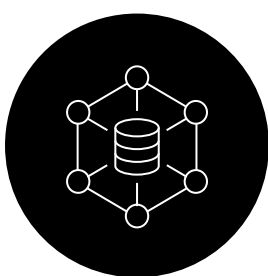# Information management in data-driven enterprises

With enterprise success increasingly built on intensive data use, ensuring the usability of that data becomes a strategic priority.

ZOHO

CONTENTS

Enterprises can build unprecedented growth on large-scale analytics and BI, but doing so creates some new and urgent data needs. Hybrid work, machine learning, and democratized BI all demand data that's fast and abundant but also accessible, reliable, and exactingly organized. See our insights about collaboration, data preparation, analytics culture, and metadata management in large-scale organizations.

Managing data in the hybrid workplace

The key to data-driven collaboration in hybrid workplaces is a centralized, hybrid-friendly data sharing strategy.
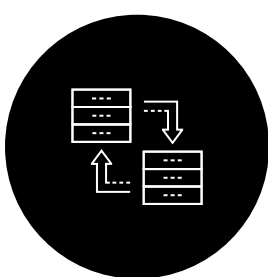
The remote work landscape has changed forever. Employees now place increased value on the ability to work from home, and many organizations are retaining remote working practices or moving to a hybrid work model, with over half of all remote-capable US workers splitting their time between the office and remote work. Hybrid working offers many of the employee experience benefits and increased productivity of remote work, without losing the office as a venue to foster collaboration and culture. While this flexible approach has clear benefits, it also brings challenges, particularly when it comes to data.

Modern cloud communication tools like video conferencing software and instant messaging apps make it easier than ever to stay connected, but it's still easier for data silos and islands to form between teams who aren't sharing a physical office space. It's also easier to miss any gaps in data literacy, and more challenging to ensure everyone is reading data in the same way. If your hybrid working strategy—and BI tools—don't adequately address these challenges, you risk a data divide between remote and office work.

64%

of employees would consider looking for a new job if required to return to the office full-time.

[ADP Research Institute]

Data silos thrive in fragmented tech stacks, so it's important for data to be centralized, especially if employees aren't. To avoid data black holes, it's vital to develop data orchestration strategies which make it seamless to get data from all the tools used across the organization into your BI platform, and to get insights and analysis out. Centralizing data in this way also helps organizations streamline data sharing policies and access requests, so people know exactly what data is available and who can share it with them.

Offering seminars or training courses to improve data literacy is always a good idea, and hybrid work opens up options.

For hybrid work to deliver on its promise to be the "best of both worlds," strategies for data-driven collaboration will need to designed to accommodate both office and remote work. A comprehensive cloud BI platform like Zoho Analytics offers powerful data analysis tools and robust prebuilt integrations or API hookups with other SaaS tools, enabling a seamless data experience for hybrid workforces.

Self-guided e-learning courses are ideal on work-from-home days, while in-person classroom seminars offer a way to bring teams together on office days. Embedding data visualizations into decks and daily use tools also helps with data literacy, especially if managers frequently reference the data and provide transparency into how it informs key strategies. Cloud collaboration tools offer a quick and easy way to ask for a second opinion on data or clarify any

means that when data is presented at in-person meetings, everyone has an existing frame of reference and can more quickly grasp the story told by the data, leaving more time to focus on creativity and collaboration.

questions or uncertainties, helping foster a data-driven and data-curious environment. Dedicated channels and message boards for data discussions are ideal for peer-to-peer learning and upskilling.

Zoho has been ahead of the game on enabling remote data access. Many of our products, like Zoho CRM, offer robust native reporting tools and customizable dashboards. Our comprehensive BI platform, Zoho Analytics, offers more ways to share insights securely through shareable dashboards, data portals, and low-code embedded BI functionality, which brings key data right to the tools and apps employees are already using in their daily work. This

Making decisions, not guesses: The road to data-driven decision-making

To achieve growth with intention, organizations are pushing the accessibility and understandability of their data as well as its role in workplace culture.

Data is, or soon will be, a business' most valuable asset, driving everything from product design to hiring. With 2.5 exabytes already generated daily, that number is expected to grow nearly 200x to 463 exabytes per day. Companies that can leverage this resource will see faster innovation, new revenue streams, and improved operations, among many other things.

But data only drives benefits when analytics are accessible, comprehensible, and trustworthy, and run on centralized, useable data. Currently, most enterprises use at least two different analytics solutions, and those systems usually don't talk to one another. This problem is compounded by lack of access; 80% of managers and executives can see organizational analytics, but only half of frontline workers can say the same.

When employees need insights but lack access, collecting the information for a single data-driven decision can take hours, if not days, turning what should be fast, routine decisions into costly, complicated processes.

To foster a shift to data-driven decision-making (DDDM), organizations are putting analytics at the center of their organizational culture, making the data they rely on more

> "
> *Among the companies already using the cloud for data storage, more than 80% use multiple clouds.*
>
> **[Flexera RightScale]**

accessible, embracing the flexibility of cloud and multi-cloud implementations, and investing in more powerful, more transparent tools.

Building a culture of analytics

Becoming an organization with an analytics culture requires analytics tools that empower and enhance decision making through explainable AI (XAI) or augmented analytics, as well as centralized, accessible data to power the organization's analytics tools.

Most importantly, it requires an ongoing, evolving training process to increase data literacy. While the specific data skills needed vary by role, data literacy is fundamentally about having the ability to generate reports from data, understand their insights, and apply them appropriately. Analytics solutions capable of guiding and empowering employee decision-making are essential tools for an analytics-driven organization.

Accessibility: Democratizing BI

Accessibility is about more than just permission levels. It requires information to be readily available to help employees in DDDM, so that they aren't

An organization with an analytics culture is one where employees turn to data when making any business-related choices. But that shift isn't easy; it requires investment in accessible, useful analytics software as well as a strategic program for fostering, rewarding and spreading data-driven decision making.

- Vijay Sundaram, CSO at Zoho

dependent on data specialists to generate reports. It requires data to be available to employees on demand; this means having unified data stored in the cloud, or multiple clouds. And it requires employees to act as data scientists without needing PhDs; this means implementing self-service BI so that creating custom dashboards and reports is a matter of drag-and-drop operations, not an appointment with a specialist.

80%
of managers, but only half of frontline employees, can access organizational analytics.

[Microstrategy]

Accessibility is also about understandability. If data isn't understandable, it isn't very useful. Modern analytics platforms featuring easy-to-use building blocks and no-code tools, combined with an increased focus on data literacy in every seat, are democratizing BI.

The cloud is overtaking on-prem

The benefits of the cloud—such as speed, ease of use, and cost savings—are well known. As a consequence, the cloud is where almost all innovation in data and analytics is taking place.

Among the companies already using the cloud for data storage, more than 80% use multiple clouds. A multi-cloud approach, coupled with adaptive data governance, helps ensure systems remain resilient and reliable while adhering to regional legislation around data processing or storage.

While multiple clouds (and the average of 4-7 tools that workers use to manage data) can run the risk of creating more siloed and fragmented information, unified data and analytics platforms (UDAPs) offer a solution. By consolidating data into a single source of truth, they allow the deployment of new tools without having to upend employee and organizational workflows. When data has to work across geographies, departments and systems, it's vital that each system is in conversation with the others and able to inform and be informed by them.

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> *With global teams, where data has to work across geographies as well as departments, it's vital that systems can easily be in conversation with the data housed in different products or geographies.*
>
> - Peter Balaji,
>   Head of Global Sales at Zoho

Augmented analytics and XAI

Augmented analytics are probably the best tool for fostering data-driven decision making. Pairing data with easy-to-understand explanations and reports helps build confidence in, and adoption of, new systems. More importantly, augmented analytics and XAI help reduce bias and risk while improving outcomes in revenue, operations, and productivity.

Because algorithms cannot escape the biases of their programmers, unconscious prejudices can result in dire consequences for those affected by the decisions, as well as to the company's reputation and bottom line. By exposing the sources, weight, and logic used in reaching recommendations, XAI makes it easy for developers and ML specialists to make algorithmic changes to

ensure better, fairer, or more effective outcomes while minimizing the chance of harm to the brand.

The continuous modeling, evaluation and optimization made possible by augmented analytics and XAI also helps in identifying new revenue streams and business models. The use of these tools is becoming de rigueur in the enterprise space; 65% of companies with ARR of $100-500 million already use advanced analytics, and nearly 80% of enterprises with 10,000+ employees plan to invest in more analytics capability.

The high costs of poor data

More data does not always mean better data. So as companies acquire exponentially more of it, good data quality management (DQM) becomes a necessity rather than an option. This is all the more true when working across multiple clouds and with multiple tools.

Lackluster DQM can have expensive ripple effects. Gartner has found that low-quality data costs organizations nearly $10 million annually; in the US alone, bad data costs more than $3 trillion per annum. And it has a direct impact on the bottom line; for almost

90% of US companies, it creates an average 12% loss in revenue.

Without good data in place, it's hard to make meaningful decisions; bad data is a big reason tech deployments fail, and it leads to poor processes across an organization, from prioritizing marketing channels that don't generate high LTV to forcing customers to repeat their issues to support reps.

From a productivity perspective, bad data causes sales reps to waste more than a quarter of their time reaching out to (and correcting) wrong contact information. And because analysts can't trust their data, one-third spend almost half their time doing "data janitorial work" like vetting and validating.

Bad data forecloses opportunities; good data creates them. Quality data results in quality insights for every department. And though data science has traditionally been the purview of high-paid consultants, emerging analytics platforms are changing that. This democratization of data made possible through the pairing of accessibility with understandability empowers all employees to become data users making data-driven decisions.

Cloud and multi-cloud implementations ensure that employees can quickly find needed (and reliable) information, while XAI and augmented analytics help people fluently apply that data to their decision making. Of course, none of this is possible without trusted data; this is where data quality management adds value. An organization that can fully implement all of these elements is fostering a culture of analytics that will help it meet the business challenges of tomorrow.

## Insights on demand

The growing importance of data in day-to-day decision-making and the need for anywhere, anytime access created by widespread remote work have made self-service BI systems hosted in the cloud an essential technology for data-driven organizations. As a cloud-native advanced BI solution, Zoho Analytics offers a bridge between distributed workforces and high-quality data insights.

Hunting for data: Emerging challenges in data management

Today's enterprise companies are leveraging new strategies to equip themselves with the clean, reliable data needed for their tech initiatives.

Within the world of business, the demand for high-quality, clean data to fuel important tech initiatives such as machine learning and business intelligence has continued to rise as these advanced technologies become crucial to compete. Depending on the use-case, organizations have employed a variety of methods to acquire the data they need at a sufficiently high standard of quality. Organizations with the vision to link those methods together have a likely path to a fully mature data science implementation capable of driving and sustaining innovation.
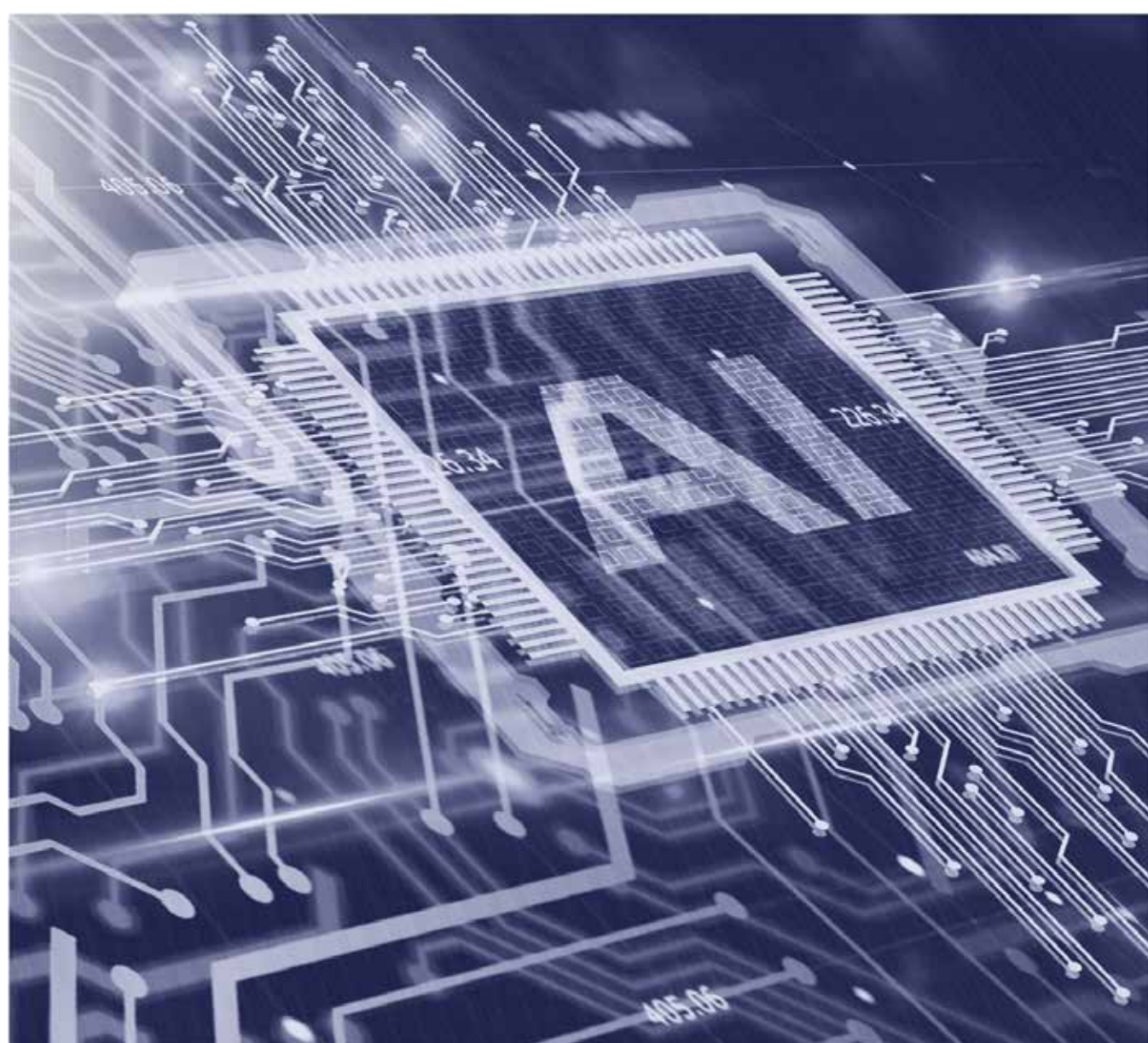
> *Less than 5% of companies are currently estimated to be properly utilizing their data to gain an effective competitive edge.*
>
> **[MIT Sloan Review]**

Synthetic data

Artificial intelligence and machine learning have become increasingly integrated into nearly every aspect of business. As the scope and accessibility of AI grows, so does the demand for high-quality data. A greater volume of training data can allow AI to perform more complex tasks, and more accurate data translates to better

performance. However, there are some tasks that many companies, despite possessing a wealth of information, simply don't have enough data to accurately automate. One challenge is that some of the tasks they're looking to automate may be so new, or so specific, that a single organization won't be able to reach a suitable level of performance using its own resources. In response, some of these organizations have opted to buy pre-packaged, pre-cleaned datasets, known as "synthetic data," in order to buoy their AI initiatives past their internal data limitations. Firms offering synthetic data services will often utilize generative adversarial networks (GAN), a form of artificial intelligence that can mass-produce realistic, albeit artificial, training data such as photoreal human faces or simulated financial data.

> *In order to remain sustainable, businesses will need to embrace a plurality of resources—as many as they can get their hands on— for ensuring both their internal business and artificial intelligence systems remain at the top of their game. When it comes to the information you rely on for decision-making, there is no 'accurate enough'.*
>
> **- Vijay Sundaram, CSO at Zoho**

Some businesses see synthetic data as a way to effectively train AI without violating user privacy. For instance, some firms offer synthetic medical record data populated by entirely fictitious patients. In other cases, synthetic data can be used to test an AI system's reactions by simulating rare "black swan" events, allowing developers to tweak the algorithm to react more effectively in

the instance of a real crisis. While the solutions offered by synthetic data are appealing to businesses that find themselves short on usable data, it's not yet a panacea. Generating artificial data that effectively reflects the real world can be a significant challenge, depending on the use-case. As the field continues to grow, however, synthetic data may become a standard component of any AI initiative.

> *The number of job postings for data scientists has more than tripled in less than ten years.*
>
> **[Indeed Hiring Lab]**

Data scientists

Data analysts are in high demand across the job market, with many organizations looking to refine their vast quantities of raw data into actionable insights, performance forecasts, and fuel for machine learning initiatives. Enterprises that are able to build out skilled data science teams will typically give them a mandate to seek out

data-based answers to important questions affecting performance across the business. Effective data science teams employ strong data location and interpretation skills, but just as importantly, they also must be able to visualize and communicate their findings in a way that's easily understood by leadership and important stakeholders.

Keep your data fresh

The incredible wealth of data available to enterprise-grade businesses can be a challenge to navigate, especially without a universal quality-control standard. In an effort to eliminate the errors and inefficiencies in their clients' analytic processes, Zoho has designed our own automated data cleaning solution included within our BI platform, Zoho Analytics.

In recent years, many organizations have struggled to fill their data science teams with enough qualified talent to meet their needs. The pool of available hires hasn't been able to grow fast enough to meet the massive boom in demand. As a consequence, the

firms able to make the most lucrative offers end up with much of the talent. This talent shortage has left some organizations in a difficult position. While their respective industries are being revolutionized by machine learning and business intelligence tech, they risk falling behind.

In response to this situation, some organizations have chosen to upskill their workforce through data literacy training as a component of their larger digital transformation initiatives. Upskilling allows these businesses to institute higher quality data collection methods at the source, org-wide, making for more reliable analysis downstream.

Data preparation

Data preparation is a critical step in ensuring the success of any BI or AI project. Without clean data, organizational leadership can't be confident that they're making well-informed decisions. The data preparation process consists of taking raw data, standardizing it, filling in missing values, and eliminating erroneous entries so that what remains can be analyzed accurately. While data preparation is a crucial step, it tends to be one of the most time-intensive parts of working with large volumes of business data.

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> *Between 60 to 80 percent of data scientists' time is dedicated solely to data preparation.*
>
> **[McKinsey]**

Since data preparation is so time- and labor-intensive, significant effort has been committed to streamlining the process, which has resulted in the development of several enterprise-grade data prep software

solutions in recent years. Data prep software vendors offer businesses the ability to automate the bulk of labor involved in cleaning large raw datasets manually, at significantly greater speeds. Not only does this provide organizational leadership with faster access to important data-driven insights, it also frees up bandwidth to better utilize their highly-valued data experts.

With less time committed to cleaning raw data, data science teams can focus on more specialized tasks, incorporate a wider variety of data sources into existing models, or even initiate larger-scale projects. Moreover, by automating a significant data bottleneck, data prep tools have the potential to reduce the pressure on enterprises to fill out data science roles otherwise needed to perform data preparation at scale.

Combining data strategies

As data science becomes increasingly necessary for success in the marketplace, companies will have to exercise ingenuity and creativity to optimize the resources they have and stay competitive. While acquiring the proper talent and training should be a focus for organizations looking to build sustainable capacity for data use, additional deployment of synthetic data combined with properly implemented data preparation software may provide the bridge that companies need to reach a sustainable, data-driven future.

Maximizing metadata in enterprise information management

Active, strategic metadata management plays an essential role in mature enterprise data governance and reducing risk exposure.

Metadata is no longer the purview of data scientists. With the explosion of data as a business resource, and the attendant exponential growth of metadata, managing and leveraging that ocean of information is an increasingly important part of enterprise information management maturity. Unfortunately, the vast majority of organizations don't currently have a larger strategic plan for leveraging metadata in data-driven decision-making (DDDM).

As enterprises mature, so does their need for flexible, comprehensive and real-time data governance. And though articulating a larger philosophical approach to data can be an organic part of an organization's evolution, it usually isn't. Instead, it's more likely to result from choices made elsewhere: ensuring regulatory compliance by establishing data privacy practices; attempting to foster a culture of analytics and DDDM; needing systems that provide consistency and accountability.

Managing metadata effectively requires precisely defining how, when, and why an enterprise will collect, engage with, and safeguard data. Of course, designing an approach is one thing; effectively implementing it is a different one entirely. It might require big shifts in organizational data culture, or building an entirely new one from scratch. Or it could involve deploying multiple solutions, like metadata lakes, data modeling, or moving to cloud platforms.

This effort is well worth it. Data governance that includes active metadata management (MM) pays big dividends, whether from risk mitigation or reductions in operational costs. And the more refined, and defined, the data governance philosophy, the more likely it is to lead to accurate data and compliance with regulatory concerns. Most important, however, is that metadata management introduces a comprehensive methodology for maximizing the value of every data point.

Making metadata meaningful

Fundamentally, good MM requires an approach that sees the forest for the trees. Metadata management is a system for organizing data so that it is useful and accessible to those who need it—a broad framework of practices and technologies that catalogs, stores, and makes data searchable. At the most practical level, it is how an enterprise handles cleaning, arranging, and safeguarding data to retain its precision and fidelity as it moves across an organization.

MM, like data governance as a whole, is an ongoing process. It requires continually evaluating roles and their respective data responsibilities, maintaining regulatory and

organizational compliance, and tracking what happens to data across its life cycle. It also requires fine-grained measurement and analysis of operational and behavioral data to generate insights into how the enterprise and its employees engage with data systems.

> *Good metadata management is key to understanding the way organizational data travels and is used. Without that information, finding areas for improvement across the data life cycle is a time-consuming process with mixed results.*
>
> **- Hyther Nizam,
>   Chief Technical Officer at Zoho**

The high costs of hidden pain points

Bad metadata creates excess overhead costs and needless risks for organizations. It's usually the result of poor data governance practices, and tends to reveal an absence of widespread DDDM and the analytics culture that supports it.

> *Data scientists and analysts spend as much as 80% of their time in "data janitorial work.*
>
> **[InfoWorld]**

Enterprises can incur high operational costs due to poor metadata management, which appears in a variety of forms across an organization. Significant amounts of sales time are wasted reaching out to bad contacts, fixing out-of-date details, and running searches on out-of-step platforms. A unified, quality source of truth can help eliminate much of this waste through automations that drive quality control.

But there are even bigger and costlier resource drains for enterprise IT teams and data scientists. Some estimates estimate that data scientists and analysts spend as much as 80% of their time in "data janitorial work." This leaves little time for generating the insights and recommendations that are these teams' purpose and mandate. When employees need reports but lack the access rights or technical knowledge to create them, they'll turn to IT for help, increasing the team's workload. And in the absence of a clearly defined data governance (and DDDM) philosophy, IT is also often saddled with determining and maintaining access permissions on an individual basis.

to deal with the terabytes of new metadata already being created daily.

Active MM comprises strategies such as: including identifying sensitive information and automatically protecting it; intelligently correlating data objects (such as tables and SQL snippets) with business terms; and contextual enhancements that increase end-user trust and encourage DDDM.

> *Enterprise software needs are certain to continue evolving, and metadata management helps bring new and disparate systems into meaningful conversation.*
>
> - Peter Balaji,
>   Global Head of Sales at Zoho

What metadata should already be doing for every organization

Good metadata management helps organizations realize a variety of benefits across their operations. Standardization of descriptive elements drives deep information linking across departments, building a common organizational lexicon. This makes for more consistent, discoverable, and contextualized data that is easy to understand and act on. In turn, this usability fosters the kind of culture of analytics that leads to improved DDDM at every level of an organization.

The best MM creates opportunities too numerous to list. It saves data scientists time, and it places their focus on creating strategic business insights. It adds consistency to organizational data, which drives gains in employee efficiency and reduces overhead and administrative costs. Organized metadata delivers higher quality data with smarter anomaly detection, which leads to faster resolution of flagged issues. By having clearly established data policies and procedures, organizations can drive

Because lack of metadata management forecloses the possibility of effective DDDM, it also exposes enterprises to unnecessary risk. Without accurate and helpful metadata, decisions will be based on trusting faulty information. Widespread access to data combined with opaque data governance is a hazard, because it creates more opportunities for data privacy mishaps and compliance failures. And most importantly, when metadata isn't properly managed, it's nearly impossible to create accurate audit trails or impact analyses. Good metadata management is key to understanding how an organization's data travels and is used, and recognizing the areas where both could be improved.

Emerging privacy regulations, coupled with shifts in consumer sentiment, have made establishing transparent processes a necessity. As the costs of customer acquisition continue to climb, retention has become all the more vital; building long-term loyalty comes (in part) from the careful handling and appropriate leveraging of sensitive data. And as third-party cookies are deprecated, organizations are turning their attention to mining first-party data to maximum effect.

Active metadata management in the governance of tomorrow

There are as many MM approaches as there are types of metadata. Broadly, metadata is collected through either passive or active means. Passive, technical metadata detailing schemas, data owners, and data types is automatically captured by most systems. Active MM includes all of that and more: how the data changes, who uses it, and additional contextualization provided by social, business and operational metadata. It is a largely automated process, driven partly by AI and machine learning; manual data management strategies simply can't scale

consistency in everything from branding to regulatory compliance.

Making data movement visible

Metadata management enriches every piece of data that moves through an organization, whether by adding intelligent context or simply offering visibility into how data flows and grows. The fine-grained, AI-informed reporting in Zoho Analytics brings data sources from any channel into a single conversation for exponentially improved insights.

Big data is only going to get bigger, and agile decision-making will be key to enterprise success in the future. Next-gen software ecosystems support this success, using embedded analytics to encourage frictionless DDDM. But it's impossible to fully realize this transformation when data is siloed and subject to inflexible, inefficient manual data governance practices.

To support growth at scale and keep pace with the exponential expansion of metadata, organizations need active metadata management that takes advantage of AI and machine learning.

Of course, active MM isn't possible without a robust tech stack that drives connectivity and collaboration among pools of information. This requires systems that are simultaneously flexible and intelligent, as skilled at identifying individual threats as they are at forecasting and modeling. Enterprises that embrace a holistic approach to data—and metadata— governance, paired with tools that create both consistency and adaptability, are positioned not only to realize the possibilities of today's data landscape, but to leverage tomorrow's as well.
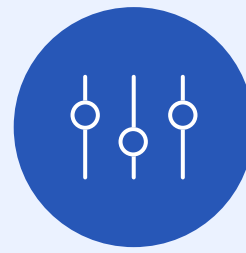
Why Zoho for Enterprise?

Proven software, customer commitment, tremendous value.
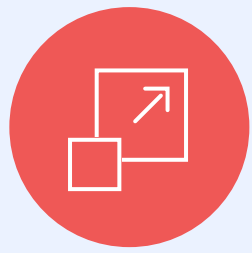
Scalability & Reliability

Zoho for Enterprise reduces the cost of infrastructure, unifies existing apps, and solves complex business problems for increased enterprise fitness, resilience, and scalability.

Customization & Extensibility

Through granular customizations and powerful in-house developer platforms, Zoho lets you orchestrate workflows, streamline data management, and deploy world-class solutions at scale.

Security & Privacy

From owning our own data centers to GDPR compliance features, Zoho enables enterprise organizations to focus on core business priorities, rather than data management.

Enterprise Services

From data migration to consultation and implementation, our team is armed with the in-depth product knowledge and industry expertise to meet your unique technical requirements.

Are you ready to transform your organization?

We're here to help. Have a 15-minute, no-obligation call with one of our **Business Architects** to get all your questions answered.

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