Emerging Trends in Data Architecture: What's the Next Big Thing?

Donna Burbank
Global Data Strategy, Ltd.

January 23, 2025

Making Well-Informed Decisions in Real Time

Lalit Ahuja

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January 23, 2025

Making a Well-Informed Decision in Real Time

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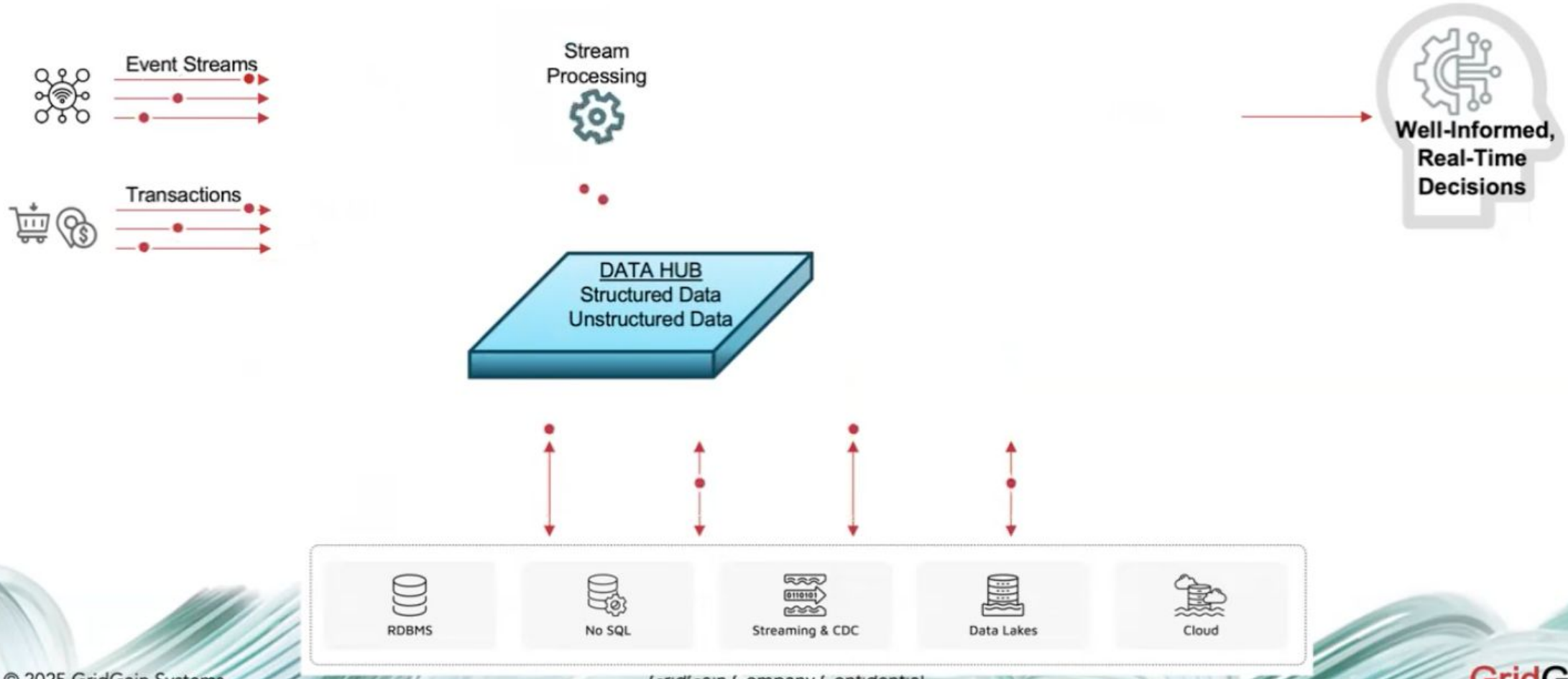

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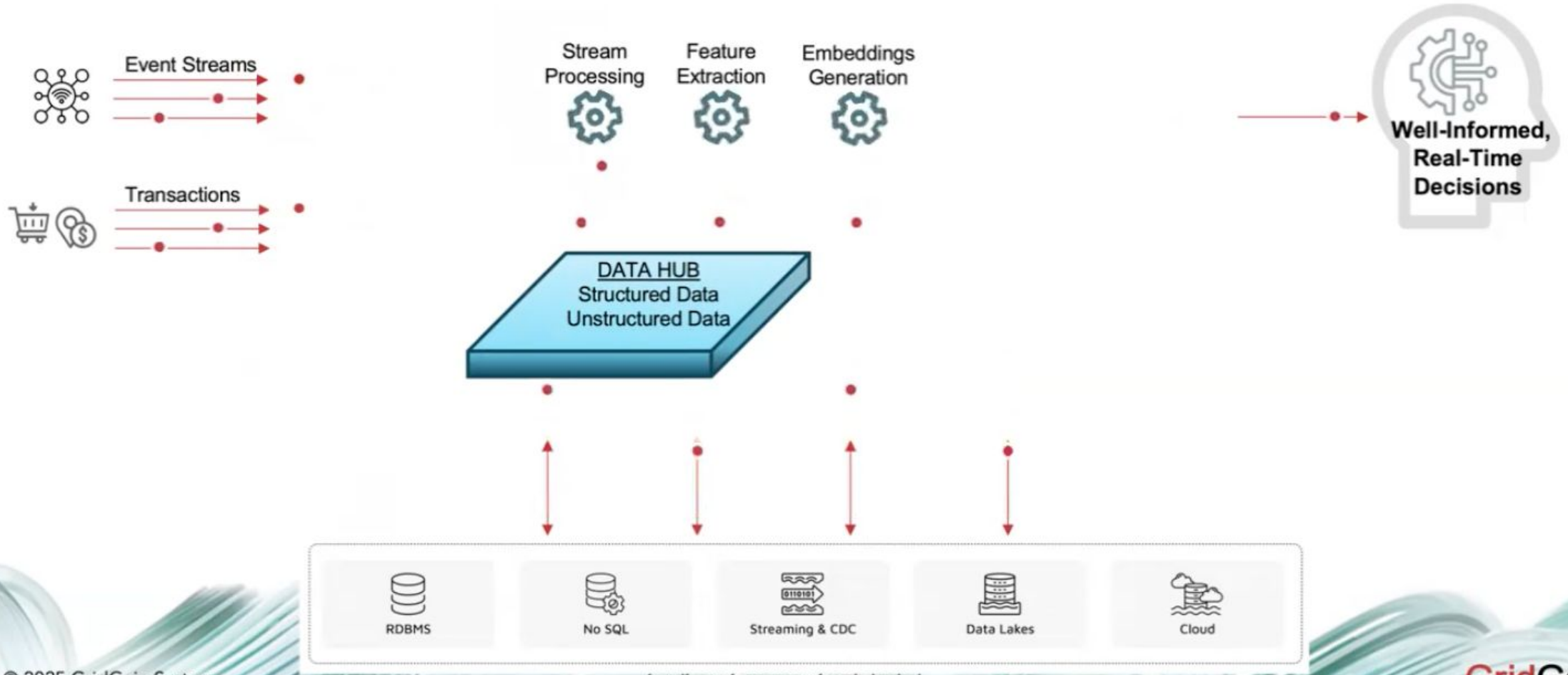

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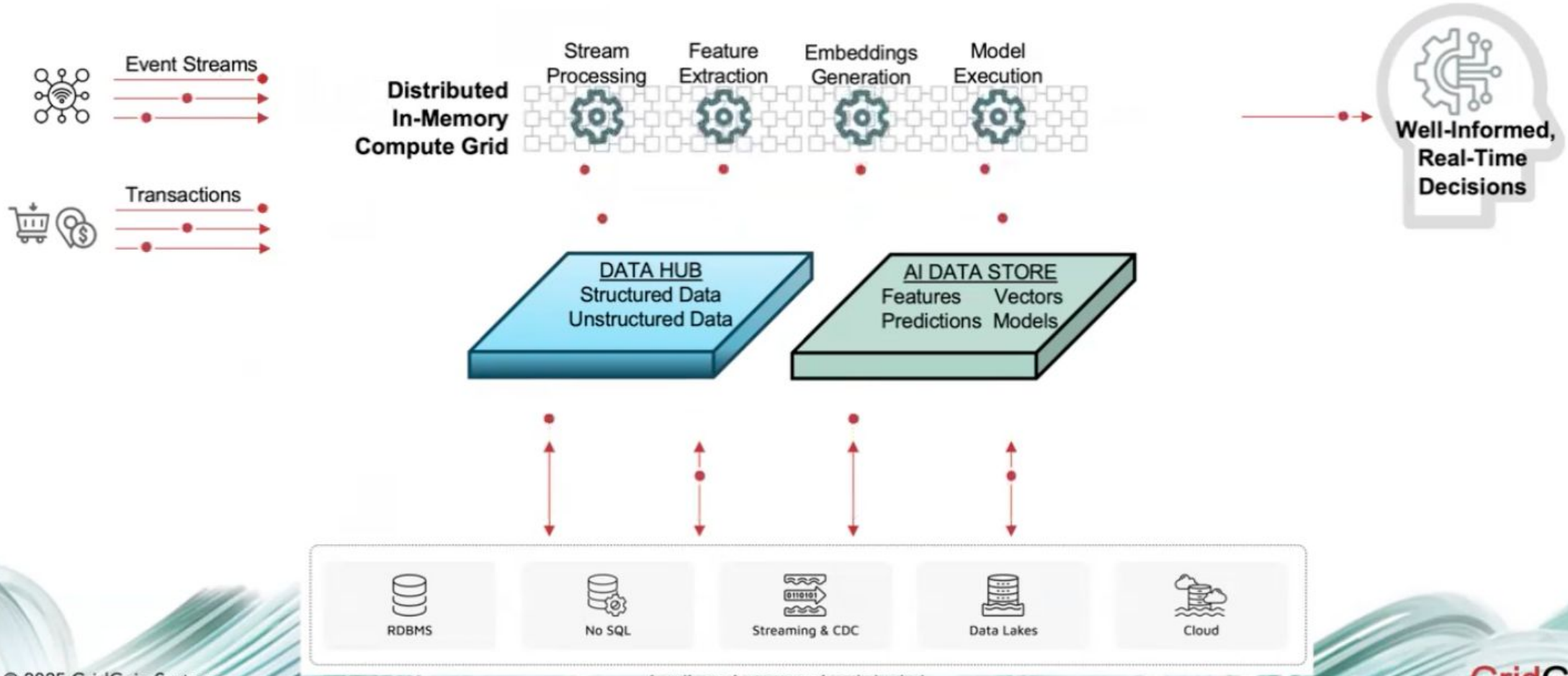

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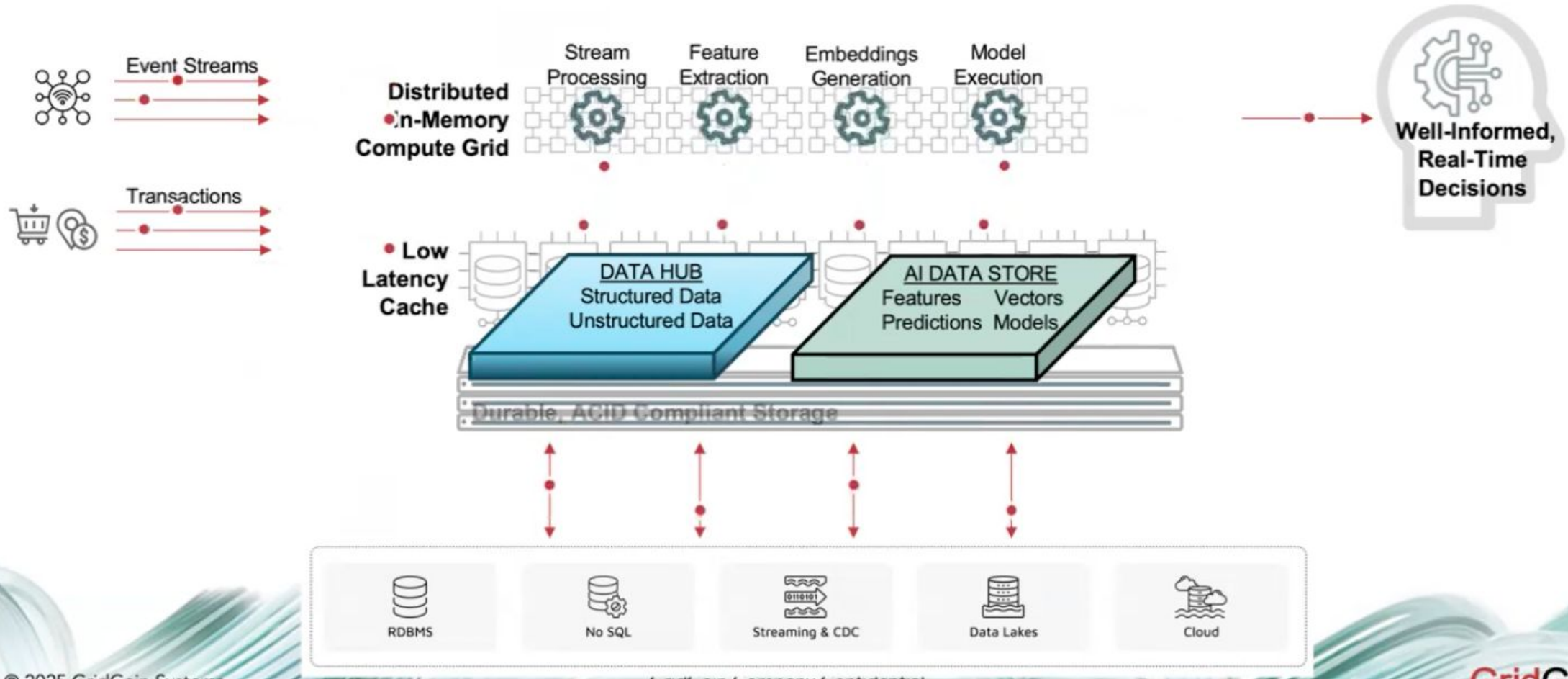

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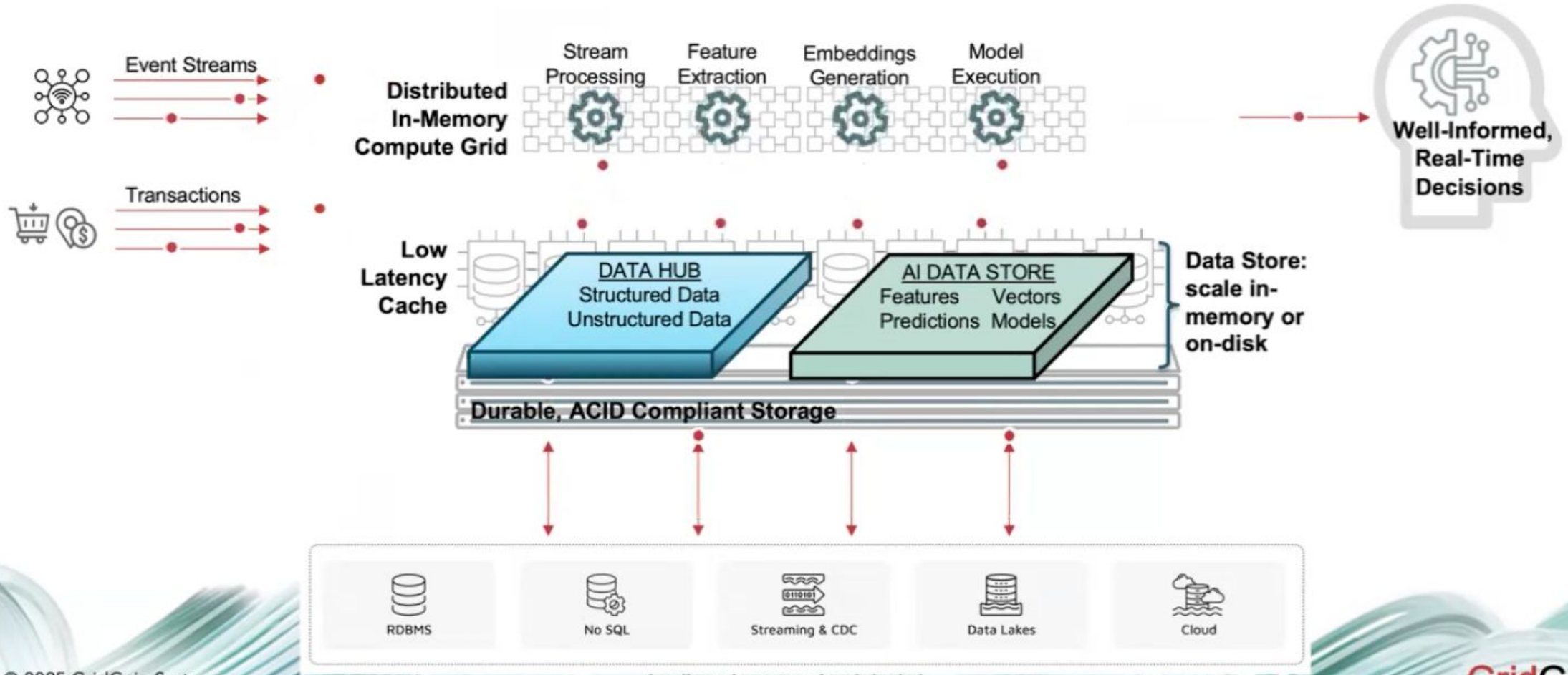

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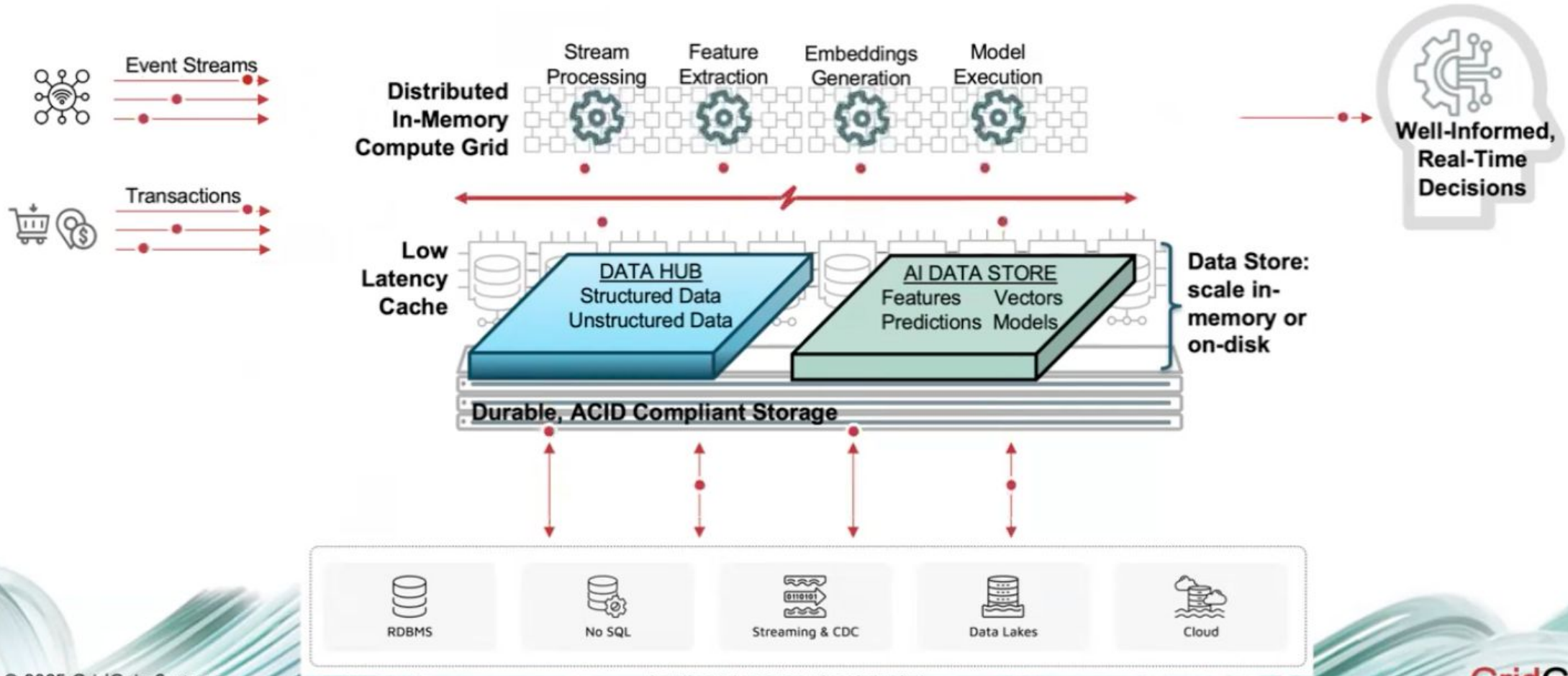

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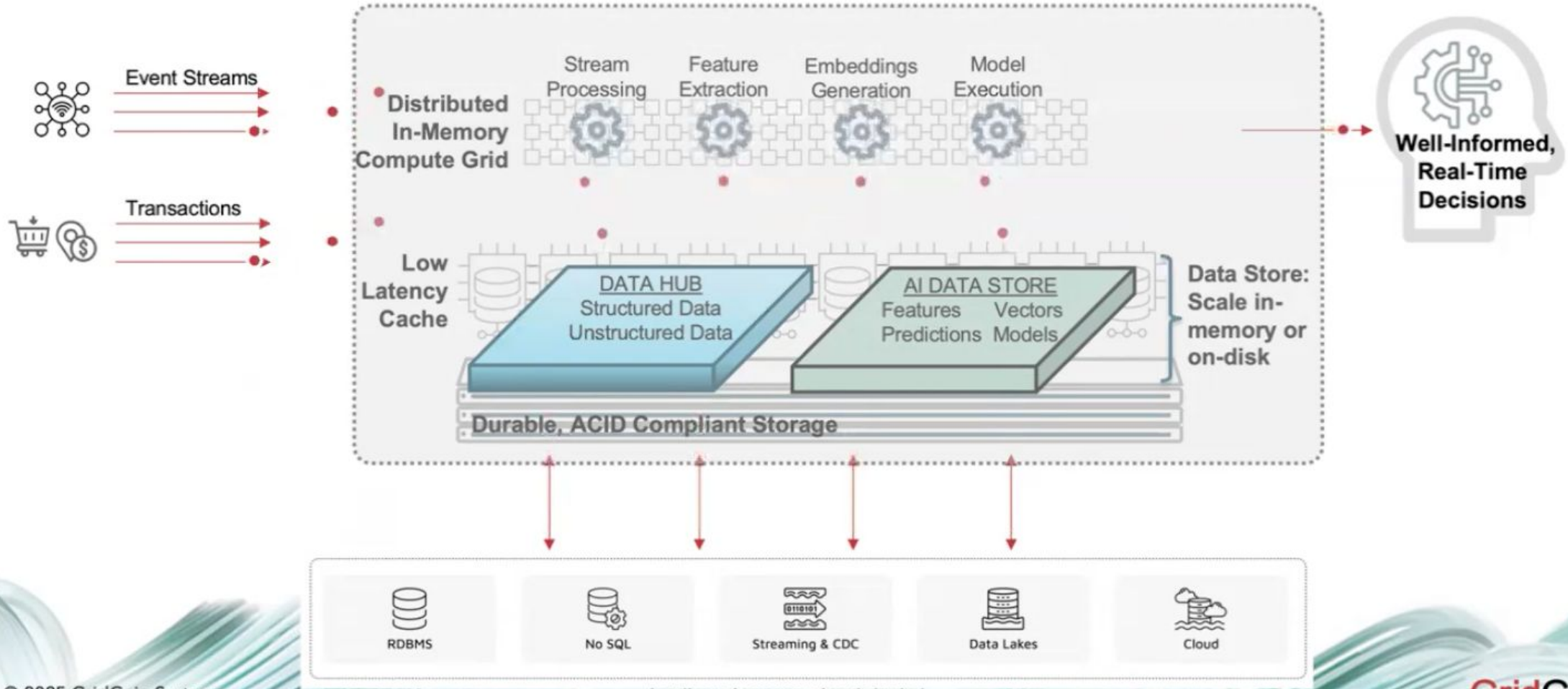
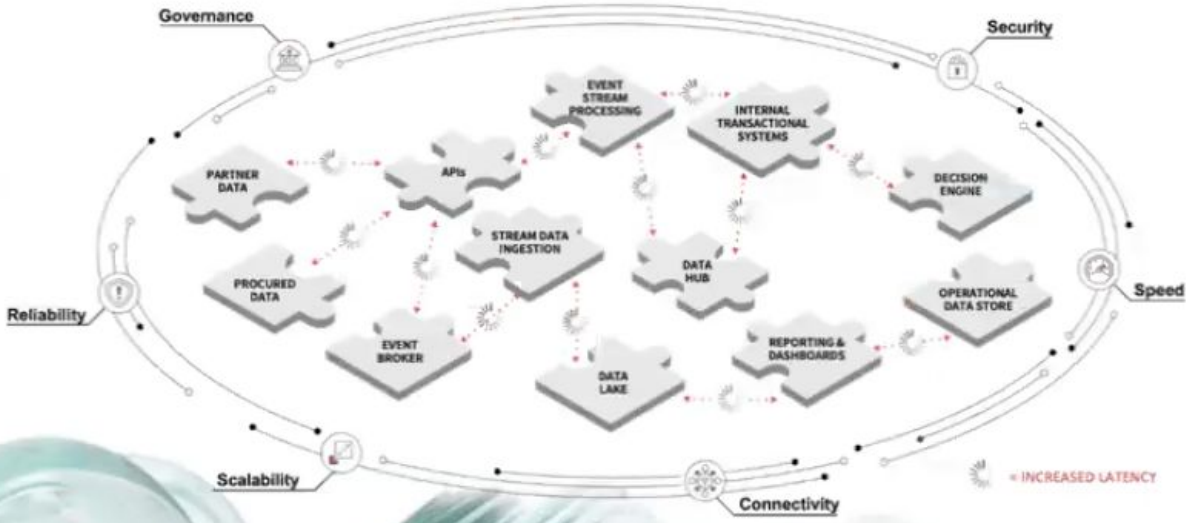


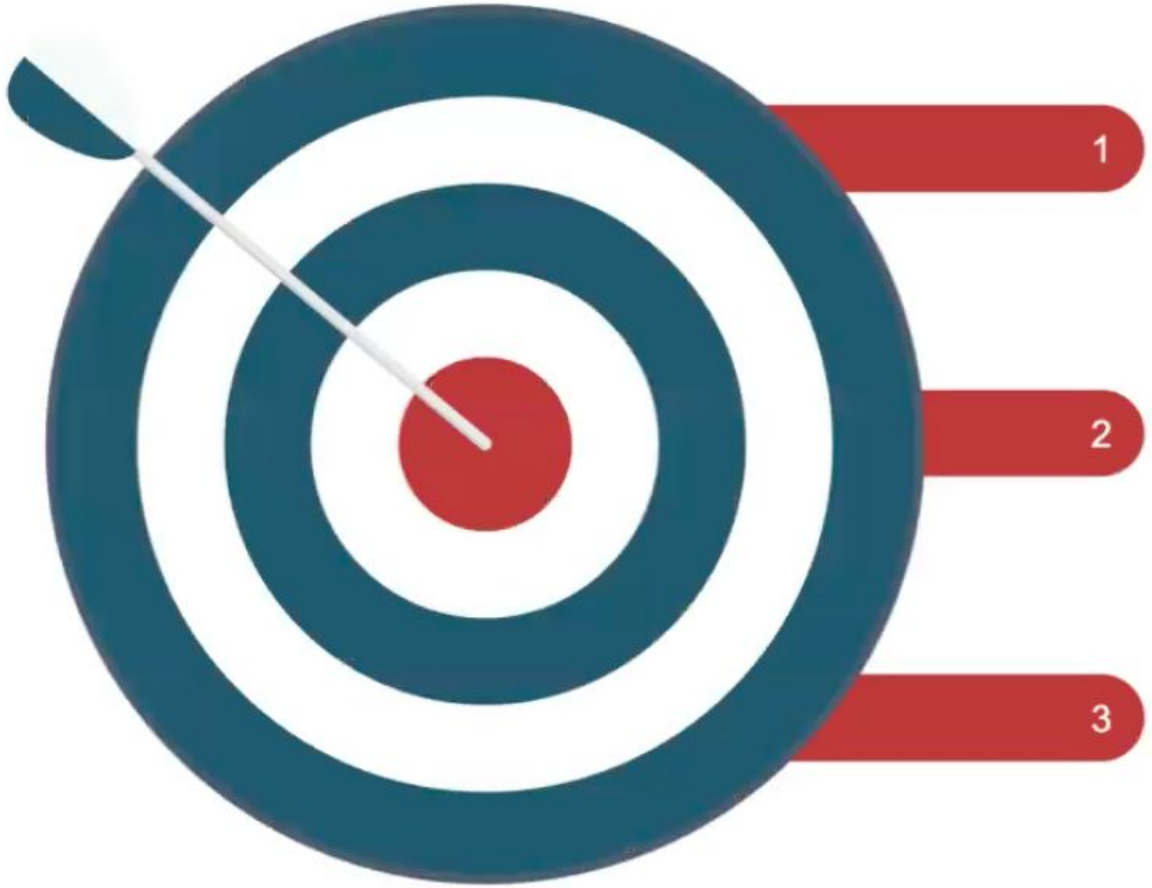
Architectural Simplicity & Optimization

- Traditional Enterprise Data Ecosystems
  - Latency across data silos
  - Risk of data loss, quality, and integrity
  - Architectural complexity



- Enterprises with Modern Data Platforms
  - Optimizes end-to-end data processing
  - Minimizes latency across the data flow
  - Simplifies your data architecture

Key Takeaways



Data driven enterprises need real-time processing

Combining streaming and transactional data with historical context and complex computations can minimize latency

Unified real-time data platforms deliver business outcomes while simplifying the enterprise data ecosystems

Donna Burbank

Donna is a recognized industry expert in data management with over 25 years of experience in da vernance metadata management, and enterprise architecture. Her background is multi-faceted across cons elopment management, brand strategy, marketing, and business leadership.

She is currently the Managing Director at Global Data Strategy, Ltd., an international data manager t 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 products in the market.

As an active contributor to the data management community, she is a long time DAMA International member the DMBOK 2.0, Past President and Advisor to the DAMA Rocky Mountain chapter, and was awarded the Excellence in Data Management rd 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 Donna is based in Boulder, Colorado, US.

DATAVERSITY Data Architecture Strategies

This Year's Lineup

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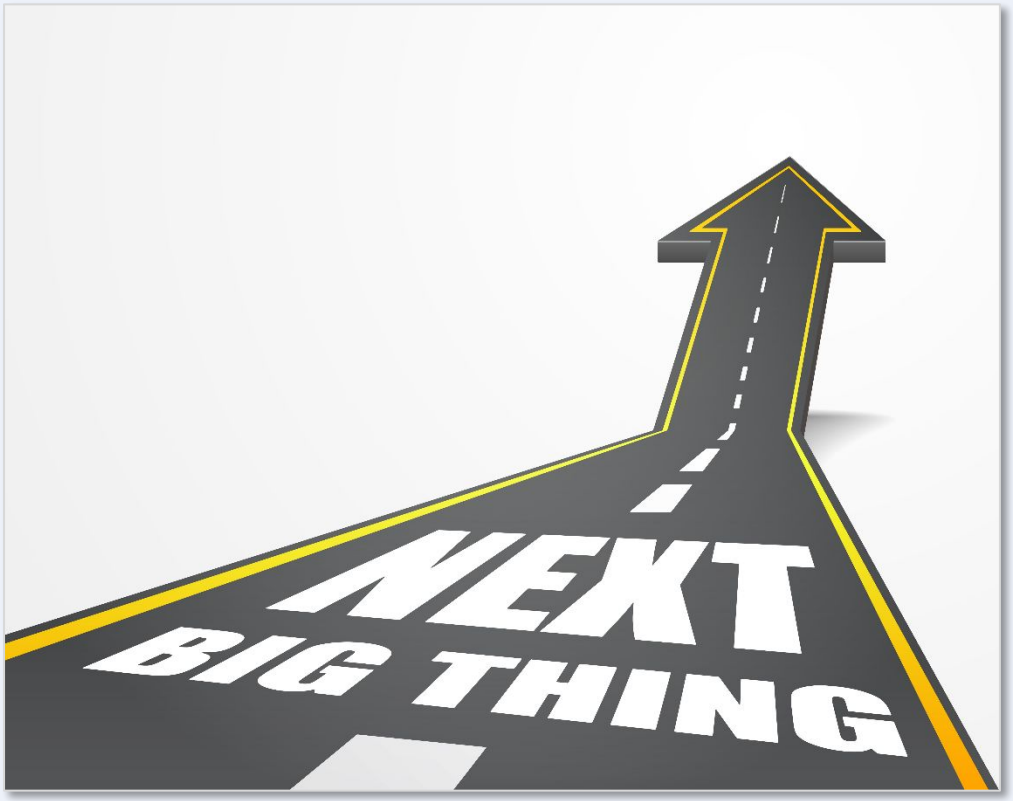
What We'll Cover Today



- With **technological innovation and change occurring at an ever-increasing rate**…
- …it's hard to keep track of **what's hype and what can provide practical value** for your organization.
- This webinar will **share the results of a recent survey on emerging trends**, along with practical commentary & advice.

The Research

- Each year, DATAVERSITY and Global Data Strategy, Ltd. partner to conduct a research survey & accompanying paper on Trends in Data Management.
- This paper provides insight on data management trends over time and a look into the future.
- Available for free download on
  - Dataversity.net
  - Globaldatastrategy.com (under Resources | Whitepapers)

The survey had a total of 334 participants, from 45 countries, and over 40 industries.

This Year's Over-Arching Theme: Judicious Use of AI

- **Artificial Intelligence (AI) was top of mind** for respondents in this year's survey, however:
  - …Thoughts had **less to do with the transformational power of AI** …
  - … and more with **concerns about how to govern the data supporting AI** and to ensure high-quality data.
- Key concerns included the need for:
  - **Data governance**
  - **Cross-functional, data-literate teams** managing enterprise data

AI: Boon for Humanity?

The Guardian

Five ways AI could improve the world: 'We can cure all diseases, stabilise our climate, halt poverty'

Forbes

Artificial Intelligence For Good: How AI Is Helping Humanity

FORTUNE

3 reasons why VC billionaire Marc Andreessen thinks 'A.I. is quite possibly the most important—and best—thing our civilization has ever created'

andreessen horowitz It's time to build

Why AI Will Save the World

by Marc Andreessen

AI – Risk to Humanity?

The New York Times

A.I. Poses 'Risk of Extinction,' Industry Leaders Warn

CENTRE FOR THE STUDY OF EXISTENTIAL RISK

Risks from Artificial Intelligence

San Francisco Chronicle

Yes, AI poses an extinction risk to humanity. And not just for the obvious reasons

- From 2001: A Space Odyssey (1968)

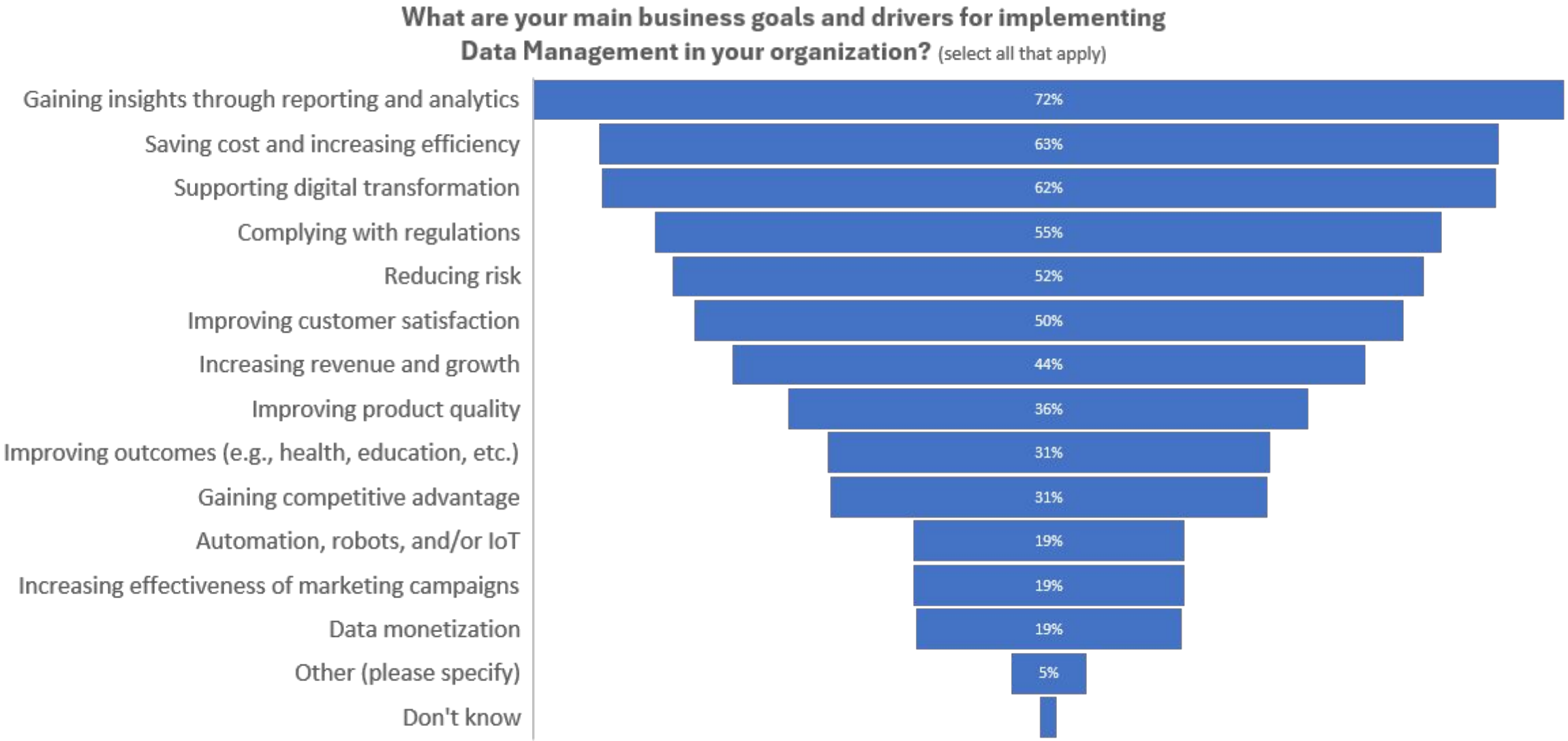
In the Words of the Survey Respondents …

"We see an intensification and renewal of data management efforts in the face of renewed regulatory focus. As organizations increasingly adopt AI initiatives, the need for effective data governance becomes more critical to ensure the reliability, transparency, and ethical use of data in AI systems."

"The Business relies too much on tools without cleaning up processes first. For example, it expects a fancy new tool with AI capabilities can bring new insights ."

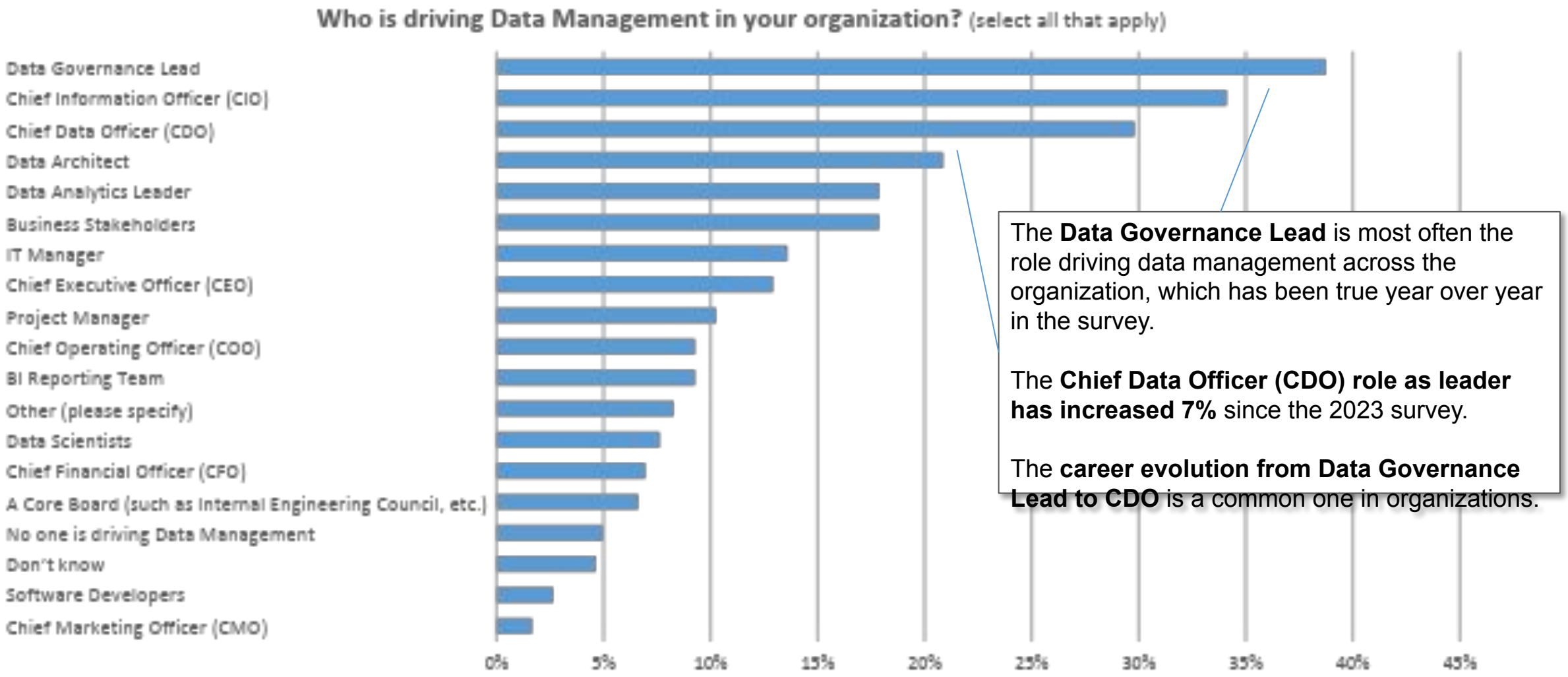
"Responsible AI and Data Ethics guidelines and practices are a priority for us ."

What's Driving the Need for Data Management?



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

It Takes a Village …



The **Data Governance Lead** is most often the role driving data management across the organization, which has been true year over year in the survey.

The **Chief Data Officer (CDO) role as leader has increased 7%** since the 2023 survey.

The **career evolution from Data Governance Lead to CDO** is a common one in organizations.

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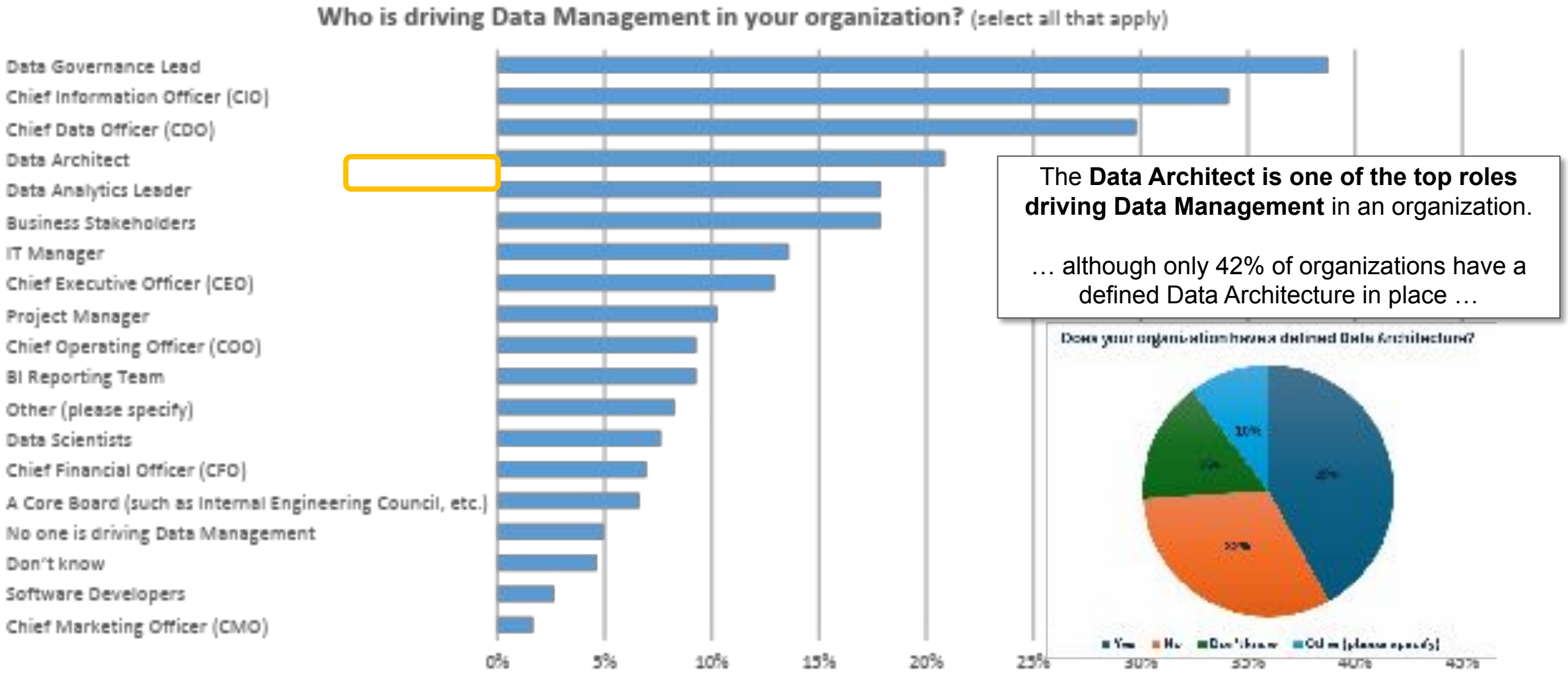
Data Architecture Plays a Pivotal Role



The **Data Architect is one of the top roles driving Data Management** in an organization.

… although only 42% of organizations have a defined Data Architecture in place …

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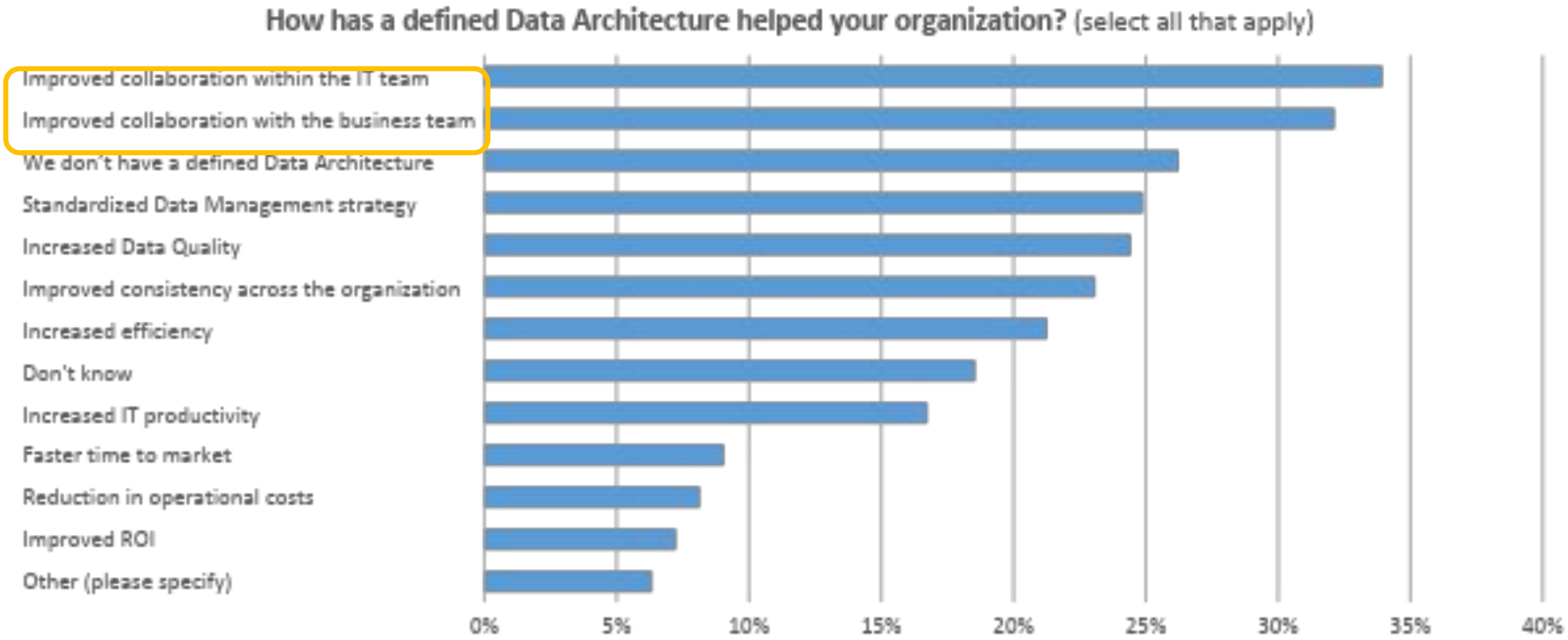
Data Architecture Driving Collaboration



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Data Architecture Drives Collaboration

- When done right, **Data Architecture drives collaboration between business and IT stakeholders**.
- Data models, architecture diagrams, and data-process overlays are **critical in understanding the impact of data on an organization**.

Real-world quotes from Architecture sessions:

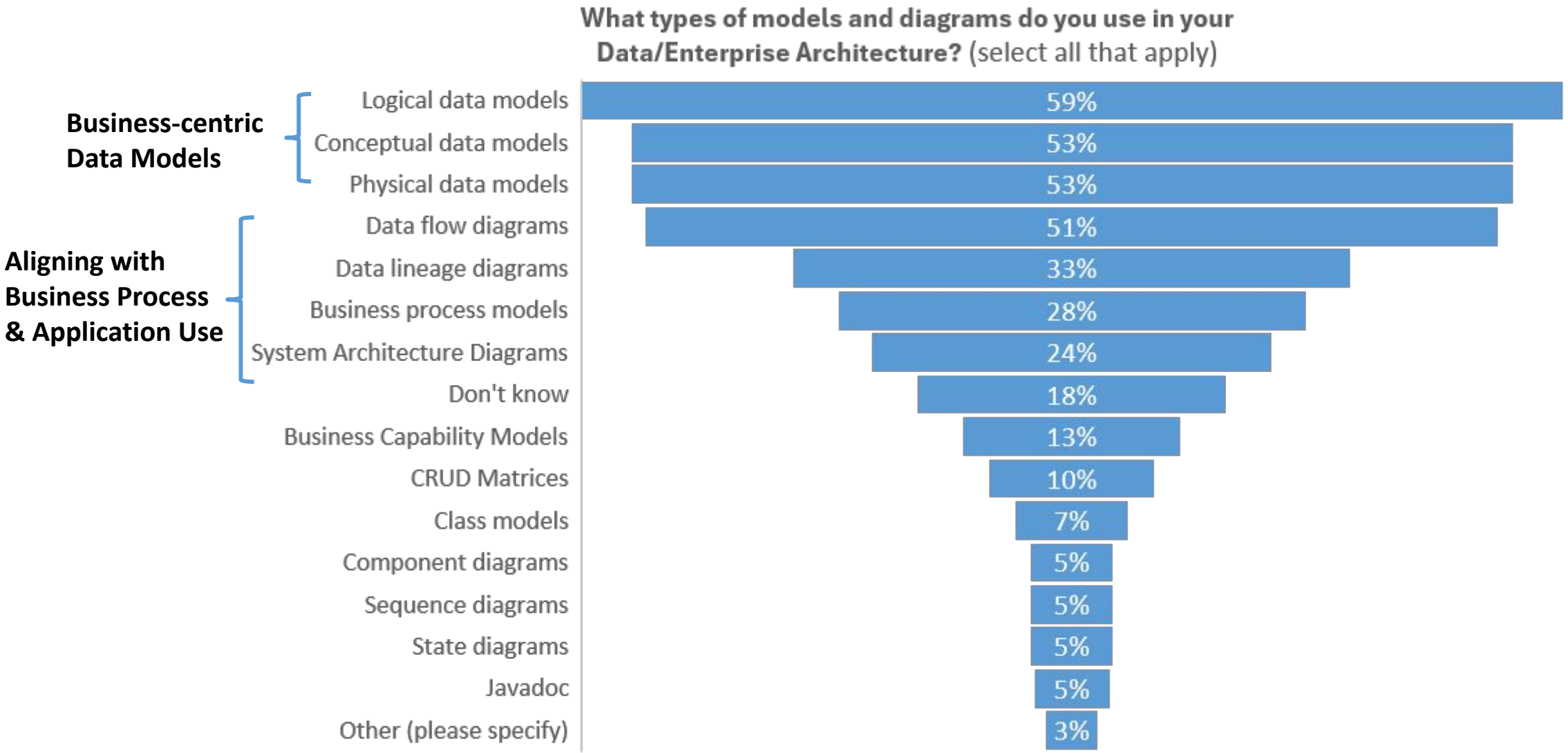
This is really elegant. You just summed up our organization in a single page.
- Early Childhood Educator

This is the clearest I've seen our business illustrated.
- Finance Executive

I'd never seen data from the Customers' perspective before. This will totally help me in my application development. Thank you!
- VP of Software Development

It's not about Data Literacy, but about having the right conversations between Business and IT , using the right tools.

Common Architecture Diagrams / Tools



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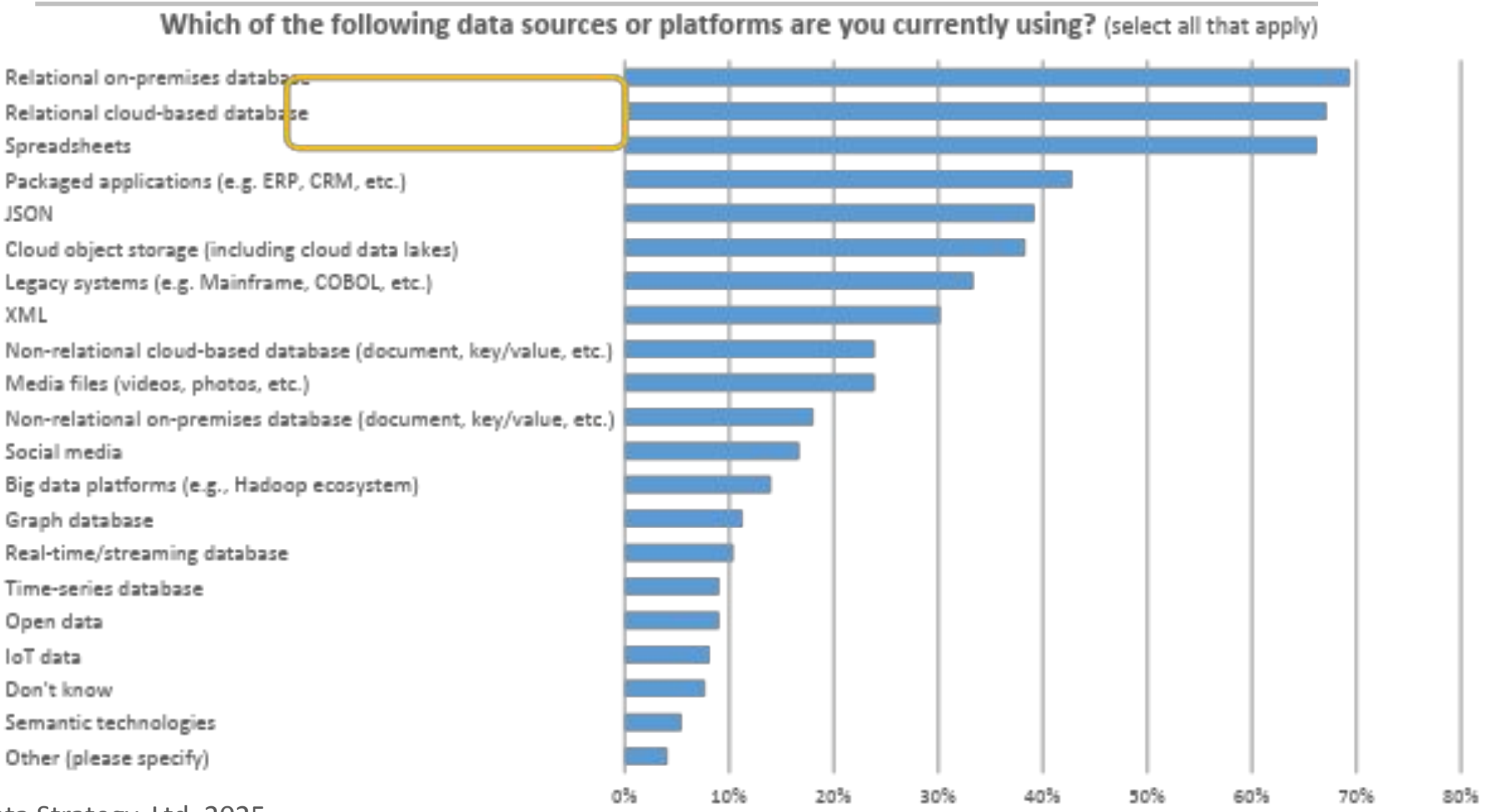
Top Data Platforms 2024

Relational Databases continue to be the leading platforms in use.



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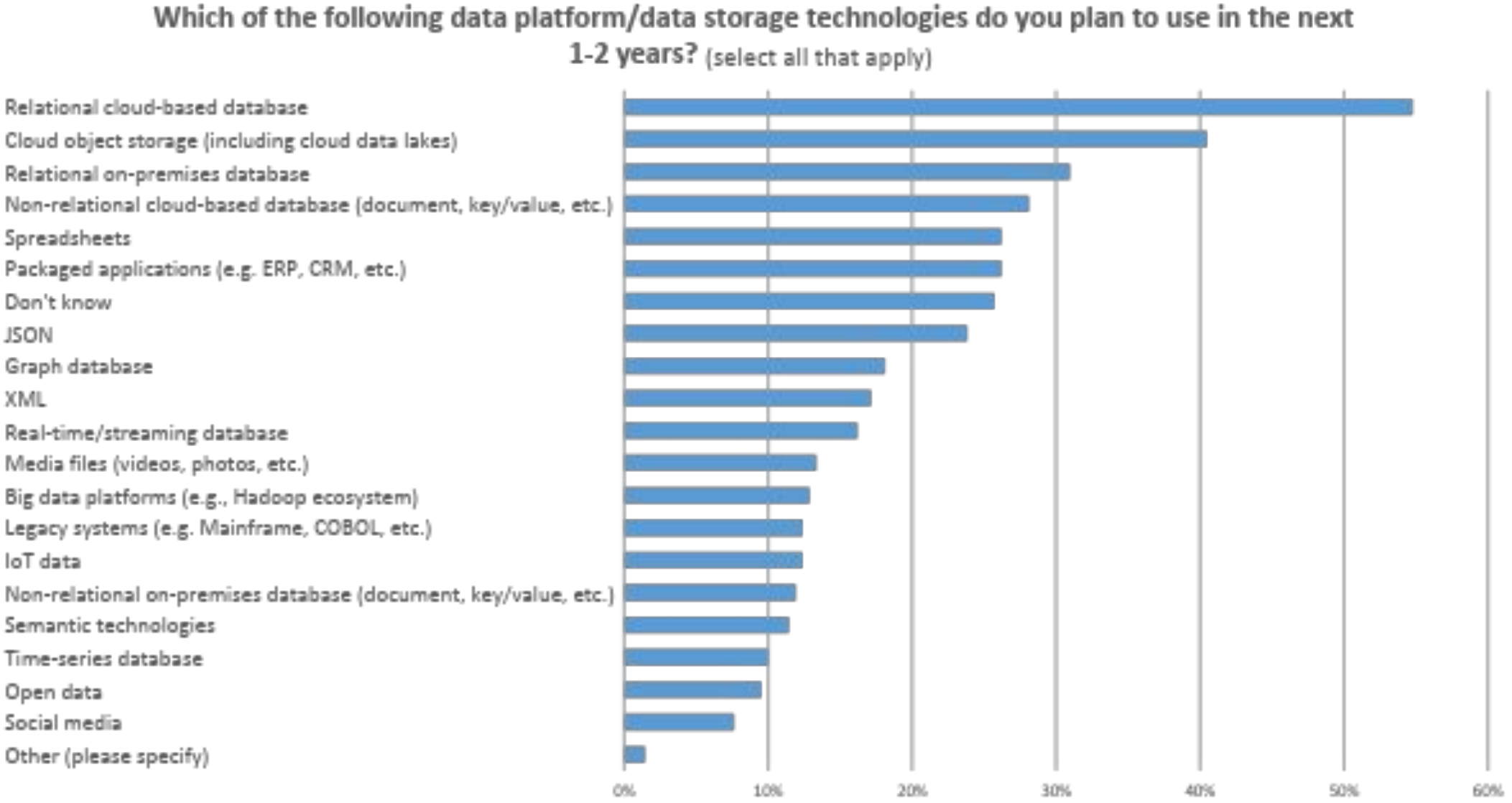
Top Platforms Planned in Future (2025-2026)



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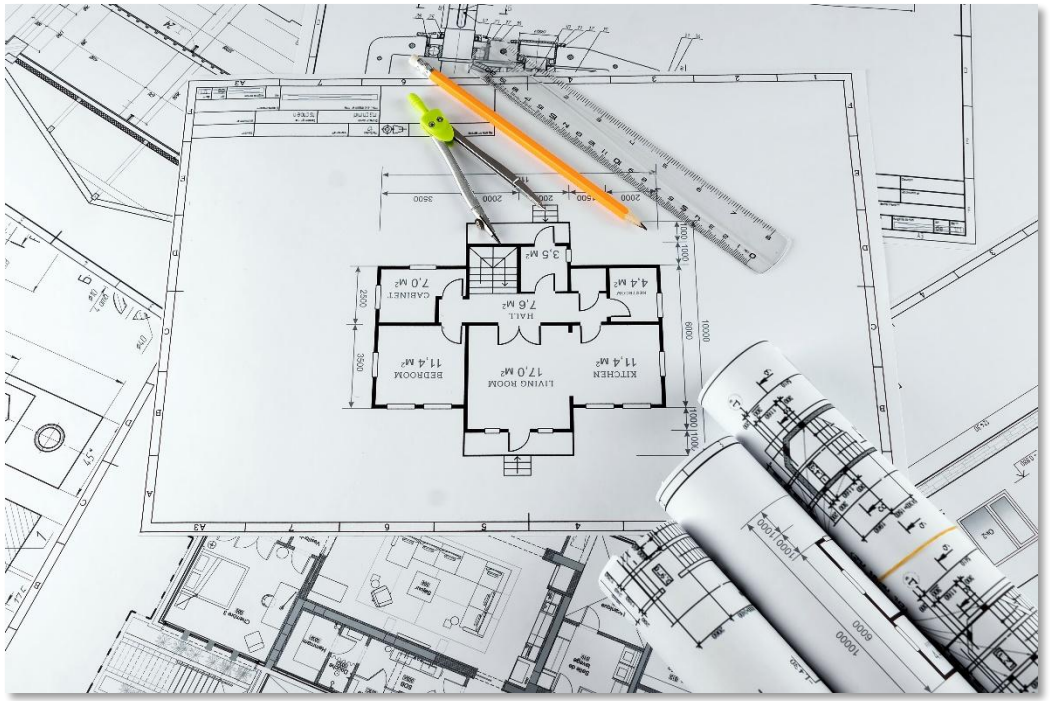
Architectures Are Becoming Ecosystems



- Singular, Fit for purpose solutions
- Design for individual use-cases (e.g. Data Warehouse, Data Lake, 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

Data Warehouse

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

Operational Data

Registration System

Facilities Management

Order Management

Etc.

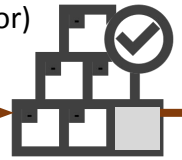
Data Integration & Transformation

- Transformation
- Standardization
- Business Rules

ETL

- Publish & Subscribe

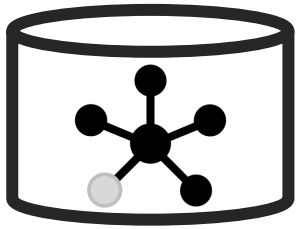
- Core data cleansed & governed for reuse (Customer, Product, Vendor)



Master Data

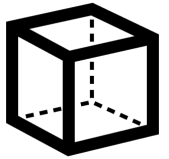
Structured Data Storage

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



Semantic Layer

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



Reporting

- Business Intelligence Reporting

Data Governance – roles, organization, policies, standards, etc.

Data Lakehouse

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

ELT

Streaming

Data Lake/ Raw Landing

- Structured Data Storage
- Unstructured Data Storage

- Transformation

Structured Data Storage

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

Semantic Layer

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

Reporting

- Business Intelligence Reporting

Advanced Analytics

- Discovery & Analysis
- AI & ML
- LLM
- Graph Relationships
- Etc…

Publish & Subscribe

Master Data

- Core data cleansed & governed for reuse (Customer, Product, Vendor)

Data Governance – roles, organization, policies, standards, etc.

Data Fabric

DATA ARCHITECTURE STRATEGIES

Reporting, Analysis, and Discovery across Disparate Data Sources

• BI Reporting

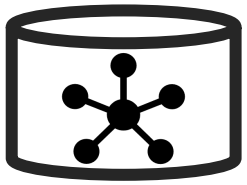
• AI / ML

• Advanced Analytics

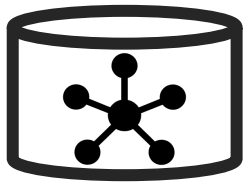
A Data Virtualization Layer Provides a Logical View for Data Access, removing the need to physically move data into a central place. A Semantic, business-friendly view is provided for Self-Service reporting.

Data Virtualization Layer

Data Warehouse 1

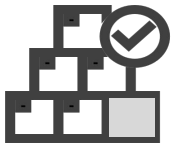


Data Warehouse 2

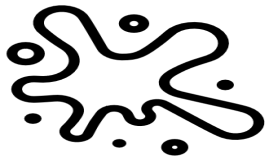


Operational System(s)

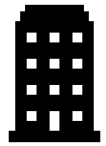
Master Data



Data Lake



Data from Partner Organizations



Etc.

Data Governance – roles, organization, policies, standards, etc.

Where are we headed?

Priorities for Coming 1-2 Years

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Summary

- **AI and Analytics are top of mind** for many organizations.
- … driving a **focus on the fundamentals such as data governance, data architecture, and data management**.
- A **diverse set of roles across the organization are needed** to drive informed data-driven decision-making.
- **Data Architecture facilitates collaboration** across roles.
- Data Platform options provide expanded options for implementation – **choose your data platforms options wisely based on business-driven use cases**.

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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?