

Software Architecture Documentation In The Real World

Document the architecture of your software easily with this highly practical, open-source template. Key Features Get to grips with leveraging the features of arc42 to create insightful documents Learn the concepts of software architecture documentation through real-world examples Discover techniques to create compact, helpful, and easy-to-read documentation Book Description When developers document the architecture of their systems, they often invent their own specific ways of articulating structures, designs, concepts, and decisions. What they need is a template that enables simple and efficient software architecture documentation. arc42 by Example shows how it's done through several real-world examples. Each example in the book, whether it is a chess engine, a huge CRM system, or a cool web system, starts with a brief description of the problem domain and the quality requirements. Then, you'll discover the system context with all the external interfaces. You'll dive into an overview of the solution strategy to implement the building blocks and runtime scenarios. The later chapters also explain various cross-cutting concerns and how they affect other aspects of a program. What you will learn Utilize arc42 to document a system's physical infrastructure Learn how to identify a system's scope and boundaries Break a system down into building blocks and illustrate the relationships between them Discover how to describe the runtime behavior of a system Know how to document design decisions and their reasons Explore the risks and technical debt of your system Who this book is for This book is for software developers and solutions architects who are looking for an easy, open-source tool to document their systems. It is a useful reference for those who are already using arc42. If you are new to arc42, this book is a great learning resource. For those of you who want to write better technical documentation will benefit from the general concepts covered in this book.

Abstract: "Documenting software architecture (DSA) is a crucial facet in the development of a software system, yet often it is carried out in a haphazard fashion, if at all. Lack of attention to the documentation results from insufficient guidance about what should be documented and when and how to capture the information so that system stakeholders find it useful. The book Documenting Software Architectures: Views and Beyond provides such guidance in the DSA approach, and this report describes the conceptual design for a documentation system based on that approach. A system is envisioned that enables the architect to capture architectural decisions and related artifacts as a living repository that can communicate information to stakeholders who might be both geographically and temporally distributed. The system must communicate in a way that allows each stakeholder quick and easy access to information relevant to the person's role in the software development process. This report describes a design prototype that demonstrates a Web-based approach to creating, communicating, and using software architecture throughout the life of the system."

With this practical book architects, CTOs, and CIOs will learn the best practices for the practice of architecture, including analysis, documentation, and communication. Author Eben Hewitt shows you how to create holistic and thoughtful technology plans, communicate them clearly, lead people toward the vision, and become a great architect or Chief Architect. This book covers each key aspect of architecture comprehensively, including how to incorporate business architecture, information architecture, data architecture, application (software) architecture together to have the best chance for the system's success. Get a practical set of proven architecture practices focused on shipping great products using architecture Learn how architecture works effectively with development teams, management, and product management teams through the value chain Find updated special coverage on machine learning architecture Get usable templates to start incorporating into your teams immediately Incorporate business architecture, information architecture, data architecture, and application (software) architecture together

Reliability prediction of a software product is complex due to interdependence and interactions among components and the difficulty of representing this behavior with tractable models. Models developed by making simplifying assumptions about the software structure may be easy to use, but their result may be far from what happens in reality. Making assumptions closer to the reality, which allows complex interactions and interdependences among components, results in models that are too complex to use. Their results may also be too difficult to interpret. The reliability prediction problem is worsened by the lack of precise information on the behavior of components and their interactions, information that is relevant for reliability modeling. Usually, the interactions are not known precisely because of subtle undocumented side effects. Without accurate precise information, even mathematically correct models will not yield accurate reliability predictions. Deriving the necessary information from program code is not practical if not impossible. This is because the code contains too much implementation detail to be useful in creating a tractable model. It is also difficult to analyze system reliability completely based on the program code. This book documents the resulting novel approach of designing, specifying, and describing the hardware and software systems in a way that helps to predict their reliability from the reliability of the components and their interactions. The design approach is named design for reliability predictability (DRP). It integrates design for change, precise behavioral documentation and structure based reliability prediction to achieve improved reliability prediction of software systems. The specification and documentation approach builds upon precise behavioral specification of interfaces using the trace function method (TFM). It also introduces a number of structure functions or connection documents. These functions capture both the static and dynamic behaviors of component based software systems. They are used as a basis for a novel document driven structure based reliability prediction model. System reliability assessment is studied in at least three levels: component reliability, which is assumed to be known; interaction reliability, a novel approach to studying software reliability; and service reliability, whose estimation is the primary objective of reliability assessment. System reliability can be expressed as a function of service reliability. A mobile streaming system, designed and developed by the author as an industrial product, is used as a case study to demonstrate the application of the approach.

arc42 by Example

Living Documentation

Justice

Fundamentals of Software Architecture

Human Rights Committee, 81st Session

A Comprehensive Framework and Guide for Practitioners

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 architect 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 other 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 era of documentation 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

Software architecture is an important factor for the success of any software project. In the context of systematic design and construction, solid software architecture ensures the fulfillment of quality requirements such as expandability, flexibility, performance, and time-to-market. Software architects reconcile customer requirements with the available technical options and the prevailing conditions and constraints. They ensure the creation of appropriate structures and smooth interfaces that work closely with software developers and other parties involved in the project. This book gives you all the basic know-how you need to begin designing scalable system software architectures. It goes into detail on all the most important terms and concepts and how they relate to other IT practices. Following on from the basics, it describes the techniques and methods required for the planning, documentation, and quality management of software architectures. It details the software architect, as well as looking at how the job itself is embedded in company and project structures. The book is designed for self-study and covers the curriculum for the Certified Professional for Software Architecture – Foundation Level (CPSA-F) exam as defined by the International Software Architecture Qualification Board (ISAQB).

Use an Approach Inspired by Domain-Driven Design to Build Documentation That Evolves to Maximize Value Throughout Your Development Lifecycle Software documentation can come to life, stay dynamic, and actually help you build better software. Writing for developers, coding architects, and other software professionals, Living Documentation shows how to create documentation that evolves throughout your entire design and development lifecycle. Through patterns, clarifying it Martraire demonstrates how to use well-crafted artifacts and automation to dramatically improve the value of documentation at minimal extra cost. Whatever your domain, language, or technologies, you don't have to choose between working software and comprehensive, high-quality documentation: you can have both. · Extract and augment available knowledge, and make it useful through living curation · Automate the creation of documentation and diagrams that evolve as know refactor documentation · Leverage documentation to improve software designs · Introduce living documentation to new and legacy environments

More and more Agile projects are seeking architectural roots as they struggle with complexity and scale - and they're seeking lightweight ways to do it Still seeking? In this book the authors help you to find your own path Taking cues from Lean development, they can help steer your project toward practices with longstanding track records Up-front architecture? Sure. You can deliver an architecture as code that compiles and that concretely guides development without bogging down the implementation Documentation? Even a whiteboard diagram, or a CRC card, is documentation: the goal isn't to avoid documentation, but to document just the right things in just the right amount Process? This all works within the frameworks of Scrum, XP, and other Agile approaches

Tool Support for Software Architecture Documentation

Software Architecture with C++

Hands-On Software Architecture with Golang

A Tragedy In Four Acts

Practical Software Architecture

Creating and Using Software Architecture Documentation Using Web-based Tool Support

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 Architecture's 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

One of the toughest challenges software architects face is to effectively document their systems and architectures. Yet this is also one of their most crucial challenges, because ambiguous, incomplete, or inaccurate documentation leads directly to failures in design and implementation. Now, pioneering IBM senior architect Tilak Mitra offers the first complete guide to writing architectural documentation that is clear, crisp, accurate, non-redundant, and usable. This is the only book to provide detailed prescriptive and pragmatic guidance for documenting any real-world IT project, regardless of system, methodology, or environment. Mitra specifically identifies the artifacts that require documentation, showing how to fully communicate your solution to stakeholders, and enable implementers to move confidently from macro-level to micro-level design. Step by step, Mitra addresses key architectural aspects including: system context, function, operations, infrastructure, integration, performance, capacity planning, SQA, and more. He shows how to avoid "over-engineering" and excessive documentation that can delay project delivery and increase risk, while ensuring that designers and developers always have the accurate and specific guidance they need.

With this practical book architects, CTOs, and CIOs will learn the best practices for the practice of architecture, including analysis, documentation, and communication. Author Eben Hewitt shows you how to create holistic and thoughtful technology plans, communicate them clearly, lead people toward the vision, and become a great architect or Chief Architect. This book covers each key aspect of architecture comprehensively, including how to incorporate business architecture, information architecture, data architecture, application (software) architecture together to have the best chance for the system's success. Get a practical set of proven architecture practices focused on shipping great products using architecture Learn how architecture works effectively with development teams, management, and product management teams through the value chain Find updated special coverage on machine learning architecture Get usable templates to start incorporating into your teams immediately Incorporate business architecture, information architecture, data architecture, and application (software) architecture together

Hands-On Software Architecture with Golang starts with a brief introduction to architectural elements, Go, and a case study to demonstrate architectural principles. You'll then move on to look at code-level aspects such as modularity, class design, and constructs specific to Golang and implementation of design patterns. As you make your way through the chapters, you'll explore the core objectives of architecture such as effectively managing complexity, scalability, and reliability of software systems. You'll also work through creating distributed systems and their communication before moving on to modeling and scaling of data. In the concluding chapters, you'll learn to deploy architectures and plan the migration of applications from other languages. By the end of this book, you will have gained insight into various design and architectural patterns, which will enable you to create robust, scalable architecture using Golang. What you will learn/Understand architectural paradigms and deep dive into MicroservicesDesign parallelism/concurrency patterns and learn object-oriented design patterns in GoExplore API-driven systems architecture with introduction to REST and GraphQL standardsBuild event-driven architectures and make your architectures anti-fragileEngineer scalability and learn how to migrate to Go from other languagesGet to grips with deployment considerations with CI/CD pipeline, cloud deployments, and so onBuild an end-to-end e-commerce (travel) application backend in GoWho this book is for Hands-On Software Architecture with Golang is for software developers, architects, and CTOs looking to use Go in their software architecture to build enterprise-grade applications. Programming knowledge of Golang is assumed.

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.

Just Enough Software Architecture

Designing Software Architectures

Conference Resolution for Software Architecture Documentation

A Study Guide for the Certified Professional for Software Architecture® – Foundation Level – ISAQB compliant

A Risk-Driven Approach

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 starts to make architecture relevant to all software developers. Developers need to understand how to use constraints as guardrails 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.

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.

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, release, and deployment of 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.

Documenting Software ArchitecturesViews and BeyondPearson Education

Ontology-based Software Architecture Documentation

Become a successful software architect by implementing effective architecture concepts

A Practical Approach

Documenting Software Architectures : Views and Beyond

Software Architecture and Design for Reliability Predictability

Software Architecture in Practice

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 spectrum of system 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

A Comprehensive Process for Defining Software Architectures That Work A good software architecture is the foundation of any successful software system. Effective architecting requires a clear understanding of organizational roles, artifacts, activities performed, and the optimal sequence for performing those activities. With The Process of Software Architecting , Peter Eeles and Peter Cripps provide guidance on these challenges by covering all aspects of architecting a software system, introducing best-practice techniques that apply in every environment, whether based on Java EE, Microsoft .NET, or other technologies. Eeles and Cripps first illuminate concepts related to software architecture, including architecture documentation and reusable assets. Next, they present an accessible, task-focused guided tour through a typical project, focusing on the architect's role, with common issues illuminated and addressed throughout. Finally, they conclude with a set of best practices that can be applied to today's most complex systems. You will come away from this book understanding The role of the architect in a typical software development project How to document a software architecture to satisfy the needs of different stakeholders The applicability of reusable assets in the process of architecting The role of the architect with respect to requirements definition The derivation of an architecture based on a set of requirements The relevance of architecting in creating complex systems The Process of Software Architecting will be an indispensable resource for every working and aspiring software architect—and for every project manager and other software professional who needs to understand how architecture influences their work. Architecture is crucial to the success of any large software system -- but even a superb architecture will fall if it isn't communicated well. Now, there's a language- and notation-independent guide to capturing architecture so it can be used successfully by every analyst, software designer, and developer. The authors review the diverse goals and uses of software architecture documentation, providing documentation strategies for several common scenarios. They identify the basic unit of software architecture documentation: the viewpoint, which specifies the type of information to be provided in an architectural view. For each viewpoint -- Modules, Component-and-Connectors, and Allocation -- they offer detailed guidance on documenting what really matters. Next, they demonstrate how to package architecture documentation in coherent, usable form: augmenting architectural views with documentation of interfaces and behavior; accounting for architectural variability and dynamic systems; and more.

"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 an important and highly-influential part of software development, and this book is a great resource for software architects, project managers, and other software professionals who need to understand how to design 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, release, and deployment of 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.

Documenting Software ArchitecturesViews and BeyondPearson Education

Design and architect highly scalable and robust applications using Go Design modern systems using effective architecture concepts, design patterns, and techniques with C++20 Presentation Patterns

Software Architecture in DoD Acquisition: A Reference Standard for a Software Architecture Document

Evaluating Software Architectures

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.

Getting Architecture Right: Detailed Practical Guidance For Archiving Any Real-World IT Project To Build Effective, Scalable, and Resilient Systems. Software architects must tread a fine line between precision and ambiguity (a.k.a.abig antique pictures). This is difficult but crucial: Failure to achieve this balance often leads directly to poor system design and implementation. Now, pioneering IBM Distinguished Engineer and Chief Technology Officer Tilak Mitra offers the first complete guide to developing end-to-end solution architectures that are "just enough"—identifying and capturing the most important artifacts, without over-engineering or excessive documentation, and providing a practical approach to consistent and repeated success in defining software architectures. Practical Software Architecture provides detailed prescriptive and pragmatic guidance for architecting any real-world IT project, regardless of system, methodology, or environment. Mitra specifically identifies the artifacts that require emphasis and shows how to communicate evolving solutions with stakeholders, bridging the gap between architecture and implementation.

Apply business requirements to IT infrastructure and deliver a high-quality product by understanding architectures such as microservices, DevOps, and cloud-native using modern C++ standards and features Key FeaturesDesign scalable large-scale applications with the C++ programming languageArchitect software solutions in a cloud-based environment with continuous integration and continuous delivery (CI/CD)Achieve architectural goals by leveraging design patterns, language features, and useful toolsBook Description Software architecture refers to the high-level design of complex applications. It is evolving just like the languages we use, but there are architectural concepts and patterns that you can learn to write high-performance apps in a high-level language without sacrificing readability and maintainability. If you're working with modern C++, this practical guide will help you put your knowledge to work and design distributed, large-scale apps. You'll start by getting up to speed with architectural concepts, including established patterns and rising trends, then move on to understanding what software architecture actually is and start exploring its components. Next, you'll discover the design concepts involved in application architecture and the patterns in software development, before going on to learn how to build, package, integrate, and deploy your readiness. In the concluding chapters, you'll explore different architectural qualities, such as maintainability, reusability, testability, performance, scalability, and security. Finally, you will get an overview of distributed systems, such as service-oriented architecture, microservices, and cloud-native, and understand how to apply them in application development. By the end of this book, you'll be able to build distributed services using modern C++ and associated tools to deliver solutions as per your clients' requirements. What you will learn/Understand how to apply the principles of software architectureApply design patterns and best practices to meet your architectural goalsWrite elegant, safe, and performant code using the latest C++ featuresBuild applications that are easy to maintain and deployExplore the different architectural approaches and learn to apply them as per your requirementSimplify development and operations using application containersDiscover various techniques to solve common problems in software design and developmentWho this book is for This software architecture C++ programming book is for experienced C++ developers looking to become software architects or develop enterprise-grade applications.

Job titles like "Technical Architect" and "Chief Architect" nowadays abound in software industry, yet many people suspect that "architectural" 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.

Documenting Software Architecture: Documenting Interfaces

4th European Conference - ECSA 2010, Copenhagen, Denmark, August 23-26, 2010, Proceedings

Essential Software Architecture

For Agile Software Development

Software Architecture Documentation in Practice

Software Systems Architecture

This book constitutes the refereed proceedings of the 15th International Conference on Software Architecture, ECSA 2021, held in Sweden, in September 2021. Due to the COVID-19 pandemic, the conference was held virtually. For the Research Track, 11 full papers, presented together with 5 short papers, were carefully reviewed and selected from 58 submissions. The papers are organized in topical sections as follows: architectures for reconfigurable and self-adaptive systems; machine learning for software architecture; architectural knowledge, decisions, and rationale; architecting for quality attributes; architecture-centric source code analysis; and experiences and learnings from industrial case studies.

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.

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.

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

Lean Architecture

Applied Software Architecture

Software Architecture with Python

Techniques for Crafting Better Presentations

A New Theory and Practical Guide for Modern Architects

Software Architect's Handbook

Presentation Patterns is the first book on presentations that categorizes and organizes the building blocks (or patterns) that you'll need to communicate effectively using presentation tools like Keynote and PowerPoint. Patterns are like the lower-level steps found inside recipes; they are the techniques you must master to be considered a master chef or master presenter. You can use the patterns in this book to construct your own recipes for different contexts, such as business meetings, technical demonstrations, scientific expositions, and keynotes, just to name a few. Although there are no such things as antirecipes, this book shows you lots of antipatterns—things you should avoid doing in presentations. Modern presentation tools often encourage ineffective presentation techniques, but this book shows you how to avoid them. Each pattern is introduced with a memorable name, a definition, and a brief explanation of motivation. Readers learn where the pattern applies, the consequences of applying it, and how to apply it. The authors also identify critical antipatterns: clichés, fallacies, and design mistakes that cause presentations to disappoint. These problems are easy to avoid—once you know how. Presentation Patterns will help you Plan what you'll say, who you'll say it to, when you'll talk, and where you'll Present perfectly calibrate your presentation to your audience Use the storyteller's "narrative arc" to full advantage Strengthen your credibility—and avoid mistakes that hurt it Hone your message before you ever touch presentation software Incorporate visuals that support your message instead of hindering it Create highly effective "infodecks" that work when you're not able to deliver a talk in person Construct slides that really communicate and avoid "Anti Fonts," "Floodmarks," "Alienating Artifacts," and other errors Master 13 powerful techniques for delivering your presentation with power, authority, and clarity Whether you use this book as a handy reference or read it from start to finish, it will be a revelation: an entirely new language for systematically planning, creating, and delivering more powerful presentations. You'll quickly find it indispensable—no matter what you're presenting, who your audiences are, or what message you're driving home.

Abstract: "In an organization that uses an architecture-centric development approach, it is the purpose of the software architect, especially the product documentation, to guide all stakeholders who contribute in one way or another to the development of the products(s). Unfortunately, in many organizations, this documentation ends up on the shelves, unused and collecting dust. This happens in part because it is difficult to keep the architecture documentation current, hard for nondevelopers to understand what the documents describe, and challenging for nondevelopers to use the tools necessary to access the documentation.

This technical note discusses the benefits and challenges of using a wiki-based collaborative environment to create software architecture documentation. The findings are based on two experiences. The first was that of a team of Carnegie Mellon[registered trademark] University Master of Software Engineering (MSE) program students that used the wiki tool in a real-world software project. For its customer, the team had to produce and document the architecture of a system that will be developed by many geographically distributed teams. The second experience was a study conducted by another MSE student to reconstruct and document the architecture of a multitier enterprise application using the wiki tool and UML 2.0."

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).

The right software architecture is essential for a software-intensive system to meet its functional requirements as well as its quality requirements that govern real-time performance, reliability, maintainability, and a host of other quality attributes. Because an architecture comprises the earliest, most important, and most far-reaching design decisions, it is important for an acquisition organization to exercise its oversight prerogatives with respect to software architecture. Having the right software architecture documentation is a prerequisite for managing and guiding a software development effort and conducting in situ software architecture evaluations. Conducting an architecture evaluation to determine the software architect's fitness for purpose is one of the most powerful, technical risk mitigation strategies available to a program office. This report provides an example reference standard for a Software Architecture Document (SAD). An acquisition organization can use this standard to contractually acquire the documentation needed for communicating the software architecture design and conducting software architecture evaluations. The example used in this report is drawn from an actual SAD written by a major U.S. Department of Defense contractor in a weapon system acquisition. The intent of this report is to provide an example for other acquisition efforts to use (and adapt as appropriate) in their own procurements.

Semantic Software Design

Perspectives on an Emerging Discipline

An Engineering Approach

Summary Record of the 1st Part (public) of the 2199th Meeting, Held at the Palais Wilson, Geneva, on Tuesday, 13 July 2004

Software architecture documentation in practice

Arc42 by Example

Document the architecture of your software easily with this highly practical, open-source template. Key FeaturesGet to grips with leveraging the features of arc42 to create insightful documentsLearn the concepts of software architecture documentation through real-world examplesDiscover techniques to create compact, helpful, and easy-to-read documentationBook Description When developers document the architecture of their systems, they often invent their own specific ways of articulating structures, designs, concepts, and decisions. What they need is a template that enables simple and efficient software architecture documentation. arc42 by Example shows how it's done through several real-world examples. Each example in the book, whether it is a chess engine, a huge CRM system, or a cool web system, starts with a brief description of the problem domain and the quality requirements. Then, you'll discover the system context with all the external interfaces. You'll dive into an overview of the solution strategy to implement the building blocks and runtime scenarios. The later chapters also explain various cross-cutting concerns and how they affect other aspects of a program. What you will learnUtilize arc42 to document a system's physical infrastructureLearn how to identify a system's scope and boundariesBreak a system down into building blocks and illustrate the relationships between themDiscover how to describe the runtime behavior of a systemKnow how to document design decisions and their reasonsExplore the risks and technical debt of your systemWho this book is for This book is for software developers and solutions architects who are looking for an easy, open-source tool to document their systems. It is a useful reference for those who are already using arc42. If you are new to arc42, this book is a great learning resource. For those of you who want to write better technical documentation will benefit from the general concepts covered in this book.

This is the fourth in a series of SEI reports on documenting software architectures. This report details guidance for documenting the interfaces to software elements. It prescribes a standard organization (template) for recording semantic as well as syntactic information about an interface. Stakeholders of interface documentation are enumerated, available notations for specifying interfaces are described, and three examples are provided.

15th European Conference, ECSA 2021, Virtual Event, Sweden, September 13-17, 2021, Proceedings

Moving from System Context to Deployment

Experience Using the Web-based Tool Wiki for Architecture Documentation

The Process of Software Architecting

Software Architecture

Software Architecture Fundamentals