

Data Modeling – a two day workshop with Alec Sharp, Clariteq Systems Consulting Ltd.

Data Modeling

A Business-Oriented Approach to Entity-Relationship Modeling – 2 days

Overview:

Data modeling is critical to the design of quality databases, but is also essential to other requirements specification techniques such as workflow modeling, use cases, and service definition because it ensures a common understanding of the things – the entities – that processes and applications deal with. This workshop introduces entity-relationship modeling from a non-technical perspective, and explores contextual, conceptual, and detailed modeling techniques that maximize user involvement.

Description:

Data modeling was originally developed as a tool for improving database design, but has become a fundamental requirements definition technique for all business analysts, whether they are primarily concerned with data structures, application logic, user interface behavior, or business processes. A key driver is that applying data modeling early in requirements definition allows analysts and clients to develop a common understanding of the business entities (e.g., Customer, Order, Product, Part, etc.) that business processes and information systems deal with, their interrelationships, and the rules that govern them. This eliminates the problems of inconsistent terminology and conflicting assumptions that otherwise plague application development, package selection and implementation, system integration, and process redesign projects.

This workshop introduces entity-relationship modeling from a non-technical perspective, thoroughly covering the basic components of a data model - entities, relationships, attributes, and identifiers. In addition to showing how and when to use these components in developing a data model, it includes far more advice on the *process* of developing a data model than other courses, including specific methods for getting subject matter experts involved and maintaining their commitment. The content is presented within the context of a clearly-defined, three-phase data modeling methodology that supports progressive detail and precision.

Two points are worth emphasizing:

- This workshop is packed with practical tips, techniques, “scripts,” checklists, and guidelines for the analyst. All of the material is based on years of project experience; abstract theory is avoided.
- The emphasis is on “business-friendly” techniques which support and encourage the full involvement of non-technical subject matter experts, which is essential for quality data models

Instructor – Alec Sharp:

With over 25 years of consulting experience, Alec has provided hands-on data modeling expertise throughout North America, Asia, and Europe – this workshop is based on real-world experience, not textbook theory. Alec has also delivered hundreds of Data Modeling and Advanced Data Modeling workshops, and top-rated presentations at international conferences, including “The Seven Deadly Sins of Data Modeling,” “Data Modeling – New Uses for New Times,” “The Lost Art of Conceptual Modeling,” “Getting Traction for Data Modeling – Winning Over the Masses,” and “The Human Side of Data Modeling.” Alec is the principal author of “Workflow Modeling” (Artech House, 2001) which is a consistent best-seller in the field, and is widely used as an MBA text and consulting guide.

Target Audience:

New or experienced data modelers, data analysts, and DBAs will benefit from the workshop’s practical methods and guidelines. The workshop is also very popular with business analysts and application designers/developers needing to understand data modeling and how it supports requirements definition or process analysis. As well, it’s suitable for business professionals and managers needing to understand how this technique can uncover and resolve inconsistency in business terminology, policy, and rules.

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Course Topics:

- Essentials of Data Modeling
 - What really *is* a data model?
 - Essential components – entities, relationships, and attributes
 - The basics of diagramming – Entity-Relationship Diagrams (“ERDs”)
 - The narrative parts of a data model – definitions and assertions
 - Group exercise – getting started on a data model, then refining it
 - Common misconceptions about data models and data modeling
 - The real purpose of a data model
 - Three types of data models – different levels of details for different purposes
 - Contextual, Conceptual, and Logical Data Models – purpose, audience, definition, and examples
 - How data models help in process improvement, requirements definition, and reporting
 - Forward- and reverse-engineering uses of data modeling
 - Overview of a three-phase methodology for developing a data model
 - References – books and useful web sites
- Phase 1 – Establish the initial conceptual data model
 - Top down vs. bottom up approaches to beginning a data model – when is each appropriate?
 - Advantages of a bottom-up approach
 - A bottom-up approach focusing on collecting and analyzing terminology
 - A structure for sorting terms and discovering entities
 - Exercise – developing an initial conceptual data model
 - Entities – what they are and are not
 - Guidelines for naming and defining entities
 - Three questions to help you quickly develop clear, useful entity definitions
 - Five criteria that entities must satisfy, and four common errors in identifying entities
 - Exercise – identifying flawed entities
 - Identifying relationships
 - Fundamental vs. irrelevant or transitive relationships
 - Good and bad relationship names
 - Multiplicity or cardinality – 1:1, 1:M, and M:M relationships, and useful facts about each
 - Common errors and special cases – recursive, multiple, and supertype-subtype relationships
 - Attributes – guidelines and types
 - Attributes in conceptual models vs. logical models
- Phase 2 – Develop the initial logical data model by adding rigor, structure, and detail
 - What’s involved in developing a logical model – shifting the focus from entities to attributes
 - Multi-valued, redundant, and constrained attributes, with simple patterns for dealing with each
 - An understandable guide to normalization – first, second, and third normal forms
 - Higher order (fourth and fifth) and Boyce-Codd normal forms
 - Guidelines for a smooth progression from conceptual to logical
 - Exercise – developing the initial logical data model
 - Four types of entities – kernel, characteristic, associative, and reference
 - Guidelines and patterns for dealing with each type of entity
 - How to draw your E-R Diagram for maximum readability and correctness
 - Optional and mandatory relationships
 - Considering time and history when looking at relationships
 - Six questions to ask whenever a data range appears in a data model
 - Identifying and dealing with transitive relationships – clues and proof

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- Phase 3 – Refine and extend the logical data model by discovering and meeting new requirements
 - Attribute granularity – definitions of non-atomic and semantically overloaded attributes
 - Guidelines for making non-atomic attributes atomic
 - The perils of semantic overload, and what to do about it
 - Dealing with derived attributes, and when to show them on the model
 - A classword-based approach to attribute naming
 - Typical attribute documentation
 - A common source of confusion and disagreement – primary keys
 - What primary keys are, what they're really for, and three essential criteria
 - Alternate and foreign keys
 - Why meaningless primary keys are used, and guidelines for creating them
 - Guidelines for reference data
 - Pulling it together – key techniques and guidelines covered in the class so far
 - Using event analysis to discover additional requirements
 - Exercise – using event analysis and extending a data model
 - Presentation by teams of their solutions
 - How data modeling relates to process modeling, use cases, and services
 - A layered framework for business analysts
 - How other techniques (e.g., workflow modeling) support data modeling
 - A three-step procedure for meeting new requirements
 - Advice on extending the model in an orderly fashion
 - Exercise – meeting new requirements on the data model
 - Recap – contextual, conceptual, and logical data models
 - Different skills and participants for conceptual vs. logical modeling
 - How the modeler/analysts's role changes as a project progresses
 - A little philosophy for effective data modeling
 - The four Ds of data modeling – definition, dependency, detail, and demonstration
 - Wrap-up – the approach we followed throughout the class