Hype Cycle for Data and Analytics Governance, 2023

Published 26 July 2023 - ID G00791668 - 102 min read

By Analyst(s): Guido De Simoni, Saul Judah, Andrew White

Initiatives: Data and Analytics Programs and Practices; Evolve Technology and Process Capabilities to Support D&A

Data and analytics leaders need to understand the hype and progress of innovations in governance practices and technology so that their adoption delivers organizational benefits at the right time. This research explores the hype of such innovations in driving business value through D&A governance.

Strategic Planning Assumptions

By 2026, 15% of large enterprises will have evaluated connected governance to effectively manage complex cross-organizational challenges with governance programs.

By 2026, 20% of large enterprises will use a single data and analytics governance platform to unify and automate discrete governance programs.

Analysis

What You Need to Know

Data and analytics (D&A) leaders are faced with strategic business requirements and increasingly distributed D&A initiatives. However, data distribution, disconnected business processes, and data silos in organizations make it difficult to govern and trust the data and analytics needed to drive business value. This leads to operational inflexibility, complexity and higher business costs, making it increasingly difficult to make effective strategic business decisions. Other requirements emerged specifically around security and privacy, from an increasing focus on ethical issues, to the mainstay of definitions and models for a common understanding of data, to a continued interest in data quality.

This Hype Cycle assesses the progress of governance innovations across all use cases. The number and diversity of these use cases have increased significantly in recent years, so we have reflected this in the broader perspective of this year's Hype Cycle.

Additional 2023 Hype Cycles that can help form a holistic view of D&A:

- Hype Cycle for Data Management, 2023
- Hype Cycle for Data and Analytics Programs and Practices, 2023
- Hype Cycle for Analytics and Business Intelligence, 2023
- Hype Cycle for Data Science and Machine Learning, 2023
- Hype Cycle for Artificial Intelligence, 2023
- Hype Cycle for Data Security, 2023
- Hype Cycle for Privacy, 2023

The Hype Cycle

D&A leaders know there is no shortage of digital business technologies, but they struggle to leverage their value to meet business expectations. That's because internal business practices are often inadequate, rendering even the best technology solutions ineffective.

General market interest in D&A governance innovations has increased. In the past year, the volume of requests from Gartner clients for data and analytics governance has reached almost 4,000 inquiries (recorded from January 2022 through February 2023).

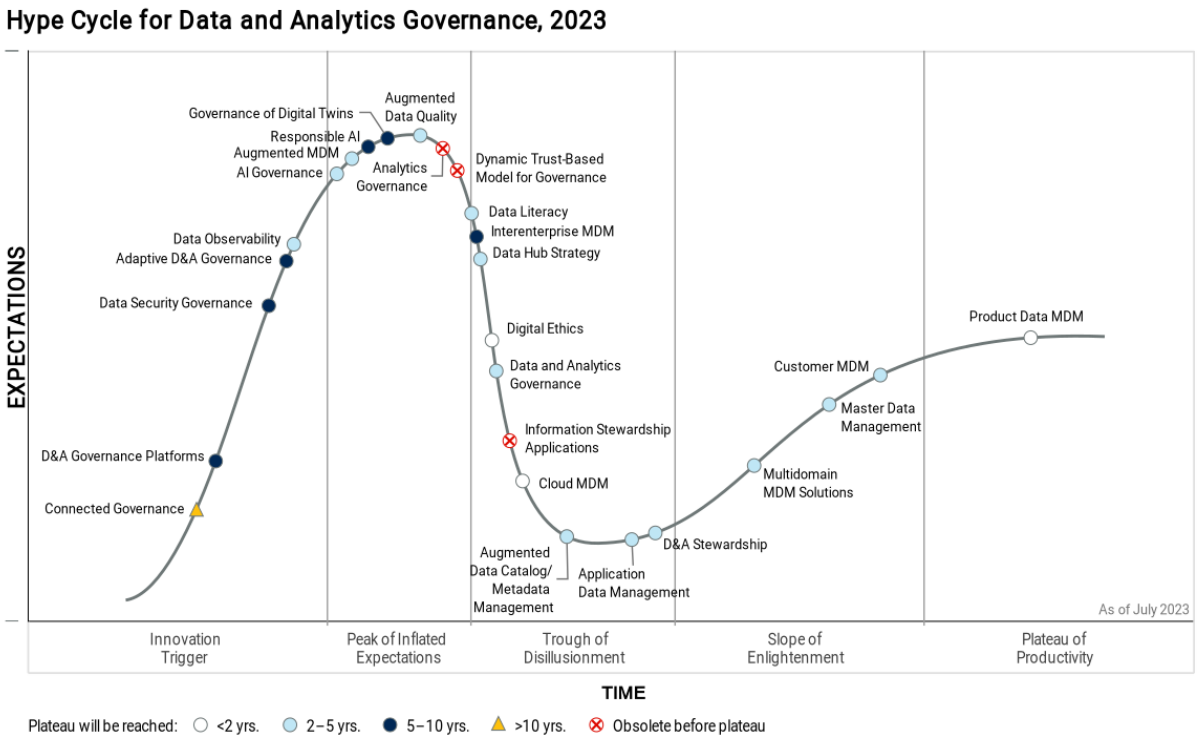
This is due in part to the inability to achieve business results with outdated governance practices. The 2021 Gartner Data and Analytics Governance Survey shows that the delivery of D&A governance objectives is falling short of expectations, with only 18% of companies deploying more mature governance practices. In addition, the volume of requests for data and analytics governance tools, solutions and platforms has remained high (over 2,000 inquiries recorded from January 2022 through February 2023).

The hype and interest in the technology innovations in this Hype Cycle are increasing rapidly, which often translates into vendor investments in advanced functional capabilities. For example, multidomain master data management (MDM) is now the most common MDM implementation approach, as its capabilities are leveraged to deliver greater business value. Advanced data catalogs and metadata management solutions are no longer perceived as just IT tools, but rather provide enhanced and controlled support for collaborative enterprise D&A activities.

The Hype Cycle confirms that innovation is emerging from new perspectives on governance (e.g., connected governance, adaptive D&A governance) and from new technologies (e.g., D&A governance platforms, augmented MDM, augmented data quality, data observability). The combination of focused discipline and technology leads to business value (see Connected Governance Drives Adoption of Data and Analytics Governance Platforms).

The Hype Cycle shows that the D&A governance discipline as a whole has benefited from the testing and adoption of metadata management and MDM technology (as it climbs to the peak).

Figure 1: Hype Cycle for Data and Analytics Governance, 2023



The Priority Matrix

Data and analytics governance aims to increase the business value of D&A assets through better oversight, accountability and decision rights. This can improve the efficiency and productivity of established business processes and support business growth. Other relevant outcomes include new value creation (e.g., monetization, new products/services, new market entry, external stakeholder outcomes) and risk mitigation (e.g., legal risks, regulatory risks, financial risks, health and safety risks). The hype around technology always promises that technology alone will solve the problem, but that is never true. Investment decisions must be made in the context of information maturity and corporate culture.

From an overall perspective, those responsible for data and analytics should:

- Focus on the elements that are likely to reach the Plateau of Productivity within two to five years.

- Pay particular attention to cross-enterprise MDM, advanced data cataloging and metadata management solutions, data and analytics governance, and advanced data quality.
- Also consider the less mature innovations, such as adaptive D&A governance and D&A governance platforms. They promise high value for companies, albeit with a longer time horizon. Companies seeking competitive advantage through D&A governance should actively explore and evaluate these innovations to integrate them into their business value chains.

Table 1: Priority Matrix for Data and Analytics Governance, 2023

(Enlarged table in Appendix)

Benefit	*Years to Mainstream Adoption*			
↓	*Less Than 2 Years* ↓	*2 - 5 Years* ↓	*5 - 10 Years* ↓	*More Than 10 Years* ↓
Transformational		Augmented Data Quality Data Literacy	Adaptive D&A Governance Data Security Governance Responsible AI	
High	Cloud MDM Digital Ethics Product Data MDM	AI Governance Augmented Data Catalog/Metadata Management Customer MDM D&A Stewardship Data and Analytics Governance Data Hub Strategy Data Observability Master Data Management Multidomain MDM Solutions	D&A Governance Platforms Interenterprise MDM	Connected Governance
Moderate		Application Data Management Augmented MDM	Governance of Digital Twins	
Low				

Source: Gartner (July 2023)

On the Rise

Connected Governance

Analysis By: Saul Judah, Malcolm Murray, Andrew White

Benefit Rating: High

Market Penetration: Less than 1% of target audience

Maturity: Embryonic

Definition:

Connected governance is a framework for establishing a virtual governance layer across organizations and business functions, or legal entities, in multiple geographies to achieve cross-enterprise business outcomes. By connecting existing governance bodies within and across enterprises, its component-based approach enables complex business challenges to be addressed without adding further layers of bureaucracy.

Why This Is Important

Governance bodies for enterprise functions such as HR, risk, and data and analytics are typically adequate for addressing their individual domain areas. However, cross-enterprise and interenterprise governance challenges are increasingly difficult to overcome. Rather than creating yet another permanent governance body, connected governance leverages existing governance bodies through a virtual framework, providing strategic oversight and accountability management across them with minimum additional overhead.

Business Impact

Senior business executives and board members spanning multiple organizations, legal entities and geographies will find value in exploring connected governance to address cross-enterprise strategic issues and opportunities. Organizations anticipating mergers and acquisitions (M&As) will find value in connected governance, enabling both value and risk management to be addressed earlier and allowing experimentation with governance bodies prior to their formal adoption.

Drivers

- The fast pace of deglobalization and digitalization is putting pressure on senior leaders across multiple business functions to respond to business and regulatory demands at greater effectiveness and speed than they are able to with their existing capabilities. Existing governance bodies are designed to address their functional areas, but understanding accountability and decision rights across these proves very difficult. This is especially relevant when some of the functional areas exist in different legal entities and different countries, and the same business asset is subject to potentially conflicting governance policies.
- A key driver for adoption of connected governance stems from the limitations of existing approaches. Traditional approaches to cross-enterprise governance challenges have been to establish another layer of governance, which adds a greater overhead cost, creates another layer of bureaucracy and is often inflexible. Furthermore, some strategic challenges (such as M&A and business model changes) require a one-off response for governance, and creation of additional governance layers in these circumstances is an excessive drain on executives' time without accrued benefit. Consequently, adoption of connected governance becomes an attractive option.

Obstacles

- Connected governance leverages existing governance bodies, but some of these bodies may operate poorly. As a result, the value that connected governance offers may be depleted in organizations that are not already mature in their governance.
- Siloed governance efforts might reinforce those silos and prevent the benefits of connected governance without disruptive organizational change. Either way, inertia and local success of siloed governance will slow down the adoption of connected governance.
- Once the board of directors or executive committee has approved the cross-governance initiative, an executive leader is expected to shape the cross-governance response. However, this needs support and facilitation from a strategic governance office, which requires skills that are currently in short supply.

User Recommendations

- Evaluate whether connected governance would benefit your organization. If you operate in a complex environment, across multiple legal entities and geographies, there may be challenges that are difficult to address now. In such situations, put on the agenda of your executive committee meeting to initiate a cost-benefit assessment and report its findings. If this does not apply at your organization, connected governance may not be for you.
- Connected governance needs the support of strategic, cross-enterprise governance. Analyze whether this needs a dedicated governance office or if operating as a virtual governance office will be sufficient. If your strategic challenge is a one-off situation, or if you are trialing this as a new initiative, a virtual office may be sufficient for now. However, large enterprises in diverse, complex ecosystems and expecting to address many strategic scenarios may necessitate a dedicated strategic governance office to support connected governance.

Gartner Recommended Reading

Connected Governance Orchestrates Complex Cross-Enterprise Decisions

Connected Governance Drives Adoption of Data and Analytics Governance Platforms

Quick Answer: What Kind of Governance Does Healthcare Data Interoperability Need?

Choose the Optimal Corporate Structure to Cope With Geopolitical Risks

Trends 2023: Rise and Risks From EU, U.S., China and Other Sovereign Data Strategies and Policies

D&A Governance Platforms

Analysis By: Guido De Simoni

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

A data and analytics (D&A) governance platform represents a set of integrated technology capabilities that help govern and steward a range of policies spanning security, quality, access, retention, privacy and ethics. It exposes a user experience for policy setting and enforcement to all relevant participants (e.g., data stewards in business roles, business analysts, line of business [LOB] users, data scientists and governance board members).

Why This Is Important

The most complex governance challenges can no longer be met with siloed approaches. Convergence of capabilities is mandatory. Today, the execution of D&A governance is inconsistent, with different organizations using different types of technology. These disparities impede the success of digital business initiatives. Governance needs have grown more diverse and complex; all aspects of governance for all types of policies can benefit from cohesive technology support.

Business Impact

D&A leaders adopting D&A governance platforms will benefit from:

- An ability to mitigate risk from most complex, cross-organizational governance challenges
- Enhanced productivity and efficiency in governance processes, more rigor in enforcement of policies, and therefore more control and trust in data and analytics
- Emerging augmented data management capabilities that discover data and its relationships to seed and power various governance work efforts
- Converging long-term, discrete markets that will collide into one

Drivers

- Increasing complexity from data sovereignty requirements and digital strategies is forcing organizations to simplify and coordinate governance efforts globally across privacy, security, storage, access, use and sharing.
- Organizations want to have automated, synchronized, integrated, cost-effective and efficient D&A governance solutions with a central design, yet a distributed deployment. This requirement is driven by the growing recognition that the work of data and analytics governance is different from the work of data management, but that augmented data management supports the growth of these platforms of convergence.

- All of these aspects are operationalized, and more efficiency is gained when identification of data sources, curation of data, application of workflow, harmonization, reporting and visualization are provided in a coherent platform with automation. For example, you can address autogeneration of data quality rules using a number of methods. These include rule definitions and automated execution of data quality checks, AI-assisted data curation and association of business terms to technical artifacts, automated classification of sensitive data, and build subject registry.

Obstacles

- D&A governance today is served by discrete markets, each with its own solution. Inertia and sunk costs will slow down the emergence of this newer market.
- The current convergence within data management may not satisfy the needs of organizations across D&A governance.
- Incompatibility between what vendors can support and what different customer environments require will likely necessitate multiple metadata management solutions.
- Data management executes the policy that D&A covernance sets. The work — policy setting, enforcement and execution — is different, so the technology capacities, roles and value propositions of the platforms are different.
- Other obstacles reside in the cultural shift that many organizations must address in leveraging the inherent value of D&A governance. When organizations are committing to data and analytics initiatives aligned to mission-critical priorities, such obstacles can jeopardize the adoption of these platforms as enablers for continuous improvement. We estimate that this innovation will reach the Plateau of Productivity in more than 10 years.

User Recommendations

- Design proofs of concept that will capitalize on the required critical technology capabilities. Identify the relevance of these technologies and their connection to business outcomes as a first step. Then look into their ability to support specific use cases (such as risk management and compliance).
- Minimize the number of tools and solutions deployed by analyzing your strategic approach to D&A governance and by using available market technology capabilities in end-to-end scenarios supported by emerging D&A governance platforms.

Sample Vendors

Alex Solutions; Collibra; data.world; Global Data Excellence; IBM; Informatica; OvalEdge

Gartner Recommended Reading

The Role of Technology in Data and Analytics Governance Policy Management

Market Guide for Data and Analytics Governance Platforms

Tool: Vendor Identification for Data and Analytics Governance Platforms

Data Security Governance

Analysis By: Brian Lowans, Andrew Bales, Joerg Fritsch, Bart Willemsen

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Definition:

Data security governance (DSG) enables the assessment and prioritization of business risks, caused by data security, privacy, and compliance issues. This enables organizations to establish data security policies that support business outcomes and balance business needs against associated business risks. These risks arise from security, data residency and privacy issues, as data is processed across ecosystems or shared with partners.

Why This Is Important

DSG enables the assessment, prioritization and mitigation of business risks caused by security, privacy, and other compliance issues, as data proliferates across on-premises and multicloud architectures. DSG establishes a balance between business priorities and risk mitigation through data security policies that can be applied across the whole IT architecture.

Business Impact

DSG offers a balanced approach to define how data is accessed and used to support business performance objectives and client experience, while enforcing appropriate data security and privacy controls to mitigate risks. DSG requires collaboration among chief information security officers (CISOs), chief data and analytics officers (CDAOs), and business leaders, through a data security steering committee (DSSC). This would help break down communication barriers and contribute toward business outcomes.

Drivers

- It is essential to use DSG as a continuous process to manage, assess and prioritize business risks, and create focused data security policies that can mitigate those risks.
- Data security policies are needed to guide the implementation of consistent data access privileges security controls across a portfolio of datasets.
- DSG must be leveraged to address internal and external requirements to manage user access privileges to each dataset in terms of privacy, confidentiality, integrity, availability, business purpose, and life cycle risks.
- Organizations need to develop processes to create and orchestrate data security policies across multiple independent data security and identity access management (IAM) products, to minimize data security policy gaps and inconsistencies.
- No single product mitigates business risk sufficiently, emphasizing the need for centralized creation and coordination of data security policies.
- It is essential to leverage adequate privacy impact assessments (PIA) through DSG to mitigate data residency and sovereignty risks.

Obstacles

- Business stakeholders have fragmented responsibilities for managing data. Unless they create data security policies together with DSG, they will fail to balance business outcomes and risk mitigation.
- The deployment of data security, IAM and application products are purchased and managed by different leaders.
- Each product applies independent security controls, as IAM products do not control access to data. Data security products often operate on either unstructured or structured data, apply controls to specific platforms, and use custom data discovery technology. This reduces the effectiveness of DSG because it is not possible to deploy consistent data security policies.
- The security team must orchestrate data security policies manually across the portfolio of available security product controls. This also requires regular data risk assessments (DRA) to assess gaps and inconsistencies that need to be reported as stronger business risks, or to support new policies or product deployments.

User Recommendations

- Use DSG to create and manage consistent data security policies across your portfolio of datasets, according to the level of business risks defined.
- Use DSG to analyze business risks and their impacts due to specific security monetization choices, by using infonomics to evaluate the financial impacts on business outcomes.
- Use principles such as Gartner's financial data risk assessment (FinDRA) to establish prioritization of security investment options.
- Ensure cooperation and collaboration between the CDAO and the CISO, to reduce redundancy and waste in evaluating data management and security.
- Apply data security policies across all data security, IAM and application management products that interact with each dataset.
- Consider leveraging the DSSC to reach out to your CIO, CDAO or risk officer to extend your DSG operating model with connected governance. This would help with the most complex, cross-enterprise and geographic risk governance programs.

Gartner Recommended Reading

Use the Data Security Governance Framework to Balance Business Needs and Risks

4 Critical Steps to Accelerate the Adoption of Data Security Governance

Use a Data Security Steering Committee to Realize Data Security Governance Objectives

A Data Risk Assessment Is the Foundation of Data Security Governance

3 Steps to Effectively Capture and Communicate the Business Value of Cybersecurity Initiatives

Adaptive D&A Governance

Analysis By: Saul Judah

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Adaptive data and analytics (D&A) governance is an organizational capability that enables context-appropriate governance styles and mechanisms to be applied to different D&A scenarios to achieve desired business outcomes.

Why This Is Important

As organizations accelerate or scale out their digital business initiatives, ecosystems and platforms, their ability to deliver expected business value is limited by their current business practices — in particular, their governance of D&A assets. Despite greater diversity and complexity in business scenarios than ever before, D&A governance has typically continued to adopt a single, control-oriented approach, which is often unresponsive to business needs and causes or reinforces data silos.

Business Impact

Adaptive D&A governance has the potential to be a transformational change agent for digital business. It enables application of different governance styles (control, outcome, agility and autonomous) to different D&A scenarios, depending on business context. This allows better enterprise collaboration in D&A initiatives, allowing enterprises to respond faster to opportunities and become more competitive, resilient and risk-aware.

Drivers

- As levels of risk appetite and demands for growth have risen in organizations, so have expectations for flexibility and agility from D&A initiatives to meet these needs. As a result, chief data and analytics officers are increasingly turning to adaptive D&A governance practices that enable the greater flexibility, scale and resilience needed in D&A initiatives to deliver dynamic business outcomes.
- Both D&A and business leaders recognize that increased investment in infrastructure, such as D&A platforms, cannot yield the expected ROI without corresponding improvement in D&A governance practices.
- Organizations maturing in D&A increasingly recognize the key role that business leaders play in driving their governance initiatives. Business demand for greater flexibility, agility, responsiveness and interconnectedness of D&A requires better governance practices than currently exist. This, in turn, is leading D&A leaders to explore adaptive D&A governance.

Obstacles

- Although D&A governance practices are maturing in many organizations, maturity is still lower than in other areas, such as data management and analytics. Many organizations still take an IT-oriented, center-out, single-style approach to governance, which resembles compliance rather than governance. This is outdated and wrong and needs to change.
- Poor data literacy is prevalent in organizations. Business leaders often fail to understand or accept accountability for the information assets they create, instead expecting their data office (typically residing in IT) to sort out their data. When data offices initiate governance initiatives, business leaders fail to engage effectively, or at all.

User Recommendations

- Use the IT Score for Data & Analytics to evaluate your maturity and readiness to enhance governance capabilities. Don't establish agility and autonomous governance without foundations for control- and/or outcome-based governance.
- Create a proof-of-concept (POC) initiative to test the applicability of one of the advanced governance styles (like an autonomous governance style) in your environment; evaluate the business outcomes and value, emerging risks, technological limitations and cultural barriers to wider adoption.
- Engage senior business executive leadership to discuss the results of the POC initiative. Create a business case and strategic roadmap to establish adaptive D&A governance.
- Establish the control and outcome styles of adaptive governance first; evolve to the agile and autonomous styles subsequently. Use minimum governance, focusing on limiting the scope of data, analytics and business processes to those that deliver greatest business value and organizational outcomes.

Gartner Recommended Reading

Data and Analytics Leaders Must Use Adaptive Governance to Succeed in Digital Business

2022 Strategic Roadmap for Data and Analytics Governance

Adopt SMART Principles for Adaptive Data and Analytics Governance

Next Best Actions to Improve Your Data and Analytics Governance

Data Observability

Analysis By: Melody Chien, Ankush Jain

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Data observability is a technology that supports an organizations' ability to understand the health of an organization's data, data pipelines, data landscape, and data infrastructure by continuously monitoring, tracking, alerting and troubleshooting issues to reduce and prevent data errors or system downtime. It tells us what went wrong based on agreed upon SLAs for data quality and usage; reasons; assesses the impacts; and recommends solutions. Data observability improves reliability of data by increasing our ability to observe changes, discover unknowns and take appropriate actions.

Why This Is Important

Data observability uses data profiling, AI/ML, lineage and active metadata to provide the following benefits:

- **Monitor & Detect:** Provide a holistic view to determine how components of data pipelines are operating, evaluate whether data quality meets expectations, and detect data related issues.
- **Alert & Troubleshoot:** Send right alerts to the right people at the right time and perform root cause analysis.
- **Resolve & Prevent:** Provide recommendations to fix the issues or optimize data pipelines to meet business requirements with the goal to prevent downtime or critical data issues before affecting business.

Business Impact

- Data observability allows technical teams to gain visibility of the health of data pipelines and infrastructure. They can identify possible drifts in various areas, and minimize the time to investigate and solve issues, preventing unplanned outages or critical data errors.
- Business users will also gain visibility of data quality and associated financial impacts. This will ensure appropriate use and management of data to meet governance requirements.
- Data observability allows facilitation and improvement of the data fabric with continuous observations and evaluations of the data and analytics ecosystem.

Drivers

- Data and analytics leaders face a growing number of mixed data stacks, diversity of datasets, unexpected data drifts such as change in schema or business context, high demand for data quality and near zero tolerance of downtime. All these add to the challenges in data management. They need a holistic view of the state of data quality and data pipelines within interconnected systems.
- Data pipelines move data from point to point and deliver data to consumers. This journey can be disrupted by unexpected events such as data quality issues or a lack of infrastructure resources. The data that flows through these pipelines needs to be monitored for loss of quality, performance or efficiency. Organizations need to be able to identify points of failure before they have a chance to propagate. Data observability automatically detects important events and analyzes various signals to troubleshoot the issues, and provides actionable insights of what to do next.
- Data observability goes beyond traditional monitoring. It provides a multidimensional view of data including performance, quality, usage and financial impacts to the downstream applications. Leveraging active metadata, lineage of data and AI/ML, data observability generates real-time insight by monitoring the business context and analyzing data pattern, comparing history, and developing a semantic understanding of the data. It provides an end-to-end observability to help organizations be better equipped to handle critical events and prevent business disruptions.
- This capability is essential to the data fabric design concept and becomes an important building block to further automation in data management practices.

Obstacles

- There is no standard definition of what constitutes a data observability solution. Vendors offer a range of different capabilities often branded as data observability which is causing confusion in the market and leading to issues adopting the tools.
- The current vendor landscapes are very fragmented based on coverage areas and data environments supported. Most vendors focus on observability of the data quality and data pipelines, and are less concerned about data usages and financial impacts. The full end-to-end observations are not quite there yet from individual vendors.
- Most data observability tools only support the modern data stack. This limits their application in large enterprise environments with more complex data environments in many cases using legacy data management tools.
- Most data observability tools target the data engineer persona and are positioned as IT tools. Though business users receive important insights from data observability tools, they may find them less user-friendly.
- Organizations are embracing the concept of “observability.” But the actual adoption of the tools is not straightforward. The consideration of how they connect to the overall ecosystem and connecting this to data governance strategy is still a concern.

User Recommendations

- Identify the data elements or data pipelines which require high standards or SLA in quality, uptime, latency and performance. Pinpoint the gap of current monitoring capabilities vs. desired capabilities to support the requirements.
- Evaluate data observability tools available in the market that can enhance your observability based on priority of business requirements, primary users and interoperability with the enterprise data ecosystems.
- Pilot data observability program by building a monitoring mechanism as a starting point to increase visibility over the health of data. Invest in observability capabilities in a cloud environment first, as it's commonly supported by vendors and is faster and easier to demonstrate value.
- Include both business and IT perspectives when evaluating data observability tools by engaging with both personas early on in the evaluation process.
- Partner with business stakeholders to evaluate and demonstrate business value of data observation practices by tracking improvement of data quality, reduction in downtime and ability to meet SLAs to show tangible benefits.

Sample Vendors

Acceldata; Ataccama; Bigeye; Collibra; IBM; Kensu; Monte Carlo; Soda; Unravel

Gartner Recommended Reading

Data and Analytics Essentials: Data Observability

Quick Answer: What Is Data Observability?

The State of Data Quality Solutions: Augment, Automate and Simplify

Market Guide for DataOps Tools

At the Peak

AI Governance

Analysis By: Svetlana Sicular

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

AI governance is the process of creating policies, assigning decision rights, and ensuring organizational accountability for risks and investment decisions for the application and use of artificial intelligence techniques. AI governance is part of adaptive data and analytics governance, addressing the predictive and generative nature of AI.

Why This Is Important

With AI now delivering value in the enterprise, data and analytics leaders observe that scaling AI without governance is ineffective and dangerous. Generative AI and applications, like OpenAI's ChatGPT, make AI governance a necessity, as using pretrained AI models billions of times sharpens risk concerns. The leaders want to balance AI's business value and the need for appropriate oversight. AI draws the attention of legislators worldwide, who mandate actions by clarifying AI governance priorities.

Business Impact

AI governance, as part of the organizational governance structure, enacts responsible AI, and provides common implementation and adherence mechanisms across the business ecosystem when it comes to:

- Ethics, fairness, and safety to protect the business and its reputation,
- Trust and transparency to support AI adoption via explainability, bias mitigation, model governance, operationalization, and collaboration norms and capabilities.
- Diversity to ensure the right technology and roles for each AI project.

Drivers

- AI governance is in the peak area of the Hype Cycle. Enterprise practitioners are taking steps toward establishing AI governance. Leading organizations in various industries establish AI governance by addressing standards for AI development and operations, providing best practices, guidelines for model management and monitoring, data labeling and interpretation, explainability, fairness, bias mitigation, security, and legal.

- Regulations around the globe target AI directly and affect AI practices indirectly, making AI governance goals more concrete. The U.S. Blueprint for an AI Bill of Rights provides governance pathways, from principles to practice. The objective of the EU AI Act is to "enhance governance and effective enforcement of existing law on fundamental rights and safety requirements applicable to AI systems." The Algorithmic Impact Assessment is a mandatory risk assessment tool intended to support the Treasury Board of Canada. Singapore's Model AI Governance Framework guides organizations in developing appropriate governance structures and mechanisms.

- Trust and transparency of AI solutions are crucial for AI adoption. The probabilistic and opaque nature of AI is new to audiences familiar with deterministic outcomes. AI governance can minimize misinterpretations of AI results by scrutinizing trust in data sources and the explainability of AI decisions. It provides specific testing and validation guidelines, differentiating "life-critical AI."

- AI governance is necessary to establish AI accountability. It is difficult to achieve because use cases differ in terms of their data, solution and outcome requirements. It outlines reactive responsibilities, actions and procedures in the case of unanticipated and unintended consequences. It ensures that ethics are considered for each use case.

Obstacles

- Often, AI governance is stand-alone from mainstream governance initiatives, which stalls its progress. The best method is to extend existing governance mechanisms to take advantage of recognizable policies and methods, such as in data governance. AI governance benefits from a conversation with the security, legal and customer experience functions.

- Many governance initiatives assume command and control. Instead, adaptive governance supports freedom and creativity in AI teams but also protects the organization from reputational and regulatory risks. Little or no governance in AI teams to facilitate freedom and creativity is an acceptable approach if this is a conscious governance decision.
- AI value assurance and model risk management are new in AI. While methods exist — for example, in the financial industry — they are largely unknown to others, and every governance organization is inventing its own.
- Technologies to support AI governance are fragmented and are often designed for a single industry.

User Recommendations

- Extend to AI your existing governance mechanisms, such as risk management or data and analytics governance.
- Establish and refine processes for handling AI-related business decisions. Blend processes, people and technology to succeed.
- Aim to align your AI governance framework with the laws and regulations in your jurisdiction(s) to directionally assure your efforts amid evolving AI-specific considerations. Gain agreement on AI risk guidelines that are driven by the business risk appetite and regulations.
- Decide on the organizational structure and accountability for propagating responsible AI — for example, what to centralize and what to do locally.
- Implement tools for AI review and validation. For each AI use case, require an independent AI model validator, a data scientist whose job is to assure model explainability and robustness. Have all parties in the process defend their decisions in front of their peers and validators.
- Ensure that humans are in the loop to mitigate AI deficiencies.

Sample Vendors

Arthur; Chatterbox Labs; Credo AI; DarwinAI; FICO; Google; IBM; Prodago; SAS; Weights & Biases

Gartner Recommended Reading

Applying AI — Governance and Risk Management

4 AI Governance Actions to Make a Swift Business Impact

Artificial Intelligence Primer for 2023

Augmented MDM

Analysis By: Thornton Craig, Helen Grimster

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Obsolete

Definition:

Augmented master data management (MDM) is the application of graph analytics, machine learning and similar advanced technologies to MDM. Augmented MDM extends traditional MDM capabilities to reduce manual data management and governance tasks. It generates insights on complex relationships within and across both application and master data, allowing for technology to play an active role in enabling more adaptive and context-centric approaches to master data management.

Why This Is Important

Organizations use MDM to accelerate and differentiate digital transformations, particularly around customer/citizen and product/service experiences. Augmented MDM enhances MDM by the use of ML and graph analysis to identify sources of master data, uncover previously unknown relationships across master data entities, and accelerate functions like entity resolution and data quality. Data and analytics leaders' need for faster insights requires them to incorporate augmented MDM capabilities.

Business Impact

Augmented MDM enables acceleration of business capabilities by:

- Increased revenue associated with enhanced digital experiences, such as uncovering previously unknown data relationships leading to sales opportunities.
- Faster processing of larger datasets to derive candidate master data definitions and identification of data assets.

- Improved operational efficiencies and lower MDM program operating costs via automation of data management and governance tasks such as entity resolution and data quality.

Drivers

- Taking more context-centric views and better governance of core master data objects.
- The value generated by exposing previously unknown relationships between master and nonmaster data within large, unstructured datasets.
- Businesses' focus on creating "360-degree views" of their master data domains, fueling an expansion in the number of data types (such as application data) and data sources included in the scope of an MDM program.

Obstacles

- Augmented MDM is still in the early stages of development, both from the perspectives of customer demand and vendor focus. Although some vendors already offer augmented MDM as part of their solution, others are just starting to plan for it.
- Technical impediments: MDM solution providers must upgrade their platforms to integrate new features into existing infrastructures — which for many means a revamping of their underlying architectures.
- Individual capabilities described by augmented MDM are also available across other data and analytics solutions and emerging data fabric. Convergence of capabilities across the data management markets (active metadata-driven) and new emerging market for data and analytics governance platforms lead to this technology's obsolescence.

User Recommendations

- Be skeptical of vendors who focus their value propositions primarily on augmented MDM. Many MDM requirements, especially legal, finance or compliance-driven use cases, remain firmly rooted in traditional approaches to MDM.
- Evaluate your expected business outcomes and use cases — as some may not align well with augmented MDM, regardless of vendor.
- Be wary of augmented MDM vendors that lack the ability to integrate the use of graph and ML for data discovery, profiling and visualization with governance processes and operational MDM use cases.
- Contemplate a “best of breed” approach to solving for your needs when incumbent solutions lack augmented MDM capabilities. The combination of MDM, customer data platforms, analytics platforms, data quality and metadata management tools may support augmented MDM requirements for specific use cases.

Sample Vendors

CluedIn; Informatica; Profisee; Reltio; Syndigo; Tamr

Gartner Recommended Reading

Understanding Modern MDM

Responsible AI

Analysis By: Svetlana Sicular

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Responsible artificial intelligence (AI) is an umbrella term for aspects of making appropriate business and ethical choices when adopting AI. These include business and societal value, risk, trust, transparency, fairness, bias mitigation, explainability, sustainability, accountability, safety, privacy, and regulatory compliance. Responsible AI encompasses organizational responsibilities and practices that ensure positive, accountable, and ethical AI development and operation.

Why This Is Important

Responsible AI has emerged as the key AI topic for Gartner clients. When AI replaces human decisions and generates brand-new artifacts, it amplifies both good and bad outcomes. Responsible AI enables the right outcomes by ensuring business value while mitigating risks. This requires a set of tools and approaches, including industry-specific methods, adopted by vendors and enterprises. More jurisdictions introduce new regulations that challenge organizations to respond in meaningful ways.

Business Impact

Responsible AI assumes accountability for AI development and use at the individual, organizational and societal levels. If AI governance is practiced by designated groups, responsible AI applies to everyone involved in the AI process. Responsible AI helps achieve fairness, even though biases are baked into the data; gain trust, although transparency and explainability methods are evolving; and ensure regulatory compliance, despite the AI's probabilistic nature.

Drivers

- Responsible AI means a deliberate approach in many directions at once. Data science's responsibility to deliver unbiased, trusted and ethical AI is just the tip of the iceberg. Responsible AI helps AI participants develop, implement, utilize and address the various drivers they face.
- Organizational driver assumes that AI's business value versus risk in regulatory, business and ethical constraints should be balanced, including employee reskilling and intellectual property protection.
- Societal driver includes resolving AI safety for societal well-being versus limiting human freedoms. Existing and pending legal guidelines and regulations, such as the EU's Artificial Intelligence Act, make responsible AI a necessity.
- Customer/citizen driver is based on fairness and ethics and requires resolving privacy versus convenience. Customers should exhibit readiness to give their data in exchange for benefits. Consumer and citizen protection regulations provide the necessary steps, but do not relieve organizations of deliberation specific to their constituents.
- With further AI adoption, the responsible AI framework is becoming more important and is better understood by vendors, buyers, society and legislators.
- AI affects all ways of life and touches all societal strata; hence, the responsible AI challenges are multifaceted and cannot be easily generalized. New problems constantly arise with rapidly evolving technologies and their uses, such as using OpenAI's ChatGPT or detecting deepfakes. Most organizations combine some of the drivers under the umbrella of responsible AI, namely, accountability, diversity, ethics, explainability, fairness, human centricity, operational responsibility, privacy, regulatory compliance, risk management, safety, transparency and trustworthiness.

Obstacles

- Poorly defined accountability for responsible AI makes it look good on paper but is ineffective in reality.
- Unawareness of AI's unintended consequences persists. Forty percent of organizations had an AI privacy breach or security incident. Many organizations turn to responsible AI only after they experience AI's negative effects, whereas prevention is easier and less stressful.
- Legislative challenges lead to efforts for regulatory compliance, while most AI regulations are still in draft. AI products' adoption of regulations for privacy and intellectual property makes it challenging for organizations to ensure compliance and avoid all possible liability risks.
- Rapidly evolving AI technologies, including tools for explainability, bias detection, privacy protection and some regulatory compliance, lull organizations into a false sense of responsibility, while mere technology is not enough. A disciplined AI ethics and governance approach is necessary, in addition to technology.

User Recommendations

- Publicize consistent approaches across all focus areas. The most typical areas of responsible AI in the enterprise are fairness, bias mitigation, ethics, risk management, privacy, sustainability and regulatory compliance.
- Designate a champion accountable for the responsible development and use of AI for each use case.
- Define model design and exploitation principles. Address responsible AI in all phases of model development and implementation cycles. Go for hard trade-off questions. Provide responsible AI training to personnel.
- Establish operationalize responsible AI principles. Ensure diversity of participants and the ease to voice AI concerns.
- Participate in industry or societal AI groups. Learn best practices and contribute your own, because everybody will benefit from this. Ensure policies account for the needs of any internal or external stakeholders.

Sample Vendors

Amazon; Arthur; Fiddler; Google; H2O.ai; IBM; Microsoft; Responsible AI Institute; TAZI.AI; TruEra

Gartner Recommended Reading

A Comprehensive Guide to Responsible AI

Expert Insight Video: What Is Responsible AI and Why Should You Care About It?

Best Practices for the Responsible Use of Natural Language Technologies

Activate Responsible AI Principles Using Human-Centered Design Techniques

How to Ensure Your Vendors Are Accountable for Governance of Responsible AI

Governance of Digital Twins

Analysis By: Roger Williams, Alfonso Velosa, Marc Halpern

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Governance of digital twins refers, in an enterprise context, to the specification of decision rights and a framework to ensure that digital twins deliver intended business benefits at an acceptable level of organizational cost and risk. This applies for the entire life cycle of a digital twin's physical-world counterpart.

Why This Is Important

Digital twins can greatly reduce the costs and risks of managing physical systems, though barriers to scaling them up operationally threaten the value that enterprises can derive from them. Without effective governance, IT leaders risk inheriting a digital twin portfolio that lacks standardization and consistency. It is in the interest of both an enterprise and its IT leaders to address potential governance shortcomings early.

Business Impact

Enterprise governance of digital twins is fundamental to realizing sustained value, because traditional project-based approaches to implementing digital twins will not maintain the value of digital twins throughout the long time spans associated with many of the physical items they represent.

Digital twins are starting to enable new digital business models, such as digital threads and product servicing, as well as updated versions of existing models.

Organizations that govern digital twins effectively will be best-placed to achieve good business outcomes.

Drivers

- No industry standards or common integration frameworks exist for digital twin data, models, analytics or security. This often results in digital twins being managed in isolation, rather than as an integrated set of investments.
- Stakeholders from all business functions and across IT, operational technology and engineering technology teams seek significant, yet varied, benefits. Stewardship of digital twins is needed to meet their diverse requirements.
- The need for coordination on composite and organizational digital twins with shared-data models across multiple enterprises adds another layer of complexity that demands governance.
- Competency in IT disciplines such as application portfolio management will be severely taxed, because digital twins could potentially outnumber business applications by at least a factor of 10 (e.g., an organization with 100 business applications in its portfolio may end up with 1,000 associated digital twins).
- These factors threaten the scalability and value that organizations can realize from digital twins and related investments in, for example, the Internet of Things.

Obstacles

- Decision makers tend to lose their focus on governance due to other more obvious and pressing concerns.
- Accountability for digital twin outcomes is often unassigned or unclear.
- Stakeholder participation is often ineffective at defining desired digital twin outcomes and deciding about digital twin projects.
- Deviations from expected business performance often lead to unpredictable identifications, communications and actions (e.g., causal analysis, course correction or project cancellation).
- Lack of transparency about, and lack of reuse of, the decision mechanisms required to build collective trust in governance outcomes.

User Recommendations

- **Accountability:** Create a charter for governing digital twins that emphasizes three primary roles, namely executive sponsor, program lead and owner of digital twins. Ensure steering committees and other governing bodies provide accountability for outcomes, participation by appropriate stakeholders, predictability in terms of how results are reported and acted on, and transparency about digital twins' performance and conformance.
- **Participation:** Define decision models that specify who (internally and externally) should participate in decision phases, such as about which digital twins to create and whether to promote a digital twin to a production environment.
- **Predictability:** Ensure all stakeholders know what is required of them regarding digital twin management activities, how they will be informed of outcomes and what actions will be taken.
- **Transparency:** Check that relevant information about intentions, data quality, availability, timing, formats and templates are available to stakeholders in digital twins.

Sample Vendors

Bentley Systems; GE Digital; Mavim; Microsoft; Software AG

Gartner Recommended Reading

Ignition Guide to Creating a Digital Twin MVP

Evaluate Data Design Patterns to Optimize Digital Twins

What Data and Analytics Leaders Need to Know and Do About Digital Twins

Augmented Data Quality

Analysis By: Ankush Jain

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Augmented data quality (ADQ) solutions provide the capabilities for enhanced experience aimed at improved insight discovery; next-best-action suggestions; and automation by leveraging artificial intelligence (AI)/machine learning (ML) features, graph analysis and metadata analytics. Each technology can work both independently and cooperatively to create network effects, which can then be used to increase data quality automation and effectiveness across a wide range of data quality use cases.

Why This Is Important

Ensuring high-quality data is important to data and analytics endeavors. Based on rapid expansion of contemporary data environments, a multitude of data types and pressing demands of businesses, organizations are searching for innovative approaches that are fast, affordable, scalable and easy to implement to tackle data quality issues. ADQ technologies revolutionize conventional and time-consuming manual procedures by increasing automation and enhancing insights.

Business Impact

- Automation/augmentation enhance data quality, reduce manual effort and improve efficiency.
- Multipersona usability enables nontechnical users to run processes via natural language, eliminating skill barriers.
- AI/ML techniques and metadata analytics enhance multiple data quality processes.
- Semantic connections, lineage tracing and domain data mapping enable impacts/solutions to be identified by knowledge graphs.
- Support for data engineers includes monitoring/observability across complex landscapes.

Drivers

- Traditional data quality practices that rely on manual efforts and subject matter experts struggle to address complex and exception-prone data quality problems.
- Data quality across various use cases offers accelerated time to value, reduced risk and increased competitive advantage across all business activities and user groups.
- Augmented data quality solutions are essential for emerging and future data ecosystems, integrating seamlessly with cohesive designs, such as data fabrics, supporting operational excellence and enhancing financial governance.
- Organizations need seamless integration, agile deployments and bidirectional exchange of intelligence with adjacent data management functions, which is core to ADQ.
- ADQ enables organizations to scale and unify data quality efforts for enterprisewide success, which is often a challenge, due to limited internal capabilities and strategies.
- ADQ makes use of advanced techniques including ML, natural language processing (NLP), large language models and GenAI, active metadata and knowledge graphs. This enables augmentation across several data quality capabilities, such as profiling and monitoring/observability; data transformation; rule discovery and creation; matching, linking and merging; data quality remediation; and role-based usability.
- Embracing augmented data quality solutions and leveraging emerging technologies is crucial to improve data integrity, governance and overall success in the data ecosystem.

Obstacles

- **Limited awareness and understanding of benefits** of ADQ solutions can impede adoption. Organizations should actively educate their teams about the value and potential impact of these tools, fostering a culture that embraces and leverages advanced data quality technologies.
- **Lack of scalability and integration with existing data infrastructure** can be an obstacle to the adoption of ADQ tools.
- **The lack of explainability and traceability of AI/ML algorithms** could lead to reluctance to adopt these tools.
- **The inclusion of data and analytics governance is crucial** when implementing ADQ tools. AI-driven automation provides users with independence, but it is essential to embed governance requirements into the AI models to mitigate data-related risks.

User Recommendations

- **Evaluate data quality capabilities:** Assess manual efforts/complexity needed to support use cases. Identify improvement areas ADQ can address. This will help determine requirements for adopting ADQ.
- **Explore ADQ capabilities:** Investigate the features, setup process, required skills and constraints associated with ADQ solutions. Assess offerings from incumbent data quality vendors and explore product roadmaps for enhancement.
- **Establish data cataloging:** Implement practices to collect/analyze metadata for automation and efficient data quality processes. Enhance management of data assets and facilitate ADQ integration.
- **Align with data governance:** Partner with stakeholders to monitor ADQ solutions. Ensure to governance requirements and framework adherence. Establish metrics to show benefits/business value.
- **Collaborate with solution providers:** Provide feedback, share experiences and suggest enhancements. Engage in user forums, contribute to improvements and shape development roadmap to meet needs.

Sample Vendors

Ataccama; Collibra; DQLabs; Experian; IBM; Informatica; Precisely; Syniti; Talend

Gartner Recommended Reading

The State of Data Quality Solutions: Augment, Automate and Simplify

Augmented Data Quality Represents a New Option for Upscaling Data Quality Capabilities

Building Automation Into Your Data Quality Initiatives

Magic Quadrant for Data Quality Solutions

Critical Capabilities for Data Quality Solutions

Analytics Governance

Analysis By: Andrew White, Kurt Schlegel

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Analytics governance is the setting and enforcement of D&A governance policy along the analytics pipeline, from data discovery through analytics deployment, and access to the analysis and insight. Though the markets use the term “governance” here, what is being delivered by technology vendors is not related to policy setting or enforcement, but execution of policy along the analytics pipeline. A more appropriate name would be analytics stewardship.

Why This Is Important

With increasing interest in analytics and AI, the shift to cloud, and the increased risk from failure and exposure to regulatory controls, the interest in governance along the entire analytics pipelines has ballooned. Unfortunately, there is a huge misunderstanding in the market. What needs to take place in the analytics pipeline is the same as what takes place upstream in operational systems. As few people understand this, hype and confusion reign, and redundant investments exist.

Business Impact

Organizations that balance investments between the latest analytics, BI and data science technology and the needed support for governance will get a greater return on both investments. With the right business outcome and adaptive governance focus, the least amount of mission-critical data and analytics will be governed. This would assist with trusted and reliable analysis and insight leverage.

Drivers

- 2023 is marked with wide data, “lakehouses,” data and analytics producers, data fabrics, and data mesh. At the same time, the analytics pipeline is stretched across organizations and clouds. Complexity and confusion is a big driver of analytics governance.
- A shift in focus from truth to trust in governing data and analytics assets, as the vastness of data can no longer be managed with current truth-based (i.e., yes/no) approaches.
- Increase in demand and deployment of self-service analytics and BI, and more rapid prototyping of analytics outputs by users closer to the point of decision.
- The interest and need to govern data inbound to a data warehouse or lake, to have access to that data in the analytics development, and to model, share and create new analytics.
- More complex organizational structures lead to increased demand, whereby various works of data, analytics or governance are widely distributed across business units, business functions, fusion teams, and IT.
- Third-party and regulatory compliance with data privacy, security, access, quality, and ethics drive increased hype to fever pitch.
- Preservation of privacy that may even conflict when operating across multiple jurisdictions.

Obstacles

- Many organizations think that “analytics governance” is different from data and analytics governance, instead of observing the same patterns and solutions that emerge in both.
- Over time, analytics governance will be recognized as part of D&A governance. Hence, stand-alone capabilities will become obsolete before achieving mass-market adoption.
- Vendors who offer analytics, BI, data science and AI solutions are not naturally familiar with or capable of meeting needs of analytic governance. But vendors will often want to meet requests from clients in the positive, so they are trying to develop analytics governance solutions.
- Some solutions that are more capable upstream of data governance in operational use cases are not actually effective at policy execution in analytics use cases. For example, implementing operational MDM in a data lake would create more problems than it might actually solve.

User Recommendations

- Validate your governance charter with the work of policy setting (i.e., governance), policy enforcement (i.e., stewardship) and policy execution (i.e., management) along your analytic pipeline. This will reduce redundancy and save money, and lead to improved outcomes.
- Don’t assume your analytics solutions support your requirements for analytics stewardship (or governance). At most, they might execute a technical rule in their application. You may need to build your own stewardship capability until the vendors meet your needs.
- Don’t assume you need to start with a data or analytics catalog. In case you don’t know your organization’s data and analytics, simply ask your business leaders.

Sample Vendors

Alation; ALTR Solutions; Collibra; ZenOptics

Gartner Recommended Reading

Data and Analytics Leaders Must Use Adaptive Governance to Succeed in Digital Business

Next Best Actions to Improve Your Data and Analytics Governance

Infographic: Data and Analytics Governance Survey: IT Says Mission Accomplished; Business Disagrees

Use Enterprise Metadata Management to Extend Information Governance to Analytics

Dynamic Trust-Based Model for Governance

Analysis By: Andrew White, Saul Judah

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

A dynamic trust-based model for D&A governance leverages ML to dynamically discover, inform, and then set desired trust, reliability and efficacy of data, analytics, systems, partners and organizations, to ensure appropriate asset usage and risk mitigation. It offers a graduated approach to governance compared to traditional dimensions common in data quality and MDM that focus on a single dimension (e.g., yes/no compliance or single version of the truth) for the policy or definitional rules.

Why This Is Important

Common and long-standing governance models use yes/no conclusions, yet this binary approach no longer serves business needs adequately. A dynamic trust-based model uses a graduated capability such that an attribute might be useful in some cases, but perhaps not all. It also introduces multiple layers of “yes” or “may be.” Trust-based governance models are becoming dynamic as they are being enhanced to use machine learning (ML) to discover and profile data that might well demonstrate trust as evidenced by frequent usage.

Business Impact

Traditional data quality and entity resolution definitions tend to focus on yes/no or single responses, and these limit the flexibility of data and analytics governance. A trust-based approach alleviates the challenge and will reduce costs, mitigate risks and help businesses achieve their expected goals more effectively. Enhanced with ML, dynamic trust models achieve their goals much faster.

Drivers

- Hype and expectations around trust and trust-based governance models is being reinvigorated by augmentation with ML to help speed up implementation. ML-augmented knowledge graphs, entity resolution and data quality are helping discover relationships in data to help infer or inform additional insights on data use, which can help reinforce trust.
- The use of data to drive decisions and outcomes is still at a fever pitch, and the idea that trust over truth is an appropriate concept is now common.
- Trust is at the center of the effective use of analytics and artificial intelligence (AI) since it aligns with the vagaries and contexts of complex situations and models. Absolute forms of data quality and definitions do not work well in these new environments, which are predicated on openness, shareability and exploration.
- Trust cannot be assumed; it needs to be evaluated and calibrated to the business outcome, and is hard to earn when people or relationships are involved.
- Master data management (MDM), data quality, active metadata techniques, and various elements of data and analytics (D&A) governance are adding trust-supporting capabilities widely.
- This model will be adopted into D&A governance platforms over time as a common capability and will become obsolete before the plateau.

Obstacles

- Lack of maturity in governance is the biggest obstacle to trust-based governance. D&A teams often spend much of their time firefighting operational issues (e.g., data quality issues that prevent a business transaction or a report with “bad” data). They don’t have the opportunity to step back and assess their landscape and understand the lineage, curation and usage of their ecosystem by their organizational users. As a result, they are unable to put in place a framework that will help them reduce the issues they face on a daily basis.
- Widely deployed technologies, such as data dictionaries, glossaries, catalogs, data quality and entity resolution, and business rule engines, are also being augmented with ML. Thus, they are also converging and evolving, which makes it harder to work out where and when to innovate with a trust-based approach.
- Use and adoption of ML in many different use cases continues apace but reliably producing high-value insights remains elusive.

User Recommendations

- Pilot a dynamic trust model to some critical data and its source where governance policy efforts to date appear costly or onerous. Explore how it can help users of the data align their risk mitigation efforts to the value and use of the (trusted) data.
- Use a simple three-tier framework (untrusted, unknown, trusted) when data quality has only a single dimension (e.g., yes/no), and test the boundaries and the savings in time and effort to govern such data.
- Augment your data catalog, data dictionary or glossary program with dynamic trust model capability to help speed up implementation and leverage of such data.
- Align trust-based governance to your data use case and enterprise goals. Many use cases will still work very effectively with traditional rules and policies, such as those defined by yes/no qualifications. But for departmental use, that data might be treated differently, especially if enriched with third-party data for analytics, such as a customer data platform (CDP). It is in the CDP that trust may be more useful than a truth-based approach.

Sample Vendors

Alation; Informatica; Precisely

Gartner Recommended Reading

7 Must-Have Foundations for Modern Data and Analytics Governance

Reset Your Information Governance Approach by Moving From Truth to Trust

Why Situational Trust Is Key to Data Sharing for Business Value

Predicts 2023: Distributed Business Decisions Need Balanced Governance Approaches

Sliding into the Trough

Data Literacy

Analysis By: Alan D. Duncan, Donna Medeiros, Sally Parker

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Data literacy is the ability to read, write and communicate data in context, with an understanding of the data sources and constructs, analytical methods and techniques applied. Data-literate individuals have the ability to identify, understand, interpret and act upon data within business context and influence the resulting business value or outcomes.

Why This Is Important

Data and analytics (D&A) are pervasive in all aspects of businesses, communities and our personal lives. Thus, data literacy is foundational to the digital economy and society. It helps stakeholders:

- Draw a directlink between D&A and desired outcomes
- Unlock knowledge workers' business acumen
- Explain how to identify, access, integrate and manage datasets
- Draw insights relevant to specific use cases
- Describe advanced analytics techniques and enable AI
- Reduce risk through improved decision making

Business Impact

To become data-driven and equipped to use data and analytics to their competitive advantage, enterprises require explicit and lasting organizational change. Chief data and analytics officers (CDAOs) need to promote and orchestrate “leadership moments” where they act as role models, exemplifying new cultural traits at critical points. To be successful, they will need to guide the workforce by addressing both data literacy and data-driven culture.

Drivers

- The continued growth in digital transformation is amplifying a focus on D&A best practices. Employee data literacy is becoming increasingly recognized as an important factor in an organization’s overall digital dexterity.
- The role of the D&A function has evolved. It is now at the core of an organization’s business model and digital platforms, and with everyone being an information worker, the footprint of business use of data and analytics is broader than ever before.
- Effective D&A strategies require an increased focus on change management. Higher-performing CDAOs prioritize their emphasis, energy and effort on change management requirements, including data literacy.
- Defining what data-driven behaviors are expected — using a “from/to/because” approach — is central to employee development plans. It ensures that creators, consumers and intermediaries have the necessary D&A skills, knowledge and competencies.
- Data literacy is not a one-off project. CDAOs need to take immediate action to create and sustain data literacy through assessment of maturity, awareness, and education. Quick wins build momentum, but lasting and meaningful change takes time because it requires people to learn new skills and behave in new ways. (For example, there is a hunger for this type of skills development within Gen Z, especially in order to future-proof their careers.)

Obstacles

- Lack of common data literacy models/frameworks/standards and terminology.
- Varying interpretations of the term “data literacy” in terms of training, curriculum and understanding, ranging from enhanced data visualization skills to fostering business curiosity about data.
- Failure to measure contribution of data to business outcomes.

- A sporadic and inconsistent approach to training and certification.
- Not recognizing that data use is a behavioral change or change management initiative.
- Lack of talent and poor data literacy within the current workforce.
- Lack of initiatives to address cultural and data literacy challenges within strategies and programs.
- Overall adoption will still take years, due to the complexity of upskilling entire workforces.
- Data literacy is treated as a checkbox activity, especially when delegated to more junior (and unempowered) resources.
- Lack of a designated leader accountable for the development and execution of the program, roadmap and communication plan.

User Recommendations

- Make the business case for data literacy by identifying stakeholder outcomes and linking these to underlying learning needs.
- Designate a leader who will be accountable for developing and executing the roadmap.
- Foster data literacy during D&A requirements gathering by bringing data and business experts together around the problem to be solved.
- Call out examples of “good” and “bad” data literacy to promote desired behaviors.
- Nurture data literacy by rewarding stakeholders who recognize this as a factor for success and sharing their stories.
- Partner with HR and business leaders to incorporate data literacy learning outcomes into job descriptions, career paths and employee value proposition.
- Use data literacy assessments to evaluate current skill levels and desire to participate.
- Go beyond vendor product training to focus on people’s role- and industry-related D&A skills. Improve learning effectiveness by using a mix of training delivery methods (classroom, online, community, on the job).

Sample Vendors

Avado; The Center of Applied Data Science (CADS); Coursera; The Data Lodge; Data To The People; Pluralsight; Skillsoft; Udacity; Udemy

Gartner Recommended Reading

How CDAOs Must Lead Data Literacy and Data-Driven Culture

Address Both 'Skill' and 'Will' to Deliver Data-Driven Business Change

Drive Business Outcomes by Measuring the Value of Data Literacy

Tackle Data Literacy Head-On to Avoid Data and Analytics Program Failure

Partner With Data Literacy Providers to Accelerate the Time to Value for Data-Driven Enterprises

Data Hub Strategy

Analysis By: Andrew White, Thornton Craig

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

A data hub strategy effectively determines where, when and how data needs to be mediated, governed and shared in an enterprise. It layers data and analytics governance requirements atop sharing demands to establish the patterns for data flow. The strategy drives the implementation of one or more data hubs — architectures that enable data sharing and access by connecting data producers (applications, processes and teams) with data consumers (other applications, processes and teams).

Why This Is Important

Digital business cannot scale by continuing to piecemeal all the programs and practices that have evolved in the last 10 years. A connected, aligned approach is needed. A data hub strategy provides that connected approach to streamline and simplify how all programs related to D&A governance operate: data quality, MDM, ADM, metadata management, data catalogs and so on. You end up getting more from less effort and investment.

Business Impact

- Increased operational efficiency by aligning and integrating previously siloed governance programs such as data quality, MDM, ADM, metadata management, data catalogs and so on.
- Increased return on all D&A investments through more effective and targeted efforts on implementing governance of D&A information assets such as data, analytics, models, etc.
- Reduced complexity and cost across overall information infrastructure and data fabric or mesh.

Drivers

- Demands for seamless data flow across teams, processes and systems in the enterprise, which have increased dramatically in complexity and mission-criticality.
- New demands for consistent and reliable sharing of critical data between the organizations and things that comprise the extended enterprise — for example, in support of Internet of Things (IoT) solutions and new digital products.
- Better collaboration across business-oriented (governance) and IT-centric (integration) roles concerned with delivering data to points of need across the enterprise.
- Longtime and continued frustration of business stakeholders over the lack of consistency and trust of data driving strategic business outcomes — a data hub strategy enables more-focused application of governance controls, as compared with trying to align governance approaches inside many endpoint systems.
- Emerging data fabric design patterns that both need and leverage trusted sources of data and can inform what data should be governed more importantly.
- Growing need for a flexible and governable architecture that complements centralized data stores such as data lakes and data warehouses.
- Desire of many organizations to leverage the concepts and successes of MDM programs toward governance and sharing of other types of critical data. Includes coupling MDM and ADM across the enterprise.

Obstacles

- Inability to modernize D&A governance programs and shift away from legacy domain and data-centric or IT focused efforts to an outcome-based program.
- Resistance from teams or business units that prefer to retain control over their choices regarding how data is shared and governed.
- Inability to enable collaboration and agreement of critical stakeholders on data sharing and governance requirements across boundaries in the enterprise.
- Overreliance on technology and viewing governance and sharing of data as purely an implementation issue.

User Recommendations

- Identify the data that is most frequently used or is most important with most business value, and that requires effective governance and sharing. This might be a lean MDM or ADM/ERP program.
- Design a data hub strategy to understand data and analytics governance and sharing requirements, and to drive integration efforts across multiple use cases.
- Include any master data, application data, reference data, analytics data hubs or other intermediaries (e.g., customer data platforms) in your overall data hub strategy.
- Iterate changes to your data hub strategy as requirements for governance, sharing and integration change.

Sample Vendors

IBM; Informatica; MarkLogic; Profisee

Gartner Recommended Reading

Data and Analytics Essentials: Data Hubs

Data Sharing Is a Business Necessity to Accelerate Digital Business

Use a Data Hub Strategy to Meet Your Data and Analytics Governance and Sharing Requirements

Data Hubs: Understanding the Types, Characteristics and Use Cases

Data Hubs, Data Lakes and Data Warehouses: How They Are Different and Why They Are Better Together

Interenterprise MDM

Analysis By: Thornton Craig, Helen Grimster

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Definition:

Interenterprise MDM is a technology-enabled discipline supporting shared governance and utilization of common master data assets across two or more interrelated businesses. Interenterprise MDM enables the creation of shared master data assets used in data pools or consortiums (such as those supporting product data or commercial credit data), data marketplaces and exchanges, and shared reference datasets.

Why This Is Important

The exchange of master data (like customer or product data) between business entities is a critical dependency. Commercial trade depends on increasingly complex digital ecosystems, hindering optimization of cross-business interactions. Interenterprise master data management (MDM) provides efficient B2B data exchange through shared governance of master data assets. Examples of this include global supply chains, distributor networks, third-party e-commerce, and outsourced customer service.

Business Impact

Any relationship between businesses that is facilitated by the exchange of master data can benefit from interenterprise MDM. Interenterprise MDM helps optimize processes that span two or more businesses by facilitating uniformity, accuracy, stewardship and semantic consistency of master data assets. It allows for scalability and automation by removing silos across processes through a shared approach to governance policies.

Drivers

The fundamental driver for investing in interenterprise MDM is the need for an effective shared approach to the management of master data assets used across interdependent business processes spanning more than one business entity. Specific drivers include:

- Optimizing the processes involved in moving goods, including raw materials, through a supply chain
- Increasing the speed and efficiency of procuring goods or services, often in support of inventory optimization efforts
- Selling, marketing or distributing products or services in third-party channels via shared product definitions and catalogs
- Utilizing external resources to manage customer service or support processes
- Creating a consistent customer definition/view in support of a complex multichannel partner or reseller network

- Connecting product and customer transactions across consistent master identifiers between offline and online retail experiences
- Reducing data management costs by taking a shared approach to the governance and stewardship of a shared pool of master data assets
- Increasing efficiency by implementing more granular data hubs to integrate and share master data across business entities, as opposed to multiple point-to-point integrations

Obstacles

- Political and cultural forces within organizations, which create fear and uncertainty around the acceptability or legality of external master data sharing.
- A lack of data and analytics governance maturity within organizations, limiting connections between investments in MDM and desired business outcomes.
- The time, resources and organizational model needed to create a data governance body that works for shared mutual interests, not the interests of any one corporate entity.
- The dynamics of certain market segments that enable a limited number of large players to dictate master data standards to customers or suppliers.
- Limited market opportunities to participate in data pools, consortiums or other similar approaches to external master data sharing.
- Many B2B initiatives are funded before organizations realize they need an explicit focus on interenterprise MDM. As such, many B2B technology vendors do not even call out the need or service.

User Recommendations

- Take an outcome-driven approach to identity use cases that would benefit from interenterprise MDM. Identify a limited number of use cases to contain scope and build a business case.
- Monitor and evaluate the benefits of participation in data exchanges, consortiums or other B2B solutions to support the use cases you identified.
- Collaborate with your business/trade partners or B2B vendor to identify areas of mutual benefit when no data consortiums (or similar) exist to support your use case.
- Address any existing barriers to external data sharing by taking a “must share data unless” approach, including recalibrating the real business risks of not sharing external master data.
- Evaluate the impacts on the people, processes and technologies needed to support an interenterprise MDM business case, along with the impacts on any existing governance processes.

Sample Vendors

e2open; Precisely; Profisee

Gartner Recommended Reading

How CDAOs Need to Prioritize Data Sharing Investments for Digital Business Success

Create a Master Data Roadmap With Gartner’s MDM Maturity Model

Digital Ethics

Analysis By: Pieter den Hamer, Frank Buytendijk, Svetlana Sicular, Bart Willemsen

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Digital ethics comprises the systems of values and moral principles for the conduct of electronic interactions among people, organizations and things. It applies to areas such as AI, data and analytics, and social media.

Why This Is Important

Digital ethics, especially around topics like privacy, bias, polarization and veracity, is a concern to many. The voice of society is getting louder, with responsible AI coming into sharp focus for individuals, organizations and governments. People, increasingly aware that their data is valuable, are frustrated by lack of transparency, misuse and breaches. Organizations are acting to mitigate ethical risks around data, AI and other digital areas, while more governments are encouraging and regulating responsible use of these in digital society.

Business Impact

Digital ethics strengthens an organization's positive influence and reputation among customers, employees, partners and society. Areas of business impact include innovation, product development, customer engagement, corporate strategy and go-to-market. Intention is key. If ethics is simply a way to achieve business performance, it comes across as disingenuous. The goal to be an ethical organization serves all parties and society more broadly, and leads to better business trust and performance.

Drivers

- The media is frequently featuring high-profile stories about the impact of data, AI and other technology on business and society at large. Board members and other executives are increasingly sharing concerns about the unintended consequences of innovative technology use.
- For many technologies, ethics was often an afterthought. However, with the emergence of artificial intelligence, the ethical discussion is now taking place both before and during a technology's widespread implementation. AI ethics aims to establish responsible use of AI and to harness AI's growing powers.
- The current hype around generative AI, including ChatGPT and similar alternatives, is raising awareness about ethical and legal issues surrounding the veracity and (intellectual) ownership of data, including training data. In addition, the potential impact of inaccurate, misleading or insensitive output is fueling ethical concerns.
- Government commissions and industry consortia are actively developing guidelines for ethical use of AI. Examples include the EU's AI Act, the Netherlands' Fundamental Rights and Algorithm Impact Assessment (FRAIA), and the U.S.'s National AI Research Resource (NAIRR) Task Force and National Artificial Intelligence Initiative to advance trustworthy AI in the U.S.
- Over the past few years, a growing number of organizations declared their AI ethics principles, frameworks and guidelines. Many are in the process of going from declaration to execution.
- Universities across the globe have added digital ethics courses and have launched programs to address ethical, policy and legal challenges posed by new technologies.
- Digital ethics is expanding to address concerns about rising energy consumption. In the case of nonrenewable energy, it is focusing on the carbon footprint of digital technology (particularly, machine learning and blockchain).

Obstacles

- Because of the ambiguous, pluralist and contextual nature of digital ethics, organizations often struggle to operationalize it and expend significant effort to implement best practices.
- Organizations see digital ethics as a moving target because of confusion around society's expectations. An organization's position and beliefs may even steer digital ethics against the majority's opinion.
- Digital ethics is too often reactive, narrowly interpreted as compliance, reduced to a checklist, confined to technical support for privacy protection, and/or viewed only as explainable AI.
- AI ethics is currently the main focus of digital ethics. Supporting technology (e.g., to protect privacy or mitigate bias) needs to mature further and apply to the broader scope of ecosystems rather than singular technologies.
- Across people, regions and cultures, opinions differ on what constitutes "good" and "bad" and what doing the right thing means. Even in organizations that recognize ethics as an important issue, consensus between internal and external stakeholders (such as customers) is sometimes illusive.

User Recommendations

- Identify specific digital ethics issues and opportunities to turn awareness into action.
- Discuss ethical dilemmas from diverse points of moral reasoning. Anticipate and account for ethical consequences. Ensure that you are comfortable defending the use of a technology, including any unintended negative outcomes.
- Elevate the conversation by focusing on digital ethics as a source of societal and business value, rather than simply focusing on compliance and risk. Link digital ethics to concrete business performance metrics.
- Ensure that digital ethics is leading and not following the adoption of new, transformative technology such as AI. Address digital ethics upfront "by design" to create methods that identify and resolve ethical dilemmas as early as possible.
- Organize training in ethics, and run workshops to create ethical awareness within all AI initiatives. These should emphasize the importance of an ethical mindset and clear accountability in AI design and implementation.

Gartner Recommended Reading

Tool: Assess How You Are Doing With Your Digital Ethics

Tool: How to Build a Digital Ethics Curriculum

AI Ethics: Use 5 Common Guidelines as Your Starting Point

How to Manage Digital Ethical Dilemmas

How to Operationalize Digital Ethics in Your Organization

Data and Analytics Governance

Analysis By: Saul Judah, Andrew White

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Data and analytics governance is the specification of decision rights and an accountability framework to ensure the appropriate behavior in the valuation, creation, consumption and control of data, analytics and AI. It includes the processes, roles, policies, standards and metrics that ensure the effective and efficient use of data and analytics in enabling an organization to achieve its goals.

Why This Is Important

Data and analytics governance allows organizations the oversight to drive better behaviors relating to information-related assets in the enterprise, enabling better business outcomes and mitigation of risk. Data and analytics leaders need good governance practices to enable key business outcomes, such as market growth, cost optimization, merger and acquisition scenarios, and compliance management.

Business Impact

Data and analytics leaders should anticipate the following impacts:

- Better governance oversight, accountability and understanding of decision rights relating to data and analytics across the enterprise and within business areas
- Increased levels of business collaboration, transparency, engagement and innovation to drive mission-critical priorities in the enterprise
- Increased levels of data literacy and cultural change enabled by better governance

Drivers

- Higher levels of risk appetite and growth expectations in organizations are based on digital as an implicit part of growth strategies. This requires data and analytics governance capabilities that enable flexibility, scale and resiliency. Data and analytics governance is hence recognized by CDAOs as among the top three critical enablers for successful data and analytics initiatives.
- Investment in data and analytics is widespread across enterprises, with business functions spending as much as central IT teams on these initiatives, causing proliferation of information silos. The need for effective governance capabilities has therefore become an increasing concern for data and analytics leaders as a framework for enabling the connected enterprise, while also addressing the local information needs of business functions.
- Organizations with higher information maturity increasingly recognize that taking a data and analytics governance approach — rather than one focusing on individual information asset types (e.g., data governance) — yields better business results. Elsewhere, we have seen organizations recognize the urgent need to establish governance "to get the ball rolling," even if it is for only data governance or analytics governance. This significant increase in effort and hype relating to data and analytics governance is being seen in all industries, geographies, organization types and maturity levels.
- Hype and interest are also growing in many areas related to data and analytics governance. These areas include AI model governance, analytics governance in data warehouses and data lakes, trust-based governance, IoT data governance, and ethics as a discrete governance policy type.

Obstacles

- Data and analytics governance is complex, organizationally challenging and politically sensitive. It is often difficult to get executive-level consensus for data and analytics governance programs, and as a result, they are led by IT, with a view to "bringing in the business later." Because these initiatives are not business-outcome-based, they typically result in failure.
- Despite the diversity and complexity of business scenarios, most organizations continue to take a one-size-fits-all, command-and-control approach to their data and analytics governance. Furthermore, most organizations have a poor understanding of executive leader accountability and decision rights for information. Establishing an effective governance for data and analytics is therefore difficult to achieve. As organizations' expectations of what can realistically be achieved through data and analytics governance decline, we see its position on the Hype Cycle descend into the Trough of Disillusionment.

User Recommendations

- Identify critical business outcomes that need good data and analytics to be successful. Focus your governance work there to maximize your investment, developing a business case if needed.
- Engage key business stakeholders and the CDAO in sponsoring and driving the initiative to enable information culture change.
- Focus on the least amount of data with the maximum business impact, while managing your risk to embed data and analytics governance in the full business context.
- Clearly define the scope of work related to data and analytics governance: policy evaluation and setting, policy interpretation and enforcement, and policy execution. The first two must be led by the business; the latter can be enabled by IT.
- Examine how data standards and metadata management can be used to implement data and analytics governance in the enterprise. Though business leaders may not fully understand their importance, an industrial governance capability needs enterprise-scale data and analytics capabilities.

Gartner Recommended Reading

7 Must-Have Foundations to Build a Modern Data and Analytics Governance Program

2022 Strategic Roadmap for Data and Analytics Governance

Quick Answer: How Can I Apply Composable Design Principles to Data and Analytics Governance Organization Capabilities?

Next Best Actions to Improve Your Data and Analytics Governance

5 Steps to Build a Business Case for Data and Analytics Governance That Even Humans Will Understand

Information Stewardship Applications

Analysis By: Andrew White, Guido De Simoni

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Obsolete

Definition:

Information stewardship applications support the work of the data and analytics (D&A) steward role in a business (not IT) context. They provide application capabilities such as policy performance monitoring, data policy analysis, business glossary, workflow, exception management and root cause analysis.

Why This Is Important

Early master data management (MDM) solutions did not support policy monitoring and enforcement capabilities, so organizations started to build their own. Then, the General Data Protection Regulation (GDPR) came along, and the entire governance market pivoted to more basic needs of risk mitigation and compliance. The industry has now come full circle. Organizations are once again building their own distinct solutions for business stewards, and vendors in the D&A governance market are back to packaging up capabilities to meet those needs.

Business Impact

Without a stewardship function, D&A governance is not sustainable or scalable. Stewards need technology to monitor and enforce the condition of data they are responsible for. Business roles have specific requirements that are not met by IT-centric capabilities. Moreover, business roles use these tools infrequently, placing a much greater importance on developing tools that are easy to onboard and intuitive to use. Until vendors deliver such tools, organizations will build their own, or their governance programs will continue to fail.

Drivers

- Ultimately, the work of the steward, in a business role, requires an exception-oriented experience that maximizes impact and ease of use. If this capability is not met, D&A governance as a business capability will continue to fail.
- Businesses are under increasing pressure to share data for better data reuse, improved consistency and accelerated time to value. The focus is on using existing data dictionaries to identify areas of synergy between data used for different business initiatives (both data content and meaning).
- More effective understanding and communication of the semantic meaning of data will help resolve contention between business teams when inconsistency arises. It will reduce time and effort wasted on reconciliation, so that resources can focus on new business actions.
- Organizations need to make intelligent decisions about the information life cycle, from data interoperability and standards to archiving, disposal and deletion.
- Compliance, data sovereignty and digital strategy requirements are growing ever complex, increasing demands on D&A governance. These demands will push governance programs over the edge, unless effective stewardship solutions are provided.

Obstacles

- Organizations are struggling to understand the unique needs of governance for analytics and business intelligence (BI). IT is well aware of what needs to take place in BI solutions, data warehouses and so on. By contrast, businesses have little interest in that work, but want to exploit key data for their most important initiatives.
- The market has moved beyond privacy as a short-term driver, and has reverted to a broad-based approach. Vendors are once again looking to be visionary with various forms of consolidation of capabilities. This shift will both hinder and speed up formation of the expected D&A governance platform on which stewardship will be supported for all policy categories. This explains why this innovation will be obsolete before plateau.
- Some D&A governance vendors remain fixated on policy execution (i.e., data management), perceiving it as an “easier” sell. Others remain fixated on IT roles and do not focus on the needs of business roles.

User Recommendations

- Evaluate the capabilities needed from fit-for-purpose, business-user-oriented information stewardship solutions, as compared with IT-centric data management tools, including data quality, metadata management and federation/integration capabilities.
- Run a proof of concept for vendor solutions involving all contributing roles, such as business users, information governance board members, information architects, information stewards and business analysts.
- Focus on all dimensions (people, process, technology and data) when addressing the D&A stewardship use case. This holistic focus will help you maximize ROI through reuse, while minimizing administrative costs and errors due to inconsistencies across technologies.
- Explore the emerging D&A governance platforms for all their data and analytics stewardship operational requirements.

Sample Vendors

Alation; Alex Solutions; Collibra; Global Data Excellence; Informatica; OvalEdge; Prodago; SAP

Gartner Recommended Reading

A Day in the Life of a Data and Analytics Steward

Market Guide for Data and Analytics Governance Platforms

Tool: Vendor Identification for Data and Analytics Governance Platforms

Tool: The Gartner Data and Analytics Governance Technology Atlas

Cloud MDM

Analysis By: Sally Parker, Helen Grimster

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Cloud master data management (MDM) solutions ensure the uniformity, accuracy, stewardship, governance, semantic consistency and accountability of the enterprise's official shared master data assets. Available in the cloud across a spectrum of resource delivery models, these range from single-tenant shared nothing (IaaS) to multitenant shared something (PaaS) to multitenant shared everything (SaaS).

Why This Is Important

Trusted master data is a foundational requirement of digital business. As organizations' applications have transitioned to the cloud as part of their digital transformation programs, so too has their associated data. This has subsequently shifted the center of gravity in favor of cloud-based MDM solutions.

Business Impact

The MDM market was relatively late in transitioning from on-premises to cloud-based solutions. Cloud-based MDM solutions have lowered the barrier to entry for MDM with the provision of access to subscription-based licensing models, deployment flexibility and improved time to value. They have effectively enabled support for the MDM best practice of "think big, start small, deliver incremental business value." As the center of gravity shifts to the cloud, it opens up greater opportunities for data sharing and syndication ecosystems.

Drivers

- **Stated vendor direction is cloud:** Vendors will ultimately pull the market to the cloud with product roadmap priorities supporting cloud-based platforms to streamline their own product management overheads.
- **Gravitational pull of their application and data ecosystems:** MDM creates a single source of truth for master data across the enterprise's heterogeneous application landscape. As the center of gravity for these applications and their data shifts to the cloud, MDM logically follows.
- **Acceptance of cloud for master data:** MDM has been slow to follow the broader software solutions market in transitioning to cloud deployment models. Vendors that previously delayed offering cloud-based solutions are responding to demand from end-user organizations now ready to embrace cloud for their most critical data — their master data.
- **Lower barrier to entry:** Cloud has lowered the barrier to entry for MDM programs, permitting expansion into a previously untapped and broader client base. SaaS also reduces some MDM skills pain points.
- **Increased availability of cloud-based offerings:** Few MDM vendors were cloud native from the outset. Through the end of 2022, MDM software solution vendors continued and completed their transitions to subscription and cloud-based solutions.
- **Scalability:** To handle compute intensive requirements such as ML/AI for matching.
- **Delivery of incremental business value:** Facilitates the best practice of a more granular and business outcome drive approach to MDM.

Obstacles

- **Migration complexity:** Not all MDM solutions are cloud-native. Some solutions rearchitected for cloud may lack functional parity in the near term as the products mature and may require a lift-and-shift migration from on-premises to cloud requiring external support services.
- **Installed base:** Although vendors are motivated to transition existing clients to cloud, clients will do this at their own pace and over time — in the absence of a hard trigger.
- **Governance:** As master data is heavily shared, a need for real-time integration into associated data sources and processes arises. Organizations in transition to cloud must optimize the business processes and more complex governance of a hybrid ecosystem.
- **Complexity of navigating the vendor landscape:** SaaS alleviates some MDM skills challenges. PaaS/IaaS offer greater configuration flexibility. Licensing constructs vary with MDM spend for some counting toward clients' cloud provider committed annual spend.
- **Best practices persist:** Cloud does not alleviate the business challenges related to being successful with MDM.

User Recommendations

- Take a "*think big, start small, deliver incremental value*" approach to MDM by leveraging cloud as the enabler for business value.
- Conduct a thorough review of current governance practices as a precursor to cloud readiness. Governance complexity increases in a hybrid ecosystem.
- Map and actively track the center of data gravity within your organization for each master data domain to identify and plan for prospective transition points for the cloud.
- Review and document integration complexity to provide a manageable integration scenario that does not negate any benefits of cloud-based MDM.
- Evaluate gaps in capability between candidate vendors' cloud-based and on-premises MDM solutions to determine when and whether a migration between the cloud and on-premises environments is viable.
- Cost should not be the driver for adoption of cloud MDM. Without appropriate capacity planning and cost modeling, cloud services may prove more expensive on a total cost of ownership (TCO) basis. Due diligence is required around capacity planning and TCO modeling.

Sample Vendors

Ataccama; CluedIn; Informatica; Profisee; Reltio; Semarchy

Gartner Recommended Reading

3 Essentials for Starting and Supporting Master Data Management

Create a Master Data Roadmap With Gartner's MDM Maturity Model

Data and Analytics Essentials: Master Data Management — Presentation Materials

Augmented Data Catalog/Metadata Management

Analysis By: Guido De Simoni, Brian Lowans, Robert Thanaraj

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Definition:

Metadata management solutions are software that includes one or more of the following: metadata repositories, a business glossary, data lineage, impact analysis, rule management, semantic frameworks, and metadata ingestion and translation from different data sources. Modern AI-driven augmented data cataloging is part of the solutions automating metadata discovery, ingestion, translation, enrichment, and the creation of semantic relationships between both business and security metadata.

Why This Is Important

Augmented data catalogs and metadata management solutions support organizations managing varied data assets. Demands for accessing, using and sharing data are not limited to IT as data-oriented citizen roles emerge. Data and analytics (D&A) and security leaders face growing security and privacy risks, necessitating new data management approaches. With the pervasive use of data across a distributed data landscape by citizen users, augmented data catalogs can support metadata discovery and inventory management automation.

Business Impact

D&A leaders investing in augmented data cataloging (ADC) and metadata management solutions will see benefits from:

- **Collaboration:** Metadata requires the contribution of many people and ADC and metadata management solutions can provide a multiuser environment to address the requirements.
- **Automation of processes:** As data changes, metadata management solutions can streamline many recurring activities by (partial) automation.
- **Cost optimization:** Metadata management solution ensures that organizations understand the datasets, workloads, queries and tools being utilized, and highlights redundant tools and technologies.

Drivers

- Augmented data cataloging and metadata management solutions can remediate suboptimal results in an organization's use of data due to improperly managed metadata. This saves time, effort and money, while ensuring organizations are not exposed to unnecessary risks.
- Innovation generated by active metadata, reducing human effort in inventorying and managing data assets, is accelerating augmented data cataloging and metadata management solutions. Humans are primarily validators as opposed to doers of the operational tasks associated with the metadata management solutions.
- Informal and formal teams emerge and convert to community participation with as much automation as possible when supported by augmented data cataloging and metadata management solutions. These demands are only starting to be addressed by vendors, with modern metadata management practices slowly being established within organizations.
- Enterprise data cataloging techniques are emerging from several vendors that combine business, security and privacy metadata. This enables cross-functional operations for both D&A and security products to leverage the same metadata management solutions.

Obstacles

- The lack of maturity of strategic business conversations about metadata management solutions, as historically, enterprises have struggled to understand, define and use metadata showing business value.
- The expensive, but required, effort to integrate metadata management solutions in multivendor environments. This inhibitor has started to be addressed by vendors and community initiatives relating to openness and interoperability (see, for example, the open-source Egeria).
- The lack of identification of metadata management solutions with capabilities that meet the current and future requirements of specific use cases.

User Recommendations

- Recognize that the augmented data cataloging and metadata management solutions market will take two to five years to reach the Plateau of Productivity as the technology continues to expand both capabilities and support for existing and emerging use cases.
- Evaluate the metadata management capabilities of your company's existing tools, including data integration, data quality and master data capabilities, before buying a modern metadata management solution.
- Pilot the use of metadata management solutions for emergent use cases, including D&A governance, security and risk, and augmented data value for analytics.
- Invest in augmented data cataloging and metadata management solutions to augment manual efforts needed to access all types of metadata and analyze the data to support your company's data fabric designs for automation.
- Drive metadata insights to mitigate risks by informing your business leaders and their teams to ask more relevant questions of the data around them.
- Cooperate with the security and privacy teams to establish if enterprise data cataloging techniques would be beneficial.

Sample Vendors

Alation; Alex Solutions; Atlan; BigID; Collibra; data.world; IBM; Informatica; Zeenea

Gartner Recommended Reading

Market Guide for Active Metadata Management

How to Succeed With Data Classification Using Modern Approaches

Quick Answer: What Is Active Metadata?

Quick Answer: What Is Data Fabric Design?

Application Data Management

Analysis By: Andrew White, Tad Travis

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Application data management (ADM) is a technology-enabled discipline where business and IT work together to ensure uniformity, accuracy, stewardship, governance, semantic consistency and accountability for data in an application or suite, such as ERP, customer data platform or custom-made app. Application data is the consistent and uniform set of identifiers and extended attributes used within an application or suite for items like customers, products or prices.

Why This Is Important

Clients continue to be shocked to find their cloud and application vendors offer modern SaaS and business applications that take scant care of governance of the data they use. The vast majority of business application implementations (including ERP, supply chain management [SCM] and even CRM) still lack holistic solutions for governance and stewardship of data. Whereas master data management (MDM) applies governance to shared data across all applications, ADM applies governance to data in a specific application.

Business Impact

ADM can offer the following benefits:

- Application data, once identified, ensures the correct governance effort is aligned to the right kind of business impact the application should have.
- Stewardship roles in the business, and in operational and analytical use cases, can be determined more effectively.
- Business goals for business applications are more likely assured with a more organized data and analytics governance approach that includes application data.
- MDM programs will help govern such application data that is shared with other applications.

Drivers

- The vast majority of “successful” go-lives of business applications, such as ERP, CRM or custom-built applications, do not include any qualification of data and analytics governance. The result, very often observed in client inquiry, is that, on average, seven months after the go-live, organizations spot the vast array of small but noticeable business issues held hostage to the lack of governed data. Business performance and process integrity fail, and business outcomes start to be negatively impacted.
- MDM was and still is misunderstood. An MDM program should have a laserlike focus on the minimal number of most widely shared attributes describing things like customer and product. Bloated MDM programs will continue to fail, leading to a greater need to split the effort up and create distinct ADM programs/requirements.
- Digital business success hinges not on the quality and governance of all data equally, but on a graduated, efficient means to classify data and apply only the needed level of governance. Such growing demand on scaling digital business will, of necessity, drive increased need to recognize and adopt ADM.

Obstacles

- Some MDM programs associated with large, global ERP, CRM and SCM implementations mistakenly centralize all the work related to governing application data. Others create a hybrid organization across business and IT, and call it all “MDM” (when it isn’t). Put another way, these programs conflate MDM and ADM, making both too slow, expensive and unwieldy. As a result, neither program is a success.
- The half-life of a successful business application go-live is, anecdotally, seven months. After that, clients tell Gartner, “We have lost control of our data.” This situation has become acceptable because, overall, most organizations don’t fail.
- The organization’s ability to change is held back, and consequently, budgets are set that even support mediocrity via poor governance practices. This is not an acceptable way to run an organization, but too few data and analytics leaders stand up and say so.
- Traditional top-down governance programs lead to the same misunderstandings and poorly scoped initiatives.

User Recommendations

Starting with a focus on business outcomes to identify what data matters most, organize, classify and govern data based on which data drives the most important business outcomes:

- Identify your application data to scope ADM. That is, identify the data that matters most to a specific set of use cases supported by one application or suite like ERP, e-commerce, product information management or customer data platform.
- Examine reusing MDM solutions to support your ADM implementation — even if in a distinct instance. The business requirements are very similar — but the value propositions are different.
- Demand from your business application provider (and those in the cloud) the necessary capability to set (that is, govern) and enforce (that is, steward) information policy pertaining to data used in the application or suite.
- Implement ADM alongside any MDM program so that they can operate at their own speeds and benefit. They do align and share metadata in support of a wider enterprise information management (EIM) program.

Sample Vendors

ChainSys; Epicor; Oracle; PiLog Group; Tealium; Utopia Global

Gartner Recommended Reading

4 Master Data Best Practices for ERP

Why CIOs in Midsize Enterprises Must Emphasize ERP Data Management

Create a Master Data Roadmap With Gartner's MDM Maturity Model

D&A Stewardship

Analysis By: Guido De Simoni, Andrew White

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Data and analytics (D&A) stewardship is the analysis, management and control of the operational processes and data needed to enforce D&A governance policies and standards. D&A stewardship may apply to data, analytics, content, algorithms, documents, images and metadata — effectively, any and all data assets as needed.

Why This Is Important

D&A stewardship promotes better behaviors across the enterprise. These behaviors emphasize continuous improvement of D&A hygiene to achieve business benefits. Organizations with established D&A stewardship practices can operationalize D&A governance more effectively.

Business Impact

By promoting and enforcing accepted data policies and standards across the organization, D&A stewardship improves the level of trusted data for business operations. Stewardship of analytics artifacts, such as machine learning (ML) models, ensures proper user behaviors and builds trust in how the business applies analytics and AI.

Drivers

- Effective D&A governance and advocacy are critical for digital transformation programs — including master data management (MDM), application data management (ADM) and business intelligence and analytics. This recognition has resulted in wider acceptance of D&A stewardship.
- When adopted correctly for D&A governance initiatives, D&A stewardship supports day-to-day business operations.
- D&A stewardship helps organizations monitor D&A against policy, identify variances and then resolve them.

Obstacles

- Despite wider acceptance of the need for D&A stewardship, many organizations rely on the reactive and heroic efforts of “citizen stewards” to solve data problems, thus holding back outcomes and decisions.
- D&A stewardship still runs as a secondary function amid the day-to-day responsibilities of business users. It is often not tied to an employee’s KPIs.
- Lack of maturity in D&A governance overall has hindered D&A stewardship, as evidenced by its slow movement through the Hype Cycle.

User Recommendations

- Align data stewardship to operational roles within business areas, as the knowledge needed for business data work might not exist in IT.
- Commit to information stewardship that spans multiple business areas, and potentially identify a lead information steward for areas where strategic programs, such as compliance, are underway.
- Clarify the chief data officer’s relationship with the D&A stewardship process in the business areas, and establish clear reporting lines for D&A stewards for consistency with desired business outcomes. IT can execute the instructions and results of stewardship (for example, data maintenance or policy execution).
- Do not outsource the work of policy enforcement. Outsourcing partners often lack context and have limited business domain knowledge.
- Establish mechanisms to recognize and reward stewardship activities and actions.

Gartner Recommended Reading

A Day in the Life of a Data and Analytics Steward

Tool: Scorecard to Identify Data Stewards in Business Teams

Climbing the Slope

Multidomain MDM Solutions

Analysis By: Helen Grimster, Sally Parker, Thornton Craig, Andrew White

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Multidomain master data management (MDM) is an enabling technology that supports the management of any number of master data domains across the full spectrum of MDM implementation styles. It can be deployed as either a single, integrated offering or a portfolio of domain-specific MDM offerings.

Why This Is Important

Multidomain MDM solutions enable the enterprise to achieve a consistent, trusted semantic view of some or all of its key master data domains. This approach offers several advantages, such as strategic, enterprisewide data governance; management of consistent master data across organizational units; alignment of business data definitions; and effective execution of data stewardship. As such, multidomain MDM solutions aid more advanced business outcomes.

Business Impact

Multidomain MDM is now the most common form of MDM implementation because:

- It enables MDM programs to scale to meet the evolving needs of digital business and many other prioritized business initiatives.
- It supports modern D&A strategies, such as adaptive governance and data fabric. In turn, it benefits from the fabric's recommendations on things like data quality and policy enforcement.
- It helps lower total cost of ownership (TCO) compared with multiple single-domain solutions. (But it may not always meet the complex needs of all domains equally.)

Drivers

- MDM solution vendors fully embrace multidomain as a concept. Vendors drive innovation of multidomain solutions. As a result, their clients have taken advantage of the inherent capabilities of the technology they have invested in.
- Multidomain MDM is the natural progression of an MDM program. For example, products are one category of master data, but those products may come from suppliers, which are another category of master data.
- Multidomain MDM enables the possibility of cross-domain relationships. Graph technology is often utilized. Cross-domain relationships and relationship discovery can provide greater insights and value for business users.
- Multidomain MDM supports multiple business process improvement efforts with one implementation across many domains — thus, you get greater business impact with a simpler implementation.

Obstacles

- MDM technology adoption alone does not ensure success. Enterprises must put effort into design, governance, business process management and organizational change management. However, they often confront challenges in these areas.
- Enterprises may struggle to define clear use cases and measurable business outcomes that justify multidomain MDM capabilities.
- Internal skills are often lacking, requiring third-party assistance.
- How MDM vendors define a “multidomain MDM solution” can vary. A vendor and its solution(s) may not support all domain requirements and capabilities equally.
- Some MDM vendors have extended their offerings into application data management (ADM). ADM is not a different domain, but it’s a different use of domain-centric data. MDM applies to widely shared data across applications, whereas ADM applies to data used in a specific application. MDM solutions can be used to implement ADM. ADM offerings cause confusion and are not the same as multidomain MDM, hence slowing adoption.

User Recommendations

- Identify measurable business outcomes that require a multidomain capability.

- Take a programmatic approach to multidomain MDM by using Gartner's MDM Operating Model (see Create a Master Data Roadmap With Gartner's MDM Maturity Model).
- Build a roadmap that aims to deliver one domain at a time, remembering to drive the program based on business outcomes.
- Assess organizational maturity. This can vary per master data domain.
- Include varying models, maturity levels and implementation styles across the different master data domains within the roadmap.
- Look for vendors that provide predefined domain-specific accelerators or quick-start packages to leverage time to value.
- Ensure that the MDM solution is ready to grow with your needs and requirements. For example, assess its ability to incorporate generative AI, data fabric and data sharing.

Sample Vendors

Ataccama; CluedIn; Informatica; Profisee; Reltio; Semarchy; Stibo Systems; Syndigo; Tamr

Gartner Recommended Reading

Quick Answer: Who Owns Master Data?

Magic Quadrant for Master Data Management Solutions

Critical Capabilities for Master Data Management Solutions

Master Data Management

Analysis By: Sally Parker

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Master data management (MDM) is a technology-enabled business discipline in which business and IT work together to ensure the uniformity, accuracy, stewardship, governance, semantic consistency and accountability of the enterprise's official shared master data assets. Master data is the least number of consistent and uniform sets of identifiers and extended attributes that describe the core entities of an enterprise.

Why This Is Important

MDM is a cross-organizational collaborative effort that focuses on the consistency, quality and ongoing stewardship of master data. Master data is the subset of data that describes the core entities an organization requires to function — customers, citizens, products, suppliers, assets and sites. Master data sits at the heart of the most important business decisions, driving a need for a consistent view across business silos.

Business Impact

MDM initiatives are progressing as a foundational component of digital transformation. Leading organizations draw a causal link between their master data (parties, things and places) and the business outcomes it supports, including customer retention, supply chain optimization, and risk and regulatory compliance.

Interest in MDM extends to a broad range of vested-interest stakeholders, including finance, marketing and supply chain. MDM is now mainstream. Organizations seeking a single view of their master data recognize it as a necessity.

Drivers

- MDM is not a new concept, but adoption varies across geographic regions, with North America the most mature region, followed by Western Europe. The rest of the world is earlier in the maturity cycle and representative of markets primed for growth.
- Business process integrity eludes organizations with complex or heterogeneous application and data landscapes. Such organizations can suffer from inconsistent master data and/or a lack of trust in their master data. Organizations are increasingly recognizing the direct and causal link between this data and business outcomes, which MDM is designed to address.
- Rapidly evolving business needs, particularly in uncertain times, translate into greater demand for the benefits afforded by MDM — notability agility. The COVID-19 pandemic, which initially stalled projects, ultimately served to fast-track a broader realization of the causal link between trusted and connected master data and business resilience.
- Interest levels are increasing across a broader range of stakeholders (beyond technology), in both private and public sectors.
- A prior hesitance to embark upon MDM initiatives, due to complexity and cost, is easing.
- The barrier to entry has dropped significantly over the past two years with the broader availability of cloud-based and subscription-based MDM vendor offerings, which are now the most dominant offerings for net new clients. This lowering of the barrier to entry renders MDM viable for a broader target audience that comprises small and midsize organizations.
- A shift in mindset toward a more granular and business-outcome-led MDM program is reflected in the MDM vendors' "land and expand" strategies, where clients start small and progress toward incremental mastery of use cases and domains.
- Digital transformation requirements are forcing organizations to either start or modernize their MDM programs to leverage more recent cloud-based offerings and new augmented MDM capabilities.

Obstacles

- **Lack of consistent vendor presence:** Coverage is weaker outside North America and Europe.
- **Technology blinkers:** The prevailing pitfall remains the instinct to treat MDM as a technology initiative in isolation. Technology alone won't solve a challenge that traverses people, processes and technology.
- **Human factors:** Organizations that fail to proactively engage business stakeholders in scoping struggle to meet expectations of value and to establish an operational governance structure in service of MDM.
- **Goals:** MDM is still too often seen as an IT project. When MDM is a data or IT project that doesn't align to business outcomes, it fails.
- **Perceived complexity:** The MDM solutions market only recently shifted toward subscription pricing, cloud-based offerings and simpler products, which contribute to more approachable solutions and shorter deployment times.
- **Skills:** Successful MDM implementations require business acumen, technology and governance capabilities. Finding the right balance and availability of these skill sets remains problematic and is driving a need for third-party services as the norm.

User Recommendations

- Use business outcomes to identify the least amount of data with the greatest business impact.
- Approach MDM as a technology-enabled business-led initiative.
- Secure executive sponsorship to facilitate cross-organizational collaboration.
- Ensure that the causal link between the MDM initiative and the business outcomes it supports is clearly understood and articulated.
- Keep your master data attributes lean and focused.
- Leverage third-party services to fast-track time to value. The majority of organizations leverage external support with their MDM strategy and/or implementation. Third parties offering industry expertise and accelerators can greatly impact time to value.

Gartner Recommended Reading

3 Essentials for Starting and Supporting Master Data Management

Create a Master Data Roadmap With Gartner's MDM Maturity Model

Data and Analytics Essentials: Master Data Management — Presentation Materials

Customer MDM

Analysis By: Sally Parker, Helen Grimster

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Definition:

Master data management (MDM) of customer data enables business and IT organizations to ensure the uniformity, accuracy, stewardship, governance, semantic consistency and accountability of an enterprise's official shared customer data assets (including, for example, customers, patients and citizens). Such implementations enable downstream systems or processes to author and/or consume customer master data as required.

Why This Is Important

Digital transformation and data-driven strategies create increased urgency around the need for consistent customer master data across business silos. Optimizing the customer experience (CX) across all touchpoints in the digital world requires an accurate, consistent and holistic view of the customer, which depends on trusted customer master data. A lack of trusted customer master data leads to fragmented experiences, increased risks and operational inefficiencies.

Business Impact

Trusted customer master data is foundational to the success of any digitalization strategy or supporting disciplines, like CRM, digital commerce or CX. MDM programs and solutions are key components of these initiatives. The ability to correctly draw on a trusted, accurate and comprehensive single customer view helps organizations:

- Optimize the CX
- Cross-sell across products and markets
- Retain customers
- Execute end-to-end customer processes efficiently
- Manage risk and regulatory compliance

Drivers

- More customer data is being generated within organizations than ever before — both from traditional and digital sources. The same is true with potential external sources of customer data, which — when aggregated with internal data — can create a massive challenge for organizations seeking a consistent, accurate and trustworthy source of all relevant customer interactions.
- The increasing adoption of applications to help organizations automate and optimize the growing number of digital interactions can create more silos of customer data. Two examples include customer data platforms (CDPs) and CRM solutions. These solutions, and others like them, create additional complexities around effective MDM of customer data.
- More traditional drivers of MDM of customer data include regulatory compliance, fraud, credit risk and multiple other operational processes. These are dependent on accurate and trustworthy customer data, and remain highly relevant even for companies prioritizing digital transformation.
- Forward-thinking companies are also evaluating integration with future-looking data fabrics and other metadata driven approaches to serve up suggested customer data for governance in a customer MDM program.

Obstacles

- MDM of customer data continues to be inhibited by inadequate focus on MDM best practices, notably alignment with business outcomes.
- Enterprisewide MDM is becoming a multifunctional data platform, increasing the overlap between customer MDM solutions and customer-data-specific applications. This increases confusion over the definition of customer master data versus application data. Broadening an MDM program scope to include application data adds risk to a customer MDM implementation.
- The capabilities of MDM technologies around context-centric and AI-driven insights generally exceed the governance maturity of most companies, hindering the value of more advanced forms of customer MDM.
- Confusion surrounds hyped technologies in adjacent categories, like CDPs that improve customer data but lack core MDM capabilities.

User Recommendations

- Use an MDM style (or styles) that reflects the business strategy of the organization and delivers business value by providing trustworthy customer data for consumption in operational business processes and downstream analytics systems.
- Ensure that your MDM of customer data strategy supports rightsized (i.e., small) requirements spanning multiple usage scenarios, implementation styles and data domains.
- Evaluate MDM (cloud or otherwise) solutions based on capabilities for data modeling and quality, integration, data stewardship and information governance, business services and workflow, measurement, and manageability. Be aware of hyped technologies in adjacent categories, like customer data platforms (CDPs), which claim to offer customer MDM features but often lack the capabilities Gartner expects from enterprise MDM platforms.
- Leverage business outcomes to help identify your most important customer master data — this activity is not replaced by data catalogs.

Sample Vendors

Ataccama; Informatica; Profisee; Reltio; Semarchy

Gartner Recommended Reading

Improve CRM and Customer Data With Master Data Management

Create a Master Data Roadmap With Gartner's MDM Maturity Model

Supporting an Enterprisewide Customer Data Strategy

Entering the Plateau

Product Data MDM

Analysis By: Helen Grimster, Thornton Craig

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Master data management (MDM) of product data enables enterprises to ensure the uniformity, accuracy, stewardship, governance, semantic consistency and accountability of their master product data. The two use cases for master product data are supply-side MDM and sell-side MDM. Supply-side MDM onboards product master data from partners upstream in a supply chain. Sell-side MDM syndicates product master data to commerce channels and partners downstream in a supply chain.

Why This Is Important

Organizations want to scale their digital strategies and become data-driven, thus increasing requirements for end-to-end product data across a spectrum of business outcomes. In addition, emerging needs related to environment, social and governance (ESG) and compliance reporting are placing new demands on this technology. Product data MDM must operate as a “passport” to share critical product data across extended supply chains.

Business Impact

Product data MDM can provide multiple benefits to product-centric organizations, including:

- Better quality and availability of product master data, which are critical to any decision making that impacts risk, revenue, service and time to market
- Enhanced business agility — particularly in manufacturing, distribution, retail and healthcare — from a holistic and trusted enterprise view of product data
- Higher customer satisfaction from robust and consistent product information
- Support for enterprise and B2B ESG compliance reporting

Drivers

- Complying with regulations in industries such as medical device manufacturing and food processing
- Reducing time to market for new products and services to achieve a competitive advantage
- Increasing revenue through better upselling and cross-selling
- Opening alternative sales by enabling product data syndication to sell-side partners
- Achieving greater business agility to adapt to a crisis
- Improving product development processes, product innovation and digital product experiences through operational efficiencies and cost savings
- Supporting strategy and reporting for ESG and sustainability

Obstacles

- **Lack of consistent vendor presence:** Coverage is weaker outside North America and Europe.
- **Technology blinkers:** The prevailing pitfall is the instinct to treat MDM as a technology initiative in isolation. Technology alone won't solve a challenge that traverses people, process and technology.
- **Human factors:** Organizations that fail to proactively engage business stakeholders in scoping struggle to meet expectations of value and to establish an operational governance structure in service of MDM.
- **Goals:** MDM is still too often seen as an IT project. When MDM is a data or IT project that doesn't align to business outcomes, it fails.
- **Perceived complexity:** The MDM solutions market only recently shifted toward subscription pricing, cloud-based offerings and simpler products, which contribute to more approachable solutions and shorter deployment times.
- **Skills:** Successful MDM implementations require business acumen, technology and governance capabilities. Finding the right balance and availability of these skill sets remains problematic and is driving a need for third-party services as the norm.

User Recommendations

- Take a programmatic approach to product data MDM by using Gartner's MDM Operating Model (see Create a Master Data Roadmap With Gartner's MDM Maturity Model).
- Engage stakeholders by focusing on measurable business outcomes.
- Rightsize the MDM roadmap. A series of small deliveries will minimize cost, risk and failures, so think big, start small, and be prepared.
- Focus on governance, people and process, not technology. MDM is a technology-enabled business discipline; a technology-only approach leads to failure.
- Leverage third parties to fast-track your time to value.

Sample Vendors

Informatica; Pimcore; Precisely; Profisee; Stibo Systems; Syndigo; Viamedici

Gartner Recommended Reading

Quick Answer: Which Data Is Master Data?

3 Essentials for Starting and Supporting Master Data Management

Create a Master Data Roadmap With Gartner's MDM Maturity Model

Quick Answer: What Data and Analytics Leaders Need to Know About Digital Product Passports

Appendixes

See the previous Hype Cycle: Hype Cycle for Data and Analytics Governance, 2022

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 2: Hype Cycle Phases

(Enlarged table in Appendix)

Phase	Definition
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant media and industry interest.
Peak of Inflated Expectations	During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the innovation is pushed to its limits. The only enterprises making money are conference organizers and content publishers.
Trough of Disillusionment	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the innovation are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the innovation to reach the Plateau of Productivity.

Source: Gartner (July 2023)

Table 3: Benefit Ratings

Benefit Rating ↓	*Definition* ↓
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner (July 2023)

Table 4: Maturity Levels

(Enlarged table in Appendix)

Maturity Levels	Status	Products/Vendors
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-box methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner (July 2023)

Evidence

2021 Gartner Data and Analytics Governance Survey: This survey was conducted online from 12 July through 22 July 2021 to test our assumption that organizations with distributed, business-outcome-based governance achieve better business results than centralized, IT/D&A-led initiatives. In total, 105 IT and Business Leaders Research Circle members participated; 57 were from Gartner's ITL Research Circle — a Gartner-managed panel — and 48 were from an external sample. Members from North America (51%), EMEA (35%), Asia/Pacific (3%) and Latin America (11%) responded to the survey. Respondents were qualified based on their involvement and participation in decision making for data and analytics governance at their organizations.

Document Revision History

Hype Cycle for Data and Analytics Governance, 2022 - 22 June 2022

Hype Cycle for Data and Analytics Governance and Master Data Management, 2021 - 20 July 2021

Hype Cycle for Data and Analytics Governance and Master Data Management, 2020 - 16 July 2020

Hype Cycle for Data and Analytics Governance and Master Data Management, 2019 - 10 July 2019

Hype Cycle for Information Governance and Master Data Management, 2018 - 24 July 2018

Hype Cycle for Information Governance and Master Data Management, 2017 - 24 July 2017

Hype Cycle for Information Governance and Master Data Management, 2016 - 11 July 2016

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

Understanding Gartner's Hype Cycles

Tool: Create Your Own Hype Cycle With Gartner's Hype Cycle Builder

Connected Governance Orchestrates Complex Cross-Enterprise Decisions

Tool: Vendor Identification for Data and Analytics Governance Platforms

Ignition Guide to Building a Data and Analytics Governance Program

Quick Answer: Who Owns Master Data?

Tool: The Gartner Data and Analytics Governance Technology Atlas

Table 1: Priority Matrix for Data and Analytics Governance, 2023

Benefit ↓	*Years to Mainstream Adoption*			
	Less Than 2 Years ↓	***2 - 5 Years*** ↓	***5 - 10 Years*** ↓	***More Than 10 Years*** ↓
Transformational		Augmented Data Quality Data Literacy	Adaptive D&A Governance Data Security Governance Responsible AI	
High	Cloud MDM Digital Ethics Product Data MDM	AI Governance Augmented Data Catalog/Metadata Management Customer MDM D&A Stewardship Data and Analytics Governance Data Hub Strategy Data Observability Master Data Management Multidomain MDM Solutions	D&A Governance Platforms Interenterprise MDM	Connected Governance
Moderate		Application Data Management Augmented MDM	Governance of Digital Twins	
Low				

Benefit	*Years to Mainstream Adoption*			
↓	***Less Than 2 Years*** ↓	***2 - 5 Years*** ↓	***5 - 10 Years*** ↓	***More Than 10 Years*** ↓

Source: Gartner (July 2023)

Table 2: Hype Cycle Phases

Phase	*Definition*
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant media and industry interest.
Peak of Inflated Expectations	During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the innovation is pushed to its limits. The only enterprises making money are conference organizers and content publishers.
Trough of Disillusionment	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the innovation are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the innovation to reach the Plateau of Productivity.

Phase ↓	Definition ↓

Source: Gartner (July 2023)

Table 3: Benefit Ratings

Benefit Rating ↓	Definition ↓
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner (July 2023)

Table 4: Maturity Levels

Maturity Levels ↓	*Status* ↓	*Products/Vendors* ↓
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-box methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner (July 2023)