Data Architecture vs. Enterprise Architecture

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Donna is a recognized industry expert in data management with over 25 years of experience in data strategy, data governance, data modeling, metadata management, and enterprise architecture. Her background is multi-faceted across consulting, product development, product management, brand strategy, marketing, and business leadership.

She is currently the Managing Director at Global Data Strategy, Ltd., an international data management consulting company that specializes in the alignment of business drivers with data-centric technology.

In past roles, she has served in key brand strategy and product management roles for several of the leading data management products in the market.

As an active contributor to the data management community, she is a long time DAMA member, contributor to the DMBOK 2.0 and 3.0, Past President and Advisor to the DAMA Rocky Mountain chapter, and was awarded the Excellence in Data Management Award from DAMA International.

She has worked with dozens of Fortune 500 companies worldwide in the Americas, Europe, Asia, and Africa and speaks regularly at industry conferences. She has co-authored several books and is a regular contributor to industry publications. She can be reached at donna.burbank@globaldatastrategy.com
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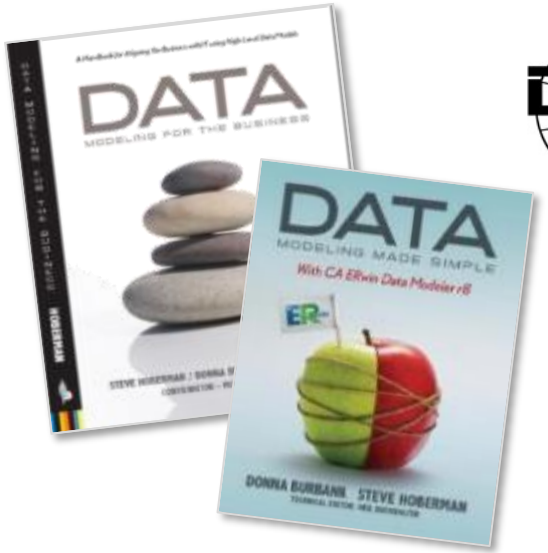

DATAVERSITY Data Architecture Strategies

This Year's Lineup

- **January** Trends in Data Architecture
- **February** Building a Data Strategy - Practical Steps for Aligning with Business Goals
- **March** Building the Right Architecture for Analytics & Reporting
- **April** Data Architect vs. Data Engineer vs. Data Scientist – Making Sense of Roles in Today's Data-Centric Organization
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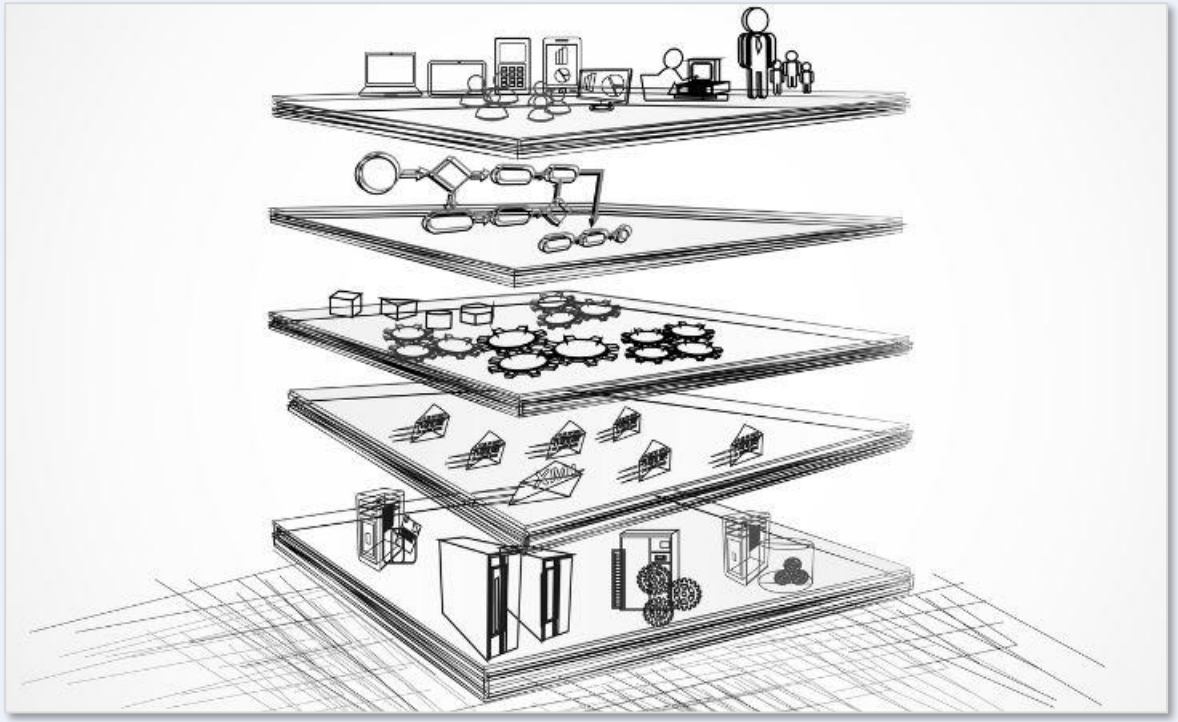
- **October** Best Practices in Metadata Management
- **December** The Business Value of Data Modeling

What We'll Cover Today

- Enterprise Architecture (EA) provides a visual blueprint of the organization, and shows **key interrelationships between data, process, applications, and more**.
- By abstracting these assets in a graphical view, it's possible to **see key interrelationships, particularly as they relate to data and its business impact across the organization**.
- This webinar will discuss how **data architecture is a key component of an overall enterprise architecture for enhanced business value and success**.



Enterprise Architecture - Definition

Supporting Business Innovation with a Strong Architectural Foundation

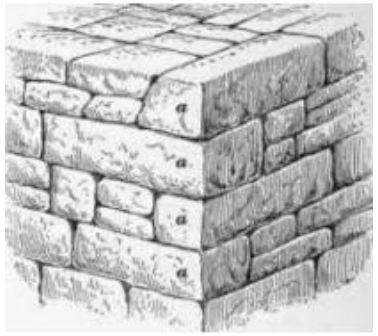
- Enterprise architecture (EA) is a discipline for proactively and holistically leading enterprise ***responses to disruptive forces by identifying and analyzing the execution of change toward desired business vision and outcomes***.

- …by presenting business and IT leaders with signature-ready recommendations for adjusting policies and projects to achieve target business outcomes that capitalize on relevant business disruptions.

- EA is used to steer decision making toward the ***evolution of the future state architecture***.[1]

Innovation

Foundation

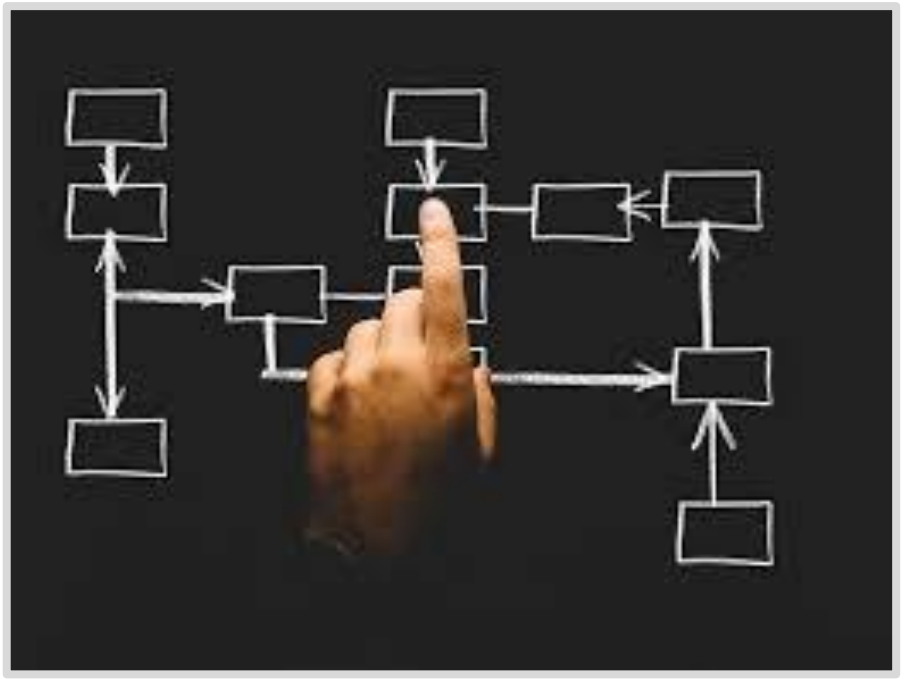


[1] Gartner IT Glossary

Enterprise Architecture – Definition for Data Architects

Modeling is important on many levels

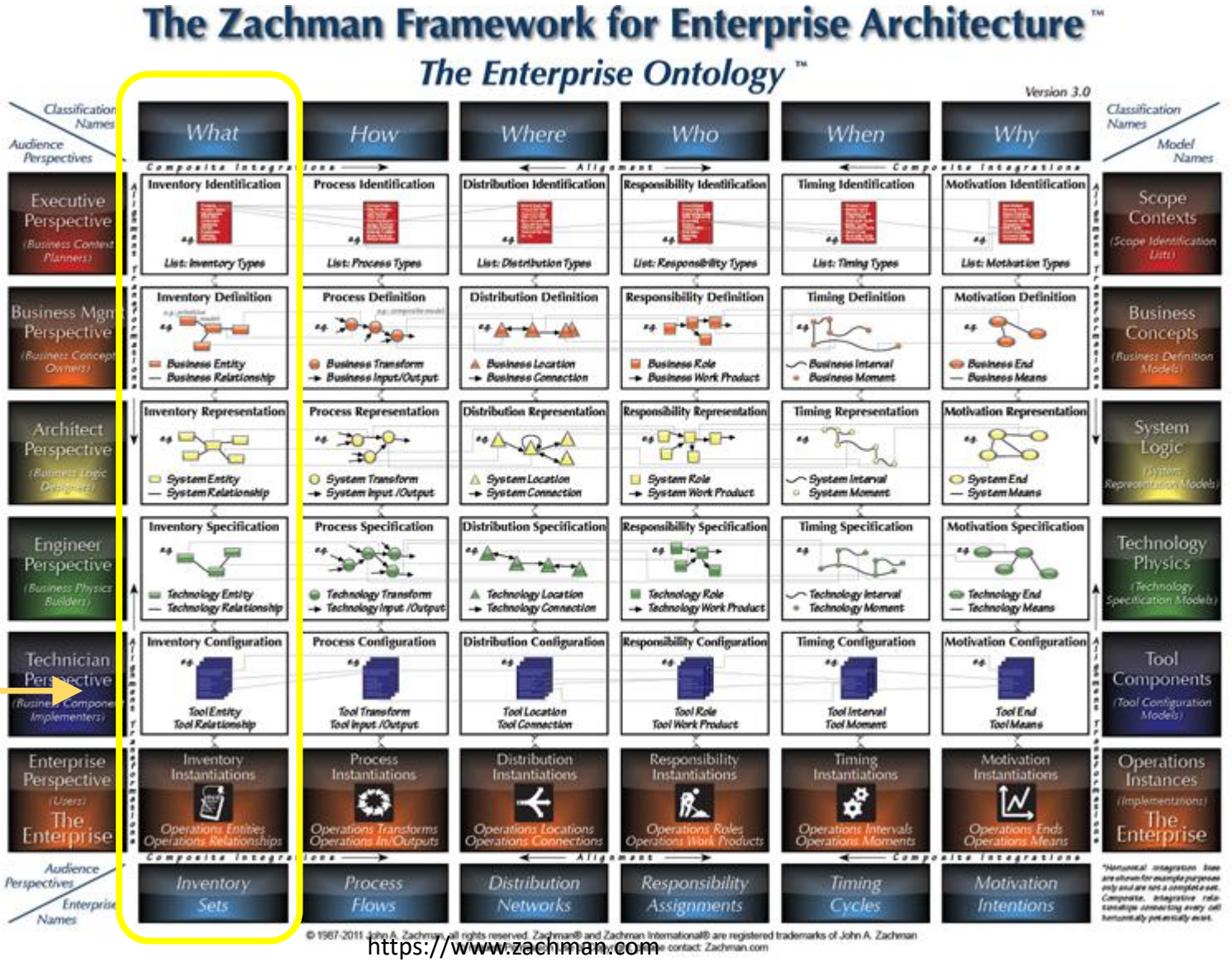
- Just as you need to model the data in an organization, you need to model the organization itself:
  - Motivations & Goals
  - Business Capabilities
  - Business Processes
- As well as the related technologies that support the organization
  - Applications
  - Data
  - Networks
  - Etc.



Frameworks for Enterprise Architecture

Zachman Framework

- The Zachman Framework organizes data into the simple categories of:
  - What
  - How
  - Where
  - Who
  - When
  - Why?
- Data fits nicely within the “What” column.

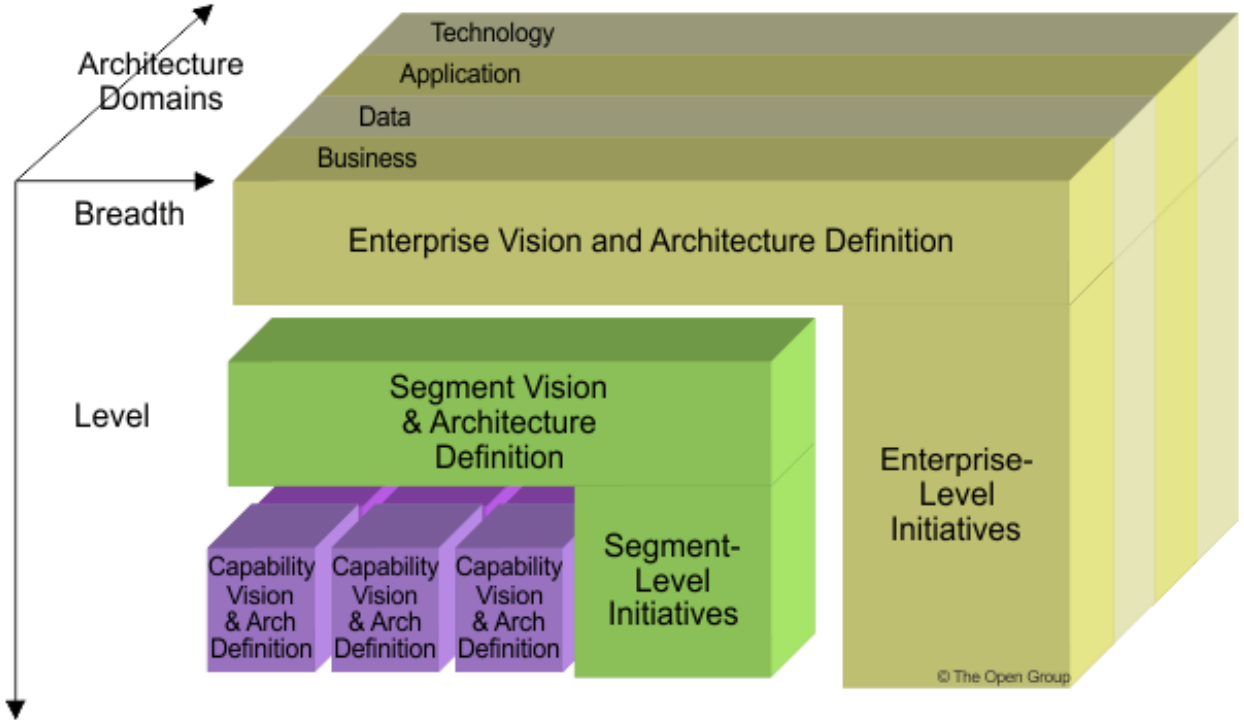


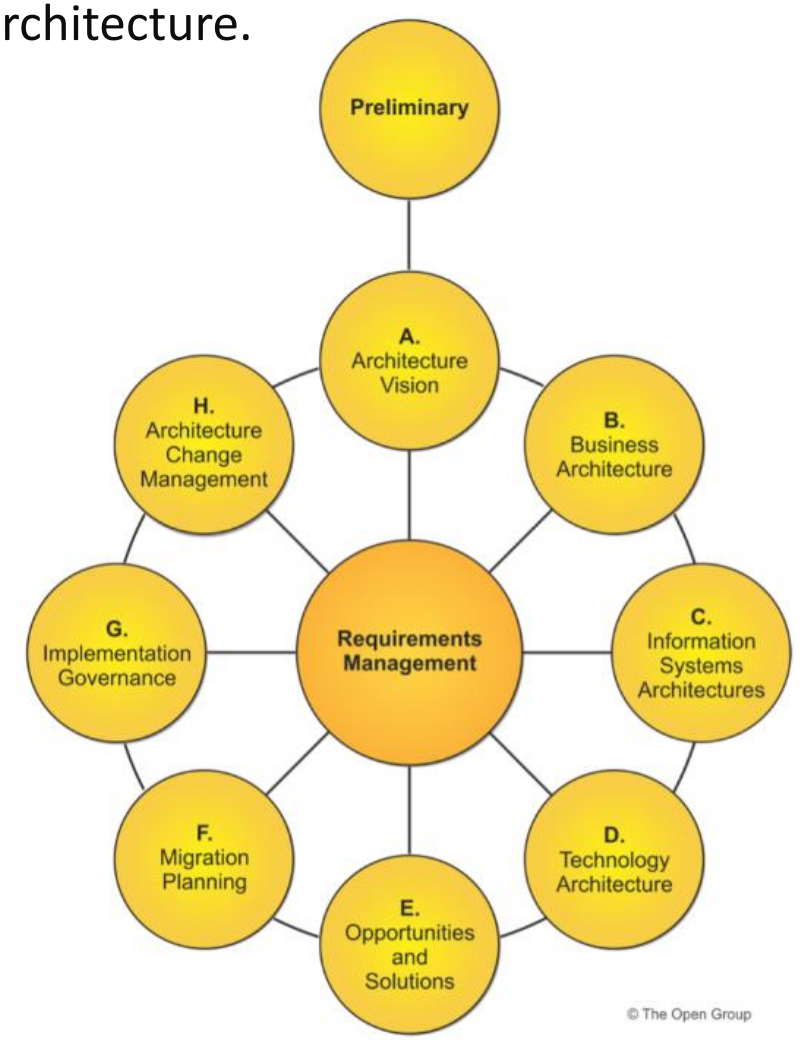
https://www.zachman.com

Frameworks for Enterprise Architecture

TOGAF EA Framework

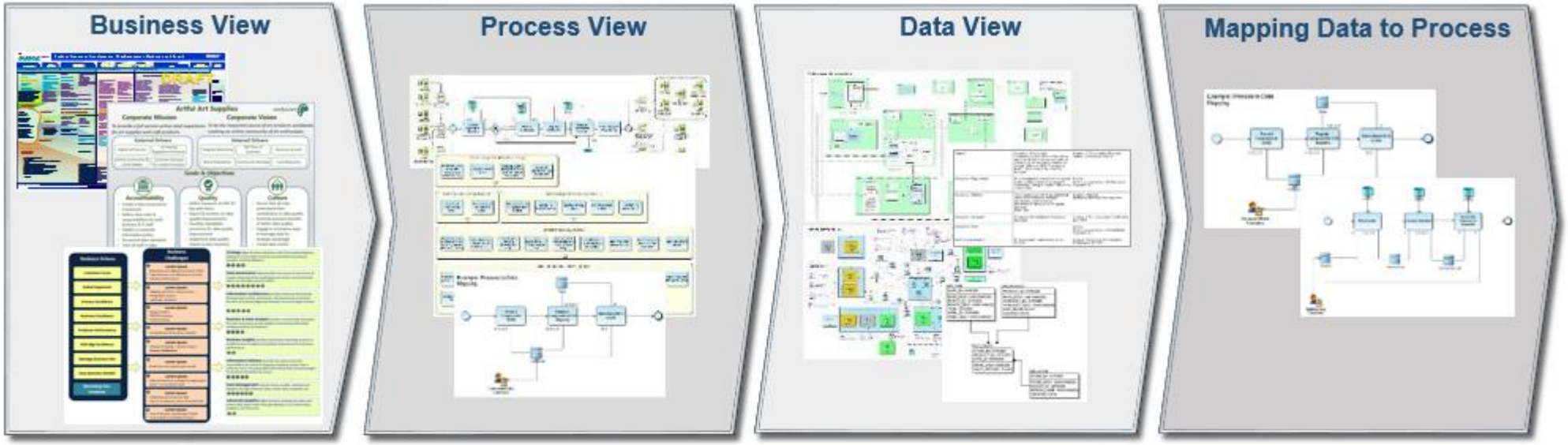
- The TOGAF Architecture Development Method (ADM) developed by the OpenGroup is a step-by-step approach to developing an enterprise architecture.
- It provides a detailed framework for building an architecture around Business, Data, Application & Technology.





Data as Part of Enterprise Architecture

- Enterprise Architecture provides a high-level view of the people, processes, applications, and data of an organization
- Putting data in business context
  - How does data link to the rest of my organization?
  - If I change data, what business processes are affected?



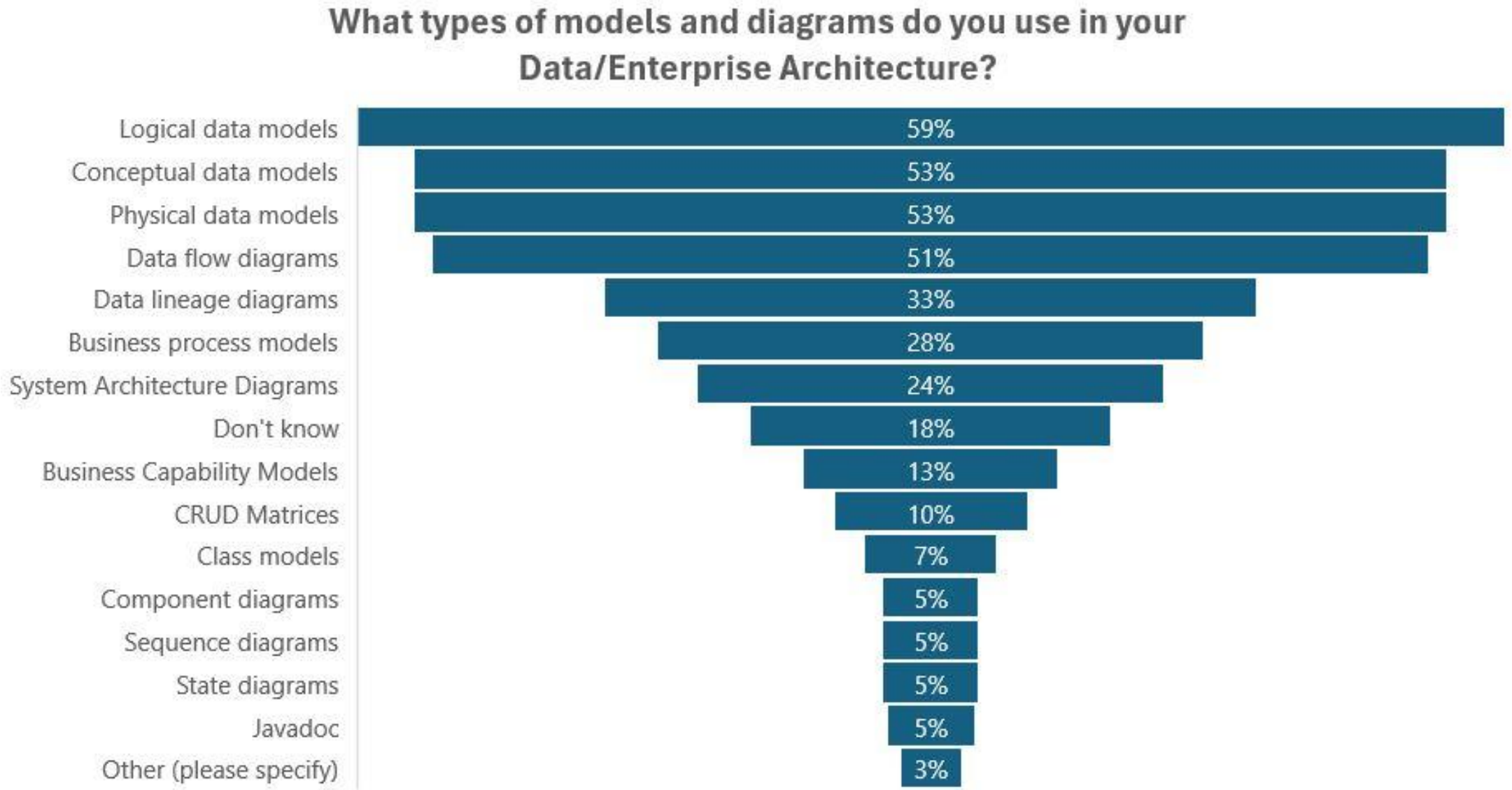
- Motivation Model
- Business & Data Capability
- Mapping Business Drivers to Data Mgt Capabilities

- High-Level Process Models
- Detailed Process Models

- Conceptual Data Models
- Business Glossary
- Logical Data Models
- Physical Data Models
- System Architecture Diagrams

- Process to Data Mapping
- Where Used / CRUD Analysis

What EA Model Types are in Use?



From Trends in Data Management, a 2024 DATAVERSITY® Report, by Donna Burbank and Michelle Knight

Architecture vs. Construction

- It's a common analogy to use building architecture as an analogy to data architecture.
- When constructing a building, there is a clear distinction between designing a house and building a house.

Design

Build

The Role of the Architect

Technology

Business

Janus

Architecture Diagrams and Artifacts – Some Tools of the Trade

Business Motivation Model

Artful Art Supplies

ArtfulArt

Corporate Mission

To provide a full service online retail experience for art supplies and craft products.

Corporate Vision

To be the respected source of art products worldwide, creating an online community of art enthusiasts.

External Drivers

- Digital Self-Service
- Increasing Regulation Pressures
- Online Community & Social Media
- Customer Demand for Instant Provision

Internal Drivers

- Targeted Marketing
- 360 View of Customer
- Revenue Growth
- Brand Reputation
- Community Building
- Cost Reduction

Data-centric Goals & Objectives

Accountability

- Create a Data Governance Framework
- Define clear roles & responsibilities for both business & IT staff
- Publish a corporate information policy
- Document data standards
- Train all staff in data accountability

Quality

- Define measures & KPIs for key data items
- Report & monitor on data quality improvements
- Develop repeatable processes for data quality improvement
- Implement data quality checks as BAU business activities

Culture

- Ensure that all roles understand their contribution to data quality
- Promote business benefits of better data quality
- Engage in innovative ways to leverage data for strategic advantage
- Create data-centric communities of interest

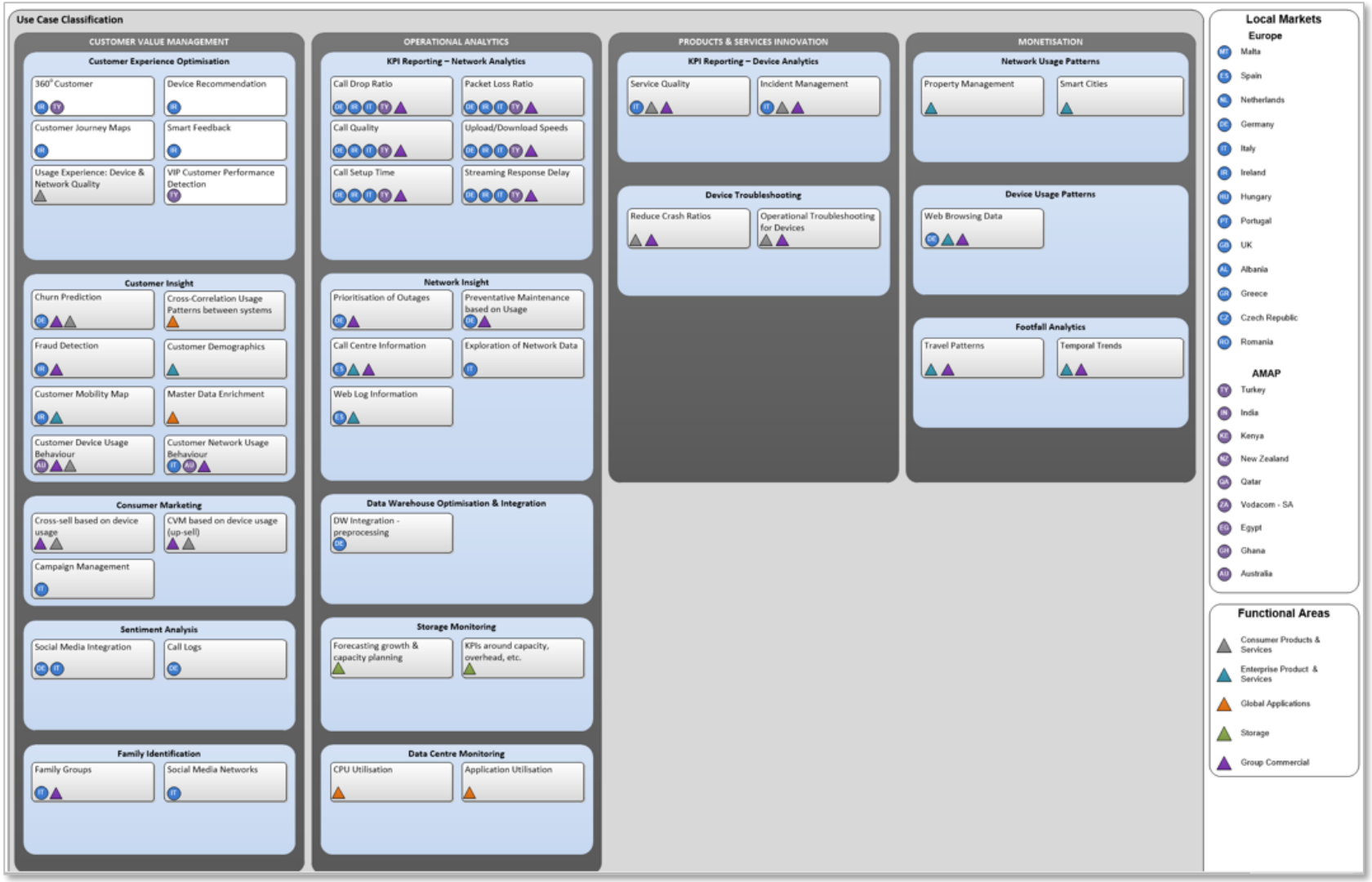
- Corporate-level Mission & Vision
- May already be created or may need to create as part of project.

- External Drivers are what you're facing in the industry
- Internal Drivers reflect internal corporate initiatives.

- Data-Centric Goals & Objectives
- Clear direction for the project
- Use marketing-style headings where possible

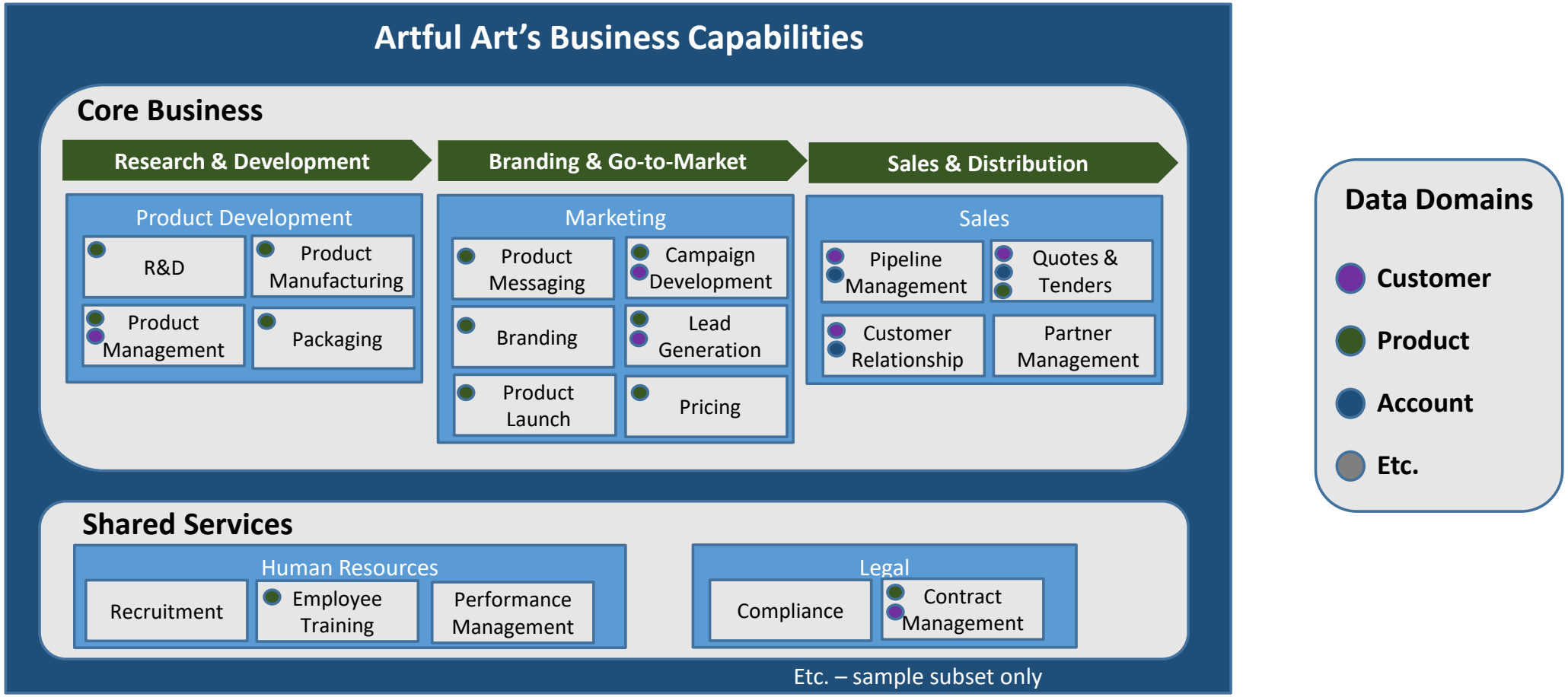
Use Case Model

- The Use Case Model
  - Categorizes existing demand
  - Provides a “heat map” of usage patterns
- Particularly important for large, geographically distributed teams & departments.



Business Capability Models

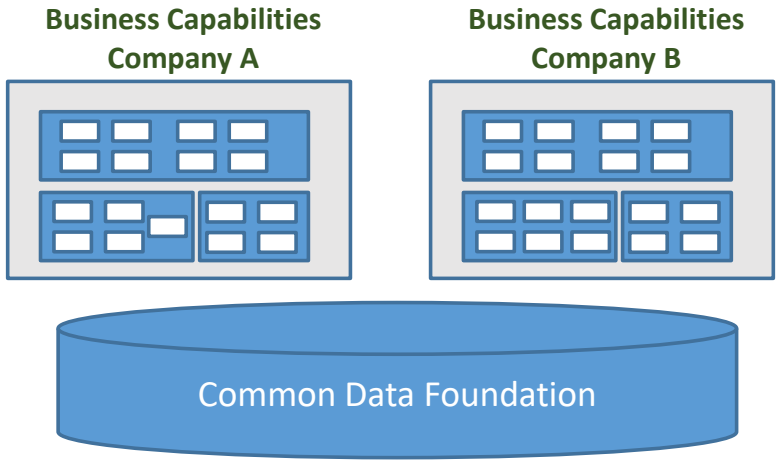
- A business capability model outlines the core functional areas of the organization.
  - Note: this is not the same as an organizational chart
  - Capabilities can be overlaid with key data domains to create a “heat map” of cross-functional data usage.



Data-Driven Merger for Financial Services

The combined information assets of both companies is one of our biggest strategic advantages.
- CEO

- A key driver for a recent merger of two large financial institutions was the integration of data assets
  - Streamlining the merger of the two organizations by *integrating the data assets*
  - Identify ways in which *data can be used to strategic advantage*
- Organizational Structure & Business Capability Alignment were critical
  - Understanding how data was used across the organization
  - Identifying efficiencies & opportunities for collaboration



Aligning Organizational Capability to Data Governance

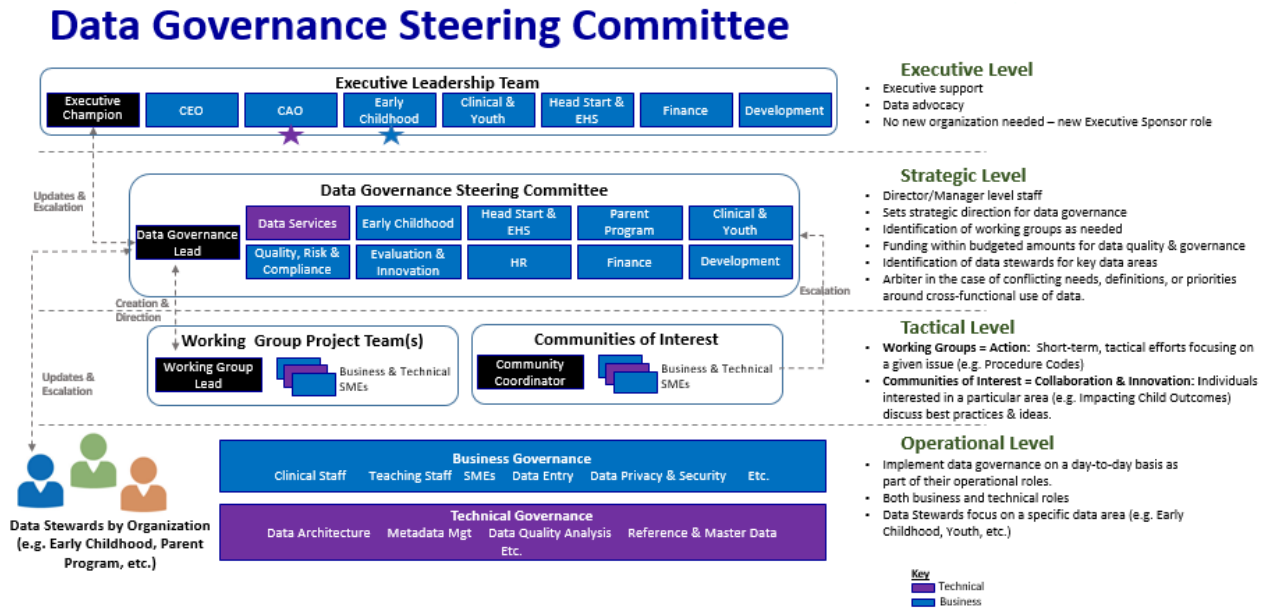
Organizational Capability, Organizational Structure, and Roles are key to Data Governance and Data-Centric Organizational Structures

Aligning to Organizational Capabilities

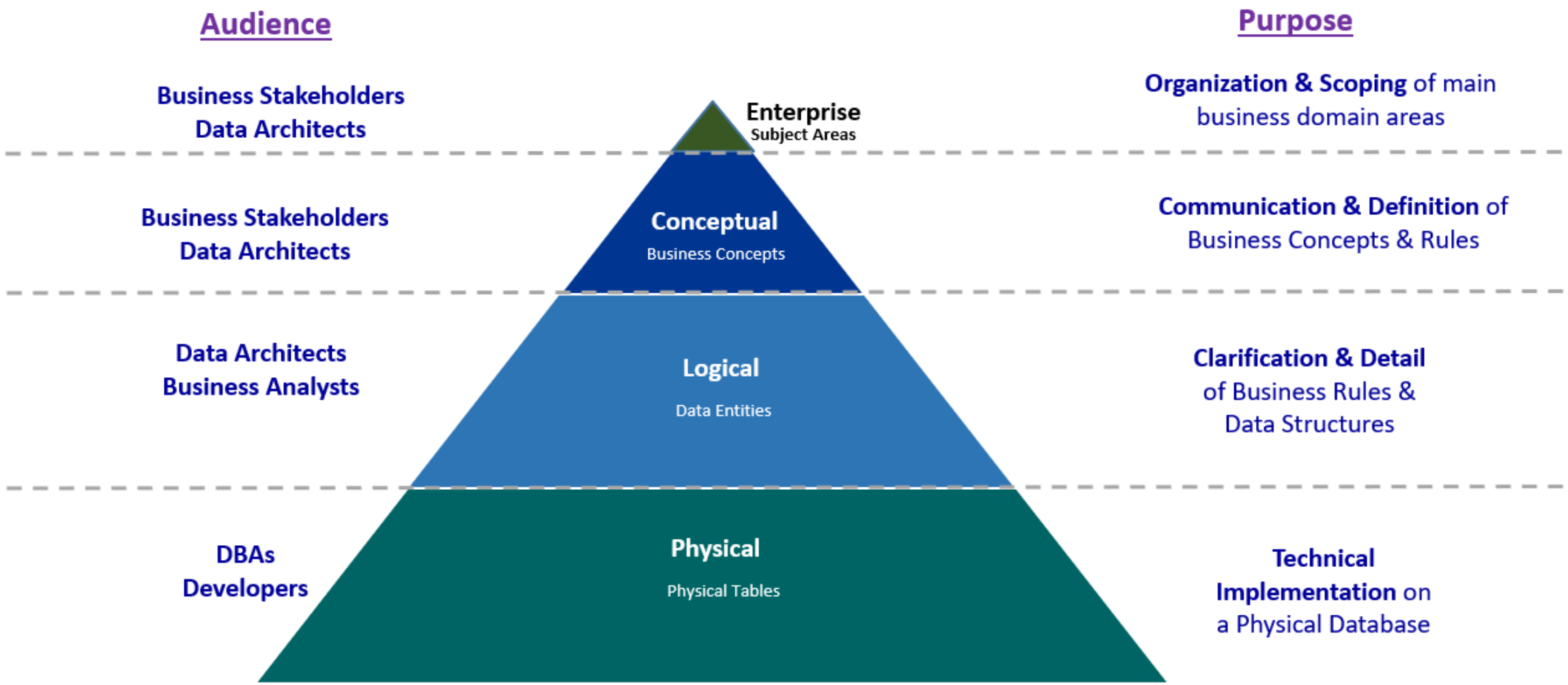
e.g. From Plan to Production to Sales & Distribution

Designing Org Structures for Data-Centric Efforts

e.g. Aligning Data Governance to Individual Culture



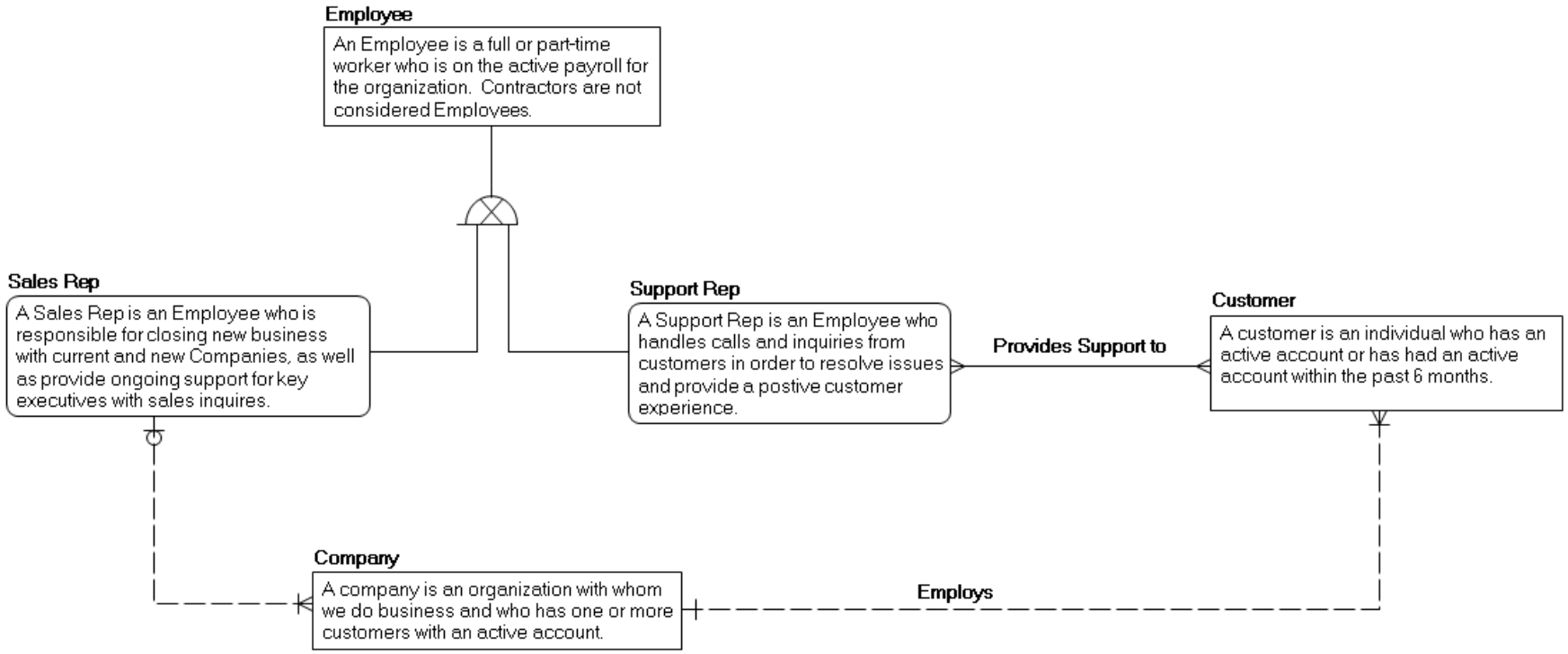
Data Models


Audience
Purpose
Business Stakeholders
Data Architects
Organization & Scoping of main business domain areas
Enterprise
Subject Areas
Business Stakeholders
Data Architects
Conceptual
Business Concepts
Communication & Definition of Business Concepts & Rules
Data Architects
Business Analysts
Logical
Data Entities
Clarification & Detail of Business Rules & Data Structures
DBAs
Developers
Physical
Physical Tables
Technical Implementation on a Physical Database

Conceptual Data Model

- A conceptual data model provides core **definitions** of key data objects.
- It also shows key **relationships** between data objects.
- Even a simple diagram as the one on the right can tell a powerful **"story"**

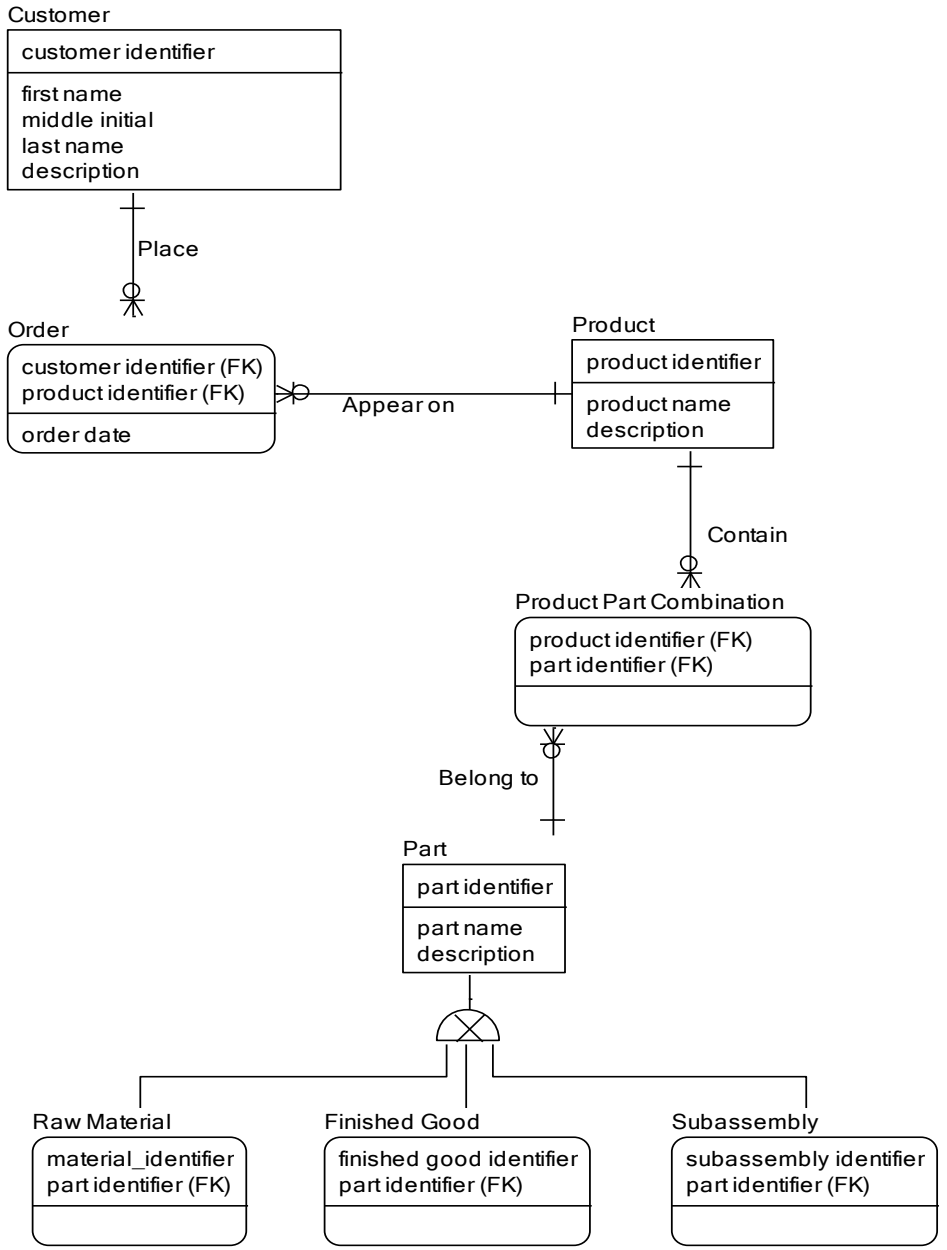
…. And uncover key b**usiness issues and opportunities**.



Logical Data Model

- A logical data model describes key business rules and definitions.
- Attributes are typically shown.
- Cardinality specifies additional detail regarding relationships.

…. The Logical Model defines additional detail regarding data entities, attributes, and their relationships.



Case Study: Data Models by Business Capability

Dataversity Webinar from March 2019

SUBJECT AREA vs. CAPABILITY MODEL

Kiewit is a company of doers.

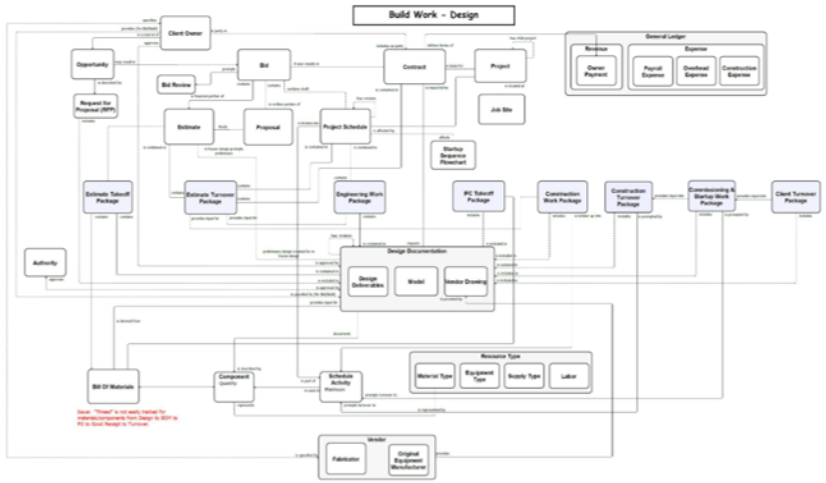
We organize our models by business capability to better align with how the business thinks about data.

DATA MODELING AT KIEWIT – MARCH 2021 18

Kiewit gave a great case study of how they used data models for business success.

Catch the replay at: https://www.dataversity.net/das-webinar-data-modeling-case-study-business-data-modeling-at-kiewit/

COMPLEX CONCEPTUAL MODELS



Kiewit designs and builds complex projects in diverse markets.

Condensing that complexity into a single page model was challenging!

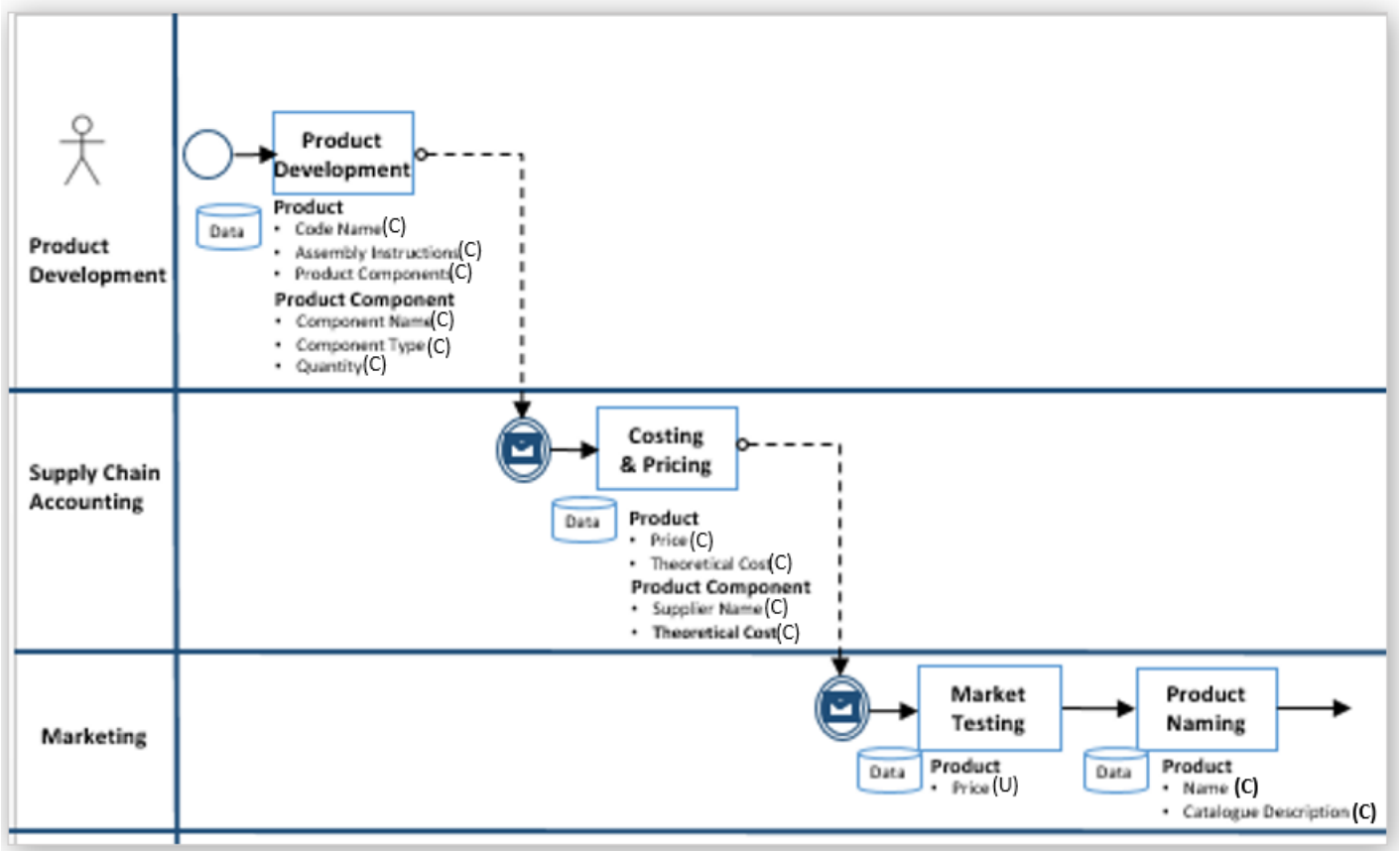
We use a one-page model to give an overview, but we work in the submodels, like the example shown here.

DATA MODELING AT KIEWIT – MARCH 2021 17

Process / Workflow Models

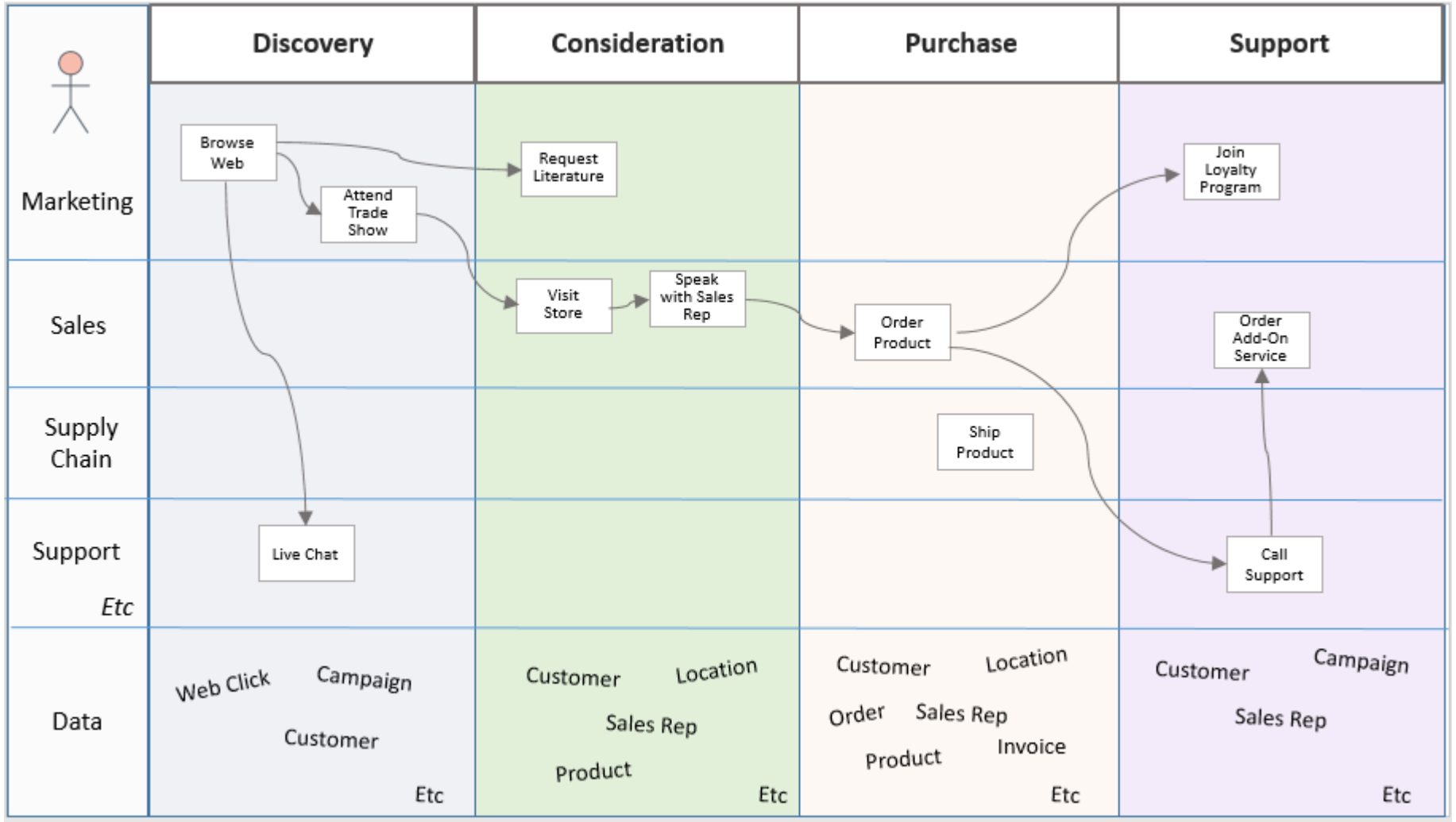
Identifying key data dependencies in core business processes

- Process models are a helpful tool for describing core business processes.
  - "Swimlanes" outline organizational considerations
  - Data can be mapped to key business processes to understand creation & usage of information.
- They are particularly helpful for areas such as Master Data Management (MDM) where process is critical to data stewardship & integration.



Customer Journey Map

- A customer journey map outlines key phases of the customer in their “journey”.
- They are similar to a process model, but with a different focus & perspective.
- Creating a data overlay is a helpful way to see the key data touched at each point in the journey.
- Journey maps can be created for other industries as well, e.g. Student, Patient, etc.

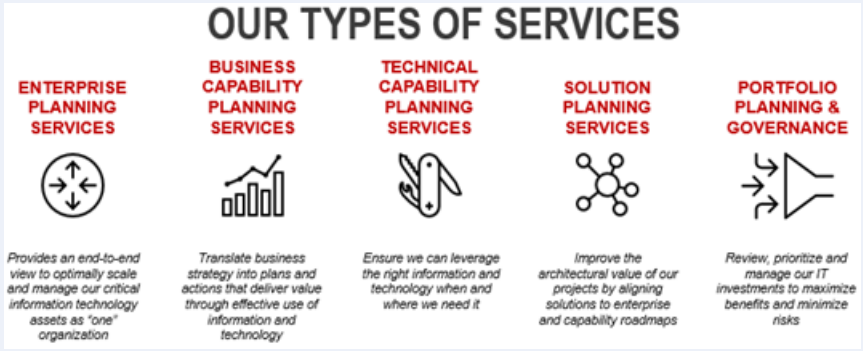


International Pharmaceutical Company

Business Alignment and IT Strategy

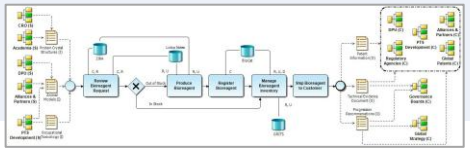
- An international Pharmaceutical company was looking to make better use of its data to streamline its:
  - Clinical Development
  - Commercial Processes
  - R&D.
- Business alignment was a key first step
  - Greater understanding how data was used by and critical to key business activities
  - Created “blueprints” of how the business runs—then how data maps to that”
  - Data models, Process models, & mappings
  - Identified opportunities for business efficiencies

1 Clearly Define & Promote Services



2 Align with Business Needs & Capabilities

3 Integrate into Project Governance



Architecture a stage gate for every project – Data, Process models & mapping

Roles & Culture: Pharmaceutical Company

- Business Acceptance: Clinical Scientists had data models on their office walls
  - "Blueprints" describing their clinical development

- Architecture team had clear direction
  - "Who we are and what we do" clearly articulated to the business
  - Best Practices made processes more efficient
  - Governance driving architecture as a "must-have" for each new initiative.

CRUD Matrix

Create, Read, Update, Delete

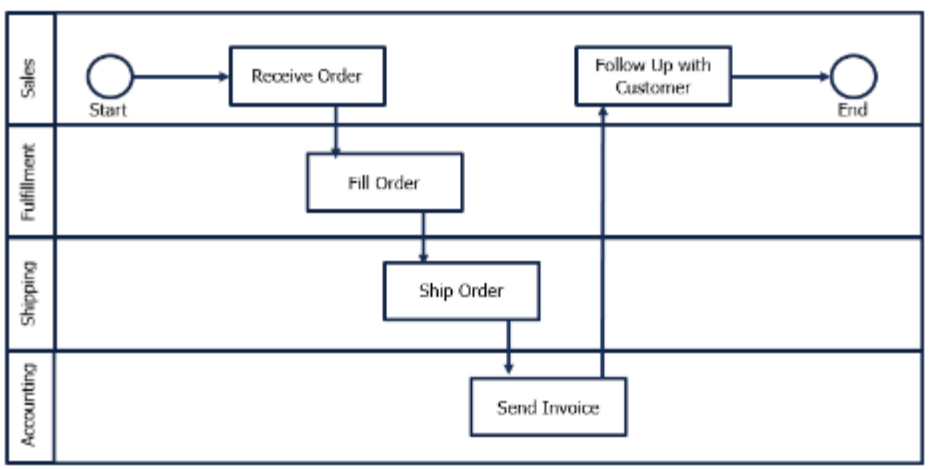
- CRUD Matrices shows where data is **C**reated, **R**ead, **U**pdated or **D**eleted across the various areas of the organization.
- They can be created by department, by system/application, etc.
- This can be a helpful tool in master data management, data governance, data quality, etc.

	Product Development	Supply Chain Accounting	Marketing	Finance
Product Assembly Instructions	**C**	**R**		
Product Components	**C**	**R**		
Product Price		**C**	**U**	**R**
Product Name	**C**		**U,D**	
Etc.				

Process Models & CRUD Fit Well Together

- Business Process Models describe key activities within the organization.
- Linking these processes to the data that is Created, Updated, or Deleted (CRUD) is important to understanding data usage.

Business Process Model



CRUD Matrix

	Customer	Order	Account	Invoice	Product
Receive Customer Order	R	C	C, R		
Process Customer Order	C,R,U		R,U		R
Fill Order	R,U		R,U		R,U
Send Invoice	R,U		R,U	C	

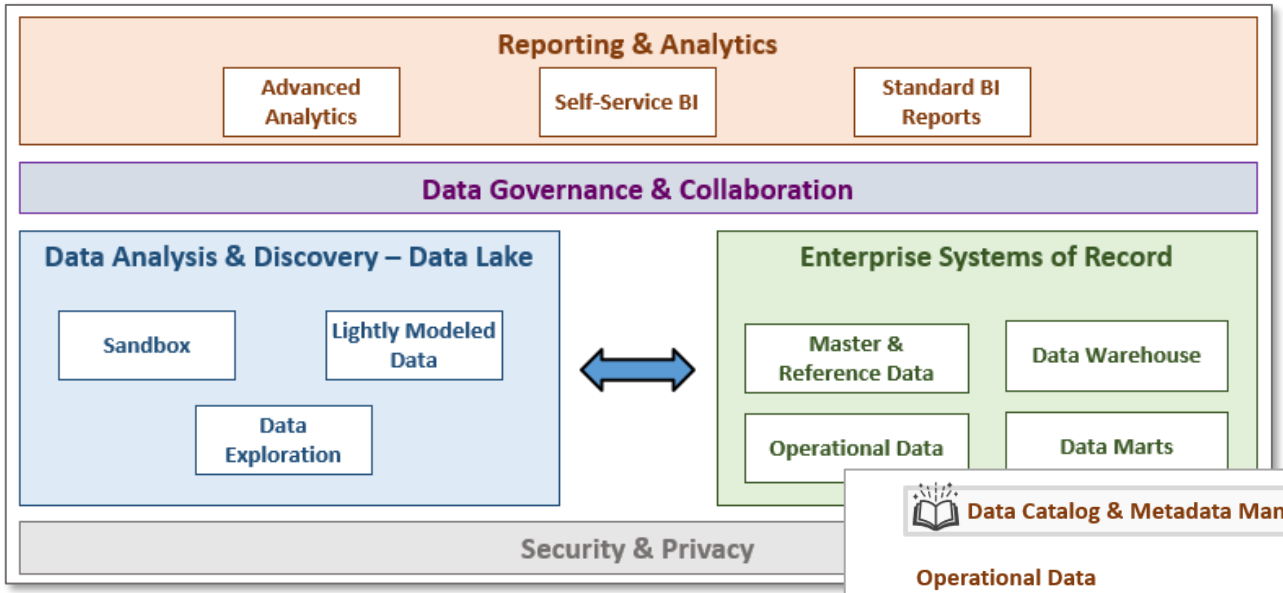
CRUD Matrix Success Stories

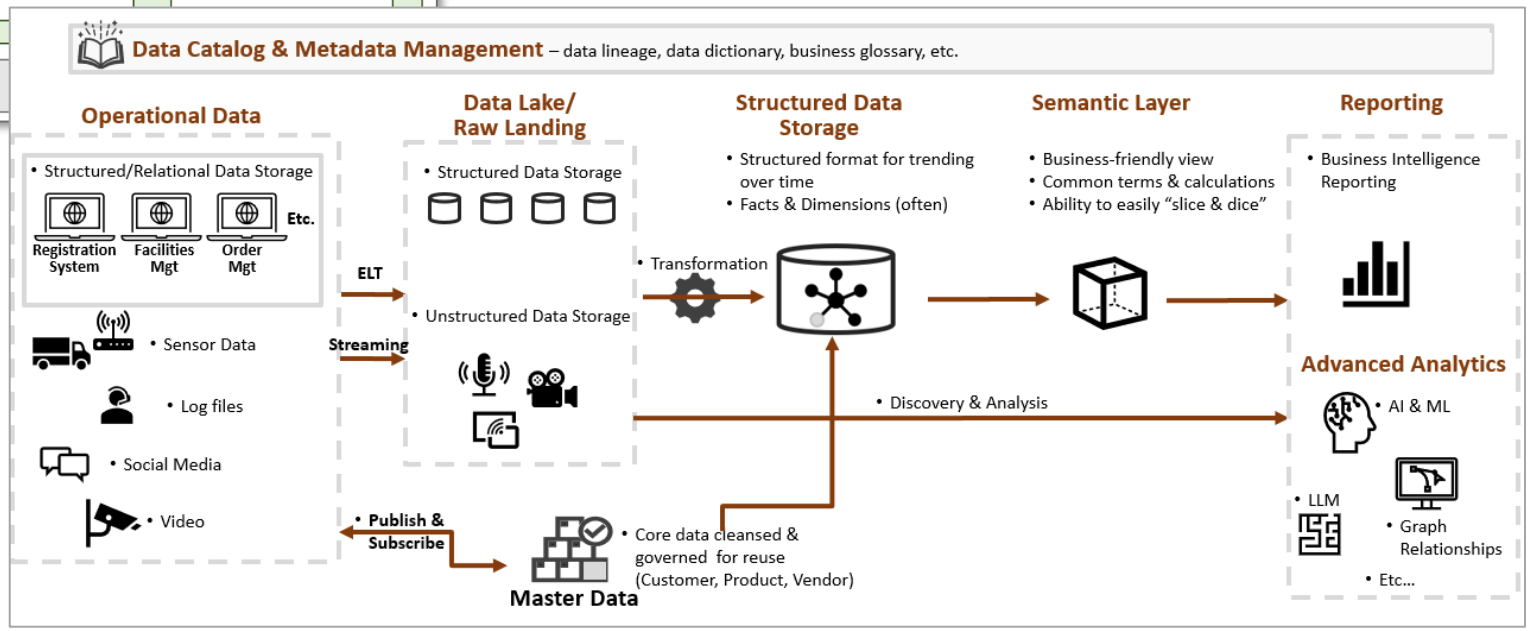
- An international Aerospace firm was **having issues with financial projections, due to differing payment terms for contracts** across systems.
- By **building process models and CRUD matrices in an interactive workshop**, teams quickly discovered that three teams were defining payment terms with vendors in separate processes and in separate systems.
- This was **quickly rectified through Data Governance and Stewardship**.

- A Retail Chain was having issues with **inconsistent Product Pricing across sales channels**.
- By **mapping out process and CRUD usage**, they discovered that three separate teams were defining pricing independently, and not coordinating with each other.
- Clear **Data Governance Stewardship and improved System Integration** fixed the issue.

System Architecture Diagrams

System architecture diagrams can create a “big picture” of how systems and their components fit together – both at the high-level and more detailed level.





System Data Architecture Success Story

- As part of a **Data Strategy effort, an online retailer created an enterprise system architecture diagram**, showing the key systems involving data.

- In doing so, they discovered a **number of redundancies and inefficiencies** including:
  - Multiple Master Data Management (MDM) systems
  - Disparate reporting "hubs" for BI and Analytics
  - Gaps in system integration & communication across teams

- This system data architecture exercise:
  - Saved hundreds of thousands of dollars in system maintenance costs
  - Improved the accuracy of enterprise reporting
  - Improved cross-team communication and collaboration

Summary

- Enterprise Architecture provides a series of models and diagrams to **describe the organization to maximize business value**
- While the number and diversity of platforms is increasing it is important to:
  - Focus on the business need and application
  - Design fit-for-purpose solutions using a number of interrelated technologies

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Who We Are: Business-Focused Data Strategy

Maximize the Organizational Value of Your Data Investment

In today's business environment, showing **rapid time to value** for any technical investment is critical.

But technology and data can be complex. At Global Data Strategy, **we help demystify technical complexity** to help you:

- Demonstrate the ROI and **business value of data**
- Build a data strategy **at your pace to match your unique culture** and organizational style.
- Create an **actionable roadmap for "quick wins"**, which building towards a long-term scalable architecture.

Global Data Strategy shares experience from some of the largest international organizations scaled to the pace of your unique team.

Global Data Strategy has worked with organizations globally in the following industries:

Finance · Retail · Social Services · Health Care · Education · Manufacturing · Government · Public Utilities · Construction · Media & Entertainment · Insurance …. and more

Thoughts? Ideas?

Questions?