

**Template for a Software Maintenance Plan**  
*Fifth Edition*

# Software Maintenance Process

## Prepare for Maintenance



## Maintenance Plan



## Perform Maintenance



Software Maintenance  
Plan Adheres to  
Standard **ISO/IEC/IEEE**  
**14764:2021**

## Software Maintenance Request



## Correction



## Enhancement



## Successful Maintenance

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# Contents

<b>Section</b>	<b>Page</b>
Revision History .....	3
Introduction .....	4
Background .....	4
About Software Maintenance .....	5
How to use this Document.....	5
Organizational Requirements.....	5
Reference Software Maintenance Standards .....	6
Warranties and Liability .....	6
Template for a Software Maintenance Plan.....	7
Recommended Table of Contents .....	8
Example Contents of a Maintenance Plan .....	9
5.1 Introduction.....	12
5.2 Maintenance Strategy.....	13
5.2.1. Level of support. ....	14
5.2.2 Support period.....	14
5.2.3 Tailoring the maintenance process.....	14
5.3 Scope of Maintenance .....	15
5.3.1 Maintenance Planning.....	15
5.4 Maintenance Organization .....	15
5.5 The Maintenance Process .....	16
5.6 Pre-Delivery and Post-Delivery Maintenance Activities.....	18
5.6.1 Pre-delivery roles and responsibilities of the maintainer.....	18
5.6.2 Establish Infrastructure and Logistics.....	20
5.6.3 Post-delivery roles and responsibilities of the maintainer .....	20
5.6.4 Perform Maintenance.....	21
5.6.4.1 Problem and Modification Analysis .....	21
5.6.4.2 Modification Implementation .....	26
5.6.4.3 Manage Results of Maintenance and Logistics .....	27
5.6.4.4 Migration.....	28
5.6.4.5 Disposal.....	29
5.7 Resources .....	30
5.7.1 Personnel resources.....	31
5.7.2 Environment resources.....	31
5.7.3 Maintenance Budget .....	32
5.8 Maintenance Cost Estimate.....	32
5.9 Training Requirements.....	32
5.10 Maintenance Records and Reports.....	33
Appendix A – Sample Modification Request Form .....	34
Modification Request.....	34
Modification Request.....	35
About the Author .....	37

## Revision History

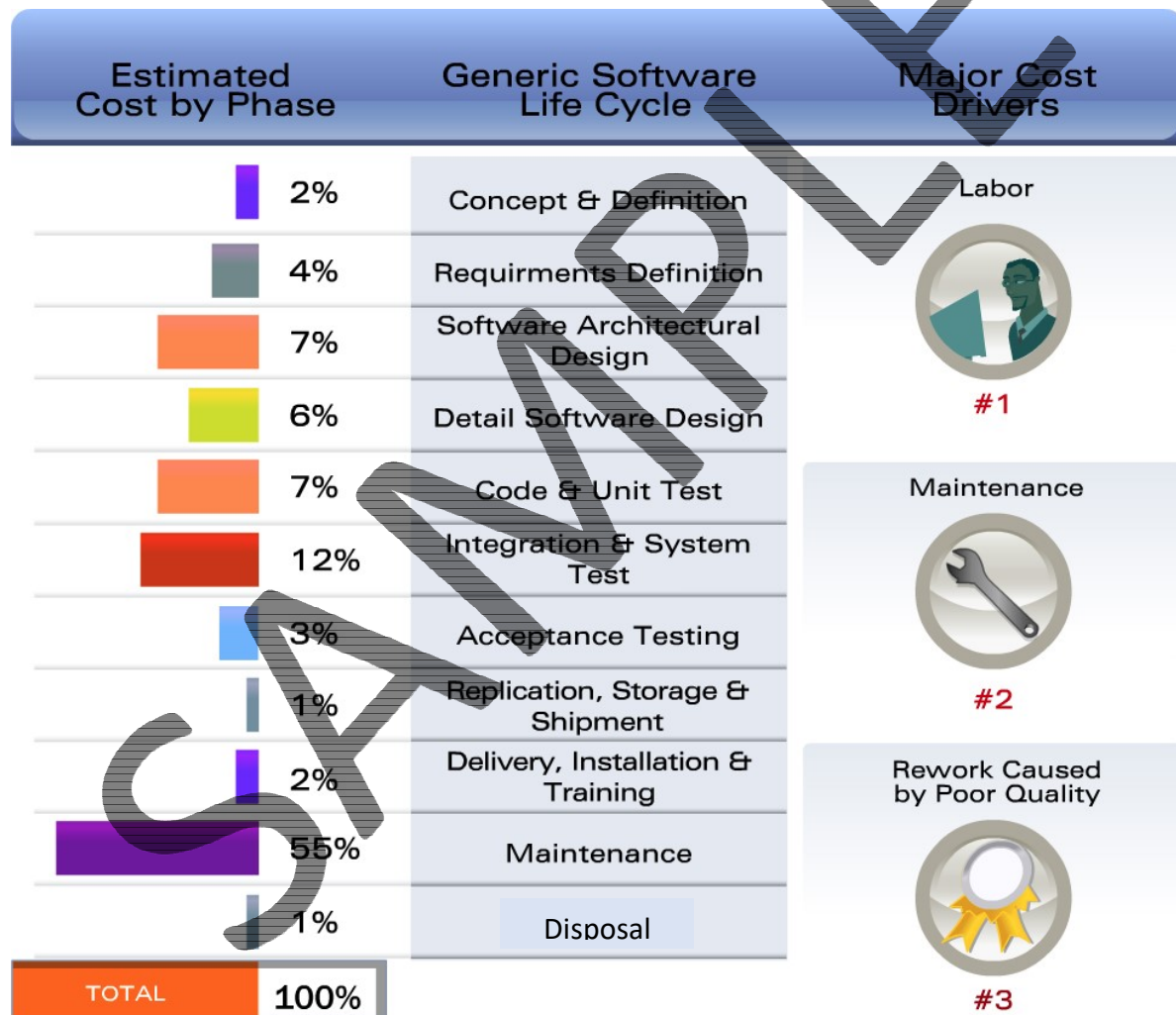
<u>Revision Number</u>	<u>Purpose</u>
<b>Second Edition</b>	Incorporated compliance with ISO/IEC 12207: Amd 1: 2002, Information Technology-Software Life Cycle Processes (AMENDMENT 1) and ISO/IEC 12207: Amd 2: 2004, Information Technology-Software Life Cycle Processes (AMENDMENT 2)
<b>Third Edition</b>	Incorporated compliance with ISO/IEC 14764: 2006, <i>Software Engineering – Software Life Cycle Processes - Maintenance</i>
<b>Fourth Edition</b>	Incorporated compliance with ISO/IEC 12207:2008, <i>Systems and software engineering - Software life cycle processes</i>
<b>Fifth Edition</b>	Incorporated compliance with ISO/IEC/IEEE 14764:2021, <i>Systems and software engineering – Maintenance</i> , and ISO/IEC/IEEE 12207:2017, <i>Systems and software engineering - Software life cycle processes</i> .

# Introduction

## Background

Software Engineering Process Technology (SEPT) has developed this template for a Software Maintenance Plan to aid an organization in implementing software maintenance requirements, as defined in ISO/IEC/IEEE 14764:2021 - *Software Engineering – Software Life Cycle Processes - Maintenance*. This template is easy to use, self-explanatory, and does not require expensive training or extensive experience.

The major life cycle cost is Maintenance (55% ) as depicted in Figure 1 “Software Life Cycle Costs”. Software disposal is the process of removing a software product from service in an orderly manner once the product has reached the end of its useful life. ( 1%)



**Fig 1 – Software Life Cycle Costs**

All IT organizations should have a well thought out Maintenance Plan that can reflect the guidance for a Maintenance Plan as in ISO/IEC/IEEE 14764:2021. This template will aid an organization to meet this goal. Proper planning can help reduce life cycle costs for this stage. It

is therefore prudent to possess software maintenance plans and procedures to contain life cycle costs, and to operate an efficient organization. Maintenance planning prepares for the personnel, environment, and financial resources required to provide software maintenance for software systems. Planning consists of developing a Maintenance Plan.

## **About Software Maintenance**

Software maintenance is the totality of activities required to provide cost-effective support to a software system. Activities are performed during the pre-delivery stage as well as the post-delivery stage. Pre-delivery activities include developing a maintenance strategy, planning for post-delivery operations, supportability, and logistics determination. Post-delivery activities include software modification, training, and operating a help desk. At the end of the software's useful life software is disposed in a controlled way (via a disposal plan). A Maintenance Plan is a document setting out the specific maintenance practices, resources, and sequence of activities relevant to maintaining a software product.

## **How to use this Document**

This document is designed to aid a person with limited knowledge of software maintenance requirements and methods to plan for software maintenance of a project or system. This template may be applied to manual or automated (computer processes) methods and can be easily implemented by one or more persons. It is applicable to small, highly critical 10-line software programs and to programs over 1 million lines of code.

## **Organizational Requirements**

Maintenance is performed by the developer, a separate maintainer, or by a third-party organization. It is important that the organization responsible for maintenance be identified in writing with full responsibilities. The Maintenance Plan accomplishes this. The maintainer should develop the Maintenance Plan as well as the supporting procedures. Since software maintenance activities invoke the use of organizational resources, it is recommended that the highest level of management in the organization approves of this undertaking and approves the final version of the plan and the procedures. Other functions that should also review and approve this plan include Software Quality Assurance, Software Engineering, Software Testing, Project Management (when applicable), the organization's Software Configuration Management Function (when applicable), and the customer (when applicable).

This template's illustrative text is designed for use as is, by stripping the tutorial notations underlined in the text. The text can also be modified for requirements and guidance to meet organizational needs, and unique environments. It is not a requirement to use the paragraph numbers contained in this document and additional comments are encouraged whenever appropriate to fully comply with an organization's specific requirements. This template is applicable to all types of software from information technology, commercial, scientific, and other non-business applications (such as creating a complex web site). The user of this template should spell out all of the issues that are prevailing regarding the need for software maintenance prior to tailoring the template to ascertain that all such organizational issues are addressed.

## Reference Software Maintenance Standards

This template meets the requirements of the following standards:

### International Standards

- ISO/IEC/IEEE 12207:2017, Systems and *software engineering - Software life cycle processes*
- ISO/IEC/IEEE 14764: 2021, *Software Engineering – Software Life Cycle Processes - Maintenance*

### Product Support

SEPT will provide 3 hours of free consulting with this product concerning the understanding and application of this template, to be provided within 60 days of purchase. This consultation is available at the SEPT Help Desk. Contact us at 425-391-2344 by e-mailing your questions to [stanmagee@smartwire.net](mailto:stanmagee@smartwire.net).

### Warranties and Liability

SEPT makes no warranties, implied or stated with respect to this template and it is provided on an “*as is basis*”. SEPT will have no liability for any indirect, incidental, special or consequential damages or any loss of revenue or profits arising under, or with respect to the use of this document.

# Template for a Software Maintenance Plan

Enter the Company/Organization Name

## Software Maintenance Plan

Enter the Program/Project Name or Product Name

Enter date prepared/approved

Enter version/revision number

Enter contact reference

*(Example: Company @ABC  
Software Maintenance Plan*

*System @XYZ*

*Date Prepared: 9-1-2022*

*Date Approved: 10-1-2022*

*Version 1.0*

*Contract @XYZ*

Enter “prepared by” name and the names of approving manager(s)

*(Example:*

*Prepared by*

*John Doe*

*“Manager of Software Maintenance Department*

*Approved by*

*Mary Smith*

*Director of Operations)*

## Recommended Table of Contents

### 0.0 Change Record

### 0.1 Index

### 1.0 Scope and Purpose

(Who, what, why, where, when)

### 2.0 Applicable Documents

(Authorizing standards and agreements plus organizational policy/procedure governing software maintenance).

### 3.0 Acronyms and Definitions

Definitions in accordance with required standard or Company standard for software maintenance).

### 4.0 Application of the Plan

(How is this plan to be used?)

### 5.0 General Requirements

(Guidance and requirements to be followed in implementing software maintenance on this project)

5.1 Introduction

5.2 Maintenance Strategy

5.3 Scope of Maintenance

5.4 Maintenance Organization

5.5 Maintenance Process(es)

5.6 Pre-Delivery and Post-Delivery Maintenance Activities

5.7 Resources

5.8. Maintenance Cost Estimate

5.9 Training Requirements

5.10 Maintenance Records and Reports

Appendix A-Sample Modification Request Form

**Note1:** a reference table is provided at Annex B to show where in ISO/IEC/IEEE 14764 the plan section is related.

**Note 2:** throughout the plan that follows Underlined text is advice for the author and should be removed after completion of the plan.



# Example Contents of a Maintenance Plan

## 1.0 Change Record

- Changes in each version
- Participants in reviews.
- Date of Issue: (Issue Date)
- Status of the Plan: Final
- Name of Issuing Organization

## 0.1 Index

### 1.0 Scope and Purpose

Describe the organizational framework that this plan shall be applied to and the purpose for its existence as illustrated below:

**Scope** -This plan provides the direction and guidance for the performance of the Software Maintenance Process for software products. It pertains to software products developed internally or externally to software organizations.

**Purpose** -The purpose of this plan is to describe the criteria and direction necessary to perform the activities of software maintenance. These are cited in the organization's software development plan, project management plan or customer statement of work.

## 2.0 Applicable Documents

List the organization's policies, procedures, standards and specifications that will govern the successful accomplishment and delivery of this program/project's product as shown below as well as the customer contract and prescribed specifications and standards.

**2.1 Organization Mission Statement.** (Prepared by: Organization President/CEO.)

**2.2 Organization Policy on Continuous Process Improvement** (Approved by: Senior Management)

**2.3 Organization Software Maintenance Process Manual** (Prepared by: Manager, Software Maintenance Department)

**2.4 Organization Quality Management Systems Manual** (Prepared by: Director Quality Assurance)

**2.5 IEEE Standards Dictionary Online:** available at <https://dictionary.ieee.org>

**2.6 ISO/IEC/IEEE 14764:2021** Software engineering – Software life cycle processes - Maintenance

**2.7 ISO/IEC/IEEE 12207:2017:** Systems and software engineering – Software life cycle processes

### 3.0 Acronyms and Definitions

All abbreviations/acronyms and unique definitions should be listed for ease of reader understanding.

#### 3.1 Acronyms used in the Software Maintenance Plan:

CCB	Configuration Control Board
ER	Enhancement Request
FCA	Functional Configuration Audit
MBSE	Model-Based System Engineering
MR	Modification Request
PCA	Physical Configuration Audit
PR	Problem Report
SCM	Software Configuration Management
SDF	Software Development Folder
SEE	Software Engineering Environment
SEPT	Software Engineering Process Technology
STE	Software Test Environment
WBT	Web Based Training

**3.2. Definitions:** Terminology used to describe the Software Maintenance Plan. Definitions are contained in ISO/IEC 14764, and ISO/IEC 12207 except as were noted or listed below. Terminology may also be defined in the organization's standards.

**Adaptive Maintenance:** The modification of a software product, performed after delivery, to keep a software product usable in a changed or changing environment.

**Additive Maintenance**

modification of a software product performed after delivery to add functionality or features to enhance the usage of the product

**Corrective Maintenance:** The reactive modification of a software product performed after delivery to correct discovered problems.

**Emergency Maintenance:** an unscheduled modification performed to temporarily keep a system operational pending corrective maintenance.

**Maintainability:** the capability of the software product to be modified. Modifications may include corrections, improvements or adaptation of the software to changes in environment, and in requirements and functional specifications [ISO/IEC 25010:2011].

**Maintainer:** An organization that performs maintenance activities.

**Maintenance Enhancement:** A maintenance enhancement is a software change which is a new requirement.

**Maintenance Plan:** A document setting out the specific maintenance practices, resources, and sequence of activities relevant to maintaining a software product.

**Modification Request (MR):** A generic term used to identify proposed changes to a software product that is being maintained.

**Perfective Maintenance:** The modification of a software product after delivery to detect and correct latent faults in the software product before they are manifested as failures.

**Preventive Maintenance:** The modification of a software product after delivery to detect and correct latent faults in the software product before they become operational faults.

**Problem Report (PR):** A term used to identify and describe problems detected in a software product.

**Software Maintenance:** Software maintenance is the totality of activities required to provide cost-effective support to a software system. Activities are performed during the pre-delivery stage as well as the post-delivery stage. Pre-delivery activities include planning for post-delivery operations, supportability, and logistics determination. Post-delivery activities include software modification, training, and operating a help desk.

**Software Migration:** Software migration is the process of transitioning a software product from an old to a new operating environment.

**Software Disposal:** Software disposal is the process of removing a software product from service in an orderly manner once the product has reached the end of its useful life.

**Software Transition:** A controlled and coordinated sequence of actions wherein software development passes from the organization performing initial software development to the organization performing software maintenance.

## 4.0 Application of this Plan

Describe the audience for this plan as illustrated below

This plan shall be provided to and followed by project/program software personnel maintaining software products as well as those responsible for the performance of software maintenance throughout the organization and those designated to perform software maintenance functions.

## 5.0 General Requirements

This section should describe the policies and responsibilities of the program/project team as it plans for software maintenance. Policies and responsibilities are usually spelled out in an organization policy/directives manual and may be referenced here. It is highly recommended, however, that such doctrine be summarized in the plan.

Many organizations put some elements of this plan on their internal web site for viewing and updating by their personnel and customer.

## 5.1 Introduction

This section describes the system to be supported and identifies the initial status of the system. Complete identification of the system should include formal and common names, nomenclature, identification number and system abbreviations. Subsystems and interfacing systems should be identified.

This plan describes the processes and procedures necessary to provide software maintenance for the @XYZ system. System @XYZ, Version 1.0 is being developed by the Software Development of Company @ABC and the Software Maintenance Department of Company @ABC will perform all software maintenance functions. NOTE: If the developer will perform maintenance, the following would be used. The Software Development Department of Company @ABC is developing System @XYZ Version 1.0. Software maintenance will also be performed by the Software Development Department. NOTE: If maintenance were outsourced to another Company, the following would be used. System @XYZ, Version 1.0 is being developed by Company @ABC and will transition to Company @DEF for software maintenance support. System @XYZ contains subsystems Collection, Processing, and Reporting. System @XYZ interfaces with systems QRS and STU. This plan details the activities required and specifies the various responsibilities in order to provide software maintenance for System @XYZ.

**5.1.1. System.** Describe the mission of the system to include mission need and employment. Identify interoperability requirements. Describe system functions. Describe the system to include descriptions of system architecture, components and interfaces, and hardware and software. Use separate subparagraphs to describe each subsystem and major hardware/software component.

System @XYZ provides payroll processing for a small business. It provides input to a third party payroll Company called ADP Inc. The data provided must be in a format compatible with ADP Inc. requirements. System @XYZ takes input from timecards, aggregates them, and formats the data to be forwarded to ADP Inc.

**5.1.2. Status.** Identify the initial status of the system. System @XYZ is under development and replaces System @XY. System @XY is a semi-automated system that is not integrated into corporate operations. System @XYZ will provide that integration and additional functionality.

**5.1.3. Support.** Describe why support is needed. System @XYZ has a projected life of 3 years. During that period, corrections and enhancements will be required. Corrective maintenance will accommodate latent defects as reported by users. Enhancements or improvements will be submitted in order to improve performance and provide additional functionality for the users. As a result, maintenance support is required.

**5.1.4. Maintainer.** Identify the maintainer. The maintainer for System @XYZ is the Software Maintenance Department of the @ABC Company. (NOTE: or the Software Maintenance Department of the @DEF Company if maintenance is provided by an outside source. Or the Software Development Department if there is no transition to a separate maintenance organization.)

**5.1.5. Software Processes.** Identify specific software activities covered by the maintenance process. Specific software activities are identified in the Organization Software Maintenance Process Manual and include Problem and Modification Analysis, Modification Implementation, and Maintenance Review and Acceptance.

**5.1.6 Contracts.** Describe any contractual protocols between customer and supplier. To get to this point, the acquirer should have prepared for acquisition of maintenance services by establishing the needs and goals of the acquisition and communicating them to the potential suppliers. Then a supplier is selected, and performance monitored. The Software Development Department of Company @ABC has a signed Memorandum of Agreement with the Software Maintenance Department of Company @ABC to provide software maintenance for system @XYZ. Through a Configuration Control Board (CCB), agreement will be reached on what corrections and enhancements will be provided in the next release. Emergency support is on an hourly basis. NOTE: For outside support use the following: Company @ABC has a signed Memorandum of Agreement with Company @DEF to provide software maintenance for system @XYZ. Through a Configuration Control Board, agreement will be reached on which corrections and enhancements will be provided in the next release. Emergency support is on an hourly basis.

**5.1.7 Performance.** Identify where maintenance will be performed, when maintenance will commence, costs to provide maintenance, and the schedule. Maintenance will be performed in (Place Name) and will commence on (Start Date). The cost to perform maintenance for 12 months is (Cost). The schedule consists of two operational versions, one in 6 months and the second in 12 months.

**5.1.8 Identification and Control of the Plan.** Identify date of issue, status of the plan, the name of the issuing organization, the approval authority, the change procedure for the plan, and a change history section.

- Participate in reviews.
- Date of Issue: (Issue Date)
- Status of the Plan: Final
- Name of Issuing Organization: Software Maintenance Department of Company @ABC
- Approval Authority: Manager of Software Maintenance Department
- Change Procedure for the Plan: Through the CCB
- Change History Section:
  - Date, Change Implemented

## **5.2 Maintenance Strategy**

To implement the maintenance process, a strategy should be developed for performing maintenance. In the maintenance strategy, maintenance methods or techniques can be described to perform the software maintenance process, keeping consistency with the software system development and operation processes, such as performing development/maintenance concurrently with operations, e.g. DevOps, or performing iterative development/maintenance

with Agile practices. There may be multiple organizations providing maintenance, so this needs to be incorporated in the strategy.

The maintenance strategy for System @XYZ covers: (add answers to sections a) to M)

- why maintenance is needed;
- who can do what;
- what the roles and responsibilities of maintainers are;
- how the work is to be implemented;
- how to sustain maintainability requirements established during software development
- what resources are available;
- where maintenance is to be performed;
- when maintenance can start;
- a system description;
- agreements;
- training;
- controls;

The Software Maintenance objective for System @XYZ is to release two operational versions during each year. The Configuration Control Board will determine the target dates and the content of each release. Support for Version 1.0 will be limited to priority one (cannot operate the system) corrective actions. All other problems will be saved and included in the next release. All enhancements will be held until a scheduled release.

### **5.2.1. Level of support.**

Describe the level of support for the system. Support will be provided for 3 years and will include support for two major releases each year. All corrective and enhancements approved by the Configuration Control Board will be included in releases. Tracking of all change requests is required. A Help Desk will be maintained, and technical support will be provided as needed.

### **5.2.2 Support period.**

Describe the support period from pre-delivery to post-delivery support. The maintainer will provide support during the development stage. This support will be on an on-call basis to review requirements, plans, etc. The post-delivery support period will be 3 years.

### **5.2.3 Tailoring the maintenance process.**

Tailor the maintenance process by referring to the maintainer's software maintenance process manual or if not available Define tailoring extent here.

Any activities and/or task in the process manual that will not be performed for System @XYZ must be specifically tailored out, i.e., deleted. In this section, identify the specific sections of the process manual that will be deleted. Software Maintenance for System @XYZ will be performed in accordance with Company @ABC's "Organization Software Maintenance Process Manual." Or, for outside support, in accordance with Company @DEF's "Software Maintenance Process Manual." As an example, System @XYZ may not require sections 3.3, 3.4 and 3.5 of the Process Manual. Thus, the following might be used: Specific activities tailored out for System @XYZ are items: 3.3, 3.4, and 3.5 of the "Organization Software Maintenance Process Manual."