DAMA New England & Northeast

CDMP Study Group

DM BoK Chapter 4: Data Architecture

March 12, 2025

Welcome to the DAMA Community!

- DAMA New England/Northeast is a Chapter of DAMA International
- Our mission is to ***inspire Data and Analytics professionals to drive transformational impact through leadership, community, and education***.
- We host educational events via Webinars and on-site
- We promote learning based on the DMBoK2 knowledge areas
- Membership benefits include:
  - Free or discounted admission
  - Educational and networking events
  - Growing base of knowledge items available via Member-only section of the Website
  - Peer-to-peer networking and mentoring opportunities

We welcome you to be part of our growing community!

Laura Sebastian-Coleman

DAMA Northeast Board Member, Finance

finance@DAMANewEngland.org

About Laura:

After earning her Ph.D. in English Literature from the University of Rochester, she moved from academia to the corporate world, eventually finding her niche in data quality management.

As a data quality practitioner, she has made significant contributions to the field, including as production Editor of the second edition of the DAMA Body of Knowledge (DAMA-DMBOK2), and writing 4 books on Data Management and Quality.

Her professional achievements include serving as the DAMA International Publications Officer and the Membership Director for IAIDQ.

She currently holds the position of VP Data Management and Governance at Prudential Financial

Laura's expertise and accolades:

Data Quality, Data Governance, DMBoK 2 editor
DAMA's award for Contributions to the Data Management Profession
IAIDQ's Distinguished Member award

Want to know more?
Check out these books, articles, podcasts, and links:

Laura's books:

- Navigating the Labyrinth
- Measuring Data Quality for Ongoing Improvement
- Meeting the Challenges of Data Quality Management
- Insurance Data Quality and Trusted Information (IDMA)

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Agenda

- Facilitator Introduction
- Welcome to DAMA New England / Northeast
- Important Information About this Study Group
- **Chapter 4: Data Architecture**
  - Overview
  - What data architecture is, how it fits with other architectural domains, and why it is important
  - Architectural frameworks and why they are important
  - Architectural artifacts: Enterprise Data Model and Data Flow Diagrams
  - Approach to studying
- Q & A
- Next Session March 19th 7 pm Chapter 5 Data Modeling and Design

Quick follow ups

- Proctoring – the CDMP site has a FAQ which provides information about online proctoring. https://cdmp.info/faqs/#study
- When you register for the exam, you will get a practice exam – 40 questions
- For other options, Google “CDMP Practice exams”

Important Information About this Study Group

- This study group is offered as a service of DAMA New England for DAMA New England / Northeast members and for other DAMA Chapter members.
- For members of other chapters, DAMA NE offers a “student membership” at no cost so that you can access our ‘Members Only’ section for Zoom call information and study materials.
- This is not an official, DAMA International authorized training course.
- All study group sessions are optional.
- The purpose of this group is to help prepare members to take the CDMP and be a support for one another.
- We will do so by reviewing the content of chapters of the DMBOK2.
- DAMA New England/Northeast makes no claims for the effectiveness of the sessions or the ability of participants to pass the CDMP exam after having attended. In fact, you should plan on doing a lot of individual study to pass the exam.
- Reminder: **For additional information, see: https://cdmp.info/**

Thinking about Architechture

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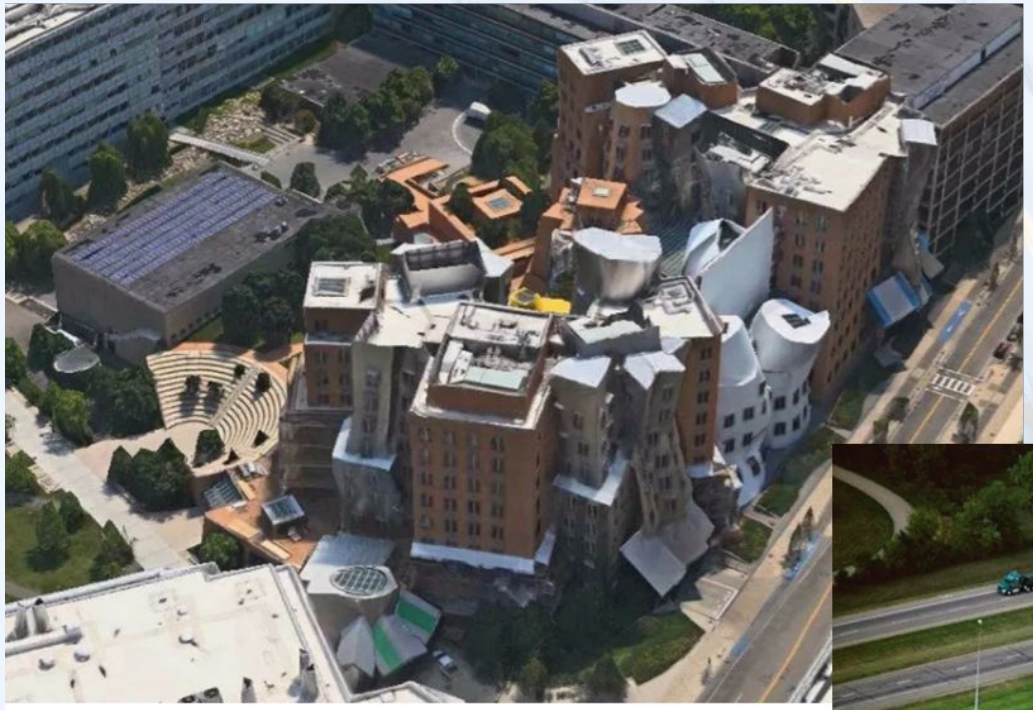
Architecture



Ray &Maria Stata Center©Pinterest

It may be good or bad, planned or unplanned.

Lotus Riverside Complex ©Archdaily

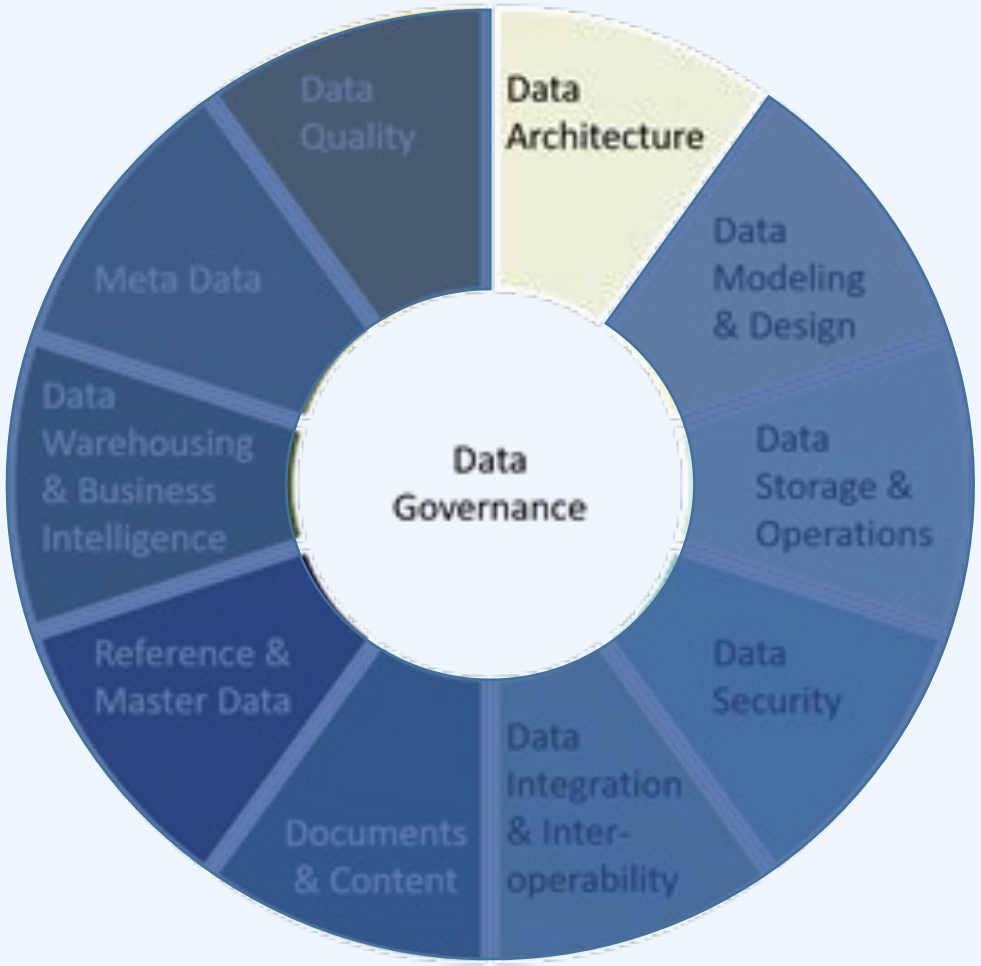
Longaberger ©Tripzilla

Like quality, Architecture exists.

Well-planned is generally better than poorly-thought out.

Thinking about Chapter 4: Data Architecture

- No organization starts from scratch, from a data perspective. Even if one did, data dependencies arise quickly.
- Architecture enables a BIG PICTURE view of an organization and its data. Architectural artifacts are the means by which an organization represents its data to itself.
- It also enables a LONG-TERM view of an organization and its data. Organizations need an architectural ROADMAP to understand where they are, as well as to understand where they want to be and how to get there.
- An architectural perspective is critical to how an organization establishes its data strategy. Architecture can DRIVE INNOVATION.
- If we recognize, as Tom Redman says, that DATA IS DOING ITS WORK when it is moving through the organization and BEING USED, we will see why ideally, data architecture practices should be comprehensive, strategic, and dynamic.



Chapter 4: Data Architecture

Identifying the data needs of the enterprise and designing and maintaining the master blueprints to meet those needs. Using master blueprints to guide data integration, control data assets, and align data investments with business strategy.

The word *Architecture* can refer to:

- A description of the current state of systems
- The components of a set of systems
- The discipline of designing systems (architecture practice)
- The intentional design of a system or a set of systems (future state or proposed architecture)
- The artifacts that describe a system (architecture documentation)
- The team that does the design work (the Architects or the Architecture team)

WORD OF THE DAY: *Perspective*
Architecture is all about perspective.

Data Architecture: Part of Enterprise Architecture

- Enterprise Architecture encompasses:
  - Business architecture
  - Data architecture
  - Application architecture
  - Technology architecture
- Enterprise Architecture enables an organization to:
  - Understand the current state of their systems
  - Promote desirable change toward future state
  - Enable regulatory compliance
  - Manage data
  - Manage the systems in which data is stored and used

- Successful Architecture depends on
  - Good design
  - Planning
  - Ensuring that the designs and plans are executed effectively
- Data Architects seek to
  - Design an optimal technical footprint
  - Improve operational and project efficiencies
  - Increase the ability of the organization to use its data.
- Data Architecture is most valuable when it supports the needs of the enterprise – rather than focusing on individual business verticals.

Data Architecture: Part of Enterprise Architecture

Domain	Enterprise Business Architecture	Enterprise Data Architecture	Enterprise Applications Architecture	Enterprise Technology Architecture
Purpose	To identify how an enterprise creates value for customers and other stakeholders	To describe how data should be organized and managed	To describe the structure and functionality of applications in an enterprise	To describe the physical technology needed to enable systems to function and deliver value
Elements	Business models, processes, capabilities, services, events, strategies, vocabulary	Data models, data definitions, data mapping specifications, data flows, structured data APIs	Business systems, software packages, databases	Technical platforms, networks, security, integration tools
Dependencies	Establishes requirements for the other domains	Manages data created and required by business architecture	Acts on specified data according to business requirements	Hosts and executes the application architecture
Roles	Business architects and analysts, business data stewards	Data architects and modelers, data stewards	Applications architects	Infrastructure architects

Data Architecture: Business Drivers

The problems Data Architecture is trying to solve:

- More data than the average bear! Most organizations have more data than a single person can understand.
- Different Levels Of detail for different decision-makers. Data needs to be represented at different levels of detail so that people can make decisions about it.
- Architectural Artifacts help with comprehension. Data architects create the artifacts that enable people to understand their organization's data.

Architecture can DRIVE INNOVATION!

Data architecture ***enables organizations to***:

- Plan for evolution: Prepare organizations to evolve products, services, and data to take advantage of business opportunities inherent in emerging technologies
- Translate requirements: Translate business needs into data and system requirements so that processes consistently have the data they require
- Manage delivery: Manage complex data and information delivery throughout the enterprise
- Facilitate alignment between Business and IT
- Act as agents for change, transformation, and agility

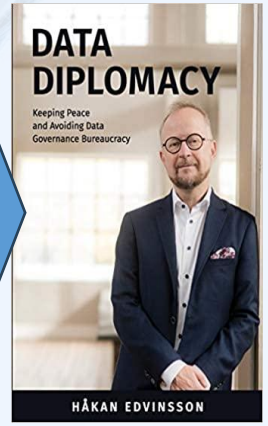
Data Architecture from different perspectives

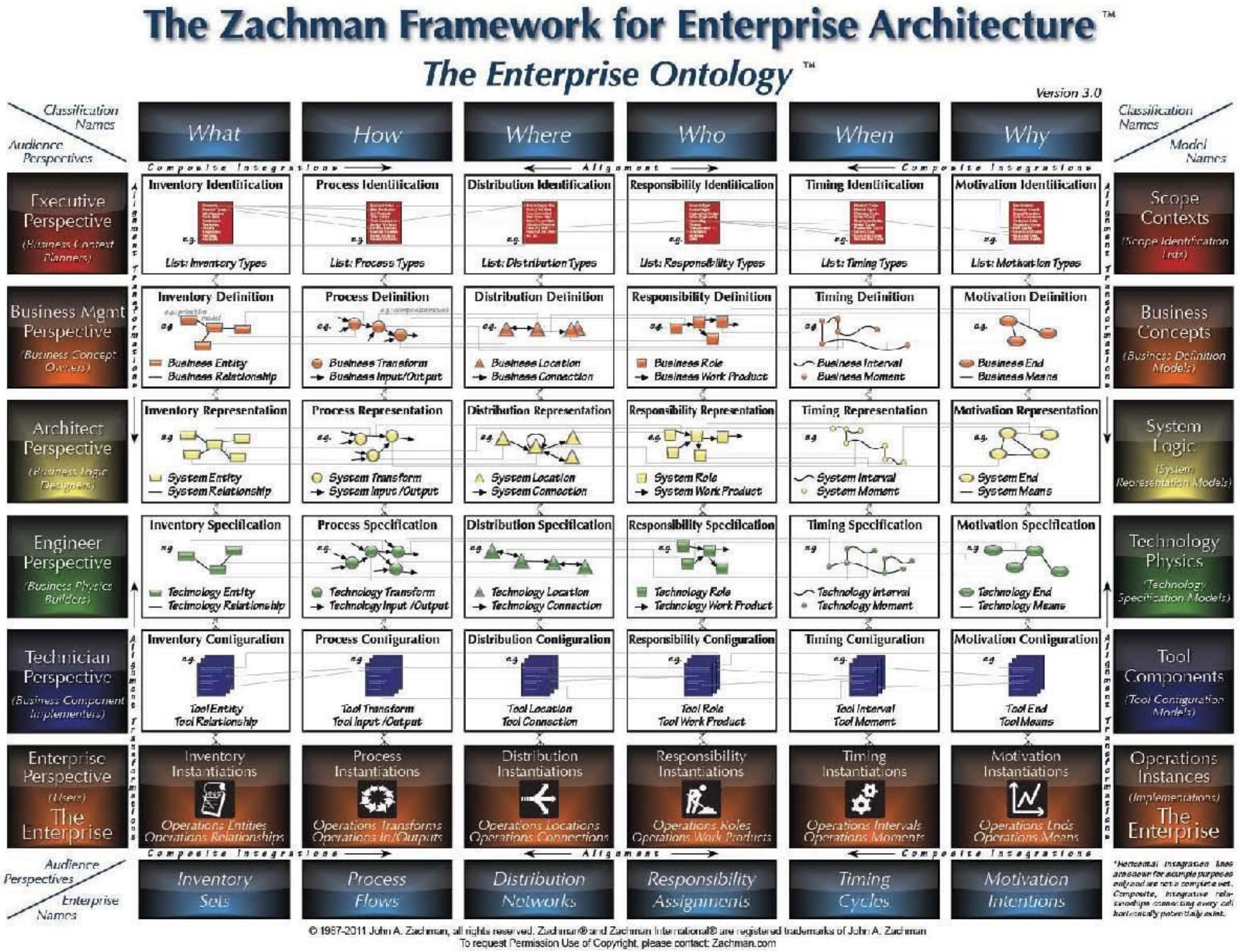
Chapter 4 looks at Data Architecture from three perspectives:

1. Data Architecture outcomes / artifacts: models, definitions and data flows on various levels of abstraction
2. Data Architecture activities, to form, deploy and fulfill Data Architecture intentions
3. Data Architecture behavior: collaborations, mindsets, and skills among the various roles that affect the enterprise's Data Architecture.

- Data Architecture artifacts (master blueprints) are used to:
  - Define data requirements
  - Guide data integration
  - Control data assets
  - Align data investments with business strategy
- Data Architects must
  - Collaborate with, learn from and influence various stakeholders that are engaged with improving the business or IT systems development
  - Help to establish the semantics of an enterprise, via a common business vocabulary

Recommended Reading:
Data Diplomacy by Hakan Edvinsson
Focuses on how architects interact with other people in the organization to get things done.
Architecture is about people!





Architectural frameworks are important to understanding architecture as a whole.

Of these, the most influential is the Zachman Framework, which is organized around basic questions related to the perspectives of stakeholders across an enterprise.

Different stakeholders require information at different levels of abstraction.

This is wicked hard to read, so the next slide has the simplified version that appears in DMBOK2.

	What	How	Where	Who	When	Why	
Executive	Inventory Identification	Process Identification	Distribution Identification	Responsibility Identification	Timing Identification	Motivation Identification	Scope Context
Business Management	Inventory definition	Process Definition	Distribution Definition	Responsibility Definition	Timing Definition	Motivation Definition	Business Concepts
Architect	Inventory Representation	Process Representation	Distribution Representation	Responsibility Representation	Timing Representation	Motivation Representation	System Logic
Engineer	Inventory Specification	Process Specification	Distribution Specification	Responsibility Specification	Timing Specification	Motivation Specification	Technology Physics
Technician	Inventory Configuration	Process Configuration	Distribution Configuration	Responsibility Configuration	Timing Configuration	Motivation Configuration	Tool Components
Enterprise	Inventory Instantiations	Process Instantiations	Distribution Instantiations	Responsibility Instantiations	Timing Instantiations	Motivation Instantiations	Operational Instances
	Inventory Sets	Process Flows	Distribution Networks	Responsibility Assignments	Timing Cycles	Motivation Intentions	

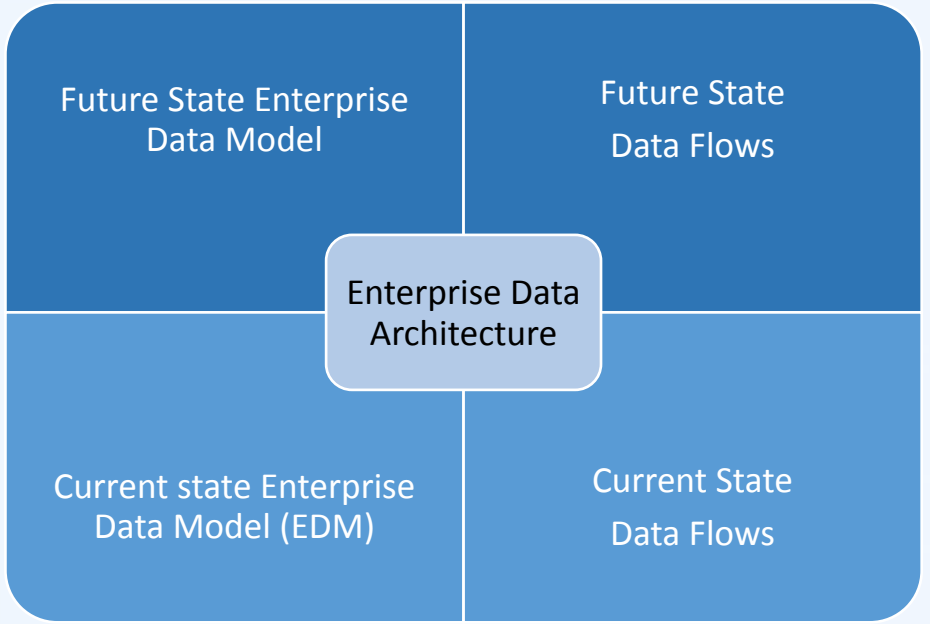
Data Architecture: EDM and Data Flow Design

Data exists in and moves through an enterprise.

Data Architecture needs to account for both the current and future state of the data model and the data flows.

Enterprise Data Model (EDM): The EDM is a holistic, enterprise-level, implementation-independent conceptual or logical data model providing a common consistent view of data across the enterprise. It sets forth the foundation for all data and data-related projects. … Any project-level data model must be based on the EDM. The EDM should be reviewed by stakeholders, so that there is consensus that it effectively represents the enterprise.

Data Flow Design: Defines the requirements and master blueprint for storage and processing across databases, applications, platforms, and networks (the components). These data flows map the movement of data to business processes, locations, business roles, and to technical components.



The EDM

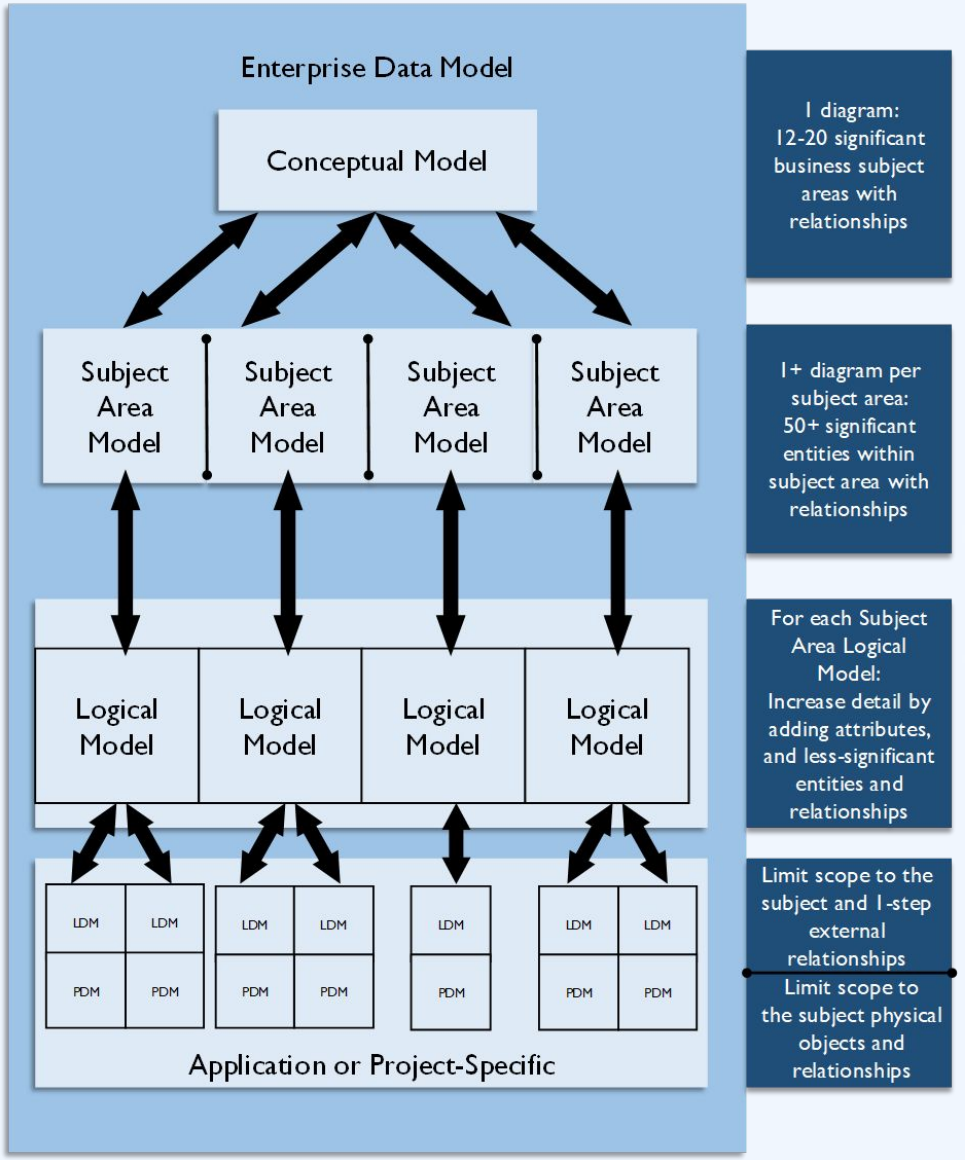
The EDM can be a stand-alone artifact, or it can be comprised of the overall set of models created by the enterprise.

Different types of models – at different levels of abstraction – must be related to each other.

Conceptual models are ultimately linkable to physical application data models

The diagram shows:

- A conceptual overview over the enterprise's subject areas
- Views of entities and relationships for each subject area
- Detailed, partially attributed logical views of these same subject areas
- Logical and physical models specific to an application or project



The Subject Area Model

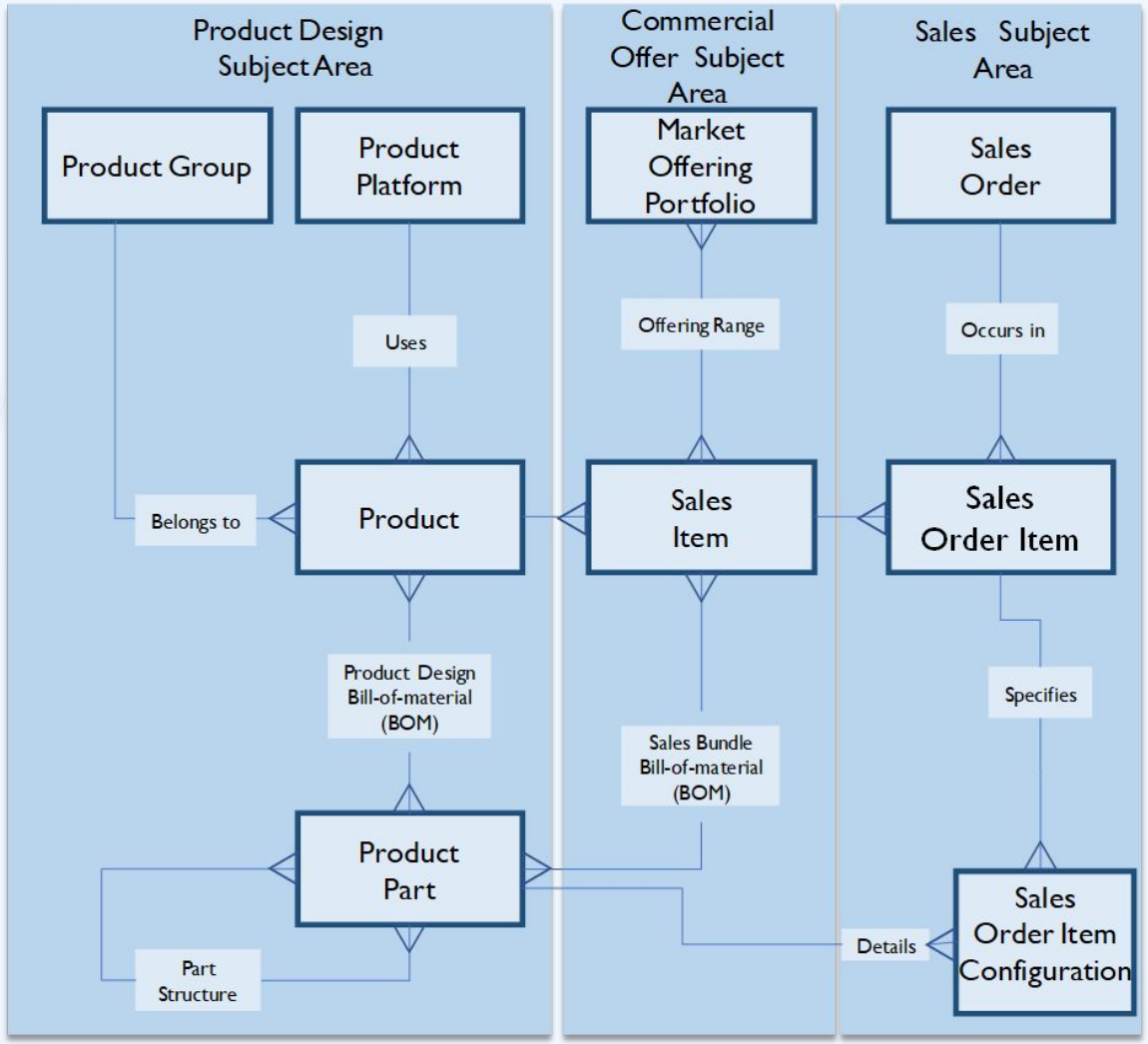
EDM can be:

- A stand-alone artifact OR
- Comprised of the overall set of models created by the enterprise

Establish a principle for division of subject areas (a subject area discriminator). For example,

- Normalization rules
- Systems portfolios (i.e., funding)
- Data governance structure and data ownership (organizational)
- Top-level processes (based on the business value chains)
- Business capabilities (enterprise architecture-based)

The Subject Area structure is usually most effective for Data Architecture work if it is formed using normalization rules.

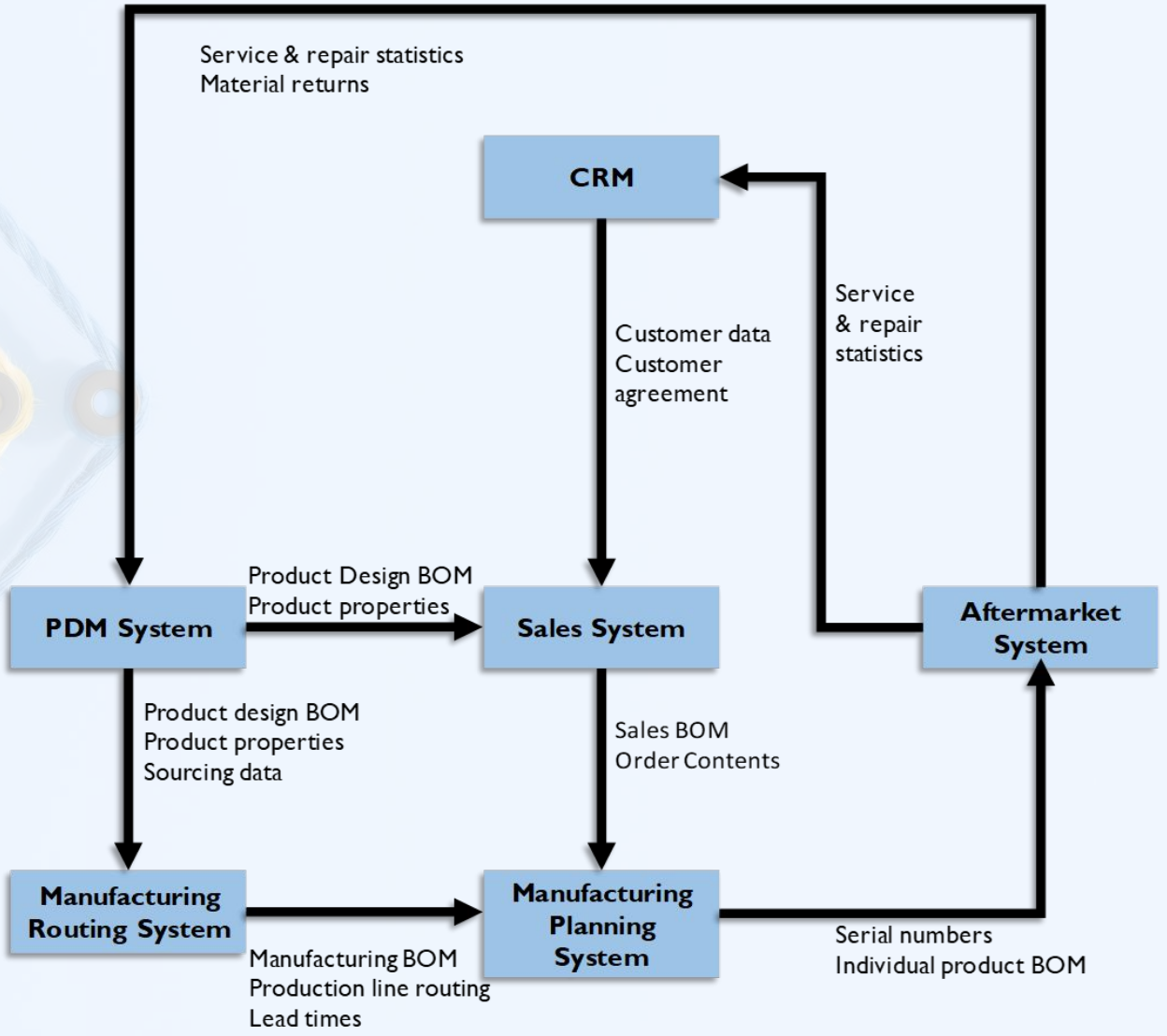


Data Flows

Data Flow diagrams depict how data moves through an organization. Data flows can be organized in different ways.

This traditional high-level flow diagram shows the movement of data between different systems that support business processes.

Such a diagram can be created with different levels of detail, depending on the audience and purpose.

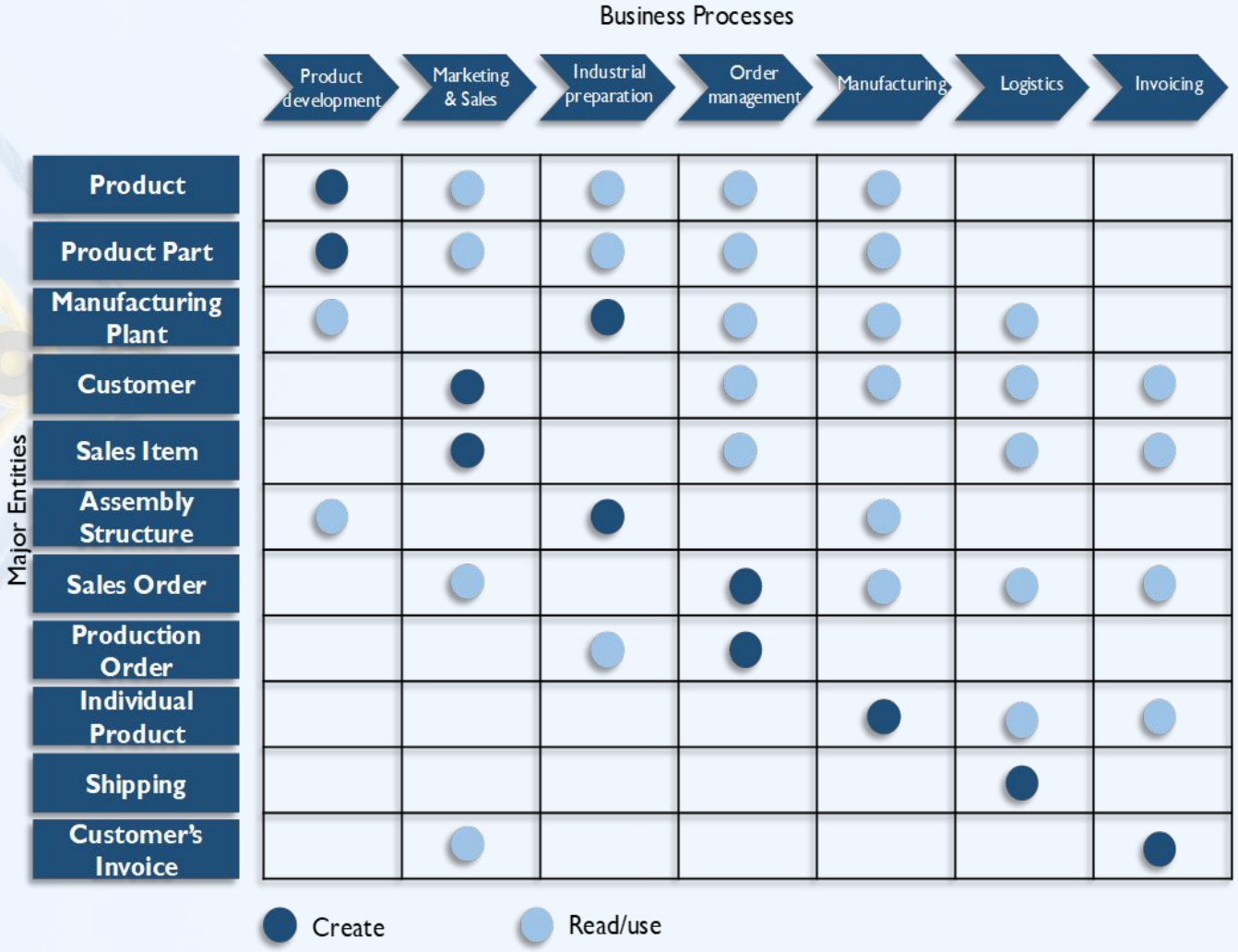


Data Flows

This matrix shows the relationship between business processes and data entities that create or use data.

Benefits of a matrix depiction:

- Shows that data does not flow in just one direction
- Shows many-to-many relationships
- Can clarify data acquisition responsibilities
- Can clarify data dependencies between processes



Data Architecture Activities: Establish the practice

Establish Data Architecture Practice

- Part of Enterprise Architecture OR adopt a framework

Account for

- Strategy
- Culture
- Organizational accountabilities, responsibilities
- Work methods
- Results / relation to roadmap

Relationship to projects

- Defining requirements
- Reviewing project data design
- Determining data lineage impact
- Data replication control
- Enforce Architecture standards
- Guide technology decisions

Evaluate Existing Specifications

Develop a roadmap

Manage enterprise requirements within projects

Data Architecture Activities

Evaluate and Update Existing Specifications

Develop a roadmap

- Manage dependencies
- Make forward-looking decisions
- Evaluate trade-offs
- Formulate pragmatic plans, aligned with business needs and opportunities, external requirements, and available resources.
- To develop a roadmap, start with the lowest dependency activities

Manage enterprise requirements within projects

- Bring an enterprise perspective to project scope
- Understand requirements
- Ensure implementation makes sense in terms of the overall architecture

Note: The role of the enterprise data architect will depend in part on the implementation methodology (e.g., waterfall, agile, hybrid)

Discussion / Q&A: How to study …

Architectural Frameworks

Architectural Artifacts

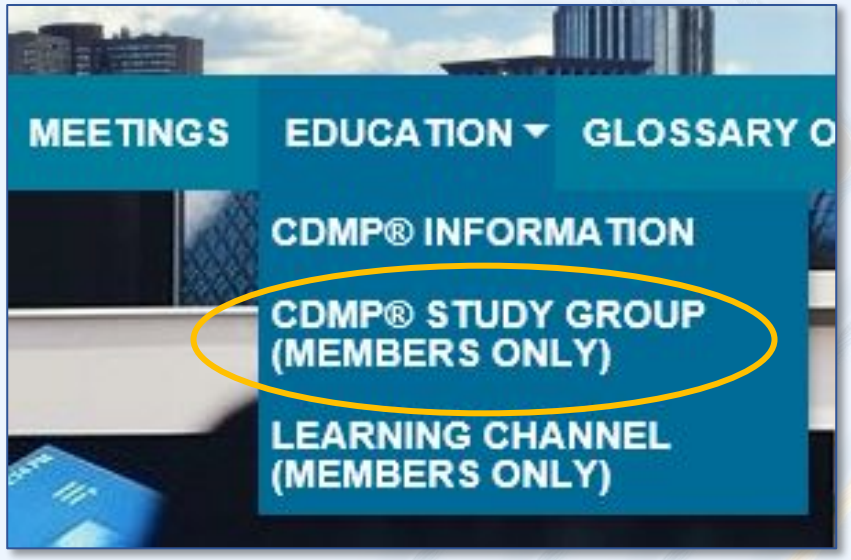
The role of the Data Architect
- Strategy / Projects
- Innovation / Quality

HOMEWORK – Data Storage and Operations

Why is the role of Database Administrator important in the support of Data Governance efforts?

Study Group Materials & Next Sessions

Study group presentations will be posted on CDMP Study Group page, on DAMA New England / Northeast website, in the Schedule & Agenda section.



March 19th

Schedule & Agenda

DMBoK Chapter Review Sessions will be held every **Wednesday at 7pm**, per the following schedule:

Date	Topic and Links to Materials	Presenter(s)	Recording Link
February 19, 2025	Overview & Introduction and Chapter 1: Data Management	Laura Sebastian-Coleman	Chapter 0 & 1 Recording
February 26, 2025	Chapter 2: Data Handling Ethics	Lynn Noel	Chapter 2 Recording
March 5,2025	Chapter 3: Data Governance	Laura Sebastian-Coleman	
March 12, 2025	Chapter 4: Data Architecture	Laura Sebastian-Coleman	
March 19, 2025	Chapter 5: Data Modeling & Design	Lynn Noel	
March 26, 2025	Chapter 6: Data Storage & Operations		
April 2, 2025	Chapter 7: Data Security	Laura Sebastian-Coleman	
April 9, 2025	Chapter 8: Data Integration and Interoperability		
April 16, 2025	Chapter 9: Document & Content Management		
April 23, 2025	Chapter 10: Reference and Master Data		
April 30, 2025	Chapter 11: Data Warehousing & Business Intelligence	David Lawrence	
May 7, 2025	Chapter 12: Metadata Management		
May 14, 2025	Chapter 13: Data Quality	Laura Sebastian-Coleman	
May 21, 2025	Chapter 14: Big Data & Data Science		
May 28, 2025	Chapter 15: Data Management Maturity Assessment		
June 4, 2025	Chapter 16: Data Management Organization & Role Expectations		
June 11, 2025	Chapter 17: Data Management & Organizational Change Management	Lynn Noel	