

2ND EDITION

DATA

MODELING MADE SIMPLE

With ER/Studio® Data Architect



ADAPTING TO AGILE DATA MODELING
IN A BIG DATA WORLD

STEVE HOBBERMAN

Data Modeling Made Simple With Erstudio Data Architect

Gerro Prinsloo, Robert Dobson



Data Modeling Made Simple With Erstudio Data Architect:

Data Modeling Made Simple Steve Hoberman, 2013 This book provides the business or IT professional with a practical working knowledge of data modelling concepts and best practices along with how to apply these principles with ER Studio DA You will build many ER Studio DA data models along the way applying best practices to master these ten objectives You will know why a data model is needed and which ER Studio DA models are the most appropriate for each situation You will be able to read a data model of any size and complexity with the same confidence as reading a book You will know how to apply all the key features of ER Studio DA You will be able to build relational and dimensional conceptual logical and physical data models in ER Studio DA You will be able to apply techniques such as indexing transforms and forward engineering to turn a logical data model into an efficient physical design You will improve data model quality and impact analysis results by leveraging ER Studio DAs lineage functionality and compare merge utility You will achieve enterprise architecture through ER Studio DAs repository and portal functionality You will be able to apply ER Studio DAs data dictionary features You will learn ways of sharing the data model through reporting and through exporting the model in a variety of formats You will leverage ER Studio DAs naming functionality to improve naming consistency This book contains four sections Section I introduces data modelling and the ER Studio DA landscape Learn why data modelling is so critical to software development and even more importantly why data modelling is so critical to understanding the business You will also learn about the ER Studio DA environment By the end of this section you will have created and saved your first data model in ER Studio DA and be ready to start modelling in Section II Section II explains all of the symbols and text on a data model including entities attributes relationships domains and keys By the time you finish this section you will be able to read a data model of any size or complexity and create a complete data model in ER Studio DA Section III explores the three different levels of models conceptual logical and physical A conceptual data model CDM represents a business need within a defined scope The logical data model LDM represents a detailed business solution capturing the business requirements without complicating the model with implementation concerns such as software and hardware The physical data model PDM represents a detailed technical solution The PDM is the logical data model compromised often to improve performance or usability The PDM makes up for deficiencies in our technology By the end of this section you will be able to create conceptual logical and physical data models in ER Studio DA Section IV discusses additional features of ER Studio DA These features include data dictionary data lineage automating tasks repository and portal exporting and reporting naming standards and compare and merge functionality

[Data Modeling Made Simple with Embarcadero ER/Studio Data Architect](#) Steve Hoberman, 2015-10 Build a working knowledge of data modeling concepts and best practices along with how to apply these principles with ER Studio This second edition includes numerous updates and new sections including an overview of ER Studio s support for agile development as well as a description of some of ER Studio s newer features for NoSQL such as MongoDB s containment

structure You will build many ER Studio data models along the way applying best practices to master these ten objectives Know why a data model is needed and which ER Studio models are the most appropriate for each situation Understand each component on the data model and how to represent and create them in ER Studio Know how to leverage ER Studio s latest features including those assisting agile teams and forward and reverse engineering of NoSQL databases Know how to apply all the foundational features of ER Studio Be able to build relational and dimensional conceptual logical and physical data models in ER Studio Be able to apply techniques such as indexing transforms and forward engineering to turn a logical data model into an efficient physical design Improve data model quality and impact analysis results by leveraging ER Studio s lineage functionality and compare merge utility Be able to apply ER Studio s data dictionary features Learn ways of sharing the data model through reporting and through exporting the model in a variety of formats Leverage ER Studio s naming functionality to improve naming consistency including the new Automatic Naming Translation feature This book contains four sections Section I introduces data modeling and the ER Studio landscape Learn why data modeling is so critical to software development and even more importantly why data modeling is so critical to understanding the business You will learn about the newest features in ER Studio including features on big data and agile and the ER Studio environment By the end of this section you will have created and saved your first data model in ER Studio and be ready to start modeling in Section II Section II explains all of the symbols and text on a data model including entities attributes relationships domains and keys By the time you finish this section you will be able to read a data model of any size or complexity and create a complete data model in ER Studio Section III explores the three different levels of models conceptual logical and physical A conceptual data model CDM represents a business need within a defined scope The logical data model LDM represents a detailed business solution capturing the business requirements without complicating the model with implementation concerns such as software and hardware The physical data model PDM represents a detailed technical solution The PDM is the logical data model compromised often to improve performance or usability The PDM makes up for deficiencies in our technology By the end of this section you will be able to create conceptual logical and physical data models in ER Studio Section IV discusses additional features of ER Studio These features include data dictionary data lineage automating tasks repository and portal exporting and reporting naming standards and compare and merge functionality

Data Modeling Made Simple with ER/Studio Data Architect Steve Hoberman,2015 Build a working knowledge of data modeling concepts and best practices along with how to apply these principles with ER Studio This second edition includes numerous updates and new sections including an overview of ER Studio s support for agile development as well as a description of some of ER Studio s newer features for NoSQL such as MongoDB s containment structure You will build many ER Studio data models along the way applying best practices to master these ten objectives Know why a data model is needed and which ER Studio models are the most appropriate for each situation Understand each component on the data model and how to represent and create them in

ER Studio Know how to leverage ER Studio s latest features including those assisting agile teams and forward and reverse engineering of NoSQL databases Know how to apply all the foundational features of ER Studio Be able to build relational and dimensional conceptual logical and physical data models in ER Studio Be able to apply techniques such as indexing transforms and forward engineering to turn a logical data model into an efficient physical design Improve data model quality and impact analysis results by leveraging ER Studio s lineage functionality and compare merge utility Be able to apply ER Studio s data dictionary features Learn ways of sharing the data model through reporting and through exporting the model in a variety of formats Leverage ER Studio s naming functionality to improve naming consistency including the new Automatic Naming Translation feature This book contains four sections Section I introduces data modeling and the ER Studio landscape Learn why data modeling is so critical to software development and even more importantly why data modeling is so critical to understanding the business You will learn about the newest features in ER Studio including features on big data and agile and the ER Studio environment By the end of this section you will have created and saved your first data model in ER Studio and be ready to start modeling in Section II Section II explains all of the symbols and text on a data model including entities attributes relationships domains and keys By the time you finish this section you will be able to read a data model of any size or complexity and create a complete data model in ER Studio Section III explores the three different levels of models conceptual logical and physical A conceptual data model CDM *Technology Made Simple for the Technical Recruiter, Second Edition* Obi Ogbanufe,2019-04-27 If you re a technical recruiter who wants to keep your skills up to date in the competitive field of technical resource placement you need a detailed guidebook to outpace competitors This technical skills primer focuses on technology fundamentals from basic programming terms to big data vocabulary network lingo operating system jargon and other crucial skill sets Topics covered include sample questions to ask candidates types of networks and operating systems software development strategies cloud systems administration and DevOps data science and database job roles and information security job roles Armed with indispensable information the alphabet soup of technology acronyms will no longer be intimidating and you will be able to analyze client and candidate requirements with confidence Written in clear and concise prose *Technology Made Simple for the Technical Recruiter* is an invaluable resource for any technical recruiter

Data Modeling for MongoDB Steve Hoberman,2014-06-01 Congratulations You completed the MongoDB application within the given tight timeframe and there is a party to celebrate your application s release into production Although people are congratulating you at the celebration you are feeling some uneasiness inside To complete the project on time required making a lot of assumptions about the data such as what terms meant and how calculations are derived In addition the poor documentation about the application will be of limited use to the support team and not investigating all of the inherent rules in the data may eventually lead to poorly performing structures in the not so distant future Now what if you had a time machine and could go back and read this book You would learn that even NoSQL databases like MongoDB require some level

of data modeling Data modeling is the process of learning about the data and regardless of technology this process must be performed for a successful application You would learn the value of conceptual logical and physical data modeling and how each stage increases our knowledge of the data and reduces assumptions and poor design decisions Read this book to learn how to do data modeling for MongoDB applications and accomplish these five objectives Understand how data modeling contributes to the process of learning about the data and is therefore a required technique even when the resulting database is not relational That is NoSQL does not mean NoDataModeling Know how NoSQL databases differ from traditional relational databases and where MongoDB fits Explore each MongoDB object and comprehend how each compares to their data modeling and traditional relational database counterparts and learn the basics of adding querying updating and deleting data in MongoDB Practice a streamlined template driven approach to performing conceptual logical and physical data modeling Recognize that data modeling does not always have to lead to traditional data models Distinguish top down from bottom up development approaches and complete a top down case study which ties all of the modeling techniques together This book is written for anyone who is working with or will be working with MongoDB including business analysts data modelers database administrators developers project managers and data scientists There are three sections In Section I Getting Started we will reveal the power of data modeling and the tight connections to data models that exist when designing any type of database Chapter 1 compare NoSQL with traditional relational databases and where MongoDB fits Chapter 2 explore each MongoDB object and comprehend how each compares to their data modeling and traditional relational database counterparts Chapter 3 and explain the basics of adding querying updating and deleting data in MongoDB Chapter 4 In Section II Levels of Granularity we cover Conceptual Data Modeling Chapter 5 Logical Data Modeling Chapter 6 and Physical Data Modeling Chapter 7 Notice the ing at the end of each of these chapters We focus on the process of building each of these models which is where we gain essential business knowledge In Section III Case Study we will explain both top down and bottom up development approaches and go through a top down case study where we start with business requirements and end with the MongoDB database This case study will tie together all of the techniques in the previous seven chapters Nike Senior Data Architect Ryan Smith wrote the foreword Key points are included at the end of each chapter as a way to reinforce concepts In addition this book is loaded with hands on exercises along with their answers provided in Appendix A Appendix B contains all of the book s references and Appendix C contains a glossary of the terms used throughout the text **DAMA-DMBOK.**

Свод знаний по управлению данными Коллектив авторов, 2020-11-16 DAMA DMBOK **DAMA-DMBOK: Guía Del Conocimiento Para La Gestión De Datos (Spanish Edition)** DAMA International, La Guía del Conocimiento para la Gestión de Datos DAMA DMBOK2 presenta una visión exhaustiva de los desafíos complejidades y valor de la gestión eficaz de los datos Las organizaciones de hoy en día reconocen que la gestión de los datos es fundamental para su éxito Reconocen que los datos tienen valor y quieren aprovechar ese valor A medida que nuestra capacidad y deseo de crear y explotar datos ha

aumentado también lo ha hecho la necesidad de prácticas de gestión de datos confiables La segunda edición de la Guía del Conocimiento para la Gestión de Datos de DAMA International actualiza y aumenta el exitoso DMBOK1 DMBOK2 un libro de referencia accesible y autorizado escrito por los principales pensadores en el campo y ampliamente revisado por los miembros de DAMA reúne materiales que describen exhaustivamente los desafíos de la gestión de datos y cómo cumplirlos mediante Definir un conjunto de principios rectores para la gestión de datos y describir cómo se pueden aplicar estos principios dentro de las áreas funcionales de gestión de datos Proporcionar un marco de referencia funcional para la implementación de prácticas de gestión de datos empresariales incluyendo prácticas métodos y técnicas ampliamente adoptadas funciones roles entregables y métricas Establecer un vocabulario común para los conceptos de gestión de datos y servir de base para las mejores prácticas para los profesionales de la gestión de datos DAMA DMBOK2 proporciona a los profesionales de la gestión de datos y de TI a ejecutivos trabajadores del conocimiento educadores e investigadores un marco para gestionar sus datos y madurar su infraestructura de información basado en estos principios Los datos son un activo con propiedades únicas El valor de los datos puede y debe expresarse en términos económicos Gestionar los datos significa gestionar la calidad de los datos Se necesitan metadatos para gestionar los datos Se necesita planificación para gestionar los datos La gestión de datos es multifuncional y requiere una amplia gama de habilidades y experiencia La gestión de datos requiere una perspectiva empresarial La gestión de datos debe tener en cuenta una serie de perspectivas La gestión de datos es la gestión del ciclo de vida de los datos Los diferentes tipos de datos tienen diferentes requerimientos de ciclo de vida La gestión de datos incluye la gestión de los riesgos asociados a los datos Los requerimientos de gestión de datos deben impulsar las decisiones sobre tecnología de la información Una gestión eficaz de los datos requiere un compromiso de liderazgo Los capítulos incluyen Gestión de Datos Manejo técnico de los Datos Gobierno de Datos Arquitectura de Datos Modelado y Diseño de Datos Almacenamiento de Datos y Operaciones Seguridad de Datos Integración de Datos e Interoperabilidad Gestión de Documentos y Contenidos Datos Maestros y de Referencia Data Warehousing e Inteligencia de Negocios Gestión de Metadatos Calidad de Datos Big Data y Ciencia de Datos Evaluación de la Madurez de la Gestión de Datos Organización de la Gestión de Datos y Expectativas de Roles Gestión de Datos y Gestión del Cambio Organizacional La estandarización de las disciplinas de gestión de datos ayudar a los profesionales de la gestión de datos a desempeñarse de forma más eficaz y consistente También permitir a los líderes de la organización reconocer el valor y las contribuciones de las actividades de gestión de datos

Advanced ER/Studio Techniques (Recorded Live at Data Modeling Zone US) Bob Conway, 2020
Recorded live at Data Modeling Zone Follow along with data modeling and ER Studio expert Bob Conway and learn advanced data modeling techniques using IDERA's ER Studio Data Architect ERSDA IDERA's ER Studio Data Architect ERSDA is a powerful desktop tool for building and maintaining logical and physical data models This presentation demonstration is targeted to current ERSDA users already familiar with features such as reverse engineering existing databases constructing

logical models forward engineering to physical models and generating DDL The presentation will touch on these and other features to illustrate some of the more subtle capabilities that can enhance and extend your model management best practices Topics covered include Reverse Engineering with Inferred Keys and Inferred Relationships Enterprise Data Dictionary for non Repository Team Server users Business Data Objects BDOs for Conceptual Logical Modeling in same DM1 file Using Compare Merge for global changes such as NULLs and Datatypes Macros to automate model maintenance The last few minutes will be open discussion with participants to shared questions challenges and special work arounds with ERSDA

Sun Tracking and Solar Renewable Energy Harvesting Gerro Prinsloo, Robert Dobson, 2015-11-02 Free to download eBook on Practical Solar Tracking Design Solar Tracking Sun Tracking Sun Tracker Solar Tracker Follow Sun Sun Position calculation Azimuth Elevation Zenith Sun following Sunrise Sunset Moon phase Moonrise Moonset calculators In harnessing power from the sun through a solar tracker or solar tracking system renewable energy system developers require automatic solar tracking software and solar position algorithms On axis sun tracking system such as the altitude azimuth dual axis or multi axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun's passage through the sky is traced with high precision in automated solar tracker applications right through summer solstice solar equinox and winter solstice Eco Friendly and Environmentally Sustainable Micro Combined Solar Heat and Power mCHP mCCHP mCHCP with Microgrid Storage and Layered Smartgrid Control towards Supplying Off Grid Rural Villages in developing BRICS countries such as Africa India China and Brazil Off grid rural villages and isolated islands areas require mCHP and trigeneration solar power plants and associated isolated smart microgrid solutions to serve the community energy needs This article describes the development progress for such a system also referred to as solar polygeneration The system includes a sun tracker mechanism wherein a parabolic dish or lenses are guided by a light sensitive mechanism in a way that the solar receiver is always at right angle to the solar radiation Solar thermal energy is then either converted into electrical energy through a free piston Stirling or stored in a thermal storage container The project includes the thermodynamic modeling of the plant in Matlab Simulink as well as the development of an intelligent control approach that includes smart microgrid distribution and optimization The book includes aspects in the simulation and optimization of stand alone hybrid renewable energy systems and co generation in isolated or islanded microgrids It focusses on the stepwise development of a hybrid solar driven micro combined cooling heating and power mCCHP compact trigeneration polygeneration and thermal energy storage TES system with intelligent weather prediction weak ahead scheduling time horizon and look ahead dispatch on integrated smart microgrid distribution principles The solar harvesting and solar thermodynamic system includes an automatic sun tracking platform based on a PLC controlled mechatronic sun tracking system that follows the sun progressing across the sky An intelligent energy management and adaptive learning control optimization approach is proposed for autonomous off grid remote power applications both for thermodynamic optimization and smart micro grid optimization for

distributed energy resources DER The correct resolution of this load following multi objective optimization problem is a complex task because of the high number and multi dimensional variables the cross correlation and interdependency between the energy streams as well as the non linearity in the performance of some of the system components Exergy based control approaches for smartgrid topologies are considered in terms of the intelligence behind the safe and reliable operation of a microgrid in an automated system that can manage energy flow in electrical as well as thermal energy systems The standalone micro grid solution would be suitable for a rural village intelligent building district energy system campus power shopping mall centre isolated network eco estate or remote island application setting where self generation and decentralized energy system concepts play a role Discrete digital simulation models for the thermodynamic and active demand side management systems with digital smartgrid control unit to optimize the system energy management is currently under development Parametric simulation models for this trigeneration system polygeneration poligeneration quadgeneration are developed on the Matlab Simulink and TrnSys platforms In terms of model predictive coding strategies the automation controller will perform multi objective cost optimization for energy management on a microgrid level by managing the generation and storage of electrical heat and cooling energies in layers Each layer has its own set of smart microgrid priorities associated with user demand side cycle predictions Mixed Integer Linear Programming and Neural network algorithms are being modeled to perform Multi Objective Control optimization as potential optimization and adaptive learning techniques

Practical Solar Tracking Automatic Solar Tracking Sun Tracking Автоматическое удержание Солнечная слежения ВС Gerro Prinsloo,Robert Dobson,2015-11-01 This book details Practical Solar Energy Harvesting Automatic Solar Tracking Sun Tracking Systems Solar Trackers and Sun Tracker Systems using motorized automatic positioning concepts and control principles An intelligent automatic solar tracker is a device that orients a payload toward the sun Such programmable computer based solar tracking device includes principles of solar tracking solar tracking systems as well as microcontroller microprocessor and or PC based solar tracking control to orientate solar reflectors solar lenses photovoltaic panels or other optical configurations towards the sun Motorized space frames and kinematic systems ensure motion dynamics and employ drive technology and gearing principles to steer optical configurations such as mangin parabolic conic or cassegrain solar energy collectors to face the sun and follow the sun movement contour continuously In general the book may benefit solar research and solar energy applications in countries such as Africa Mediterranean Italy Spain Greece USA Mexico South America Brazilia Argentina Chili India Malaysia Middle East UAE Russia Japan and China This book on practical automatic Solar Tracking Sun Tracking is in PDF format and can easily be converted to the EPUB MOBI AZW ePub FB2 LIT LRF MOBI PDB PDF TCR formats for smartphones and Kindle by using the ebook online convert com facility The content of the book is also applicable to communication antenna satellite tracking and moon tracking algorithm source code for which links to free download links are provided In harnessing power

from the sun through a solar tracker or practical solar tracking system renewable energy control automation systems require automatic solar tracking software and solar position algorithms to accomplish dynamic motion control with control automation architecture circuit boards and hardware On axis sun tracking system such as the altitude azimuth dual axis or multi axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun's passage through the sky is traced with high precision in automated solar tracker applications right through summer solstice solar equinox and winter solstice A high precision sun position calculator or sun position algorithm is this an important step in the design and construction of an automatic solar tracking system From sun tracing software perspective the sonnet Tracing The Sun has a literal meaning Within the context of sun track and trace this book explains that the sun's daily path across the sky is directed by relatively simple principles and if grasped understood then it is relatively easy to trace the sun with sun following software Sun position computer software for tracing the sun are available as open source code sources that is listed in this book Ironically there was even a system called sun chaser said to have been a solar positioner system known for chasing the sun throughout the day Using solar equations in an electronic circuit for automatic solar tracking is quite simple even if you are a novice but mathematical solar equations are over complicated by academic experts and professors in text books journal articles and internet websites In terms of solar hobbies scholars students and Hobbyists looking at solar tracking electronics or PC programs for solar tracking are usually overcome by the sheer volume of scientific material and internet resources which leaves many developers in frustration when search for simple experimental solar tracking source code for their on axis sun tracking systems This booklet will simplify the search for the mystical sun tracking formulas for your sun tracker innovation and help you develop your own autonomous solar tracking controller By directing the solar collector directly into the sun a solar harvesting means or device can harness sunlight or thermal heat This is achieved with the help of sun angle formulas solar angle formulas or solar tracking procedures for the calculation of sun's position in the sky Automatic sun tracking system software includes algorithms for solar altitude azimuth angle calculations required in following the sun across the sky In using the longitude latitude GPS coordinates of the solar tracker location these sun tracking software tools supports precision solar tracking by determining the solar altitude azimuth coordinates for the sun trajectory in altitude azimuth tracking at the tracker location using certain sun angle formulas in sun vector calculations Instead of follow the sun software a sun tracking sensor such as a sun sensor or webcam or video camera with vision based sun following image processing software can also be used to determine the position of the sun optically Such optical feedback devices are often used in solar panel tracking systems and dish tracking systems Dynamic sun tracing is also used in solar surveying DNI analyser and sun surveying systems that build solar infographics maps with solar radiance irradiance and DNI models for GIS geographical information system In this way geospatial methods on solar environment interaction makes use use of geospatial technologies GIS Remote Sensing and Cartography Climatic data and weather station or weather

center data as well as queries from sky servers and solar resource database systems i.e. on DB2 Sybase Oracle SQL MySQL may also be associated with solar GIS maps In such solar resource modelling systems a pyranometer or solarimeter is normally used in addition to measure direct and indirect scattered dispersed reflective radiation for a particular geographical location Sunlight analysis is important in flash photography where photographic lighting are important for photographers GIS systems are used by architects who add sun shadow applets to study architectural shading or sun shadow analysis solar flux calculations optical modelling or to perform weather modelling Such systems often employ a computer operated telescope type mechanism with ray tracing program software as a solar navigator or sun tracer that determines the solar position and intensity The purpose of this booklet is to assist developers to track and trace suitable source code and solar tracking algorithms for their application whether a hobbyist scientist technician or engineer Many open source sun following and tracking algorithms and source code for solar tracking programs and modules are freely available to download on the internet today Certain proprietary solar tracker kits and solar tracking controllers include a software development kit SDK for its application programming interface API attributes Pebble Widget libraries widget toolkits GUI toolkit and UX libraries with graphical control elements are also available to construct the graphical user interface GUI for your solar tracking or solar power monitoring program The solar library used by solar position calculators solar simulation software and solar contour calculators include machine program code for the solar hardware controller which are software programmed into Micro controllers Programmable Logic Controllers PLC programmable gate arrays Arduino processor or PIC processor PC based solar tracking is also high in demand using C Visual Basic VB as well as MS Windows Linux and Apple Mac based operating systems for sun path tables on Matlab Excel Some books and internet webpages use other terms such as sun angle calculator sun position calculator or solar angle calculator As said such software code calculate the solar azimuth angle solar altitude angle solar elevation angle or the solar Zenith angle Zenith solar angle is simply referenced from vertical plane the mirror of the elevation angle measured from the horizontal or ground plane level Similar software code is also used in solar calculator apps or the solar power calculator apps for IOS and Android smartphone devices Most of these smartphone solar mobile apps show the sun path and sun angles for any location and date over a 24 hour period Some smartphones include augmented reality features in which you can physically see and look at the solar path through your cell phone camera or mobile phone camera at your phone's specific GPS location In the computer programming and digital signal processing DSP environment free open source program code are available for VB Net Delphi Python C C C PHP Swift ADM F Flash Basic QBasic GBasic KBasic SIMPL language Squirrel Solaris Assembly language on operating systems such as MS Windows Apple Mac DOS or Linux OS Software algorithms predicting position of the sun in the sky are commonly available as graphical programming platforms such as Matlab Mathworks Simulink models Java applets TRNSYS simulations Scada system apps Labview module Beckhoff TwinCAT Visual Studio Siemens SPA mobile and iphone apps Android or iOS tablet apps and so

forth At the same time PLC software code for a range of sun tracking automation technology can follow the profile of sun in sky for Siemens HP Panasonic ABB Allan Bradley OMRON SEW Festo Beckhoff Rockwell Schneider Endress Hauser Fuji electric Honeywell Fuchs Yokonawa or Mitsubishi platforms Sun path projection software are also available for a range of modular IPC embedded PC motherboards Industrial PC PLC Programmable Logic Controller and PAC Programmable Automation Controller such as the Siemens S7 1200 or Siemens Logo Beckhoff IPC or CX series OMRON PLC Ercam PLC AC500plc ABB National Instruments NI PXI or NI cRIO PIC processor Intel 8051 8085 IBM Cell Power Brain or Truenorth series FPGA Xilinx Altera Nios Intel Xeon Atmel megaAVR MPU Maple Teensy MSP X MOS Xbee ARM Raspberry Pi Eagle Arduino or Arduino AtMega microcontroller with servo motor stepper motor direct current DC pulse width modulation PWM current driver or alternating current AC SPS or IPC variable frequency drives VFD motor drives also termed adjustable frequency drive variable speed drive AC drive micro drive or inverter drive for electrical mechatronic pneumatic or hydraulic solar tracking actuators The above motion control and robot control systems include analogue or digital interfacing ports on the processors to allow for tracker angle orientation feedback control through one or a combination of angle sensor or angle encoder shaft encoder precision encoder optical encoder magnetic encoder direction encoder rotational encoder chip encoder tilt sensor inclination sensor or pitch sensor Note that the tracker s elevation or zenith axis angle may be measured using an altitude angle declination angle inclination angle pitch angle or vertical angle zenith angle sensor or inclinometer Similarly the tracker s azimuth axis angle may be measured with a azimuth angle horizontal angle or roll angle sensor Chip integrated accelerometer magnetometer gyroscope type angle sensors can also be used to calculate displacement Other options include the use of thermal imaging systems such as a Fluke thermal imager or robotic or vision based solar tracker systems that employ face tracking head tracking hand tracking eye tracking and car tracking principles in solar tracking With unattended decentralised rural island isolated or autonomous off grid power installations remote control monitoring data acquisition digital datalogging and online measurement and verification equipment becomes crucial It assists the operator with supervisory control to monitor the efficiency of remote renewable energy resources and systems and provide valuable web based feedback in terms of CO₂ and clean development mechanism CDM reporting A power quality analyser for diagnostics through internet WiFi and cellular mobile links is most valuable in frontline troubleshooting and predictive maintenance where quick diagnostic analysis is required to detect and prevent power quality issues Solar tracker applications cover a wide spectrum of solar applications and solar assisted application including concentrated solar power generation solar desalination solar water purification solar steam generation solar electricity generation solar industrial process heat solar thermal heat storage solar food dryers solar water pumping hydrogen production from methane or producing hydrogen and oxygen from water HHO through electrolysis Many patented or non patented solar apparatus include tracking in solar apparatus for solar electric generator solar desalinator solar steam engine solar ice maker solar

water purifier solar cooling solar refrigeration USB solar charger solar phone charging portable solar charging tracker solar coffee brewing solar cooking or solar drying means Your project may be the next breakthrough or patent but your invention is held back by frustration in search for the sun tracker you require for your solar powered appliance solar generator solar tracker robot solar freezer solar cooker solar drier solar pump solar freezer or solar dryer project Whether your solar electronic circuit diagram include a simplified solar controller design in a solar electricity project solar power kit solar hobby kit solar steam generator solar hot water system solar ice maker solar desalinator hobbyist solar panels hobby robot or if you are developing professional or hobby electronics for a solar utility or micro scale solar powerplant for your own solar farm or solar farming this publication may help accelerate the development of your solar tracking innovation Lately solar polygeneration solar trigeneration solar triple generation and solar quad generation adding delivery of steam liquid gaseous fuel or capture food grade CO₂ systems have need for automatic solar tracking These systems are known for significant efficiency increases in energy yield as a result of the integration and re use of waste or residual heat and are suitable for compact packaged micro solar powerplants that could be manufactured and transported in kit form and operate on a plug and play basis Typical hybrid solar power systems include compact or packaged solar micro combined heat and power CHP or mCHP or solar micro combined cooling heating and power CCHP CHPC mCCHP or mCHPC systems used in distributed power generation These systems are often combined in concentrated solar CSP and CPV smart microgrid configurations for off grid rural island or isolated microgrid minigrid and distributed power renewable energy systems Solar tracking algorithms are also used in modelling of trigeneration systems using Matlab Simulink Modelica or TRNSYS platform as well as in automation and control of renewable energy systems through intelligent parsing multi objective adaptive learning control and control optimization strategies Solar tracking algorithms also find application in developing solar models for country or location specific solar studies for example in terms of measuring or analysis of the fluctuations of the solar radiation i.e direct and diffuse radiation in a particular area Solar DNI solar irradiance and atmospheric information and models can thus be integrated into a solar map solar atlas or geographical information systems GIS Such models allows for defining local parameters for specific regions that may be valuable in terms of the evaluation of different solar in photovoltaic of CSP systems on simulation and synthesis platforms such as Matlab and Simulink or in linear or multi objective optimization algorithm platforms such as COMPOSE EnergyPLAN or DER CAM A dual axis solar tracker and single axis solar tracker may use a sun tracker program or sun tracker algorithm to position a solar dish solar panel array heliostat array PV panel solar antenna or infrared solar nan antenna A self tracking solar concentrator performs automatic solar tracking by computing the solar vector Solar position algorithms TwinCAT SPA or PSA Algorithms use an astronomical algorithm to calculate the position of the sun It uses astronomical software algorithms and equations for solar tracking in the calculation of sun's position in the sky for each location on the earth at any time of day Like an optical solar telescope the solar position

algorithm pin points the solar reflector at the sun and locks onto the sun's position to track the sun across the sky as the sun progresses throughout the day Optical sensors such as photodiodes light dependant resistors LDR or photoresistors are used as optical accuracy feedback devices Lately we also included a section in the book with links to microprocessor code on how the PixArt Wii infrared camera in the Wii remote or Wiimote may be used in infrared solar tracking applications In order to harvest free energy from the sun some automatic solar positioning systems use an optical means to direct the solar tracking device These solar tracking strategies use optical tracking techniques such as a sun sensor means to direct sun rays onto a silicon or CMOS substrate to determine the X and Y coordinates of the sun's position In a solar mems sun sensor device incident sunlight enters the sun sensor through a small pin hole in a mask plate where light is exposed to a silicon substrate In a web camera or camera image processing sun tracking and sun following means object tracking software performs multi object tracking or moving object tracking methods In an solar object tracking technique image processing software performs mathematical processing to box the outline of the apparent solar disc or sun blob within the captured image frame while sun localization is performed with an edge detection algorithm to determine the solar vector coordinates An automated positioning system help maximize the yields of solar power plants through solar tracking control to harness sun's energy In such renewable energy systems the solar panel positioning system uses a sun tracking techniques and a solar angle calculator in positioning PV panels in photovoltaic systems and concentrated photovoltaic CPV systems Automatic on axis solar tracking in a PV solar tracking system can be dual axis sun tracking or single axis sun solar tracking It is known that a motorized positioning system in a photovoltaic panel tracker increase energy yield and ensures increased power output even in a single axis solar tracking configuration Other applications such as robotic solar tracker or robotic solar tracking system uses robotica with artificial intelligence in the control optimization of energy yield in solar harvesting through a robotic tracking system Automatic positioning systems in solar tracking designs are also used in other free energy generators such as concentrated solar thermal power CSP and dish Stirling systems The sun tracking device in a solar collector in a solar concentrator or solar collector Such a performs on axis solar tracking a dual axis solar tracker assists to harness energy from the sun through an optical solar collector which can be a parabolic mirror parabolic reflector Fresnel lens or mirror array matrix A parabolic dish or reflector is dynamically steered using a transmission system or solar tracking slew drive mean In steering the dish to face the sun the power dish actuator and actuation means in a parabolic dish system optically focusses the sun's energy on the focal point of a parabolic dish or solar concentrating means A Stirling engine solar heat pipe thermosyphin solar phase change material PCM receiver or a fibre optic sunlight receiver means is located at the focal point of the solar concentrator The dish Stirling engine configuration is referred to as a dish Stirling system or Stirling power generation system Hybrid solar power systems used in combination with biogas biofuel petrol ethanol diesel natural gas or PNG use a combination of power sources to harness and store solar energy in a storage medium Any multitude of energy

sources can be combined through the use of controllers and the energy stored in batteries phase change material thermal heat storage and in cogeneration form converted to the required power using thermodynamic cycles organic Rankin Brayton cycle micro turbine Stirling with an inverter and charge controller Solar Tracking Tracking Systems Solar Tracker Systems Tracker PC Automatic Solar Tracking Sun Tracking Satellite Tracking rastreador solar seguimiento solar seguidor solar automático de seguimiento solar Gerro Prinsloo, Robert Dobson, 2015-11-01 Automatic Solar Tracking Sun Tracking This book details Automatic Solar Tracking Sun Tracking Systems Solar Trackers and Sun Tracker Systems An intelligent automatic solar tracker is a device that orients a payload toward the sun Such programmable computer based solar tracking device includes principles of solar tracking solar tracking systems as well as microcontroller microprocessor and or PC based solar tracking control to orientate solar reflectors solar lenses photovoltaic panels or other optical configurations towards the sun Motorized space frames and kinematic systems ensure motion dynamics and employ drive technology and gearing principles to steer optical configurations such as mangin parabolic conic or cassegrain solar energy collectors to face the sun and follow the sun movement contour continuously seguimiento solar y automatizaci n automatizaci n seguidor solar tracking solar e automa o automa o seguidor solar inseguimento solare inseguitore solare energia termica sole seguito posizionatore motorizzato In harnessing power from the sun through a solar tracker or practical solar tracking system renewable energy control automation systems require automatic solar tracking software and solar position algorithms to accomplish dynamic motion control with control automation architecture circuit boards and hardware On axis sun tracking system such as the altitude azimuth dual axis or multi axis solar tracker systems use a sun tracking algorithm or ray tracing sensors or software to ensure the sun s passage through the sky is traced with high precision in automated solar tracker applications right through summer solstice solar equinox and winter solstice A high precision sun position calculator or sun position algorithm is this an important step in the design and construction of an automatic solar tracking system The content of the book is also applicable to communication antenna satellite tracking and moon tracking algorithm source code for which links to free download links are provided From sun tracing software perspective the sonnet Tracing The Sun has a literal meaning Within the context of sun track and trace this book explains that the sun s daily path across the sky is directed by relatively simple principles and if grasped understood then it is relatively easy to trace the sun with sun following software Sun position computer software for tracing the sun are available as open source code sources that is listed in this book The book also describes the use of satellite tracking software and mechanisms in solar tracking applications Ironically there was even a system called sun chaser said to have been a solar positioner system known for chasing the sun throughout the day Using solar equations in an electronic circuit for automatic solar tracking is quite simple even if you are a novice but mathematical solar equations are over complicated by academic experts and professors in text books journal articles and internet websites In terms of solar hobbies scholars students and Hobbyist s looking at solar tracking electronics or PC programs for solar

tracking are usually overcome by the sheer volume of scientific material and internet resources which leaves many developers in frustration when search for simple experimental solar tracking source code for their on axis sun tracking systems This booklet will simplify the search for the mystical sun tracking formulas for your sun tracker innovation and help you develop your own autonomous solar tracking controller By directing the solar collector directly into the sun a solar harvesting means or device can harness sunlight or thermal heat This is achieved with the help of sun angle formulas solar angle formulas or solar tracking procedures for the calculation of sun s position in the sky Automatic sun tracking system software includes algorithms for solar altitude azimuth angle calculations required in following the sun across the sky In using the longitude latitude GPS coordinates of the solar tracker location these sun tracking software tools supports precision solar tracking by determining the solar altitude azimuth coordinates for the sun trajectory in altitude azimuth tracking at the tracker location using certain sun angle formulas in sun vector calculations Instead of follow the sun software a sun tracking sensor such as a sun sensor or webcam or video camera with vision based sun following image processing software can also be used to determine the position of the sun optically Such optical feedback devices are often used in solar panel tracking systems and dish tracking systems Dynamic sun tracing is also used in solar surveying DNI analyser and sun surveying systems that build solar infographics maps with solar radiance irradiance and DNI models for GIS geographical information system In this way geospatial methods on solar environment interaction makes use use of geospatial technologies GIS Remote Sensing and Cartography Climatic data and weather station or weather center data as well as queries from sky servers and solar resource database systems i e on DB2 Sybase Oracle SQL MySQL may also be associated with solar GIS maps In such solar resource modelling systems a pyranometer or solarimeter is normally used in addition to measure direct and indirect scattered dispersed reflective radiation for a particular geographical location Sunlight analysis is important in flash photography where photographic lighting are important for photographers GIS systems are used by architects who add sun shadow applets to study architectural shading or sun shadow analysis solar flux calculations optical modelling or to perform weather modelling Such systems often employ a computer operated telescope type mechanism with ray tracing program software as a solar navigator or sun tracer that determines the solar position and intensity The purpose of this booklet is to assist developers to track and trace suitable source code and solar tracking algorithms for their application whether a hobbyist scientist technician or engineer Many open source sun following and tracking algorithms and source code for solar tracking programs and modules are freely available to download on the internet today Certain proprietary solar tracker kits and solar tracking controllers include a software development kit SDK for its application programming interface API attributes Pebble Widget libraries widget toolkits GUI toolkit and UX libraries with graphical control elements are also available to construct the graphical user interface GUI for your solar tracking or solar power monitoring program The solar library used by solar position calculators solar simulation software and solar contour calculators include machine program

code for the solar hardware controller which are software programmed into Micro controllers Programmable Logic Controllers PLC programmable gate arrays Arduino processor or PIC processor PC based solar tracking is also high in demand using C Visual Basic VB as well as MS Windows Linux and Apple Mac based operating systems for sun path tables on Matlab Excel Some books and internet webpages use other terms such as sun angle calculator sun position calculator or solar angle calculator As said such software code calculate the solar azimuth angle solar altitude angle solar elevation angle or the solar Zenith angle Zenith solar angle is simply referenced from vertical plane the mirror of the elevation angle measured from the horizontal or ground plane level Similar software code is also used in solar calculator apps or the solar power calculator apps for IOS and Android smartphone devices Most of these smartphone solar mobile apps show the sun path and sun angles for any location and date over a 24 hour period Some smartphones include augmented reality features in which you can physically see and look at the solar path through your cell phone camera or mobile phone camera at your phone s specific GPS location In the computer programming and digital signal processing DSP environment free open source program code are available for VB Net Delphi Python C C C PHP Swift ADM F Flash Basic QBasic GBasic KBasic SIMPL language Squirrel Solaris Assembly language on operating systems such as MS Windows Apple Mac DOS or Linux OS Software algorithms predicting position of the sun in the sky are commonly available as graphical programming platforms such as Matlab Mathworks Simulink models Java applets TRNSYS simulations Scada system apps Labview module Beckhoff TwinCAT Visual Studio Siemens SPA mobile and iphone apps Android or iOS tablet apps and so forth At the same time PLC software code for a range of sun tracking automation technology can follow the profile of sun in sky for Siemens HP Panasonic ABB Allan Bradley OMRON SEW Festo Beckhoff Rockwell Schneider Endress Hauser Fudji electric Honeywell Fuchs Yokonawa or Muthibishi platforms Sun path projection software are also available for a range of modular IPC embedded PC motherboards Industrial PC PLC Programmable Logic Controller and PAC Programmable Automation Controller such as the Siemens S7 1200 or Siemens Logo Beckhoff IPC or CX series OMRON PLC Ercam PLC AC500plc ABB National Instruments NI PXI or NI cRIO PIC processor Intel 8051 8085 IBM Cell Power Brain or Truenorth series FPGA Xilinx Altera Nios Intel Xeon Atmel megaAVR MPU Maple Teensy MSP X MOS Xbee ARM Raspberry Pi Eagle Arduino or Arduino AtMega microcontroller with servo motor stepper motor direct current DC pulse width modulation PWM current driver or alternating current AC SPS or IPC variable frequency drives VFD motor drives also termed adjustable frequency drive variable speed drive AC drive micro drive or inverter drive for electrical mechatronic pneumatic or hydraulic solar tracking actuators The above motion control and robot control systems include analogue or digital interfacing ports on the processors to allow for tracker angle orientation feedback control through one or a combination of angle sensor or angle encoder shaft encoder precision encoder optical encoder magnetic encoder direction encoder rotational encoder chip encoder tilt sensor inclination sensor or pitch sensor Note that the tracker s elevation or zenith axis angle may measured

using an altitude angle declination angle inclination angle pitch angle or vertical angle zenith angle sensor or inclinometer Similarly the tracker's azimuth axis angle be measured with a azimuth angle horizontal angle or roll angle sensor Chip integrated accelerometer magnetometer gyroscope type angle sensors can also be used to calculate displacement Other options include the use of thermal imaging systems such as a Fluke thermal imager or robotic or vision based solar tracker systems that employ face tracking head tracking hand tracking eye tracking and car tracking principles in solar tracking With unattended decentralised rural island isolated or autonomous off grid power installations remote control monitoring data acquisition digital datalogging and online measurement and verification equipment becomes crucial It assists the operator with supervisory control to monitor the efficiency of remote renewable energy resources and systems and provide valuable web based feedback in terms of CO₂ and clean development mechanism CDM reporting A power quality analyser for diagnostics through internet WiFi and cellular mobile links is most valuable in frontline troubleshooting and predictive maintenance where quick diagnostic analysis is required to detect and prevent power quality issues Solar tracker applications cover a wide spectrum of solar applications and solar assisted application including concentrated solar power generation solar desalination solar water purification solar steam generation solar electricity generation solar industrial process heat solar thermal heat storage solar food dryers solar water pumping hydrogen production from methane or producing hydrogen and oxygen from water HHO through electrolysis Many patented or non patented solar apparatus include tracking in solar apparatus for solar electric generator solar desalinator solar steam engine solar ice maker solar water purifier solar cooling solar refrigeration USB solar charger solar phone charging portable solar charging tracker solar coffee brewing solar cooking or solar drying means Your project may be the next breakthrough or patent but your invention is held back by frustration in search for the sun tracker you require for your solar powered appliance solar generator solar tracker robot solar freezer solar cooker solar drier solar pump solar freezer or solar dryer project Whether your solar electronic circuit diagram include a simplified solar controller design in a solar electricity project solar power kit solar hobby kit solar steam generator solar hot water system solar ice maker solar desalinator hobbyist solar panels hobby robot or if you are developing professional or hobby electronics for a solar utility or micro scale solar powerplant for your own solar farm or solar farming this publication may help accelerate the development of your solar tracking innovation Lately solar polygeneration solar trigeneration solar triple generation and solar quad generation adding delivery of steam liquid gaseous fuel or capture food grade CO₂ systems have need for automatic solar tracking These systems are known for significant efficiency increases in energy yield as a result of the integration and re use of waste or residual heat and are suitable for compact packaged micro solar powerplants that could be manufactured and transported in kit form and operate on a plug and play basis Typical hybrid solar power systems include compact or packaged solar micro combined heat and power CHP or mCHP or solar micro combined cooling heating and power CCHP CHPC mCCHP or mCHPC systems used in distributed

power generation These systems are often combined in concentrated solar CSP and CPV smart microgrid configurations for off grid rural island or isolated microgrid minigrid and distributed power renewable energy systems Solar tracking algorithms are also used in modelling of trigeneration systems using Matlab Simulink Modelica or TRNSYS platform as well as in automation and control of renewable energy systems through intelligent parsing multi objective adaptive learning control and control optimization strategies Solar tracking algorithms also find application in developing solar models for country or location specific solar studies for example in terms of measuring or analysis of the fluctuations of the solar radiation i e direct and diffuse radiation in a particular area Solar DNI solar irradiance and atmospheric information and models can thus be integrated into a solar map solar atlas or geographical information systems GIS Such models allows for defining local parameters for specific regions that may be valuable in terms of the evaluation of different solar in photovoltaic of CSP systems on simulation and synthesis platforms such as Matlab and Simulink or in linear or multi objective optimization algorithm platforms such as COMPOSE EnergyPLAN or DER CAM A dual axis solar tracker and single axis solar tracker may use a sun tracker program or sun tracker algorithm to position a solar dish solar panel array heliostat array PV panel solar antenna or infrared solar nantenna A self tracking solar concentrator performs automatic solar tracking by computing the solar vector Solar position algorithms TwinCAT SPA or PSA Algorithms use an astronomical algorithm to calculate the position of the sun It uses astronomical software algorithms and equations for solar tracking in the calculation of sun s position in the sky for each location on the earth at any time of day Like an optical solar telescope the solar position algorithm pin points the solar reflector at the sun and locks onto the sun s position to track the sun across the sky as the sun progresses throughout the day Optical sensors such as photodiodes light dependant resistors LDR or photoresistors are used as optical accuracy feedback devices Lately we also included a section in the book with links to microprocessor code on how the PixArt Wii infrared camera in the Wii remote or Wiimote may be used in infrared solar tracking applications In order to harvest free energy from the sun some automatic solar positioning systems use an optical means to direct the solar tracking device These solar tracking strategies use optical tracking techniques such as a sun sensor means to direct sun rays onto a silicon or CMOS substrate to determine the X and Y coordinates of the sun s position In a solar mems sun sensor device incident sunlight enters the sun sensor through a small pin hole in a mask plate where light is exposed to a silicon substrate In a web camera or camera image processing sun tracking and sun following means object tracking software performs multi object tracking or moving object tracking methods In an solar object tracking technique image processing software performs mathematical processing to box the outline of the apparent solar disc or sun blob within the captured image frame while sun localization is performed with an edge detection algorithm to determine the solar vector coordinates An automated positioning system help maximize the yields of solar power plants through solar tracking control to harness sun s energy In such renewable energy systems the solar panel positioning system uses a sun tracking techniques and a solar angle

calculator in positioning PV panels in photovoltaic systems and concentrated photovoltaic CPV systems Automatic on axis solar tracking in a PV solar tracking system can be dual axis sun tracking or single axis sun solar tracking It is known that a motorized positioning system in a photovoltaic panel tracker increase energy yield and ensures increased power output even in a single axis solar tracking configuration Other applications such as robotic solar tracker or robotic solar tracking system uses robotica with artificial intelligence in the control optimization of energy yield in solar harvesting through a robotic tracking system Automatic positioning systems in solar tracking designs are also used in other free energy generators such as concentrated solar thermal power CSP and dish Stirling systems The sun tracking device in a solar collector in a solar concentrator or solar collector Such a performs on axis solar tracking a dual axis solar tracker assists to harness energy from the sun through an optical solar collector which can be a parabolic mirror parabolic reflector Fresnel lens or mirror array matrix A parabolic dish or reflector is dynamically steered using a transmission system or solar tracking slew drive mean In steering the dish to face the sun the power dish actuator and actuation means in a parabolic dish system optically focusses the sun s energy on the focal point of a parabolic dish or solar concentrating means A Stirling engine solar heat pipe thermosyphin solar phase change material PCM receiver or a fibre optic sunlight receiver means is located at the focal point of the solar concentrator The dish Stirling engine configuration is referred to as a dish Stirling system or Stirling power generation system Hybrid solar power systems used in combination with biogas biofuel petrol ethanol diesel natural gas or PNG use a combination of power sources to harness and store solar energy in a storage medium Any multitude of energy sources can be combined through the use of controllers and the energy stored in batteries phase change material thermal heat storage and in cogeneration form converted to the required power using thermodynamic cycles organic Rankin Brayton cycle micro turbine Stirling with an inverter and charge controller

Data Modeling Made Simple with CA ERwin Data Modeler r8 Donna Burbank, Steve Hoberman, 2011-08-01 Data Modeling Made Simple with CA ERwin Data Modeler r8 will provide the business or IT professional with a practical working knowledge of data modeling concepts and best practices and how to apply these principles with CA ERwin Data Modeler r8 You ll build many CA ERwin data models along the way mastering first the fundamentals and later in the book the more advanced features of CA ERwin Data Modeler This book combines real world experience and best practices with down to earth advice humor and even cartoons to help you master the following ten objectives 1 Understand the basics of data modeling and relational theory and how to apply these skills using CA ERwin Data Modeler 2 Read a data model of any size and complexity with the same confidence as reading a book 3 Understand the difference between conceptual logical and physical models and how to effectively build these models using CA ERwin s Data Modelers Design Layer Architecture 4 Apply techniques to turn a logical data model into an efficient physical design and vice versa through forward and reverse engineering for both top down and bottom up design 5 Learn how to create reusable domains naming standards UDPs and model templates in CA ERwin Data Modeler to reduce modeling

time improve data quality and increase enterprise consistency 6 Share data model information with various audiences using model formatting and layout techniques reporting and metadata exchange 7 Use the new workspace customization features in CA ERwin Data Modeler r8 to create a workflow suited to your own individual needs 8 Leverage the new Bulk Editing features in CA ERwin Data Modeler r8 for mass metadata updates as well as import export with Microsoft Excel 9 Compare and merge model changes using CA ERwin Data Modelers Complete Compare features 10 Optimize the organization and layout of your data models through the use of Subject Areas Diagrams Display Themes and more Section I provides an overview of data modeling what it is and why it is needed The basic features of CA ERwin Data Modeler are introduced with a simple easy to follow example Section II introduces the basic building blocks of a data model including entities relationships keys and more How to examples using CA ERwin Data Modeler are provided for each of these building blocks as well as real world scenarios for context Section III covers the creation of reusable standards and their importance in the organization From standard data modeling constructs such as domains to CA ERwin specific features such as UDPs this section covers step by step examples of how to create these standards in CA ERwin Data Modeling from creation to template building to sharing standards with end users through reporting and queries Section IV discusses conceptual logical and physical data models and provides a comprehensive case study using CA ERwin Data Modeler to show the interrelationships between these models using CA ERwin s Design Layer Architecture Real world examples are provided from requirements gathering to working with business sponsors to the hands on nitty gritty details of building conceptual logical and physical data models with CA ERwin Data Modeler r8 From the Foreword by Tom Bilcze President CA Technologies Modeling Global User Community Data Modeling Made Simple with CA ERwin Data Modeler r8 is an excellent resource for the ERwin community The data modeling community is a diverse collection of data professionals with many perspectives of data modeling and different levels of skill and experience Steve Hoberman and Donna Burbank guide newbie modelers through the basics of data modeling and CA ERwin r8 Through the liberal use of illustrations the inexperienced data modeler is graphically walked through the components of data models and how to create them in CA ERwin r8 As an experienced data modeler Steve and Donna give me a handbook for effectively using the new and enhanced features of this release to bring my art form to life The book delves into advanced modeling topics and techniques by continuing the liberal use of illustrations It speaks to the importance of a defined data modeling architecture with soundly modeled data to assist the enterprise in understanding of the value of data It guides me in applying the finishing touches to my data designs **Data Model**

Scorecard Steve Hoberman, 2015-11-01 Data models are the main medium used to communicate data requirements from business to IT and within IT from analysts modelers and architects to database designers and developers Therefore it s essential to get the data model right But how do you determine right That s where the Data Model Scorecard comes in The Data Model Scorecard is a data model quality scoring tool containing ten categories aimed at improving the quality of your

organization's data models Many of my consulting assignments are dedicated to applying the Data Model Scorecard to my client's data models I will show you how to apply the Scorecard in this book This book written for people who build use or review data models contains the Data Model Scorecard template and an explanation along with many examples of each of the ten Scorecard categories There are three sections In Section I Data Modeling and the Need for Validation receive a short data modeling primer in Chapter 1 understand why it is important to get the data model right in Chapter 2 and learn about the Data Model Scorecard in Chapter 3 In Section II Data Model Scorecard Categories we will explain each of the ten categories of the Data Model Scorecard There are ten chapters in this section each chapter dedicated to a specific Scorecard category Chapter 4 Correctness Chapter 5 Completeness Chapter 6 Scheme Chapter 7 Structure Chapter 8 Abstraction Chapter 9 Standards Chapter 10 Readability Chapter 11 Definitions Chapter 12 Consistency Chapter 13 Data In Section III Validating Data Models we will prepare for the model review Chapter 14 cover tips to help during the model review Chapter 15 and then review a data model based upon an actual project Chapter 16

Data Modeling Made Simple Steve Hoberman, 2009 Read today's business headlines and you will see that many issues stem from people not having the right data at the right time Data issues don't always make the front page yet they exist within every organisation We need to improve how we manage data and the most valuable tool for explaining validating and managing data is a data model This book provides the business or IT professional with a practical working knowledge of data modelling concepts and best practices This book is written in a conversational style that encourages you to read it from start to finish and master these ten objectives Know when a data model is needed and which type of data model is most effective for each situation Read a data model of any size and complexity with the same confidence as reading a book Build a fully normalised relational data model as well as an easily navigatable dimensional model Apply techniques to turn a logical data model into an efficient physical design Leverage several templates to make requirements gathering more efficient and accurate Explain all ten categories of the Data Model Scorecard Learn strategies to improve your working relationships with others Appreciate the impact unstructured data has and will have on our data modelling deliverables Learn basic UML concepts Put data modelling in context with XML metadata and agile development

Data Architecture Charles Tupper, 2011-05-09 Data Architecture From Zen to Reality explains the principles underlying data architecture how data evolves with organizations and the challenges organizations face in structuring and managing their data Using a holistic approach to the field of data architecture the book describes proven methods and technologies to solve the complex issues dealing with data It covers the various applied areas of data including data modelling and data model management data quality data governance enterprise information management database design data warehousing and warehouse design This text is a core resource for anyone customizing or aligning data management systems taking the Zen like idea of data architecture to an attainable reality The book presents fundamental concepts of enterprise architecture with definitions and real world applications and scenarios It

teaches data managers and planners about the challenges of building a data architecture roadmap structuring the right team and building a long term set of solutions It includes the detail needed to illustrate how the fundamental principles are used in current business practice The book is divided into five sections one of which addresses the software application development process defining tools techniques and methods that ensure repeatable results Data Architecture is intended for people in business management involved with corporate data issues and information technology decisions ranging from data architects to IT consultants IT auditors and data administrators It is also an ideal reference tool for those in a higher level education process involved in data or information technology management Presents fundamental concepts of enterprise architecture with definitions and real world applications and scenarios Teaches data managers and planners about the challenges of building a data architecture roadmap structuring the right team and building a long term set of solutions Includes the detail needed to illustrate how the fundamental principles are used in current business practice *Data Modeling Made Simple with PowerDesigner* Steve Hoberman, George McGeachie, 2011 Annotation This book will provide the business or IT professional with a practical working knowledge of data modelling concepts and best practices and how to apply these principles with PowerDesigner You will build many PowerDesigner data models along the way increasing your skills in first the fundamentals and later in the book the more advanced features of PowerDesigner The book contains six sections Section I introduces data modelling along with its purpose and variations Also included is an explanation of the important role of a data modelling tool the key features required of any data modelling tool and an introduction to the essential features of PowerDesigner Section II explains all of the components on a data model including entities data elements relationships and keys and describes how to create and manage these objects in PowerDesigner Also included is a discussion of the importance of quality names and definitions for your objects Section III dives into the relational and dimensional subject area logical and physical data models and describes how PowerDesigner supports these models and the connections between them Learn how to get information into and out of PowerDesigner and improve the quality of your data models with a cross reference of key PowerDesigner features with the Data Model Scorecard Section IV contains a PowerDesigner workshop designed to consolidate everything for you Section V focuses on additional PowerDesigner features some of which have already been introduced which make life easier for data modellers Section VI discusses PowerDesigner topics beyond data modelling including the XML physical model and the other types of model available in PowerDesigner it also discusses the role of PowerDesigner in data management using the DAMA Data Management Body of Knowledge DAMA DMBOK framework

Simulation Conceptual Modeling Jeffrey Strickland, 2011-10-27 Simulation Conceptual Modeling explores several system analysis methods and conceptual modeling techniques It also discusses appropriate tools that may be used to assist with conceptual modeling In addition it discusses how to evaluate the quality of a conceptual model Some commonly used conceptual modeling techniques and methods include Data Flow Modeling Entity Relationship Modeling Event Drive Process

Chain Joint Application Development Place Transition Net Modeling State Transition Modeling Object Role Modeling and Unified Modeling Language UML **Mastering Data Warehouse Design** Claudia Imhoff, Nicholas Galletta, Jonathan G. Geiger, 2003 A cutting edge response to Ralph Kimball's challenge to the data warehouse community that answers some tough questions about the effectiveness of the relational approach to data warehousing Written by one of the best known exponents of the Bill Inmon approach to data warehousing Addresses head on the tough issues raised by Kimball and explains how to choose the best modeling technique for solving common data warehouse design problems Weighs the pros and cons of relational vs dimensional modeling techniques Focuses on tough modeling problems including creating and maintaining keys and modeling calendars hierarchies transactions and data quality *Data Modeling Made Simple* Steve Hoberman, 2005 Ever have a bad data day If you are a business user architect analyst designer or developer then you have probably had some bad data days It comes with the territory Overcoming these problems is much easier if you have an in depth understanding of the actual data That's where a data model comes in handy It's a diagram that uses text and symbols to represent groupings of data giving you a clear picture of your business and application environment The book provides the tools you need to read create and validate models of your business and applications Contains everything about modelling you need to know but were too afraid to ask such as What are the traditional and non traditional uses of a data model How do subject area logical and physical data models differ When do I build a BSAM ASAM or CSAM What is the easiest way to apply normalisation Where can I best leverage abstraction How do I decide whether to use denormalisation or dimensionality What are primary foreign alternate virtual and surrogate keys What is the best approach to building the models How can I use the Scorecard system to validate a data model Includes over 30 exercises to reinforce concepts and sharpen your skills

Software Development, 2001

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