# The journey to AI and business-ready data begins with information architecture

## Explore a trusted analytics foundation with governance and cataloging at the core

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# Introduction

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## Key takeaways

- Compliance can encourage organizations to implement ongoing and beneficial data governance strategies
- Machine learning automates governance and integration initiatives on a large scale, overcoming the difficulties presented by large volumes of data and the limitations of human ability
- Data governance is effective on-premises and in multicloud environments

Data is multiplying rapidly in quantity and variety for enterprises of all kinds. In multicloud environments, a range of data sources is exponentially increasing the stream of incoming information, from the Internet of Things and social media, to mobile devices, virtual reality implementations and optical tracking. While organizations are readily investing in artificial intelligence (AI), most haven't done due diligence to understand their data or ensure the quality of data needed to benefit from AI solutions. In many organizations, their data is inaccessible, unreliable, or non-compliant with data privacy and protection rules.

Global regulations like the General Data Protection Regulation (GDPR), the California Consumer Privacy Act (CCPA) and Brazil's Lei Geral de Proteção de Dados (LPGD) focus on personal customer and employee data. These types of regulations offer organizations an opportunity to transform and create new data-led business models, despite the severe penalties that may result from non-compliance, which can slow productivity, or damage brand value. To meet privacy obligations and protect personal information, organizations must first discover and classify their various types of data. Businesses that struggle to gather or properly use customer data can experience urgent problems. To address this challenge, organizations are implementing governed information architectures that acknowledge regulations while continuing to support data-driven organizational performance and innovation.

# The building blocks for a trusted analytics foundation

Approaching data privacy regulations as an obligation and an opportunity to modernize data infrastructures offers a significant benefit. Doing so can encourage organizations to implement data governance strategies that generate new business models and lead to data-driven insights. Unified governance and integration (UGI) initiatives apply to data, unstructured and structured, in public and private clouds. Implementing UGI for compliance is significant on its own, but its value affects other areas of an organization, particularly the governing of AI models for data scientists.

When an organization uses data governance to trust its data, users know the data came from a quality source. They know how the data is being used across the organization and they know how it will enhance any analytics project. Analytics initiatives require trusted data to work effectively no matter how advanced the tools might be. The benefits of trusted, business-ready data seem limitless. Analytics can suggest new product designs and marketing programs, and improve sales, supply-chain or customer-service initiatives. Analytics can even uncover operational inefficiencies that when eliminated, increase organizational agility and boost bottom-line revenue.

Implementing data and AI governance in your organization is comprised of several building blocks, as follows.

### Data discovery and quality

Organizations can be unaware of the large amounts of data stored within their business. The first step in data governance is to inventory organizational data. Start by focusing on data sets in a specific project, then expand to other business cases for broader organizational coverage. Data that's redundant, obsolete or trivial (ROT) is not only costly to store and manage, but also clutters decision making and operations. It can also make compliance more difficult and thwart analytics efforts. Data must meet and remain at certain quality measures to make downstream usage successful.

### Cataloging

Once data is discovered and profiled, it's cataloged using metadata tags to identify data types, usage, ownership, data lineage and more. Because companies in certain industries share common needs, pre-built industry models can expedite the cataloging process by using readily available business terms and taxonomy. With advancements in machine learning, business terms can be automatically mapped to build an enterprise catalog in a matter of hours. The cataloging foundation UGI provides, enables organizations to govern their AI models, notebooks and other data sources, creating a central library for organizational knowledge. Such a foundation is a resource for many data users in the organization including data engineers, data stewards, and line-of-business users like analysts, data scientists and marketers.

### Data movement, transformation and synchronization

Data from multiple sources can be easily integrated, transformed and shared with other systems as needed, physically or virtually. This process brings structured and unstructured data together and allows integration with open technologies like Apache Atlas and Hadoop. Creating automated data flow and synchronization helps ensure that the most recent data is available in data lakes, data warehouses, data marts and point-of-impact solutions. As data quantities increase, replication supports large volumes with low latency. Organizations can use virtualization without moving data based on their needs.

> By 2019 the analytics output of business users with self-service capabilities will surpass that of professional data scientists.

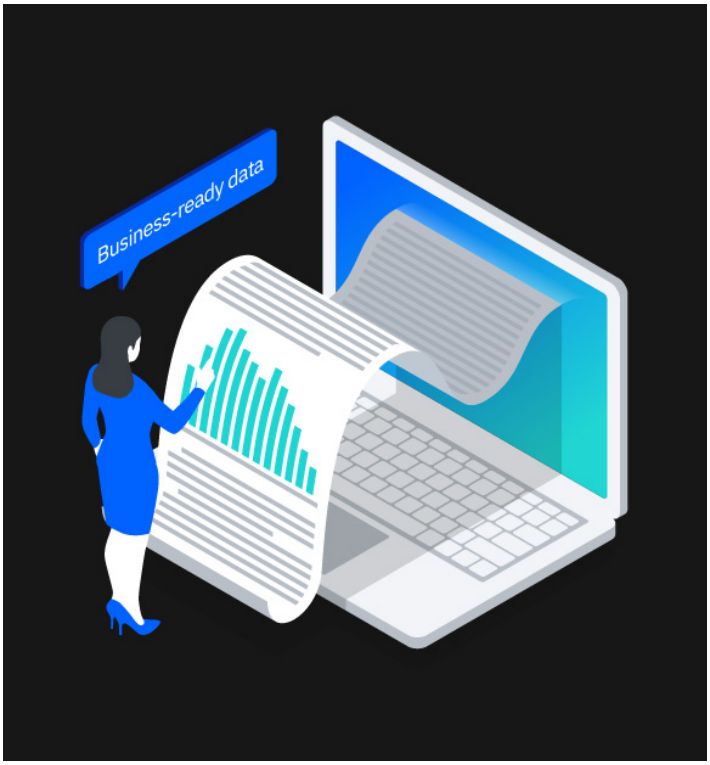
### Master data management

According to Gartner, by 2019 the analytics output of business users with self-service capabilities will surpass that of professional data scientists. It's essential for organizations to rely on a comprehensive, trusted and unified view of critical entities like customers, products and accounts. Modern master data management (MDM) implementations come with analytical graph-based exploration, a highly accurate matching engine, a data-first approach in selecting matching algorithms, and stewardship processes powered by machine learning. In addition, MDM solutions feature agile self-service access, governance tools and user-friendly dashboard capabilities.

### Data privacy and protection

Organizations must proactively secure and protect their strategic and sensitive information assets. Management of the data lifecycle goes from creation to disposal, using such practices as records management, litigation and archival storage. Through cognitive learning applied to an organization's documents and history, risks can now be automatically identified based on the organization's context.

Data that's governed both for business operations and compliance means it's business-ready and can be readily used for any decision making, improvement or innovation. As data quantities increase, replication supports large volumes with low latency. Organizations can use virtualization without moving data based on their needs.



# Machine learning accelerates governance

Machine learning now augments human intelligence and complements the significant limitations of human ability, thanks to recent technological advancements. It automates governance and integration initiatives on a large scale, overcoming the difficulties presented by large volumes of data, leading to sound data governance across the enterprise. For example, if an organization has 20,000 data terms, it typically takes six months for a six-person team to manually classify the terms to drive analytics in a reliable and trusted way. With machine learning, the same process can be completed in a few days or even hours, depending on the quantity of the data assets. This level of acceleration removes a costly burden from the governance process. Machine learning can make compliance obligations more manageable, and it paves the way for productive analytics initiatives.

**Manual classification**

**Six months to complete**


**Machine learning classification**

**Days or hours to complete**

# A single foundation for many purposes

When a governed foundation exists it can be used across business units and throughout the organization, as described in the following common-use examples.

### Governed data lake

Big data predictive analytics projects have been undertaken by a large number of organizations in a wide variety of industries. A key first step is to deposit large quantities of both structured and unstructured data in a data lake.

Organizations have used Hadoop or hand-coding solutions in their data lakes. The absence of a governance structure paired with a lack of strategy for managing data standards, business terms, lineage, usage and quality can lead to a data swamp. This occurs when users neither understand nor trust their data. Organizations are learning that their data lake needs a strategy and governance to be successful.

In a governed implementation, data in a data lake is mapped to business terms that are easy to understand by any data user and consistent across the organization. Having such data available for users can accelerate time to value for virtually any self-service data science, data exploration or AI project, which delivers agility. This access sets the foundation needed to support multicloud environments, on-premises architectures and a variety of data sources.

### Application modernization

Organizations are making large investments in modernizing applications to increase efficiency, reduce costs and gain competitive advantage. Depending on the organization, app modernization ideas can manifest themselves in many ways. Top considerations include test data management, data virtualization and connectivity. Organizations now use agile methodology to test and develop concurrently with virtual data access. They also rely on connecting business applications and data using flexible integration capabilities.

### 360-degree view of customer data

It's important that employees have trusted, up-to-date and accurate single-view master information with regard to customers, products or other entities. Erroneous or out-of-date information can damage customer interactions and erode confidence, lead to account turnover or increase supply chain costs. Data that's sourced through UGI processes can help customer interactions become ways to increase trust, brand loyalty and equity and increase supply chain agility.

### Enterprise data warehouse optimization

With the enterprise data warehouse (EDW), optimizing the architecture represents an upgrade and dramatic shift in how data gets accessed, stored, prepared, governed and analyzed. One of the most effective optimization approaches is to offload extract, transform, load (ETL) jobs, data that's no longer used and data that's required in exploratory models. This process not only reduces costs, it enables the data to be combined with other data types in environments like governed data lakes for dynamic data exploration.

### Regulatory compliance

A trusted analytics foundation empowers and accelerates compliance when it comes to regulatory mandates. Most importantly, the journey to personal data protection begins with defining what personal data is, so that an organization can discover what personal data it has. The foundational data catalog contains governing rules for data quality, enrichment and analysis, and policies for compliance.

# Conclusion

As organizations go through digital transformation, business leaders are becoming aware of the benefits of governance across their data and AI models, whether on premises or in multicloud environments. By focusing on core governance practices, organizations are preparing their data and AI not only for analytical processing and insights, but also for compliance readiness with the regulations they face. While the data volumes are extensive, machine learning and artificial intelligence practices help augment human scale and intelligence in such tasks as data mapping, cataloging, matching large data volumes and sustaining data quality.

Business leaders with vision understand that taking the time to build a solid UGI foundation will pay significant dividends today and in the near future. They realize their organizations will gain important advantages if they embrace governance as an enabler for business optimization, innovation and compliance across data and AI initiatives. It's critical to use solutions that encompass data operations management from creation to consumption. Streamlining these operations requires economies of scope, scale and sharing.

# Learn more

IBM Unified Governance and Integration solutions help you build a trusted analytics foundation to drive AI at scale.

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