

# Introduction To Software Project Management

Software Project Management: Measures for Improving Performance focuses on more than the mechanics of project execution. By showing the reader how to identify and solve real world problems that put schedule, cost, and quality at risk, this guide gets to the heart of improving project control and performance.

- Identify measurement needs and goals
- Determine what measures to use to maximize the value of data
- Interpret data and report the results
- Diagnose quality and productivity issues
- Use metrics data to solve real problems

This is a must-read for project managers and engineering managers working in organizations where deadlines are tight, the workload is daunting, and daily crises are the rule rather than the exception. The text provides simple run rate data through progressively advanced measures, as well as:

- Examples that show you how to combine measures to solve complex problems
- Exercises that guide you through best practices for metric program development and implementation

From beginning to end, *Software Project Management: Measures for Improving Performance* guides you to improved project performance — long before you turn the last page!

Why another book on software project management? For some time, the fields of project management, computer science, and software development have been growing rapidly and concurrently. Effective support for the enterprise demands the merging of these efforts into a coordinated discipline, one that incorporates best practices from both systems development and project management life cycles. Robert K. Wysocki creates that discipline in this book--a ready reference for professionals and consultants as well as a

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textbook for students of computer information systems and project management. By their very nature, software projects defy a "one size fits all" approach. In these pages you will learn to apply best-practice principles while maintaining the flexibility that's essential for successful software development.

Learn how to make the planning process fit the need \* Understand how and why software development must be planned on a certainty-to-uncertainty continuum \* Categorize your projects on a four-quadrant model \* Learn when to use each of the five SDPM strategies--Linear, Incremental, Iterative, Adaptive, and Extreme \* Explore the benefits of each strategic model and what types of projects it supports best \* Recognize the activities that go into the Scoping, Planning, Launching, Monitoring/Controlling, and Closing phases of each strategy \* Apply this knowledge to the specific projects you manage \* Get a clear picture of where you are and how to get where you want to go

Organizations of all types are consistently working on new initiatives, product lines, or implementation of new workflows as a way to remain competitive in the modern business environment. No matter the type of project at hand, employing the best methods for effective execution and timely completion of the task at hand is essential to project success. Project Management: Concepts, Methodologies, Tools, and Applications presents the latest research and practical solutions for managing every stage of the project lifecycle. Emphasizing emerging concepts, real-world examples, and authoritative research on managing project workflows and measuring project success in both private and public sectors, this multi-volume reference work is a critical addition to academic, government, and corporate libraries. It is designed for use by project coordinators and managers, business executives, researchers, and graduate-level students interested in putting research-based solutions into practice for

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effective project management.

Software engineering lies at the heart of the computer revolution. Software is used in automobiles, airplanes, and many home appliances. As the boundaries between the telecommunications, entertainment, and computer industries continue to blur in multimedia and networking, the need for software will only increase, and software will become increasingly complex. Introduction to Software Engineering gives your students the fundamentals of this growing and rapidly changing field. The book highlights the goals of software engineering, namely to write programs that have all the following attributes: efficient, reliable, usable, modifiable, portable, testable, reusable, maintainable, compatible and correct. The nine chapters cover topics that include project management, defining requirements, software design, coding, testing and integration, delivery and installation, documentation, maintenance, and research issues. The author uses a hybrid approach, combining object-oriented technology and classical programming techniques to solve computing problems. He also places a strong emphasis on Internet technology and resources. A simple, but non-trivial, running example illustrates all stages of the software engineering process. In addition, where applicable, he covers the impact of Internet technology. Introduction to Software Engineering presents the basics of software engineering in a concise and direct format. With emphasis on Internet technology, software tools for programming, and hands-on learning, this book effectively prepares students to move from an educational situation towards applying their knowledge to the complex projects faced in the professional arena.

## Features

This unique volume explores cutting-edge management approaches to developing complex software that is efficient, scalable, sustainable, and suitable for distributed

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environments. Practical insights are offered by an international selection of pre-eminent authorities, including case studies, best practices, and balanced corporate analyses. Emphasis is placed on the use of the latest software technologies and frameworks for life-cycle methods, including the design, implementation and testing stages of software development. Topics and features:

- Reviews approaches for reusability, cost and time estimation, and for functional size measurement of distributed software applications
- Discusses the core characteristics of a large-scale defense system, and the design of software project management (SPM) as a service
- Introduces the 3PR framework, research on crowdsourcing software development, and an innovative approach to modeling large-scale multi-agent software systems
- Examines a system architecture for ambient assisted living, and an approach to cloud migration and management assessment
- Describes a software error proneness mechanism, a novel Scrum process for use in the defense domain, and an ontology annotation for SPM in distributed environments
- Investigates the benefits of agile project management for higher education institutions, and SPM that combines software and data engineering

This important text/reference is essential reading for project managers and software engineers involved in developing software for distributed computing environments. Students and researchers interested in SPM technologies and frameworks will also find the work to be an invaluable resource. Prof. Zaigham Mahmood is a Senior Technology Consultant at Debesis Education UK and an Associate Lecturer (Research) at the University of Derby, UK. He also holds positions as Foreign Professor at NUST and IIU in Islamabad, Pakistan, and Professor Extraordinaire at the North West University Potchefstroom, South Africa.

The book is organized around basic principles of software

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project management: planning and estimating, measuring and controlling, leading and communicating, and managing risk. Introduces software development methods, from traditional (hacking, requirements to code, and waterfall) to iterative (incremental build, evolutionary, agile, and spiral). Illustrates and emphasizes tailoring the development process to each project, with a foundation in the fundamentals that are true for all development methods. Topics such as the WBS, estimation, schedule networks, organizing the project team, and performance reporting are integrated, rather than being relegated to appendices. Each chapter in the book includes an appendix that covers the relevant topics from CMMI-DEV-v1.2, IEEE/ISO Standards 12207, IEEE Standard 1058, and the PMI® Body of Knowledge. (PMI is a registered mark of Project Management Institute, Inc.)

Advances in Computer and Information Sciences and Engineering includes a set of rigorously reviewed world-class manuscripts addressing and detailing state-of-the-art research projects in the areas of Computer Science, Software Engineering, Computer Engineering, and Systems Engineering and Sciences. Advances in Computer and Information Sciences and Engineering includes selected papers from the conference proceedings of the International Conference on Systems, Computing Sciences and Software Engineering (SCSS 2007) which was part of the International Joint Conferences on Computer, Information and Systems Sciences and Engineering (CISSE 2007).

Introduction to Software Project Management CRC Press Drawing on best practices identified at the Software Quality Institute and embodied in bodies of knowledge from the Project Management Institute, the American Society of Quality, IEEE, and the Software Engineering Institute, Quality Software Project Management teaches

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34 critical skills that allow any manager to minimize costs, risks, and time-to-market. Written by leading practitioners Robert T. Futrell, Donald F. Shafer, and Linda I. Shafer, it addresses the entire project lifecycle, covering process, project, and people. It contains extensive practical resources-including downloadable checklists, templates, and forms.

This book constitutes the thoroughly refereed proceedings of the 6th International Conference on Subject-Oriented Business Process Management, S-BPM ONE 2014, held in Eichstätt, Germany, in April 2014. The 14 application-oriented papers selected during the peer review process and included in this volume deal with a variety of topics ranging from model elicitation over strategic alignment to the application of S-BPM in different domains like software effort estimation, production planning and education.

This Seventh Edition of Donald Reifer's popular, bestselling tutorial summarizes what software project managers need to know to be successful on the job. The text provides pointers and approaches to deal with the issues, challenges, and experiences that shape their thoughts and performance. To accomplish its goals, the volume explores recent advances in dissimilar fields such as management theory, acquisition management, globalization, knowledge management, licensing, motivation theory, process improvement, organization dynamics, subcontract management, and technology transfer. Software Management provides software managers at all levels of the organization with the information they need to know to develop their software

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engineering management strategies for now and the future. The book provides insight into management tools and techniques that work in practice. It also provides sufficient instructional materials to serve as a text for a course in software management. This new edition achieves a balance between theory and practical experience. Reifer systematically addresses the skills, knowledge, and abilities that software managers, at any level of experience, need to have to practice their profession effectively. This book contains original articles by leaders in the software management field written specifically for this tutorial, as well as a collection of applicable reprints. About forty percent of the material in this edition has been produced specifically for the tutorial. Contents: \* Introduction \* Life Cycle Models \* Process Improvement \* Project Management \* Planning Fundamentals \* Software Estimating \* Organizing for Success \* Staffing Essentials \* Direction Advice \* Visibility and Control \* Software Risk Management \* Metrics and Measurement \* Acquisition Management \* Emerging Management Topics "The challenges faced by software project managers are the gap between what the customers can envision and the reality on the ground and how to deal with the risks associated with this gap in delivering a product that meets requirements on time and schedule at the target costs. This tutorial hits the mark by providing project managers, practitioners, and educators with source materials on how project managers can effectively deal with this risk." -Dr. Kenneth E. Nidiffer, Systems & Software Consortium, Inc. "The volume has evolved into a solid set of foundation works for anyone

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trying to practice software management in a world that is increasingly dependent on software release quality, timeliness, and productivity." -Walker Royce, Vice President, IBM Software Services-Rational

Description: The book, *Software Development Teams*, offers a new and unique approach to developing software project teams. It guides IT experts and managers for forming, assessing and developing successful project management teams for effective performance and productivity. Focusing on the management side of the software industry, this text-cum-reference book discusses key aspects of the management such as performance measurement, organisational structure and development, motivation of the team with awards and rewards to bring innovative ideas, and the best practices followed in the modern software industry for measuring the team effectively. The book begins with an introduction of software teams, explaining how software projects are different. It then discusses the characteristics, skills and competencies that are required for a perfect programmer or a project manager, in addition to many other dimensions of software development teams. It further includes empirical studies on team climate, team performance, team productivity and team innovation. Next, it explores the factors that are important for maintaining the software development team climate, and the impact of conflicts on teams, which may ultimately have negative impact on the organisation. Tools and techniques to measure performance of software development team are explained along with the factors that influence the

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teams' performance, relationship between team cohesion, productivity and finally the performance. Different types of possible innovation in software teams and organisations, innovation cycle and framework, role of top management and leadership in team management are also given due weightage. Providing an exhaustive description of the origin and present status of the Indian software industry using statistical data, the book is useful for the students of MBA (IT), BE/B.Tech (CS and IT), M.Tech (CS and IT) and M.Tech (Software Engineering). The book is also useful as a reference for professionals in the field of information systems, software project management, software engineering, team management and organisational development. Key features of the book

- Highlights the latest studies in the field and cites inferences of various researchers.
- Includes numerous figures, tables, graphs, and abbreviations to clarify the concepts.
- Provides chapter-end questions and quick quiz (multiple choice questions with answers) to test the knowledge acquired.
- Incorporates keywords and adequate number of references, which make the book an ideal tool for learning the concepts of software development teams.
- Includes case studies to show the application of concepts of software development teams in real life scenarios.

????:Software engineering economics

Taking a unique approach, this practical introduction gives readers the full flavor of software project management and detailed coverage of the entire development process, not just the lists of management tasks other books provide. This approach leads the

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reader through various stages of the development process in a pragmatic and readable way, with a diversity of topics explained.

An introductory course on Software Engineering remains one of the hardest subjects to teach largely because of the wide range of topics the area encompasses. I have believed for some time that we often tend to teach too many concepts and topics in an introductory course resulting in shallow knowledge and little insight on application of these concepts. And Software Engineering is usually about application of concepts to efficiently engineer good software solutions. Goals I believe that an introductory course on Software Engineering should focus on imparting to students the knowledge and skills that are needed to successfully execute a commercial project of a few person-months effort while employing proper practices and techniques. It is worth pointing out that a vast majority of the projects executed in the industry today fall in this scope—executed by a small team over a few months. I also believe that by carefully selecting the concepts and topics, we can, in the course of a semester, achieve this. This is the motivation of this book. The goal of this book is to introduce to the students a limited number of concepts and practices which will achieve the following two objectives: – Teach the student the skills needed to execute a smallish commercial project.

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An authoritative primer on managing software-based development projects and complex software/hardware systems

**Managing the Development of Software-Intensive Systems** discusses the application of project management and general management techniques to large software development projects and complex software/hardware systems. Drawing upon the author's experience in developing a project management workshop for AT&T employees, as well as in teaching software engineering courses at Monmouth University and workshops for a variety of other audiences, this practical guide allows readers to reliably develop large software applications and systems that require the simultaneous development of electronic hardware and the software that controls the hardware. Integrates the project management processes of planning, organizing, monitoring, and control with the underlying technical processes used for product development Teaches how to plan and manage verification and validation for large software projects or complex software/hardware systems Explains what additional management activities must take place in organizations with a multi-project environment Discusses how inspection results and testing metrics can be used to monitor project status Describes techniques to help manage inherent risks in software-based product development Each chapter is accompanied by a case study based on

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an actual situation with which the author is familiar; this gives the reader experience in doing the management work. The author teaches readers how to use their own experience to improve the way they manage projects and provides a method for reviewing successes and failures to help increase their capabilities in the future. *Managing the Development of Software-Intensive Systems* serves as both an introduction to project management for software and hardware developers and as an advanced material resource for experienced managers. The contents will benefit managers of software-based development projects and organizations, as well as organizations that outsource development work. This book can also be used as a textbook in undergraduate or graduate courses in computer engineering, computer science, software engineering, information technology, commerce, and administration with an information systems orientation.

This textbook describes the approaches used by software engineers to build quality into their software. The fundamental principles of software quality management and software process improvement are discussed in detail, with a particular focus on the CMMI framework. Features: includes review questions at the end of each chapter; covers both theory and practice, and provides guidance on applying the theory in an

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industrial environment; examines all aspects of the software development process, including project planning and tracking, software lifecycles, software inspections and testing, configuration management, and software quality assurance; provides detailed coverage of software metrics and problem solving; describes SCAMPI appraisals and how they form part of the continuous improvement cycle; presents an introduction to formal methods and the Z specification language; discusses UML, which is used to describe the architecture of the system; reviews the history of the field of software quality.

2012 International Conference on Software Engineering, Knowledge Engineering and Information Engineering (SEKEIE 2012) will be held in Macau, April 1-2, 2012 . This conference will bring researchers and experts from the three areas of Software Engineering, Knowledge Engineering and Information Engineering together to share their latest research results and ideas. This volume book covered significant recent developments in the Software Engineering, Knowledge Engineering and Information Engineering field, both theoretical and applied. We are glad this conference attracts your attentions, and thank your support to our conference. We will absorb remarkable suggestion, and make our conference more successful and perfect. To build reliable, industry-applicable software products, large-scale software project groups must

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continuously improve software engineering processes to increase product quality, facilitate cost reductions, and adhere to tight schedules.

Emphasizing the critical components of successful large-scale software projects, *Software Project Management: A*

*Process Simulation and Parametric Modeling for Strategic Project Management* will offer CIOs, CTOs and Software Development Managers, IT Graduate Students an introduction to a set of technologies that will help them understand how to better plan software development projects, manage risk and have better insight into the complexities of the software development process. A novel methodology will be introduced that allows a software development manager to better plan and access risks in the early planning of a project. By providing a better model for early software development estimation and software development, managers will be better equipped to make more effective project portfolio investment choices. Moreover, the methodology will allow the software development manager to continually simulate scenarios throughout the lifecycle of the project and determine plausible alternatives before the risk becomes a reality.

This book describes a complete revolution in software engineering based on complexity science through the establishment of NSE – Nonlinear

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Software Engineering paradigm which complies with the essential principles of complexity science, including the Nonlinearity principle, the Holism principle, the Complexity Arises From Simple Rules principle, the Initial Condition Sensitivity principle, the Sensitivity to Change principle, the Dynamics principle, the Openness principle, the Self-organization principle, and the Self-adaptation principle. The aims of this book are to offer revolutionary solutions to solve the critical problems existing with the old-established software engineering paradigm based on linear thinking and simplistic science complied with the superposition principle, and make it possible to help software development organizations double their productivity, halve their cost, and remove 99% to 99.99% of the defects in their software products, and efficiently handle software complexity, conformity, visibility, and changeability. It covers almost all areas in software engineering. The tools NSE\_CLICK- an automatic acceptance testing platform for outsourcing (or internally developed) C/C++ products, and NSE\_CLICK\_J - an automatic acceptance testing platform for outsourcing (or internally developed) Java products are particularly designed for non-technical readers to view/review how the acceptance testing of a software product developed with NSE can be performed automatically, and how the product developed with NSE is truly maintainable at

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the customer site.

This book presents a detailed analysis concept and practical approach of Software Project Management. It is simple, compact, and coherent which enables the students of management to be familiar with fundamental projects. The salient and prominent features of this book are as follows: covers the complete syllabus of software Project management prescribed by U.P. Technical University, Lucknow & other universities; uses simple and easy language to understand the subject; makes software project management interesting to read and master; all topics are explained in an easy manner followed by numerous figures. The inner strength of this book lies in discussion of several questions selected from various examination papers. This book will be a boon to students and will help them to face examination in a confident manner. --

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## Software Project Management 5e

Very few software projects are completed on time, on budget, and to their original specification causing the global IT software industry to lose billions each year in project overruns and reworking software. Research supports that projects usually fail because of management mistakes rather than technical mistakes. Risk Management in Software Development Projects focuses on what the practitioner needs to know about risk in the pursuit of delivering software projects. Risk Management in Software Development Projects will help all practicing IT Project Managers and IT Managers understand: \* Key components of the risk management process \* Current processes and best practices for software risk identification \* Techniques of risk analysis \*

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Risk Planning \* Management processes and be able to develop the process for various organizations

About The Book: Richard Thayer's popular; bestselling book presents a top-down, practical view of managing a successful software engineering project. The book builds a framework for project management activities based on the planning, organizing, staffing, directing, and controlling model. Thayer provides information designed to help you understand and successfully perform the unique role of a project manager.

This book is a must for all project managers in the software field. The text focuses on the five functions of general management by first describing each function and then detailing the project management activities that support each function. This new edition shows you how to manage a software development project, discusses current software engineering management methodologies and techniques, and presents general descriptions and project management problems. The book serves as a guide for your future project management activities. The text also offers students sufficient background and instructional material to serve as a main supplementary text for a course in software engineering project management.

· Introduction to Management ·  
Software Engineering · Software Engineering Project Management · Planning's Software Engineering Project ·  
Planning: Software Cost, Schedule, and Size · Organizing a Software Engineering Project · Staffing a Software Engineering Project · Directing a Software Engineering Project · Controlling a Software Engineering Project ·  
Controlling: Software Metrics and Visibility of Progress

Our new Indian original book on software engineering covers conventional as well as current methodologies of software development to explain core concepts, with a number of case studies and worked-out examples interspersed among the chapters. Current industry practices followed in development,

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such as computer aided software engineering, have also been included, as are important topics like 'Widget based GUI' and 'Windows Management System'. The book also has coverage on interdisciplinary topics in software engineering that will be useful for software professionals, such as 'quality management', 'project management', 'metrics' and 'quality standards'. Features Covers both function oriented as well as object oriented (OO) approach Emphasis on emerging areas such as 'Web engineering', 'software maintenance' and 'component based software engineering' A number of line diagrams and examples Case Studies on the ATM system and milk dispenser Includes multiple-choice, objective-type questions and frequently asked questions with answers.

By bringing together various current directions, Software Project Management in a Changing World focuses on how people and organizations can make their processes more change-adaptive. The selected chapters closely correspond to the project management knowledge areas introduced by the Project Management Body of Knowledge, including its extension for managing software projects. The contributions are grouped into four parts, preceded by a general introduction. Part I "Fundamentals" provides in-depth insights into fundamental topics including resource allocation, cost estimation and risk management. Part II "Supporting Areas" presents recent experiences and results related to the management of quality systems, knowledge, product portfolios and global and virtual software teams. Part III "New Paradigms" details new and evolving software-development practices including agile, distributed and open and inner-source development. Finally, Part IV "Emerging Techniques" introduces search-based techniques, social media, software process simulation and the efficient use of empirical data and their effects on software-management practices. This book

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will attract readers from both academia and practice with its excellent balance between new findings and experience of their usage in new contexts. Whenever appropriate, the presentation is based on evidence from empirical evaluation of the proposed approaches. For researchers and graduate students, it presents some of the latest methods and techniques to accommodate new challenges facing the discipline. For professionals, it serves as a source of inspiration for refining their project-management skills in new areas.

This essential textbook presents a concise introduction to the fundamental principles of software engineering, together with practical guidance on how to apply the theory in a real-world, industrial environment. The wide-ranging coverage encompasses all areas of software design, management, and quality. Topics and features: presents a broad overview of software engineering, including software lifecycles and phases in software development, and project management for software engineering; examines the areas of requirements engineering, software configuration management, software inspections, software testing, software quality assurance, and process quality; covers topics on software metrics and problem solving, software reliability and dependability, and software design and development, including Agile approaches; explains formal methods, a set of mathematical techniques to specify and derive a program from its specification, introducing the Z specification language; discusses software process improvement, describing the CMMI model, and introduces UML, a visual modelling language for software systems; reviews a range of tools to support various activities in software engineering, and offers advice on the selection and management of a software supplier; describes such innovations in the field of software as distributed systems, service-oriented architecture, software as

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a service, cloud computing, and embedded systems; includes key learning topics, summaries and review questions in each chapter, together with a useful glossary. This practical and easy-to-follow textbook/reference is ideal for computer science students seeking to learn how to build high quality and reliable software on time and on budget. The text also serves as a self-study primer for software engineers, quality professionals, and software managers.

The 6th ACIS International Conference on Software Engineering, Research, Management and Applications (SERA 2008) was held in Prague in the Czech Republic on August 20 – 22. SERA '08 featured excellent theoretical and practical contributions in the areas of formal methods and tools, requirements engineering, software process models, communication systems and networks, software quality and evaluation, software engineering, networks and mobile computing, parallel/distributed computing, software testing, reuse and metrics, database retrieval, computer security, software architectures and modeling. Our conference officers selected the best 17 papers from those papers accepted for presentation at the conference in order to publish them in this volume. The papers were chosen based on review scores submitted by members or the program committee, and underwent further rounds of rigorous review.

Although software development is one of the most complex activities carried out by man, sound development processes and proper project management can help ensure your software projects are delivered on time and under budget. Providing the know-how to manage software projects effectively, Introduction to Software Project Management supplies an accessible introduction to software project management. The book begins with an overview of the fundamental techniques of project management and the technical aspects of software development. This section

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supplies the understanding of the techniques required to mitigate uncertainty in projects and better control the complexity of software development projects. The second part illustrates the technical activities of software development in a coherent process—describing how to customize this process to fit a wide range of software development scenarios. Examines project management frameworks and software development standards, including ESA and NASA guidelines, PRINCE2®, and PMBOK® Addresses open source development practices and tools so readers can adopt best practices and get started with tools that are available for free Explains how to tailor the development process to different kinds of products and formalities, including the development of web applications Includes access to additional material for both practitioners and teachers at [www.spmbook.com](http://www.spmbook.com) Supplying an analysis of existing development and management frameworks, the book describes how to set up an open-source tool infrastructure to manage projects. Since practitioners must be able to mix traditional and agile techniques effectively, the book covers both and explains how to use traditional techniques for planning and developing software components alongside agile methodologies. It does so in a manner that will help you to foster freedom and creativity in assembling the processes that will best serve your needs.

This textbook teaches the basic concepts and methods of project management but also explains how to convert them to useful results in practice. Project management offers a promising working area for theoretical and practical applications, and developing software and decision support systems (DSS). This book specifically focuses on project planning and control, with an emphasis on mathematical modeling. Models and algorithms establish a good starting point for students to study the relevant literature and support

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pursuing academic work in related fields. The book provides an introduction to theoretical concepts, and it also provides detailed explanations, application examples, and case studies that deal with real-life problems. The chapter topics include questions that underlie critical thinking, interpretation, analytics, and making comparisons. Learning outcomes are defined and the content of the book is structured following these goals. Chapter 1 begins by introducing the basic concepts, methods, and processes of project management. This Chapter constitutes the base for defining and modeling project management problems. Chapter 2 explores the fundamentals of organizing and managing projects from an organization's perspective. Issues related to project team formation, the role of project managers, and organization types are discussed. Chapter 3 is devoted to project planning and network modeling of projects, covering fundamental concepts such as project scope, Work Breakdown Structure (WBS), Organizational Breakdown Structure (OBS), Cost Breakdown Structure (CBS), project network modeling, activity duration, and cost estimating, activity-based costing (ABC), data and knowledge management. Chapter 4 introduces deterministic scheduling models, which can be used in constructing the time schedules. Models employing time-based and finance-based objectives are introduced. The CPM is covered. The unconstrained version of maximizing Net Present Value (NPV) is also treated here together with the case of time-dependent cash flows. Chapter 5 focuses on the time/cost trade-off problem, explaining how to reduce the duration of some of the activities and therefore reduce the project duration at the expense of additional costs. This topic is addressed for both continuous and discrete cases. Chapter 6 discusses models and methods of scheduling under uncertain activity durations. PERT is introduced for minimizing the expected project duration and extended to the

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PERT-Costing method for minimizing the expected project cost. Simulation is presented as another approach for dealing with the uncertainty in activity durations and costs. To demonstrate the use of the PERT, a case study on constructing an earthquake-resistant residential house is presented. Classifications of resource and schedule types are given in Chapter 7, and exact and heuristic solution procedures for the single- and multi-mode resource constrained project scheduling problem (RCPSP) are presented. The objective of maximizing NPV under resource constraints is addressed, and the capital-constrained project scheduling model is introduced. In Chapter 8, resource leveling, and further resource management problems are introduced. Total adjustment cost and resource availability cost problems are introduced. Various exact models are investigated. A heuristic solution procedure for the resource leveling problem is presented in detail. Also, resource portfolio management policies and the resource portfolio management problem are discussed. A case study on resource leveling dealing with the annual audit project of a major corporation is presented. Project contract types and payment schedules constitute the topics of Chapter 9. Contracts are legal documents reflecting the results of some form of client-contractor negotiations and sometimes of a bidding process, which deserve closer attention. Identification and allocation of risk in contracts, project control issues, disputes, and resolution management are further topics covered in this Chapter. A bidding model is presented to investigate client-contractor negotiations and the bidding process from different aspects. Chapter 10 focuses on processes and methods for project monitoring and control. Earned Value Management is studied to measure the project performance throughout the life of a project and to estimate the expected project time and cost based on the current

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status of the project. How to incorporate inflation into the analysis is presented. In Chapter 11, qualitative and quantitative techniques including decision trees, simulation, and software applications are introduced. Risk phases are defined and building a risk register is addressed. An example risk breakdown structure is presented. The design of risk management processes is introduced, and risk response planning strategies are discussed. At the end of the Chapter, the quantitative risk analysis is demonstrated at the hand of a team discussion case study. Chapter 12 covers several models and approaches dealing with various stochastic aspects of the decision environment. Stochastic models, generation of robust schedules, use of reactive and fuzzy approaches are presented. Sensitivity and scenario analysis are introduced. Also, simulation analysis, which is widely used to analyze the impacts of uncertainty on project goals, is presented. Chapter 13 addresses repetitive projects that involve the production or construction of similar units in batches such as railway cars or residential houses. Particularly in the construction industry repetitive projects represent a large portion of the work accomplished in this sector of the economy. A case study on the 50 km section of a motorway project is used for demonstrating the handling of repetitive project management. How best to select one or more of a set of candidate projects to maintain a project portfolio is an important problem for project-based organizations with limited resources. The project selection problem is inherently a multi-objective problem and is treated as such in Chapter 14. Several models and solution techniques are introduced. A multi-objective, multi-period project selection and scheduling model is presented. A case study that addresses a project portfolio selection and scheduling problem for the construction of a set of dams in a region is presented. Finally, Chapter 15 discusses three

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promising research areas in project management in detail: (i) Sustainability and Project Management, (ii) Project Management in the Era of Big Data, and (iii) the Fourth Industrial Revolution and the New Age Project Management. We elaborate on the importance of sustainability in project management practices, discuss how developments in data analytics might impact project life cycle management, and speculate how the infinite possibilities of the Fourth Industrial Revolution and the new technologies will transform project management practices.

This textbook is a systematic guide to the steps in setting up a Capability Maturity Model Integration (CMMI) improvement initiative. Readers will learn the project management practices necessary to deliver high-quality software solutions to the customer on time and on budget. The text also highlights how software process improvement can achieve specific business goals to provide a tangible return on investment. Topics and features: supplies review questions, summaries and key topics for each chapter, as well as a glossary of acronyms; describes the CMMI model thoroughly, detailing the five maturity levels; provides a broad overview of software engineering; reviews the activities and teams required to set up a CMMI improvement initiative; examines in detail the implementation of CMMI in a typical organization at each of the maturity levels; investigates the various tools that support organizations in improving their software engineering maturity; discusses the SCAMPI appraisal methodology.

Software project management is a crucial element in successful software and IT development, and requires students to develop an understanding of technical methodology and an appreciation of the many human factors that can play a part in software projects. The new fifth edition of Software Project Management has been fully revised and updated to help students to grasp these contrasting skills,

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and learn about new developments in the discipline. It provides both undergraduate and postgraduate students with a comprehensive introduction to software project management and has enjoyed a loyal following of users since the first edition published.

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