

IEEE Std 830-1998

(Revision of
IEEE Std 830-1993)

IEEE Recommended Practice for Software Requirements Specifications

Sponsor

**Software Engineering Standards Committee
of the
IEEE Computer Society**

Approved 25 June 1998

IEEE-SA Standards Board

Abstract: The content and qualities of a good software requirements specification (SRS) are described and several sample SRS outlines are presented. This recommended practice is aimed at specifying requirements of software to be developed but also can be applied to assist in the selection of in-house and commercial software products. Guidelines for compliance with IEEE/EIA 12207.1-1997 are also provided.

Keywords: contract, customer, prototyping, software requirements specification, supplier, system requirements specifications

The Institute of Electrical and Electronics Engineers, Inc.
145 East 47th Street, New York, NY 10017-2394, USA

Copyright © 1998 by the Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 1998. Printed in the United States of America.

ISBN 0-7381-0332-2

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. Members of the committees serve voluntarily and without compensation. They are not necessarily members of the Institute. The standards developed within IEEE represent a consensus of the broad expertise on the subject within the Institute as well as those activities outside of IEEE that have expressed an interest in participating in the development of the standard.

Use of an IEEE Standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation. When a document is more than five years old and has not been reaffirmed, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE Standard.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretation is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of all concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration.

Comments on standards and requests for interpretations should be addressed to:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331

Note: Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. The IEEE shall not be responsible for identifying patents for which a license may be required by an IEEE standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Authorization to photocopy portions of any individual standard for internal or personal use is granted by the Institute of Electrical and Electronics Engineers, Inc., provided that the appropriate fee is paid to Copyright Clearance Center. To arrange for payment of licensing fee, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; (978) 750-8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Introduction

(This introduction is not a part of IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications.)

This recommended practice describes recommended approaches for the specification of software requirements. It is based on a model in which the result of the software requirements specification process is an unambiguous and complete specification document. It should help

- a) Software customers to accurately describe what they wish to obtain;
- b) Software suppliers to understand exactly what the customer wants;
- c) Individuals to accomplish the following goals:
 - 1) Develop a standard software requirements specification (SRS) outline for their own organizations;
 - 2) Define the format and content of their specific software requirements specifications;
 - 3) Develop additional local supporting items such as an SRS quality checklist or an SRS writer's handbook.

To the customers, suppliers, and other individuals, a good SRS should provide several specific benefits, such as the following:

- *Establish the basis for agreement between the customers and the suppliers on what the software product is to do.* The complete description of the functions to be performed by the software specified in the SRS will assist the potential users to determine if the software specified meets their needs or how the software must be modified to meet their needs.
- *Reduce the development effort.* The preparation of the SRS forces the various concerned groups in the customer's organization to consider rigorously all of the requirements before design begins and reduces later redesign, recoding, and retesting. Careful review of the requirements in the SRS can reveal omissions, misunderstandings, and inconsistencies early in the development cycle when these problems are easier to correct.
- *Provide a basis for estimating costs and schedules.* The description of the product to be developed as given in the SRS is a realistic basis for estimating project costs and can be used to obtain approval for bids or price estimates.
- *Provide a baseline for validation and verification.* Organizations can develop their validation and verification plans much more productively from a good SRS. As a part of the development contract, the SRS provides a baseline against which compliance can be measured.
- *Facilitate transfer.* The SRS makes it easier to transfer the software product to new users or new machines. Customers thus find it easier to transfer the software to other parts of their organization, and suppliers find it easier to transfer it to new customers.
- *Serve as a basis for enhancement.* Because the SRS discusses the product but not the project that developed it, the SRS serves as a basis for later enhancement of the finished product. The SRS may need to be altered, but it does provide a foundation for continued production evaluation.

The readers of this document are referred to Annex B for guidelines for using this recommended practice to meet the requirements of IEEE/EIA 12207.1-1997, IEEE/EIA Guide—Industry Implementation of ISO/IEC 12207: 1995, Standard for Information Technology—Software life cycle processes—Life cycle data.

Participants

This recommended practice was prepared by the Life Cycle Data Harmonization Working Group of the Software Engineering Standards Committee of the IEEE Computer Society. At the time this recommended practice was approved, the working group consisted of the following members:

Leonard L. Tripp, *Chair*

Edward Byrne
Paul R. Croll
Perry DeWeese
Robin Fralick
Marilyn Ginsberg-Finner
John Harauz
Mark Henley

Dennis Lawrence
David Maibor
Ray Milovanovic
James Moore
Timothy Niesen
Dennis Rilling

Terry Rout
Richard Schmidt
Norman F. Schneidewind
David Schultz
Basil Sherlund
Peter Voldner
Ronald Wade

The following persons were on the balloting committee:

Syed Ali
Theodore K. Atchinson
Mikhail Auguston
Robert E. Barry
Leo Beltracchi
H. Ronald Berlack
Richard E. Biehl
Michael A. Blackledge
Sandro Bologna
Juris Borzovs
Kathleen L. Briggs
M. Scott Buck
Michael Caldwell
James E. Cardow
Enrico A. Carrara
Lawrence Catchpole
Keith Chan
Antonio M. Cicu
Theo Clarke
Sylvain Clermont
Rosemary Coleman
Virgil Lee Cooper
W. W. Geoff Cozens
Paul R. Croll
Gregory T. Daich
Geoffrey Darnton
Taz Daughtrey
Bostjan K. Derganc
Perry R. DeWeese
James Do
Evelyn S. Dow
Carl Einar Dragsted
Sherman Eagles
Christopher
Leo Egan
Richard E. Fairley
John W. Fendrich
John Forster
Kipoy Fortenberry
Eva Freund
Richard C. Fries
Roger U. Fujii
Adel N. Ghannam
Marilyn Ginsberg-Finner
John Garth Glynn
Julio Gonzalez-Sanz
L. M. Gunther

David A. Gustafson
Jon D. Hagar
John Harauz
Robert T. Harley
Herbert Hecht
William Hefley
Manfred Hein
Mark Heinrich
Mark Henley
Debra Herrmann
John W. Horch
Jerry Huller
Peter L. Hung
George Jackelen
Frank V. Jorgensen
William S. Junk
George X. Kanarek
Richard Karcich
Ronald Keatt
Julius Keiner
Robert J. Kierzyk
Dwayne L. Knirk
Wayne Koenig
Thomas M. Kurihara
John B. Lane
J. Dennis Lawrence
Fang Ching Lim
William M. Lively
James J. Longbucco
Dieter Look
John Lord
Stan Magee
David Maibor
Harold Mains
Robert A. Martin
Tomoo Matsubara
Mike McAndrew
Patrick D. McCray
Christopher McMacken
Jerome W. Mersky
Bret Michael
Alan Miller
Celia H. Modell
James W. Moore
Pavol Navrat
Myrna L. Olson

Indradeb P. Pa
Alex P
Peter T. P
Lawrence Przybylski
Kenneth R. Ptack
Francis D. Reilly
Dennis Rilling
Andrew P. Sage
Helmut Sandmayr
Stephen R. Schach
Hans Schaefer
Norman Schneidewind
David J. Schultz
Lisa A. Selmon
Robert W. Shillato
David M. Siefert
Carl A. Singer
James M. Sivak
Richard S. Sky
Nancy M. Smith
Melford E. Smyre
Harry M. Sneed
Alfred R. Sorkowitz
Donald W. Sova
Luca Spotorno
Julia Stesney
Fred J. Strauss
Christine Brown Strysik
Toru Takeshita
Richard H. Thayer
Booker Thomas
Patricia Trellue
Theodore J. Urbanowicz
Glenn D. Venables
Udo Voges
David D. Walden
Dolores Wallace
William M. Walsh
John W. Walz
Camille SWhite-Partain
Scott A. Whitmire
P. A. Wolfgang
Paul R. Work
Natalie C. Yopconka
Janusz Zalewski
Geraldine Zimmerman
Peter F. Zoll

When the IEEE-SA Standards Board approved this recommended practice on 25 June 1998, it had the following membership:

Richard J. Holleman, *Chair*

Donald N. Heirman, *Vice Chair*

Judith Gorman, *Secretary*

Satish K. Aggarwal
Clyde R. Camp
James T. Carlo
Gary R. Engmann
Harold E. Epstein
Jay Forster*
Thomas F. Garrity
Ruben D. Garzon

James H. Gurney
Jim D. Isaak
Lowell G. Johnson
Robert Kennelly
E. G. "Al" Kiener
Joseph L. Koepfinger*
Stephen R. Lambert
Jim Logothetis
Donald C. Loughry

L. Bruce McClung
Louis-François Pau
Ronald C. Petersen
Gerald H. Peterson
John B. Posey
Gary S. Robinson
Hans E. Weinrich
Donald W. Zipse

*Member Emeritus

Valerie E. Zelenty
IEEE Standards Project Editor

Contents

1. Overview.....	1
1.1 Scope.....	1
2. References.....	2
3. Definitions.....	2
4. Considerations for producing a good SRS.....	3
4.1 Nature of the SRS	3
4.2 Environment of the SRS	3
4.3 Characteristics of a good SRS.....	4
4.4 Joint preparation of the SRS	8
4.5 SRS evolution	8
4.6 Prototyping.....	9
4.7 Embedding design in the SRS.....	9
4.8 Embedding project requirements in the SRS	10
5. The parts of an SRS	10
5.1 Introduction (Section 1 of the SRS).....	11
5.2 Overall description (Section 2 of the SRS).....	12
5.3 Specific requirements (Section 3 of the SRS).....	15
5.4 Supporting information.....	19
Annex A (informative) SRS templates.....	21
Annex B (informative) Guidelines for compliance with IEEE/EIA 12207.1-1997.....	27

IEEE Recommended Practice for Software Requirements Specifications

1. Overview

This recommended practice describes recommended approaches for the specification of software requirements. It is divided into five clauses. Clause 1 explains the scope of this recommended practice. Clause 2 lists the references made to other standards. Clause 3 provides definitions of specific terms used. Clause 4 provides background information for writing a good SRS. Clause 5 discusses each of the essential parts of an SRS. This recommended practice also has two annexes, one which provides alternate format templates, and one which provides guidelines for compliance with IEEE Std 12207.1-1997.

1.1 Scope

This is a recommended practice for writing software requirements specifications. It describes the content and qualities of a good software requirements specification (SRS) and presents several sample SRS outlines.

This recommended practice is aimed at specifying requirements of software to be developed but also can be applied to assist in the selection of in-house and commercial software products. However, application to already-developed software could be counterproductive.

When software is embedded in some larger system, such as medical equipment, then issues beyond those identified in this recommended practice may have to be addressed.

This recommended practice describes the process of creating a product and the content of the product. The product is an SRS. This recommended practice can be used to create such an SRS directly or can be used as a model for a more specific standard.

This recommended practice does not identify any specific method, nomenclature, or tool for preparing an SRS.