Enterprise Data Architecture

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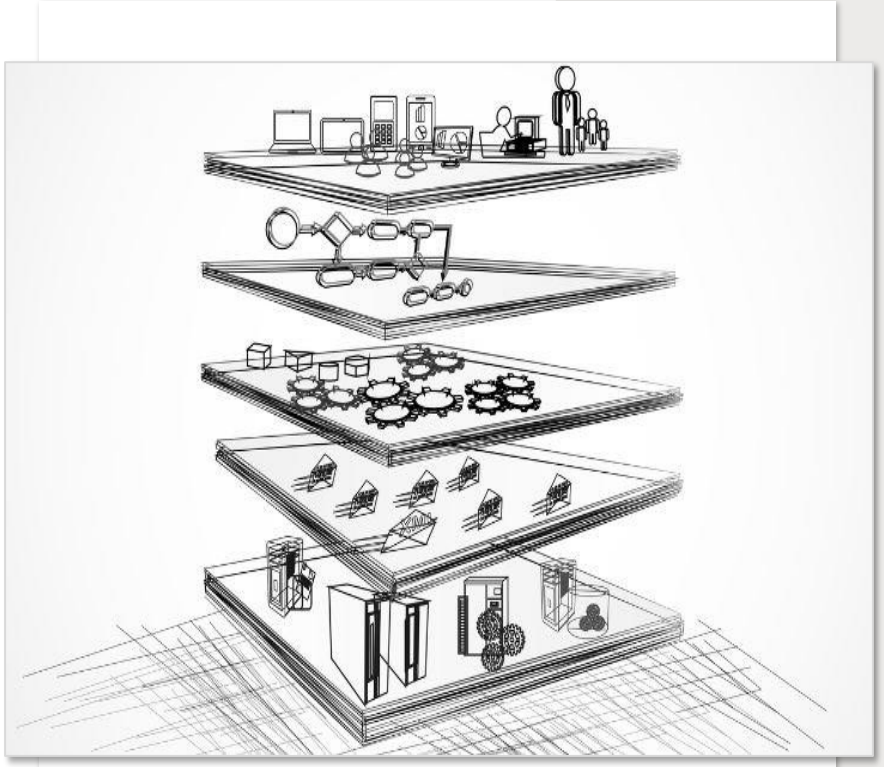
Enterprise Architecture vs. Data Architecture

https://www.slideshare.net/Dataversity/enterprise-architecture-vs-data-architecture-254666897

Enterprise Architecture vs. Data Architecture

- 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 session will discuss how **data architecture is a key component of an overall enterprise architecture for enhanced business value and success**.



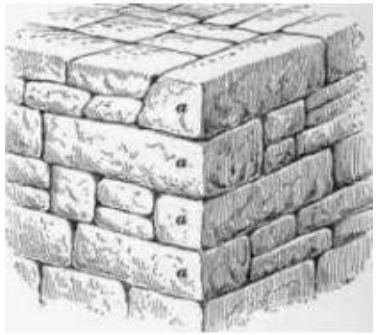
Enterprise Architecture - Definition

Supporting Business Innovation with a Strong Architectural Foundation

- Enterprise architecture (EA) is a strategic approach to designing and managing an organization's structure, processes, information, technology, and resources in a coherent and integrated manner.
- It provides a holistic view of how different components of an organization work together to achieve its goals and objectives.
- The primary purpose of enterprise architecture is to align an organization's business and technology strategies, improve efficiency, and facilitate effective decision-making.
- Overall, enterprise architecture is a dynamic discipline that enables organizations to manage complexity, drive innovation, and optimize their resources to achieve desired business outcomes.

Innovation

Foundation



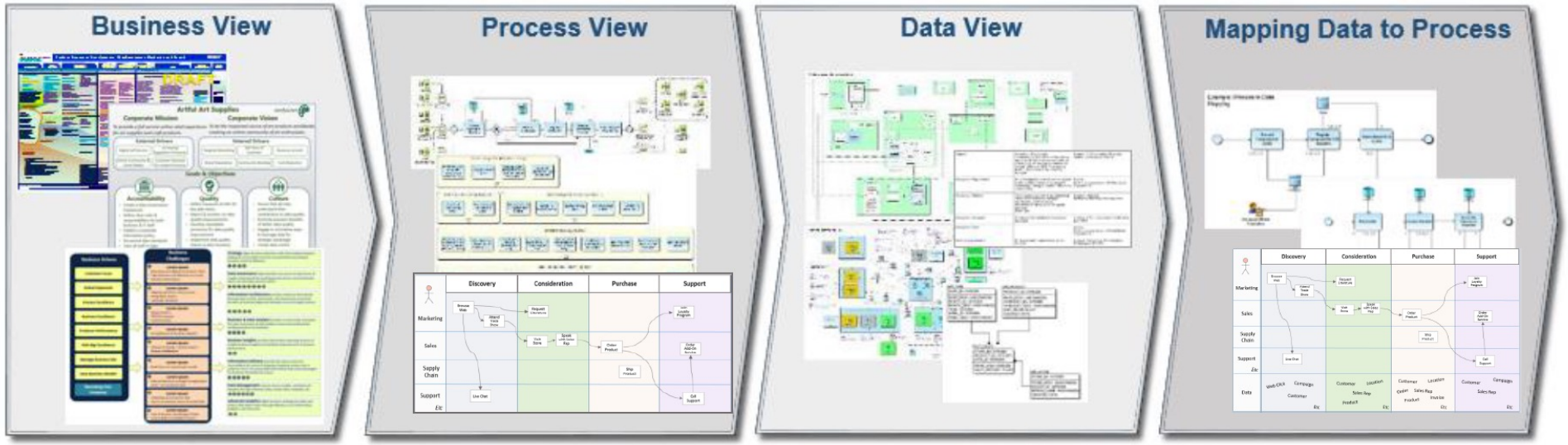
Enterprise Architecture – Definition for Data Architects

Modeling is important on many levels

- Enterprise Architecture (EA) from a data architect's perspective refers to the systematic and strategic approach to designing, organizing, and managing an organization's data assets and related technologies within the broader context of the entire enterprise.
- It involves aligning data-centric solutions with the organization's business goals, processes, and IT infrastructure to ensure that data is effectively leveraged for decision-making, innovation, and competitive advantage.
- Data architects play a critical role in ensuring that the organization's data assets are effectively managed, integrated, and leveraged to support business strategies.
- They work within the framework of enterprise architecture to create a cohesive data ecosystem that maximizes the value of data across the organization.

Data is Part of a Wider Enterprise Architecture

- Enterprise Architecture provides a high-level view of the people, processes, applications, and data of an organization
- Putting data in business context, e.g.
  - 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
- Customer Journey Maps

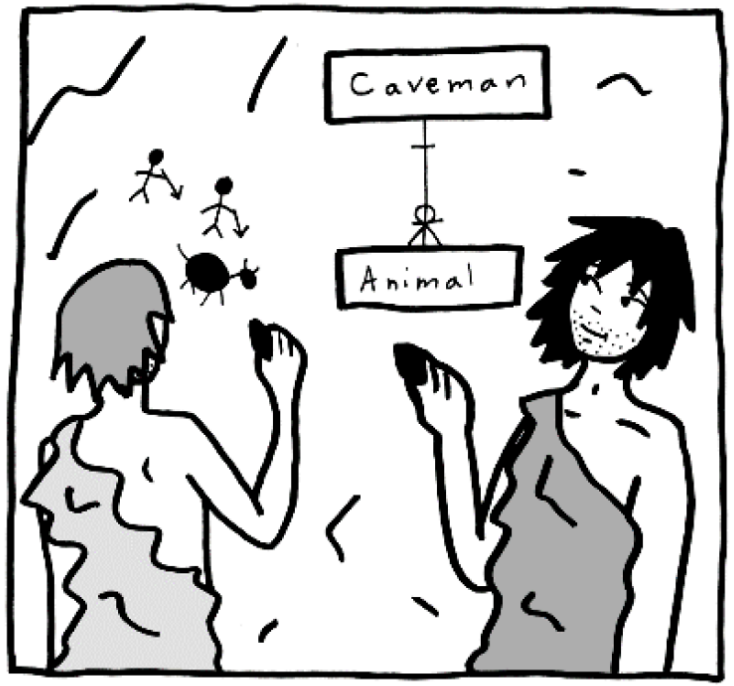
- Conceptual Data Models
- Business Glossary
- Logical Data Models
- Physical Data Models

- Process to Data Mapping
- Where Used / CRUD Analysis
- Customer Journey Maps w/ Data Overlay

A Data Model Is a Visual Representation of Core Concepts

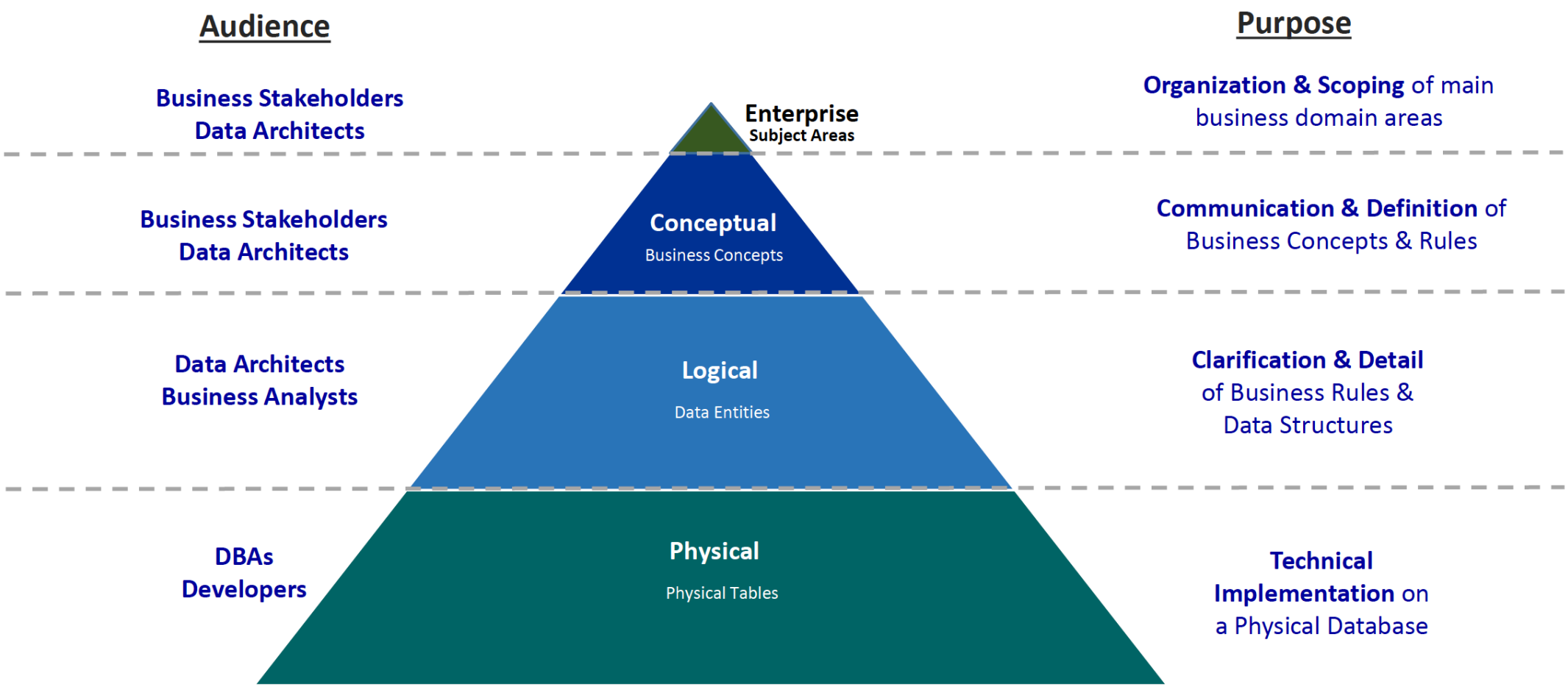
A data model is a graphical view of the core concepts important to the organization. It's a great way to inventory and prioritize data areas.

Humans tend to think in Pictures.



From Data Modeling for the Business by Hoberman, Burbank, Bradley, Technics Publications, 2009

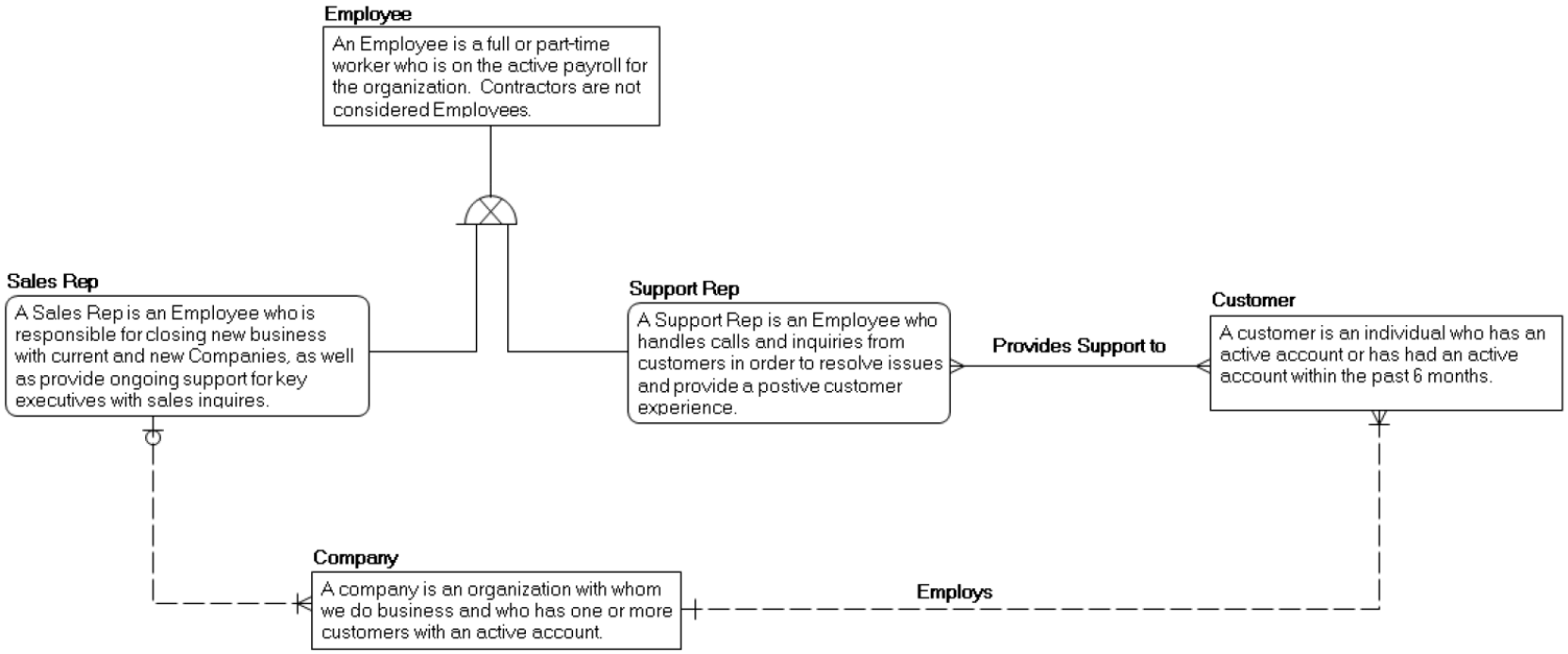
Levels of data models



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"**

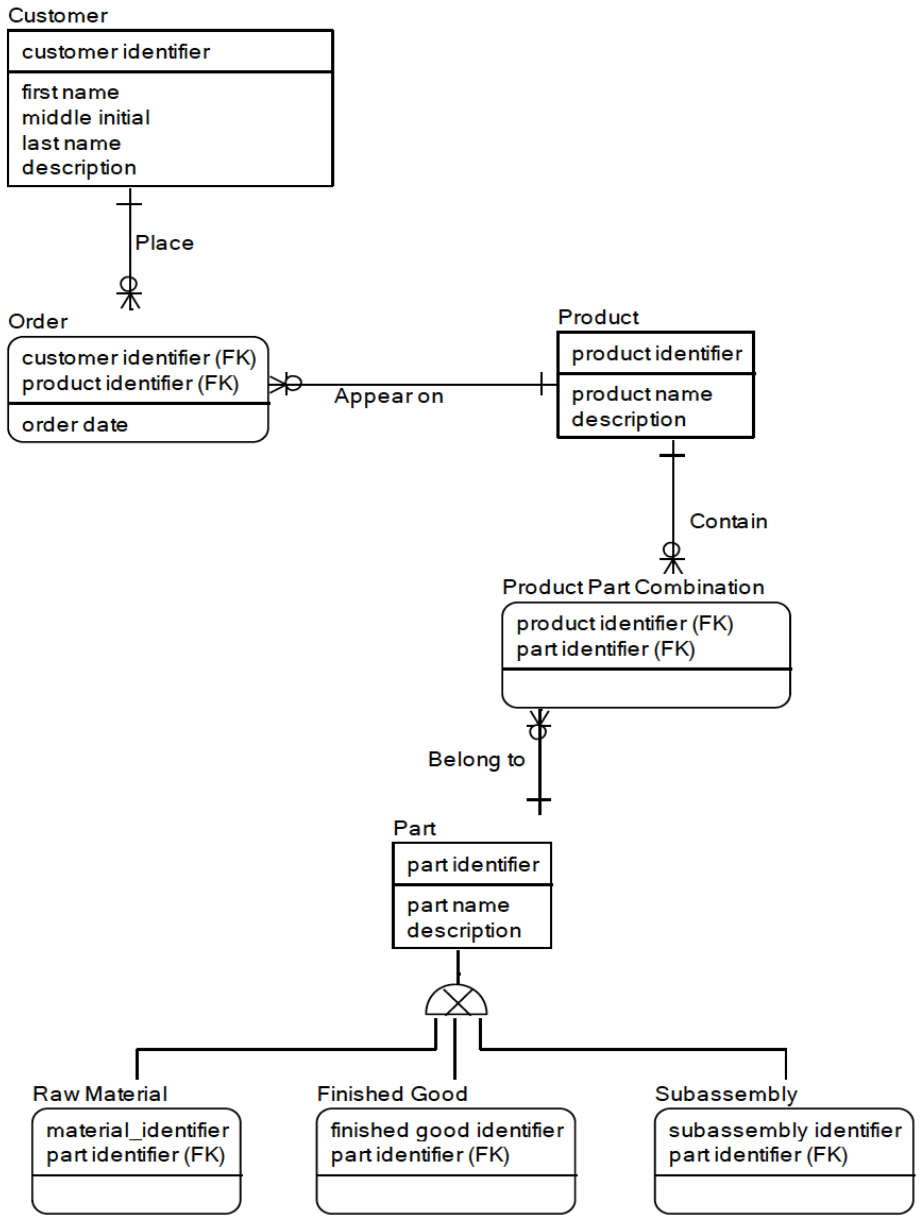
…. And uncover key b**usiness issues and opportunities**.



Logical Data Model

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

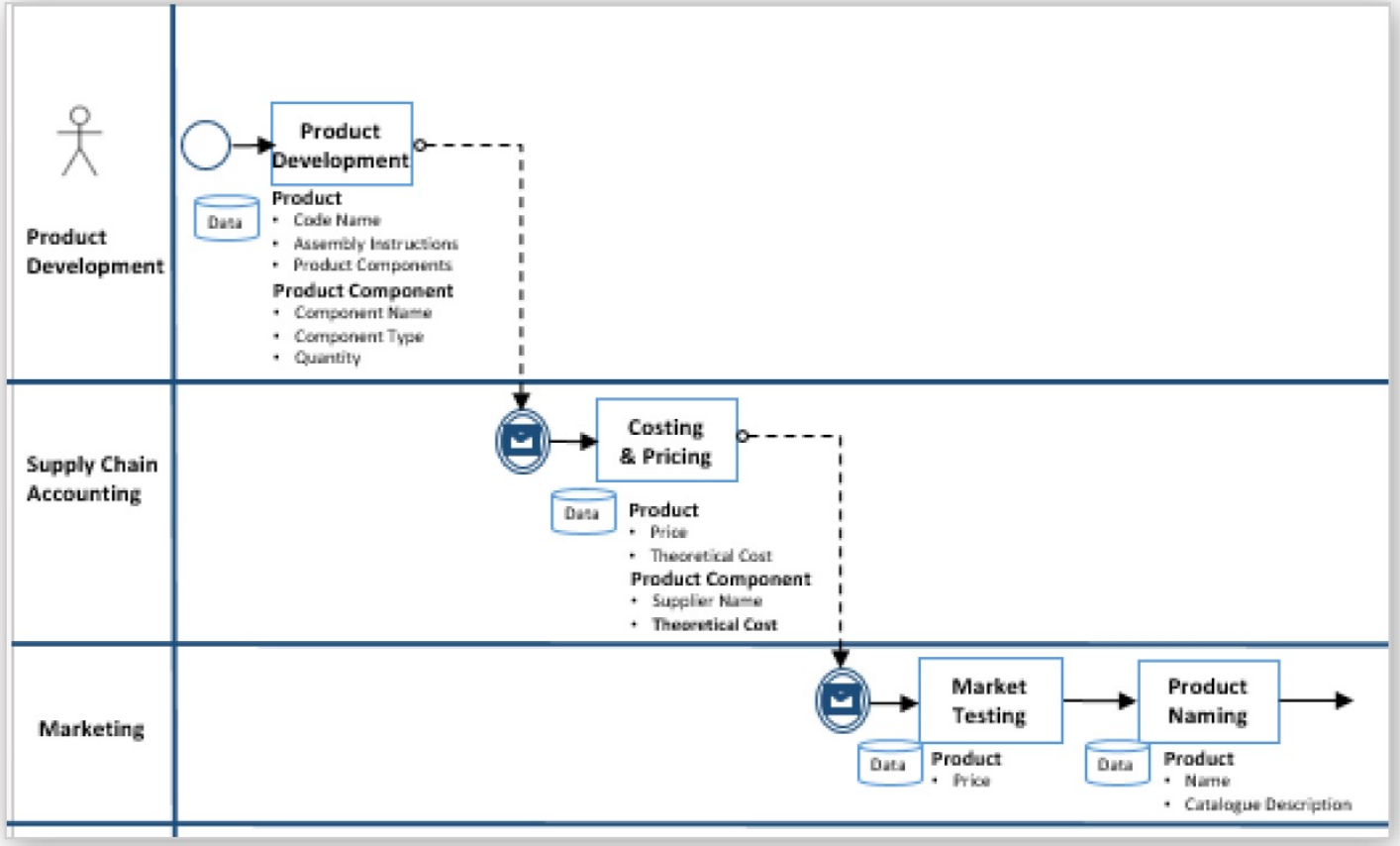
…. The Logical Model defines additional detail regarding data entities, attributes, and their relationships.



Process / Workflow Models

Identifying key data dependencies in core business processes

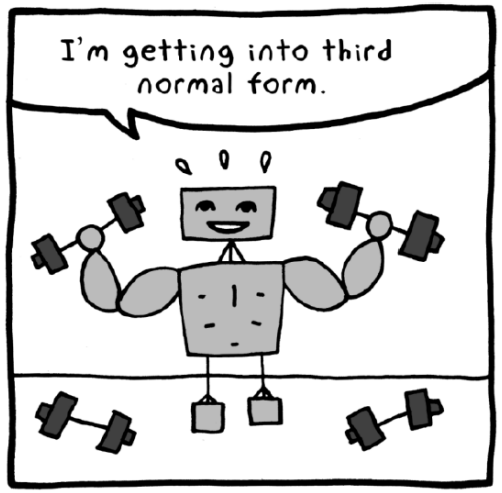
- Process models are a helpful tool for describing core business processes.
  - "Swimlanes" outline organizational considerations
  - Data can be mapped to key business processes to understand creation & usage of information.
- They are particularly helpful for areas such as Master Data Management (MDM)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



Different Physical Models for Different Use Cases

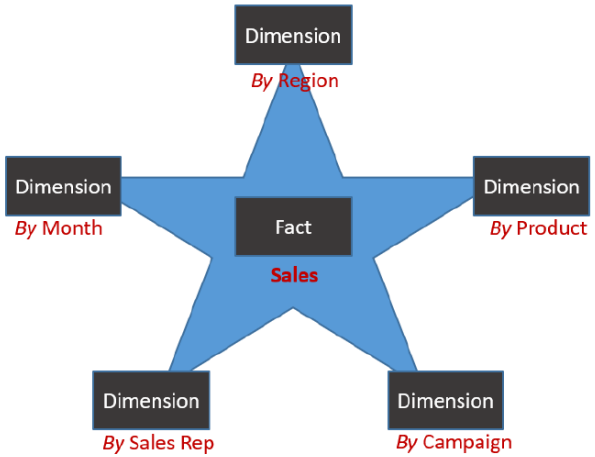
Relational – Normal Form

- Reduce redundancy for operational data
- Increase data quality
- Ensure consistency (ACID transactions)



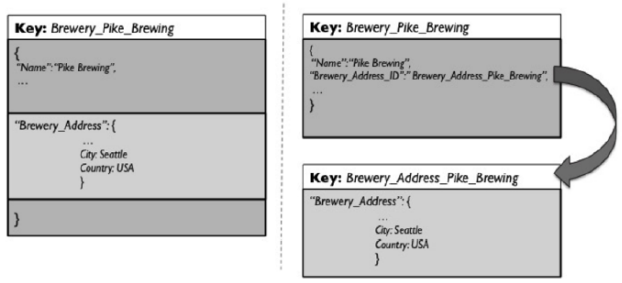
Dimensional– Star Schema

- Ease of reporting for summarized and historical data
- Ability to easily "slice and dice" for self-service reporting
- Performance and flexibility



NoSQL

- Speed of retrieval, low latency
- High data volumes
- Flexibility for change



…And More!

- There are numerous ways to model and store data.
  - Hierarchical/XML
  - Graph
  - COBOL Copybook!
  - S3 "buckets"
  - Data Vault
  - Etc…

No modeling technique is inherently "better" than another. Data use cases & purpose drives what "good" looks like.

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

Architects vs. Engineers vs. Builders

- Similarly, there is a clear distinction between architects, engineers, builders who build the house.

I work with the owner to understand their needs and draw the diagrams to match their vision & requirements.

Architect

I work onsite to make sure that the building is structurally sound.

Engineer

I swing the hammer to make sure the house gets built.

Builder

Architects vs. Engineers vs. Builders

- Unfortunately, with data professionals, the distinctions aren't as obvious.

I work with the owner to understand their needs and draw the diagrams to match their vision & requirements.

Architect

I make sure that the data platform is structurally sound.

Engineer

I write code to ensure working applications and databases.

Builder

The Role of the Architect

Technology

Business

Janus

Summary