November 11-15 in Philadelphia, PA
## Pre-Conference Tutorials

### Monday, November 11

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<thead>
<tr>
<th>Time</th>
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<tr>
<td>7:00-9:00</td>
<td><strong>Breakfast in the Jefferson</strong></td>
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</table>
| 8:30-4:30  | **Data Modeling Fundamentals**  
Steve Hoberman, Steve Hoberman & Associates, LLC  
FDR, Pg 5  

**Modeling Beyond Relational - A tour of real world data models**  
(using MongoDB as an example)  
Austin Zellner, MongoDB  
Sherman, Pg 14  

**Acting For Data Modelers**  
Geoffrey Hitch, Tepper School of Business, Carnegie Mellon University  
Betsy Ross, Pg 21  

**CDMP Workshop and Exams**  
(workshop in the morning and “Pay Only if you Pass” exams in the afternoon)  
Stacey Haurin, Corporation Service Company  
Adams, Pg 35 |

## Post-Conference Tutorials

### Friday, November 15

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| 8:30-12:00 | **But I Only Have Small Data: Application of Ishikawa’s 7 Tools**  
Dan McGrath, Texas Tech University  
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**Data Structure Graph Hands-On Workshop**  
Doug Needham, Kore Wireless  
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**Ensemble Logical Modeling Workshop**  
Remco Broekmans, Genesee Academy  
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| 12:00-1:00 | **Lunch in the Jefferson**                                                                      |
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<td>8:30-10:00</td>
<td>Building Data Models for a Procure-to Pay (P2P) Blockchain Application</td>
<td>Dr. Prashanth Southekal, DBP-Institute</td>
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<td>Managing Time in a Data Warehouse</td>
<td>Dirk Lerner, TEDAMOH</td>
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<td>Improve Your Data Model by Effectively Mapping Your Customer Lifecycle</td>
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<td>10:30-12:00</td>
<td>The Most “Universal” Data Model Patterns</td>
<td>Len Silverston, Universal Data Models</td>
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<td>Are you sure you trust the data for that critical business decision?</td>
<td>Ron Huizenga, IDERA</td>
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<td>Christian Hädrich, DÖRFFLER + PARTNER</td>
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<td>1:00-2:15</td>
<td>KEYNOTE: Drag and Drop Development (and Data Modeling)</td>
<td>Gary Hoberman, UnQork</td>
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<td>2:15-2:45</td>
<td>Afternoon Snacks</td>
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<td>2:45-4:15</td>
<td>Managing Your Performance: Visual, Aural &amp; Temporal Communication Tools</td>
<td>Geoffrey Hitch, Tepper School of Business,</td>
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<td>Modeling JSON</td>
<td>Austin Zellner, MongoDB</td>
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<td>A day in the life of a Data Architect and Integration Architect</td>
<td>Al Calbazana and Stacey Haurin, Corporation Service Company</td>
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<td>Hands-On Modeling Tools</td>
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<td>Hackolade Hands-on</td>
<td>Pascal Desmarest, Hackolade</td>
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<td>Marco Wobben, BCP Software</td>
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<td>7:30-8:00</td>
<td>Zen with Len: Zen and the Art of Data Maintenance Len Silverston, Data Modeling Thought Leader and Zen Priest Pg 9</td>
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<td>ER/Studio SIG Ron Huizenga, IDERA</td>
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<td>Demystifying Data Warehousing as a Service Kent Graziano, Snowflake Computing Pg 33</td>
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<td>Agile Data Modeling: Strategies for Collaboration, Flexibility, and Evolution Scott Ambler, Disciplined Agile</td>
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<td>Drowning in Data, Starving for Wisdom: Tools Addressing the Human Element of Data Modeling Len Silverston, Universal Data Models Pg 5</td>
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<td>Data Vault Journey Dirk Lerner, TEDAMOH Pg 19</td>
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<td>Making Sense of Schema-On-Read Kent Graziano, Snowflake Computing Page 33</td>
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<td>Data Modeling Case Study: A Public Sector Tale Brad Steinke, Bureau of Criminal Apprehension Pg 12</td>
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<td>DMZ’s Annual Achievement Award KEYNOTE: Agile and Data: From Rhetoric to Reality, Scott Ambler Norman Daoust: Data Management Annual Summary (Jefferson)</td>
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<td>2:15-2:45</td>
<td>Afternoon Snacks</td>
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<td>2:45-4:15</td>
<td>What Can Data Modelers Learn from Ontologists? Norman Daoust, Daoust Associates Pg 3</td>
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<td>Using the Chebotko Method to Design Sound and Scalable Data Models for Apache Cassandra Dr. Artem Chebotko, DataStax Pg 24</td>
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<td>Digital Transformation: Data Modeling for APIs Christina Burnett, T-Mobile Pg 11</td>
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<td>DMZ’s Famous Casino Night! (Jefferson)</td>
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<td>Morning Chi Gung with Kent Graziano (FDR)</td>
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<td><strong>Beyond Data Modeling:</strong> Artificial Intelligence and Machine Learning</td>
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<td>Dr. Raja</td>
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<td><strong>Introduction to Graph Databases and Graph Data Modeling with Neo4j</strong></td>
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<td>Dave Fauth, Neo Technology</td>
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<td><strong>Bigger is often Better:</strong> Data Modeling in the Age of Big Data</td>
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<td>Dr. Raja</td>
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<td><strong>Model-Based Agile Development</strong></td>
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<td>Bob Conway, Information Engineering Associates</td>
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<td>KEYNOTE: 20 Rules of Analytics: Confessions of a Data Scientist</td>
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<td>Dan McGrath, Texas Tech University</td>
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<td><strong>Universal Business Glossaries and Data Models</strong></td>
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<td>Len Silverston, Universal Data Models</td>
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<td><strong>Elections Are Complex:</strong> A Ballot Data Model</td>
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<td>David Hay, Elections Are Complex</td>
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<td>4:30-6:00</td>
<td>Exploring the “City of Brotherly Data Modeling Love”</td>
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Data Modeling Fundamentals

Steve Hoberman, Steve Hoberman & Associates

Assuming no prior knowledge of data modeling, we start off with an exercise that will illustrate why data models are essential to understanding business processes and business requirements. Next, we will explain data modeling concepts and terminology, and provide you with a set of questions you can ask to quickly and precisely identify entities (including both weak and strong entities), data elements (including keys), and relationships (including subtyping). We will discuss the three different levels of modeling (conceptual, logical, and physical), and for each explain both relational and dimensional mindsets.

Steve Hoberman has trained more than 10,000 people in data modeling since 1992. Steve is known for his entertaining and interactive teaching style (watch out for flying candy!), and organizations around the globe have brought Steve in to teach his Data Modeling Master Class, which is recognized as the most comprehensive data modeling course in the industry. Steve is the author of nine books on data modeling, including the bestseller Data Modeling Made Simple. One of Steve’s frequent data modeling consulting assignments is to review data models using his Data Model Scorecard® technique. He is the founder of the Design Challenges group, Conference Chair of the Data Modeling Zone conferences, and recipient of the Data Administration Management Association (DAMA) International Professional Achievement Award.

How to Effectively Present Your Data Model

Norman Daoust, Daoust Associates

Congratulations, you have created a data model that you know is well suited to meeting the needs of your business stakeholders. But getting them to recognize that and to appreciate your efforts can be a challenge. Unless, of course, you consistently employ a set of techniques and best practices for presenting your data model.

We will review several different techniques for presenting data models to business stakeholders and examine a set of best practices and tips that you can employ.

Attendees will learn several techniques for presenting data models to business stakeholders, and a set of best practices and tips to help your stakeholders understand your data models.

modeling, and UML state machine modeling. His clients have included the Centers for Disease Control and Prevention (CDC), the Veteran’s Health Administration, the Canadian Institute for Health Information, several healthcare provider organizations, a Fortune 500 software company, and several start-ups. He has been an active contributor to the healthcare industry standard data model, the Health Level Seven (HL7) Reference Information Model (RIM) since its inception. Norman’s book, “UML Requirements Modeling for Business Analysts” explains how to adapt the Unified Modeling Language (UML) for analysis purposes. Norman is an engaging speaker who enjoys making complex topics easy and enjoyable.

What Can Data Modelers Learn from Ontologists?

Norman Daoust, Daoust Associates

An ontology is the “study of … the basic categories of being and their relations” per Wikipedia. Ontologists have been working for thousands of years to understand reality. Data modelers have been working for less than fifty years to model portions of reality.

What can data modelers learn from ontologists? Have ontologists already created ontologies that encompass most of the concepts we need to include in our data models? Should we incorporate some of their ideas?

This presentation reviews two high level ontologies and examines their relevance to your data models. Attendees are encouraged to bring a data model so that you can fit it into an ontology during the exercise portion of the presentation.

Attendees will learn about two high-level ontologies, how they can significantly enhance your data models, five tips data modelers can adapt from ontologies, and what ontologies will not do for you.

Norman Daoust founded his consulting company Daoust Associates, www.DaoustAssociates.com in 2001. He is not just a data architect and data modeler: he also enjoys decision modeling, process modeling, and UML state machine modeling. His clients have included the Centers for Disease Control and Prevention (CDC), the Veteran’s Health Administration, the Canadian Institute for Health Information, several healthcare provider organizations, a Fortune 500 software company, and several start-ups. He has been an active contributor to the healthcare industry standard data model, the Health Level Seven (HL7) Reference Information Model (RIM) since its inception. Norman’s book, “UML Requirements Modeling for Business Analysts” explains how to adapt the Unified Modeling Language (UML) for analysis purposes. Norman is an engaging speaker who enjoys making complex topics easy and enjoyable.
Data Structure Graph Hands-On Workshop

Doug Needham, Kore Wireless

A Data Structure graph is a measurement tool applying the concepts of graph theory to data modeling and data architecture. For those familiar with using Data Modeling tools, there is an adage associated with creating new data models. “Try not to cross the lines. If you cross the lines, your ERD will be complex.” This “rule of thumb” can be found in Graph Theory. A planar graph is a graph that can be embedded in the plane, i.e., it can be drawn on the plane in such a way that its edges intersect only at their endpoints. In other words, it can be drawn in such a way that no edges cross each other. This mathematical reason for not crossing the lines is one of the many applications of graph theory to data modeling.

- **Graph Theory and Network Science overview.** We will talk about some of the history of graph theory, how it evolved into network science, and its applications in the “real world”. Many terms will be defined, and their use applied to various problems. Graph Clustering and general clustering techniques will get a brief overview.

- **ERD Data Modeling Fundamentals.** Here we will create a few entities and relationships. The most fundamental types of data modeling will be covered in this class.

- **Tool Overview.** Gephi, Tulip and R, will be discussed. Our lab later will be done in Gephi. Tool setup, and a short demo of how to use the tool. Statistics, measures, filters, and on screen graph manipulation will be demonstrated.

- **Converting an ERD to a Data Structure Graph.** Using Dbeaver and some python code that will be handed out, we will reverse engineer an existing data model and create an input file for Gephi to use in the lab. For any of you who have existing data models you wish to review, this is the portion of the class where we will convert your data model into a data structure graph that can be analyzed with Gephi, Tulip, R, and Python.

- **Volumetrics.** Volumetrics is the study of the space requirements of data models. We will discuss the basic formulas for how to create volumetric estimates. Then we will show how to analyze an existing database for growth patterns. These volumetric measurements will assist us in the topographic component of the lab.

- **Lab.** During the lab, we will load our data structure graph into Gephi and explore the data model using the tools and techniques learned earlier. The centrality measures along with volumetric and structural data will be analyzed and some basic clustering techniques will be covered demonstrating how to analyze the internal structure of a data model.

- **Transition from DSG Level 1 to DSG Level 2, and Q&A.** What we have been working on during this lab is a Data Structure Graph Level 1. A Data Structure Graph Level 2 is a larger graph
that incorporates the transfer of data from one application to another within an enterprise. The same analytical techniques can be applied to both Level 1 and Level 2 Data Structure Graphs but the interpretation, meaning, and applicability are slightly different. We will discuss these topics and leave room for further questions and answers.

Doug started his career as a Marine Database Administrator supporting operational systems that spanned the globe in support of the Marine Corps missions. Since then Doug has worked as a consultant, data engineer, and data architect for Enterprises of all sizes from 3M and Lockheed Martin to a number of startups. Working in industries like Telecom, Retail, Medical, Industrial, and Education, Doug has worked with data that supports a variety of mission critical needs. Organizing data to make it easily accessible to people that need it has been Doug’s main purpose during this time. In working with such a variety of use-cases, applications, source systems, and analytical needs, Doug began to understand how to apply Social Network Analysis to the field of data modeling and data architecture. These techniques have been around since the time of Euler and applying them to the growing needs of our ever expanding data infrastructure has shone new light on a field defined by Codd, Inmon, Kimball, and others.

Doug is excited to share Network techniques and their application with anyone who will listen. Doug is always looking to learn new things.

Universal Business Glossaries and Data Models

Len Silverston, Universal Data Models

Having clear, consistent, enterprise-wide, and agreed upon business glossary, terms and models can have a huge effect in improving productivity, facilitating more effective communications, decreasing costs of systems development and maintenance, increasing data quality, and enhancing systems integration.

Yet, so many organizations struggle to develop a commonly accepted vocabulary of business terms and models.

This presentation provides tools and techniques to jump-start development of a business glossaries as well as associated data models using ‘universal’ constructs.

We will discuss case studies of organizations that successfully used these tools and developed a common business glossary as well as agreed upon models.

In this information, fun, and interactive seminar, you will learn:

- The greatest challenges regarding developing a Universal business glossary and common models from decades of past experiences
• How to jump-start development of a business glossary saving huge costs and time

• 15 important guidelines for developing definitions within the business glossary or for use in developing data model definitions

• ‘Universal’ data constructs/models for business functions and how this relates to glossaries and business data models

Len Silverston is a best-selling author, consultant, and speaker with over 30 years of experience helping organizations in various data governance and data management programs. Mr. Silverston is an internationally acclaimed expert and thought leader in the fields of data governance, data modeling, data management, and in the human dynamics of integrating information. He has helped many organizations successfully implement data governance programs, for example, from 2010 through 2012, he guided and provided data governance consulting for his client who won the 2012 Data Governance Best Practice Award.

He is the author of The Data Model Resource Book series (Volumes 1, 2, and 3), which describe hundreds of reusable data models. The volume 1 book was rated #12 on the Computer Literacy Best Seller List and his volume 1 and 2 books have been translated into Chinese and in 2009, he co-authored “The Data Model Resource Book, Volume 3, Universal Patterns for Data Modeling”, which has been into Korean. Mr. Silverston has published many articles and has been a keynote speaker at many international data conferences. He is the winner of the DAMA (Data Administration Management Association) International Professional Achievement Award and the DAMA International Community Award. He has given many keynotes and has received the highest speaker rating at several international conferences. Mr. Silverston’s company, Universal Data Models, LLC, provides consulting, training, publications, and software to enable information integration.

The Most “Universal” Data Model Patterns

Len Silverston, Universal Data Models

There are some data model constructs that are so universal that they appear in almost every data model. This seminar will share many alternatives for modeling these prevalent constructs and point out the pros and cons of modeling them in various ways.

For example, modeling contact information, including traditional contact methods such as phone, fax, email, and international addresses as well as newer ways to contact someone such as Twitter, Facebook, and Skype are very common data requirements which are often much more complex than one may think. There is a common data requirement to classify data, for example, to model customer types, product categories, and many other classifications. These classifications are often modeled differently
depending on the entity being modeled. By using the classification pattern and alternatives that this seminar will share, we can understand valid ways of modeling classifications and keeping our data model consistent while using high quality constructs to model classifications. Other very common data requirements are the need to model statuses, hierarchies, demographics, and product/service information.

Based upon decades of research on ‘universal’ models, this seminar will provide in-depth patterns and alternatives for modeling these constructs that are bound to be needed and that are widely useful. Participants will leave with a toolkit of the latest versions of these patterns that they can use on subsequent modeling efforts.

Participants of this session will gain:

- Effective data model templates for modeling the most common patterns in data models, such as contact information, demographics, classifications, statuses, hierarchies, roles, and product/service information

- Valid variations and alternatives in modeling these types of data models constructs and the pros and cons of these alternatives

- Exercises in using these patterns and in how to select the best choice for your modeling effort and/or organization

- Pitfalls in avoiding ineffective ways to model these critical constructs

- Options about how to model these constructs using different styles such as modeling them using a very specific style or very generalized styles and the pros and cons of these styles.

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Drowning in Data, Starving for Wisdom: Tools Addressing the Human Element of Data Modeling

Len Silverston, Universal Data Models

What is “wisdom”? Wisdom is the ability to accurately interpret what is happening and take the appropriate actions that are in the best interest of you, your team, and your organization. We are in the midst of a data revolution.

How do we apply real wisdom in our data modeling profession?

This fun, interactive, informative, and practical presentation will discuss how we can apply wisdom to data modeling as it applies to both traditional as well as emerging data management disciplines. For example, how can we be efficient and effective in data modeling in our traditional data management efforts such as data strategies, data governance, master data management, data modeling, and ensure that we do the same for these newer disciplines including big data, internet of things, cognitive computing and artificial intelligence.

We will focus on something that is often missed and yet so critically important in these efforts – applying wisdom using specific, practical, and human behavioral tools. The presentation will cover:

- Important questions to consider regarding data modeling in both traditional and emerging data management disciplines
- Human factors that are important to address in data modeling such as underlying purpose, motivations, trust, communications and conflict managements.
- Powerful techniques and tools that we can use to apply wisdom in data modeling
- How to collaborate effectively with our modeling in an increasingly complex world

Len Silverston is a best-selling author, consultant, and speaker with over 30 years of experience helping organizations in various data governance and data management programs. Mr. Silverston is an internationally acclaimed expert and thought leader in the fields of data governance, data modeling, data management, and in the human dynamics of
integrating information. He has helped many organizations successfully implement data governance programs, for example, from 2010 through 2012, he guided and provided data governance consulting for his client who won the 2012 Data Governance Best Practice Award.

He is the author of The Data Model Resource Book series (Volumes 1, 2, and 3), which describe hundreds of reusable data models. The volume 1 book was rated #12 on the Computer Literacy Best Seller List and his volume 1 and 2 books have been translated into Chinese and in 2009, he co-authored “The Data Model Resource Book, Volume 3, Universal Patterns for Data Modeling”, which has been into Korean. Mr. Silverston has published many articles and has been a keynote speaker at many international data conferences. He is the winner of the DAMA (Data Administration Management Association) International Professional Achievement Award and the DAMA International Community Award. He has given many keynotes and has received the highest speaker rating at several international conferences.

Mr. Silverston’s company, Universal Data Models, LLC, provides consulting, training, publications, and software to enable information integration.

Zen with Len: Zen and the Art of Data Maintenance

Len Silverston, Universal Data Models, Data Modeling Thought Leader and Zen Priest


Len Silverston, who is not only a data modeling and data management thought leader, but is also a fully ordained Zen priest and spiritual teacher, will provide this brief overview of what meditation is, why it is important, how to meditate, and lead a sitting meditation and moving meditation (Qigong) session. Learn more and be more productive at this conference by using the unique techniques shared in this session. Come invigorate yourself, reduce stress, and develop what matters a great deal: your mind.

This will be an enlightening, wonderful session to start your day in a relaxed and receptive state of mind!

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Introduction to Graph Databases and Graph Data Modeling with Neo4j

Dave Fauth, Neo Technology

How do I start with Neo4j? What is Cypher? Are graph databases only suitable for graph-based domains like social networks? Or can I use it reasonably in enterprise projects? How do I transform my domain into a graph model? This tutorial will answer these questions with a mixture of theory and hands-on practice sessions. Attendees will quickly learn how easy it is to develop a Neo4j-backed application. Skills taught:

- An understanding of graph databases
- How to use graph databases

Dave joined Neo4j 2 1/2 years ago working as a Field Engineer on the East Coast. He has been working with Graph Databases and Neo4j for over 4 years. He has been a speaker at the GraphConnect conferences and various meetups. Prior to joining Neo Technologies, Dave worked in the Intelligence Community providing data strategy and data exploitation support.

ER/Studio SIG

Ron Huizenga, IDERA

Learn about the latest enhancements available in ER/Studio for data modeling, business process modeling and change management, and ask the IDERA team any questions you have on ER/Studio!
Ron Huizenga is the Senior Product Manager of Enterprise Architecture and Modeling at IDERA. Ron has over 30 years of business and IT experience as an executive and consultant, spanning a diverse range of industries. His manufacturing background in particular instilled a commitment to continuous improvement and quality, resulting in Six Sigma Lean and Black Belt certifications. His hands-on experience in large-scale enterprise initiatives includes enterprise & data architecture, business transformation and software development. His background provides practical, real-world insights to enterprise data architecture, business architecture, and governance initiatives.

Digital Transformation: Data Modeling for APIs

Christina Burnett, T-Mobile

Digital transformation drives change into both the architecture and the organization of the enterprise. The move toward domain-based development of micro-services in an enterprise environment has been seen by some as the death knell for data modeling. I argue that, in this brave new world, the need for data modeling is even greater. APIs are exposed to more people with less context to interpret the API. Use of micro-service architecture increases the number of transformation boundaries. Having a common understanding of the meaning of data increases speed to market, reduces the number of defects due to invalid transformation, and improves the percentage of API reuse within the enterprise.

Ontology and Graph DB for the Reluctant ER Modeler

Mark Ouska, Semantic Arts

Ontologies are models that capture meaning in a machine-readable form. If I told you my parents had three boys, Jim, Daniel, and me, you would know Jim and Daniel were my brothers, even though I didn’t tell you that. With an ontology, you can easily define family relationships so the computer can infer the unstated fact they are my
brothers just like you, a human, can. A traditional data structure would require several joins. A graph database stores the schema and data together, pre-joined in packets called triples, i.e. George isParentOf Mark, Mary isParentOf Jim. The graph database can then be directly queried (with SPARQL) to retrieve the stated and infer the unstated data. But here’s the thing - the ontology creates the mathematical precision to know, not just guess at the unknown.

This IS the next disruptive technology, and you should invest the time to at least understand it!

- Ontologies model meaning with mathematical precision.
- Graph databases pre-join data under management.
- Ontology-driven data management can accurately infer data that isn’t even there.
- Data can be integrated in-place by its meaning rather than table and column names.
- Come find out how ontology-driven systems will replace our current brittle environments.

Mark Ouska is an Enterprise Agile Data Strategist and Ontologist with over 30 years of professional information management experience in Enterprise Business Data Architecture. He’s an Enterprise Data Strategy expert focused on data leadership and enterprise information management strategy development. He’s demonstrated success recruiting key cross-functional business segments to participate in accurate technical articulation and execution of business data goals and objectives. He has proven expertise extracting business data requirements, developing relationships, and evolving models that execute the enterprise data vision. Public and private-sector leadership experience implementing solutions that are willingly adopted by technical staff, critical business leadership and championed by VP and C-Level constituents. Experience in multiple industries including Pharmaceutical Research, Retail, Health Care, Financial Services, Consulting, Criminal Justice, Insurance, Natural Resources, Petrochemicals, and Software Development.

Data Modeling Case Study: A Public Sector Tale

Brad Steinke, Bureau of Criminal Apprehension

There are varied challenges to modeling law enforcement data in the public sector for the state; not owning the data, it has a high degree of complexity, siloed operations, dozens of applications, few agreed upon terms and definitions and tackling it as a project instead of a self-sustaining Data Governance and Enterprise Architecture activity. Within many public sectors, we encounter multiple inconsistent standards, legislative mandates and
senate hearings all the while the culture and the historical development methodology seem to be the biggest hurdles. This presentation will be an interactive session (I cannot do all the talking and modeling) discussing my experiences, as well as yours, for moving forward and achieving Data Governance through an evolving Enterprise Architecture process in order to understand and model data.

What I hope you get out of this discussion:

- You are not alone. Modeling and Governance challenges occur in most organizations and take time.
- Example Data Flow Modeling options that all mean the same thing.
- How to approach and address modeling issues with data.

Are you sure you trust the data for that critical business decision?

Ron Huizenga, IDERA

When making business decisions, it is essential to use data that we can trust. However, in order to trust data we must understand its lineage. Unfortunately, the term “Data Lineage” has become somewhat ambiguous since it is often used in different contexts. One aspect is known as “Business Lineage” which links metadata constructs to specific terms in a business glossary. This approach is used by numerous data governance solutions, but comes up short, since it does nothing to trace the real flow of information through an organization.

Data’s journey is often comprised of many different steps or hops between different systems and data stores, introducing changes along the way. “Technical Lineage” traces those steps and accompanying transformations to build an audit trail of the data journey. True “Data lineage” combines both Business Lineage and Technical Lineage and provides context to fully understand the data life cycle. Every step in data’s journey is a potential source for introduction of error that could compromise data quality, and hence, business decisions. This session offers a comprehensive discussion of data lineage and associated data quality remediation approaches that are essential to build a foundation for data governance.
Ron Huizenga is the Senior Product Manager of Enterprise Architecture and Modeling at IDERA. Ron has over 30 years of business and IT experience as an executive and consultant, spanning a diverse range of industries. His manufacturing background in particular instilled a commitment to continuous improvement and quality, resulting in Six Sigma Lean and Black Belt certifications. His hands-on experience in large-scale enterprise initiatives includes enterprise & data architecture, business transformation and software development. His background provides practical, real-world insights to enterprise data architecture, business architecture, and governance initiatives.

Modeling Beyond Relational - A tour of real world data models (using MongoDB as an example)

Austin Zellner, MongoDB

We were taught to think of the world as rows and columns, but the reality is that the future belongs to complex shapes and streams of data. How do we approach conceptualizing different models based on use cases rather than optimizing for relational theory? That’s what we will explore in this session.

Assuming no prior knowledge of NoSQL or MongoDB, we will explore the common data model patterns and use MongoDB as an example database to build live records and examples. We’ll also explore strategies on how to approach new use cases and systematically determine the right model and pattern to apply.

Bring your laptop to practice, or just a pencil and paper!

Austin Zellner is a Principal Solutions Architect with MongoDB, the leading Document Model based database. Prior to selling software, Austin worked as a developer for 20 years, focusing on complex data models in the insurance, retail, manufacturing, and sales support systems use cases. Austin loves to teach and draw on whiteboards.

Modeling JSON

Austin Zellner, MongoDB

JSON (JavaScript Object Notation) is the most popular format for data exchange between applications (move aside XML!). JSON is also the preferred storage method for many NoSQL databases. In this session, not only will you learn about the structure of JSON, you will also learn the various ways of modeling JSON.
Forward engineer a set of requirements into JSON and reverse engineer a JSON document into a data model. Be prepared to practice as well!

Austin Zellner is a Principal Solutions Architect with MongoDB, the leading Document Model based database. Prior to selling software, Austin worked as a developer for 20 years, focusing on complex data models in the insurance, retail, manufacturing, and sales support systems use cases. Austin loves to teach and draw on whiteboards.

But I Only Have Small Data: Application of Ishikawa’s 7 Tools

Dan McGrath, Texas Tech University

In contrast to machine learning and artificial intelligence trends, many people need to still process little data, which can be up to 1,000,000 rows when using Excel. This workshop will demonstrate the seven classic quality tools Dr. Ishikawa championed for Japanese manufacturing in the middle of the 20th century. Data mining is reductionist in that holdings are “sliced and diced” until a subset is obtained that matches the selection criteria. In keeping with Dr. Ishikawa’s continuous improvement philosophy, the list has been updated to take advantage of the computational capabilities of Excel and JMP. The seven tools that will be reviewed are:

- Flow Charts
- Diagrams
- Check Sheets and Pareto Charts
- Run Charts and Univariate Analysis
- Histograms
- Control Charts
- Scatter Diagrams

Interactive exercise will demonstrate the tools utility during this workshop. The workshop is a summary of Dan’s book, Quantitative Analysis for System Applications.

Daniel A. McGrath, Ph.D., is the President of Llano Estacado Management Science Co. He also is an Instructor in the Industrial, Manufacturing, and Systems Engineering Department at Texas Tech. He has over 35 years of experience analyzing big data sets with many quantitative and statistical tools and software packages. He has a diversity of degrees: BA in Geography and Geosciences, MS in Soil Science, PhD in Systems and Engineering Management with all being from Texas Tech. He has worked extensively in environmental, project management, continuous
improvement, business intelligence, and financial job functions. In addition, he has been a Project Management Professional and a Six Sigma Master Black Belt. He lives in Texas and travels widely, helping customers find their lost cities of gold!

Data Ethics: From Headlines to Headway
Bridget Cogley, Teknion Data Solutions

The world of data is expanding rapidly, and change is coming. As data workers, we are realizing our roles and use of data are evolving, and we must evolve with it. This presentation addresses recent headlines on data and the impact these concerns can have on the modern business model. Learn skills to identify what’s happening within your own internal systems and be empowered to address them individually. Learn how to be more pro-active in your data strategy, how to identify potential risks and the effects that they can have if not addressed. This session also explores issues specific to data modelers and provides ethical tools to identify and address potential pitfalls.

A former interpreter, Bridget Cogley brings an interdisciplinary approach to working with data. She’s worked as a consultant for the last 4 years and is a recognized Tableau Zen Master (2016-2018). Prior to consulting, she managed an analysis department for 5 years, including overseeing the databases, creating data sources, and providing analysis. Bridget has experience managing, directing HR, strategizing sales approach, and grant-writing. She was a certified American Sign Language Interpreter for 9 years, specializing in medical and post-secondary settings.

Improve Your Data Model by Effectively Mapping Your Customer Lifecycle
Gary Jordan, Red Hat

As we search for strategic advantages in the marketplace we tend to look to new products and enhanced sales techniques. However, improvements to our data model and our data architecture can give us an edge with analytics. By enhancing our understanding of the customer lifecycle and the data flow around our customer contacts we can identify changes that will give us a deeper understanding of our customer’s behavior and drivers.

In this hands-on workshop you will practice:

- Mapping the data flow of your customer contacts.
- Documenting the lifecycle of your customer’s relationship with your organization.
- Identifying points of optimization for your data model and your data architecture.
- Determining how you can leverage your Data Governance program to enforce a new set of practices.

A data model and a data architecture that are built with an understanding of your customer’s lifecycle can give your company a strategic advantage in the marketplace. This starts with a detailed mapping of the dataflow of your customer contacts and will provide new customer insights.
Gary Jordan is a Senior Principal Business Systems Analyst on the Data Architecture Team at Red Hat, an Open Source company. He is responsible for mapping the Customer Lifecycle and ensuring the architectural model will enable the analytics for strategic insights into customer behavior.

Elections Are Complex: A Ballot Data Model

David Hay

In 2018, David Hay had the opportunity to be an Election Day Judge in Harris County (which is approximately Houston), Texas. In this role, he supervised the acceptance and routing to booths of 769 voters.

Among other things, this introduced him to the origin and structure of the ballots that appeared in each booth.

Each polling location is in a mapped neighborhood “precinct”, and supports the voters living in that neighborhood. Each of these has a different ballot template, depending on the congressional, judicial, and various legislative districts that the precinct’s map overlays. The ballot seen by each voter in h’ booth is based that on that template, but templates are different from precinct to precinct.

The task of managing this collection of ballots with their overlapping election districts is incredibly complex. Since he has data modeling in his blood, Mr. Hay saw that the best way to make sense out of it all would be to portray it as a (conceptual) data model—which he proceeded to do.

Viewers of this presentation will have the opportunity to see that model. It is divided into the following sections:

- **Geopolitical Area** – Each precinct—a neighborhood area—is a well-defined geopolitical area, as are the multiple electoral districts that are the basis for candidates for office. Among others, these include US Congressional Districts, state Senate Districts and state Legislative Districts.

- **Precinct Structure** – Each voting place represents one precinct. The precinct is the place where voters register and candidates organize their campaigns. This part of the model shows how each precinct, as a geopolitical area, is related to the other geopolitical areas that overlap it.

- **Voter Registration** – This involves recording information about each prospective voter. Among other things, each person is placed in a single precinct, based on h’ residence address.

- **Candidacy** – Each candidate runs in a county, election district, or the state as a whole. Each ballot must show just those
candidates relevant to a particular precinct.

- **Election** – An election consists of an array of ballots constructed, one for each precinct, in terms of the election districts that overlap that precinct.

- **Voter Action** – When a registered voter votes, ‘e uses a ballot which describes those candidacies that apply to h’ precinct.

This process is conducted by two different agencies in the County, with various bits of hardware and software. Data quality? Uh, yes, that’s important. But as always achieving it requires a good understanding of the underlying structure of the data involved. This model is intended to contribute to that.

David Hay was in fact born the year that the transistor was invented. Some thirty years ago he took up the production of data models to support strategic information planning and requirements analysis. He has worked in a variety of industries, including, among others, power generation, clinical pharmaceutical research, oil refining, banking, and broadcast. He is President of Essential Strategies International, a consulting firm dedicated to helping clients define corporate information architecture, identify requirements, and plan strategies for the implementation of new systems.

Mr. Hay is the author of the ground-breaking 1995 book, Data Model Patterns: Conventions of Thought, as well as Requirements Analysis: From Business Views to Architecture, and Data Model Patterns: A Metadata Map.

Since then, he has written Enterprise Model Patterns: Describing the World, and UML and Data Modeling: A Reconciliation, both published by Technics Publications. Also published by Technics Publications is his latest book, Achieving Buzzword Compliance: Data Architecture Language and Vocabulary.

Mr. Hay has spoken numerous times to “The Data Modeling Zone”, annual DAMA International Conferences (both in the United States and overseas), annual conferences for various vendor user groups, and numerous local chapters of both data administration and database management system groups.

He may be reached at dch@essentialstrategies.com or (713) 464-8316. Many of his works can be found at http://articles.essentialstrategies.com.

Managing Time in a Data Warehouse

Dirk Lerner, TEDAMOH

“Over time, things change - things like customers, products, accounts, and so forth. But most of the data we keep about things describes what they are like currently, not what they used to be like. When things change, we update the data that describes them so that the description remains current. But all these
things have a history, and many of them have a future as well, and often data about their past or about their future is also important.” – Tom Johnston

Today, most data warehouses already store the history of the data. But what about events that took place at a different time than what the data warehouse represents to us? Or data that will be valid in the future? For example, generally planned prices for products and goods in the future or special prices for discount battles around “Black Friday”.

The speaker will focus in this session on the method and techniques for storing bitemporal data in a Data Warehouse. He will show bitemporal basics for a better understanding of loading data as well as the concepts to develop SQL Queries to insert and update temporal data within a Data Warehouse.

What attendees will learn in this session:

- Basic bitemporal concepts
- Examples of data modeling a bitemporal Database Object
- Load bitemporal data into a Data Warehouse
- Examples of SQL Queries to insert and update temporal data

Dirk Lerner is an experienced independent consultant and owner of TEDAMOH. For 15 years he has led BI projects and is considered a global expert on BI architectures and data modeling. As a full scale data architect, Dirk advocates flexible, lean and easily extendable data warehouse principles and practices.

As a pioneer for Data Vault and FCO-IM in Germany, he wrote various publications, is an international speaker at conferences and author of the blog https://DataVaultModeling.de.

Data Vault Journey

Dirk Lerner, TEDAMOH

This case study will explain how an organization used the Data Vault to create a data warehouse that was:

- more flexible,
- more agile,
- faster,
- and less complex.

During this case study workshop, you will become part of the data modeling team where you will learn the Data Vault basics and then apply what you learn to several real-world hands-on examples.

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he has led BI projects and is considered a global expert on BI architectures and data modeling. As a full scale data architect, Dirk advocates flexible, lean and easily extendable data warehouse principles and practices.

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Ensemble Logical Modeling Workshop

Remco Broekmans, Genesee Academy

Ensemble modeling is quickly becoming the standard approach for modeling the data warehouse. It’s a unique data modeling technique that uses Core Business Concepts and Natural Business Relations to build the framework of the Data Warehouses.

Data Vault is by far the leading modeling pattern within the Ensemble modelling family (which also includes Focal Point & Anchor & others). All members of the family are based upon the paradigm: “Separate things that change from those that do not change”. How to gather the information requirements and translate these into an Ensemble Logical Model fit for your Data Warehouse model? This has always been a hard task done by specialist in between the business and IT. This specialist has always been an intermediate role with all the challenges of translating the requirements in such a way that this is understood by the modeler and the developer as well as the business. With Agile techniques as the new way of working we need to find other ways to model our Data Warehouse. In the ideal world this is a group effort called “model storming” sessions.

This session will not only learn you what an Ensemble Logical Model is and why it is good for use as pattern for the data warehouse but will also give you a sneak preview on how to run the ELM Workshop. As we believe in learning by doing this will be an interactive session where we will create a data model.

Remco Broekmans Is the vice president of international programs for Genesee Academy. He works in Business Intelligence and Enterprise Data Warehousing as a trainer, advisor and speaker with a focus on modeling and architecture including Ensemble and Data Vault modeling. He works internationally, and is based in the Netherlands.

The last 15 years, Remco has taught different classes on business intelligence and data warehousing, and has worked for several consulting companies before starting his own companies; Coarem and BI Academy.

So, You Want an Integrated, Enterprise, Logical, Data Model . . .

William Donlin, Progressive Insurance

The overarching assumption is that participants in the discussion already understand the basic data modeling practice. We will begin by reviewing the terms that will be used during the discussion. After a common understanding of the terms is reached, we will create a logical data model with entities and attributes from a generic list of terms. The participants will work together in groups to research and understand the data elements. Upon completion of the research and documentation, we will follow a “bottom-up” process of data modeling to integrate each group’s data model into a single Enterprise Logical Data Model.

We will finish the class participation effort by using the integrated logical data models to create an integrated Enterprise Conceptual Data Model. A light lecture to discuss which hard and soft skill sets it takes to complete this effort at their own companies will finish the course.

William (Bill) Donlin has served as a Data Modeler, and other data architecture roles, for the past 17 years as a part of an IT career spanning almost 40 years. Earlier in his career, he served as an Application Developer in both development and production support roles. Mr. Donlin has created a multitude of Enterprise-Wide Conceptual and Enterprise-Wide Logical Data Models over those 17 years. He has authored many white papers discussing topics such as: data modeling, data model content and look & feel standards, data architecture, data privacy, data governance and has created standard process flows to help newer data modelers follow a standard, stable and repeatable practice to help ensure data model consistency.

Acting For Data Modelers

Geoffrey Hitch, Tepper School of Business, Carnegie Mellon University

Half of the time, business boils down to ‘I don’t like that guy.’

Roger Sterling, HBO’s Mad Men

Perception may or may not be Reality. But Perception is, in fact, what Influences people.

This experiential workshop focuses on how you as a data modeler can compellingly Influence Listeners’ perception of you, & how to more effectively express yourself & lead through the use of practical, hands-on tools from Acting in professional, live Theatre.
This workshop encourages the participants toward the goals of Assertiveness, Confidence & Expressiveness, and “to fake it until you become it”. It challenges participants to take risks & “get out of themselves”, to think more flexibly and expand their comfort zones when communicating in public, to more effectively focus their communications, & to invest in empathy – toward becoming more focused & personally-connected data modelers. Its techniques have been taught for over 25 years to thousands of graduate students, undergraduates, and executives.

In this workshop, you will learn:

- to assertively Influence others through knowledgeable use of “Actions” toward a Goal
- to influence Listeners with greater assertiveness, confidence & expressiveness;
- to grab, hold & shape audience attention & interest;
- to come across as prepared, credible, & able to highlight the ‘aha’ of the message.

Toward these Objectives, participants will examine the “Inner” Acting tools of:

- the definition and practical execution of “Action”;
- the practical use of “Action” to influence Listeners toward a desired Goal;
- “The Seven Steps of Effective Presence”

Participants will also examine the “Outer” Acting tools of:

- the three parts of The Audience-Pleasing Form;
- “Visual, Aural & Temporal Communication Tools”: influencing what the audience sees, hears, & experiences in time.
- to raise consciousness regarding outer communication tools, such as: eye contact, body language, movement & stillness, appropriate gesture, key words, vocal inflection, vocally commanding a room, & dynamic diversity.

Since 1994, Geoffrey’s workshops & courses – Acting For Business (I & II), Acting For Management, Executive Presence & Executives OnStage -- have empowered thousands of Ph.D., MBA, Undergraduate, Executive Education participants, faculty & administration in Pittsburgh, Atlanta, Shanghai, Doha Qatar, London, & Amsterdam with more-effective communication & leadership skills.

His extensive teaching experience has involved topics such as: empathetic listening; getting rid of monotony; maintaining audience interest; visual, aural & temporal communication tools; overcoming
nervousness and lack of self-confidence; shaping & focusing a speech or presentation; solving vocal strain & audibility problems; & achieving clarity in English as a second language -- for participants from: India; Korea; Turkey; Russia; Uzbekistan; Israel; French, Spanish, Arabic & Chinese-speaking countries; & even Staten Island. He serves annually as the on-screen leader in three instructional videos -- “The Elevator Pitch”, “The STAR Story”, and “Interviewing Persuasively” -- used in the MBA Base Camp for Tepper’s Career Opportunities Center & the Accelerate Leadership Center.

Geoffrey has also been a professional theatre director since 1975, directing over 160 productions of world premieres of original works, dramas, classics, musicals & comedies for numerous theatres including: London: nine years as Guest then Resident Director at the Embassy Theatre & Embassy Studio -- directing Brecht, Shakespeare, Shanley, Shaw & Shepard; Equity regional theatres, including: The Barter Theatre of Virginia; Charlotte Repertory Theatre; Theatre By The Sea & Kingston Arts Centre (Rhode Island); West Virginia Public Theatre; Worcester Foothills Theatre; The City Theatre (Pittsburgh); the Baltimore Shakespeare Festival, & the North Carolina Shakespeare Festival; International festivals: The Spoleto Festival; the William Poel Festival (on the Olivier Stage, Royal National Theatre); & The Edinburgh Festival where his production of BOOTH won a First Award; North American tour: BEAUTY & THE BEAST; Off-Broadway: The Roundabout Theatre; Equity Library Theatre; Circle Repertory Company (NYC); New York Theatre Works; & the W.P.A. Theatre. He also directed for ABC’s daytime drama One Life To Live, & for WQED-TV of The Public Broadcasting System. He has been an active professional member of the Stage Directors and Choreographers society (SDC) since 1984.

Managing Your Performance: Visual, Aural & Temporal Communication Tools

Geoffrey Hitch, Tepper School of Business, Carnegie Mellon University

We first define Visual Variety in the “Frame” of your presentation: differences to consider among public speaking appearances in a one-on-one; at a podium; spot-lit at a podium; on a full stage; as part of a panel; on camera, etc.

Next we cover Visual, Aural, and Temporal Communication Tools, including:

- Determining your Relationship with Your Audience, and Why You Are There.
- Entering A Room: Making The First Impression.
- Listening: A Communicator’s Most Important Tool.
- Standing Still for Power; fighting “loose feet”.
- Moving For Visual Variety.
- Preliminary Gestures or Movements.
- The “Sustained Gesture”.
- Mastering The Podium, and the Chair.
- What To Do With Your Hands.
- Sounding Like What You Mean.
• Dropping Off The “Vocal Cliff”.
• The Importance of Key Words.
• A Good Exit Is A Short Exit.

Since 1994, Geoffrey’s workshops & courses -- Acting For Business (I & II), Acting For Management, Executive Presence & Executives OnStage -- have empowered thousands of Ph.D., MBA, Undergraduate, Executive Education participants, faculty & administration in Pittsburgh, Atlanta, Shanghai, Doha Qatar, London, & Amsterdam with more-effective communication & leadership skills.

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Using the Chebotko Method to Design Sound and Scalable Data Models for Apache Cassandra

Dr. Artem Chebotko, DataStax

Apache Cassandra is a leading open-source, distributed database for modern cloud applications. It is known for its instantaneous response time, linear scalability to very large
datasets and millions of transactions per second, always-on availability, and seamless multi-data center support. Data modeling is the primary challenge to adopting Apache Cassandra in your data layer. In this talk, we present a rigorous and practical data modeling approach that ensures sound and efficient Apache Cassandra database schema design. Based on a selected use case, we demonstrate key techniques for designing conceptual, logical, and physical data models for a Cassandra database. You will learn about the Apache Cassandra data model, query language, query-driven data modeling methodology, data model visualization techniques, and relevant tools.

Dr. Artem Chebotko is a Solutions Architect at DataStax, Inc. His core expertise is in data modeling, data management, data mining, and data analytics. For over 15 years, he has been leading and participating in research and development projects on NoSQL, Graph, XML, Relational, and Provenance databases. His current focus is on distributed data management technologies, including Apache Cassandra, Apache Spark, Apache Solr, Apache Kafka, Apache TinkerPop, and DataStax Enterprise. He is the inventor of the Big Data Modeling Methodology for Apache Cassandra and the author of over 50 peer-reviewed research and technical papers published in international journals and conference proceedings. He is an educator with extensive experience in both industry and academic training. He received his Ph.D. in Computer Science from Wayne State University in 2008.

Model-Based Agile Development

Bob Conway, Information Engineering Associates

Some believe that Agile Development and Data Modeling are fundamentally at odds. Many ‘Agilists’ regard data modeling as a luxury we cannot afford in order to move fast. Some even regard modeling and architecture as relics of waterfall bureaucracy to be avoided altogether.

In fairness, many modelers/architects dismiss Agile as a passing fad that accelerates siloed solutions and is ultimately incompatible with enterprise integration. Cheap, fast or good. Pick two out of three.

Truthfully, both of those perspectives are wrong. It is feasible to achieve enterprise integration through incremental sprints but requires new thinking and adjusted practices by scrum masters as well as data architects.

This workshop will guide participants through the RAPID® Architecture/Methodology; a model-based, agile development approach that delivers value early and fast yet achieves enterprise integration across successive projects.
Bob Conway is the founder of and Principal Consultant with Information Engineering Associates, a Colorado-based consulting firm focused on training and development of data management best practices. His twenty-five year consulting experience spans diverse industries including, Oil & Gas, Financial Services, Manufacturing, Retail, Automotive, Telecommunications, Health Care, Federal and Municipal Government. Bob has implemented successful data warehouses for numerous clients from small start-ups to Fortune 500 firms with demonstrable return-on-investment. As an adjunct faculty member Bob has taught graduate level Information Management classes at two major universities. Bob is a frequent speaker at local and national conferences. He brings his rich business and technical experience into presentations with real world examples. His delivery style is informative and entertaining.

Advanced ER/Studio Techniques

Bob Conway, Information Engineering Associates

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 DMI 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.
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Building Data Models for a Procure-to Pay (P2P) Blockchain Application

Dr. Prashanth Southekal, DBP-Institute

Blockchain is a distributed and decentralized ledger or database that is shared across a public or private computing network and usually without a central authority. Architecturally, enabling a Blockchain application rests on a shared data model for the secure management of smart contracts as trust in paramount in distributed applications. In this presentation, Prashanth Southekal will present his Data Modelling architectural work on a Blockchain application in the procure-to-pay (P2P) domain in an Oil and gas pipeline company. The specific work within the P2P domain was on the 3-way match to enable the pipeline millers, coaters, shippers, the oil pipeline company, and the oil pipeline company’s client to efficiently collaborate. The Blockchain application developed was based on the Hyperledger Sawtooth protocol for building, deploying, and running distributed P2P ledgers.

Prashanth Southekal is a Technology and Data Analytics professional with over 20 years of experience from companies such as Shell, Apple, P&G, SAP, Husky Energy, and GE. He specializes in deriving business value from digital technologies and data especially in Enterprise Asset Management (EAM), Order-to-Cash (OTC), and Procure-to Pay (P2P) domains. Prashanth is the adjunct faculty of Data Analytics at University of Alberta (UoA) and University of Calgary (UoC) and he is also a regular speaker and writer on Data Analytics, Solution/Data Architecture, & KPI based Dashboards. He is the author of the book - Data for Business Performance (DBP) and is currently working on his next book on Enterprise Analytics.

Virtual Data Warehousing

Christian Hädrich, DÖRFFLER + PARTNER

“For a Data Warehouse we do not have enough time” .... sound familiar to you?
Data Models are purpose driven. Although you can have a “wrong” Data Model, usually, there is no single “right” one. Be aware: Data only represents the real world (or what we call the “truth”). Like a map, that just shows us partial information (or an image) of the landscape, data representing business objects or processes can never be complete. And as you have maps for different purposes and levels of abstraction, some data models are better suited for some situations than others – you may need different ones even in a single company. Usually information is digitalized in order to automate and speed up business processes. Data Modeling is the art of defining a structure that describes how the data is stored with a view to efficiently process it and to draw the correct meaning. And just like on a map the information often is condensed or sometimes even just simplified.

When building a Data Warehouse we have to deal with two different types of Data Models: Data Model(s) of the Source System(s) and the Data Model of the Data Warehouse. Data Models of the Source Systems are designed for Source-System-Purposes and usually can’t be influenced by the needs of a Data Warehouse. The Data Model of a Data Warehouse is designed by the Data Warehouse Team. It should be able to receive all incoming data from the Source Systems but also feed the information demands of all consumers. Ideally a Core Data Warehouse model is multi-purpose-able. Guess what: the more purposes you try to satisfy, the harder it can be to design (and especially also feed) your model.

In 2014 Roelant Vos published the idea of a Virtual Enterprise Data Warehouse. The idea was conceived as a result of working on improvements for the generation of Data Warehouse loading processes. It is, in a way, an evolution in ETL generation thinking. Combining Data Vault Modeling with a Persistent Historical Data Store provides additional functionality because it allows the designer to preview new designs as well as to refactor parts of the existing Data Warehouse solution. Hybrid approaches for Data Warehousing are designed to be flexible, to be adaptable to accommodate changes in business use and interpretation. Working with data can be complex, and often the ‘right’ answer for the purpose is the result of a series of iterations where Business Subject Matter Experts and Data Professionals collaborate.

In other words, the Data Warehouse model itself is not always something you always can get right in one go. In fact, it can take a long time for a Data Warehouse model to stabilize, and in the current fast-paced environments this may even never be the case. The Virtual Data Warehouse helps maintain both, the mindset and capability for a data solution to keep evolving with the business and to reduce technical debt on an ongoing basis. This mindset also enables some truly fascinating opportunities such as the ability to maintain version control of the data model, the metadata and their relationship - to be able to represent the entire Data Warehouse as it was at a certain point in time - or to even allow different Data Models for different business domains at the same time.
Beyond Data Modeling: Artificial Intelligence and Machine Learning

Dr. Raja Sooriamurthi, Carnegie Mellon University

The combined advances in hardware, software, and communication over the past few decades form the basis of our current disruptive age of Data. Massive amounts of data (terabytes and beyond) are available in a range of domains: science, commerce, finance, healthcare, social media, real-time sensors etc. At historically unprecedented levels we are able to collect, transmit, curate, and process huge amounts of data at enormous speeds resulting in our ability to do ongoing tasks better and to do tasks we couldn’t do before. Data, like fossils, tells us something about the past. The premise is that past patterns are predictive of future behavior. For example, a casino may want to identify whether there is a certain group of customers from which more business occurs. A cell phone company may want to know if there is a risk of customers leaving for another carrier. In this talk, we will discuss various analytic tasks that facilitate such actionable insights such as prediction, optimization, recommendation, classification, clustering etc.

Dr. Raja Sooriamurthi is a Teaching Professor with the Information Systems Program at Carnegie Mellon University, Pittsburgh. His research and teaching interests span the fields of artificial intelligence and software development with a current focus on data-driven decision making. Along with his co-authors, he has investigated a novel approach to teaching critical thinking and problem solving termed puzzle-based learning resulting in the book Guide to Teaching Puzzle-based Learning (Springer, 2014). In addition to his university courses, Raja has taught several conference and industry workshops in the US, Australia, the Middle-East (Qatar, The United Arab Emirates), and India. Over the years, since a graduate student, his pedagogical efforts have been recognized with several awards for teaching excellence.

Bigger is often Better: Data Modeling in the Age of Big Data

Dr. Raja Sooriamurthi, Carnegie Mellon University

Since early 2000 the nature of data has morphed. Big Data is differentiated from traditional data in terms of many ‘V’s, the three
prominent of which are: volume, velocity, and variety. This raises some foundational questions. For example, when we process data at the Tera, Petabyte level and beyond, what fundamental shift in our approach to solving problems occurs? Given the fast transmission and computational speeds of current systems, what new capabilities are enabled by the processing of huge amounts of data in real time? Estimates are that more than 90% of the world’s data is not structured (i.e., not in classical relational databases amenable to SQL queries). What type of new actionable insights are facilitated by the processing of semi-structured (e.g., csv, JSON) and unstructured (e.g., text, images, audio) data? In this talk, we’ll discuss the nature of big data and will discuss various tools, techniques for harnessing the power and how the role of the data modeler is evolving.

Dr. Raja Sooriamurthi is a Teaching Professor with the Information Systems Program at Carnegie Mellon University, Pittsburgh. His research and teaching interests span the fields of artificial intelligence and software development with a current focus on data-driven decision making. Along with his co-authors, he has investigated a novel approach to teaching critical thinking and problem solving termed puzzle-based learning resulting in the book Guide to Teaching Puzzle-based Learning (Springer, 2014). In addition to his university courses, Raja has taught several conference and industry workshops in the US, Australia, the Middle-East (Qatar, The United Arab Emirates), and India. Over the years, since a graduate student, his pedagogical efforts have been recognized with several awards for teaching excellence.

Agile Data Modeling: Strategies for Collaboration, Flexibility, and Evolution

Scott Ambler, Disciplined Agile, Inc.

Data modeling is the act of exploring, and organizing into potential structures, data. Data modeling is an important part of many IT endeavors, or at least it should be, but it is rarely the primary aspect of those endeavors regardless of what data professionals may want to believe. Agile is the act of working in a collaborative, flexible, and evolutionary (iterative and incremental) manner. As you would guess, agile data modeling is data modeling performed in a collaborative, flexible, and evolutionary manner. This presentation explores how we go about agile data modeling in practice.

We will cover:

1. Why do we data model?
2. The agile database techniques stack
3. How much detail do we actually need?
4. Collaborative strategies for agile data modeling
5. How do we design for flexibility?
6. How to safely and quickly evolve your data model

Scott is the Chief Scientist at Disciplined Agile, Inc. He works with organizations around the world to help them to adopt agile and lean strategies across the enterprise. He provides training, coaching, and mentoring in disciplined agile and lean strategies at both the project and organizational level. Scott is the (co)-creator of the Disciplined Agile (DA) framework as well as the Agile Modeling (AM) and Agile Data (AD) methodologies. He is the (co)-author of several books, including Choose Your WoW!, An Executive’s Guide to the Disciplined Agile Framework, Refactoring Databases, Agile Modeling, Agile Database Techniques, and The Object Primer 3rd Edition. Scott blogs regularly at DisciplinedAgileDelivery.com and he can be contacted via Disciplined-Agile.com.

CaseTalk - Data Modeling by Example

Marco Wobben, BCP Software

Q: Data modeling is described as a craft and once completed the results may even seem artful. Yet outsiders may see data modeling as abstract, time consuming or even unnecessary. In many cases the data modeler interviews business experts, studies piles of requirements, talks some more, and then, hocus pocus, presents a diagram with boxes, crow’s feet, arrows, etc… Then the slow process begins to keep the diagrams up to date, explain what the diagrams behold, and sometimes even data modelers themselves may get lost while maintaining a growing set of data models and requirements.

A: Fact based information modeling is the very opposite of abstract. Fact based information modeling uses natural language which expresses facts that are intelligible for both business and technical people. It does not require people to understand the modeler’s magical language of boxes and arrows. Although models can be presented in several diagramming notations, they can be validated in natural language at all times. This gives data modelers, technically skilled people, and business people the benefit of having a well-documented and grounded data model. Therefore the method of Fact Oriented Modeling, is also known as “Data Modeling by Example”.

Presentation Highlights:

- key elements of fact oriented modeling;
- data modeling with facts;
- visualizing the model;
- validating and verbalizing;
- transforming and generating output (E.g.: SQL, Relational, UML, XSD, PowerDesigner, etc.).
Marco Wobben is director of BCP Software and has been developing software well over 30 years. He has developed a wide range of applications from financial expert software, software to remotely operate bridges, automating DWH generating and loading, and many back- and front office and web applications. For the past 10 years, he is product manager and lead developer of CaseTalk, the CASE tool for fact based information modeling, which is widely used in universities in the Netherlands and across the globe.

A day in the life of a Data Architect and Integration Architect

Al Calbazana and Stacey Haurin, Corporation Service Company

This case study describes a method used to build durable, discoverable, and extendable enterprise business and data services using a model-driven approach. This approach introduces conceptual models, logical models, and metadata to the process of developing web service specifications. The primary goal of this approach is to improve the productivity, efficiency, and consistency of service designers and solution architects in an Agile environment. Explore the drivers and benefits of this approach, as well as the lessons learned.

Al Calbazana is an experienced, hands-on, Senior Architect at Corporation Service Company involved in integration architecture and web service design. He has been in the software industry since 2000 and has experience in application design and development, systems integration, and enterprise architecture. Al studied at the University of Delaware and Wilmington University and has a degree in Computer Science. While not working in technology, Alejandro enjoys spending time with his family and playing the guitar.

Stacey Haurin is a business minded data professional with a passion for data and people. Stacey is an Enterprise Data Architect at Corporation Service Company with more than 15 years of experience in Data Architecture, Data Modeling and Data Governance in the Services, Lifesciences, Healthcare and P&C Insurance industries. She earned her degree in Information Systems from Drexel University and is a Certified Data Management
Professional (CDMP) with a dual specialty in Data Modeling and Data Governance. Stacey is active in her professional community currently serving as DAMA International VP Chapter Services and DAMA Philadelphia President; as well as serving on multiple committee for DAMA International including DAMA Excellences Awards and CDMP exam question writing. Stacey was a founding member of Philadelphia Enterprise Modeling User Group, formerly serving as President and Program Chair. Additional information can be found on her LinkedIn profile https://www.linkedin.com/in/stacey-haurin-786642/ Follow her on twitter at @staceyleehaurin. Stacey currently resides in Southeast Pennsylvania.

Demystifying Data Warehousing as a Service

Kent Graziano, Snowflake Computing

We all know that data warehouses and best practices for them are changing dramatically today. As organizations build new data warehouses and modernize their data analytics ecosystem, they are turning to Data Warehousing as a Service (DWaaS) in hopes of taking advantage of the performance, concurrency, simplicity, and lower cost of a cloud-based platform or simply to reduce their data center footprint (and the maintenance that goes with that).

But what is a DWaaS really? How is it different from traditional on-premises data warehousing and big data systems?

In this talk we will:

- Demystify DWaaS by defining it and its goals
- Discuss the real-world benefits of DWaaS
- Describe the key features and design of a DWaaS as exemplified by Snowflake and its novel multi-cluster, shared-data architecture.

Kent Graziano is the Chief Technical Evangelist and Sr Director Customer Advisory Solutions for Snowflake Computing. His is an award winning author, speaker, and trainer, in the areas of data modeling, data architecture, and data warehousing. He is an Oracle ACE Director - Alumni, member of the OakTable Network, a certified Data Vault Master and Data Vault 2.0 Practitioner (CDVP2), expert data modeler and solution architect with more than 30 years of experience, including two decades doing data warehousing and business intelligence (in multiple industries). He is an internationally recognized expert in Oracle SQL Developer Data Modeler and Agile Data Warehousing. Mr. Graziano has developed and led many successful software and data warehouse implementation teams, including multiple agile DW/BI teams. He has written numerous articles, authored three Kindle book (available on Amazon.com), co-authored four books (including the 1st Edition of The Data Model Resource Book), and has given hundreds of presentations, nationally and internationally. He was a co-author on the first book on Data Vault, and the technical editor for Super Charge Your Data Warehouse. In 2014, he was voted one of the best presenters at OUGF14 in Helsinki, Finland. You can follow Kent on twitter @KentGraziano or on his blog The Data Warrior (http://kentgraziano.com).

Making Sense of Schema-On-Read

Kent Graziano, Snowflake Computing

With the increasing prevalence of semi-structured data from IoT devices, web logs, and other sources,
Data architects and modelers have to learn how to interpret and project data from things like JSON. While the concept of loading data without upfront modeling is appealing to many, ultimately, in order to make sense of the data and use it to drive business value, we have to turn that schema-on-read data into a real schema! That means data modeling! In this session I will walk through both simple and complex JSON documents, decompose them, then turn them into a representative data model using Oracle SQL Developer Data Modeler. I will show you how they might look using both traditional 3NF and data vault styles of modeling. In this session you will:

1. See what a JSON document looks like
2. Understand how to read it
3. Learn how to convert it to a standard data model

Kent Graziano is the Chief Technical Evangelist and Sr Director Customer Advisory Solutions for Snowflake Computing. His is an award winning author, speaker, and trainer, in the areas of data modeling, data architecture, and data warehousing. He is an Oracle ACE Director - Alumni, member of the OakTable Network, a certified Data Vault Master and Data Vault 2.0 Practitioner (CDVP2), expert data modeler and solution architect with more than 30 years of experience, including two decades doing data warehousing and business intelligence (in multiple industries). He is an internationally recognized expert in Oracle SQL Developer Data Modeler and Agile Data Warehousing. Mr. Graziano has developed and led many successful software and data warehouse implementation teams, including multiple agile DW/BI teams. He has written numerous articles, authored three Kindle book (available on Amazon.com), co-authored four books (including the 1st Edition of The Data Model Resource Book), and has given hundreds of presentations, nationally and internationally. He was a co-author on the first book on Data Vault, and the technical editor for Super Charge Your Data Warehouse. In 2014, he was voted one of the best presenters at OUGF14 in Helsinki, Finland. You can follow Kent on twitter @KentGraziano or on his blog The Data Warrior (http://kentgraziano.com).

Hackolade Hands-on

Pascal Desmares, Hackolade

NoSQL Data Modeling and API Design with Hackolade:

You will learn how to master Hackolade to perform schema design of JSON nested hierarchies, NoSQL document or column-family databases and key-value stores, Neo4j graphs, as well as Swagger/OpenAPI or GraphQL APIs.

Session highlights:

- Application overview
- Hackolade modeling philosophy
- UI fundamentals
- Advanced features
Pascal Desmarets is the Founder and CEO of Hackolade. He leads the company and all efforts involving business strategy, product innovation, and customer relations, as it focuses on producing user-friendly, powerful visual tools to smooth the onboarding of NoSQL technology in corporate IT landscapes. Hackolade’s software combines the comfort and simplicity of graphic data modeling, with the power of NoSQL document databases, resulting in reduced development time, increased application quality, and lower execution risks.

**CDMP Workshop and Exams**

**Stacey Haurin, Corporation Service Company**

This CDMP preparation workshop presents an overview of the all new DMBoK2 based DAMA Certified Data Management Professional (CDMP) Certification. It describes the CDMP levels, pass marks, prerequisites and the typical experience required.

The bulk of this workshop is spent on preparing delegates to sit the CDMP examinations at DMZ (or later).

It covers:

- the syllabus of CDMP, focusing on the Data Management Fundamentals exam,
- key learning points,
- examination strategies, and
- example questions.

**Preparation for the exam is Monday morning, and you can take any of the exams Monday afternoon or Friday afternoon. There is a Pay Only If You Pass promotion for DMZ.**

Stacey Haurin is a business minded data professional with a passion for data and people. Stacey is an Enterprise Data Architect at Corporation Service Company with more than 15 years of experience in Data Architecture, Data Modeling and Data Governance in the Services, Lifesciences, Healthcare and P&C Insurance industries. She earned her degree in Information Systems from Drexel University and is a Certified Data Management Professional (CDMP) with a dual specialty in Data Modeling and Data Governance. Stacey is active in her professional community currently serving as DAMA International VP Chapter Services and DAMA Philadelphia President; as well as serving on multiple committee for DAMA International including DAMA Excellences Awards and CDMP exam question writing. Stacey was a founding member of Philadelphia Enterprise Modeling User Group, formerly serving as President and Program Chair. Additional information can be found on her LinkedIn profile https://www.linkedin.com/in/staceyleehaurin-786642/ Follow her on twitter at @staceyleehaurin. Stacey currently resides in Southeast Pennsylvania.