



Emerging Trends in Data Architecture

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Who Am I?

Donna Burbank is a recognised industry expert in information management with over 20 years of experience in data strategy, information management, 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 information 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 at CA Technologies and Embarcadero

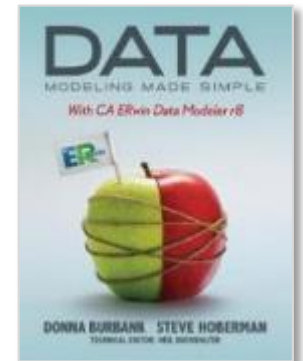
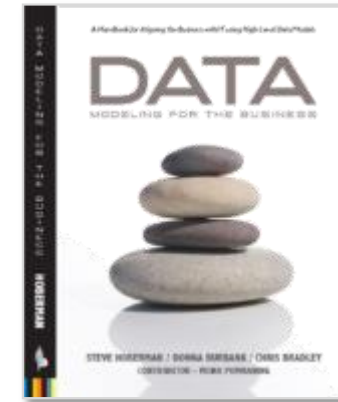
Technologies for several of the leading data management products in the market.

As an active contributor to the data management community, she is a long time DAMA International member, Past President and Advisor to the DAMA Rocky Mountain chapter, and was recently awarded the Excellence in Data Management Award from DAMA International in 2016.

She was on the review committee for the Object Management Group's (OMG) Information Management Metamodel (IMM) and the Business Process Modeling Notation (BPMN). Donna is also an analyst at the Boulder BI Train Trust (BBBT) where she provides advices and gains insight on the latest BI and Analytics software in the market.

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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 two books: *Data Modeling for the Business* and *Data Modeling Made Simple with ERwin Data Modeler* and is a regular contributor to industry publications. She can be reached at donna.burbank@globaldatastrategy.com. Donna is based in Boulder, Colorado.



Who Are You? Survey

How Would You Describe Your Role?



Businessperson or Business Analyst



Data Architect, Data Modeler, or Data Analyst



Enterprise Architect



Business Intelligence Analyst or Developer



DBA, Programmer, or Technical IT



Data Scientist



A combination of the above



Other



What We'll Cover Today

- With technology changing at a faster pace than ever before, it can be challenging to keep up with the latest innovations in data architecture. If you're wondering which technologies and trends your organization should include as part of your enterprise data architecture, you're not alone.
 - How do we define Data Architecture in today's data ecosystem?
 - Which are the hot technologies to adopt?
 - What might be a fad or passing trend? Which are on their way out?
 - How can a data architecture support my business goals?
- Content is based on research from a 2017 DATAVERSITY survey on "Emerging Trends in Data Architecture".



What is Data Architecture?

DMBOK Definition

- The DAMA Data Management Body of Knowledge (DMBOK), defines data architecture as the following:
- “Data Architecture is fundamental to data management. Because most organizations have more data than individual people can comprehend, it is necessary to represent organizational data at different levels of abstraction so that it can be understood and management can make decisions about it.
- ... Data Architecture artifacts include specifications used to describe existing state, define data requirements, guide data integration, and control data assets as put forth in data strategy.
- An organization’s Data Architecture is described by an integrated collection of master design documents at different levels of abstraction, including standards that govern how data is collected, stored, arranged, used, and removed. It is also classified by descriptions of all the containers and paths that data takes through an organization’s systems.”



What is Data Architecture?

Survey Respondents Provided a Range of Views

- Survey respondents also provided a range of relevant definitions including:

“...the practice of examining the enterprise strategy, and identifying the key Data Integration points that need to be enabled to execute that strategy, and laying out a roadmap for creating the core capabilities to deliver those integrations, so that companies can ***leverage data as a strategic asset.***”

“...***the science*** of assessing where your company data is, ***and the art of designing the best future way of storing data across the enterprise.***”

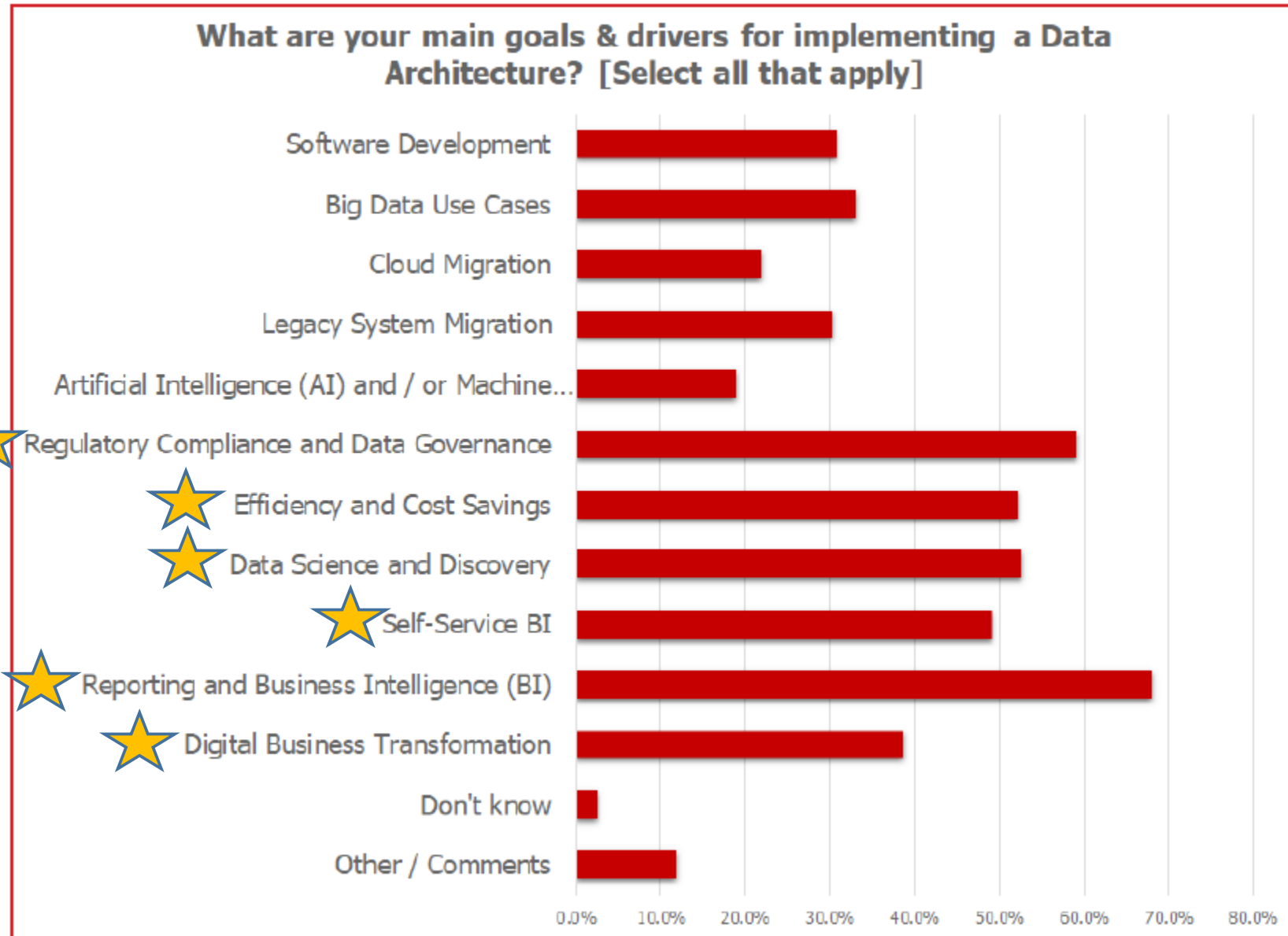
“...**the discipline to help businesses manage their data** in the most effective, secure, compliant, and profitable way.”



Business Drivers for Data Architecture

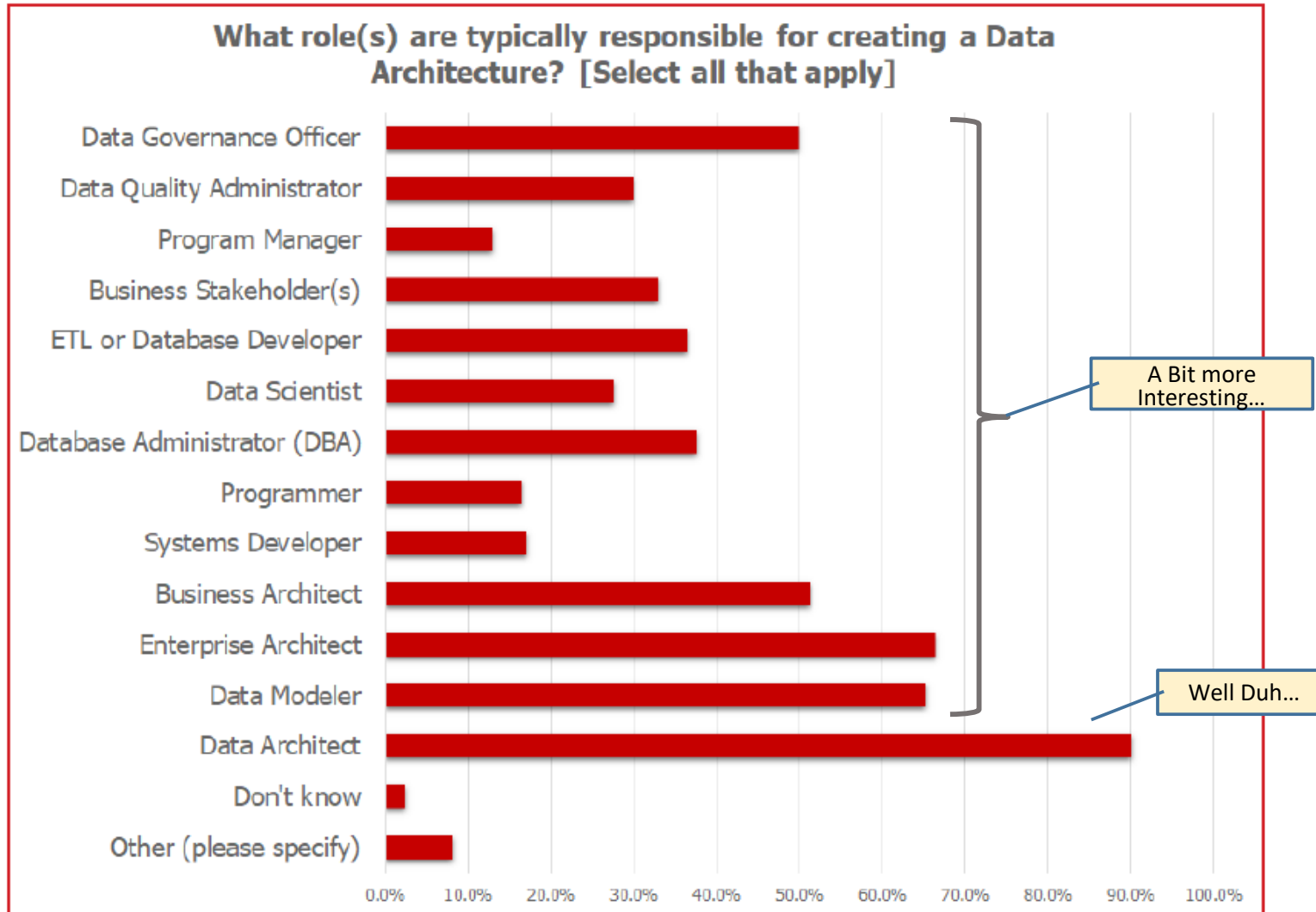
What's Driving the Need?

- As more organizations see data as a strategic asset, and with the drive towards Digital Business Transformation on the rise, **the need to analyze, understand & govern core data assets continue to be a key goal.**



Who is Responsible for Creating a Data Architecture?

Wide Range of Responses shows Need for Collaboration



- With a greater business focus on data and a wider range of technologies associated with Data Management...
- ... it is not surprising that there is a concomitant rise in the diversity of roles responsible for developing a Data Architecture.
- ... the role of the data architect, not surprisingly, continues to play a large role.

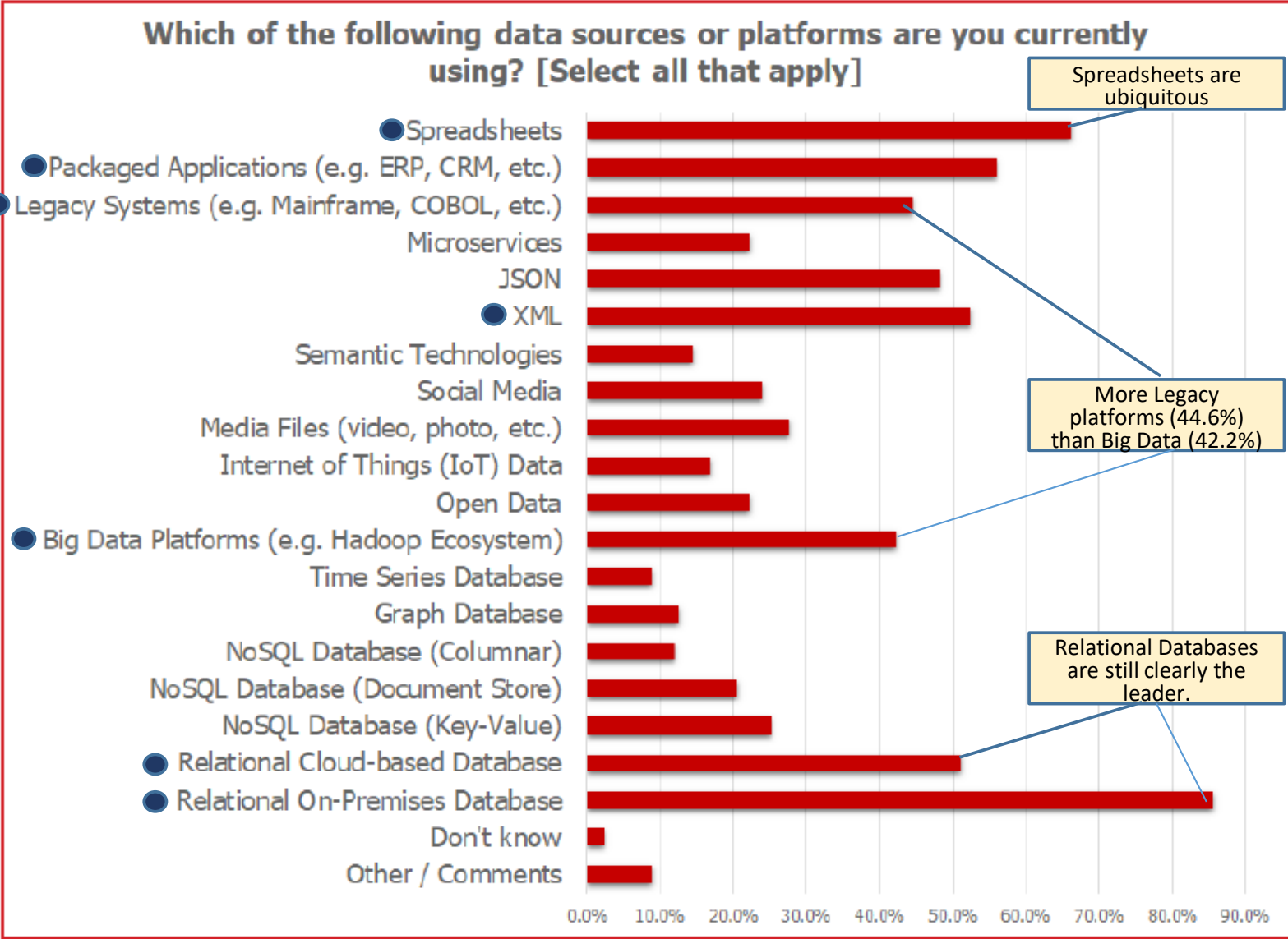
Collaboration is Key to a Successful Data Architecture.

What Data Platforms are Currently in Use?

“Which of the following data sources or platforms are you currently using?
[Select all that apply]

- A wide range of technologies are currently in use.

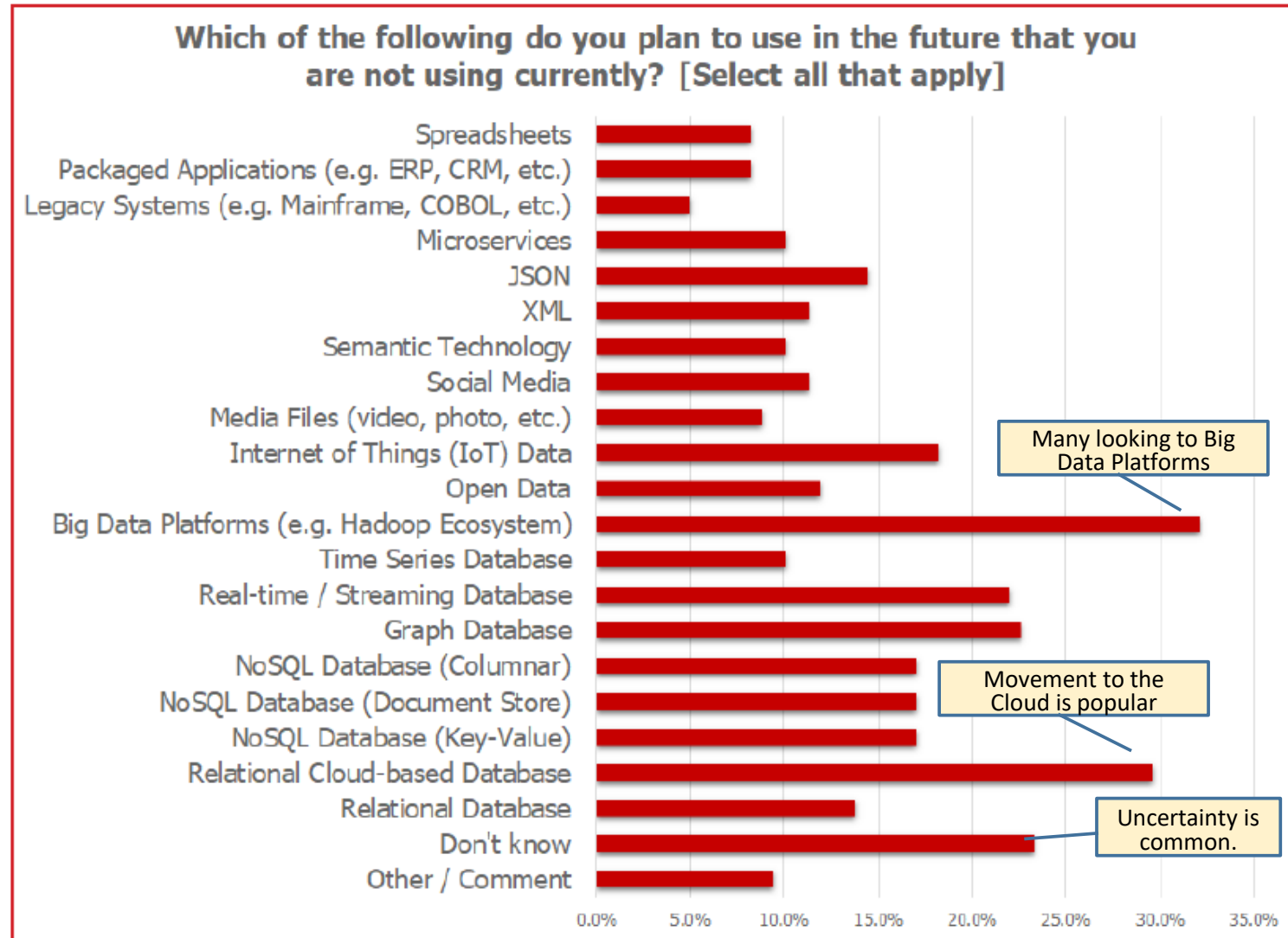
“
Even with the emergence of new technologies, the relational database continues to be the tried and true workhorse of the organization.
”



Emerging Technologies

“Which of the following do you plan to use in the future *that you are not using currently?* [Select all that Apply]”

- For those looking at new technologies, there is a wide range of responses.
 - Big Data Platforms a leader
 - Move to Cloud RDMBS
 - Graph Database
 - Real-time Streaming
 - Internet of Things (IoT)
- Many are ***still uncertain***, indicating the vast rate of change and wide array of choices available.



Moving to the Cloud

A Growing Trend

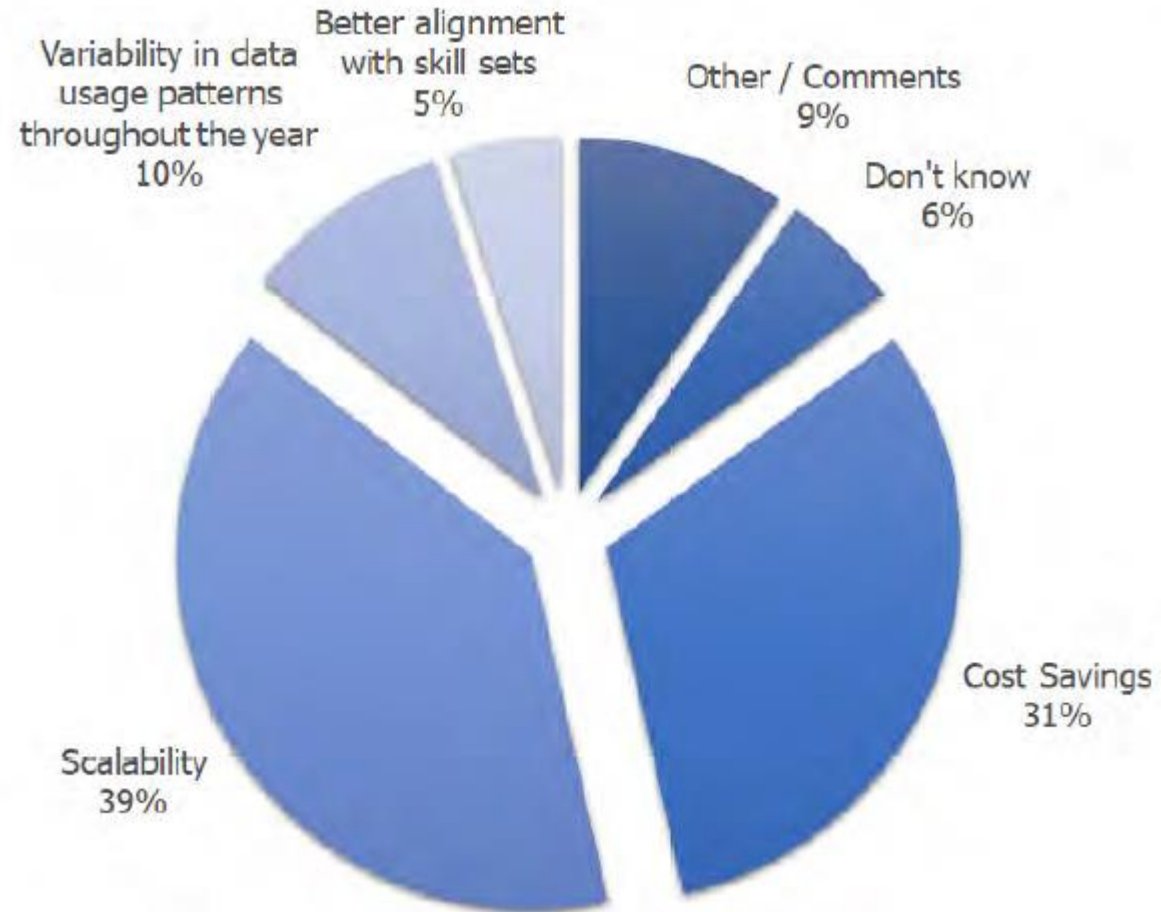
- As indicated in the previous response re: Future Technologies, adoption of Cloud Technologies is on the rise, with ***over 75% of respondents currently implementing a Cloud strategy, or planning to in the future.***

“

Cloud adoption is clearly on the rise with over 75% of respondents currently implementing a Cloud strategy or planning to in the future.

”

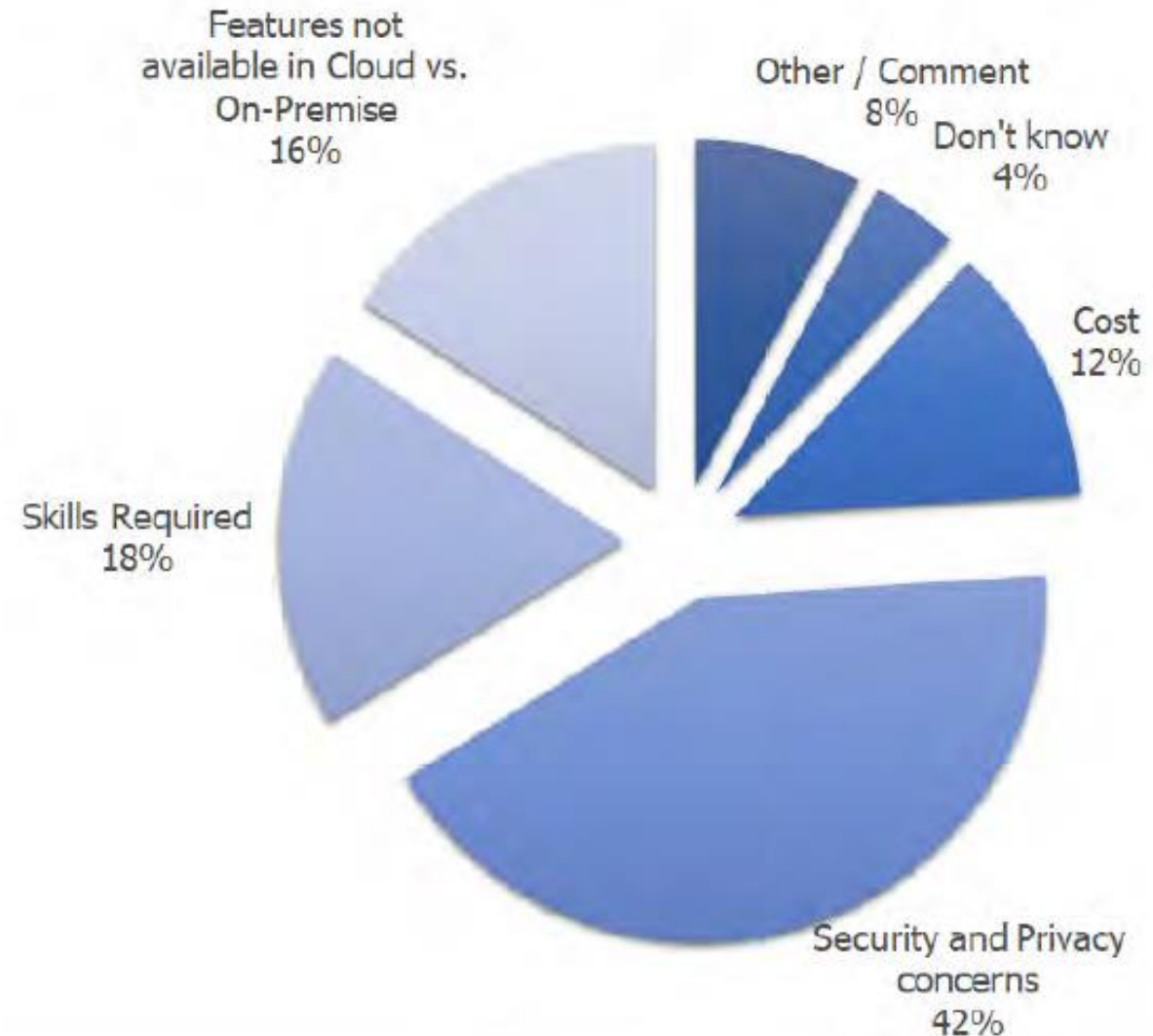
Scalability & Cost Savings are leading reasons for moving to the Cloud



Cloud Migration not without its Concerns

What are your Concerns regarding moving data to the Cloud? [Select All that Apply]

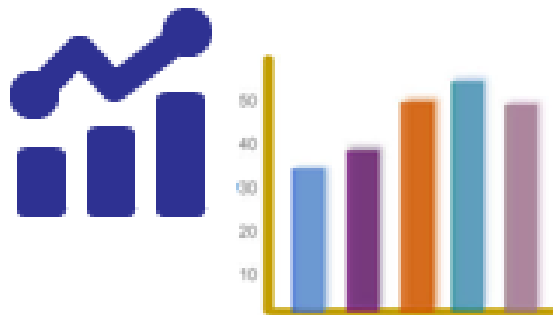
- ***Security & Privacy are leading concerns*** for those moving to the Cloud.



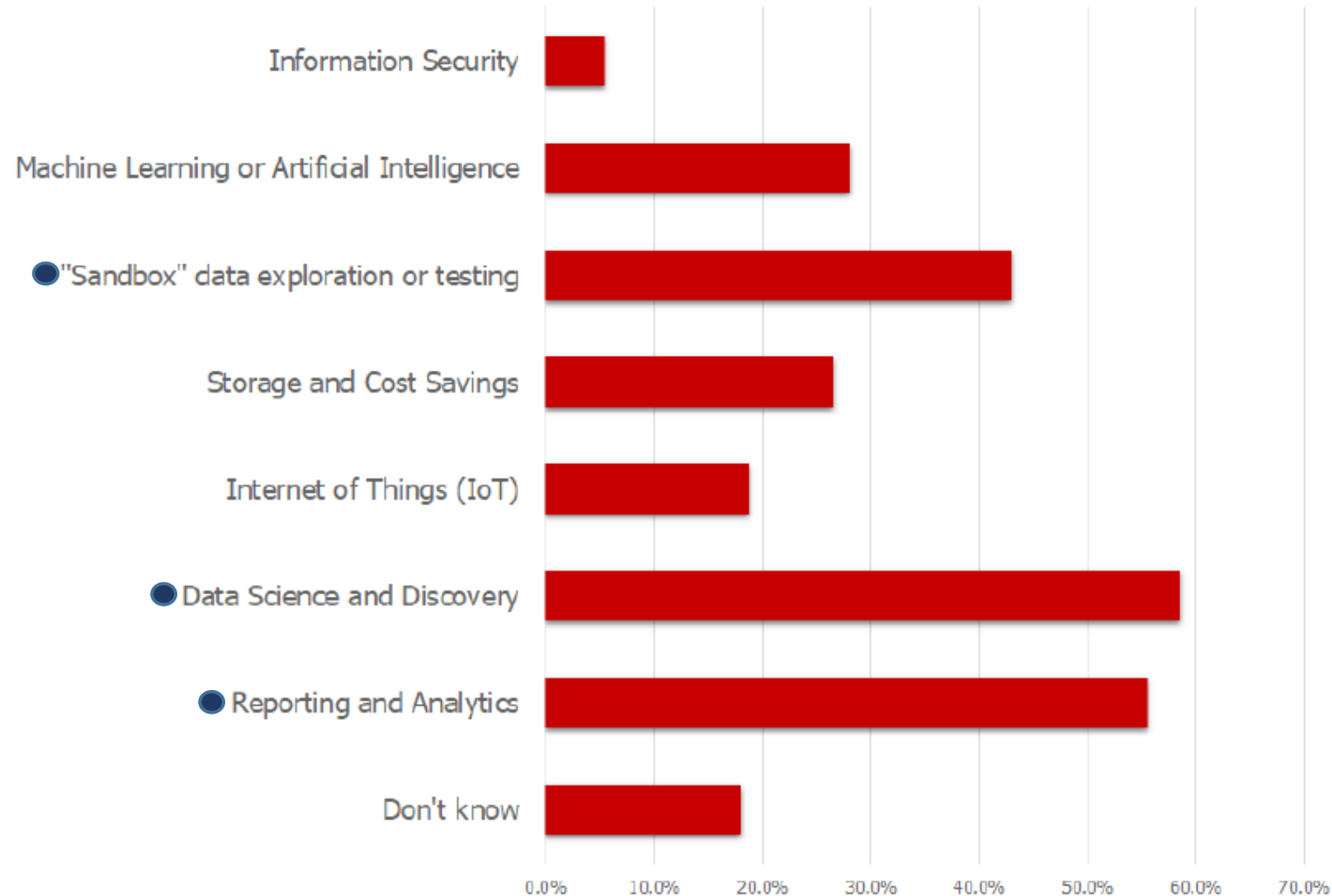
Big Data a Growing Trend

Analysis & Discovery are Key Drivers

- Over 70% of organizations are either using Big Data solutions, or planning to in the future.
- Analysis & Discovery are leading trends including:
 - Data Science & Discovery
 - Reporting & Analytics
 - “Sandbox” Exploration



For what use cases are you using Big Data? [Select all that apply]



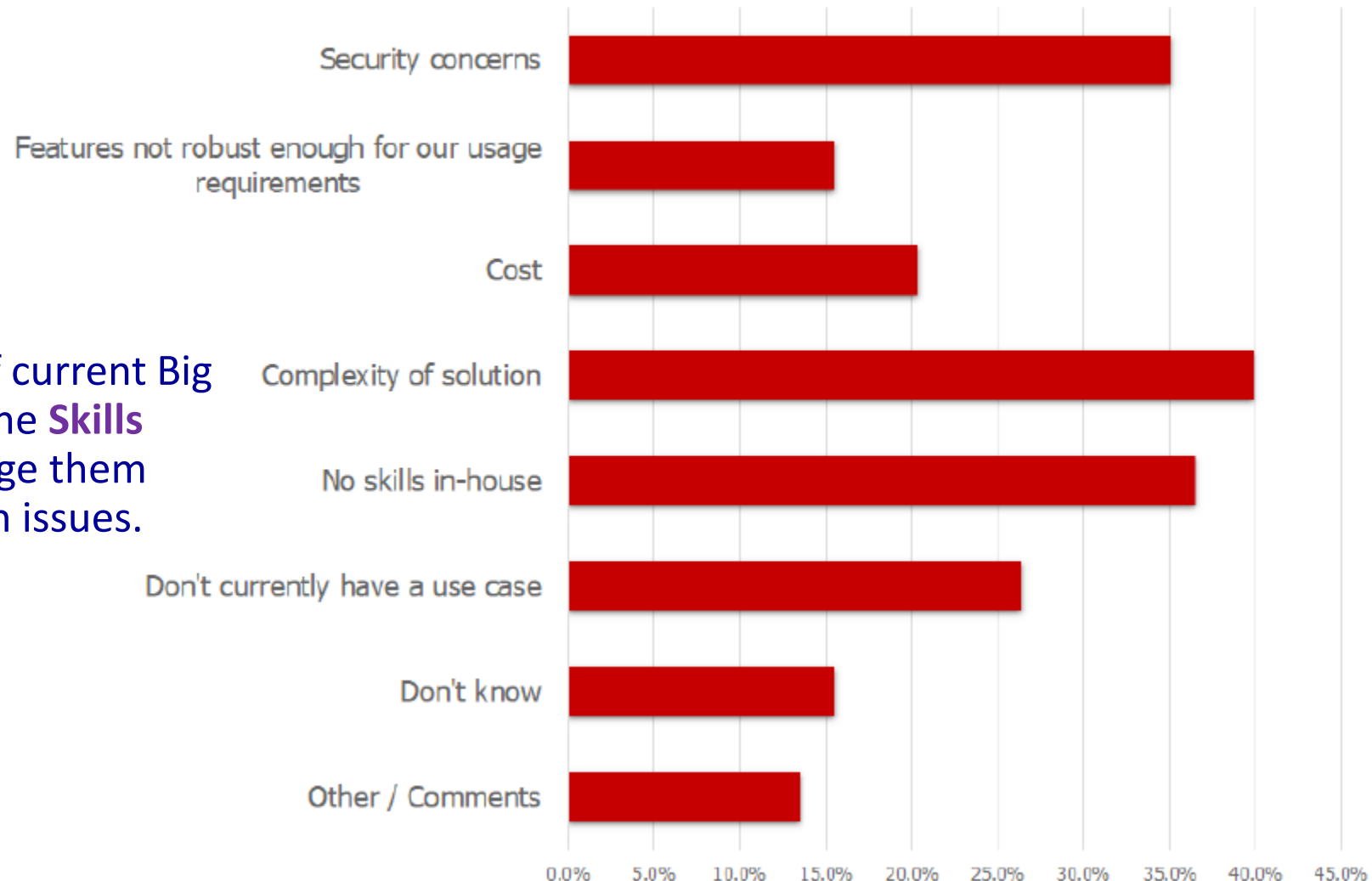
Big Data Concerns

- **Security** is a leading concern, and **Data Governance** was a top write-in response.

Data Governance and Data Security are key issues for both Big Data and Cloud implementations. This a key challenge of modern Data Architecture—managing high volumes of data from disparate sources in a governed manner.

- The **Complexity** of current Big Data solutions & the **Skills Required** to manage them were also common issues.

What are your concerns, if any, about using Big Data? [Select all that apply]

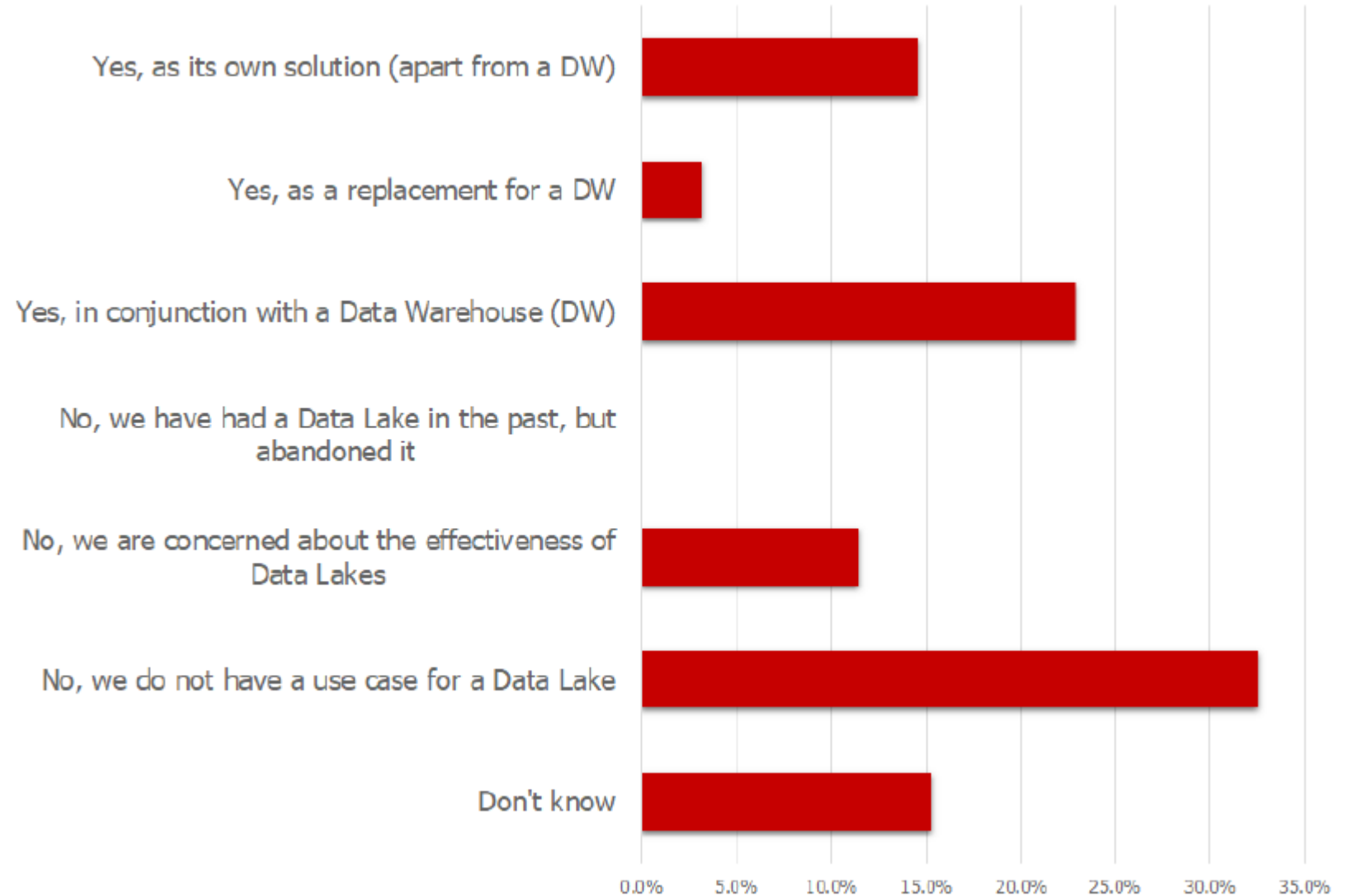


Data Lakes

- There was a mixed response to Data Lake Implementation

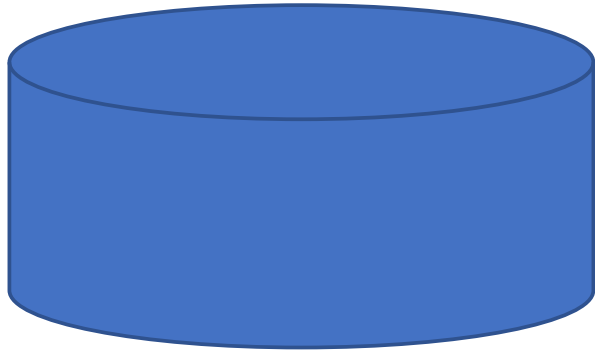


Are you currently implementing a Data Lake?



Data Warehouse vs. Data Lake

A **Data Warehouse** is a storage repository that holds current and historical data used for creating analytical reports. Data structures & requirements are pre-defined, and data is organized & stored according to these definitions.



Data Warehouse

A **Data Lake** is a storage repository that holds a vast amount of raw data in its native format, including structured, semi-structured, and unstructured data. The data structure & requirements are not defined until the data is needed.



Data Lake

Master Data Management

- As more and more organizations struggle with obtaining a **single, consistent view of core data such as Product, Customer, Vendor, and Location**, Master Data Management (MDM) is seeing a rise in implementations with **over 65% of respondents** pursuing a MDM strategy.

Notably, over 65% of respondents are actively pursuing an MDM strategy in various stages of maturity.

- **Master Data** is the consistent and uniform set of identifiers and extended attributes that describes **the core entities of the enterprise** including customers, prospects, citizens, suppliers, sites, hierarchies and chart of accounts (*sic*).
- **Master data management (MDM)** is a technology-enabled discipline in which business and IT work together to ensure the uniformity, accuracy, stewardship, semantic consistency and accountability of the enterprise's official shared master data assets.

- Source Gartner



Data Modeling is Hotter than ever

Sexiest job of the 21st Century?

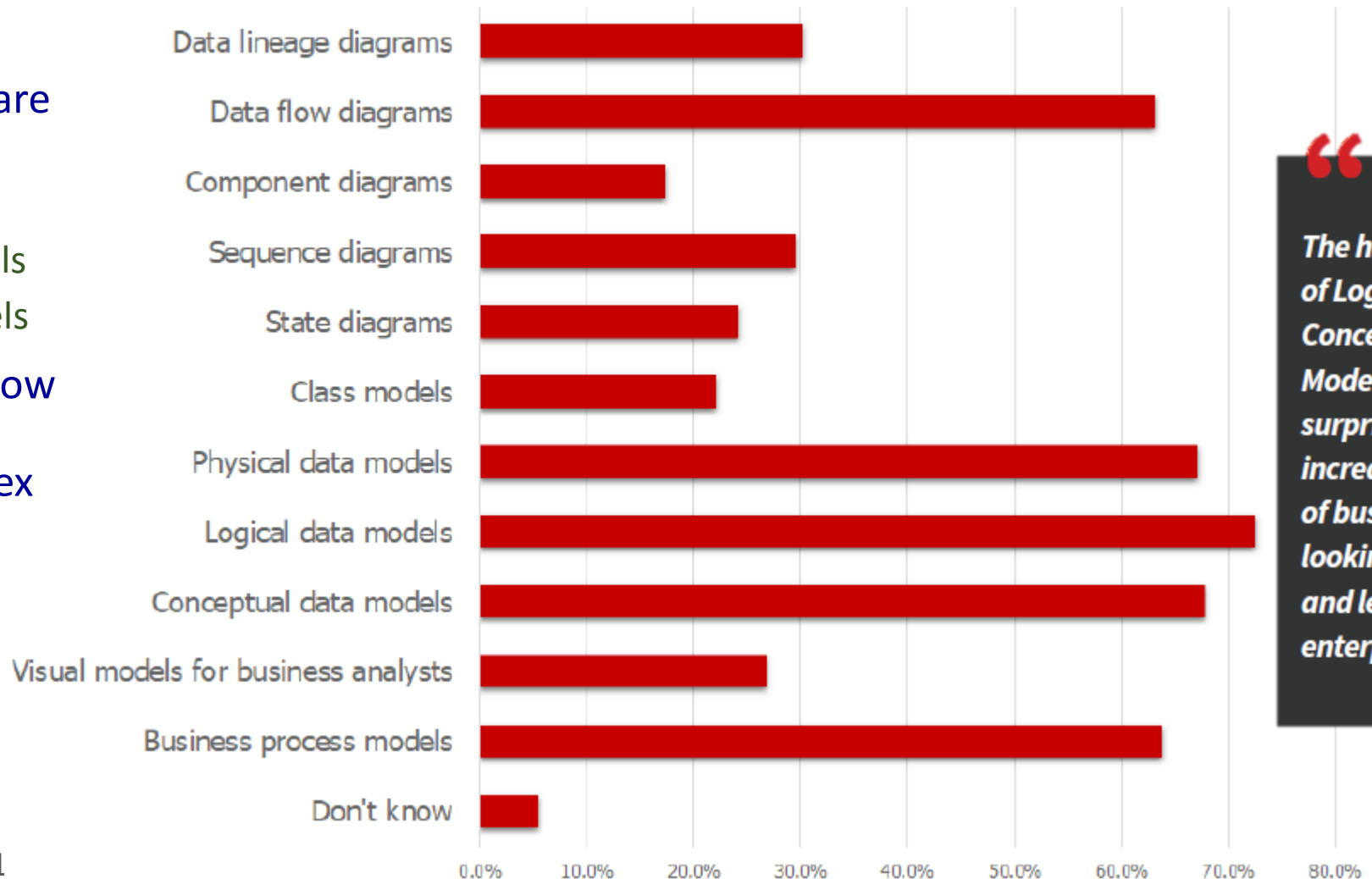
In a recent DATAVERSITY survey,
over 96% of were engaged in Data
Modeling in their organizations.



Types of Models & Diagrams in Use

- Business-centric models are popular:
 - Logical Data Models
 - Conceptual Data Models
 - Business Process Models
- As well as models that show the interactions between systems in today's complex data environment:
 - Data Flow Diagrams

What types of models and diagrams do you use in your enterprise architecture? [Select all that apply]



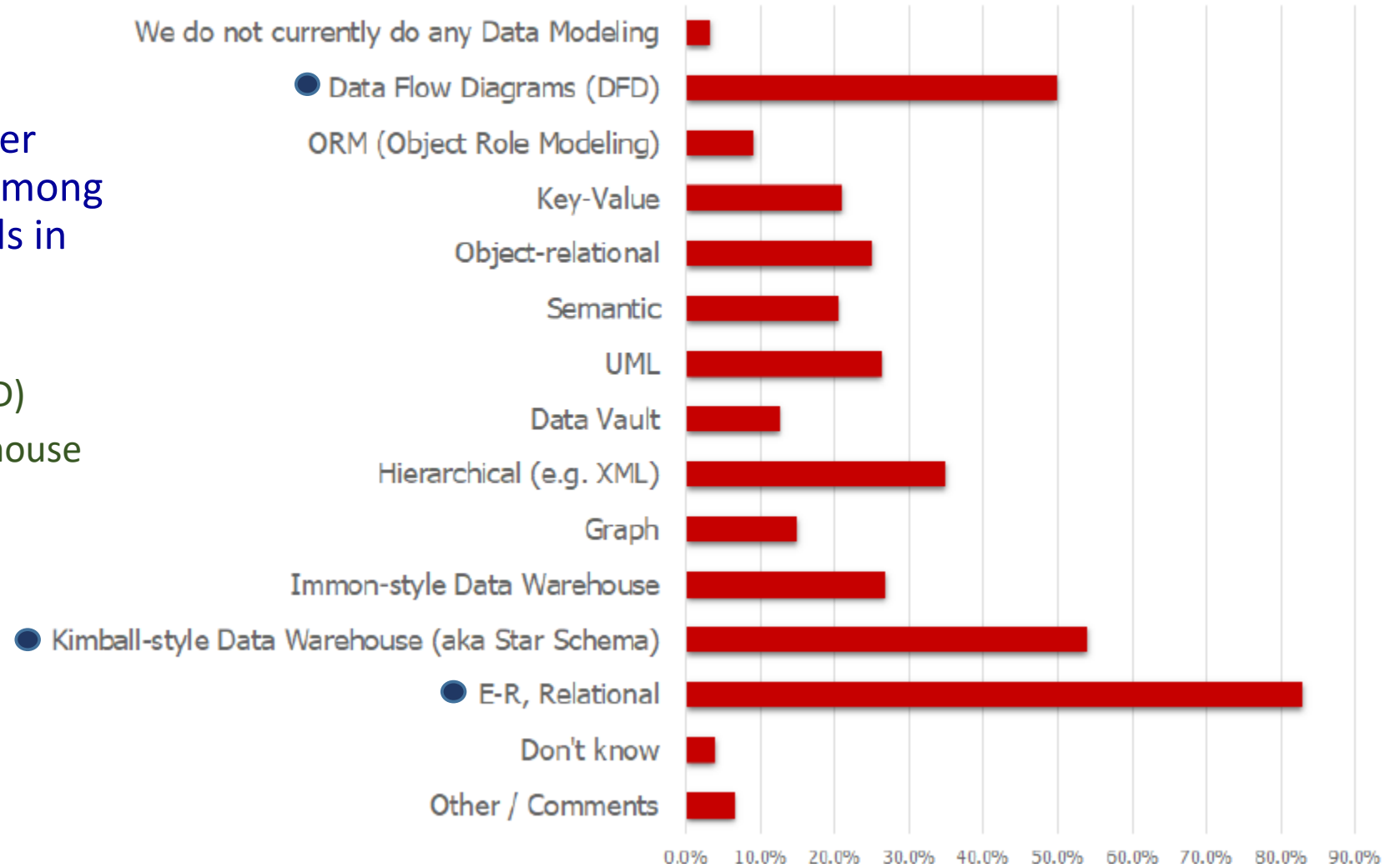
The high popularity of Logical and Conceptual Data Models is not surprising, given the increasing number of business users looking to understand and leverage enterprise data.



Data Modeling styles vary, but ER and DFD are leaders

- Every modeler has his or her own style and methods. Among the most common methods in use are:
 - Entity Relational (E/R)
 - Data Flow Diagrams (DFD)
 - Star Schema Data Warehouse (Kimball-style)

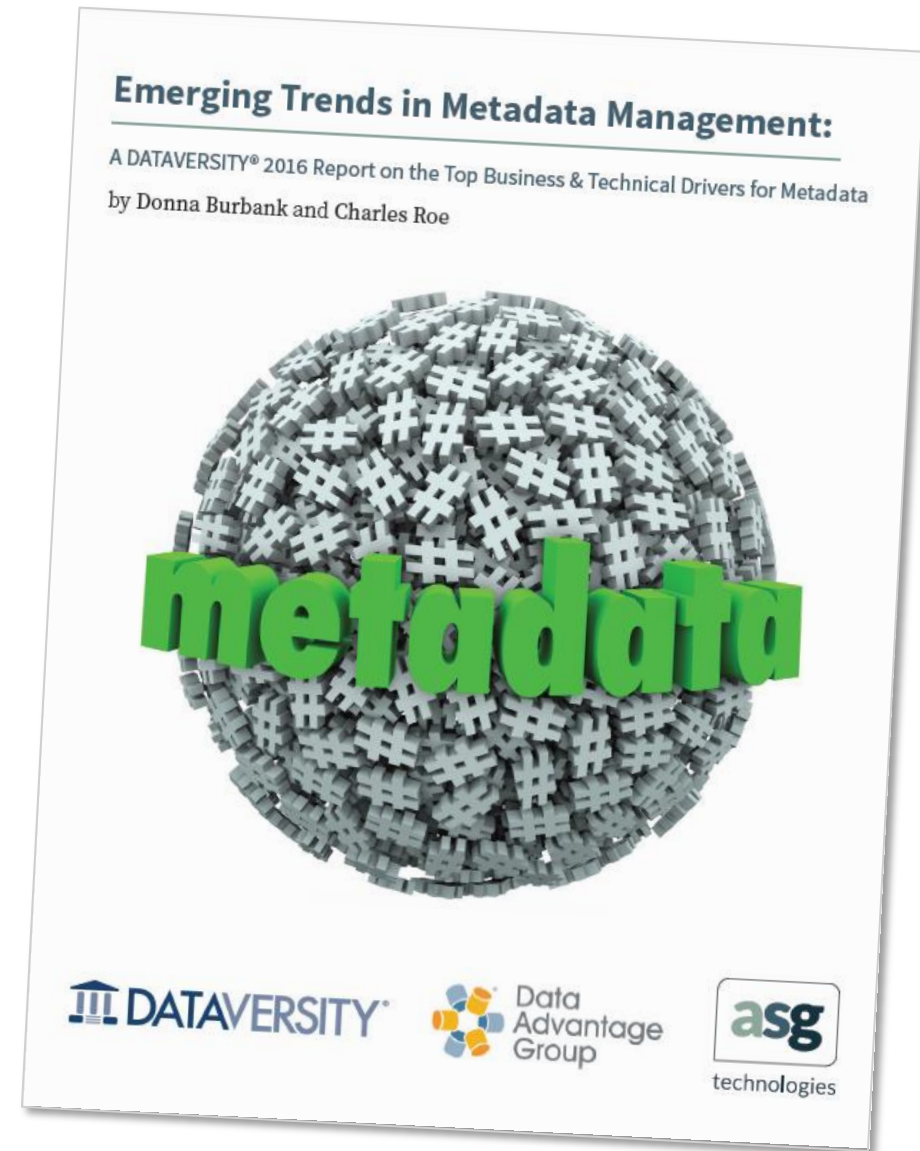
Which methods of Data Modeling do you use in your organization?
[Select all that apply]



Metadata is Hotter than ever

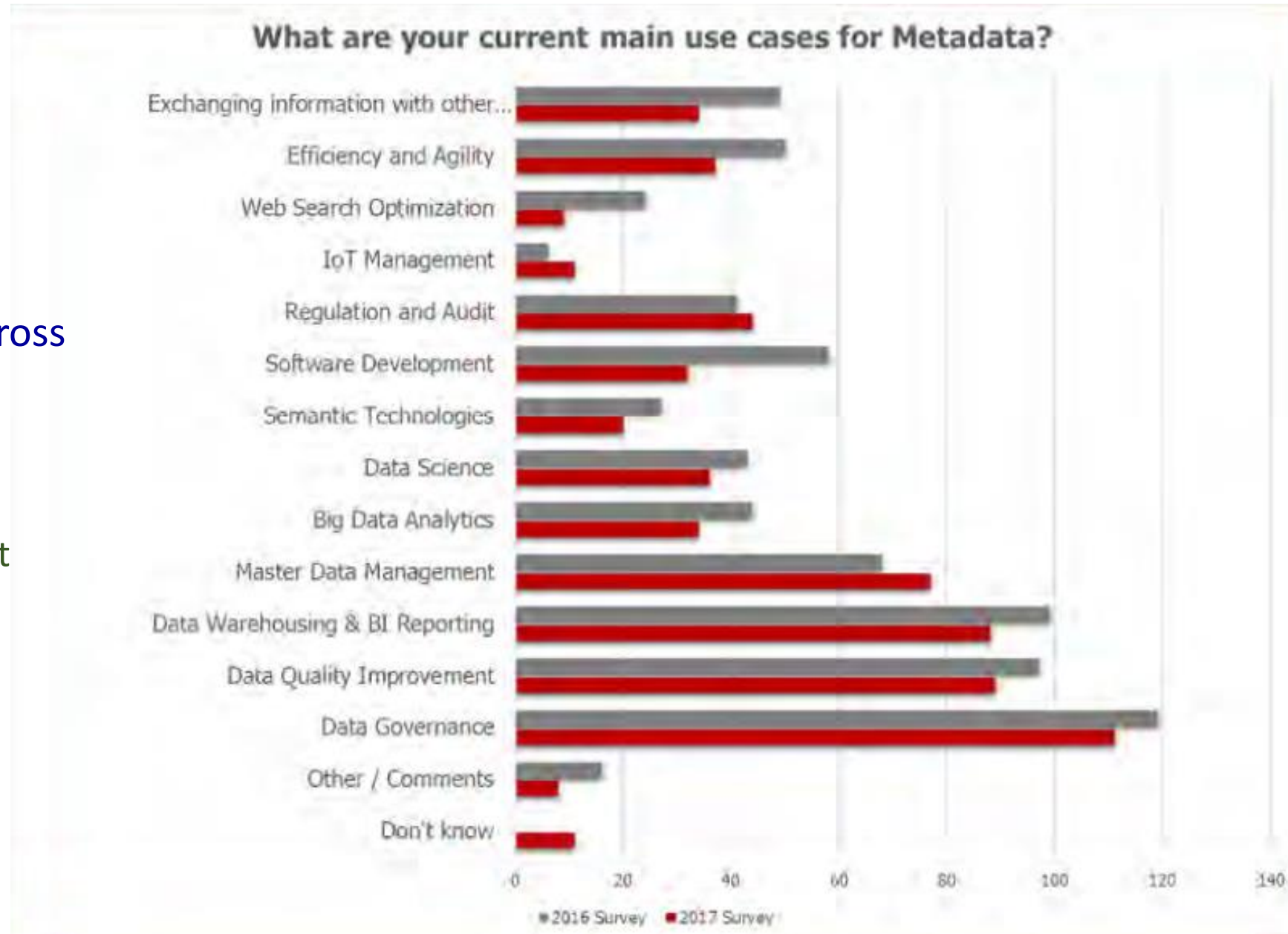
The other sexiest job of the 21st Century?

In a recent DATAVERSITY survey, over 80% of respondents stated that:
Metadata is as important, if not *more important*, than in the past.



Metadata Management Use Cases

- Use Cases were similar across the 2016 & 2017 surveys:
- 2017 saw growth in:
 - Regulation & Audit
 - Master Data Management

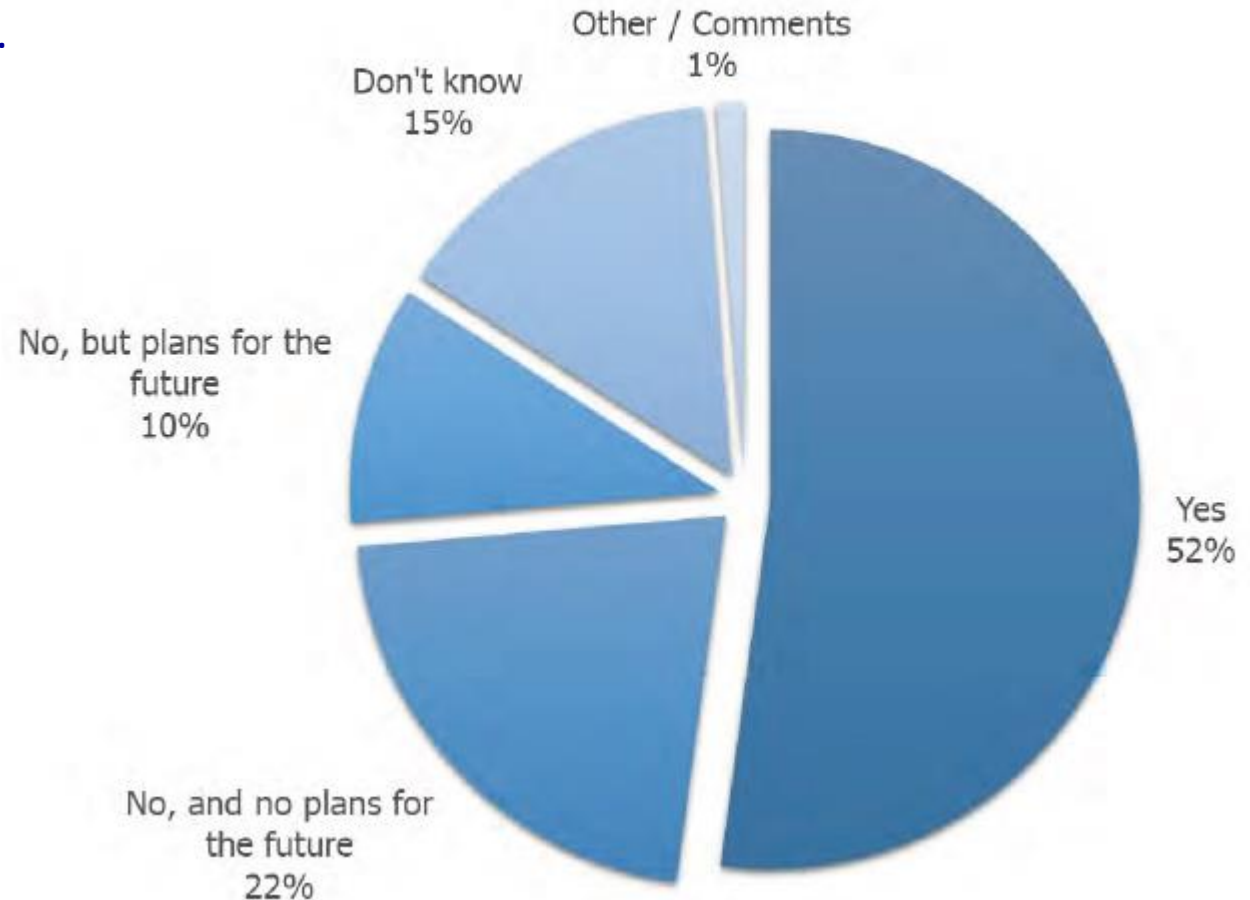


Open Source

Open Source adoption is on the Rise

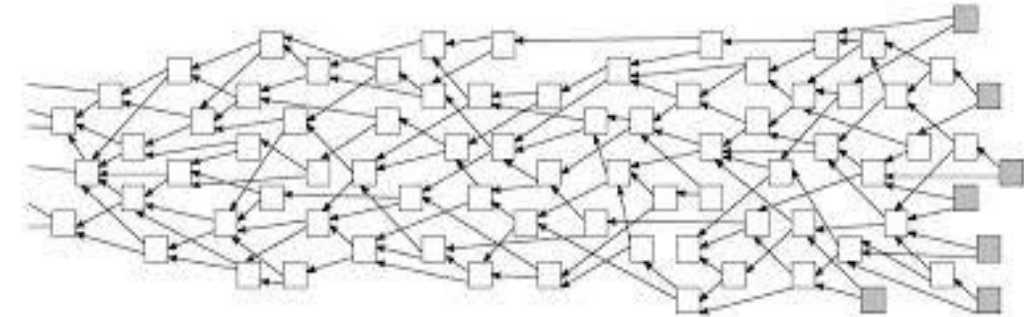
- The Cost Savings and Flexibility with the Open Source approach is appealing to many.
 - Projects supported by the Apache Foundation such as Cassandra, Hadoop, Hive, Spark, Lucene, Pig, Storm, etc. are in production at enterprises worldwide.
- Open Source often requires more in-house developers to implement and lacks the support of commercial products.
 - Some are packed with other applications & sold commercially with support available.

Are you currently using any Open Source technologies in your Data Architecture?



Blockchain

- Blockchain has received much attention in the media as a way to revolutionize financial and other industries. According to Harvard Business Review:



“With blockchain, we can imagine a world in which contracts are embedded in digital code and stored in transparent, shared databases, where they are protected from deletion, tampering, and revision. In this world, every agreement, every process, every task, and every payment would have a digital record and signature that could be identified, validated, stored, and shared. Intermediaries like lawyers, brokers, and bankers might no longer be necessary. Individuals, organizations, machines, and algorithms would freely transact and interact with one another with little friction. This is the immense potential of blockchain.”

Among survey respondents, however, **only 7.7% are actively using or pursuing use of Blockchain technology.**

Blockchain Use Cases

- For those using Blockchain technologies, use cases are not limited to financial transactions.
- These include:
 - Identity Management
 - Records Management
 - Supply Chain Management
 - Peer-to-Peer Transactions
 - Regulatory Compliance and Audit
 - Capital Markets
 - International Payments



Summary

- A Robust Data Architecture supports managing **Data as a Strategic Asset**
- With growing interest from business users, more roles than ever are involved in Data Architecture decisions, driving the need for **collaboration**.
- Organizations are faced with the challenge of making sense of an ever-changing data technology landscape
 - **Relational Databases** are by far the leader in use by most enterprises
 - Many organizations support **both legacy systems (e.g. mainframe) and emerging technologies** such as Big Data.
 - **Big Data** is the leader in new technology plans for organizations
 - Some newer technologies, such as Blockchain, have yet to see widespread adoption
- The move to the **Cloud** lends to both **Cost Savings & Scalability** as well as **Security & Privacy concerns**.
- **Models and metadata are more important than ever** in gaining an understanding of both business requirements & technical implementation.



About Global Data Strategy, Ltd

Data-Driven Business Transformation

- Global Data Strategy is an international information management consulting company that specializes in the alignment of business drivers with data-centric technology.
- Our passion is data, and helping organizations enrich their business opportunities through data and information.
- Our core values center around providing solutions that are:
 - **Business-Driven:** We put the needs of your business first, before we look at any technology solution.
 - **Clear & Relevant:** We provide clear explanations using real-world examples.
 - **Customized & Right-Sized:** Our implementations are based on the unique needs of your organization's size, corporate culture, and geography.
 - **High Quality & Technically Precise:** We pride ourselves in excellence of execution, with years of technical expertise in the industry.

Business Strategy



Aligned With



Data Strategy



Visit www.globaldatastrategy.com for more information



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White Paper: Trends in Data Architecture

Free Download

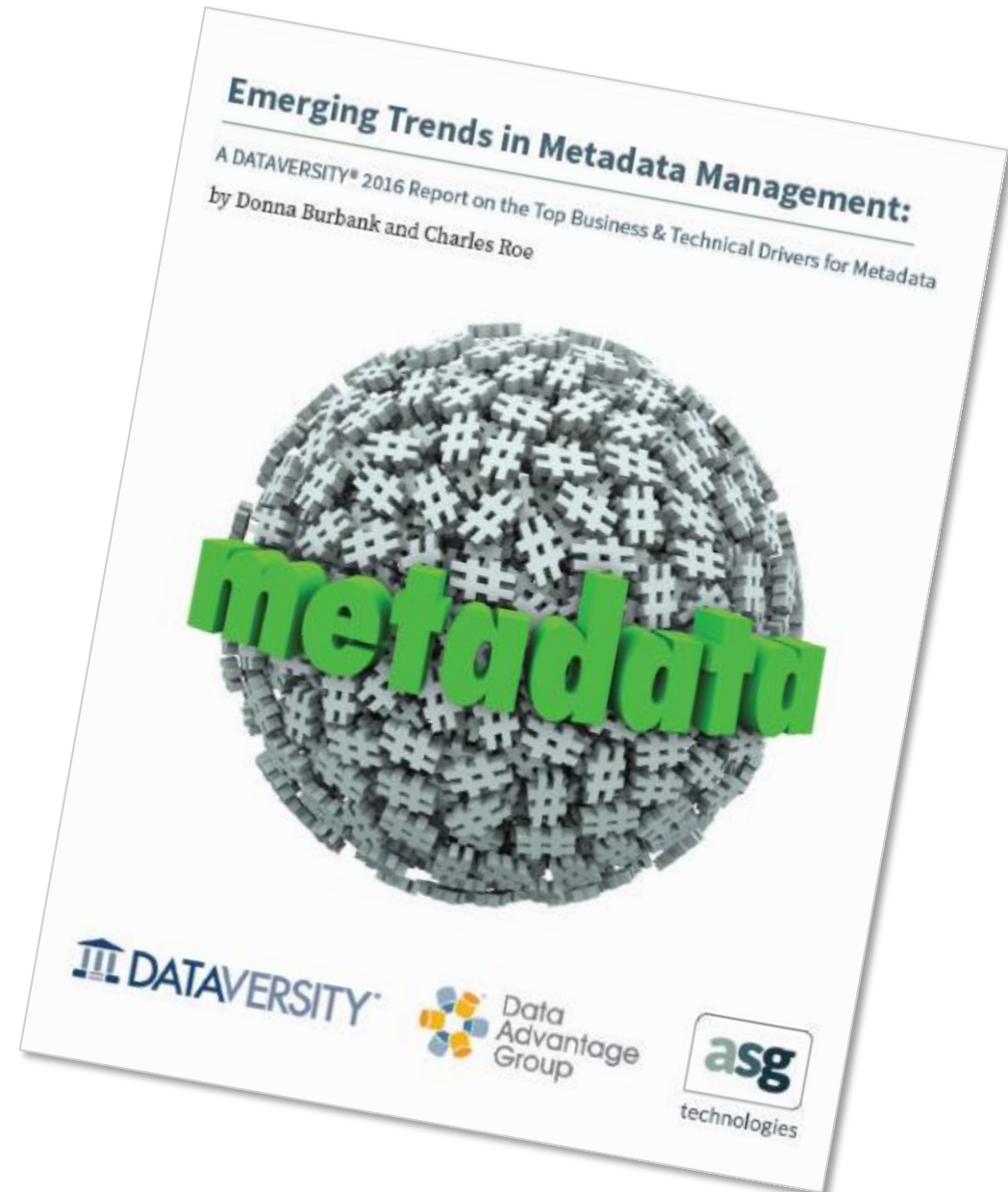
- Available for download on dataversity.net



White Paper: Emerging Trends in Metadata Management

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 - Under 'Whitepapers'



Questions?

Thoughts? Ideas?

