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REFACTORING DATABASES

EVOLUTIONARY DATABASE DESIGN

A MARTIN FOWLER SIGNATURE BOOK

SCOTT W. AMBLER

PRAMOD J. SADALAGE

Forewords by Martin Fowler, John Graham, Sachin Rekhi, and Dr. Paul Dorsey

Refactoring Databases Evolutionary Database Design

Christian G. Meyer

Refactoring Databases Evolutionary Database Design:

   Refactoring Databases Scott W. Ambler,Pramod J. Sadalage,2006-03-03 Refactoring has proven its value in a wide range of development projects helping software professionals improve system designs maintainability extensibility and performance Now for the first time leading agile methodologist Scott Ambler and renowned consultant Pramodkumar Sadalage introduce powerful refactoring techniques specifically designed for database systems Ambler and Sadalage demonstrate how small changes to table structures data stored procedures and triggers can significantly enhance virtually any database design without changing semantics You ll learn how to evolve database schemas in step with source code and become far more effective in projects relying on iterative agile methodologies This comprehensive guide and reference helps you overcome the practical obstacles to refactoring real world databases by covering every fundamental concept underlying database refactoring Using start to finish examples the authors walk you through refactoring simple standalone database applications as well as sophisticated multi application scenarios You ll master every task involved in refactoring database schemas and discover best practices for deploying refactorings in even the most complex production environments The second half of this book systematically covers five major categories of database refactorings You ll learn how to use refactoring to enhance database structure data quality and referential integrity and how to refactor both architectures and methods This book provides an extensive set of examples built with Oracle and Java and easily adaptable for other languages such as C C or VB NET and other databases such as DB2 SQL Server MySQL and Sybase Using this book s techniques and examples you can reduce waste rework risk and cost and build database systems capable of evolving smoothly far into the future   Recipes for Continuous Database Integration Pramod J. Sadalage,2003-03-26 This is the eBook version of the printed book The past few years have seen the rise of agile or evolutionary methods in software development These methods embrace change in requirements even late in the project The ability to change software is because of certain practices that are followed within teams such as Test Driven Development Pair Programming and Continuous Integration Continuous Integration provides a way for software teams to integrate their work more than once a day and promotes confidence in the software that is being developed by the team It is thought that this practice is difficult to apply when continuously integrating the database with application code hence Evolutionary Database Development is considered a mismatch with agile methods Pramod Sadalage shows that this is not necessarily true Continuous Integration changed the way software is written Why not extend and make the database part of the same Continuous Integration cycle so that you can see integrated results of your application as well as your database Delivered in PDF format for quick and easy access Recipes for Continuous Database Integration shows how the database can be brought under the preview of Continuous Integration allowing all teams to integrate not only their application code but also their database This Short Cut presents a recipe for each task that needs to be done Each recipe starts with a statement of a problem followed by an explanation and solution It provides concrete ways

and examples to implement ideas in Refactoring Databases Evolutionary Database Design by Scott W Ambler and Pramod Sadalage Table of Contents What This Short Cut Covers Introduction Recipe 1 Continuously Integrating Recipe 2 Extracting Your Database in Scripts Recipe 3 Using Version Control for Your Database Recipe 4 Automating Database or Schema Creation Recipe 5 Creating Objects in Your Database Recipe 6 Removing Database Objects Recipe 7 Removing Your Database Recipe 8 Using the Build Property Files Recipe 9 Re Creating Your Application Database for Any Build Recipe 10 Making It Easy for New Developers to Join the Team Recipe 11 Integrating on Every Check In Recipe 12 Naming Upgrade Scripts Recipe 13 Automating Database Change Script Creation Recipe 14 Implementing Database Version Checking Recipe 15 Sending Upgrades to Customers Sample Code Further Reading About the Author What s in the Companion Book Related Publication   <u>Database Modeling and Design</u> Toby J. Teorey,Sam S. Lightstone,Tom Nadeau,H.V. Jagadish,2011-02-10 Includes bonus chapters from the book Physical database design   *Building Evolutionary Architectures* Neal Ford,Rebecca Parsons,Patrick Kua,2017-09-18 The software development ecosystem is constantly changing providing a constant stream of new tools frameworks techniques and paradigms Over the past few years incremental developments in core engineering practices for software development have created the foundations for rethinking how architecture changes over time along with ways to protect important architectural characteristics as it evolves This practical guide ties those parts together with a new way to think about architecture and time   **Domain-Driven Refactoring** Alessandro Colla,Alberto Acerbis,2025-05-16 Apply domain driven design practices effortlessly to evolve your system into a modern robust application while mastering refactoring techniques that drive real world results Key Features Learn how to modernize your system to make it as frictionless as possible Gain hands on experience in applying strategic and tactical patterns through real world examples Transform your architecture with practical guidance for seamless refactoring Purchase of the print or Kindle book includes a free PDF eBook Book Description As software development continues to grow mastering domain driven design DDD will help transform your approach to complex systems Filled with actionable insights and practical examples this book is your essential guide to implementing DDD principles covering its key concepts and practical applications in modern architecture Alessandro an eCommerce specialist and DDD expert with 30 years of experience and Alberto a dedicated backend developer tap into their extensive expertise to help you refactor your monolith into a modular structure whether it be evolving into microservices or enhancing a maintainable monolith resulting in a system that adapts to changing business needs and non functional requirements You ll explore vital DDD patterns like strategic design with bounded contexts and ubiquitous language improving communication between technical and domain experts The chapters take you through modeling techniques to manage complexity and increase flexibility while also addressing microservices integration including inter service communication transaction management and data strategies By the end of this book you ll be able to decompose a monolith and refine its architecture for adaptability all while ensuring business logic remains central to your software

design and development What you will learn Find out how to recognize the boundaries of your system s components Apply strategic patterns such as bounded contexts and ubiquitous language Master tactical patterns for building aggregates and entities Discover principal refactoring patterns and learn how to implement them Identify pain points in a complex code base and address them Explore event driven architectures for component decoupling Get skilled at writing tests that validate and maintain architectural integrity Who this book is for This book is ideal for software developers architects and team leads looking to modernize legacy applications using domain driven design principles If you re a backend developer or software engineer looking to enhance your understanding of DDD this guide will elevate your skills in designing robust systems Team leads and architects will find valuable insights for guiding their teams through the transition from monoliths to microservices Familiarity with C is a must as the book provides practical examples in this language **Advances in Databases and Information Systems** Morzy Tadeusz,Patrick Valduriez,Ladjel Bellatreche,2015-08-14 This book constitutes the thoroughly refereed proceedings of the 19th East European Conference on Advances in Databases and Information Systems ADBIS 2015 held in Poitiers France in September 2015 The 31 full papers and 18 short papers presented were carefully selected and reviewed from 135 submissions The papers are organized in topical sections such as database theory and access methods user requirements and database evolution multidimensional modeling and OLAP ETL transformation extraction and archiving modeling and ontologies time series processing performance and tuning advanced query processing approximation and skyline confidentiality and trust **Database and Expert Systems Applications** Sven Hartmann,Hui Ma,2016-08-05 This two volume set LNCS 9827 and LNCS 9828 constitutes the refereed proceedings of the 27th International Conference on Database and Expert Systems Applications DEXA 2016 held in Porto Portugal September 2016 The 39 revised full papers presented together with 29 short papers were carefully reviewed and selected from 137 submissions The papers discuss a range of topics including Temporal Spatial and High Dimensional Databases Data Mining Authenticity Privacy Security and Trust Data Clustering Distributed and Big Data Processing Decision Support Systems and Learning Data Streams Data Integration and Interoperability Semantic Web and Data Semantics Social Networks and Network Analysis Linked Data Data Analysis NoSQL NewSQL Multimedia Data Personal Information Management Semantic Web and Ontologies Database and Information System Architectures Query Answering and Optimization Information Retrieval and Keyword Search Data Modelling and Uncertainty **Database Administration** Craig S. Mullins,2012-10-11 Database Administration Second Edition is the definitive technology independent guide to the modern discipline of database administration Packed with best practices and proven solutions for any database platform or environment this text fully reflects the field s latest realities and challenges Drawing on more than thirty years of database experience Mullins focuses on problems that today s DBAs actually face and skills and knowledge they simply must have Mullins presents realistic thorough and up to date coverage of every DBA task including creating database environments data modeling normalization design performance data integrity

compliance governance security backup recovery disaster planning data and storage management data movement distribution data warehousing connectivity metadata tools and more This edition adds new coverage of Big Data database appliances cloud computing and NoSQL Mullins includes an entirely new chapter on the DBA s role in regulatory compliance with substantial new material on data breaches auditing encryption retention and metadata management You ll also find an all new glossary plus up to the minute DBA rules of thumb   Learning Serverless Jason Katzer,2020-10-29 Whether your company is considering serverless computing or has already made the decision to adopt this model this practical book is for you Author Jason Katzer shows early and mid career developers what s required to build and ship maintainable and scalable services using this model With this book you ll learn how to build a modern production system in the cloud viewed through the lens of serverless computing You ll discover how serverless can free you from the tedious task of setting up and maintaining systems in production You ll also explore new ways to level up your careerand design develop and deploy with confidence In three parts this book includes The Path to Production Examine the ins and outs of distributed systems microservices interfaces and serverless architecture and patterns The Tools Dive into monitoring observability and alerting logging pipelines automation and deployment Concepts Learn how to design security and privacy how to manage quality through testing and staging and how to plan for failure   **Infrastructure as Code** Kief Morris,2020-12-08 Six years ago Infrastructure as Code was a new concept Today as even banks and other conservative organizations plan moves to the cloud development teams for companies worldwide are attempting to build large infrastructure codebases With this practical book Kief Morris of ThoughtWorks shows you how to effectively use principles practices and patterns pioneered by DevOps teams to manage cloud age infrastructure Ideal for system administrators infrastructure engineers software developers team leads and architects this updated edition demonstrates how you can exploit cloud and automation technology to make changes easily safely quickly and responsibly You ll learn how to define everything as code and apply software design and engineering practices to build your system from small loosely coupled pieces This book covers Foundations Use Infrastructure as Code to drive continuous change and raise the bar of operational quality using tools and technologies to build cloud based platforms Working with infrastructure stacks Learn how to define provision test and continuously deliver changes to infrastructure resources Working with servers and other platforms Use patterns to design provisioning and configuration of servers and clusters Working with large systems and teams Learn workflows governance and architectural patterns to create and manage infrastructure elements   **Agile Software Architecture** Michael Stal,2013-11-27 This chapter describes how to systematically prevent software architecture erosion by applying refactoring techniques Software architecture modifications are common rather than the exception in software development Modifications come in different flavors such as redefining or adding requirements changing infrastructure and technology or causing changes by bugs and incorrect decisions But no matter where these changes originate they need special attention from software architects Otherwise if software architects

merely focus on adding new features changes or extensions that by themselves might not be adequate design erosion will be the final result In a systematic approach software architects evaluate the existing software design before adding new artifacts or changing existing ones Whenever they identify architecture problems they immediately resolve architectural issues thus assuring high quality and sustainability Software architecture refactoring enables such iterative architecture improvement It consists of indentifying problems applying the right refactorings and testing the results Architecture refactoring is often combined with code refactoring activities to add the best value Refactoring patterns offer proven solutions for recurring architectural problems hence providing a toolset to software engineers **The Art of Agile Development** James Shore,Shane Warden,2021-10-12 Most companies developing software employ something they call Agile But there s widespread misunderstanding of what Agile is and how to use it If you want to improve your software development team s agility this comprehensive guidebook s clear concrete and detailed guidance explains what to do and why and when to make trade offs In this thorough update of the classic Agile how to guide James Shore provides no nonsense advice on Agile adoption planning development delivery and management taken from over two decades of Agile experience He brings the latest ideas from Extreme Programming Scrum Lean DevOps and more into a cohesive whole Learn how to successfully bring Agile development to your team and organization or discover why Agile might not be for you This book explains how to Improve agility create the conditions necessary for Agile to succeed and scale in your organization Focus on value work as a team understand priorities provide visibility and improve continuously Deliver software reliably share ownership decrease development costs evolve designs and deploy continuously Optimize value take ownership of product plans budgets and experiments and produce market leading software *Software Design X-Rays* Adam Tornhill,2018-03-08 Are you working on a codebase where cost overruns death marches and heroic fights with legacy code monsters are the norm Battle these adversaries with novel ways to identify and prioritize technical debt based on behavioral data from how developers work with code And that s just for starters Because good code involves social design as well as technical design you can find surprising dependencies between people and code to resolve coordination bottlenecks among teams Best of all the techniques build on behavioral data that you already have your version control system Join the fight for better code Use statistics and data science to uncover both problematic code and the behavioral patterns of the developers who build your software This combination gives you insights you can t get from the code alone Use these insights to prioritize refactoring needs measure their effect find implicit dependencies between different modules and automatically create knowledge maps of your system based on actual code contributions In a radical much needed change from common practice guide organizational decisions with objective data by measuring how well your development teams align with the software architecture Discover a comprehensive set of practical analysis techniques based on version control data where each point is illustrated with a case study from a real world codebase Because the techniques are language neutral you can apply them to

your own code no matter what programming language you use Guide organizational decisions with objective data by measuring how well your development teams align with the software architecture Apply research findings from social psychology to software development ensuring you get the tools you need to coach your organization towards better code If you re an experienced programmer software architect or technical manager you ll get a new perspective that will change how you work with code What You Need You don t have to install anything to follow along in the book TThe case studies in the book use well known open source projects hosted on GitHub You ll use CodeScene a free software analysis tool for open source projects for the case studies We also discuss alternative tooling options where they exist   **Devops in Practice** Danilo Sato,2014-04-16 DevOps is a cultural and professional movement that s trying to break these walls Focused on automation collaboration tool sharing and knowledge sharing DevOps has been revealing that developers and system engineers have a lot to learn from one another In this book Danilo Sato will show you how to implement DevOps and Continuous Delivery practices so as to raise your system s deployment frequency at the same time as increasing the production application s stability and robustness You will learn how to automate a web application s build and deploy phases and the infrastructure management how to monitor the system deployed to production how to evolve and migrate an architecture to the cloud and still get to know several other tools that you can use on your company   **Refactoring HTML** Elliotte Rusty Harold,2012-03-16 Like any other software system Web sites gradually accumulate cruft over time They slow down Links break Security and compatibility problems mysteriously appear New features don t integrate seamlessly Things just don t work as well In an ideal world you d rebuild from scratch But you can t there s no time or money for that Fortunately there s a solution You can refactor your Web code using easy proven techniques tools and recipes adapted from the world of software development In Refactoring HTML Elliotte Rusty Harold explains how to use refactoring to improve virtually any Web site or application Writing for programmers and non programmers alike Harold shows how to refactor for better reliability performance usability security accessibility compatibility and even search engine placement Step by step he shows how to migrate obsolete code to today s stable Web standards including XHTML CSS and REST and eliminate chronic problems like presentation based markup stateful applications and tag soup The book s extensive catalog of detailed refactorings and practical recipes for success are organized to help you find specific solutions fast and get maximum benefit for minimum effort Using this book you can quickly improve site performance now and make your site far easier to enhance maintain and scale for years to come Topics covered include Recognizing the smells of Web code that should be refactored Transforming old HTML into well formed valid XHTML one step at a time Modernizing existing layouts with CSS Updating old Web applications replacing POST with GET replacing old contact forms and refactoring JavaScript Systematically refactoring content and links Restructuring sites without changing the URLs your users rely upon This book will be an indispensable resource for Web designers developers project managers and anyone who maintains or updates existing sites It

will be especially helpful to Web professionals who learned HTML years ago and want to refresh their knowledge with today s standards compliant best practices This book will be an indispensable resource for Web designers developers project managers and anyone who maintains or updates existing sites It will be especially helpful to Web professionals who learned HTML years ago and want to refresh their knowledge with today s standards compliant best practices   Innovations for Requirement Analysis. From Stakeholders' Needs to Formal Designs Barbara Paech,Craig Martell,2008-11-27 Wearepleasedtopresenttheproceedingsofthe14thMontereyWorkshop which tookplaceSeptember10 13 2007inMonterey CA USA Inthispreface wegive the reader an overview of what took place at the workshop and introduce the contributions in this Lecture Notes in Computer Science volume A complete introduction to the theme of the workshop as well as to the history of the Monterey Workshop series can be found in Luqi and Kordon s Advances in Requirements Engineering Bridging the Gap between Stakeholders Needs and Formal Designs in this volume This paper also contains the case study that many participants used as a problem to frame their analyses and a summary of the workshop s results The workshop consisted of three keynote talks three panels presentations of peer reviewed papers as well as presentations of various position papers by the participants The keynote speakers at this year s workshop were Daniel Berry Aravind Joshi and Lori Clarke Each of their talks was used to set the tone for the p sentations and discussions for that particular day Daniel Berry presented an overview of the needs and challenges of natural language processing in requi ments engineering with a special focus on ambiguity in his talk Ambiguity in Natural Language Requirements Aravind Joshi provided an overview of current natural language processing research in discourse analysis in the talk Some Recent Developments in Natural Language Processing Finally Lori Clarke showed how to combine formal requirements speci cation with natural language processing to cope with the complex domain of medical information processes in Getting the Details Right   *The Art of Lean Software Development* Curt Hibbs,Steve Jewett,Mike Sullivan,2009-01-15 This succinct book explains how you can apply the practices of Lean software development to dramatically increase productivity and quality Based on techniques that revolutionized Japanese manufacturing Lean principles are being applied successfully to product design engineering the supply chain and now software development With The Art of Lean Software Development you ll learn how to adopt Lean practices one at a time rather than taking on the entire methodology at once As you master each practice you ll see significant measurable results With this book you will Understand Lean s origins from Japanese industries and how it applies to software development Learn the Lean software development principles and the five most important practices in detail Distinguish between the Lean and Agile methodologies and understand their similarities and differences Determine which Lean principles you should adopt first and how you can gradually incorporate more of the methodology into your process Review hands on practices including descriptions benefits trade offs and roadblocks Learn how to sell these principles to management The Art of Lean Software Development is ideal for busy people who want to improve the development process but can t afford the disruption of a

sudden and complete transformation The Lean approach has been yielding dramatic results for decades and with this book you can make incremental changes that will produce immediate benefits This book presents Lean practices in a clear and concise manner so readers are motivated to make their software more reliable and less costly to maintain I recommend it to anyone looking for an easy to follow guide to transform how the developer views the process of writing good software Bryan Wells Boeing Intelligence Security Sytems Mission System If you re new to Lean software development and you re not quite sure where to start this book will help get your development process going in the right direction one step at a time John McClenning software development lead Aclara   Evolve the Monolith to Microservices with Java and Node Sandro De Santis,Luis Florez,Duy V Nguyen,Eduardo Rosa,IBM Redbooks,2016-12-05 Microservices is an architectural style in which large complex software applications are composed of one or more smaller services Each of these microservices focuses on completing one task that represents a small business capability These microservices can be developed in any programming language This IBM Redbooks publication shows how to break out a traditional Java EE application into separate microservices and provides a set of code projects that illustrate the various steps along the way These code projects use the IBM WebSphere Application Server Liberty IBM API ConnectTM IBM Bluemix and other Open Source Frameworks in the microservices ecosystem The sample projects highlight the evolution of monoliths to microservices with Java and Node

Agile Analytics Ken Collier,2012 Using Agile methods you can bring far greater innovation value and quality to any data warehousing DW business intelligence BI or analytics project However conventional Agile methods must be carefully adapted to address the unique characteristics of DW BI projects In Agile Analytics Agile pioneer Ken Collier shows how to do just that Collier introduces platform agnostic Agile solutions for integrating infrastructures consisting of diverse operational legacy and specialty systems that mix commercial and custom code Using working examples he shows how to manage analytics development teams with widely diverse skill sets and how to support enormous and fast growing data volumes Collier s techniques offer optimal value whether your projects involve back end data management front end business analysis or both Part I focuses on Agile project management techniques and delivery team coordination introducing core practices that shape the way your Agile DW BI project community can collaborate toward success Part II presents technical methods for enabling continuous delivery of business value at production quality levels including evolving superior designs test driven DW development version control and project automation Collier brings together proven solutions you can apply right now whether you re an IT decision maker data warehouse professional database administrator business intelligence specialist or database developer With his help you can mitigate project risk improve business alignment achieve better results and have fun along the way   **Balancing Agility and Formalism in Software Engineering** Bertrand Meyer,J.R. Nawrocki,Bartosz Walter,2008-07-31 This book constitutes the thoroughly refereed post conference proceedings of the Second IFIP TC 2 Central and East Conference on Software Engineering Techniques CEE SET 2007 held in Poznan Poland in October 2007 The

21 revised full papers presented together with 2 keynote addresses were carefully reviewed and selected from 73 initial submissions The papers are organized in topical sections on measurement processes UML experiments tools and change

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