



# PRACTICAL SOFTWARE REUSE

- ▲ Read about how software reuse can be adopted successfully
- ▲ Learn about how others have employed software reuse to benefit the business
- ▲ Understand the issues that affect the success (or otherwise) of software reuse

Michel Ezran, Maurizio Morisio and Colin Tully



Springer

PRACTITIONER SERIES



# Practical Software Reuse The Essential Guide

**Hafedh Mili**



## **Practical Software Reuse The Essential Guide:**

**Practical Software Reuse** Michel Ezran, Maurizio Morisio, Colin Tully, 2002-03-11 Software reuse promises high value to businesses that develop software opening the door to radical improvements in productivity cost and time to market This book is for those who are wondering whether they should adopt reuse and how and also for those who have already started to adopt it but are wondering where they may be going wrong and how they could do better It emphasizes the practical issues that influence success or failure in reuse and offers a concise and balanced coverage of the essentials

**Architecting with RM-ODP** Janis Putman, 2001 Preface To understand anything you should not try to understand everything Aristotle The whole is greater than the sum of the parts the part is greater than a fraction of the whole Aristotle Architecting is a challenging process of abstraction composition modularity and simplification to create an architecture specification An architecture specification captures the essence and definition of the system understanding parts and the relationships among the parts An architecture specification defines how a system solves a business problem within the scope of the business Putman Leave the beaten track occasionally and dive into the woods You will be certain to find something that you have never seen before

Alexander Graham Bell There are large gaps in the theory and practice of software architecture and engineering Much is published about the representation of a software architecture such as the Unified Modeling Language UML but little is available about the specification for a software architecture Software engineering methods of domain engineering process modeling languages and well formed patterns of reasoning aid in the specification of an architecture The Reference Model of Open Distributed Processing RM ODP defines the standard reference model for distributed software systems architectures based on object oriented techniques accepted at the international level RM ODP is a standard adopted by the International Standards Organization ISO and the International Telecommunications Union ITU RM ODP is embedded and used actively in mission critical systems industries such as in telecommunications in health care on Wall Street financial services industry in various Government systems Logistics in European Government Agencies such as UK Aviation control systems as a foundation for the Object Management Group OMG Object Management Architecture OMA for defining enterprise architectures and for defining software architectures The software systems architecture work that is emerging and is focused either at the component level or at the systems level provides a key resource for architecting This is enhanced by the architecting techniques of RM ODP This book assembles these great ideas explains what they mean and shows how to use them for practical benefit along with real world case study examples By using the RM ODP specification constructs associated languages architecture patterns of reasoning semantic behavior specification and conformance testing abilities readers will be able to architect their specific systems based on the RM ODP specification foundations and specify architectures that work One of the purposes of this book is to provide the approach to using the RM ODP foundations in architecting and specifying a distributed processing system that addresses such key properties as interoperability

dependability portability integration composability scalability transparency behavior specification quality of service policy management federation and conformance validation Another purpose of this book is to explain the underlying foundations for creating an architectural specification These foundations come not only from RM ODP but also from the current work in software systems architecture Another purpose is to guide the reader to understand the importance and benefits of creating an architecture specification for an enterprise Yet another purpose is to provide the reader with the principles to construct software systems architecture at both introductory and in depth levels By applying the proven techniques of RM ODP for what makes a good architecture readers will be able to build their own tailored architectures and clearly represent them in UML or some other tool with an understanding of the underlying principles Practitioners of RM ODP have found that the standard is extremely beneficial in guiding architecture definition and providing standard terminology principles for distributed object applications and infrastructures from an enterprise perspective Outstanding Features This book is intended to provide valuable insight into successful architecture specification by describing an unprecedented foundation to accomplish this task describing the use of the foundation explaining the relationships of the concepts of architecting explaining the relationships of the concepts of distributed processing and identifying the right methods and possible tools for architecting All material for the book has been derived from actual experiences A medical case study is used throughout the book in ever increasing detailed specification This medical case study is based on actual experience of the author In addition many metamodels are provided to represent the concepts of RM ODP All of these metamodels are contributions from the author This is information that readers can use and apply in their architecting today RM ODP provides a reference framework grammars methods of abstraction and composition and separation of concerns to achieve an architecture specification of the system RM ODP provides a framework for this separation using viewpoints as well as separating out certain decisions e g product decisions until later Further the reference model provides a set of definitions which always aids in communicating with others There is little in the literature about RM ODP or architecture specification and certainly not a book dedicated as a tutorial of these subjects Now there is In summary this book offers the following How to manage the architecting process in the lifecycle of a system How to solve many architecture reuse and cost effectiveness problems How to create a business specification How to understand and use the concepts of distributed processing in an architecture How to architect effectively How to specify an architecture How to understand and specify semantic behavior and nonfunctional properties of a system the ilities How to provide the right level of detail in an architecture specification How to ensure the implementation conforms to the architecture specification How to use RM ODP effectively How to use popular tools such as UML to describe an architecture A definitive tutorial of RM ODP Audience This book is designed for Those in the Distributed Software Systems Architecture community who are interested in a methodology for using proven architecture principles Professional software architects who are looking for new ideas about architecting a system Within this book the reader will

find discussions of the techniques for architecting for creating an architecture specification and RM ODP's relationship to other architecture frameworks Program managers interested in how to create a cost effective architecture within their enterprise that focuses on the needs of the enterprise and solves an enterprise problem They will learn how to do this through an overview of RM ODP the program benefits for using it and where RM ODP fits in the system lifecycle process Systems engineers interested in the lifecycle approach to enterprise architecture specification Experienced engineers interested in expanding their understanding of how to create a valid architecture specification and gain an understanding of the distributed processing system concepts why certain constructions are valid and why some are not what is to be specified and how and some new ideas and approaches to architecting a system The reader will be able to develop a collection of useful distributed processing architecting techniques that expand upon the current software systems architecture capabilities Developers interested in the practice of architecture specification and aligning current technology to achieve a workable system while allowing evolutionary changes in technology solutions Researchers interested in solutions and aids for furthering the research work in architecture specification Individuals in the software community who are generally interested in the application of an architecture method Readers will find examples of the applications of RM ODP and specific analysis techniques The expected audience will be novice and mid level program managers software engineers those in the IEEE DoD research communities consortia and general architecture readers This book can be used as a textbook and reference book for studies in the methods of architecture for graduate studies in software architecture specification for training information about software architecture and RM ODP for further education of consultants integration specialists and acquisition managers who need to approve and fund such work and for researchers who are expanding the discipline of software architecture The inclusion of RM ODP will bring to the U S principally the outstanding work that was accomplished by the international standards working group In brief the RM ODP principles form a solution set and foundation for all software architecting endeavors It is the formalized framework for this topic and at the International Standard IS level of acceptance It forms a solution set and foundation for reuse of design patterns to provide cost effective software architecture It is the process for this topic but has never before been described in a book Many program managers who typically set the stage as to the methodology of choice for a project software engineers and researchers in academia and in DARPA are unaware of the power and solutions provided by the standard or the process of identifying and instantiating reuse of all the expensive assets of architecture Many do not realize that there is a language for specifying software intensive distributed processing and that language is precisely and rigorously defined in RM ODP for reuse Those debating definitions for architecture system interface and others can reuse the internationally agreed upon definitions Finally with the inclusion of RM ODP and its relationship to other architecture frameworks it is expected that many software engineers will benefit from reading this work since it will be the first time these subjects are discussed in print How to Use This Book This book is

divided into four parts aimed at increasing levels of detail Part One provides an overview of the field of software architecture an RM ODP primer for managers and an RM ODP primer for architects Part Two provides an in depth study of RM ODP and how to use it Areas of importance and utility from RM ODP are highlighted Ambiguity in RM ODP is highlighted Warnings in the use of RM ODP are highlighted Part Three provides a discussion of the principal architecture patterns of use arranged by topic Several of these patterns of use come from emerging work under the initiative of RM ODP as well as lessons learned from the practice of RM ODP These patterns of reasoning used by the architect are founded on the principals of RM ODP as discussed in Part Two of the book Part Four concludes with relating RM ODP to other architecture methods It also provides emerging technologies to further the patterns of reasoning for use in architecting and a set of architecting heuristics The information contained in this book is organized in a manner that provides clear insight into the world of distributed software intensive processing architecture for designers and developers who are familiar with information systems technology but want to know more about how to build a good architecture Starting with a tutorial about software architecture and then a tutorial about the standard for software architecture the reader need not be an expert in the area of international standards RM ODP software architecture or specific technologies The book goes on to address the needs of the variety of readers for which it is intended Each chapter in the book provides an overview of the subject of the chapter as well as a summary For those who wish a broad brush exposure to RM ODP the primers of Part One provide this as well as the overviews and summaries in each chapter of interest As each chapter progresses in Parts Two and Three more and more in depth detail is provided The readings of these chapters are aimed at those who wish to know the technical details of a topic There are two case studies used throughout the book at various levels of detail The primary case study is a Hospital enterprise based upon the author s experience with the medical profession A secondary case study is an airline reservation system also based upon the author s experience These case studies are used to describe the concepts of RM ODP and to show how they might be used

**Software Reuse: Methods, Techniques, and Tools** Jan Bosch, Charles Krueger, 2004-06-14 After three decades of research and practice reuse of existing software artefacts remains the most promising approach to decreasing effort for software development and evolution increasing quality of software artefacts and decreasing time to market of software products Over time we have seen impressive improvements in extra organizational reuse e g COTS as well as in intra organizational reuse e g software product families Despite the successes that we as a community have achieved several challenges remain to be addressed The theme for this eighth meeting of the premier international conference on software reuse is the management of software variability for reusable software All reusable software operates in multiple contexts and has to accommodate the differences between these contexts through variation In modern software the number of variation points may range in the thousands with an even larger number of dependencies between these points Topics addressing the theme include the representation design assessment and evolution of software variability The proceedings that you are

holding as you read this report on the current state of the art in software reuse Topics covered in the proceedings include software variability testing of reusable software artefacts feature modeling aspect oriented software development composition of components and services model based approaches and several other aspects of software reuse May 2004 Jan Bosch Charles Krueger Organizing Committee General Chair Kyo C Kang Pohang University of Science and Technology Korea Program Co chairs Jan Bosch University of Groningen The Netherlands Charles Krueger BigLever Software Inc U S A

**Reuse Based Software Engineering** Hafedh Mili,2002 Publisher description for Reuse based software engineering techniques organization and measurement Hafedh Mili et al Bibliographic record and links to related information available from the Library of Congress catalog Information from electronic data provided by the publisher May be incomplete or contain other coding Integrating three important aspects of software reuse technical management and organizational this indispensable reference shows how these fundamental aspects are used in the development lifecycle of component based software engineering and product line engineering The book explores the basic foundations upon which reuse processes and approaches can be established and discusses state of the art and state of the practice of software reuse Library of Congress subject headings for this publication Computer software Reusability **Software Reuse Techniques** Carma L. McClure,1997 McClure takes software reuse beyond good intentions by presenting specific reuse techniques that have repeatedly helped companies lower costs and improve quality *Aerospace Technologies Advancements* Thawar Arif,2010-01-01 Space technology has become increasingly important after the great development and rapid progress in information and communication technology as well as the technology of space exploration This book deals with the latest and most prominent research in space technology The first part of the book first six chapters deals with the algorithms and software used in information processing communications and control of spacecrafts The second part chapters 7 to 10 deals with the latest research on the space structures The third part chapters 11 to 14 deals with some of the latest applications in space The fourth part chapters 15 and 16 deals with small satellite technologies The fifth part chapters 17 to 20 deals with some of the latest applications in the field of aircrafts The sixth part chapters 21 to 25 outlines some recent research efforts in different subjects **Practical Software Reuse** Donald J. Reifer,1997-08-18 The comprehensive guide to software re engineering and reuse Despite the fact that most software uses the same blocks of code over and over again almost all software is built from the ground up Just starting to catch on is the idea that these blocks of code can be used as standard components in creating new applications However this assembly line mentality is foreign to most software developers Practical Software Reuse shows developers how to take advantage of existing codes to build commercial software faster and cheaper covering reuse operations competitive benchmarking transitioning to the reuse process utilizing off the shelf software and more *Information Systems Engineering* Sjaak Brinkkemper,2000 This book contains a collection of 24 state of the art contributions in the area of Information Systems Engineering It was compiled as a tribute to Professor Janis

Bubenko on the occasion of his retirement from the University of Stockholm in February 2000 The contributions are arranged in three sections Information Society with such subjects as B2B E Commerce human imperfection stream data management and enterprise modeling Approaches to Information Systems Engineering discussing data warehouse development web enabled methods reuse and meta data Concepts for Information Systems on more fundamental notions such as time abstraction co operation intention and information All the contributors are well known and highly reputed scholars in the area of Information Systems Engineering from all over the world

**Software Development Patterns and Antipatterns** Capers Jones, 2021-08-26 Software development has been a troubling since it first started There are seven chronic problems that have plagued it from the beginning Incomplete and ambiguous user requirements that grow by 2% per month Major cost and schedule overruns for large applications 35% higher than planned Low defect removal efficiency DRE Cancelled projects that are not completed 30% above 10 000 function points Poor quality and low reliability after the software is delivered 5 bugs per FP Breach of contract litigation against software outsource vendors Expensive maintenance and enhancement costs after delivery These are endemic problems for software executives software engineers and software customers but they are not insurmountable In Software Development Patterns and Antipatterns software engineering and metrics pioneer Capers Jones presents technical solutions for all seven The solutions involve moving from harmful patterns of software development to effective patterns of software development The first section of the book examines common software development problems that have been observed in many companies and government agencies The data on the problems comes from consulting studies breach of contract lawsuits and the literature on major software failures This section considers the factors involved with cost overruns schedule delays canceled projects poor quality and expensive maintenance after deployment The second section shows patterns that lead to software success The data comes from actual companies The section s first chapter on Corporate Software Risk Reduction in a Fortune 500 company was based on a major telecom company whose CEO was troubled by repeated software failures The other chapters in this section deal with methods of achieving excellence as well as measures that can prove excellence to C level executives and with continuing excellence through the maintenance cycle as well as for software development

**Books in Print Supplement ,2002**

**Software Reuse** Even-André Karlsson, 1995-08-18 Dispenses outstanding guidance on how organisations can develop software with a view to adapting components for reuse Describes a software reuse methodology which provides a practical framework to support the management of reuse Offers invaluable insight into implementing reuse strategies

[A Guide to Software Configuration Management](#) Alexis Leon, 2000 This comprehensive explanation of Software Configuration Management SCM provides a basic definition of SCM as a scientific tool that brings control to the developmental process and explains the procedures for SCM implementation in any organization It also reviews each phase in the software development life cycle and teaches how SCM can help software developers avoid pitfalls at every step

[Software Reuse](#) ,2004 **Future-Proof**

**Software-Systems** Frank J. Furrer,2019-09-25 This book focuses on software architecture and the value of architecture in the development of long lived mission critical trustworthy software systems The author introduces and demonstrates the powerful strategy of Managed Evolution along with the engineering best practice known as Principle based Architecting The book examines in detail architecture principles for e g Business Value Changeability Resilience and Dependability The author argues that the software development community has a strong responsibility to produce and operate useful dependable and trustworthy software Software should at the same time provide business value and guarantee many quality of service properties including security safety performance and integrity As Dr Furrer states Producing dependable software is a balancing act between investing in the implementation of business functionality and investing in the quality of service properties of the software systems The book presents extensive coverage of such concepts as Principle Based Architecting Managed Evolution Strategy The Future Principles for Business Value Legacy Software Modernization Migration Architecture Principles for Changeability Architecture Principles for Resilience Architecture Principles for Dependability The text is supplemented with numerous figures tables examples and illustrative quotations Future Proof Software Systems provides a set of good engineering practices devised for integration into most software development processes dedicated to the creation of software systems that incorporate Managed Evolution

*Collaborative Software Engineering* Ivan Mistrik,John Grundy,André van der Hoek,Jim Whitehead,2010-03-10 Collaboration among individuals from users to developers is central to modern software engineering It takes many forms joint activity to solve common problems negotiation to resolve conflicts creation of shared definitions and both social and technical perspectives impacting all software development activity The difficulties of collaboration are also well documented The grand challenge is not only to ensure that developers in a team deliver effectively as individuals but that the whole team delivers more than just the sum of its parts The editors of this book have assembled an impressive selection of authors who have contributed to an authoritative body of work tackling a wide range of issues in the field of collaborative software engineering The resulting volume is divided into four parts preceded by a general editorial chapter providing a more detailed review of the domain of collaborative software engineering Part 1 is on Characterizing Collaborative Software Engineering Part 2 examines various Tools and Techniques Part 3 addresses organizational issues and finally Part 4 contains four examples of Emerging Issues in Collaborative Software Engineering As a result this book delivers a comprehensive state of the art overview and empirical results for researchers in academia and industry in areas like software process management empirical software engineering and global software development Practitioners working in this area will also appreciate the detailed descriptions and reports which can often be used as guidelines to improve their daily work

**Proceedings of the Fifth Symposium on Software Reusability, SSR'99** ,1999

**Practical Support for ISO 9001 Software Project Documentation** Susan K. Land,John W. Walz,2006-10-13 This book addresses how to meet the specific documentation requirements in support of the ISO 9001

software process definition documentation and improvement which is an integral part of every software engineering effort Provides a set of templates that support the documentation required for basic software project control and management The book provides specific support for organizations that are pursuing software process improvement efforts *A Guide to the Evaluation of Educational Experiences in the Armed Services*, 2002 *Software Engineering: A Practitioner's Approach* Roger S. Pressman, 2010 For over 20 years this has been the best selling guide to software engineering for students and industry professionals alike This seventh edition features a new part four on web engineering which presents a complete engineering approach for the analysis design and testing of web applications COMPSAC 2001, 2001 Papers from an October 2001 address such themes as requirements engineering component based development protocols and harmonization quality management software architecture workflow systems and software testing distributed systems UML commercial off the shelf components e learning applicat

## **Practical Software Reuse The Ebential Guide** Book Review: Unveiling the Power of Words

In some sort of driven by information and connectivity, the power of words has be evident than ever. They have the ability to inspire, provoke, and ignite change. Such is the essence of the book **Practical Software Reuse The Ebential Guide**, a literary masterpiece that delves deep to the significance of words and their affect our lives. Written by a renowned author, this captivating work takes readers on a transformative journey, unraveling the secrets and potential behind every word. In this review, we will explore the book is key themes, examine its writing style, and analyze its overall effect on readers.

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