked for meeting the required baselining criteria, according to the CM plan?				
8	Is the existence and correctness of all backups checked?				
9	Are the suitable corrective actions and closure criteria to resolve all NCs determined?				
10	Are all NCs to closure and verification of closure tracked?				

CM: Baselining Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Are baseline release reports created?				
2	Are release reports reviewed?				
3	Is baseline created?				
4	Are baseline and CM environment archived?				
5	Are the baseline and its content announced to all relevant stakeholders?				

CM: Change Control Procedure Audit Checklist

This procedure will be audited taking the following readiness criteria into consideration

No	Readiness Criteria	Compliance			Comment
		Yes	No	NA	
1	Is the change request analyzed?				
2	Is the impact of the required changes studied?				
3	Are the associated changes in project size, effort, schedule, cost and quality estimated?				
4	Is the CR recorded in the change log?				
5	Is approved CR planned?				

6	Is the change implemented according to the plan?				
7	Is the implementation verified?				
8	Is the CR closed?				

SECC