

## Data Model Patterns A Metadata Map The Morgan Kaufmann Series In Data Management Systems

Software engineering requires specialized knowledge of a broad spectrum of topics, including the construction of software and the platforms, applications, and environments in which the software operates as well as an understanding of the people who build and use the software. Offering an authoritative perspective, the two volumes of the Encyclopedia of Software Engineering cover the entire multidisciplinary scope of this important field. More than 200 expert contributors and reviewers from industry and academia across 21 countries provide easy-to-read entries that cover software requirements, design, construction, testing, maintenance, configuration management, quality control, and software engineering management tools and methods. Editor Phillip A. Laplante uses the most universally recognized definition of the areas of relevance to software engineering, the Software Engineering Body of Knowledge (SWEBOK®), as a template for organizing the material. Also available in an electronic format, this encyclopedia supplies software engineering students, IT professionals, researchers, managers, and scholars with unrivaled coverage of the topics that encompass this ever-changing field. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-mail) online.sales@tandf.co.uk

This book constitutes the proceedings of the 20th International Conference on Web Information Systems Engineering, WISE 2019, held in Hong Kong, China, in November 2019. Due to the problems/protests in Hong Kong, WISE 2019 was postponed from November 26–30, 2019 until January 19–22, 2020. The 50 full papers presented were carefully reviewed and selected from 211 submissions. The papers are organized in the following topical sections: blockchain and crowdsourcing; machine learning; deep learning; recommender systems, data mining; web-based applications; entity linkage and disambiguation; graph learning; knowledge graphs; graph mining; and text mining.

Managing Data in Motion describes techniques that have been developed for significantly reducing the complexity of managing system interfaces and enabling scalable architectures. Author April Reeve brings over two decades of experience to present a vendor-neutral approach to moving data between computing environments and systems. Readers will learn the techniques, technologies, and best practices for managing the passage of data between computer systems and integrating disparate data together in an enterprise environment. The average enterprise's computing environment is comprised of hundreds to thousands computer systems that have been built, purchased, and acquired over time. The data from these various systems needs to be integrated for reporting and analysis, shared for business transaction processing, and converted from one format to another when old systems are replaced and new systems are acquired. The management of the "data in motion" in organizations is rapidly becoming one of the biggest concerns for business and IT management. Data warehousing and conversion, real-time data integration, and cloud and "big data" applications are just a few of the challenges facing organizations and businesses today. Managing Data in Motion tackles these and other topics in a style easily understood by business and IT managers as well as programmers and architects. Presents a vendor-neutral overview of the different technologies and techniques for moving data between computer systems including the emerging solutions for unstructured as well as structured data types Explains, in non-technical terms, the architecture and components required to perform data integration Describes how to reduce the complexity of managing system interfaces and enable a scalable data architecture that can handle the dimensions of "Big Data"

A quick and reliable way to build proven databases for core business functions Industry experts raved about The Data Model Resource Book when it was first published in March 1997 because it provided a simple, cost-effective way to design databases for core business functions. Len Silverston has now revised and updated the hugely successful First Edition, while adding a companion volume to take care of more specific requirements of different businesses. Each volume is accompanied by a CD-ROM, which is sold separately. Each CD-ROM provides powerful design templates discussed in the books in a ready-to-use electronic format, allowing companies and individuals to develop the databases they need at a fraction of the cost and a third of the time it would take to build them from scratch. With each business function boasting its own directory, this CD-ROM provides a variety of data models for specific implementations in such areas as financial services, insurance, retail, healthcare, universities, and telecom.

Written in plain English and based on successful client engagements, Data Modeling of Financial Derivatives: A Conceptual Approach introduces new and veteran data modelers, financial analysts, and IT professionals to the fascinating world of financial derivatives. Covering futures, forwards, options, swaps, and forward rate agreements, finance and modeling expert Robert Mamayev shows you step-by-step how to structure and describe financial data using advanced data modeling techniques. The book introduces IT professionals, in particular, to various financial and data modeling concepts that they may not have seen before, giving them greater proficiency in the financial language of derivatives—and greater ability to communicate with financial analysts without fear or hesitation. Such knowledge will be especially useful to those looking to pick up the necessary skills to become productive right away working in the financial sector. Financial analysts reading this book will come to grips with various data modeling concepts and therefore be in better position to explain the underlying business to their IT audience. Data Modeling of Financial Derivatives—which presumes no advanced knowledge of derivatives or data modeling—will help you: Learn the best entity–relationship modeling method out there—Barker’s CASE methodology—and its application in the financial industry Understand how to identify and creatively reuse data modeling patterns Gain an understanding of financial derivatives and their various applications Learn how to model derivatives contracts and understand the reasoning behind certain design decisions Resolve derivatives data modeling complexities parsimoniously so that your clients can understand them intuitively Packed with numerous examples, diagrams, and techniques, this book will enable you to recognize the various design patterns that you are most likely to encounter in your professional career and apply them successfully in practice. Anyone working with financial models will find it an invaluable tool and career booster. What you’ll learnYou will learn how to: Recognize and identify financial derivatives Reuse data modeling patterns and apply them to create something new Data model simple and complex options Data model SWAPS Data model futures and forward contracts Who this book is for Data modelers, financial analysts, IT professionals, and anyone with an interest in data modeling and business analysis. Table of Contents Introduction Notation Financial Contracts Primer Modeling Forward Contracts Modeling Futures Contracts Modeling Options Advanced Options Modeling – Designing

Trading Strategies Swaps and Forward Rate Agreements (FRAs) Finishing Thoughts

A Reconciliation

The Path of Least Resistance and Greatest Success

Practical Use Cases with the Leading NoSQL Database

Data Architecture Language and Vocabulary

Managing Data in Motion

Hadoop Application Architectures

*Developing High Quality Data Models provides an introduction to the key principles of data modeling. It explains the purpose of data models in both developing an Enterprise Architecture and in supporting Information Quality; common problems in data model development; and how to develop high quality data models, in particular conceptual, integration, and enterprise data models. The book is organized into four parts. Part 1 provides an overview of data models and data modeling including the basics of data model notation; types and uses of data models; and the place of data models in enterprise architecture. Part 2 introduces some general principles for data models, including principles for developing ontologically based data models; and applications of the principles for attributes, relationship types, and entity types. Part 3 presents an ontological framework for developing consistent data models. Part 4 provides the full data model that has been in development throughout the book. The model was created using Jotne EPM Technologys EDMVisualExpress data modeling tool. This book was designed for all types of modelers: from those who understand data modeling basics but are just starting to learn about data modeling in practice, through to experienced data modelers seeking to expand their knowledge and skills and solve some of the more challenging problems of data modeling. Uses a number of common data model patterns to explain how to develop data models over a wide scope in a way that is consistent and of high quality Offers generic data model templates that are reusable in many applications and are fundamental for developing more specific templates Develops ideas for creating consistent approaches to high quality data models*

*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.*

*"This book provides insights into state-of-the-art modeling languages and methods used for reference modeling. A reference model provides a blueprint for information systems development and analysis. Well-established reference models for industrial, retail and other industries are described"--Provided by publisher.*

*With the immense cost savings and scalability the cloud provides, the rationale for building cloud native applications is no longer in question. The real issue is how. With this practical guide, developers will learn about the most commonly used design patterns for building cloud native applications using APIs, data, events, and streams in both greenfield and brownfield development. You'll learn how to incrementally design, develop, and deploy large and effective cloud native applications that you can manage and maintain at scale with minimal cost, time, and effort. Authors Kasun Indrasiri and Sriskandarajah Suhothayan highlight use cases that effectively demonstrate the challenges you might encounter at each step. Learn the fundamentals of cloud native applications Explore key cloud native communication, connectivity, and composition patterns Learn decentralized data management techniques Use event-driven architecture to build distributed and scalable cloud native applications Explore the most commonly used patterns for API management and consumption Examine some of the tools and technologies you'll need for building cloud native systems*

*A practical guide to implementing your enterprise data lake using Lambda Architecture as the base About This Book Build a full-fledged data lake for your organization with popular big data technologies using the Lambda architecture as the base Delve into the big data technologies required to meet modern day business strategies A highly practical guide to implementing enterprise data lakes with lots of examples and real-world use-cases Who This Book Is For Java developers and architects who would like to implement a data lake for their enterprise will find this book useful. If you want to get hands-on experience with the Lambda Architecture and big data technologies by implementing a practical solution using these technologies, this book will also help you. What You Will Learn Build an enterprise-level data lake using the relevant big data technologies Understand the core of the Lambda architecture and how to apply it in an enterprise Learn the technical details around Sqoop and its functionalities Integrate Kafka with Hadoop components to acquire enterprise data Use Flume with streaming technologies for stream-based processing Understand stream-based processing with reference to Apache Spark Streaming Incorporate Hadoop components and know the advantages they provide for enterprise data lakes Build fast, streaming, and high-performance applications using ElasticSearch Make your data ingestion process consistent across various data formats with configurability Process your data to derive intelligence using machine learning algorithms In Detail The term "Data Lake" has recently emerged as a prominent term in the big data industry. Data scientists can make use of it in deriving meaningful insights that can be used by businesses to redefine or transform the way they operate. Lambda architecture is also emerging as one of the very eminent patterns in the big data landscape, as it not only helps to derive useful information from historical data but also correlates real-time data to enable business to take critical decisions. This book tries to bring these two important aspects — data lake and lambda architecture—together. This book is divided into three main sections. The first introduces you to the concept of data lakes, the importance of data lakes in enterprises, and getting you up-to-speed with the Lambda architecture. The second section delves into the principal components of building a data lake using the Lambda architecture. It introduces you to popular big data technologies such as Apache Hadoop, Spark, Sqoop, Flume, and ElasticSearch. The third section is a highly practical demonstration of putting it all together, and shows you how an enterprise data lake can be implemented, along with several real-world use-cases. It also shows you how other peripheral components can be added to the lake to make it more efficient. By the end of this book, you will be able to choose the right big data technologies using the lambda architectural patterns to build your enterprise data lake. Style and approach The book takes a pragmatic approach, showing ways to leverage big data technologies and lambda architecture to build an enterprise-level data lake.*

*Database Interactions in Object Oriented Applications*

*UML and Data Modeling*

*Model-Driven Design Using Business Patterns*

*Data Management at Scale*

*Complex Systems in Knowledge-based Environments: Theory, Models and Applications*

*The Data Model Resource Book, Volume 2*

Imagine what you could do if scalability wasn't a problem. With this hands-on guide, you'll learn how the Cassandra database management system handles hundreds of terabytes of data while remaining highly available across multiple data centers. This expanded second edition—updated for Cassandra 3.0—provides the technical details and practical examples you need to put this database to work in a production environment. Authors Jeff Carpenter and Eben Hewitt demonstrate the advantages of Cassandra’s non-relational design, with special attention to data modeling. If you’re a developer, DBA, or application architect looking to solve a database scaling issue or future-proof your application, this guide helps you harness Cassandra’s speed and flexibility. Understand Cassandra’s distributed and decentralized structure Use the Cassandra Query Language (CQL) and cqlsh—the CQL shell Create a working data model and compare it with an equivalent relational model Develop sample applications using client drivers for languages including Java, Python, and Node.js Explore cluster topology and learn how nodes exchange data Maintain a high level of performance in your cluster Deploy Cassandra on site, in the Cloud, or with Docker Integrate Cassandra with Spark, Hadoop, Elasticsearch, Solr, and Lucene

What value does data modeling contribute to an organization, and how can that value be increased? Starting with analogies from Native American storytelling traditions and drawing on his experiences as an officer in Toastmasters (the International public speaking organization), Larry shows us how we can be data modeling Shamans. We can use data models to bring people together to solve business problems, reengineer inefficient business processes, forge agreements on data meanings, create new business opportunities, and promote data quality and reuse. Drawing from a host of disciplines, from storytelling to cognitive behavioral therapy, from landscaping to Human-Centered Design, from business process reengineering to domain-driven development, from Agile to object-oriented design, Larry weaves all these threads together into a compelling narrative of using data to get us successfully from where we are now to where we want to be! If you're a data professional, the bad news is that change is inevitable. But the good news is that change is not only possible, but fun! Larry's book shows how to navigate the shoals of business and technology change, from Agile development to NoSQL databases to Domain-Driven Development to microservices to cloud computing. The Journey starts here.

In the era of "Big Data," effective information management has become crucial to the success of virtually all organizations. Unfortunately, few IT practitioners know today's best practices for successfully managing enterprise information resources. "Patterns for Information Management" offers the solution: a multi-disciplinary patterns-based approach that reflects where information comes from, how it is distributed, protected, governed, monitored -- and, ultimately, utilized. Leading IBM information management experts Mandy Chessell and Harald Smith show how to design, integrate, and optimize "information supply chains" that:
\* Effectively characterize the information issues associated with today's complex distributed systems\* Fully reflect today's service-oriented, message-based environments\* Establish an information landscape that is effective, manageable, ordered, and efficient.\* Create orderly flows of information which can be reused and synchronized wherever necessary\* Support reasoned decision-making about the applicability and consequences of each alternative approach Chessell and Smith complement their plain-English information pattern language with a complete case study demonstrating its real-world applications. Their pioneering guidebook will serve as both an indispensable guide to architects at all levels of experience "and" an outstanding long-term information management reference.

The key to a successful MDM initiative isn't technology or methods, it's people: the stakeholders in the organization and their complex ownership of the data that the initiative will affect. Master Data Management equips you with a deeply practical, business-focused way of thinking about MDM—an understanding that will greatly enhance your ability to communicate with stakeholders and win their support. Moreover, it will help you deserve their support: you'll master all the details involved in planning and executing an MDM project that leads to measurable improvements in business productivity and effectiveness.
\* Presents a comprehensive roadmap that you can adapt to any MDM project.
\* Emphasizes the critical goal of maintaining and improving data quality.
\* Provides guidelines for determining which data to "master.
\* Examines special issues relating to master data metadata.
\* Considers a range of MDM architectural styles.
\* Covers the synchronization of master data across the application infrastructure.

This book analyzes the methods, technologies, standards, and languages to structure and describe data in their entirety. It reveals common features, hidden assumptions, and ubiquitous patterns among these methods and shows how data are actually structured and described independently from particular trends and technologies. Examples of data structuring methods analyzed critically include: Encodings (e.g. Unicode) Identifiers and Identifier systems (e.g. ISBN) File systems Database Systems (record databases, relational databases, NoSQL...) Data structuring languages (JSON, XML, CSV, RDF...) markup languages (SGML, HTML, TEI, Markdown...) Schema languages (BNF, XSD, RDFS, OWL, SQL...) Conceptual modeling languages (ERM, ORM, UML, DSL...) Conceptual diagrams It is shown how particular method of data structuring and description can best be categorized by their primary purpose.The study further exposes five basic paradigms that deeplyshape how data is structured and described in practice. The third results is a pattern language of data structuring. Patterns show problems and solutions which occur over and over again in data. Each pattern is described with its benefits, consequences, pitfalls, and relations to other patterns. The results can help to better understand data and its actualforms, both for consumption and creation of data. Possible applications include data analysis, data modeling, data archaeology, and data literacy.

Distributed Data at Web Scale  
Describing Data Patterns  
Enterprise Model Patterns  
Patterns of Data Modeling  
A Conceptual Approach  
Metadata Management with IBM InfoSphere Information Server

**Data-governance programs focus on authority and accountability for the management of data as a valued organizational asset. Data Governance should not be about command-and-control, yet at times could become invasive or threatening to the work, people and culture of an organization. Non-Invasive Data Governance™ focuses on formalizing existing accountability for the management of data and improving formal communications, protection, and quality efforts through effective stewarding of data resources. Non-Invasive Data Governance will provide you with a complete set of tools to help you deliver a successful data governance program. Learn how:**

- Steward responsibilities can be identified and recognized, formalized, and engaged according to their existing responsibility rather than being assigned or handed to people as more work.
- Governance of information can be applied to existing policies, standard operating procedures, practices, and methodologies, rather than being introduced or emphasized as new processes or methods.
- Governance of information can support all data integration, risk management, business intelligence and master data management activities rather than imposing inconsistent rigor to these initiatives.
- A practical and non-threatening approach can be applied to governing information and promoting stewardship of data as a cross-organization asset.
- Best practices and key concepts of this non-threatening approach can be communicated effectively to leverage strengths and address opportunities to improve.

**Data-driven insights are a key competitive advantage for any industry today, but deriving insights from raw data can still take days or weeks. Most organizations can’t scale data science teams fast enough to keep up with the growing amounts of data to transform. What’s the answer? Self-service data. With this practical book, data engineers, data scientists, and team managers will learn how to build a self-service data science platform that helps anyone in your organization extract insights from data. Sandeep Uttamchandani provides a scorecard to track and address bottlenecks that slow down time to insight across data discovery, transformation, processing, and production. This book bridges the gap between data scientists bottlenecked by engineering realities and data engineers unclear about ways to make self-service work. Build a self-service portal to support data discovery, quality, lineage, and governance Select the best approach for each self-service capability using open source cloud technologies Tailor self-service for the people, processes, and technology maturity of your data platform Implement capabilities to democratize data and reduce time to insight Scale your self-service portal to support a large number of users within your organization**

**The data lake is a daring new approach for harnessing the power of big data technology and providing convenient self-service capabilities. But is it right for your company? This book is based on discussions with practitioners and executives from more than a hundred organizations, ranging from data-driven companies such as Google, LinkedIn, and Facebook, to governments and traditional corporate enterprises. You’ll learn what a data lake is, why enterprises need one, and how to build one successfully with the best practices in this book. Alex Gorelik, CTO and founder of Waterline Data, explains why old systems and processes can no longer support data needs in the enterprise. Then, in a collection of essays about data lake implementation, you’ll examine data lake initiatives, analytic projects, experiences, and best practices from data experts working in various industries. Get a succinct introduction to data warehousing, big data, and data science Learn various paths enterprises take to build a data lake Explore how to build a self-service model and best practices for providing analysts access to the data Use different methods for architecting your data lake Discover ways to implement a data lake from experts in different industries**

**Here you’ll find one key to the development of a successful information system: Clearly capture and communicate both the abstract and concrete building blocks of data that describe your organization. In 1995, David Hay published Data Model Patterns: Conventions of Thought - the groundbreaking book on how to use standard data models to describe the standard business situations. Enterprise Model Patterns: Describing the World builds on the concepts presented there, adds 15 years of practical experience, and presents a more comprehensive view. You will learn how to apply both the abstract and concrete elements of your enterprise’s architectural data model through four levels of abstraction: Level 0: An abstract template that underlies the Level 1 model that follows, plus two meta models:**

- Information Resources. In addition to books, articles, and e-mail notes, it also includes photographs, videos, and sound recordings.
- Accounting. Accounting is remarkable because it is itself a modeling language. It takes a very different approach than data modelers in that instead of using entities and entity classes that represent things in the world, it is concerned with accounts that represent bits of value to the organization.
- Level 1: An enterprise model that is generic enough to apply to any company or government agency, but concrete enough to be readily understood by all. It describes:
- People and Organization. Who is involved with the business? The people involved are not only the employees within the organization, but customers, agents, and others with whom the organization comes in contact. Organizations of interest include the enterprise itself and its own internal departments, as well as customers, competitors, government agencies, and the like.
- Geographic Locations. Where is business conducted? A geographic location may be either a geographic area (defined as any bounded area on the Earth), a geographic point (used to identify a particular location), or, if you are an oil company for example, a geographic solid (such as an oil reserve).
- Assets. What tangible items are used to carry out the business? These are any physical things that are manipulated, sometimes as products, but also as the means to producing products and services.
- Activities. How is the business carried out? This model not only covers services offered, but also projects and any other kinds of activities. In addition, the model describes the events that cause activities to happen.
- Time. All data is positioned in time, but some more than others.
- Level 2: A more detailed model describing specific functional areas:
- Facilities
- Human Resources
- Communications and Marketing
- Contracts
- Manufacturing
- The Laboratory
- Level 3: Examples of the details a model can have to address what is truly unique in a particular industry. Here you see how to address the unique bits in areas as diverse as:
- Criminal Justice. The model presented here is based on the “Global Justice XML Data Model” (GJXDM).
- Microbiology
- Banking. The model presented here is the result of working for four different banks and then adding some thought to come up with something different from what is currently in any of them.
- Highways. The model here is derived from a project in a Canadian Provincial Highway Department, and addresses the question “what is a road?”

**What value does semantic data modeling offer? As an information architect or data science professional, let’s say you have an abundance of the right data and the technology to extract business gold—but you still fail. The reason? Bad data semantics. In this practical and comprehensive field guide, author Panos Alexopoulos takes you on an eye-opening journey through semantic data modeling as applied in the real world. You’ll learn how to master this craft to increase the usability and value of your data and applications. You’ll also explore the pitfalls to avoid and dilemmas to overcome for building high-quality and valuable semantic representations of data. Understand the fundamental concepts, phenomena, and processes related to semantic data modeling Examine the quirks and challenges of semantic data modeling and learn how to effectively leverage the available frameworks and tools Avoid mistakes and bad practices that can undermine your efforts to create good data models Learn about model development dilemmas, including representation, expressiveness and content, development, and governance Organize and execute semantic data initiatives in your organization, tackling technical, strategic, and organizational challenges**

**Data Lake for Enterprises**  
**Semantic Modeling for Data**  
**Achieving Buzzword Compliance**  
**Pattern Enterpr Applica Arch**  
**Non-Invasive Data Governance**  
**Conventions of Thought**

*In 1995, David Hay published "Data Model Patterns: Conventions of Thought" -- the groundbreaking book on how to use standard data models to describe the standard business situations. This book builds on the concepts presented there, adds 15 years of practical experience, and presents a more comprehensive view. You will learn how to apply both the abstract and concrete elements of your enterprise's architectural data model through four levels of abstraction: Level 0: An abstract template that underlies the Level 1 model that follows, plus two meta models; Level 1: An enterprise model that is generic enough to apply to any company or government agency, but concrete enough to be readily understood by all; Level 2: A more detailed model describing specific functional areas; Level 3: Examples of the details a model can have to address what is truly unique in a particular industry.*

*What do you know about your data? And how do you know what you know about your data? Information governance initiatives address corporate concerns about the quality and reliability of information in planning and decision-making processes. Metadata management refers to the tools, processes, and environment that are provided so that organizations can reliably and easily share, locate, and retrieve information from these systems. Enterprise-wide information integration projects integrate data from these systems to one location to generate required reports and analysis. During this type of implementation process, metadata management must be provided along each step to ensure that the final reports and analysis are from the right data sources, are complete, and have quality. This IBM® Redbooks® publication introduces the information governance initiative and highlights the immediate needs for metadata management. It explains how IBM InfoSphere™ Information Server provides a single unified platform and a collection of product modules and components so that organizations can understand, cleanse, transform, and deliver trustworthy and context-rich information. It describes a typical implementation process. It explains how InfoSphere Information Server provides the functions that are required to implement such a solution and, more importantly, to achieve metadata management. This book is for business leaders and IT architects with an overview of metadata management in information integration solution space. It also provides key technical details that IT professionals can use in a solution planning, design, and implementation process.*

*As data management and integration continue to evolve rapidly, storing all your data in one place, such as a data warehouse, is no longer scalable. In the very near future, data will need to be distributed and available for several technological solutions. With this practical book, you'll learnhow to migrate your enterprise from a complex and tightly coupled data landscape to a more flexible architecture ready for the modern world of data consumption. Executives, data architects, analytics teams, and compliance and governance staff will learn how to build a modern scalable data landscape using the Scaled Architecture, which you can introduce incrementally without a large upfront investment. Author Piethain Strengholt provides blueprints, principles, observations, best practices, and patterns to get you up to speed. Examine data management trends, including technological developments, regulatory requirements, and privacy concerns Go deep into the Scaled Architecture and learn how the pieces fit together Explore data governance and data security, master data management, self-service data marketplaces, and the importance of metadata*

*Data Model Patterns: A Metadata Map not only presents a conceptual model of a metadata repository but also demonstrates a true enterprise data model of the information technology industry itself. It provides a step-by-step description of the model and is organized so that different readers can benefit from different parts. It offers a view of the world being addressed by all the techniques, methods, and tools of the information processing industry (for example, object-oriented design, CASE, business process re-engineering, etc.) and presents several concepts that need to be addressed by such tools. This book is pertinent, with companies and government agencies realizing that the data they use represent a significant corporate resource recognize the need to integrate data that has traditionally only been available from disparate sources. An important component of this integration is management of the "metadata" that describe, catalogue, and provide access to the various forms of underlying business data. The "metadata repository" is essential to keep track of the various physical components of these systems and their semantics. The book is ideal for data management professionals, data modeling and design professionals, and data warehouse and database repository designers. A comprehensive work based on the Zachman Framework for information architecture—encompassing the Business Owner's, Architect's, and Designer's views, for all columns (data, activities, locations, people, timing, and motivation) Provides a step-by-step description of model and is organized so that different readers can benefit from different parts Provides a view of the world being addressed by all the techniques, methods and tools of the information processing industry (for example, object-oriented design, CASE, business process re-engineering, etc.) Presents many concepts that are not currently being addressed by such tools — and should be*

*This book shows how to apply pattern ideas in business applications. It presents more than 20 structural and behavioral business patterns that use the REA (resources, events, agents) pattern as a common backbone. The developer working on business frameworks can use the patterns to derive the right abstractions and to design and ensure that the meta-rules are followed by the developers of the actual applications. The application developer can use these patterns to design a business application, to ensure that it does not violate the domain rules, and to adapt the application to changing requirements without the need to change the overall architecture.*

*Search Patterns*  
*Data Access Patterns*  
*Learning JavaScript Design Patterns*  
*Data Modeling of Financial Derivatives*  
*Design Patterns for Cloud Native Applications*  
*The Enterprise Big Data Lake*

Data Model Patterns: A Metadata MapElsevier

With Learning JavaScript Design Patterns, you'll learn how to write beautiful, structured, and maintainable JavaScript by applying classical and modern design patterns to the language. If you want to keep your code efficient, more manageable, and up-to-date with the latest best practices, this book is for you. Explore many popular design patterns, including Modules, Observers, Facades, and Mediators. Learn how modern architectural patterns—such as MVC, MVP, and MVVM—are useful from the perspective of a modern web application developer. This book also walks experienced JavaScript developers through modern module formats, how to namespace code effectively, and other essential topics. Learn the structure of design patterns and how they are written Understand different pattern categories, including creational, structural, and behavioral Walk through more than 20 classical and modern design patterns in JavaScript Use several options for writing modular code—including the Module pattern, Asynchronous Module Definition (AMD), and CommonJS Discover design patterns implemented in the jQuery library Learn popular design patterns for writing maintainable jQuery plug-ins “This book should be in every JavaScript developer’s hands. It’s the go-to book on JavaScript patterns that will be read and referenced many times in the future.”—Andrée Hansson, Lead Front-End Developer, presis!

Understand the language and vocabulary of Data Architecture. The Data Architecture field is rife with terms that have become “fashionable”. Some of the terms began with very specific, specialized, meanings – but as their use spread, they lost the precision of their technical definitions and become, well, “buzzwords”. A buzzword is “a word or expression from a particular subject area that has become fashionable because it has been used a lot”. Compliance is “the obeying of an accepted principle or instruction that states the way things are or should be done.” The assignment is to take buzzwords and follow rules to use them correctly. We cut through the hype to arrive at buzzword compliance – the state where you fully understand the words that in fact have real meaning in the data architecture industry. This book will rationalize the various ways all these terms are defined. Of necessity, the book must address all aspects of describing an enterprise and its data management technologies. This includes a wide range of subjects, from entity/relationship modeling, through the semantic web, to database issues like relational and “beyond relational” (“NoSQL”) approaches. In each case, the definitions for the subject are meant to be detailed enough to make it possible to understand basic principles—while recognizing that a full understanding will require consulting the sources where they are more completely described. The book’s Glossary contains a catalogue of definitions and its Bibliography contains a comprehensive set of references.

Best-selling author and database expert with more than 25 years of experience modeling application and enterprise data, Dr. Michael Blaha provides tried and tested data model patterns, to help readers avoid common modeling mistakes and unnecessary frustration on their way to building effective data models. Unlike the typical methodology book, Patterns of Data Modeling provides advanced techniques for those who have mastered the basics. Recognizing that database representation sets the path for software, determines its flexibility, affects its quality, and influences whether it succeeds or fails, the text focuses on databases rather than programming. It is one of the first books to apply the popular patterns perspective to database systems and data models. It offers practical advice on the core aspects of applications and provides authoritative coverage of mathematical templates, antipatterns, archetypes, identity, canonical models, and relational database design.

The practice of enterprise application development has benefited from the emergence of many new enabling technologies. Multi-tiered object-oriented platforms, such as Java and .NET, have become commonplace. These new tools and technologies are capable of building powerful applications, but they are not easily implemented. Common failures in enterprise applications often occur because their developers do not understand the architectural lessons that experienced object developers have learned. Patterns of Enterprise Application Architecture is written in direct response to the stiff challenges that face enterprise application developers. The author, noted object-oriented designer Martin Fowler, noticed that despite changes in technology--from Smalltalk to CORBA to Java to .NET--the same basic design ideas can be adapted and applied to solve common problems. With the help of an expert group of contributors, Martin distills over forty recurring solutions into patterns. The result is an indispensable handbook of solutions that are applicable to any enterprise application platform.

This book is actually two books in one. The first section is a short tutorial on developing enterprise applications, which you can read from start to finish to understand the scope of the book’s lessons. The next section, the bulk of the book, is a detailed reference to the patterns themselves. Each pattern provides usage and implementation information, as well as detailed code examples in Java or C#. The entire book is also richly illustrated with UML diagrams to further explain the concepts. Armed with this book, you will have the knowledge necessary to make important architectural decisions about building an enterprise application and the proven patterns for use when building them. The topics covered include · Dividing an enterprise application into layers · The major approaches to organizing business logic · An in-depth treatment of mapping between objects and relational databases · Using Model-View-Controller to organize a Web presentation · Handling concurrency for data that spans multiple transactions · Designing distributed object interfaces

Patterns of Information Management  
Data Model Patterns: A Metadata Map  
Agile Analytics  
Fowler

The Data Model Resource Book  
Reference Modeling for Business Systems Analysis

*Helps you learn how to develop a conceptual, business-oriented entity/relationship model, using a variation on the UML Class Model notation. This book is suitable for data modellers who are convinced that UML has nothing to do with them, and UML experts who don't realise that architectural data modelling really is*

*different from object modelling.*

*This third volume of the best-selling "Data Model Resource Book" series revolutionizes the data modeling discipline by answering the question "How can you save significant time while improving the quality of any type of data modeling effort?" In contrast to the first two volumes, this new volume focuses on the fundamental, underlying patterns that affect over 50 percent of most data modeling efforts. These patterns can be used to considerably reduce modeling time and cost, to jump-start data modeling efforts, as standards and guidelines to increase data model consistency and quality, and as an objective source against which an enterprise can evaluate data models. Praise for The Data Model Resource Book, Volume 3 "Len and Paul look beneath the superficial issues of data modeling and have produced a work that is a must for every serious designer and manager of an IT project." —Bill Inmon, World-renowned expert, speaker, and author on data warehousing and widely recognized as the "father of data warehousing" "The Data Model Resource Book, Volume 3: Universal Patterns for Data Modeling is a great source for reusable patterns you can use to save a tremendous amount of time, effort, and cost on any data modeling effort. Len Silverston and Paul Agnew have provided an indispensable reference of very high-quality patterns for the most foundational types of datamodel structures. This book represents a revolutionary leap in moving the data modeling profession forward." —Ron Powell, Cofounder and Editorial Director of the Business Intelligence Network "After we model a Customer, Product, or Order, there is still more about each of these that remains to be captured, such as roles they play, classifications in which they belong, or states in which they change. The Data Model Resource Book, Volume 3: Universal Patterns for Data Modeling clearly illustrates these common structures. Len Silverston and Paul Agnew have created a valuable addition to our field, allowing us to improve the consistency and quality of our models by leveraging the many common structures within this text." —Steve Hoberman, Best-Selling Author of Data Modeling Made Simple "The large national health insurance company I work at has actively used these data patterns and the (Universal Data Models) UDM, ahead of this book, through Len Silverston's UDM Jump Start engagement. The patterns have found their way into the core of our Enterprise Information Model, our data warehouse designs, and progressively into key business function databases. We are getting to reuse the patterns across projects and are reaping benefits in understanding, flexibility, and time-to-market. Thanks so much." —David Chasteen, Enterprise Information Architect "Reusing proven data modeling design patterns means exactly that. Data models become stable, but remain very flexible to accommodate changes. We have had the fortune of having Len and Paul share the patterns that are described in this book via our engagements with Universal Data Models, LLC. These data modeling design patterns have helped us to focus on the essential business issues because we have leveraged these reusable building blocks for many of the standard design problems. These design patterns have also helped us to evaluate the quality of data models for their intended purpose. Many times there are a lot of enhancements required. Too often the very specialized business-oriented data model is also implemented physically. This may have significant drawbacks to flexibility. I'm looking forward to increasing the data modeling design pattern competence within Nokia with the help of this book." —Teemu Mattelmaki, Chief Information Architect, Nokia "Once again, Len Silverston, this time together with Paul Agnew, has made a valuable contribution to the body of knowledge about datamodels, and the act of building sound data models. As a professional d*

*What people are saying about Search Patterns "Search Patterns is a delight to read -- very thoughtful and thought provoking. It's the most comprehensive survey of designing effective search experiences I've seen." --Irene Au, Director of User Experience, Google "I love this book! Thanks to Peter and Jeffery, I now know that search (yes, boring old yucky who cares search) is one of the coolest ways around of looking at the world." --Dan Roam, author, The Back of the Napkin (Portfolio Hardcover) "Search Patterns is a playful guide to the practical concerns of search interface design. It contains a bonanza of screenshots and illustrations that capture the best of today's design practices and presents a fresh perspective on the broader role of search and discovery." --Marti Hearst, Professor, UC Berkeley and author, Search User Interfaces (Cambridge University Press) "It's not often I come across a book that asks profound questions about a fundamental human activity, and then proceeds to answer those questions with practical observations and suggestions. Search Patterns is an expedition into the heart of the web and human cognition, and for me it was a delightful journey that delivered scores of insights." --Dave Gray, Founder and Chairman, XPLANE "Search is swiftly transforming everything we know, yet people don't understand how mavens design search: by stacking breadcrumbs, scenting widgets, and keeping eyeballs on the engine. I urge you to put your eyeballs on this unique and important book." --Bruce Sterling, Writer, Futurist, and Co-Founder, The Electronic Frontier Foundation "As one who searches a lot (and often ends up frustrated), Search Patterns is a revelation." --Nigel Holmes, Designer, Theorist, and Principal, Explanation Graphics "Search Patterns is a fabulous must-have book! Inside, you'll learn the whys and wheres of practically every modern search design trick and technique." --Jared Spool, CEO and Founder, User Interface Engineering Search is among the most disruptive innovations of our time. It influences what we buy and where we go. It shapes how we learn and what we believe. In this provocative and inspiring book, you'll explore design patterns that apply across the categories of web, ecommerce, enterprise, desktop, mobile, social, and real-time search and discovery. Filled with colorful illustrations and examples, Search Patterns brings modern information retrieval to life, covering such diverse topics as relevance, faceted navigation, multi-touch, personalization, visualization, multi-sensory search, and augmented reality. By drawing on their own experience-as well as best practices and evidence-based research-the authors not only offer a practical guide to help you build effective search applications, they also challenge you to imagine the future of discovery. You'll find Search Patterns intriguing and invaluable, whether you're a web practitioner, mobile designer, search entrepreneur, or just interested in the topic. Discover a pattern language for search that embraces user psychology and behavior, information architecture, interaction design, and emerging technology Boost enterprise efficiency and e-commerce sales Enable mobile users to achieve goals, complete tasks, and find what they need Drive design innovation for search interfaces and applications*

*The tremendous growth in the availability of inexpensive computing power and easy availability of computers have generated tremendous interest in the design and imp- mentation of Complex Systems. Computer-based solutions offer great support in the design of Complex Systems. Furthermore, Complex Systems are becoming incre- ingly complex themselves. This research book comprises a selection of state-of-the-art contributions to topics dealing with Complex Systems in a Knowledge-based En- ronment. Complex systems are ubiquitous. Examples comprise, but are not limited to System of Systems, Service-oriented Approaches, Agent-based Systems, and Complex Distributed Virtual Systems. These are application domains that require knowledge of engineering and management methods and are beyond the scope of traditional systems. The chapters in this book deal with a selection of topics which range from unc- tainty representation, management and the use of ontological means which support and are large-scale business integration. All contributions were invited and are based on the recognition of the expertise of the contributing authors in the field. By colle- ing these sources together in one volume, the intention was to present a variety of tools to the reader to assist in both study and work. The second intention was to show how the different facets presented in the chapters are complementary and contribute towards this emerging discipline designed to aid in the analysis of complex systems.*

*This third volume of the best-selling "Data Model Resource Book" series revolutionizes the data modeling discipline by answering the question "How can you save significant time while improving the quality of any type of data modeling effort?" In contrast to the first two volumes, this new volume focuses on the fundamental, underlying patterns that affect over 50 percent of most data modeling efforts. These patterns can be used to considerably reduce modeling time and cost, to jump-start data modeling efforts, as standards and guidelines to increase data model consistency and quality, and as an objective source against which an enterprise can evaluate data models.*

*A Library of Universal Data Models by Industry Types*

*Design for Discovery*

*A Value-driven Approach to Business Intelligence and Data Warehousing*

*Master Data Management*

*Data Modeling Essentials*

*20th International Conference, Hong Kong, China, January 19–22, 2020, Proceedings*

Whether you're building a social media site or an internal-use enterprise application, this hands-on guide shows you the connection between MongoDB and the business problems it's designed to solve. You'll learn how to apply MongoDB design patterns to several challenging domains, such as ecommerce, content management, and online gaming. Using Python and JavaScript code examples, you'll discover how MongoDB lets you scale your data model while simplifying the development process. Many businesses launch NoSQL databases without understanding the techniques for using their features most effectively. This book demonstrates the benefits of document embedding, polymorphic schemas, and other MongoDB patterns for tackling specific big data use cases, including: Operational intelligence: Perform real-time analytics of business data Ecommerce: Use MongoDB as a product catalog master or inventory management system Content management: Learn methods for storing content nodes, binary assets, and discussions Online advertising networks: Apply techniques for frequency capping ad impressions, and keyword targeting and bidding Social networking: Learn how to store a complex social graph, modeled after Google+ Online gaming: Provide concurrent access to character and world data for a multiplayer role-playing game

Get expert guidance on architecting end-to-end data management solutions with Apache Hadoop. While many sources explain how to use various components in the Hadoop ecosystem, this practical book takes you through architectural considerations necessary to tie those components together into a complete tailored application, based on your particular use case. To reinforce those lessons, the book's second section provides detailed examples of architectures used in some of the most commonly found Hadoop applications. Whether you're designing a new Hadoop application, or planning to integrate Hadoop into your existing data infrastructure, Hadoop Application Architectures will skillfully guide you through the process. This book covers: Factors to consider when using Hadoop to store and model data Best practices for moving data in and out of the system Data processing frameworks, including MapReduce, Spark, and Hive Common Hadoop processing patterns, such as removing duplicate records and using windowing analytics Giraph, GraphX, and other tools for large graph processing on Hadoop Using workflow orchestration and scheduling tools such as Apache Oozie Near-real-time stream processing with Apache Storm, Apache Spark Streaming, and Apache Flume Architecture examples for clickstream analysis, fraud detection, and data warehousing

25 proven patterns for improving data access and application performance Efficient, high-quality data access code is crucial to the performance and usability of virtually any enterprise application--and there's no better way to improve an existing system than to optimize its data access code. Regardless of database engine, platform, language, or application, developers repeatedly encounter the same relational database access challenges. In Data Access Patterns, Clifton Nock identifies 25 proven solutions, presenting each one in the form of a clear, easy-to-use pattern. These patterns solve an exceptionally wide range of problems including creating efficient database-independent applications, hiding obscure database semantics from users, speeding database resource initialization, simplifying development and maintenance, improving support for concurrency and transactions, and eliminating data access bottlenecks. Every pattern is illustrated with fully commented Java/JDBC code examples, as well as UML diagrams representing interfaces, classes, and relationships. The patterns are organized into five categories: Decoupling Patterns: Build cleaner, more reliable systems by decoupling data access code from other application logic Resource Patterns: Manage relational database resources more efficiently Input/Output Patterns: Simplify I/O operations by translating consistently between "physical" relational data and domain object representations of that data Cache Patterns: Use caching strategically, to optimize the tradeoffs between data access optimization and cache overhead Concurrency Patterns: Implement concurrency and transactions more effectively and reliably Data Access Patterns demystifies techniques that have traditionally been used only in the most robust data access solutions--making those techniques practical for every software developer, architect, and designer.

This is the digital version of the printed book (Copyright © 1996). Learning the basics of a modeling technique is not the same as learning how to use and apply it. To develop a data model of an organization is to gain insights into its nature that do not come easily. Indeed, analysts are often expected to understand subtleties of an organization's structure that may have evaded people who have worked there for years. Here's help for those analysts who have learned the basics of data modeling (or "entity/relationship modeling") but who need to obtain the insights required to prepare a good model of a real business. Structures common to many types of business are analyzed in areas such as accounting, material requirements planning, process manufacturing, contracts, laboratories, and documents. In each chapter, high-level data models are drawn from the following business areas: The Enterprise and Its World The Things of the Enterprise Procedures and Activities Contracts Accounting The Laboratory Material Requirements Planning Process Manufacturing Documents Lower-Level Conventions

Data Modeling Essentials, Third Edition, covers the basics of data modeling while focusing on developing a facility in techniques, rather than a simple familiarization with "the rules". In order to enable students to apply the basics of data modeling to real models, the book addresses the realities of developing systems in real-world situations by assessing the merits of a variety of possible solutions as well as using language and diagramming methods that represent industry practice. This revised edition has been given significantly expanded coverage and reorganized for greater reader comprehension even as it retains its distinctive hallmarks of readability and usefulness. Beginning with the basics, the book provides a thorough grounding in theory before guiding the reader through the various stages of applied data modeling and database design. Later chapters address advanced subjects, including business rules, data warehousing, enterprise-wide modeling and data management. It includes an entirely new section discussing the development of logical and physical modeling, along with new material describing a powerful technique for model verification. It also provides an excellent resource for additional lectures and exercises. This text is the ideal reference for data modelers, data architects, database designers, DBAs, and systems analysts, as well as undergraduate and graduate-level students looking for a real-world perspective. Thorough coverage of the fundamentals and relevant theory. Recognition and support for the creative side of the process. Expanded coverage of applied data modeling includes new chapters on logical and physical database design. New material describing a powerful technique for model verification. Unique coverage of the practical and human aspects of modeling, such as working with business specialists, managing change, and resolving conflict.

A General Deconstruction of Metadata Standards

The Self-Service Data Roadmap

MongoDB Applied Design Patterns

The Data Model Resource Book, Volume 1

Data Model Storytelling

Describing the World

A quick and reliable way to build proven databases for core business functions Industry experts raved about The Data Model Resource Book when it was first published in March 1997 because it provided a simple, cost-effective way to design databases for core business functions. Len Silverston has now revised and updated the hugely successful 1st Edition, while adding a companion volume to take care of more specific requirements of different businesses. This updated volume provides a common set of data models for specific core functions shared by most businesses like human resources management, accounting, and project management. These models are standardized and are easily replicated by developers looking for ways to make corporate database development more efficient and cost effective. This guide is the perfect complement to The Data Model Resource CD-ROM, which is sold separately and provides the powerful design templates discussed in the book in a ready-to-use electronic format. A free demonstration CD-ROM is available with each copy of the print book to allow you to try before you buy the full CD-ROM.

Developing High Quality Data Models

Data Integration Best Practice Techniques and Technologies

Web Information Systems Engineering – WISE 2019

Delivering the Promise of Big Data and Data Science

Data Model Patterns

A Library of Universal Data Models for All Enterprises