

Software Architecture In Practice 3rd Edition Sei Series In Software Engineering

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Software Architecture: The Hard Parts - Neal Ford 2021-09-23

There are no easy decisions in software architecture. Instead, there are many hard parts--difficult problems or issues with no best

practices--that force you to choose among various compromises. With this book, you'll learn how to think critically about the trade-offs involved with distributed architectures. Architecture veterans and practicing consultants

Neal Ford, Mark Richards, Pramod Sadalage, and Zhamak Dehghani discuss strategies for choosing an appropriate architecture. By interweaving a story about a fictional group of technology professionals--the Sysops Squad--they examine everything from how to determine service granularity, manage workflows and orchestration, manage and decouple contracts, and manage distributed transactions to how to optimize operational characteristics, such as scalability, elasticity, and performance. By focusing on commonly asked questions, this book provides techniques to help you discover and weigh the trade-offs as you confront the issues you face as an architect. Analyze trade-offs and effectively document your decisions Make better decisions regarding service granularity Understand the complexities of breaking apart monolithic applications Manage and decouple contracts between services Handle data in a highly distributed architecture Learn patterns to manage workflow and transactions

when breaking apart applications
Software Architecture 2 - Mourad Chabane
Oussalah 2014-06-02

Over the past 20 years, software architectures have significantly contributed to the development of complex and distributed systems. Nowadays, it is recognized that one of the critical problems in the design and development of any complex software system is its architecture, i.e. the organization of its architectural elements. Software Architecture presents the software architecture paradigms based on objects, components, services and models, as well as the various architectural techniques and methods, the analysis of architectural qualities, models of representation of architectural templates and styles, their formalization, validation and testing and finally the engineering approach in which these consistent and autonomous elements can be tackled.

Designing Data-Intensive Applications - Martin

Kleppmann 2017-03-16

Data is at the center of many challenges in system design today. Difficult issues need to be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by examining the pros and cons of various technologies for processing and storing data. Software keeps changing, but the fundamental principles remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems you already use, and learn how to use and operate them

more effectively Make informed decisions by identifying the strengths and weaknesses of different tools Navigate the trade-offs around consistency, scalability, fault tolerance, and complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from their architectures

Essential Software Architecture - Ian Gorton
2011-04-27

Job titles like “Technical Architect” and “Chief Architect” nowadays abound in software industry, yet many people suspect that “architecture” is one of the most overused and least understood terms in professional software development. Gorton’s book tries to resolve this dilemma. It concisely describes the essential elements of knowledge and key skills required to be a software architect. The explanations encompass the essentials of architecture thinking, practices, and supporting technologies. They range from a general understanding of

structure and quality attributes through technical issues like middleware components and service-oriented architectures to recent technologies like model-driven architecture, software product lines, aspect-oriented design, and the Semantic Web, which will presumably influence future software systems. This second edition contains new material covering enterprise architecture, agile development, enterprise service bus technologies, RESTful Web services, and a case study on how to use the MeDICi integration framework. All approaches are illustrated by an ongoing real-world example. So if you work as an architect or senior designer (or want to someday), or if you are a student in software engineering, here is a valuable and yet approachable knowledge source for you.

Managing Technical Debt - Philippe Kruchten

2019-04-15

“This is an incredibly wise and useful book. The authors have considerable real-world experience

in delivering quality systems that matter, and their expertise shines through in these pages. Here you will learn what technical debt is, what is it not, how to manage it, and how to pay it down in responsible ways. This is a book I wish I had when I was just beginning my career. The authors present a myriad of case studies, born from years of experience, and offer a multitude of actionable insights for how to apply it to your project.” -Grady Booch, IBM Fellow Master Best Practices for Managing Technical Debt to Promote Software Quality and Productivity As software systems mature, earlier design or code decisions made in the context of budget or schedule constraints increasingly impede evolution and innovation. This phenomenon is called technical debt, and practical solutions exist. In Managing Technical Debt, three leading experts introduce integrated, empirically developed principles and practices that any software professional can use to gain control of technical debt in any software system. Using

real-life examples, the authors explain the forms of technical debt that afflict software-intensive systems, their root causes, and their impacts. They introduce proven approaches for identifying and assessing specific sources of technical debt, limiting new debt, and “paying off” debt over time. They describe how to establish managing technical debt as a core software engineering practice in your organization. Discover how technical debt damages manageability, quality, productivity, and morale—and what you can do about it Clarify root causes of debt, including the linked roles of business goals, source code, architecture, testing, and infrastructure Identify technical debt items, and analyze their costs so you can prioritize action Choose the right solution for each technical debt item: eliminate, reduce, or mitigate Integrate software engineering practices that minimize new debt Managing Technical Debt will be a valuable resource for every software professional who wants to

accelerate innovation in existing systems, or build new systems that will be easier to maintain and evolve.

Software Architecture in Practice - Len Bass
2012-09-25

The award-winning and highly influential *Software Architecture in Practice, Third Edition*, has been substantially revised to reflect the latest developments in the field. In a real-world setting, the book once again introduces the concepts and best practices of software architecture—how a software system is structured and how that system’s elements are meant to interact. Distinct from the details of implementation, algorithm, and data representation, an architecture holds the key to achieving system quality, is a reusable asset that can be applied to subsequent systems, and is crucial to a software organization’s business strategy. The authors have structured this edition around the concept of architecture influence cycles. Each cycle shows how

architecture influences, and is influenced by, a particular context in which architecture plays a critical role. Contexts include technical environment, the life cycle of a project, an organization's business profile, and the architect's professional practices. The authors also have greatly expanded their treatment of quality attributes, which remain central to their architecture philosophy—with an entire chapter devoted to each attribute—and broadened their treatment of architectural patterns. If you design, develop, or manage large software systems (or plan to do so), you will find this book to be a valuable resource for getting up to speed on the state of the art. Totally new material covers Contexts of software architecture: technical, project, business, and professional Architecture competence: what this means both for individuals and organizations The origins of business goals and how this affects architecture Architecturally significant requirements, and how to determine them Architecture in the life

cycle, including generate-and-test as a design philosophy; architecture conformance during implementation; architecture and testing; and architecture and agile development Architecture and current technologies, such as the cloud, social networks, and end-user devices

Fowler - Martin Fowler 2012-03-09

The practice of enterprise application development has benefited from the emergence of many new enabling technologies. Multi-tiered object-oriented platforms, such as Java and .NET, have become commonplace. These new tools and technologies are capable of building powerful applications, but they are not easily implemented. Common failures in enterprise applications often occur because their developers do not understand the architectural lessons that experienced object developers have learned. Patterns of Enterprise Application Architecture is written in direct response to the stiff challenges that face enterprise application developers. The author, noted object-oriented

designer Martin Fowler, noticed that despite changes in technology--from Smalltalk to CORBA to Java to .NET--the same basic design ideas can be adapted and applied to solve common problems. With the help of an expert group of contributors, Martin distills over forty recurring solutions into patterns. The result is an indispensable handbook of solutions that are applicable to any enterprise application platform. This book is actually two books in one. The first section is a short tutorial on developing enterprise applications, which you can read from start to finish to understand the scope of the book's lessons. The next section, the bulk of the book, is a detailed reference to the patterns themselves. Each pattern provides usage and implementation information, as well as detailed code examples in Java or C#. The entire book is also richly illustrated with UML diagrams to further explain the concepts. Armed with this book, you will have the knowledge necessary to make important architectural decisions about

building an enterprise application and the proven patterns for use when building them. The topics covered include · Dividing an enterprise application into layers · The major approaches to organizing business logic · An in-depth treatment of mapping between objects and relational databases · Using Model-View-Controller to organize a Web presentation · Handling concurrency for data that spans multiple transactions · Designing distributed object interfaces

The Art of Systems Architecting, Third Edition - Mark W. Maier 2009-01-06

If engineering is the art and science of technical problem solving, systems architecting happens when you don't yet know what the problem is. The third edition of a highly respected bestseller, The Art of Systems Architecting provides in-depth coverage of the least understood part of systems design: moving from a vague concept and limited resources to a satisfactory and feasible system concept and an

executable program. The book provides a practical, heuristic approach to the "art" of systems architecting. It provides methods for embracing, and then taming, the growing complexity of modern systems. New in the Third Edition: Five major case studies illustrating successful and unsuccessful practices Information on architecture frameworks as standards for architecture descriptions New methods for integrating business strategy and architecture and the role of architecture as the technical embodiment of strategy Integration of process guidance for organizing and managing architecture projects Updates to the rapidly changing fields of software and systems-of-systems architecture Organization of heuristics around a simple and practical process model A Practical Heuristic Approach to the Art of Systems Architecting Extensively rewritten to reflect the latest developments, the text explains how to create a system from scratch, presenting invention/design rules together with clear

explanations of how to use them. The author supplies practical guidelines for avoiding common systematic failures while implementing new mandates. He uses a heuristics-based approach that provides an organized attack on very ill-structured engineering problems. Examining architecture as more than a set of diagrams and documents, but as a set of decisions that either drive a system to success or doom it to failure, the book provide methods for integrating business strategy with technical architectural decision making.

The Software Architect Elevator - Gregor Hohpe 2020-04-08

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

Software Architectures, Components, and Applications - Sven Overhage 2008-01-23

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.

Continuous Architecture in Practice - Murat Erder 2021-04

In Continuous Architecture in Practice, three leading software architecture experts update the discipline's classic practices for today's environments, software development contexts, and applications. Coverage includes: Discover what's changed, and how the architect's role must change Reflect today's quality attributes in evolvable architectures Understand team-based software architecture, and architecture as a "flow of decisions" Architect for security,

including continuous threat modeling and mitigation Explore architectural opportunities to improve performance in continuous delivery environments Architect for scalability, avoid common scalability pitfalls, and scale microservices and serverless environments Improve resilience and reliability in the face of inevitable failures Architect data for NoSQL, big data, and analytics Use architecture to promote innovation: case studies in AI/ML, chatbots, and blockchain

Software Architecture - Muhammad Ali Babar
2010-08-27

Welcome to the European Conference on Software Architecture (ECSA), which is the premier European software engineering conference. ECSA provides researchers and practitioners with a platform to present and discuss the most recent, innovative, and significant findings and experiences in the field of software architecture research and practice. The fourth edition of ECSA was built upon a

history of a successful series of European workshops on software architecture held from 2004 through 2006 and a series of European software architecture conferences from 2007 through 2009. The last ECSA was merged with the 8th Working IEEE/IFIP Conference on Software Architecture (WICSA). Apart from the traditional technical program consisting of keynote talks, a main - search track, and a poster session, the scope of the ECSA 2010 was broadened to incorporate other tracks such as an industry track, doctoral symposium track, and a tool demonstration track. In addition, we also offered several workshops and tutorials on diverse topics related to software architecture. We received more than 100 submissions in the three main categories: full research and experience papers, emerging research papers, and research challenges papers. The conference attracted papers (co-)authored by researchers, practitioners, and academics from 30 countries (Algeria, Australia, Austria, Belgium, Brazil,

Canada, Chile, China, Colombia, Czech Republic, Denmark, Finland, France, Germany, Hong Kong, I-land, India, Ireland, Israel, Italy, The Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Tunisia, United Kingdom, United States).

Clean Architecture - Robert C. Martin

2017-09-12

Practical Software Architecture Solutions from the Legendary Robert C. Martin (“Uncle Bob”) By applying universal rules of software architecture, you can dramatically improve developer productivity throughout the life of any software system. Now, building upon the success of his best-selling books Clean Code and The Clean Coder, legendary software craftsman Robert C. Martin (“Uncle Bob”) reveals those rules and helps you apply them. Martin’s Clean Architecture doesn’t merely present options. Drawing on over a half-century of experience in software environments of every imaginable type, Martin tells you what choices to make and why

they are critical to your success. As you’ve come to expect from Uncle Bob, this book is packed with direct, no-nonsense solutions for the real challenges you’ll face—the ones that will make or break your projects. Learn what software architects need to achieve—and core disciplines and practices for achieving it Master essential software design principles for addressing function, component separation, and data management See how programming paradigms impose discipline by restricting what developers can do Understand what’s critically important and what’s merely a “detail” Implement optimal, high-level structures for web, database, thick-client, console, and embedded applications Define appropriate boundaries and layers, and organize components and services See why designs and architectures go wrong, and how to prevent (or fix) these failures Clean Architecture is essential reading for every current or aspiring software architect, systems analyst, system designer, and software manager—and for every

programmer who must execute someone else's designs. Register your product for convenient access to downloads, updates, and/or corrections as they become available.

Software Systems Architecture - Rozanski
2005-09

Software Architecture in Practice - Len Bass
2003

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.

Software Architecture in Practice - Len Bass
2003-04-09

This award-winning book, substantially updated to reflect the latest developments in the field, introduces the concepts and best practices of software architecture--how a software system is structured and how that system's elements are meant to interact. Distinct from the details of implementation, algorithm, and data

representation, an architecture holds the key to achieving system quality, is a reusable asset that can be applied to subsequent systems, and is crucial to a software organization's business strategy. Drawing on their own extensive experience, the authors cover the essential technical topics for designing, specifying, and validating a system. They also emphasize the importance of the business context in which large systems are designed. Their aim is to present software architecture in a real-world setting, reflecting both the opportunities and constraints that companies encounter. To that end, case studies that describe successful architectures illustrate key points of both technical and organizational discussions. Topics new to this edition include: Architecture design and analysis, including the Architecture Tradeoff Analysis Method (ATAM) Capturing quality requirements and achieving them through quality scenarios and tactics Using architecture reconstruction to recover undocumented

architectures Documenting architectures using the Unified Modeling Language (UML) New case studies, including Web-based examples and a wireless Enterprise JavaBeans™ (EJB) system designed to support wearable computers The financial aspects of architectures, including use of the Cost Benefit Analysis Method (CBAM) to make decisions If you design, develop, or manage the building of large software systems (or plan to do so), or if you are interested in acquiring such systems for your corporation or government agency, use *Software Architecture in Practice, Second Edition*, to get up to speed on the current state of software architecture. [Just Enough Software Architecture](#) - George Fairbanks 2010-08-30

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 tar pit 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.

Software Product-Family Engineering - Frank van der Linden 2002-04-24

This book constitutes the thoroughly refereed post-proceedings of the 4th International Workshop on Product Family Engineering, PFE 2001, held in Bilbao, Spain, in October 2001. The 31 revised full papers presented together with an introduction and six session reports were carefully reviewed and selected for inclusion in the book. The papers are organized in topical sections on product issues, process

issues, community issues, platform and quality solutions, diversity solutions, product validation, and process validation.

Continuous Architecture - Murat Erder
2015-10-21

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

Applied Software Architecture - Christine Hofmeister 2000

"Designing a large software system is an extremely complicated undertaking that requires juggling differing perspectives and differing goals, and evaluating differing options. Applied Software Architecture is the best book yet that

gives guidance as to how to sort out and organize the conflicting pressures and produce a successful design." -- Len Bass, author of Software Architecture in Practice. Quality software architecture design has always been important, but in today's fast-paced, rapidly changing, and complex development environment, it is essential. A solid, well-thought-out design helps to manage complexity, to resolve trade-offs among conflicting requirements, and, in general, to bring quality software to market in a more timely fashion. Applied Software Architecture provides practical guidelines and techniques for producing quality software designs. It gives an overview of software architecture basics and a detailed guide to architecture design tasks, focusing on four fundamental views of architecture-- conceptual, module, execution, and code. Through four real-life case studies, this book reveals the insights and best practices of the most skilled software architects in designing

software architecture. These case studies, written with the masters who created them, demonstrate how the book's concepts and techniques are embodied in state-of-the-art architecture design. You will learn how to: create designs flexible enough to incorporate tomorrow's technology; use architecture as the basis for meeting performance, modifiability, reliability, and safety requirements; determine priorities among conflicting requirements and arrive at a successful solution; and use software architecture to help integrate system components. Anyone involved in software architecture will find this book a valuable compendium of best practices and an insightful look at the critical role of architecture in software development. 0201325713B07092001 *Software Architecture* - Mary Shaw 1996 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.

Guide to Advanced Empirical Software Engineering - Forrest Shull 2007-11-21

This book gathers chapters from some of the top international empirical software engineering researchers focusing on the practical knowledge necessary for conducting, reporting and using empirical methods in software engineering. Topics and features include guidance on how to design, conduct and report empirical studies. The volume also provides information across a range of techniques, methods and qualitative and quantitative issues to help build a toolkit applicable to the diverse software development contexts

The Semantic Web: Research and Applications - Sean Bechhofer 2008-05-20

This volume contains the papers from the technical programme of the 5th European Semantic Web Conference, ESWC 2008, that took place during June 1-5, 2008 in Tenerife,

Islas Canarias, Spain. ESWC 2008 was the latest in a series of annual, international events focusing on the dissemination and discussion of the latest research and applications of Semantic Web technologies. The call for papers saw over 270 submissions, a comparable figure to the previous year, indicating that the conference series has reached a certain level of maturity. The review process was organized - ing a two-tiered system. First, each submission was reviewed by at least three members of the Programme Committee. Submissions were also assigned to a - nior Programme Committee member, who led discussions between reviewers and provided a metareview and provisional decision. A physical Programme C- mittee meeting was then held, where the final decisions were made. Competition was as strong as ever, and the Programme Committee selected 51 papers to be presented at the conference. In addition to the technical research paper track, a system demo track was

included, with its own review process. Twenty-vedemo papers were selected for publication. System demo authors were given the opportunity to present their work in dedicated sessions during the conference, while an evening reception was also devoted to the presentation of posters and demonstrations of systems. As in past years, ESWC subscribed to the call to “eat our own dog food,” with the publication of a rich set of semantic metadata describing the conference. Three invited talks were given by distinguished scientists: Nigel Shadbolt (Garlik Ltd.

Software Architecture - Patrick Donohoe
1999-02-28

Software architecture is a primary factor in the creation and evolution of virtually all products involving software. It is a topic of major interest in the research community where pronusmg formalisms, processes, and technologies are under development. Architecture is also of major interest in industry because it is recognized as a

significant leverage point for manipulating such basic development factors as cost, quality, and interval. Its importance is attested to by the fact that there are several international workshop series as well as major conference sessions devoted to it. The First Working IFIP Conference on Software Architecture (WICSA1) provided a focused and dedicated forum for the international software architecture community to unify and coordinate its effort to advance the state of practice and research. WICSA 1 was organized to facilitate information exchange between practising software architects and software architecture researchers. The conference was held in San Antonio, Texas, USA, from February 22nd to February 24th, 1999; it was the initiating event for the new IFIP TC-2 Working Group on Software Architecture. This proceedings document contains the papers accepted for the conference. The papers in this volume comprise both experience reports and technical papers. The proceedings reflect the

structure of the conference and are divided into six sections corresponding to the working groups established for the conference.

Architecture-centric Software Project Management - Daniel J. Paulish 2002

To fully leverage the value of software architecture in enterprise development projects, you need to expressly and consciously link architecture with project management. This book shows how, drawing on powerful lessons learned at Siemens, one of the world's leading software development organizations. The authors offer insight into project management for software architects, insight into software architecture for project managers, and above all, insight into integrating the two disciplines to maximize the effectiveness of both of them. Learn how to develop cost and schedule estimates for development projects, based on software architecture; how to clarify architecture so projects can be more effectively planned and managed; and then how to use

architecture to organize, implement, and measure the project iteratively as work progresses.

Beautiful Architecture - Diomidis Spinellis
2009-01-15

What are the ingredients of robust, elegant, flexible, and maintainable software architecture? Beautiful Architecture answers this question through a collection of intriguing essays from more than a dozen of today's leading software designers and architects. In each essay, contributors present a notable software architecture, and analyze what makes it innovative and ideal for its purpose. Some of the engineers in this book reveal how they developed a specific project, including decisions they faced and tradeoffs they made. Others take a step back to investigate how certain architectural aspects have influenced computing as a whole. With this book, you'll discover: How Facebook's architecture is the basis for a data-centric application ecosystem The effect of Xen's

well-designed architecture on the way operating systems evolve How community processes within the KDE project help software architectures evolve from rough sketches to beautiful systems How creeping featurism has helped GNU Emacs gain unanticipated functionality The magic behind the Jikes RVM self-optimizable, self-hosting runtime Design choices and building blocks that made Tandem the choice platform in high-availability environments for over two decades Differences and similarities between object-oriented and functional architectural views How architectures can affect the software's evolution and the developers' engagement Go behind the scenes to learn what it takes to design elegant software architecture, and how it can shape the way you approach your own projects, with Beautiful Architecture.

Evaluating Software Architectures - Clements
2002-09

This Book Describes Systematic Methods For Evaluating Software Architectures And Applies

Them To Real-Life Cases. Evaluating Software Architectures Introduces The Conceptual Background For Architecture Evaluation And Provides A Step-By-Step Guide To The Process Based On Numerous Evaluations Performed In Government And Industry.

Fundamentals of Software Architecture - Mark Richards 2020-01-28

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

Engineering Interactive Systems - Jan Gulliksen 2008-12-23

Engineering Interactive Systems 2007 is an IFIP working conference that brings together researchers and practitioners interested in

strengthening the scientific foundations of user interface design, examining the relationship between software engineering (SE) and human-computer interaction (HCI) and on how user-centered design (UCD) could be strengthened as an essential part of the software engineering process. Engineering Interactive Systems 2007 was created by merging three conferences: • HCSE 2007 - Human-Centered Software Engineering held for the first time. The HCSE Working Conference is a multidisciplinary conference entirely dedicated to advancing the basic science and theory of human-centered software systems engineering. It is organized by IFIP WG 13.2 on Methodologies for User-Centered Systems Design. • EHCI 2007 - Engineering Human Computer Interaction was held for the tenth time. EHCI aims to investigate the nature, concepts, and construction of user interfaces for software systems. It is organized by IFIP WG 13.4/2.7 on User Interface Engineering. • DSV-IS 2007 - Design,

Specification and Verification of Interactive Systems was held for the 13th time. DSV-IS provides a forum where researchers working on model-based techniques and tools for the design and development of interactive systems can come together with practitioners and with those working on HCI models and theories. *Software Product Lines* - Paul Clements 2015-12-04

Designing Software Architectures - Humberto Cervantes 2016-04-29

Designing Software Architectures will teach you how to design any software architecture in a systematic, predictable, repeatable, and cost-effective way. This book introduces a practical methodology for architecture design that any professional software engineer can use, provides structured methods supported by reusable chunks of design knowledge, and includes rich case studies that demonstrate how to use the methods. Using realistic examples, you'll master

the powerful new version of the proven Attribute-Driven Design (ADD) 3.0 method and will learn how to use it to address key drivers, including quality attributes, such as modifiability, usability, and availability, along with functional requirements and architectural concerns. Drawing on their extensive experience, Humberto Cervantes and Rick Kazman guide you through crafting practical designs that support the full software life cycle, from requirements to maintenance and evolution. You'll learn how to successfully integrate design in your organizational context, and how to design systems that will be built with agile methods. Comprehensive coverage includes Understanding what architecture design involves, and where it fits in the full software development life cycle Mastering core design concepts, principles, and processes Understanding how to perform the steps of the ADD method Scaling design and analysis up or down, including design for pre-sale processes or

lightweight architecture reviews Recognizing and optimizing critical relationships between analysis and design Utilizing proven, reusable design primitives and adapting them to specific problems and contexts Solving design problems in new domains, such as cloud, mobile, or big data

Architecting Software Intensive Systems -

Anthony J. Lattanze 2008-11-18

Architectural design is a crucial first step in developing complex software intensive systems. Early design decisions establish the structures necessary for achieving broad systemic properties. However, today's organizations lack synergy between software their development processes and technological methodologies.

Providing a thorough treatment of Requirements Engineering for Software and Systems, Second Edition - Phillip A. Laplante 2013-10-17

As requirements engineering continues to be recognized as the key to on-time and on-budget

delivery of software and systems projects, many engineering programs have made requirements engineering mandatory in their curriculum. In addition, the wealth of new software tools that have recently emerged is empowering practicing engineers to improve their requirements engineering habits. However, these tools are not easy to use without appropriate training. Filling this need, *Requirements Engineering for Software and Systems, Second Edition* has been vastly updated and expanded to include about 30 percent new material. In addition to new exercises and updated references in every chapter, this edition updates all chapters with the latest applied research and industry practices. It also presents new material derived from the experiences of professors who have used the text in their classrooms. Improvements to this edition include: An expanded introductory chapter with extensive discussions on requirements analysis, agreement, and consolidation An expanded chapter on

requirements engineering for Agile methodologies An expanded chapter on formal methods with new examples An expanded section on requirements traceability An updated and expanded section on requirements engineering tools New exercises including ones suitable for research projects Following in the footsteps of its bestselling predecessor, the text illustrates key ideas associated with requirements engineering using extensive case studies and three common example systems: an airline baggage handling system, a point-of-sale system for a large pet store chain, and a system for a smart home. This edition also includes an example of a wet well pumping system for a wastewater treatment station. With a focus on software-intensive systems, but highly applicable to non-software systems, this text provides a probing and comprehensive review of recent developments in requirements engineering in high integrity systems.

Software Architecture - Flavio Oquendo

2007-09-11

This book constitutes the refereed proceedings of the First European Conference on Software Architecture, ECSA 2007, held in Aranjuez, Spain. The 12 revised long papers presented together with four short papers cover description languages and metamodels, architecture-based code generation, run-time monitoring, requirements engineering, service-oriented architectures, aspect-oriented software architectures, ontology-based approaches, autonomic systems, middleware and web services.

SOA Design Patterns - Thomas Erl 2008-12-31

In cooperation with experts and practitioners throughout the SOA community, best-selling author Thomas Erl brings together the de facto catalog of design patterns for SOA and service-orientation. More than three years in development and subjected to numerous industry reviews, the 85 patterns in this full-color book provide the most successful and

proven design techniques to overcoming the most common and critical problems to achieving modern-day SOA. Through numerous examples, individually documented pattern profiles, and over 400 color illustrations, this book provides in-depth coverage of:

- Patterns for the design, implementation, and governance of service inventories—collections of services representing individual service portfolios that can be independently modeled, designed, and evolved.
- Patterns specific to service-level architecture which pertain to a wide range of design areas, including contract design, security, legacy encapsulation, reliability, scalability, and a variety of implementation and governance issues.
- Service composition patterns that address the many aspects associated with combining services into aggregate distributed solutions, including topics such as runtime messaging and message design, inter-service security controls, and transformation.
- Compound patterns (such as Enterprise Service

Bus and Orchestration) and recommended pattern application sequences that establish foundational processes. The book begins by establishing SOA types that are referenced throughout the patterns and then form the basis of a final chapter that discusses the architectural impact of service-oriented computing in general. These chapters bookend the pattern catalog to provide a clear link between SOA design patterns, the strategic goals of service-oriented computing, different SOA types, and the service-orientation design paradigm. This book series is further supported by a series of resources sites, including soabooks.com, soaspecs.com, soapatterns.org, soamag.com, and soaposters.com.

Software Architecture - Richard N. Taylor
2009-01-09

Software architecture is foundational to the development of large, practical software-intensive applications. This brand-new text covers all facets of software architecture and

how it serves as the intellectual centerpiece of software development and evolution. Critically, this text focuses on supporting creation of real implemented systems. Hence the text details not only modeling techniques, but design, implementation, deployment, and system adaptation -- as well as a host of other topics -- putting the elements in context and comparing and contrasting them with one another. Rather than focusing on one method, notation, tool, or process, this new text/reference widely surveys software architecture techniques, enabling the instructor and practitioner to choose the right tool for the job at hand. Software Architecture is intended for upper-division undergraduate and graduate courses in software architecture, software design, component-based software engineering, and distributed systems; the text may also be used in introductory as well as advanced software engineering courses.

97 Things Every Software Architect Should Know - Richard Monson-Haefel 2009-02-05

In this truly unique technical book, today's leading software architects present valuable principles on key development issues that go way beyond technology. More than four dozen architects -- including Neal Ford, Michael Nygard, and Bill de hOra -- offer advice for communicating with stakeholders, eliminating complexity, empowering developers, and many more practical lessons they've learned from years of experience. Among the 97 principles in this book, you'll find useful advice such as: Don't Put Your Resume Ahead of the Requirements (Nitin Borwankar) Chances Are, Your Biggest Problem Isn't Technical (Mark Ramm) Communication Is King; Clarity and Leadership, Its Humble Servants (Mark Richards) Simplicity Before Generality, Use Before Reuse (Kevlin Henney) For the End User, the Interface Is the System (Vinayak Hegde) It's Never Too Early to Think About Performance (Rebecca Parsons) To be successful as a software architect, you need to master both business and technology. This

book tells you what top software architects think is important and how they approach a project. If you want to enhance your career, 97 Things Every Software Architect Should Know is essential reading.

[Architecting Dependable Systems II](#) - Rogério de Lemos 2004-11-29

As software systems become ubiquitous, the issues of dependability become more and more critical. Given that solutions to these issues must be taken into account from the very beginning of the design process, it is appropriate that dependability is addressed at the architectural level. This book results from an effort to bring together the research communities of software architectures and dependability. Inspired by the ICSE 2003 Workshop on Software Architectures for Dependable Systems, the book focuses on topics relevant to improving the state of the art in architecting dependable systems. The 15 thoroughly reviewed papers originate partly from the workshop; others were solicited in

order to achieve complete coverage of all relevant aspects. The papers are organized into topical sections on architectures for dependability, fault-tolerance in software architectures, dependability analysis in software architectures, and industrial experience.

Documenting Software Architectures - Paul Clements 2010-10-05

Software architecture—the conceptual glue that holds every phase of a project together for its many stakeholders—is widely recognized as a critical element in modern software development. Practitioners have increasingly discovered that close attention to a software system’s architecture pays valuable dividends. Without an architecture that is appropriate for the problem being solved, a project will stumble along or, most likely, fail. Even with a superb architecture, if that architecture is not well understood or well communicated the project is unlikely to succeed. *Documenting Software Architectures, Second Edition*, provides the most

complete and current guidance, independent of language or notation, on how to capture an architecture in a commonly understandable form. Drawing on their extensive experience, the authors first help you decide what information to document, and then, with guidelines and examples (in various notations, including UML), show you how to express an architecture so that others can successfully build, use, and maintain a system from it. The book features rules for sound documentation, the goals and strategies of documentation, architectural views and styles, documentation for software interfaces and software behavior, and templates for capturing and organizing information to generate a coherent package. New and improved in this second edition: Coverage of architectural styles such as service-oriented architectures, multi-tier architectures, and data models Guidance for documentation in an Agile development environment Deeper treatment of documentation of rationale, reflecting best industrial practices

Improved templates, reflecting years of use and feedback, and more documentation layout options A new, comprehensive example (available online), featuring documentation of a Web-based service-oriented system Reference guides for three important architecture documentation languages: UML, AADL, and SySML

Documenting Software Architectures - Paul Clements 2011

A complete, timely update to the classic work on capturing software architecture in writing •

- Updated to use UML 2.0 throughout, with a complete Java/SOA-based case study, and covers architecture documentation in agile/lightweight/spiral environments.
- Covers goals, strategies, rules, and hands-on best practices, and provides proven templates for generating coherent documentation.
- Foreword by Grady Booch. This book's first edition offered breakthrough, start-to-finish guidance for software architects who want to document their

architectures in a way that others can understand and accurately implement. Already a classic - and still a best-seller - this book has now been thoroughly updated to reflect today's most important software trends. Both an overview and a hands-on guide, this book introduces the uses of software architecture documentation; provides rules for sound documentation; shows how to document both interfaces and behavior; and offers proven templates for generating coherent documentation. This edition's extensive updates include:

- The use of UML 2.0 throughout.
- A new case study based on Java and SOA.
- Coverage of architectures generated via agile, lightweight, and spiral methods.
- Updates for consistency with SEI's growing portfolio of architecture courses.
- Clearer terminology and explanations throughout.
- Coverage of frameworks such as TOGAF, DODAF, and FEAF.
- Coverage of documentation tools such as wikis and Lattix DSMs.
- New techniques for

documenting variability across product lines.

- Best practices for reviewing and validating documentation.
- Comparisons of 'Views and Beyond' vs '4+1' approaches.
- Improved

alignment with the IEEE-471 standard. This book continues to stand alone in helping architects document their architectures so they will actually be implemented as intended.