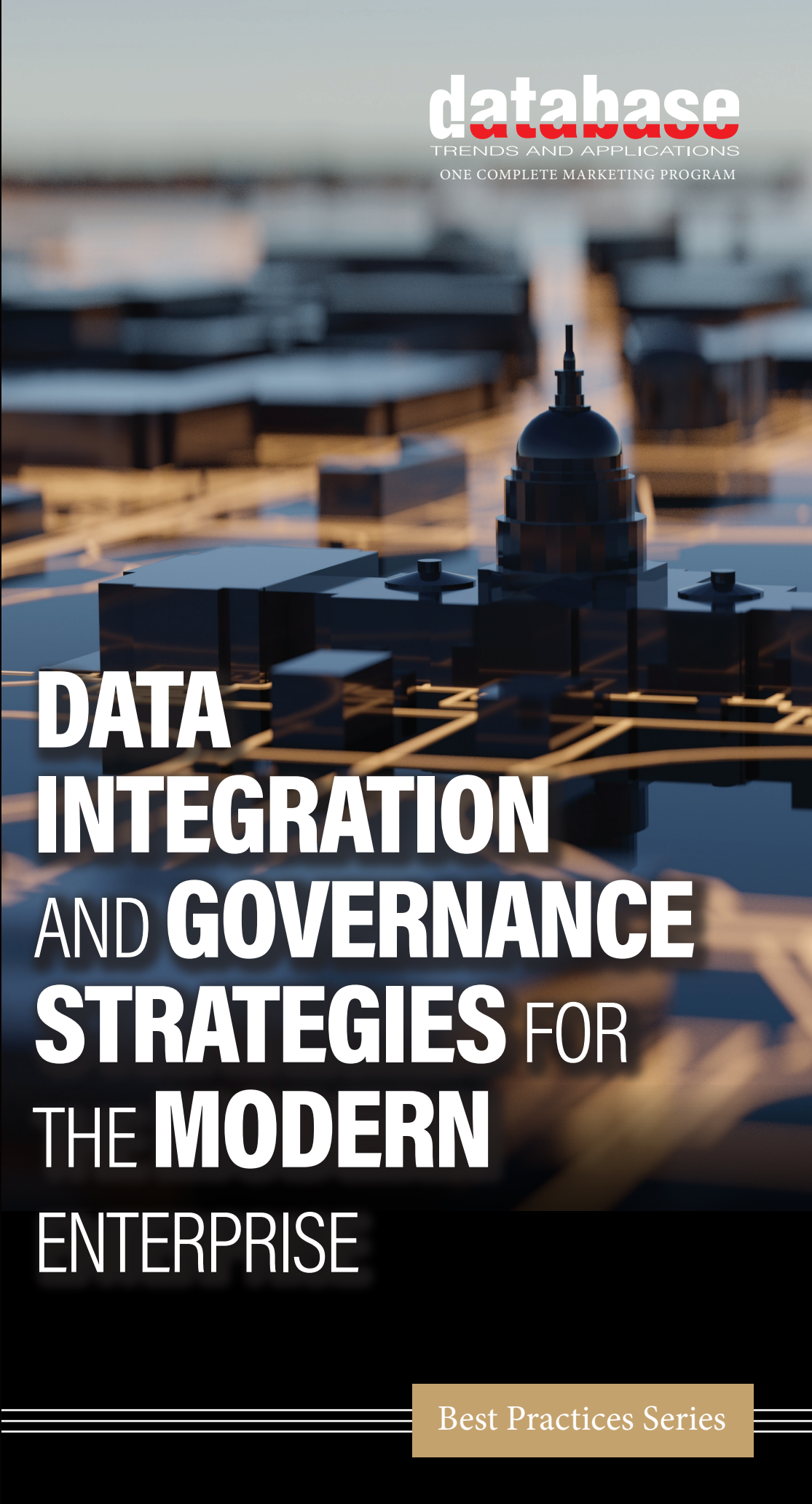




DATA INTEGRATION AND GOVERNANCE STRATEGIES FOR THE MODERN ENTERPRISE

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Best Practices Series

While the idea of “every business is a software business” has been the catchphrase for organizations for some time now, it’s more accurate to say that “every business is a data business.” Organizations are being built on data and valued for their data. However, transforming into a data-driven business is hampered by data silos, complexity, dysfunctional corporate cultures, and a lack of vision.

There’s much more at stake with well-planned and well-executed data integration and governance than simply keeping all your data in line. It can make or break a business. “Data governance is not just a check box exercise, but a strategic investment that can propel you ahead of the competition,” said Jayesh Chaurasia, an analyst with Forrester.

This message resonates in corporate C-suites, a survey of 600 chief data officers (CDOs), released early this year by Informatica, confirms. Data

management investments are showing no signs of slowing down this year—despite any economic headwinds. A majority, 68%, predict increased data management investment in 2023. In addition, the

priority for this year. Another 42% plan to invest in data quality and master data management capabilities.

“As data strategies evolve rapidly, data leaders are looking to change and adapt

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survey finds data governance is CDOs’ number-one priority.

Data fragmentation and lack of cooperation across businesses are the top issues these data executives are grappling with. A majority, 55%, report having more than 1,000 sources of data in their organization. In addition, 52% cite improved governance over their data and processes as a top data strategy

quickly, including exploring new trends such as data mesh, data fabric, data observability, sustainability, and data marketplaces—all of which require data visibility and governance,” the report’s authors state. “As data leaders bring strategies and tools together to achieve their business priorities, developing metrics and measurements for business outcomes is critical.”

Data integration and governance requires engagement from across the enterprise, involving database administrators, data analysts, executives, and line employees.

There is a lot of work that needs to be done, however—especially on the organizational side. In its analysis, Forrester finds that fewer than 10% of enterprises can be considered “advanced” in their insights-driven capabilities. “The key differentiator between beginner, intermediate, and advanced capabilities is not primarily about technology or data; it’s about the organizational habits and practices that enable all stakeholders to securely access timely, relevant, clean, complete data for developing insights and applying it to their decisions,” said Chaurasia. “This is the realm of data governance.”

The following are best practices in developing a forward-looking data integration and governance strategy:

- **Put the business in charge.** Data integration and governance is an extensive effort that touches every part of the enterprise. That means business leaders need to prioritize where and when investments occur in these efforts, as both human and financial resources are involved.
- **Assist the business in planning its data integration and governance strategy.** Data managers and business managers need to work collaboratively in establishing the priorities and requirements for developing a data integration road map and data governance framework. Importantly, this needs to be a continuous process.
- **Promote data ownership, sharing, and collaboration to break down data silos.** Data silos—long the bane of enterprises—continuously interrupt, inhibit, or even prevent the flow of information across business units needed for analytics. “Collaboration, a centralized repository of data knowledge, and the establishment of data-sharing channels are vital to overcome this challenge,” Chaurasia urged.
- **Maintain emphasis on data compliance and security.** Data security needs to remain front and center of all initiatives, preferably built into solutions and processes as they are designed. Compliance is a key part of this equation, as data management practices need to comply with local, national, and extra-national laws and regulations. In today’s global economy, for example, all companies do business with countries in the European Union, which has stringent privacy and data residency requirements. “Data governance frameworks, policies, and procedures establish data protection and access control mechanisms to ensure that data is only used by authorized people for appropriate purposes,” said Chaurasia.
- **Establish a working data governance framework.** Such a framework “defines roles and responsibilities to ensure data ownership that supports data definitions, quality standards, sharing parameters, and access control, enabling users to easily discover, understand, and utilize available data assets,” according to Chaurasia.
- **Make data discoverable through a master data management (MDM) plan and data catalog.** With MDM, administrators and users have an awareness of available data assets through a single enterprise repository. Likewise, a data catalog presents available data sources at the click of a button for users.
- **Monitor, measure, and maintain visibility.** Data managers need observability across all data management movement through their enterprises. Data is continuously moving; new sources are constantly coming online; new users are accessing applications and data; and fresh data is required for updating the training of AI models.
- **Automate as much as possible.** Maintaining data operations may be too overwhelming for data staffs with high volumes of data of all types flowing through organizations. With business demands for initiatives around real-time applications and AI on the rise, look to automate as many data integration tasks as possible.
- **Put data accessibility and self-service in place.** Let’s face it, data managers simply don’t have the time or resources to attend to every user request for data or analytical reporting. Plus, with businesses moving so fast, users often need to assemble analytics reports or apps at a moment’s notice. “Well-defined data governance policies provide guidelines for data access, usage, and interpretation, supporting business users with the ability to explore and analyze data on their own,” Chaurasia said.
- **Promote data ownership and accountability.** This is an important link in all data integration and governance initiatives. Everyone has a role to play. Data owners are responsible for the quality and timeliness of the data; data engineers and administrators assure the quality and security of data; data stewards help enforce governance policies; data analysts and scientists transform raw data into business value.

Data integration and governance requires engagement from across the enterprise, involving database administrators, data analysts, executives, and line employees. All participate in a continuous process of discovering, identifying, ingesting, and managing data. With demands for advanced initiatives such as AI and machine learning on the rise, there’s never been a more important time for well-designed data integration and governance. ■

—Joe McKendrick

Logical Data Management and Data Governance



Data governance, ranked fourth in BARC's Data, BI & Analytics Trend Monitor for four years in a row since 2018, leaped into the #3 spot in BARC's 2022 edition. It is no surprise that data governance is suddenly rising in importance.

Organizations have been struggling with big data's rising volumes, velocity, and variety, and by now, with data lakes, they have found places to store it that are not only high-capacity and cost-effective but also very convenient, as they can accept data in any format. But now, organizations need to be able to get the most out of the data they have. This explains the rising importance of data governance, since poorly governed data just cannot be trusted and used as readily.

One of the biggest impediments to effective data governance is data silos, since each silo needs to be updated separately with the latest policies. This is not only an administrative headache but also a task that is not likely to be administered synchronously across the organization and therefore not likely to be successful.

Data silos, unfortunately, are one of the side effects of traditional data infrastructures. Such infrastructures rely on the physical replication of data from multiple source systems into a central repository like a data warehouse or data lake, a process that takes time and resources, leaving some sources separated from others. Also, many traditional data warehouses simply cannot accommodate unstructured or streaming data, which creates an additional source of data silos. Other sources of silos include SaaS applications, which often store data in proprietary formats, and data lakes, which store data in different, often incompatible formats. Some silos persist due to laws preventing certain data from being exported overseas.

The Denodo Platform employs a logical approach to data management rather than a traditional, physical approach. It enables real-time, logical connections to data across myriad different types of data sources, including unstructured and streaming sources, without needing to first copy data into a centralized repository. Such sources include legacy databases, data warehouses, and data marts; cloud repositories and software-as-a-service (SaaS) sources; Internet-of-Things (IoT) sources, and many others. It can then deliver unified, trusted data via standard protocols. In this way, the Denodo Platform eliminates data silos, enabling users to find, query, and analyze distributed data as if it were in a single, integrated data source, which surmounts that first obstacle to data governance.

help organizations build and deploy effective data governance programs. The Denodo Platform's data catalog supports data lineage tracking, tagging entries, and implementing semantic policies above the available data. With its support for diverse technologies and use cases, the Denodo Platform also enables data architectures specifically designed to manage data in geographic locations, for example, by only exposing summary-compliant information to external consumers. BHP, a mining company, uses the Denodo Platform in exactly this way.

By serving as a single data access layer across the different data assets of an enterprise, the Denodo Platform facilitates the deployment of data governance and security policies.

It also enables highly granular policies. With support for attribute-based access control (ABAC), the Denodo Platform combines semantic layer, tagging, and session attributes to enable globally defined access policies based on data sensitivity, user roles, business requirements, and other factors. In addition to role-based authentication, the Denodo Platform enables widespread authorization with both schema-wide and data-specific permissions. It also enables the automatic, selective masking of individual cells.

The Denodo Platform's tag-based security policies are completely abstracted from the specific tables containing the semantic security rules, so they are independent of the underlying technology.

Simplifying and democratizing data governance administration, Denodo Platform policies require no coding. The Denodo Platform can delegate authentication to external providers, such as LDAP or Active Directory, in which case administrators do not have to define users in the built-in user management system.

Finally, the Denodo Platform logs each and every data access, making it straightforward to prove compliance. Many Denodo customers take this to the next level by creating compliance dashboards, and some apply artificial intelligence (AI) and machine learning (ML) to identify potential risks.

DATA GOVERNANCE IN ACTION

A wide variety of companies leverage the Denodo Platform across diverse industries, and data governance across their integrated data sets is not just an added feature; it is intrinsic to the platform's inherent design. ■

THE DENODO PLATFORM AND DATA GOVERNANCE

Beyond its fundamental architecture, the Denodo Platform offers advanced data management tools and features to further

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