



The 2023 Business Guide to

Data Management Modernization





Contents

1: Data Management Modernization At A Glance	9: Increase in Data Privacy Policies and Laws
Page 3	Page 11
2: 2023 Guide For Data Management in Business	10: Data Resilience Improves with Modern Data Stack
Page 4	Page 12
3: Data Architecture Will Become More Complex	11: Employee Skills Will Include Enhanced Data Literacy
Page 5	Page 13
4: Data Governance Will Be Key for Successful Modernization	12: Major Challenges of 2023: Modernizing Legacy Data Management Systems
Page 6	Page 14
5: Developers Will Build Directly In The Data Cloud	13: The AI and IT Talent Gap
Page 7	Page 15
6: Data Analytics Will Make Use of AI Technology	14: The Solution: Work With a Managed Service Provider
Page 8	Page 16
7: Data Reliability Will Employ Blockchain Technology	15: Modernize Data Management with Hakkoda
Page 9	Page 17
8: Businesses Will Need Reinforced Data Security	
Page 10	

Preface

Moving into 2023, unprecedented volumes of data make it more important than ever to ensure reliable data management. This encompasses multiple aspects of a business's data systems, such as architecture, and resilience.

New Era of Data Management

The beginning of 2023 heralds a new era of data management, as businesses continue to evolve their systems under the weight of larger data volumes, new work models, and security considerations. The ongoing popularity of remote work continues to push more data into the cloud. Global interaction is on the rise too, affecting security and privacy considerations. In the year ahead, we'll see data architecture become more complex, along with the advent of new approaches to data governance and new methods of extracting value from business data analytics.





1 Data Management Modernization At A Glance

Some of the most important changes we'll continue to see in 2023 are:

Machine learning

Democratization of data through updated governance models will expand the use of business analytics throughout organizations. Meanwhile, **machine learning** will accelerate the pace of business, requiring real-time analytics to keep up.

Automation

In a bid to improve performance, automation will become more widespread and intelligent. Previously, automation has been used in a fragmentary way and with relatively simple tools. The next year will bring steep advances in the practice and function of business automation.

Data Modernization

The ability to manage data will increasingly differentiate market-leading revenue generators from competitors. The term “data management” covers all aspects of handling data—from acquisition to storing and processing. In 2023, **data modernization** will drive business intelligence and either advances business success or hold companies back.

Governance Changes

Following **governance changes**, more companies will develop privacy policies to meet growing pressure from customers and regulators. Companies will also focus on standardizing metadata to enhance data quality. This often overlooked activity makes data more reusable.

Headless BI

Looking forward, **headless BI** will continue to be one of the principal factors driving data modernization. Headless BI entails separating the front end from the back end of online services. The drive to customize the front-end experience for users will continue to create data silos on the back end. As a result, metrics stores will come to the rescue for many organizations.

Data Analytics

Data analytics will give businesses the necessary understanding to make smarter decisions and outwit the competition. Information on customers and operations can reveal the more efficient choices for tough situations. It takes effective data management to rise above the fray, making this a key consideration for the new year.



2 2023 Guide For Data Management In Business

Data management touches on many aspects of how an organization handles information. If we think of data as a business resource of growing relevance, it makes sense that data management is a critical activity—just as a company must manage finances and human resources.

Some of the most significant aspects of data management in 2023 include designing architectures capable of handling more complexity, policies to support business strategy, and security in the face of new threats. Additional challenges comprise protecting private information and making data usable for the personnel who rely on it.

On some level, the factors driving the escalating importance of data are simple: There's more of it. Databases cover more topics in greater depth, graphics are richer, and a larger percentage of the population works with data. Each year, businesses produce more data than the last. Big data requires more adaptable tools such as machine learning—an approach to artificial intelligence (AI) that's increasingly ubiquitous.

Feature stores are another fast growing staple of data management. A feature store is an ML-specific data system used to centralize storage, processing, and access to frequently used features. Such tools make them available for reuse in the development of future machine learning models. Feature stores operationalize the input, tracking, and governance of data. Rather than having to search in multiple locations to find a useful piece of data-handling code or re-engineer it entirely, a feature store saves time, effort, and money.

As an example, a financial institution may use features to calculate fraud risk scores in real time. Because these calculations will become more common in 2023—with even greater capabilities—it's essential to build and improve functionality. A feature store maintains tested statistical methods that can be used with any data, making it a valuable aspect of modern data management.

ML and feature stores won't be the only major innovations that become commonplace for data management in 2023. In this report, you'll learn what's next for big data, and stay ahead of the curve with data modernization insights that help you operationalize your data and build competitive advantages in the year ahead.



3 Data Architecture Will Become More Complex

The architecture of an organization's data influences how information travels through the company—from collection to transformation, distribution, and consumption. As a result, architecture is an area likely to become more complicated (and challenging) in the next few years.

Business requirements will strain existing architectures as more companies strive to deliver omnichannel experiences. Individual expectations will also necessitate change. Customers now expect their data to be available and seamlessly usable, whether in-store, on mobile, or anywhere else. The sheer volume of data businesses will need to make available will inevitably result in data silos, which is where architecture becomes key.

The increasing popularity of AI is a further motivator to improve architecture. AI modalities, including machine learning, can place a heavy burden on data architecture. Little wonder, as imitating a human requires the rapid processing of convoluted data.

Fortunately, this burgeoning complexity offers opportunities for agile businesses to gain competitive advantages with intelligent data architecture. In 2023, successful data organizations will rely on multi-modal architecture that supports both human and machine learning intelligence. This emphasis on multi-modality will allow businesses to combat the growing complexity of data architecture that results from layering, silos, and segmentations. To future proof and create sustainable data architecture, multi-modal structures will be key.

The right architecture design makes it easier and faster to handle substantial volumes of data. Hakkoda's data experts help companies select data lakes, mesh, vault, and warehouses (or the right kind of data architecture) to support their business. All data architecture isn't built the same, and in 2023, businesses that future-proof their data with the implementation of crucial data architecture will outpace competitors.



4 Data Governance Will Be Key For Successful Modernization

How an organization governs or controls its data is another key component of success in the digital age.

As with architecture, governance should extend throughout the entire data life cycle. Regardless of the industry, it's important to consolidate and strengthen your data governance in the coming year.



Data governance procedures control how information is gathered, stored, processed, and disposed of. These procedures ensure that information remains trustworthy, setting standards to keep data secure, private, accurate, available, and usable across the enterprise. The most modern approaches of data governance, however, enable more access and more control, which has been long held challenge in this area.

In 2023, data governance processes and guidelines will need to cover the following elements:

- **Procedures and Documentation:**
Documenting policies keeps everyone aware of correct practices.
- **Data Integrity:**
Optimizing workflows to build data integrity into daily operating procedures keeps data consistent and usable.
- **Audits and Quality Control:**
Periodic audits help evaluate how well the company meets requirements over time.

Essentially, the goal is to focus on policies such that every part of your organization produces consistent and compliant data. This may, for instance, entail practices to remove inconsistent, empty, or redundant data.

The good news is, modern approaches to data governance will allow organizations to marry greater access with increased control, solving a decades old struggle for balance. In 2023, businesses with modern data governance will be able to surge ahead of the competition with data driven decisioning.



5 Developers Will Build In The Data Cloud

In 2023, Snowflake's innovative Data Cloud will continue to drive the industry forward, with new functionality that will change the way developers interact with cloud databases.

Snowflake's Native Application Framework makes it possible for developers to build, monetize, and deploy their applications, all within the Data Cloud.

Many have heralded the release as a new era of collaboration, and given the exceptional potential of Snowflake's Native Applications, it's sure to be a hot topic for businesses in the year ahead.

Some of the functionalities include the ability to build using Snowflake features such as stored procedures, user-defined functions (UDFs), and user-defined table functions (UDTFs).

Looking for a leg up on how to start using UDFs and UDTFs in Snowflake's Native Application Framework? Hakkoda's data experts have already begun mapping the most effective ways to build within the cloud.

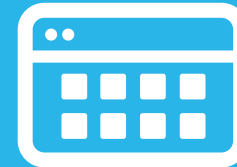
In 2023, businesses that embrace Native Applications and begin collaborating and building directly within the cloud are likely to:

- Get value from their data faster
- Improve security and governance
- Access cutting-edge technologies

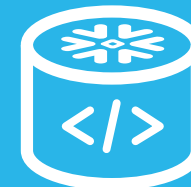
As a result, Snowflake's Native Applications Framework isn't a feature to be ignored in 2023. Companies that make time to learn and invest in this new addition to the Snowflake Marketplace are primed to enjoy a variety of financial and competitive advantages.



1. BUILD
apps using Snowflake
functionalities



2. DISTRIBUTE & MONETIZE
on Snowflake Marketplace



3. DEPLOY
within Snowflake
customers' accounts



6 Data Analytics Will Make Use of AI Technology

One of the hot topics heading into 2023 is how you can best exploit business intelligence. It's no surprise given that for many companies, their data is worth as much or more than the business itself. Using modern data analytics tools, a company can leverage their data to understand historical outcomes and apply this information to improve future results.

AI will have a significant impact in this arena. Many forecasting techniques use AI to predict future outcomes.

For instance, a business may combine past sales data, seller performance history and signals from active pipeline and marketing data to forecast sales for the coming quarters. Other predictions can also be made, such as asset values or resource costs.

Hakkoda offers analytics consulting to improve the quality and performance of data. This service goes beyond data architecture to incorporate governance, security, and sharing.

By refining and consolidating your data, it becomes possible to accelerate innovation.





7 Businesses Will Need Reinforced Data Security

Data breaches are currently in the headlines—definitely not the sort of publicity that most businesses want! On top of the loss of valuable data resources, this type of scenario also constitutes a serious loss of face for the company involved. Moreover, data breaches may expose victims to fines for compliance failures.

Modern data security also encompasses issues of access control, data masking, and data privacy. Access controls, which specify who can and should see data down to the cell level, can now be assigned based on unique user profiles. Role-based access control (RBAC), attribute-based access control (ABAC), policy-based access control (PBAC) and access control lists (ACL) will be major components of data security policy in 2023.

Moving to the cloud is another vital innovation for organizations looking to modernize their data systems and management. This option offers a new layer of security for industries exchanging sensitive information, like the finance and healthcare sectors. More advanced security operations centers (SOCs) store high-volume security logs with a security data lake—a specialized data lake designed for collecting and manipulating security data and contextual business data.

In 2023, advanced security operations will leverage technology like the Snowflake Data Cloud in combination with modern data architecture to create robust security protocols and advance the number of operations that can be securely transacted.





8 Data Reliability Will Employ Blockchain Technology

Blockchain is a technology that will assume a bigger role in data reliability in 2023. Companies can use it to track information—where consistent transaction documentation is protecting data from becoming corrupted. While some key applications involve safeguarding sensitive information for the financial and healthcare sectors, blockchain is also being applied in exciting new ways to areas such as logistics. One great example of these innovations is the smart contract, which uses blockchain to enforce agreed rules reliably. Data will take center stage next year, drawing additional attention to the question of reliability.

A data-driven company only makes sense if it has sound and comprehensive data. Here, a reliability assessment can gauge the current situation and indicate which issues need to be fixed first.

As more organizations start working to improve their data reliability, it will become increasingly evident which efforts deliver optimal value. While key pieces of data that feed into analytics or sales processes are considered urgent, other reliability concerns can wait for longer-term projects to repair.



9 Increase in Data Privacy Policies and Laws

Individuals want—and have a right—to control how their personal information is used. This trend has implications for businesses in terms of data management. For instance, a law may require companies to take protective measures for customers' names and addresses, or to delete such data on a customer's request.

A number of countries and US states are implementing laws modeled on the European Union's General Data Protection Regulation (GDPR). Such laws establish requirements for businesses that store information on individuals.

When you combine the complex mix of international regulations with more and more business activities crossing borders, it can be difficult to keep up with the relevant laws.

Within a modern data stack approach, tools such as Snowflake can address data retention, data residency, data access, data usage and data lineage.





10 Data Resilience Improves with Modern Data Stack

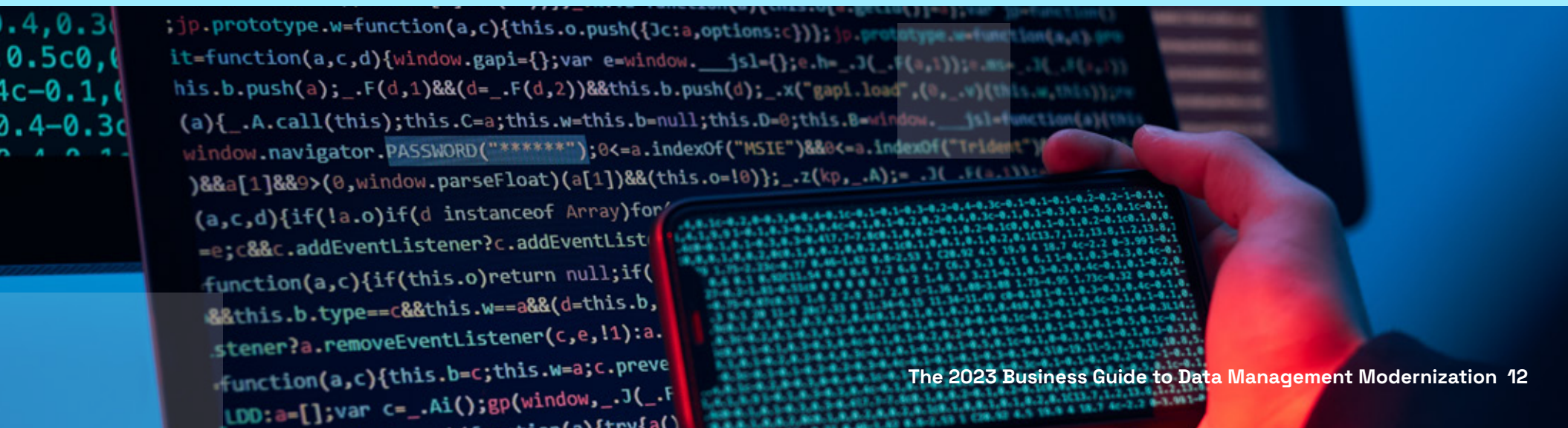
Despite all the efforts a company makes to ensure data security and reliability, risks remain. Data resilience refers to an organization's capacity to recover from data governance, security or usage failures when they arise.

Automated tools contribute to data resilience. Although replicating data to multiple sites may add to costs, it ensures that data remains available—even after severe failures. Consequently, data resilience is especially relevant for mission-critical processes.

As data migrates to cloud applications like Snowflake, organizations gain control over data resilience and enjoy a variety of new options for securing it. Many data resilience tasks, like testing and QAing data, require copies. With legacy data systems, businesses needed to pay to store that data twice. But with tools like Snowflake's Zero-copy Cloning, organizations can test and QA their database without physically copying data.

It's also standard for modern data stack (MDS) providers to provide resilience measures for securing and restoring historical cloud data. [Snowflake's Time Travel and Fail-safe program](#) offers the ability to restore data for up to 90 days to all tables, schemas and databases, as well as a disaster recovery.

In 2023, organizations building with the MDS will have a significant advantage when it comes to data resilience. Going forward, the major struggle businesses face with data resilience will hinge on unstructured data (customer messages or social network commentary) vs structured data (such as databases). This dichotomy poses a challenge for resilience because some backup and recovery solutions support structured data better. As unstructured data sources continue to provide larger and larger troves of insight, effective and integrated management will need to include resilient unstructured data.



11 Employee Skills Will Include Enhanced Data Literacy

With the ongoing democratization of data, it's increasingly important for employees to be able to understand and use data. The term "data literacy" is analogous to the broader notion of literacy—in this case, specifically for computer-based information.

Leading companies already have programs to support information literacy, and this will become even more important in 2023. When leaders can explain the usefulness of data to regular users, the whole organization benefits. As a result, decisions throughout the company will become more informed and intelligent.

Staff in all departments will increasingly have to deal with data. Therefore, it's essential that businesses allocate resources to improving employees' skills. Additionally, it makes sense to teach users in all departments exactly which data they have access to.



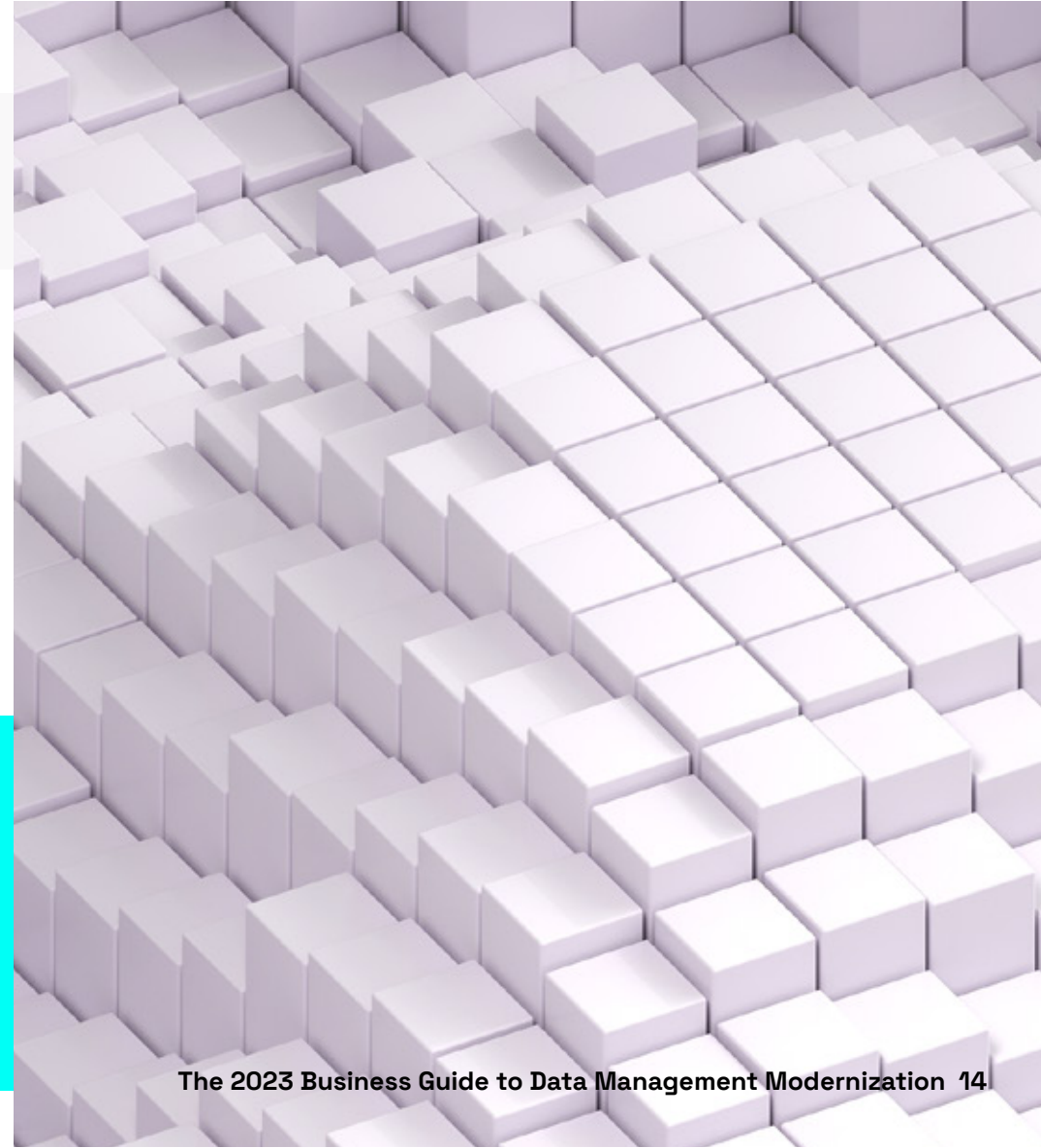
12 Major Challenges of 2023: Modernizing Legacy Data Management Systems

With each passing year, organizations that rely on legacy data systems fall further behind for one reason: legacy systems aren't oriented toward business needs. Legacy data systems refers to an on-premise ecosystem and SQL warehouses that are both logically coupled and complex. These outdated data models pose a variety of problems, chief among them a long turnaround time to setup infrastructure, slow response to new information, and expensive journeys to insights.

Perhaps the most striking example of the consequences of technical debt and a lingering reliance on legacy data systems is the Southwest Airlines meltdown that came at the end of 2022, costing the airline millions of dollars in lost fares and dissatisfied customers. Businesses that don't prioritize data modernization will eventually face costs elsewhere in their organization.

In contrast to legacy systems, the modern data stack (MDS) is a set of tools, hosted in the cloud, that enable highly efficient data integration, as well as a strong foundation for DataOps and MLOps. An MDS allows organizations to move from an IT-focused to a business-focused operating model, delivering plug and play flexibility, operational AI and BI and the ability to dramatically enhance your organization's data governance.

For all the difficulties of upgrading from a legacy data system to the MDS, it remains a practical necessity to adapt to new data models in the cloud, like Snowflake. To avoid continuing to accrue technical debt, businesses need to start—or continue—their digital transformation plans in the upcoming year. There are vendors like Hakkoda who can accelerate the transition to cloud-native technology, with specialized consultants certified in the full suite of MDS tools.



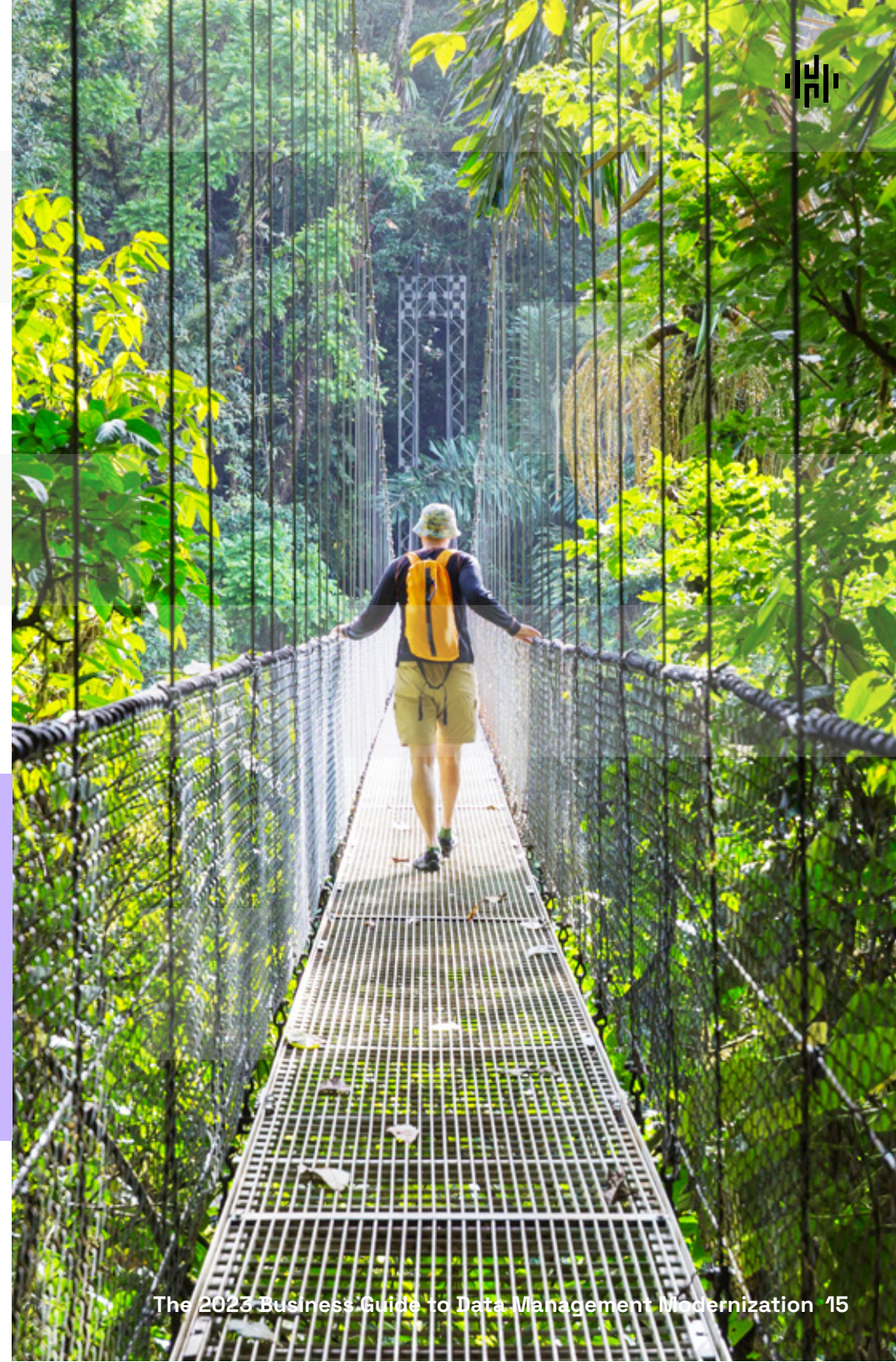
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The AI and IT Talent Gap

While many businesses have made data modernization a priority for the year ahead, the current economic climate presents challenges for tech leaders. Hiring freezes, scant talent in the marketplace and high in-house hiring costs are all obstacles for many organizational data and analytics goals.

A particular problem coming to the fore in 2023 is the increased talent shortage in AI and machine learning (ML). These rank among the hottest trends now sweeping through the industry. The race is on to have the best AI and ML experts bring their skills. Companies failing to do so risk not having the features and efficiency to serve a new generation of customers.

A number of organizations are using data service providers that have already managed to hire ML developers. This can be done via nearshoring. That is, using nearby countries that have modern educational systems and lower prices, such as Costa Rica. Hakkoda works with top talent in Costa Rica, and can assist you with ML, AI, and other areas involving data management.



14 The Solution: Work With a Managed Service Provider

The smart way to solve the major challenges in data management is with a managed service provider. An MSP offers just the right combination of benefits for modernizing legacy systems and addressing the IT skills gap, provided they already have the latest data technologies along with highly trained personnel.

Rather than getting stuck in the old break-fix pattern, this is an excellent opportunity to move into a modern end-to-end approach to data management. In 2023, technology is undergoing a revolution in areas such as machine learning and other data-intensive activities. Now is the best time to embrace these new technologies—with the help of a trusted partner.

Working with an IT vendor gives you the agility to meet tomorrow's needs. No more worries over downtime and disorganized data. When you work with experienced professionals, you'll have confidence in a smooth modernization process.

A commonly encountered problem in cloud migration is the lack of skilled staff. The same lack of skilled staff makes it a challenge to develop ML solutions or to manage data properly. A managed service provider offers an affordable and fast answer to these challenges. It's just a matter of deciding what you need done and the solution will be provided.



15 Modernize Data Management with Hakkoda

The data management business is expanding rapidly. As such, 2023 will be an exciting yet challenging year. Modern data management with a provider like Hakkoda can help you meet those challenges. And as an experienced service provider, they'll help you tackle some of the biggest goals—including machine learning.

Core aspects of data management need revamping to maintain their industry leadership. While architecture and governance are responsible for organizing data, analytics and literacy help make that data valuable to your business. Meanwhile, reliability, security, privacy, and resilience will ensure the integrity of your data.

The safest and most effective way to upgrade old systems is to use a specialized MSP like Hakkoda. This approach also allows you to access the latest technological expertise, such as AI. And all without the issues of hiring in a tight labor market—or the risks of DIY approaches.

Talk with Hakkoda about your IT needs today. We're here to deliver robust solutions that will carry you into 2023—and beyond.

