



# Building the Right Architecture for Analytics & Reporting

Donna Burbank  
Global Data Strategy, Ltd.  
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RELTIO

# Building the Right Architecture for Analytics & Reporting

Sriraj Rajaram  
Product Management



Organizational data initiatives are challenged by a trust gap

# TRUST GAP

Poor quality data

Shaky governance

Lack of skills

77% of decision makers are concerned their organization's data is neither timely nor reliable to use for operational and analytical needs.<sup>1</sup>

# Siloed, fragmented data: A common barrier to digital transformation



Create data system  
of record

Make data reusable and  
interoperable across the  
enterprise

Ingest, process, activate in  
real time, at scale

# Reltio unifies, manages, mobilizes your core data



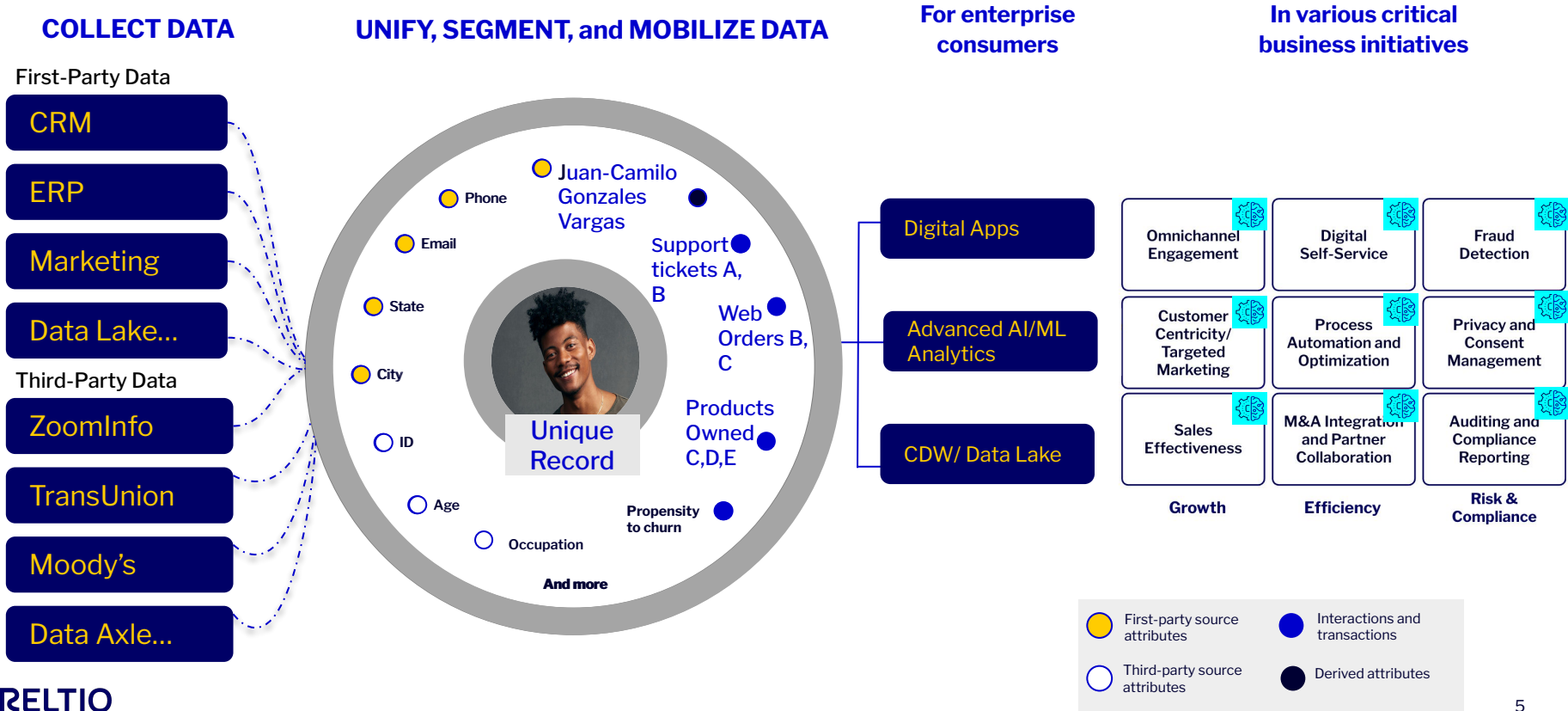
Trusted, unified data

Real-time, always on

Secure, scalable,  
and flexible

Built for AI, built with AI

# Reltio activates key data assets across data initiatives



Learn more at [Reltio.com](https://www.reltio.com)



Learn about Reltio's modern  
data management solutions  
and customer stories at  
[www.reltio.com](https://www.reltio.com)

# Donna Burbank



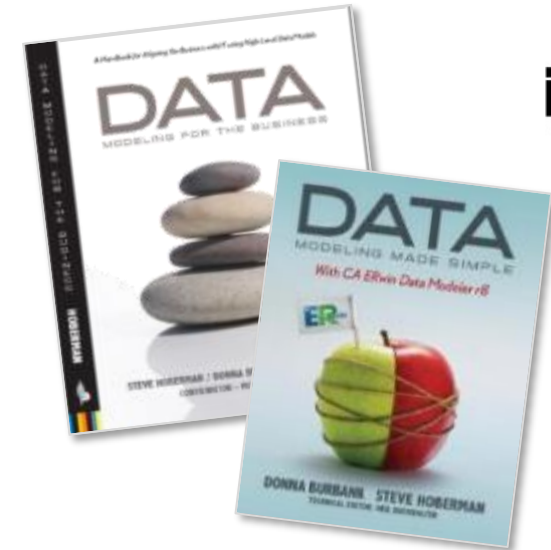
Donna is a recognized industry expert in data management with over 25 years of experience in data strategy, data governance, data modeling, metadata management, and enterprise architecture. Her background is multi-faceted across consulting, product development, product management, brand strategy, marketing, 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 International member, contributor to the DMBOK 2.0, 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](mailto:donna.burbank@globaldatastrategy.com)  
Donna is based in Boulder, Colorado, US.



# 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
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- **December** The Business Value of Data Modeling



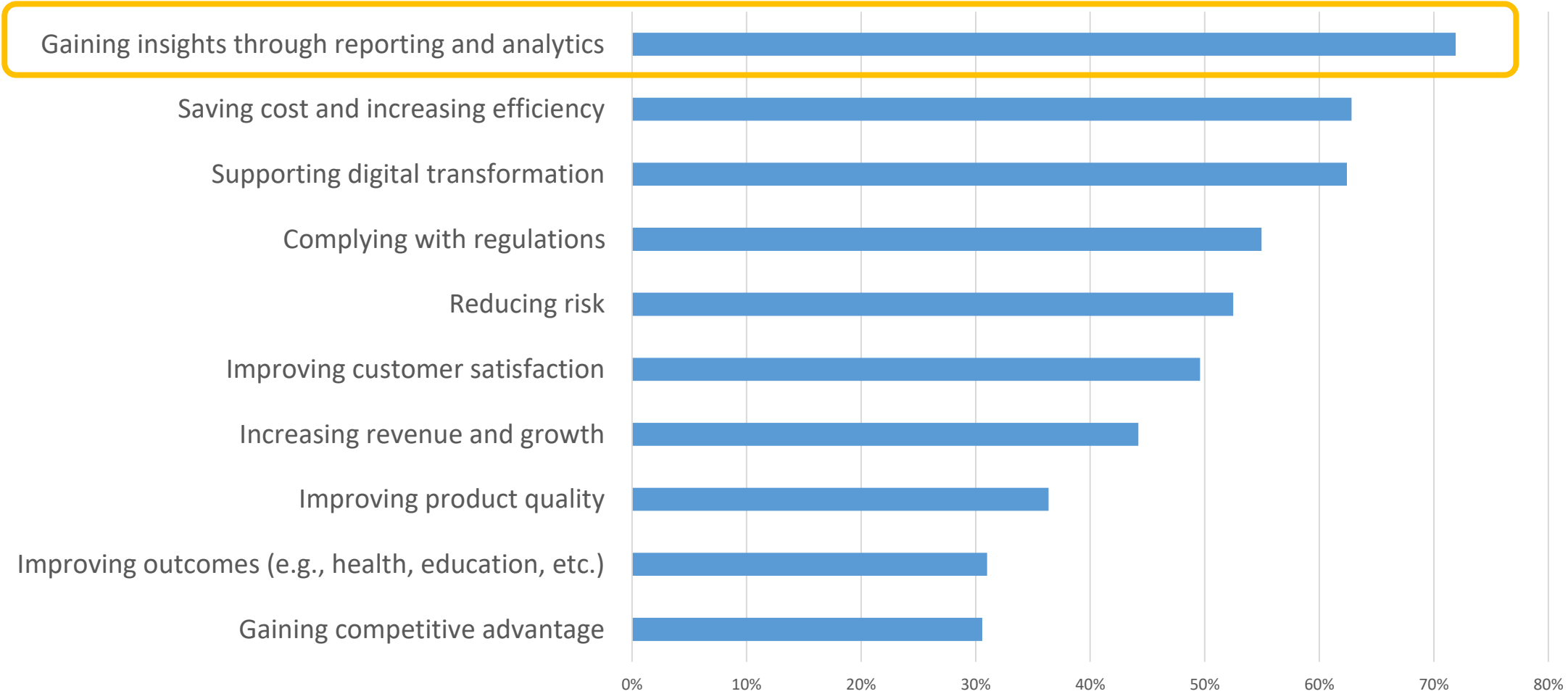
# What We'll Cover Today

- With the rapid changes in technology available to support AI, analytics, and reporting, it can be confusing where to start in creating a modern data architecture.
- This webinar will cover what new technologies and techniques are available to support modern analytics, and what tried-and-true fundamentals are still relevant.



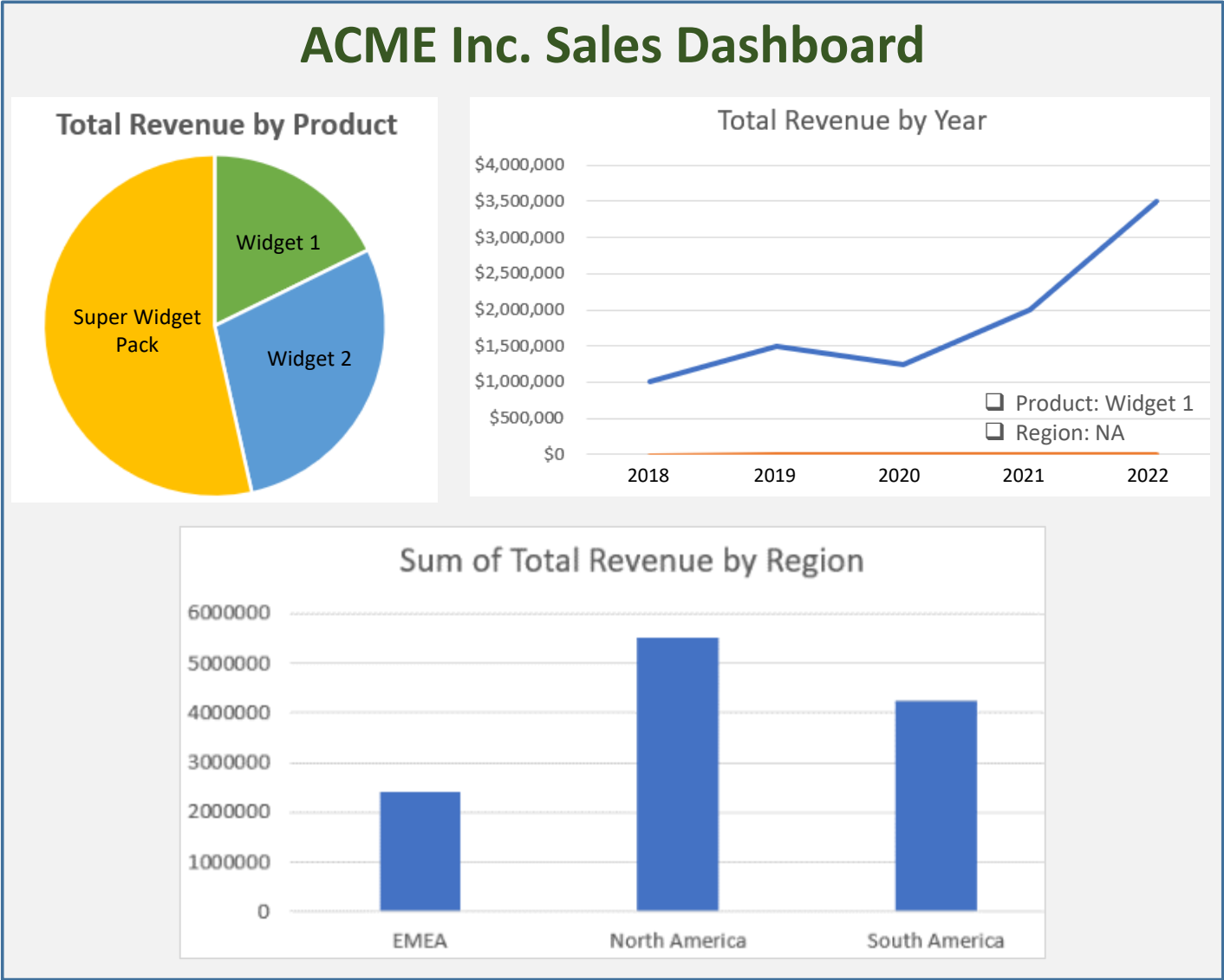
# Business Goals & Drivers for Data Management

Top 10 Business Goals & Drivers for Data Management



# Early Business Intelligence (BI) Reporting





Natural Language Processing (NLP) was available even in the 1960s.

```
Welcome to
      EEEEE  LL      IIII  ZZZZZZ  AAAAA
      EE      LL      II    ZZ      AA  AA
      EEEEE  LL      II    ZZZ      AAAAAA
      EE      LL      II    ZZ      AA  AA
      EEEEE  LLLLLL  IIII  ZZZZZZ  AA  AA

Talk to Eliza

> Hello, I am Eliza.
* I am very sad
> How long have you been very sad?
* A long time
> Tell me more...
* I'm often sad
> Did you come to me because you are often sad?
```

ChatGPT

I am very sad

I'm really sorry you're feeling this way. Do you want to talk about what's on your mind? I'm here to listen. ❤️

I have been sad a very long time.

I'm really sorry you're going through this. Feeling sad for a long time can be exhausting and overwhelming. You're not alone, and you don't have to go through this by yourself.

Would you like to talk about what's been weighing on you? Or maybe we can find something that brings even a little comfort right now? I'm here for you. ❤️

# Image & Pattern Recognition

Show me a picture of a frog on a bicycle



What is the Part Number for this item?

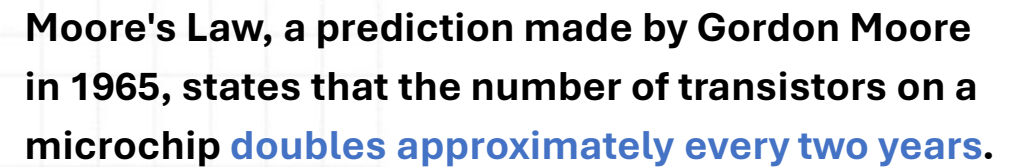


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Part Number  
PHY18374EU



# What has changed?

**DATA  
ARCHITECTURE  
STRATEGIES**



# Graphical Processing Units (GPUs)

**GPUs are specialized processors that excel at handling complex calculations, making them ideal for tasks like gaming, 3D rendering, and AI.**



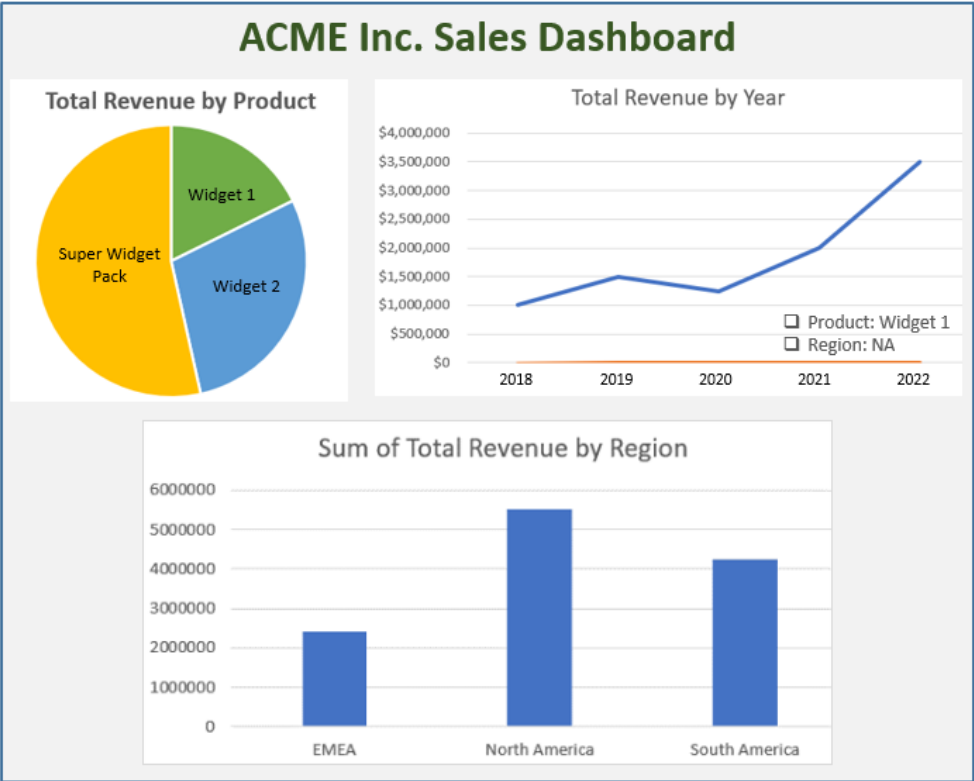
# Vector Databases

- Vector Databases are used to represent images, audio text and other complex data (e.g. molecular structures).
- Images are converted into numerical vectors that capture semantic meaning.
- Vector databases find data points that are close to each other in the vector space, based on similarity metrics.
- Video and Audio Search are common use cases for Vector Databases.

Find me a picture of a green frog on a bicycle.



# Combining Both Worlds



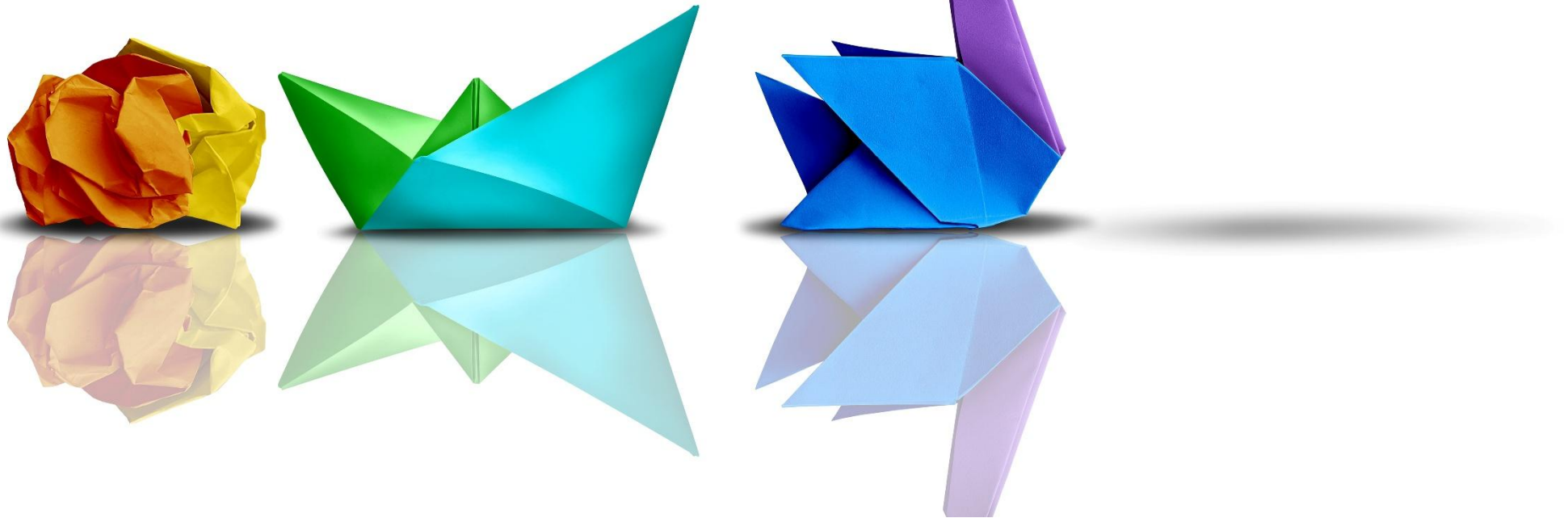
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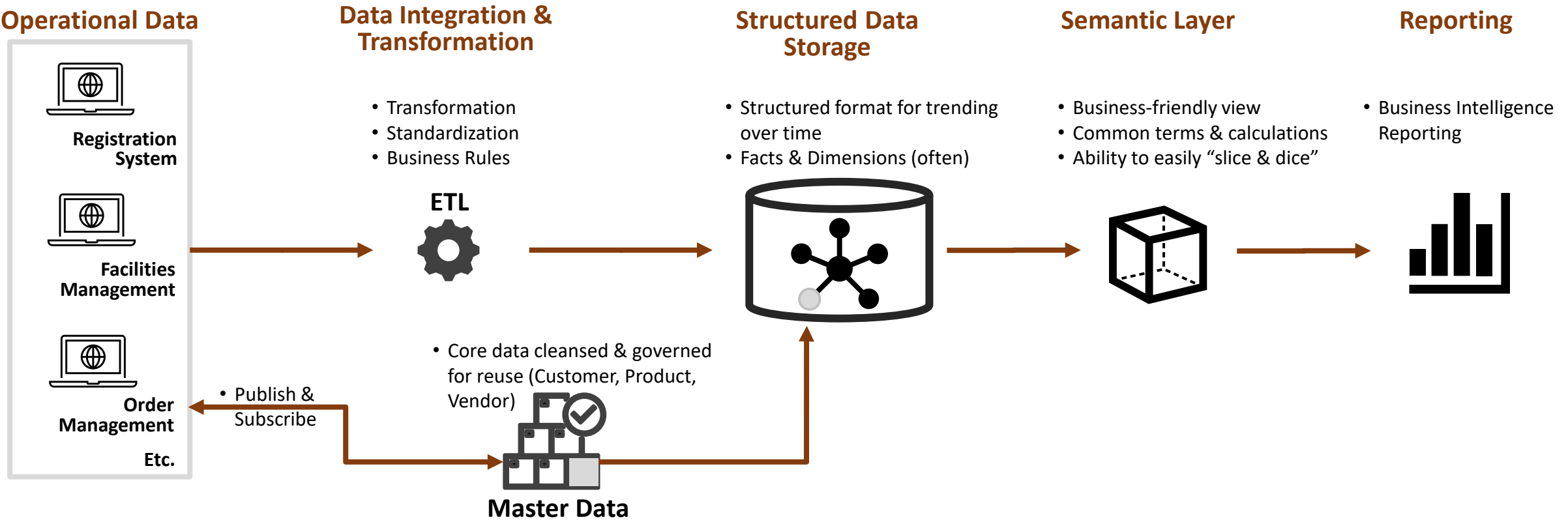
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# The Evolution of Architectures & Ecosystems

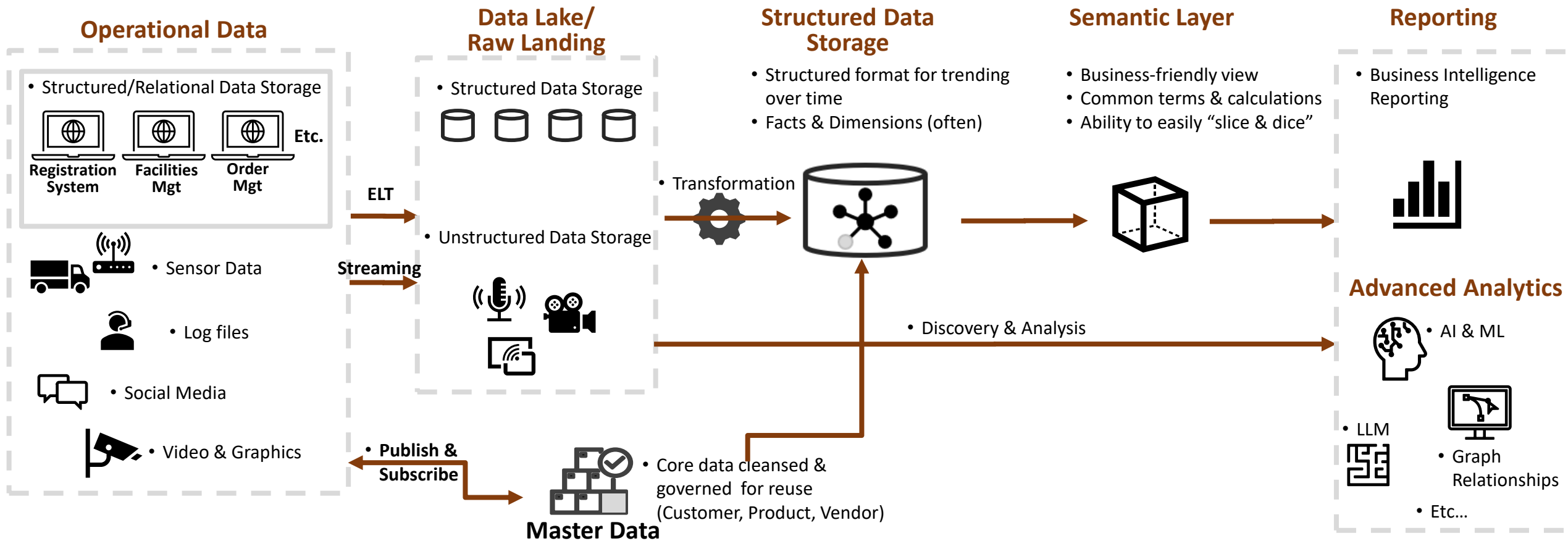


 **Data Catalog & Metadata Management** – data lineage, data dictionary, business glossary, etc.

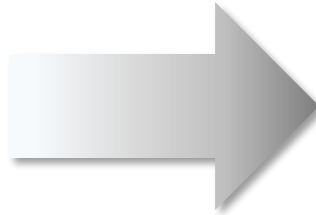
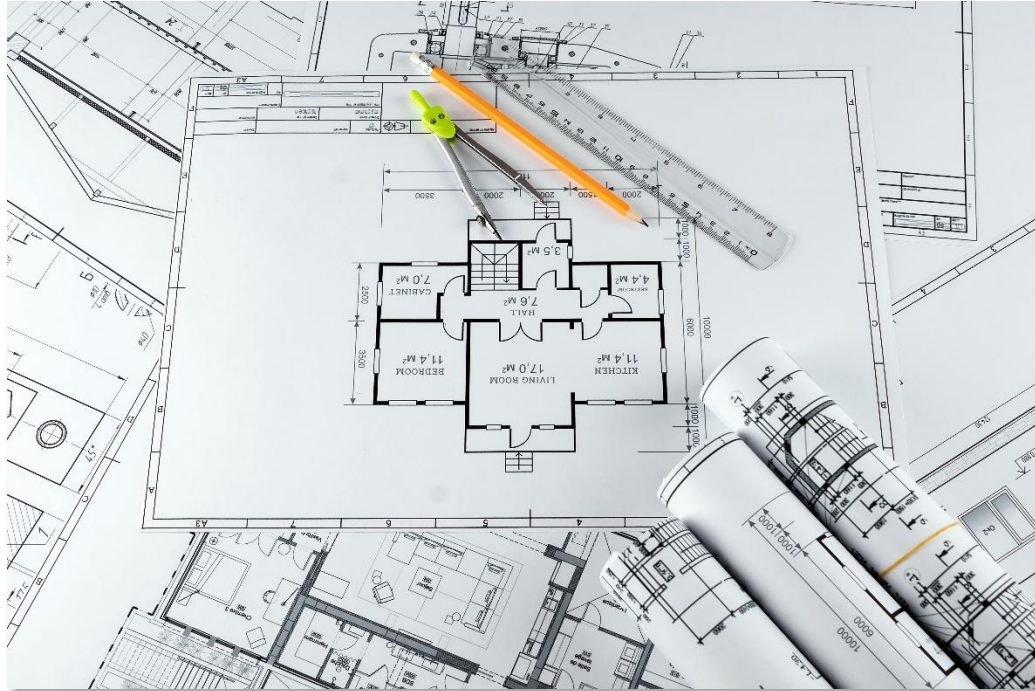




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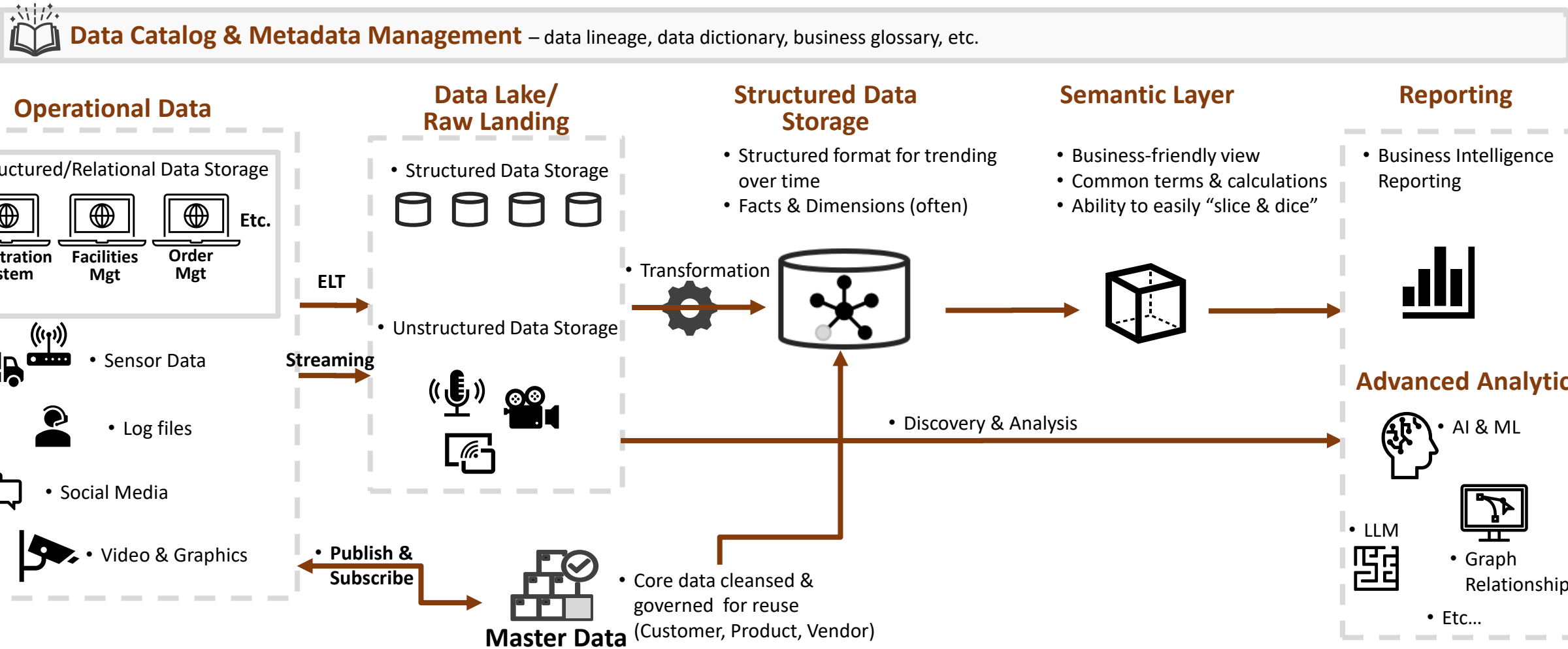
# Architectures Are Becoming Ecosystems



- Singular, Fit for purpose solutions
- Design for individual use-cases (e.g. DW, Big Data Analytics)
- Scalability could be limited by platform
- Targeted users by solution

- Dynamic, interrelated best of breed solutions
- Multi-faceted, interrelated use cases
- Faster-scalability with cloud-based provisioning
- User communities with self-service reporting & analytics capabilities

# Key Components of a Modern Data Architecture

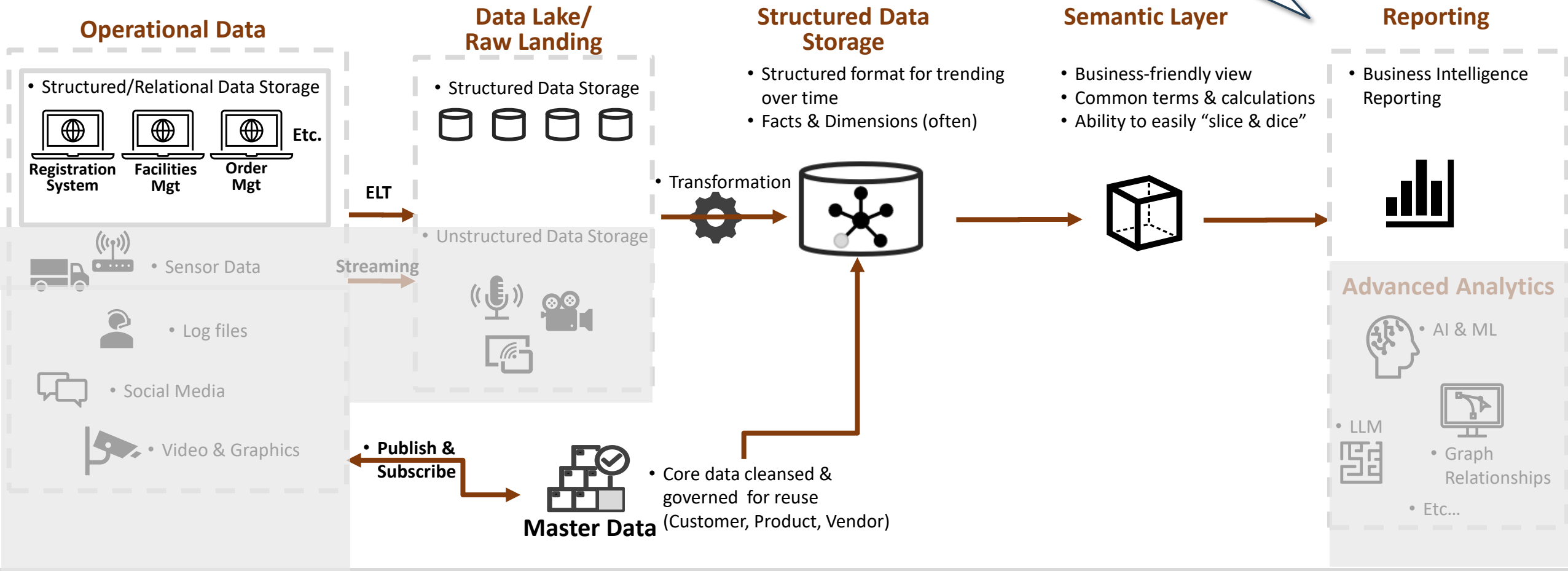


# Key Components of a Modern Data Architecture



**Data Catalog & Metadata Management** – data lineage, data dictionary, business glossary, etc.

Show me  
Product Sales  
Trends Over  
Time.



# Key Components of a Modern Data Architecture



**Data Catalog & Metadata Management** – data lineage, data dictionary, business glossary, etc.

## Operational Data

- Structured/Relational Data Storage
  - Registration System
  - Facilities Mgt
  - Order Mgt
  - Etc.
- Sensor Data
- Log files
- Social Media

• Video & Graphics



## Data Lake/ Raw Landing

- Structured Data Storage
- Unstructured Data Storage

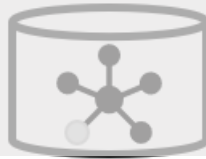
ELT  
Streaming



## Structured Data Storage

- Structured format for trending over time
- Facts & Dimensions (often)

• Transformation



## Semantic Layer

- Business-friendly view
- Common terms & calculations
- Ability to easily “slice & dice”



## Reporting

- Business Intelligence Reporting



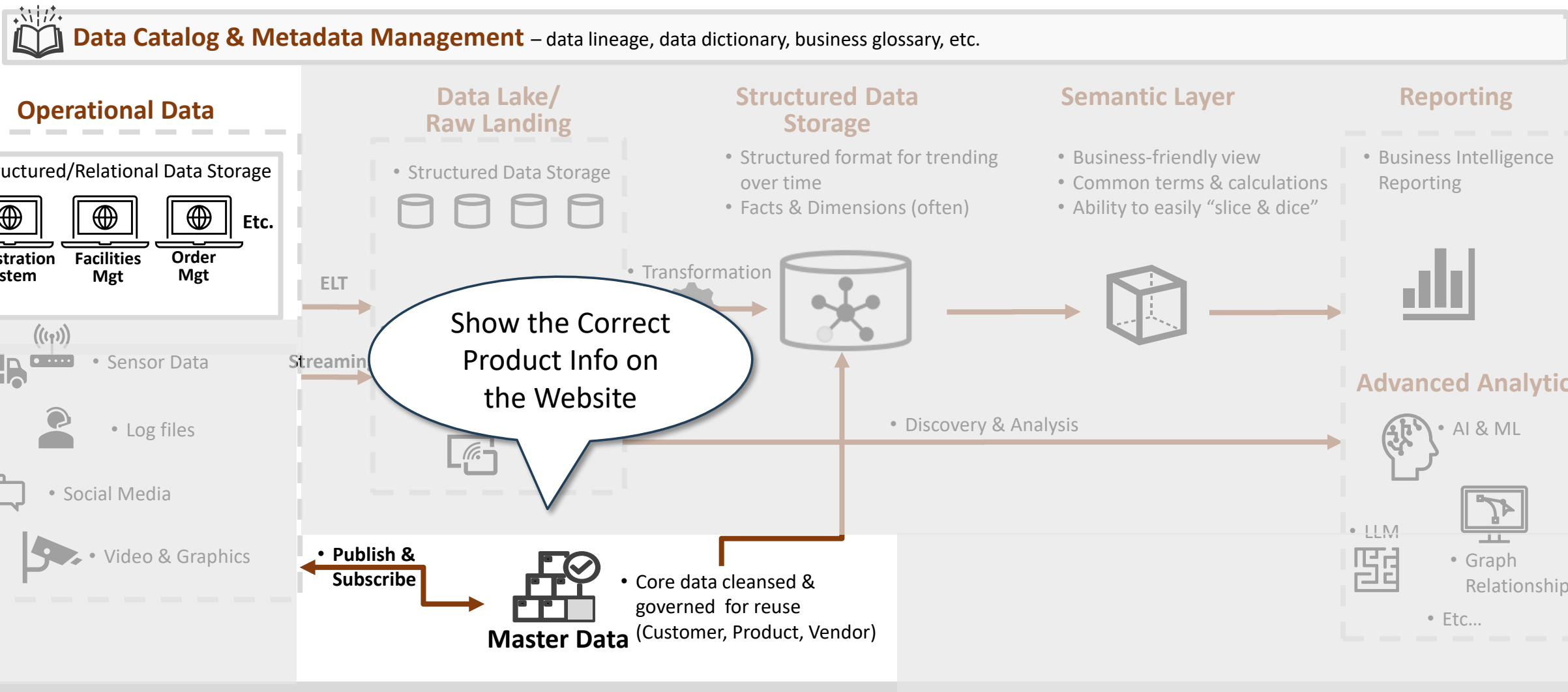
## Advanced Analytics

- AI & ML
- LLM
- Graph Relationships
- Etc...

**Master Data**  
Core data cleansed & governed for reuse (Customer, Product, Vendor)


• Publish & Subscribe

# Key Components of a Modern Data Architecture



# The Design Aspect of Data Architecture for BI & Analytics





**I want to see historical data  
trending over time to “slice & dice”  
by year, by region, by product  
from a single source of trusted data  
from all systems.**

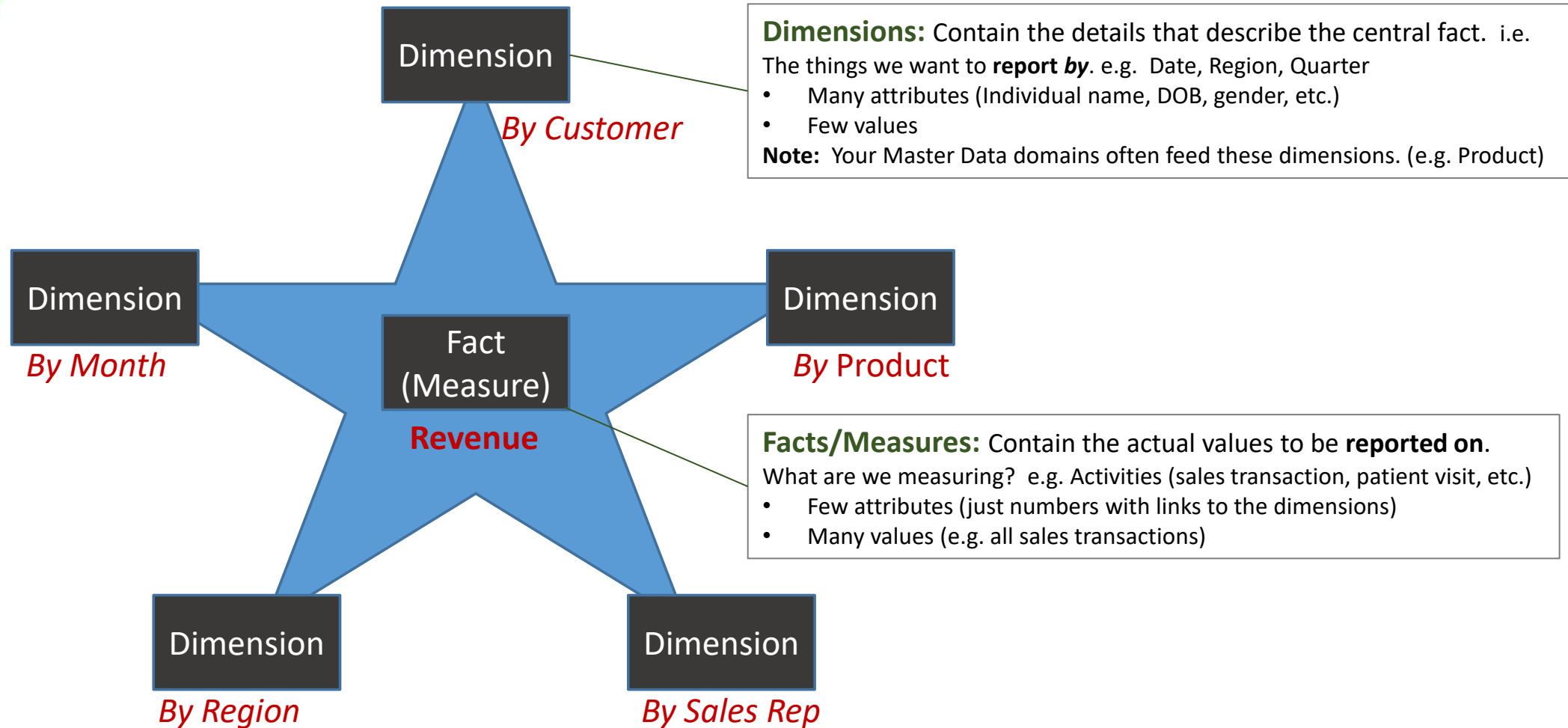
**... but I don't want one of those old-fashioned data warehouses!**



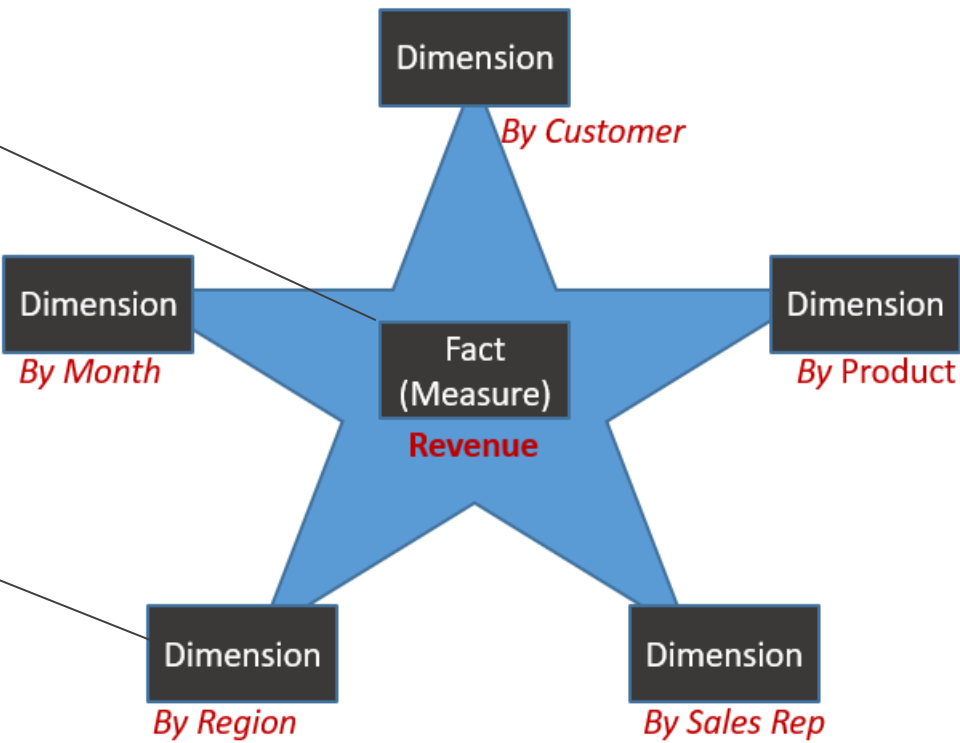
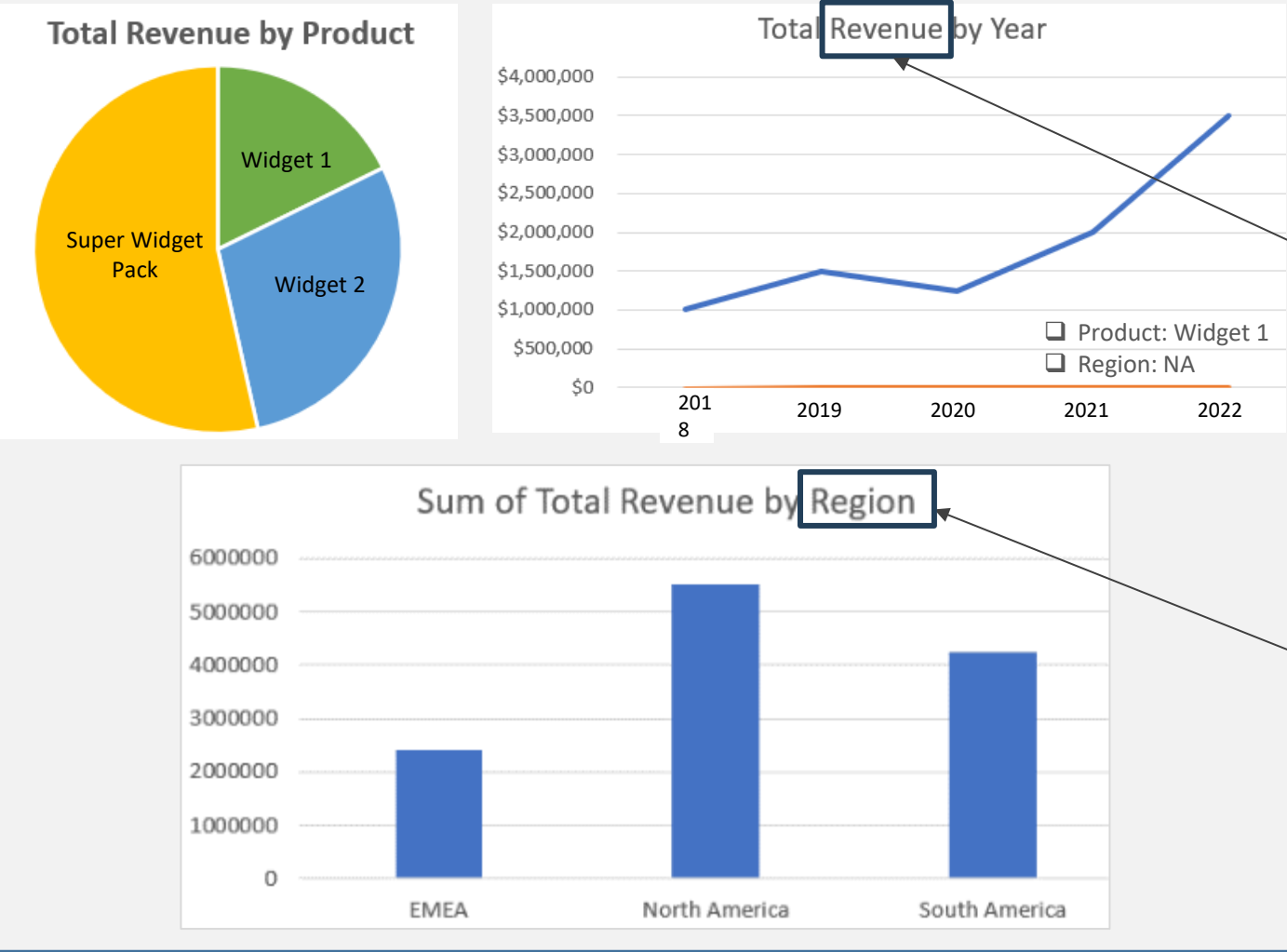
# The Star Schema



The Star Schema is still a user-friendly and performant way to “slice and dice” data for reporting.



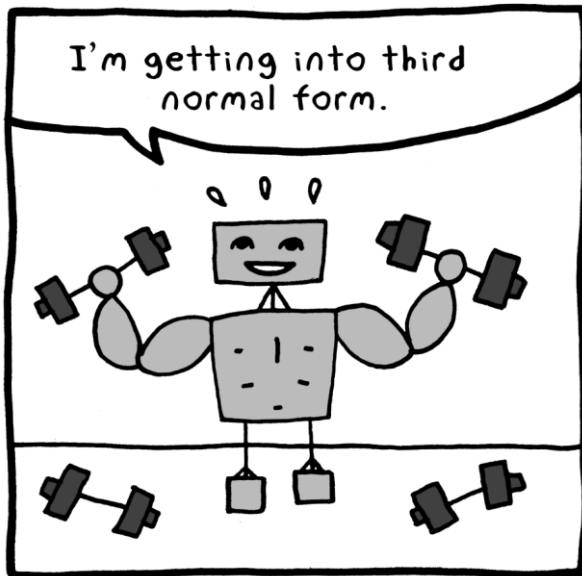
## ACME Inc. Sales Dashboard



# Different Physical Models for Different Use Cases

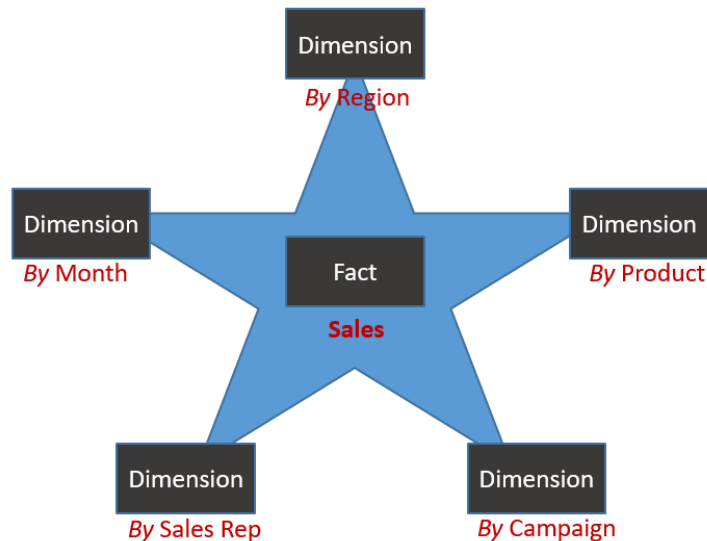
## Relational – Normal Form

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



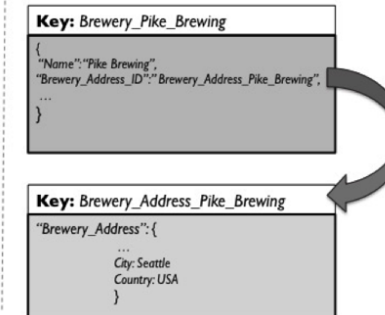
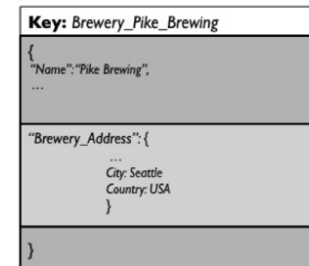
## Dimensional– Star Schema

- 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.

# Design Patterns

There are a number of design patterns available to fit a variety of use cases  
(*again – there is no “one size fits all”* )

## Inmon vs. Kimball

The battle still rages...



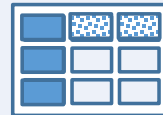
## Data Vault

Hubs, Links and Satellites



## Columnar

Columns vs. Rows



## Flatten Everything

Popular with Data Science



## Graph

Good for discovering connections

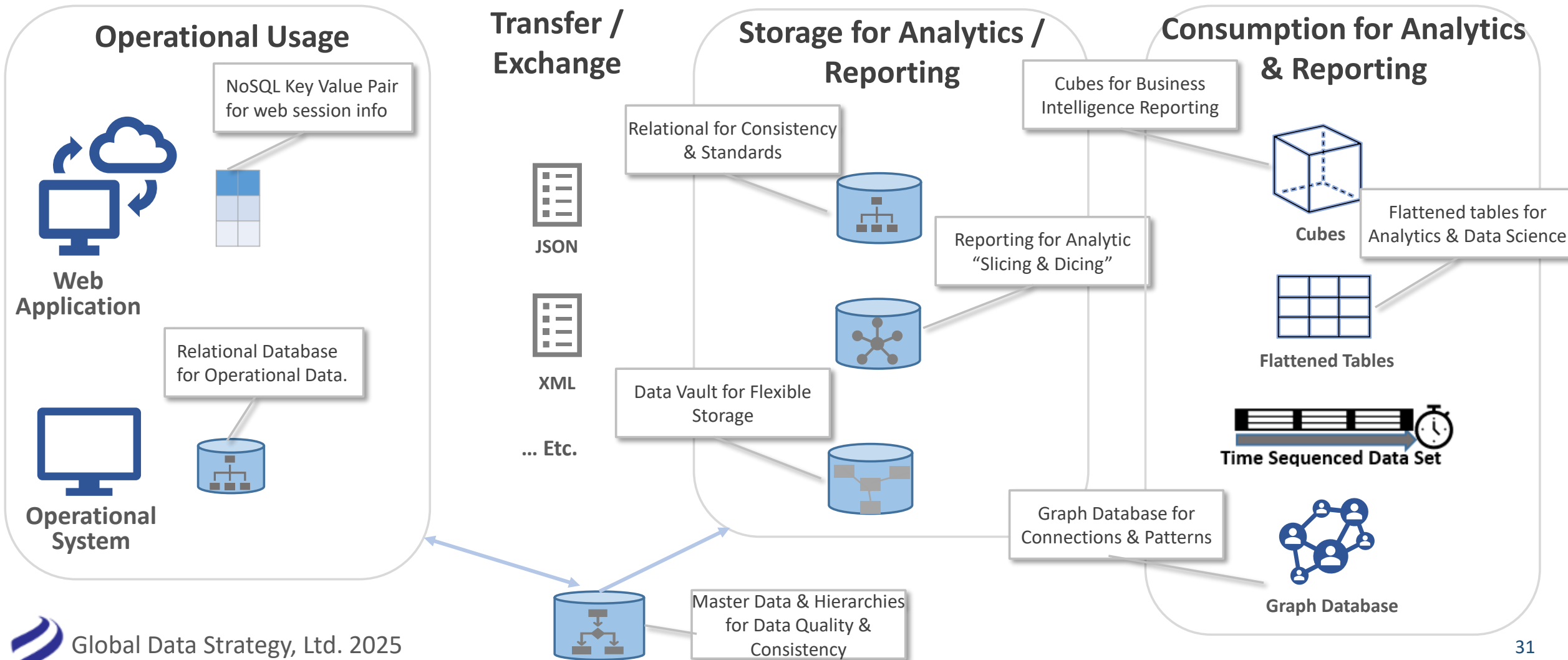


**And More...**  
Choices abound...



# In a Typical Organization, there are many Use Cases for Data Models

The following is just a subset of options that exist....



# Summary

**Analytics and Reporting are key priorities for today's data-driven business.**

- **A strong data architecture is needed to support successful analytics**
- There are **many choices** in the marketplace, and at the same time, **core fundamentals still apply**.
- **Choose your architecture wisely**, and have fun and success with the numerous options available in today's market.



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# Who We Are: Business-Focused Data Strategy

Maximize the Organizational Value of Your Data Investment



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

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 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?**