

A GUIDE TO THE PROJECT MANAGEMENT BODY OF KNOWLEDGE

PMI Standards Committee

William R. Duncan, Director of Standards

Project Management Institute
130 South State Road
Upper Darby, PA 19082 USA

Library of Congress Cataloging-in-Publication Data

A guide to the project management body of knowledge.

p. cm.

“1996 ed.”—Pref.

“This ... supersedes PMI’s Project Management Body of Knowledge (PMBOK) document that was published in 1987”—Pref.

Includes index.

ISBN: 1-880410-12-5 (pbk. : alk. paper)

ISBN: 1-880410-13-3 (hdbk)

1. Industrial project management. I. Project Management Institute. II. Project management body of knowledge (PMBOK)

HD69.P75G845 1996

658.4’04—dc20

95-39934

CIP

PMI Communications welcomes corrections and comments on its documents. In addition to comments directed to the PMI Standards Committee about the substance of *A Guide to the Project Management Body of Knowledge*, please feel free to send comments on typographical, formatting, or other errors. Simply make a copy of the relevant page of the *PMBOK Guide*, mark the error, and send it to: PMI Communications, 40 Colonial Square, Sylva, NC 28779 USA, phone: 704/586-3715, fax: 704/586-4020, e-mail: pmicom@ix.netcom.com.

Copyright ©1996 by the Project Management Institute. All rights reserved. Permission to republish in full is granted freely. No part of this work may be reproduced or transmitted in any form or by any means, electronic, manual, photocopying, recording, or by any information storage and retrieval system, without prior written permission of the publisher. Send permission request to Permissions, PMI Communications, 40 Colonial Square, Sylva, NC 28779 USA.

Printed and bound by Automated Graphic Systems, Charlotte, NC, USA.

PMI publications are available at special quantity discounts. For more information, please write to the Business Manager, PMI Communications, 40 Colonial Square, Sylva, NC 28779 USA or contact your local bookstore.

The paper used in this book complies with the Permanent Paper Standard issued by the National Information Standards Organization (Z39.48—1984).

10 9 8 7 6 5 4 3 2 1

CONTENTS



List of Figures vi

Preface to the 1996 Edition vii

I. The Project Management Framework

Chapter 1 Introduction 3

Chapter 2 The Project Management Context 11

Chapter 3 Project Management Processes 27

II. The Project Management Knowledge Areas

Chapter 4 Project Integration Management 39

Chapter 5 Project Scope Management 47

Chapter 6 Project Time Management 59

Chapter 7 Project Cost Management 73

Chapter 8 Project Quality Management 83

Chapter 9 Project Human Resource Management 93

Chapter 10 Project Communications Management 103

Chapter 11 Project Risk Management 111

Chapter 12 Project Procurement Management 123

III. Appendices

Appendix A The Project Management Institute Standards-Setting Process 137

Appendix B Evolution of PMI's *A Guide to the Project Management Body of Knowledge* 139

Appendix C Contributors and Reviewers 141

Appendix D Notes 145

Appendix E Application Area Extensions 147

Appendix F Additional Sources of Information on Project Management 149

Appendix G Summary of Project Management Knowledge Areas 151

IV. Glossary and Index

Glossary 157

Index 173

LIST OF FIGURES

Figure 1-1	Overview of Project Management Knowledge Areas and Project Management Processes	7
Figure 1-2	Relationship of Project Management to Other Management Disciplines	9
Figure 2-1	Sample Generic Life Cycle	12
Figure 2-2	Representative Life Cycle for Defense Acquisition, per US DOD 5000.2 (Rev 2/26/93)	13
Figure 2-3	Representative Construction Project Life Cycle, per Morris	14
Figure 2-4	Representative Life Cycle for a Pharmaceuticals Project, per Murphy	15
Figure 2-5	Representative Software Development Life Cycle, per Muench (reprinted by permission, Sybase, Inc., ©1994)	16
Figure 2-6	Organizational Structure Influences on Projects	18
Figure 2-7	Functional Organization	19
Figure 2-8	Projectized Organization	19
Figure 2-9	Weak Matrix Organization	21
Figure 2-10	Balanced Matrix Organization	21
Figure 2-11	Strong Matrix Organization	22
Figure 2-12	Composite Organization	22
Figure 3-1	Links Among Processes in a Phase	28
Figure 3-2	Overlap of Process Groups in a Phase	29
Figure 3-3	Interaction Between Phases	29
Figure 3-4	Relationships Among the Initiating Processes	30
Figure 3-5	Relationships Among the Planning Processes	31
Figure 3-6	Relationships Among the Executing Processes	33
Figure 3-7	Relationships Among the Controlling Processes	34
Figure 3-8	Relationships Among the Closing Processes	35
Figure 4-1	Project Integration Management Overview	41
Figure 4-2	Coordinating Changes Across the Entire Project	45
Figure 5-1	Project Scope Management Overview	48
Figure 5-2	Sample Work Breakdown Structure for Defense Materiel Items	54
Figure 5-3	Sample Work Breakdown Structure Organized by Phase	55
Figure 5-4	Sample Work Breakdown Structure for Waste Water Treatment Plant	55
Figure 6-1	Project Time Management Overview	60
Figure 6-2	Network Logic Diagram Drawn Using the Precedence Diagramming Method	63
Figure 6-3	Network Logic Diagram Drawn Using the Arrow Diagramming Method	64
Figure 6-4	PERT Duration Calculation	68
Figure 6-5	Project Network Diagram with Scheduled Dates	69
Figure 6-6	Bar (Gantt) Chart	69
Figure 6-7	Milestone Chart	70
Figure 6-8	Time-Scaled Network Diagram	70
Figure 7-1	Project Cost Management Overview	74
Figure 7-2	Illustrative Cost Baseline Display	79
Figure 8-1	Project Quality Management Overview	84
Figure 8-2	Cause-and-Effect Diagram (reprinted from Lewis R. Ireland, <i>Quality Management for Projects and Programs</i> , Project Management Institute, 1991)	86
Figure 8-3	Sample Process Flowchart (reprinted from Lewis R. Ireland, <i>Quality Management for Projects and Programs</i> , Project Management Institute, 1991)	87
Figure 8-4	Control Chart of Project Schedule Performance (reprinted from Lewis R. Ireland, <i>Quality Management for Projects and Programs</i> , Project Management Institute, 1991)	90
Figure 8-5	Pareto Diagram	91
Figure 9-1	Project Human Resource Management Overview	94
Figure 9-2	Responsibility Assignment Matrix	96
Figure 9-3	Illustrative Resource Histogram	97
Figure 10-1	Project Communications Management Overview	104
Figure 10-2	Illustrative Graphic Performance Report	109
Figure 10-3	Illustrative Tabular Performance Report	110
Figure 11-1	Project Risk Management Overview	112
Figure 11-2	Summing Probability Distributions	116
Figure 11-3	Results from a Monte Carlo Simulation of a Project Schedule	118
Figure 11-4	Path Convergence	118
Figure 11-5	Decision Tree	119
Figure 12-1	Project Procurement Management Overview	124

PREFACE TO THE 1996 EDITION



This document supersedes PMI's *Project Management Body of Knowledge (PMBOK)* document that was published in 1987. To assist users of this document who may be familiar with its predecessor, we have summarized the major differences here.

1. *We changed the title to emphasize that this document is not the PMBOK.* The 1987 document defined the PMBOK as "all those topics, subject areas and intellectual processes which are involved in the application of sound management principles to ... projects." Clearly, one document will never contain the entire PMBOK.
2. *We have completely rewritten the Framework section.* The new section consists of three chapters:
 - *Introduction*, which sets out the purpose of the document and defines at length the terms "project" and "project management."
 - *The Project Management Context*, which covers the context in which projects operate—the project life cycle, stakeholder perspectives, external influences, and key general management skills.
 - *Project Management Processes*, which describes how the various elements of project management interrelate.
3. *We have developed a revised definition of "project."* We wanted a definition that was both inclusive (it should not be possible to identify any undertaking generally thought of as a project that does not fit the definition) and exclusive (it should not be possible to describe any undertaking which satisfies the definition and is not generally thought of as a project). We reviewed many of the definitions of project in the existing literature and found all of them unsatisfactory in some way. The new definition is driven by the unique characteristics of a project: *a project is a temporary endeavor undertaken to create a unique product or service.*
4. *We have developed a revised view of the project life cycle.* The 1987 document defined project phases as subdivisions of the project life cycle. We have reordered this relationship and defined the project life cycle as a collection of phases whose number and names are determined by the control needs of the performing organization.
5. *We have changed the name of the major sections from "function" to "knowledge area."* The term "function" had been frequently misunderstood to mean an element of a functional organization. The name change should eliminate this misunderstanding.
6. *We formally recognized the existence of a ninth knowledge area.* There has been widespread consensus for some time that project management is an integrative process. Chapter 4, Project Integration Management, recognizes the importance of this subject.
7. *We have added the word "project" to the title of each knowledge area.* Although this may seem redundant, it helps to clarify the scope of the document. For example, Project Human Resource Management covers only those aspects of managing human resources that are unique or nearly unique to the project context.

8. *We have chosen to describe the knowledge areas in terms of their component processes.* The search for a consistent method of presentation led us to completely restructure the 1987 document into 37 “project management processes.” Each process is described in terms of its inputs, outputs, and tools and techniques. Inputs and outputs are documents (e.g., a scope statement) or documentable items (e.g., activity dependencies). Tools and techniques are the mechanisms applied to the inputs to create the outputs. In addition to its fundamental simplicity, this approach offers several other benefits:
- It emphasizes the interactions among the knowledge areas. Outputs from one process become inputs to another.
 - The structure is flexible and robust. Changes in knowledge and practice can be accommodated by adding a new process, by resequencing processes, by subdividing processes, or by adding descriptive material within a process.
 - Processes are at the core of other standards. For example, the International Organization for Standardization’s quality standards (the ISO 9000 series) are based on identification of business processes.
9. *We added some illustrations.* When it comes to work breakdown structures, network diagrams, and S-curves, a picture is worth a thousand words.
10. *We have significantly reorganized the document.* The following table provides a comparison of the major headings of the 1987 document and this one:

1987 Number and Name	1996 Number and Name
0. PMBOK Standards	B. Evolution of PMI’s <i>A Guide to the Project Management Body of Knowledge</i>
1. Framework: The Rationale	1. Introduction (basic definitions)
2. Framework: An Overview	2. The Project Context (life cycles)
	1. Various portions
	2. Various portions
	3. Various portions
3. Framework: An Integrative Model	3. Project Management Processes
4. Glossary of General Terms	4. Project Integration Management
A. Scope Management	IV. Glossary
B. Quality Management	5. Project Scope Management
C. Time Management	8. Project Quality Management
D. Cost Management	6. Project Time Management
E. Risk Management	7. Project Cost Management
F. Human Resource Management	11. Project Risk Management
G. Contract/Procurement Management	9. Project Human Resource Management
H. Communications Management	12. Project Procurement Management
	10. Project Communications Management

11. *“To classify” has been removed from the list of purposes.* Both this document and the 1987 version provide a structure for organizing project management knowledge, but neither is particularly effective as a classification tool. First, the topics included are not comprehensive—they do not include innovative or unusual practices. Second, many elements have relevance in more than one knowledge area or process such that the categories are not unique.

We plan to update this document regularly. Your comments are both welcome and requested. Please send them to:

PMI Standards Committee
130 South State Road
Upper Darby, PA 19082
USA

Phone: 610/734-3330
Fax: 610/734-3266
E-mail: pmieo@ix.netcom.com
World Wide Web: <http://www.pmi.org>