Software Architecture Documentation In The Real World

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CHRISTENSEN PERKINS

Robotic Fabrication in Architecture, Art and Design Pearson

Documenting Software ArchitecturesViews and BeyondPearson Education

Evaluating Software Architectures Springer Science & Business Media

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.

The Process of Software Architecting dpunkt.verlag

A comprehensive guide to exploring software architecture concepts and implementing best practices Key Features Enhance your skills to grow your career as a software architect Design efficient software architectures using patterns and best practices Learn how software architecture relates to an organization as well as software development methodology Book Description The Software Architect’s Handbook is a comprehensive guide to help developers, architects, and senior programmers advance their career in the software architecture domain. This book takes you through all the important concepts, right from design principles to different considerations at various stages of your career in software architecture. The book begins by covering the fundamentals, benefits, and purpose of software architecture. You will discover how software architecture relates to an organization, followed by identifying its significant quality attributes. Once you have covered the basics, you will explore design patterns, best practices, and paradigms for efficient software development. The book discusses which factors you need to consider for performance and security enhancements. You will learn to write documentation for your architectures and make appropriate decisions when considering DevOps. In

addition to this, you will explore how to design legacy applications before understanding how to create software architectures that evolve as the market, business requirements, frameworks, tools, and best practices change over time. By the end of this book, you will not only have studied software architecture concepts but also built the soft skills necessary to grow in this field. What you will learn Design software architectures using patterns and best practices Explore the different considerations for designing software architecture Discover what it takes to continuously improve as a software architect Create loosely coupled systems that can support change Understand DevOps and how it affects software architecture Integrate, refactor, and re-architect legacy applications Who this book is for The Software Architect’s Handbook is for you if you are a software architect, chief technical officer (CTO), or senior developer looking to gain a firm grasp of software architecture.

Documenting Software Architectures Newnes

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 illustrations, and concrete examples, Cyrille 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 knowledge changes · Use development tools to refactor documentation · Leverage documentation to improve software designs · Introduce living documentation to new and legacy environments

Experience Using the Web-based Tool Wiki for Architecture Documentation Pearson Education India

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.

Software Architecture with Python Marshall & Brainerd

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.

Practical Software Architecture Pearson Education

A guide to successfully operating in a lean-agile organization for solutions architects and enterprise architects Key Features Develop the right combination of processes and technical excellence to address architectural challenges Explore a range of architectural techniques to modernize legacy systems Discover how to design and continuously improve well-architected sustainable software Book Description Many organizations have embraced Agile methodologies to transform their ability to rapidly respond to constantly changing customer demands. However, in this melee, many enterprises often neglect to invest in architects by presuming architecture is not an intrinsic element of Agile software development. Since the role of an architect is not pre-defined in Agile, many organizations struggle to position architects, often resulting in friction with other roles or a failure

to provide a clear learning path for architects to be productive. This book guides architects and organizations through new Agile ways of incrementally developing the architecture for delivering an uninterrupted, continuous flow of values that meets customer needs. You'll explore various aspects of Agile architecture and how it differs from traditional architecture. The book later covers Agile architects' responsibilities and how architects can add significant value by positioning themselves appropriately in the Agile flow of work. Through examples, you'll also learn concepts such as architectural decision backlog,the last responsible moment, value delivery, architecting for change, DevOps, and evolutionary collaboration. By the end of this Agile book, you'll be able to operate as an architect in Agile development initiatives and successfully architect reliable software systems. What you will learn Acquire clarity on the duties of architects in Agile development Understand architectural styles such as domain-driven design and microservices Identify the pitfalls of traditional architecture and learn how to develop solutions Understand the principles of value and data-driven architecture Discover DevOps and continuous delivery from an architect's perspective Adopt Lean-Agile documentation and governance Develop a set of personal and interpersonal qualities Find out how to lead the transformation to achieve organization-wide agility Who this book is for This agile study guide is for architects currently working on agile development projects or aspiring to work on agile software delivery, irrespective of the methodology they are using. You will also find this book useful if you're a senior developer or a budding architect looking to understand an agile architect's role by embracing agile architecture strategies and a lean-agile mindset. To understand the concepts covered in this book easily, you need to have prior knowledge of basic agile development practices.

Documenting Architectural Layers Addison-Wesley Professional

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 behavior of 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.

A Risk-Driven Approach Springer

With this practical book, architects, CTOs, and CIOs will learn a set of patterns 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

Software Architecture Knowledge Management Packt Publishing Ltd

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.

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

"O'Reilly Media, Inc."

Abstract: "In an organization that uses an architecture-centric development approach, it is the purpose of the software architecture, especially the product documentation, to guide all stakeholders who contribute in one way or another to the

development of the product(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."

Rob|Arch 2012 Springer Nature

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

Designing Software Architectures "O'Reilly Media, Inc."

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.

Ontology-based Software Architecture Documentation Addison-Wesley Professional

This practical guide 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.

Software Architecture in Practice Packt Publishing Ltd

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

Software Architect’s Handbook Pearson Education

A software architecture manifests the major early design decisions, which determine the system’s development, deployment and evolution. Thus, making better architectural decisions is one of the large challenges in software engineering. Software architecture knowledge management is about capturing practical experience and translating it into generalized architectural knowledge, and using this knowledge in the communication with stakeholders during all phases of the software lifecycle. This book presents a concise description of knowledge management in the software architecture discipline. It explains the importance of sound knowledge management practices for improving software architecture processes and products, and makes clear the role of knowledge management in software architecture and software development processes. It presents many approaches that are in use in software companies today, approaches that have been used in other domains, and approaches under development in academia. After an initial introduction by the editors, the contributions are grouped in three parts on "Architecture Knowledge Management", "Strategies and Approaches for Managing Architectural Knowledge", and "Tools and Techniques for Managing Architectural Knowledge". The presentation aims at information technology and software

engineering professionals, in particular software architects and software architecture researchers. For the industrial audience, the book gives a broad and concise understanding of the importance of knowledge management for improving software architecture process and building capabilities in designing and evaluating better architectures for their mission- and business-critical systems. For researchers, the book will help to understand the applications of various knowledge management approaches in an industrial setting and to identify research challenges and opportunities.

Agile Software Architecture Pearson Education

Architecture is crucial to the success of any large software system -- but even a superb architecture will fail 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 viewtype, which specifies the type of information to be provided in an architectural view. For each viewtype -- 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.

Aligning Agile Processes and Software Architectures Addison-Wesley Professional

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."

Living Documentation Packt Publishing Ltd

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.

Applied Software Architecture Cambridge Scholars Publishing

Agile software development approaches have had significant impact on industrial software development practices. Today, agile software development has penetrated to most IT companies across the globe, with an intention to increase quality,

productivity, and profitability. Comprehensive knowledge is needed to understand the architectural challenges involved in adopting and using agile approaches and industrial practices to deal with the development of large, architecturally challenging systems in an agile way. Agile Software Architecture focuses on gaps in the requirements of applying architecture-centric approaches and principles of agile software development and demystifies the agile architecture paradox. Readers will learn how agile and architectural cultures can co-exist and support each other according to the context. Moreover, this book will also provide useful leads for future research in architecture and agile to bridge such gaps by developing appropriate approaches that incorporate architecturally sound practices in agile methods. Presents a consolidated view of the state-of-art and state-of-practice as well as the newest research findings Identifies gaps in the requirements of applying architecture-centric approaches and principles of agile software development and demystifies the agile architecture paradox Explains whether or not and how agile and architectural cultures can co-exist and support each other depending upon the context Provides useful leads for future research in both architecture and agile to bridge such gaps by developing appropriate approaches, which incorporate architecturally sound practices in agile methods