

Software Architecture Organizational Principles And Patterns

A comprehensive guide to exploring software architecture concepts and implementing best practices Key Features Enhance your skills to grow your career as a software architect Design efficient software architectures using patterns and best practices Learn how software architecture relates to an organization as well as software development methodology Book Description The Software Architect's Handbook is a comprehensive guide to help developers, architects, and senior programmers advance their career in the software architecture domain. This book takes you through all the important concepts, right from design principles to different considerations at various stages of your career in software architecture. The book begins by covering the fundamentals, benefits, and purpose of software architecture. You will discover how software architecture relates to an organization, followed by identifying its significant quality attributes. Once you have covered the basics, you will explore design patterns, best practices, and paradigms for efficient software development. The book discusses which factors you need to consider for performance and security enhancements. You will learn to write documentation for your architectures and make appropriate decisions when considering DevOps. In addition to this, you will explore how to design legacy applications before understanding how to create software architectures that evolve as the market, business requirements, frameworks, tools, and best practices change over time. By the end of this book, you will not only have studied software architecture concepts but also built the soft skills necessary to grow in this field. What you will learn Design software architectures using patterns and best practices Explore the different considerations for designing software architecture Discover what it takes to continuously improve as a software architect Create loosely coupled systems that can support change Understand DevOps and how it affects software architecture Integrate, refactor, and re-architect legacy applications Who this book is for The Software Architect's Handbook is for you if you are a software architect, chief technical officer (CTO), or senior developer looking to gain a firm grasp of software architecture.

As a software architect you work in a wide-ranging and dynamic environment. You have to understand the needs of your customer, design architectures that satisfy both functional and non-functional requirements, and lead development teams in implementing the architecture. And it is an environment that is constantly changing: trends such as cloud computing, service orientation, and model-driven procedures open up new architectural possibilities. This book will help you to develop a holistic architectural awareness and knowledge base that extends beyond concrete methods, techniques, and technologies. It will also help you to acquire or expand the technical, methodological, and social competences that you need. The authors place the spotlight on you, the architect, and offer you long-term architectural orientation. They give you numerous guidelines, checklists, and best practices to support you in your practical work. "Software Architecture" offers IT students, software developers, and software architects a holistic and consistent orientation across relevant topics. The book also provides valuable information and suggestions for system architects and enterprise architects, since many of the topics presented are also relevant for their work. Furthermore, IT project leads and other IT managers can use the book to acquire an enhanced understanding of architecture. Further information is available at www.software-architecture-book.org.

For courses in Advanced Software Engineering or Object-Oriented Design. This book covers the human and organizational dimension of the software improvement process and software project management - whether based on the CMM or ISO 9000 or the Rational Unified Process. Drawn from a decade of research, it emphasizes common-sense practices. Its principles are general but concrete; every pattern is its own

Read Online Software Architecture Organizational Principles And Patterns

built-in example. Historical supporting material from other disciplines is provided. Though even pattern experts will appreciate the depth and currency of the material, it is self-contained and well-suited for the layperson.

This innovative book uncovers all the steps readers should follow in order to build successful software and systems. With the help of numerous examples, Albin clearly shows how to incorporate Java, XML, SOAP, ebXML, and BizTalk when designing true distributed business systems. Teaches how to easily integrate design patterns into software design. Documents all architectures in UML and presents code in either Java or C++.

As the digital economy changes the rules of the game for enterprises, the role of software and IT architects is also transforming. Rather than focus on technical decisions alone, architects and senior technologists need to combine organizational and technical knowledge to effect change in their company's structure and processes. To accomplish that, they need to connect the IT engine room to the penthouse, where the business strategy is defined. In this guide, author Gregor Hohpe shares real-world advice and hard-learned lessons from actual IT transformations. His anecdotes help architects, senior developers, and other IT professionals prepare for a more complex but rewarding role in the enterprise. This book is ideal for: Software architects and senior developers looking to shape the company's technology direction or assist in an organizational transformation. Enterprise architects and senior technologists searching for practical advice on how to navigate technical and organizational topics. CTOs and senior technical architects who are devising an IT strategy that impacts the way the organization works. IT managers who want to learn what's worked and what hasn't in large-scale transformation.

This book constitutes the refereed proceedings of the 12th European Conference on Software Architecture, ECSA 2018, held in Madrid, Spain, in September 2018. The 17 full papers presented together with 7 short papers were carefully reviewed and selected from 96 submissions. They are organized in topical sections as follows: Self-Adaptive Architectures, IoT Architectures, Embedded and Cyber-Physical Systems, Microservices Architectures, Service-Oriented Architectures, Architectural Design Decisions, Software Architecture in Practice.

"This book addresses the complex issues associated with software engineering environment capabilities for designing real-time embedded software systems"--Provided by publisher.

Software Paradigms provides the first complete compilation of software paradigms commonly used to develop large software applications, with coverage ranging from discrete problems to full-scale applications. The book focuses on providing a structure for understanding a hierarchy of software development approaches, and showing the relationships between the different models. Coverage includes paradigms in design patterns, software components, software architectures, and frameworks. Chapters within each of these sections include design issues related to building and using the paradigm as well as numerous real world applications. A practical overview of the hierarchy of development paradigms, Software Paradigms is an excellent teaching tool for undergraduates and graduates, and a comprehensive and reliable reference for software engineers.

Introduction. Architectural styles. Case studies. Shared information systems. Architectural design guidance. Formal models and specifications. Linguistics issues. Tools for architectural design. Education of software architects.

This is the eagerly-anticipated revision to one of the seminal books in the field of software architecture which clearly defines and explains the topic.

"This book covers both theoretical approaches and practical solutions in the processes for aligning enterprise, systems,

and software architectures"--Provided by publisher.

Software Architecture Organizational Principles and Patterns Software Architecture

This book constitutes the refereed proceedings of the 13th International Working Conference on Requirements Engineering: Foundation for Software Quality, REFSQ 2007, held in Trondheim, Norway. It covers goal-driven requirements engineering (RE), products and product-lines, value-based RE and the value of RE, requirements elicitation, requirements specification, industrial experience of RE, and requirements quality and quality requirements. A software architecture manifests the major early design decisions, which determine the system's development, deployment and evolution. Thus, making better architectural decisions is one of the large challenges in software engineering. Software architecture knowledge management is about capturing practical experience and translating it into generalized architectural knowledge, and using this knowledge in the communication with stakeholders during all phases of the software lifecycle. This book presents a concise description of knowledge management in the software architecture discipline. It explains the importance of sound knowledge management practices for improving software architecture processes and products, and makes clear the role of knowledge management in software architecture and software development processes. It presents many approaches that are in use in software companies today, approaches that have been used in other domains, and approaches under development in academia. After an initial introduction by the editors, the contributions are grouped in three parts on "Architecture Knowledge Management", "Strategies and Approaches for Managing Architectural Knowledge", and "Tools and Techniques for Managing Architectural Knowledge". The presentation aims at information technology and software engineering professionals, in particular software architects and software architecture researchers. For the industrial audience, the book gives a broad and concise understanding of the importance of knowledge management for improving software architecture process and building capabilities in designing and evaluating better architectures for their mission- and business-critical systems. For researchers, the book will help to understand the applications of various knowledge management approaches in an industrial setting and to identify research challenges and opportunities.

In the field of formal methods in computer science, concurrency theory is receiving a constantly increasing interest. This is especially true for process algebra. Although it had been originally conceived as a means for reasoning about the semantics of current programs, process algebraic formalisms like CCS, CSP, ACP, π -calculus, and their extensions (see, e.g., [154, 119, 112, 22, 155, 181, 30]) were soon used also for comprehending functional and nonfunctional aspects of the behavior of communicating concurrent systems. The scientific impact of process calculi and behavioral equivalences at the base of process algebra is witnessed not only by a very rich literature. It is in fact worth

mentioning the standardization procedure that led to the development of the process algebraic language LOTOS [49], as well as the implementation of several modeling and analysis tools based on process algebra, like CWB [70] and CADP [93], some of which have been used in industrial case studies. Furthermore, process calculi and behavioral equivalences are by now adopted in university-level courses to teach the foundations of concurrent programming as well as the model-driven design of concurrent, distributed, and mobile systems. Nevertheless, after 30 years since its introduction, process algebra is rarely adopted in the practice of software development. On the one hand, its technicalities often obfuscate the way in which systems are modeled. As an example, if a process term comprises numerous occurrences of the parallel composition operator, it is hard to understand the communication scheme among the various subterms. On the other hand, process algebra is perceived as being difficult to learn and use by practitioners, as it is not close enough to the way they think of software systems.

Software Systems Architecture is a practitioner-oriented guide to designing and implementing effective architectures for information systems. It is both a readily accessible introduction to software architecture and an invaluable handbook of well-established best practices. It shows why the role of the architect is central to any successful information-systems development project, and, by presenting a set of architectural viewpoints and perspectives, provides specific direction for improving your own and your organization's approach to software systems architecture. With this book you will learn how to Design an architecture that reflects and balances the different needs of its stakeholders Communicate the architecture to stakeholders and demonstrate that it has met their requirements Focus on architecturally significant aspects of design, including frequently overlooked areas such as performance, resilience, and location Use scenarios and patterns to drive the creation and validation of your architecture Document your architecture as a set of related views Use perspectives to ensure that your architecture exhibits important qualities such as performance, scalability, and security The architectural viewpoints and perspectives presented in the book also provide a valuable long-term reference source for new and experienced architects alike. Whether you are an aspiring or practicing software architect, you will find yourself referring repeatedly to the practical advice in this book throughout the lifecycle of your projects. A supporting Web site containing further information can be found at www.viewpoints-and-perspectives.info

The book provides comprehensive coverage of the fundamental concepts of computer organization and architecture. Its focus on real-world examples encourages students to understand how to apply essential organization and architecture concepts in the computing world. The book teaches you both the hardware and software aspects of the computer. It explains computer components and their functions, interconnection structures, bus structures, computer arithmetic, processor organization, memory organization, I/O functions, I/O structures, processing unit organization, addressing modes, instructions, instruction pipelining,

instruction-level parallelism, and superscalar processors. The case studies included in the book help readers to relate the learned computer fundamentals with the real-world processors.

Annotation. This book constitutes the refereed proceedings of the International Workshops on Service-Oriented Computing, ICSOC/ServiceWave 2009, held in Stockholm, Sweden, in November 2009. The book includes papers of workshops on trends in enterprise architecture research (TEAR 2009), SOA, globalization, people, and work (SG-PAW), service oriented computing in logistics (SOC-LOG), non-functional properties and service level agreements management in service oriented computing (NFPSLAM-SOC 09), service monitoring, adaptation and beyond (MONA+), engineering service-oriented applications (WESOA09), and user-generated services (UGS2009). The papers are organized in topical sections on business models and architecture; service quality and service level agreements track; and service engineering track.

Researchers and professionals will find in this text the thoroughly refereed post-proceedings of the Third International Conference on the Quality of Software Architectures, QoSA 2007, held in Medford, MA, USA, in 2007. It was mounted in conjunction with the 10th International ACM SIGSOFT Symposium on Component-Based Software Engineering, CBSE 2007. The 13 revised full papers presented together with one keynote lecture were carefully reviewed and selected from 42 submissions.

The purpose of large-scale software architecture is to capture and describe practical representations to make development teams more effective. In this book the authors show how to utilise software architecture as a tool to guide the development instead of capturing the architectural details after all the design decisions have been made. * Offers a concise description of UML usage for large-scale architecture * Discusses software architecture and design principles * Technology and vendor independent

For over 20 years, Software Engineering: A Practitioner's Approach has been the best selling guide to software engineering for students and industry professionals alike. The sixth edition continues to lead the way in software engineering. A new Part 4 on Web Engineering presents a complete engineering approach for the analysis, design, and testing of Web Applications, increasingly important for today's students. Additionally, the UML coverage has been enhanced and significantly increased in this new edition. The pedagogy has also been improved in the new edition to include sidebars. They provide information on relevant software tools, specific work flow for specific kinds of projects, and additional information on various topics. Additionally, Pressman provides a running case study called "Safe Home" throughout the book, which provides the application of software engineering to an industry project. New additions to the book also include chapters on the Agile Process Models, Requirements Engineering, and Design Engineering. The book has been completely updated and contains hundreds of new references to software tools that address all important topics in the book. The ancillary material for the book includes an expansion of the case study, which illustrates it with UML diagrams. The On-Line Learning Center includes resources for both instructors and students such as checklists, 700 categorized web references, Powerpoints, a test bank, and a software engineering library-containing over 500 software engineering papers. TAKEAWY HERE IS THE FOLLOWING: 1. AGILE PROCESS METHODS ARE COVERED EARLY IN CH. 42. NEW PART ON WEB APPLICATIONS --5 CHAPTERS

This volume examines proven software configuration management strategies to allow professionals to deliver quality software systems with the least amount of wasted effort. It is designed to help managers build and foster a development environment focused on producing optimal teamwork.

Salary surveys worldwide regularly place software architect in the top 10 best jobs, yet no real guide exists to help developers become architects. Until now. This book provides the first comprehensive overview of software architecture's many aspects. Aspiring and existing architects alike will examine architectural characteristics, architectural patterns, component determination, diagramming and presenting architecture, evolutionary architecture, and many other topics. Mark Richards and Neal Ford—hands-on practitioners who have taught software architecture classes professionally for years—focus on architecture principles that apply across all technology stacks. You'll explore software architecture in a modern light, taking into account all the innovations of the past decade. This book examines:

- Architecture patterns: The technical basis for many architectural decisions
- Components: Identification, coupling, cohesion, partitioning, and granularity
- Soft skills: Effective team management, meetings, negotiation, presentations, and more
- Modernity: Engineering practices and operational approaches that have changed radically in the past few years
- Architecture as an engineering discipline: Repeatable results, metrics, and concrete valuations that add rigor to software architecture

Continuous Architecture provides a broad architectural perspective for continuous delivery, and describes a new architectural approach that supports and enables it. As the pace of innovation and software releases increases, IT departments are tasked to deliver value quickly and inexpensively to their business partners. With a focus on getting software into end-users hands faster, the ultimate goal of daily software updates is in sight to allow teams to ensure that they can release every change to the system simply and efficiently. This book presents an architectural approach to support modern application delivery methods and provide a broader architectural perspective, taking architectural concerns into account when deploying agile or continuous delivery approaches. The authors explain how to solve the challenges of implementing continuous delivery at the project and enterprise level, and the impact on IT processes including application testing, software deployment and software architecture. Covering the application of enterprise and software architecture concepts to the Agile and Continuous Delivery models Explains how to create an architecture that can evolve with applications Incorporates techniques including refactoring, architectural analysis, testing, and feedback-driven development Provides insight into incorporating modern software development when structuring teams and organizations

1. 1 Background In this work, we develop a framework for the design of multi-agent systems inspired by (human) organizational principles. Organizations are complex entities formed to overcome various limitations of individual agencies, such as cognitive, physical, temporal and institutional limitations. There is a parallel between the complexity of organizations and multi-agent systems. Therefore, we explore the use of concepts, methods and techniques from human organizational design as architectural principles for multi-agent systems. Three research lines are presented: organizational modeling and coordination, interoperability

and agent models. Organizational modeling and coordination are concerned with how resources (i. e. agents) can be identified and related to each other. In order to have agents cooperate, several issues of interoperability have to be addressed. Agent models deal with the design of individual intelligent software agents, taking into account typical features of agent intelligence. Every (human) activity raises two challenges: division of labor and coordination [Mintzberg, 1993]. Division of labor is the decomposition of work (or goals) into various distinct tasks. Coordination refers to managing relations between these tasks to carry out the work. The patterns of division of labor, responsibilities (people who do the work), clustering of responsibilities into units and coordination between units can be defined by organizational structures [Galbraith, 1973]. The design of an organization should cover how one or more actors are engaged in one or more tasks, where knowledge, capabilities and resources are distributed. Microservices can have a positive impact on your enterprise—just ask Amazon and Netflix—but you can fall into many traps if you don't approach them in the right way. This practical guide covers the entire microservices landscape, including the principles, technologies, and methodologies of this unique, modular style of system building. You'll learn about the experiences of organizations around the globe that have successfully adopted microservices. In three parts, this book explains how these services work and what it means to build an application the Microservices Way. You'll explore a design-based approach to microservice architecture with guidance for implementing various elements. And you'll get a set of recipes and practices for meeting practical, organizational, and cultural challenges to microservice adoption. Learn how microservices can help you drive business objectives Examine the principles, practices, and culture that define microservice architectures Explore a model for creating complex systems and a design process for building a microservice architecture Learn the fundamental design concepts for individual microservices Delve into the operational elements of a microservices architecture, including containers and service discovery Discover how to handle the challenges of introducing microservice architecture in your organization

The software development ecosystem is constantly changing, providing a constant stream of new tools, frameworks, techniques, and paradigms. Over the past few years, incremental developments in core engineering practices for software development have created the foundations for rethinking how architecture changes over time, along with ways to protect important architectural characteristics as it evolves. This practical guide ties those parts together with a new way to think about architecture and time. The first guide to tackle security architecture at the software engineering level Computer security has become a critical business concern, and, as such, the responsibility of all IT professionals. In this groundbreaking book, a security expert with AT&T Business's renowned Network Services organization explores system security architecture from a software engineering perspective. He explains why strong security must be a guiding principle of the development process and identifies a common set of features found in most security products, explaining how they can and should impact the development cycle. The book also offers in-depth discussions of security technologies, cryptography, database security, application and operating system security, and more. This is a practical guide for software developers, and different than other software architecture books. Here's why: It teaches risk-driven architecting. There is no need for meticulous designs when risks are small, nor any excuse for sloppy designs when risks

threaten your success. This book describes a way to do just enough architecture. It avoids the one-size-fits-all process trap with advice on how to tune your design effort based on the risks you face. It democratizes architecture. This book seeks to make architecture relevant to all software developers. Developers need to understand how to use constraints as guiderails that ensure desired outcomes, and how seemingly small changes can affect a system's properties. It cultivates declarative knowledge. There is a difference between being able to hit a ball and knowing why you are able to hit it, what psychologists refer to as procedural knowledge versus declarative knowledge. This book will make you more aware of what you have been doing and provide names for the concepts. It emphasizes the engineering. This book focuses on the technical parts of software development and what developers do to ensure the system works not job titles or processes. It shows you how to build models and analyze architectures so that you can make principled design tradeoffs. It describes the techniques software designers use to reason about medium to large sized problems and points out where you can learn specialized techniques in more detail. It provides practical advice. Software design decisions influence the architecture and vice versa. The approach in this book embraces drill-down/pop-up behavior by describing models that have various levels of abstraction, from architecture to data structure design.

Presents an approach to software architecture that takes organizational issues into consideration. The approach uses a series of five principles--vision, rhythm, anticipation, partnering, and simplification--to reveal hidden risks and opportunities of software architecture. Complementing these principles are criteria, patterns, and antipatterns. The criteria help assess how well each principle is being performed currently, and the patterns and antipatterns provide guidance on how to apply the principles. c. Book News Inc.

bull; Reflects all of the changes that were integrated into RUP v2003-the latest version of the very popular product bull; Learn the key concepts, fundamentals of structure, integral content, and motivation behind the RUP bull; Covers all phases of the software development lifecycle -from concept, to delivery, to revision

Managing a software development project is a complex process. There are lots of deliverables to produce, standards and procedures to observe, plans and budgets to meet, and different people to manage. Project management doesn't just start and end with designing and building the system. Once you've specified, designed and built (or bought) the system it still needs to be properly tested, documented and settled into the live environment. This can seem like a maze to the inexperienced project manager, or even to the experienced project manager unused to a particular environment. A Hacker's Guide to Project Management acts as a guide through this maze. It's aimed specifically at those managing a project or leading a team for the first time, but it will also help more experienced managers who are either new to software development, or dealing with a new part of the software life-cycle. This book: describes the process of software development, how projects can fail and how to avoid those failures outlines the key skills of a good project manager, and provides practical advice on how to gain and deploy those skills takes the reader step-by-step through the main stages of the project, explaining what must be done, and what must be avoided at each stage suggests what to do if things start to go wrong! The book will also be useful to designers and architects, describing

important design techniques, and discussing the important discipline of Software Architecture. This new edition: has been fully revised and updated to reflect current best practices in software development includes a range of different life-cycle models and new design techniques now uses the Unified Modelling Language throughout

Architect and design highly scalable, robust, clean, and highly performant applications in Python About This Book Identify design issues and make the necessary adjustments to achieve improved performance Understand practical architectural quality attributes from the perspective of a practicing engineer and architect using Python Gain knowledge of architectural principles and how they can be used to provide accountability and rationale for architectural decisions Who This Book Is For This book is for experienced Python developers who are aspiring to become the architects of enterprise-grade applications or software architects who would like to leverage Python to create effective blueprints of applications. What You Will Learn Build programs with the right architectural attributes Use Enterprise Architectural Patterns to solve scalable problems on the Web Understand design patterns from a Python perspective Optimize the performance testing tools in Python Deploy code in remote environments or on the Cloud using Python Secure architecture applications in Python In Detail This book starts off by explaining how Python fits into an application architecture. As you move along, you will understand the architecturally significant demands and how to determine them. Later, you'll get a complete understanding of the different architectural quality requirements that help an architect to build a product that satisfies business needs, such as maintainability/reusability, testability, scalability, performance, usability, and security. You will use various techniques such as incorporating DevOps, Continuous Integration, and more to make your application robust. You will understand when and when not to use object orientation in your applications. You will be able to think of the future and design applications that can scale proportionally to the growing business. The focus is on building the business logic based on the business process documentation and which frameworks are to be used when. We also cover some important patterns that are to be taken into account while solving design problems as well as those in relatively new domains such as the Cloud. This book will help you understand the ins and outs of Python so that you can make those critical design decisions that not just live up to but also surpass the expectations of your clients. Style and approach Filled with examples and use cases, this guide takes a no-nonsense approach to help you with everything it takes to become a successful software architect.

Software development organizations are now discovering the efficiencies that can be achieved by architecting entire software product families together. In Software Architecture for Product Families, experts from one of the world's most advanced software domain engineering projects share in-depth insights about the techniques that work -- and those that don't. The book offers a solutions-oriented, case-study approach covering the entire development lifecycle, based on

advanced work done by three of Europe's leading technology companies and their academic partners. Discover the challenges that drive companies to consider architecting product families, and the new problems they encounter in doing so. Master concepts and terms that can be used to describe the architecture of a product family; then learn how to assess that architecture, and transform it into working applications. The authors also present chapter-length, real-world case studies of domain engineering projects at Nokia, Philips, and ABB.

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.

The TOGAF® Standard, a standard of The Open Group, is a proven Enterprise Architecture methodology and framework used by the world's leading organizations to improve business efficiency. It is the most prominent and reliable Enterprise

Architecture standard, ensuring consistent standards, methods, and communication among Enterprise Architecture professionals. Those professionals fluent in the TOGAF approach enjoy greater industry credibility, job effectiveness, and career opportunities. The TOGAF approach helps practitioners avoid being locked into proprietary methods, utilize resources more efficiently and effectively, and realize a greater return on investment.

This book illustrates the role of software architecture and its application in business. The author describes enterprise architecture along with business architecture to show the role of software architecture in both areas. The place of software architecture in business is outlined from many perspectives in this context. The book outlines quality attributes and how managers can use software architecture to build high quality products. Topics include business software architecture, dealing with qualities, achieving quality attributes, managing business qualities, software product line, Internet of Things (IOT), and Service Oriented Business Architecture. The book is intended to benefit students, researchers, software architects, and business architects. Provides quick and easy access to all the important aspects of software architecture in business; Highlights a wide variety of concepts of software architecture in a straightforward manner, for students, practitioners, or architects; Presents different applications of software architecture in business. This book constitutes the proceedings of the 11th European Conference on Software Architecture, ECSA 2017, held in Canterbury, UK, in September 2017. The 9 full papers presented together with 12 short papers and one keynote talk were carefully reviewed and selected from 54 submissions. They are organized in topical sections on Software Architecture Analysis and Verification; Software Architecture Evolution; Automatic Generation; Architectural Decisions; Software Architecture Practice.?

The authors explain the underlying software development principles behind theRUP, and guide readers in its application in their organization.

This book constitutes the thoroughly refereed post-proceedings of the 5th International Workshop on Product-Family Engineering, PFE 2003, held in Siena, Italy in November 2003. The 36 revised full papers presented together with an introductory overview and 3 keynote presentations were carefully selected during two rounds of reviewing and improvement. The papers are organized in topical sections on variation mechanisms, requirements analysis and management, product derivation, transition to family development, industrial experience, evolution, and decision and derivation.

[Copyright: 999768739a374d8415f62cc6a1cc8c49](#)