



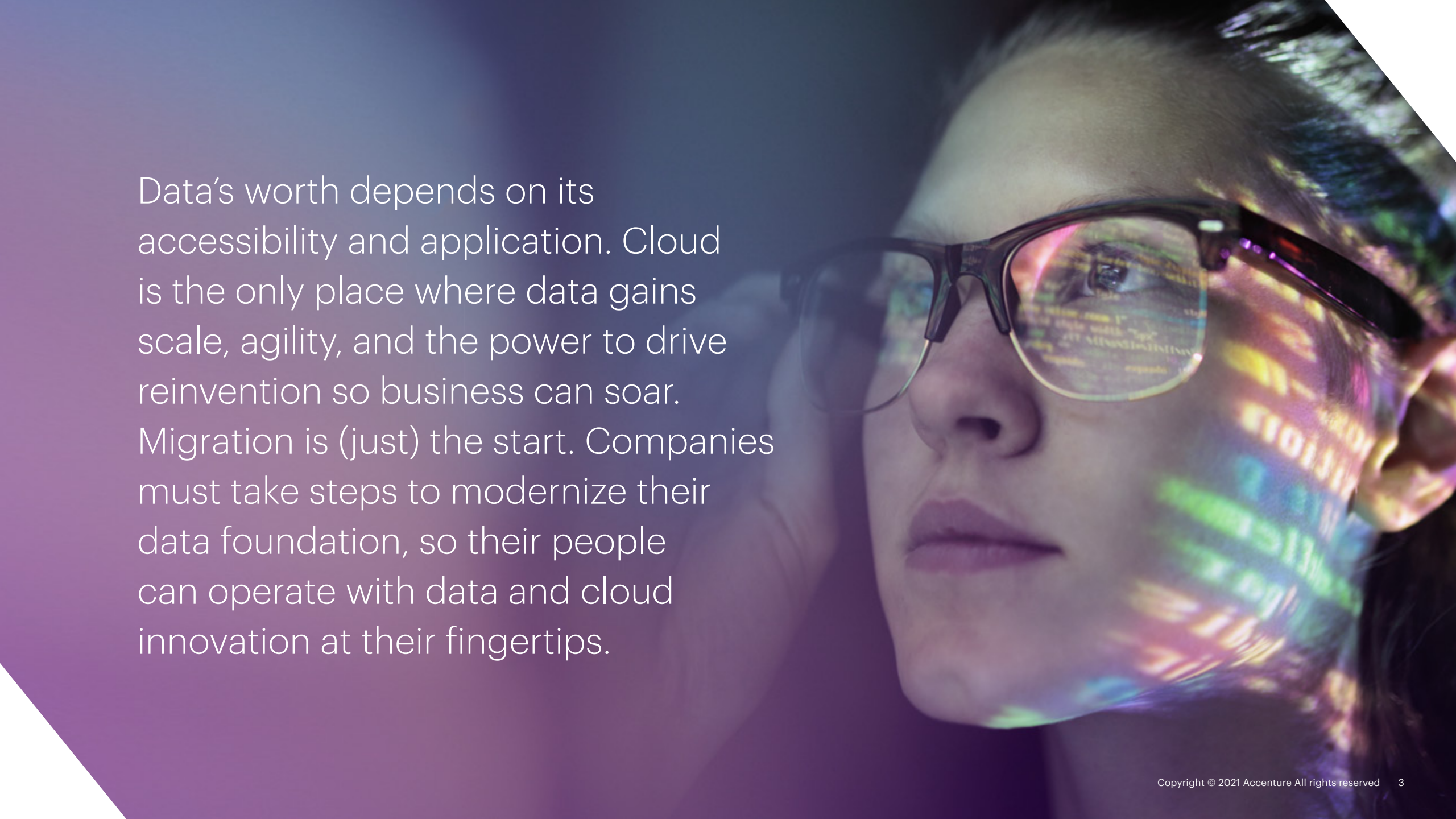
Lighting the way with data on cloud

Modernize and transform your
data foundation on cloud

accenture

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A close-up, profile view of a woman wearing glasses. Her face and the lenses of her glasses are covered in vibrant, multi-colored digital reflections, including binary code (0s and 1s) and abstract data patterns in shades of blue, green, yellow, and purple. The background is dark and out of focus, suggesting a digital or data environment.

Data's worth depends on its accessibility and application. Cloud is the only place where data gains scale, agility, and the power to drive reinvention so business can soar. Migration is (just) the start. Companies must take steps to modernize their data foundation, so their people can operate with data and cloud innovation at their fingertips.

The growing data opportunity

Almost every day, up to 2.5 quintillion bytes of data are created by humans, edge, IOT devices and machines.ⁱ The volume of data and the pace of its accumulation can only accelerate in the future. In fact, over 50% of the primary responsibility of data analytics leaders will comprise data created, managed, and analyzed in edge environments by 2023.ⁱⁱ

Companies who harness data to derive value through data-driven decisioning are differentiating themselves. And driving business outcomes by generating new and deeper insights that inspire innovation, smarter decision making and more efficient operations. These companies leverage insights to understand customers more deeply and transform the business to serve them better. They can uncover new opportunities and exploit them faster than competitors.





Cloud is the only place
where data gains scale,
agility, and the power to
drive reinvention



Why the cloud makes data more valuable

To handle high volume and variety of data from many disparate sources, you need a modern data foundation. A modern data foundation can be built anywhere, but it is best suited to reside on cloud.

The fact is, all the most advanced tools for understanding, analyzing, and consuming data are predominantly available on the cloud. And new capabilities are continually being developed by all the major cloud providers. That's one reason organizations that move their data and analytics to the cloud are outpacing their peers in revenue growth, according to recent Accenture research.ⁱⁱⁱ

Cloud-based architectures and platforms enable all types of data to come together in one place as a powerful collective resource for the entire enterprise—and at massive scale yet with lower total cost of ownership and better quality. Cloud also allows you to ingest data from internal and new external sources in real time, get all that data to work together, and then use analytics, AI, and automation to adapt data for all kinds of use cases.

A modern cloud foundation makes data accessible, trustworthy, and analysis-ready, at speed and at scale

To unleash the true potential of data on cloud requires having the appropriate culture, talent, processes, and technology elements. In this article, we'll focus primarily on the technology needed to enable data-led transformation: the data foundation.

So, what is a data foundation? A data foundation consists of frameworks, capabilities, tools, and services that efficiently and effectively store, process, manage and serve data. A strong data foundation should provide easy and timely access to integrated, trusted and analysis-ready data at scale.

For most companies, the power of data is constrained by an inadequate or nonexistent data foundation. As a result, data is locked in legacy, on-premise platforms that are often siloed, making it difficult, if not impossible, to get different types of data to work together. It makes it even harder for business users to find and consume all the right data they need to arrive at the appropriate decisions.





Deriving the desired business value from data requires the data foundation to be modernized— enabling data to be broken out of legacy silos so it can be unified in the cloud, across different dimensions and processed with cutting-edge analytical tools. This requires the right storage, the right warehouses, the right compute, the right access—all in the cloud—to enable agile data capabilities that drive business outcomes.

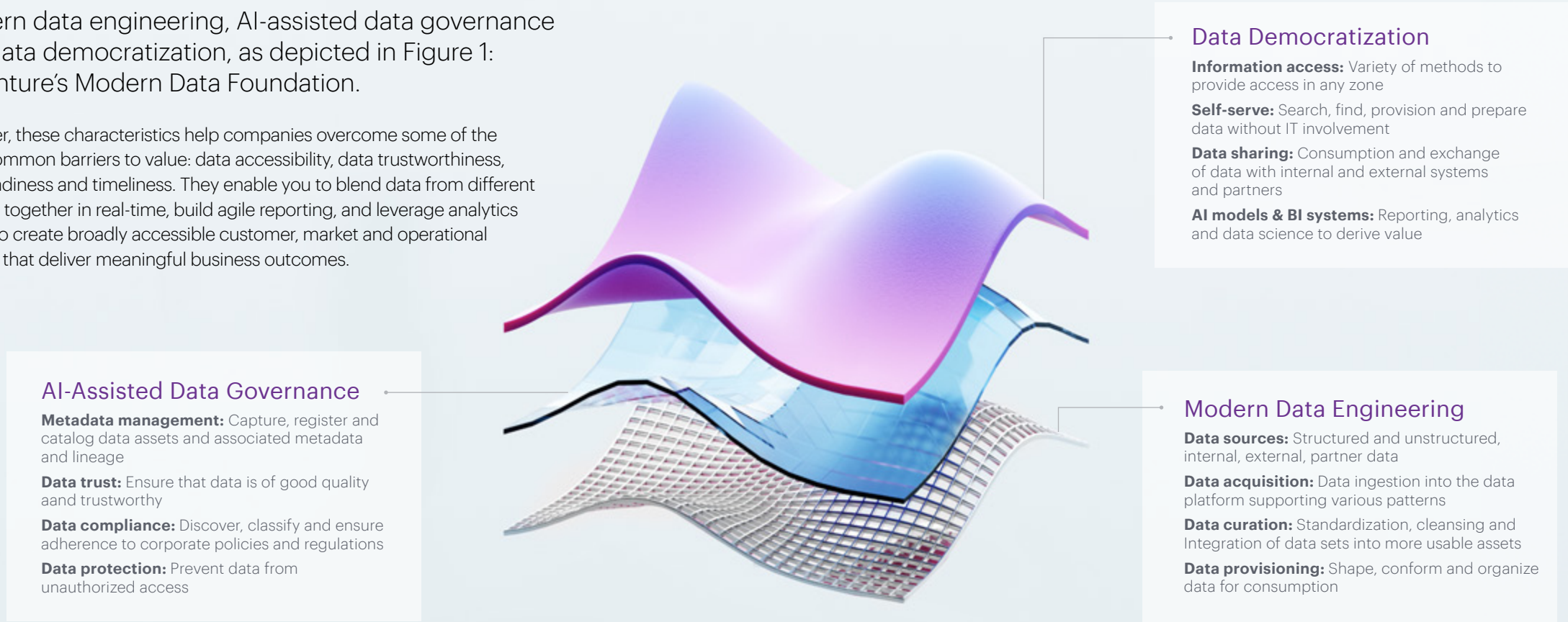
Getting it all right is exactly what the West Midlands Police (WMP) did. WMP is the second-largest force in England outside of London and serves nearly 2.8M people. WMP has an unmatched commitment to using data by building and relying on a modern, scalable data foundation. Utilizing AWS, the WMP data foundation helps to provides accurate information on people, crime and trends, and is easily accessible via smart phones. More importantly, officers have data they can trust, at their fingertips. The solution was designed to automatically reload fresh data from legacy systems every few hours which is critical any time, but especially when lives are at stake.^{iv}

So is the case when planning for scenarios in different industries and pilots for industrial intelligence operations and retail innovation for Lushang Group. This state-owned, cross-industry industrial company faced multiple challenges from digital disruption and needed to respond to the government's call for digital transformation. Along with Alibaba, they created a big data operation center, integrated data assets, and launched a data mid-platform.^v

What makes a data foundation modern?

A modern data foundation has three core characteristics: modern data engineering, AI-assisted data governance and data democratization, as depicted in Figure 1: Accenture's Modern Data Foundation.

Together, these characteristics help companies overcome some of the most common barriers to value: data accessibility, data trustworthiness, data readiness and timeliness. They enable you to blend data from different sources together in real-time, build agile reporting, and leverage analytics and AI to create broadly accessible customer, market and operational insights that deliver meaningful business outcomes.



AI-Assisted Data Governance

- Metadata management:** Capture, register and catalog data assets and associated metadata and lineage
- Data trust:** Ensure that data is of good quality and trustworthy
- Data compliance:** Discover, classify and ensure adherence to corporate policies and regulations
- Data protection:** Prevent data from unauthorized access

Data Democratization

- Information access:** Variety of methods to provide access in any zone
- Self-serve:** Search, find, provision and prepare data without IT involvement
- Data sharing:** Consumption and exchange of data with internal and external systems and partners
- AI models & BI systems:** Reporting, analytics and data science to derive value

Modern Data Engineering

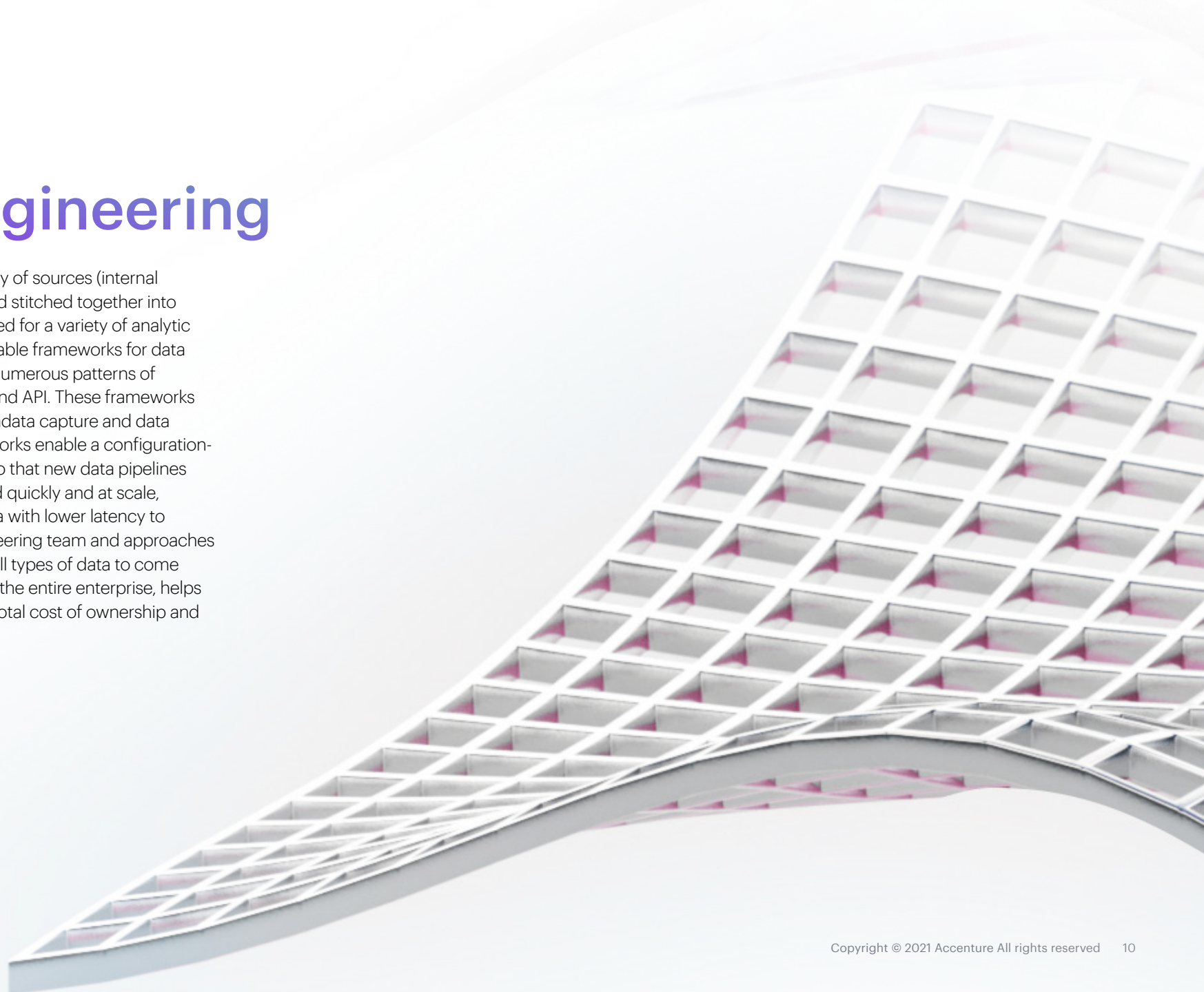
- Data sources:** Structured and unstructured, internal, external, partner data
- Data acquisition:** Data ingestion into the data platform supporting various patterns
- Data curation:** Standardization, cleansing and integration of data sets into more usable assets
- Data provisioning:** Shape, conform and organize data for consumption

Figure 1: Accenture's Modern Data Foundation

MODERN DATA FOUNDATION

Modern Data Engineering

In a modern data foundation, data is acquired from a variety of sources (internal and external) in a variety of ways (batch, real-time, APIs) and stitched together into highly curated and reusable data sets that can be consumed for a variety of analytic purposes. Specialized data engineers should develop reusable frameworks for data ingestion and ETL (Extract, Transform, Load) that support numerous patterns of data, such as mainframe, XML, JSON, CSV, stream based and API. These frameworks also handle rules for data quality and standardization, metadata capture and data classification as part of data pipeline activities. The frameworks enable a configuration-driven approach to data ingestion and ETL/data curation so that new data pipelines for analytic use cases and data products can be developed quickly and at scale, leveraging cloud services. These pipelines help deliver data with lower latency to increase analytics speed. With the appropriate data engineering team and approaches in place, cloud-based architectures and platforms enable all types of data to come together in one place as a powerful collective resource for the entire enterprise, helps in making data accessible at massive scale yet with lower total cost of ownership and better quality.





MODERN DATA FOUNDATION

AI-Assisted Data Governance

Cloud-based AI tools bring the advanced capabilities and scale to help automatically cleanse, classify, and secure data in the cloud as it is ingested to support better quality, veracity, and ethical handling. To realize effective data stewardship, many companies need training and policies, supported by self-help tools, and enforced with data access controls and firewall protections. To support data ethics, cloud-based AI and automation can help govern how data is collected, stored, accessed, and managed over its lifespan. Advanced cloud technologies make it easier to catalog data so it is better understood and can be appropriately classified. It even reveals biases embedded in the data sets. In short, the advanced tools available on cloud should give you confidence in the quality and trustworthiness of your data.

MODERN DATA FOUNDATION

Data Democratization

A modern data foundation gets more data into more hands. It makes data accessible and easy to use in a timely manner, while feeding multiple consumption models (self-serve, AI models, BI systems, data scientists, etc.). The latest cloud-based tools democratize data and empower more people across your enterprise to easily find and consume data that's relevant to their specific business needs—faster. Cloud not only makes data more accessible and trustworthy but allows it to arrive analysis-ready. This is because the most advanced tools for understanding, analyzing, and consuming data are predominantly available on the cloud. And new capabilities are continually being developed by all the major cloud providers, meaning the most exciting and interesting breakthroughs are happening on the cloud. The tools and technologies available on the cloud enable you to get much more value from data. You can combine more types of data—in real time and at scale—and apply advanced technologies like AI and ML in ways simply not possible on premise. Effectively achieving all of this would be unimaginable on legacy platforms. But with a modern data foundation on cloud, you can envision new ways to use data.

Consider Intermarché, the third largest grocery chain in France. They set out to increase their 15 percent market share in a completely new and bold way: by harnessing the power of data. They used a Microsoft Azure Data Factory to collect, mine and analyze data and develop new use cases. These insights were streamed to the stores, enabling them to tailor product assortments to local consumer patterns and expectations.^{vi}

Similarly, a European supermarket knew that keeping up with fast-changing food tastes wasn't enough to keep customers satisfied. It needed to stay one step ahead by predicting what foods customers would want—before they had their first craving. Leveraging Google Cloud, the company designed a smart food trend solution on the Google Cloud Platform. It analyzed hundreds of millions of data points, including social media content, to inform their ranging, assortment, and merchandising decisions. Actionable insights and detailed customer intelligence now enables chefs, buyers, product innovation specialists, marketers, and others to better serve customers. Most importantly, the new solution enables the company to stay ahead and prepare for changes in consumer demand.



Path to a modern data foundation on cloud

GETTING STARTED:

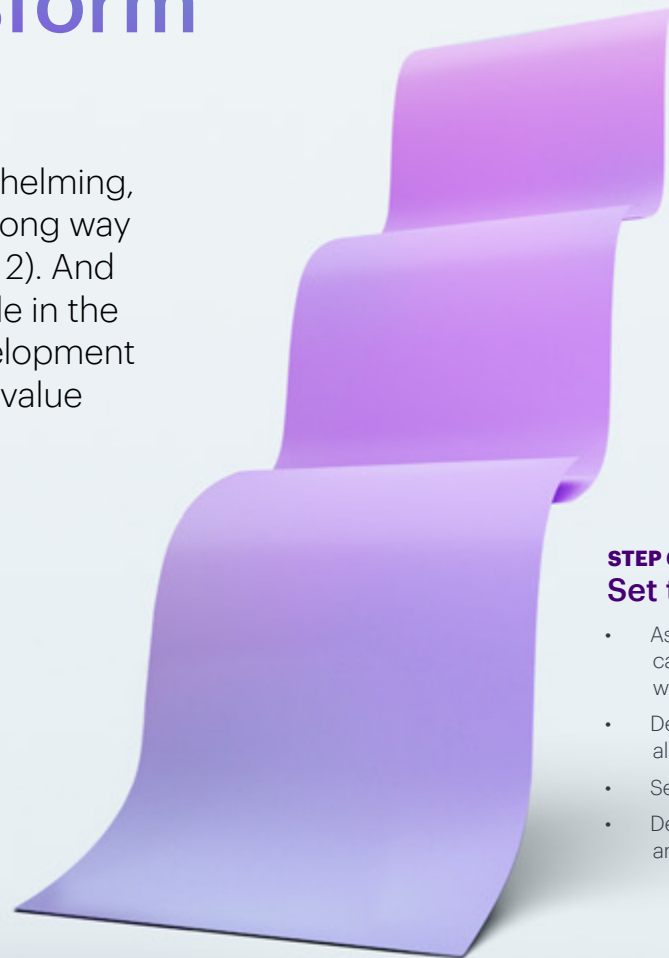
The top 10 questions to answer

Building a truly modern data foundation on the cloud involves a multitude of considerations. Here are the top 10 most important questions that must be answered as you shape a successful modernization program:

- 01 What are the critical gaps and weaknesses in your current data capabilities and how do you mature them further?
- 02 Which cloud service provider(s) should you collaborate with and what cloud model will you operate – single public cloud, multi-cloud, or hybrid-cloud? Which services from the CSPs are the most relevant for you?
- 03 What is the optimal data architecture and the capabilities required to meet your business objectives?
- 04 What data products (pre-integrated, curated data) should you create that will drive down costs for potential future implementations and bring consistency across multiple consumption patterns?
- 05 Should you re-host, re-platform or re-engineer current data, processing and consumption workloads to the cloud?
- 06 What data governance is needed to ensure data quality and that data is handled securely and in compliance with corporate and regulatory policies?
- 07 How do you democratize data and enable self-service?
- 08 What external data is needed to generate new insights? How can it be captured in a more timely or real-time manner?
- 09 What roles and skills are needed to successfully build and operate the data foundation in cloud? Do you have those in-house or do you need to collaborate with an external provider?
- 10 Do you have a data product mindset and orientation within the organization? If not, what do you need to do to get started?

Three steps to transform data on cloud

Tackling these top 10 considerations can feel overwhelming, but thoughtful planning and prioritization can go a long way to simplifying the many choices to be made (Figure 2). And teaming with an experienced partner knowledgeable in the complexities of the journey can accelerate the development of your modern data foundation and ultimately, the value derived from it.



STEP 03: **Operate and Optimize**

- Automate data governance
- Infuse AI/ML into data management
- Automate processes for data operation (dev ops/sec ops)

STEP 02: **Make the Move** **Migrate and Modernize**

- Stand up cloud services
- Build your data foundation
- Migrate, as needed, from on-prem
- Build, as needed, new data products

STEP 01: **Set the Stage**

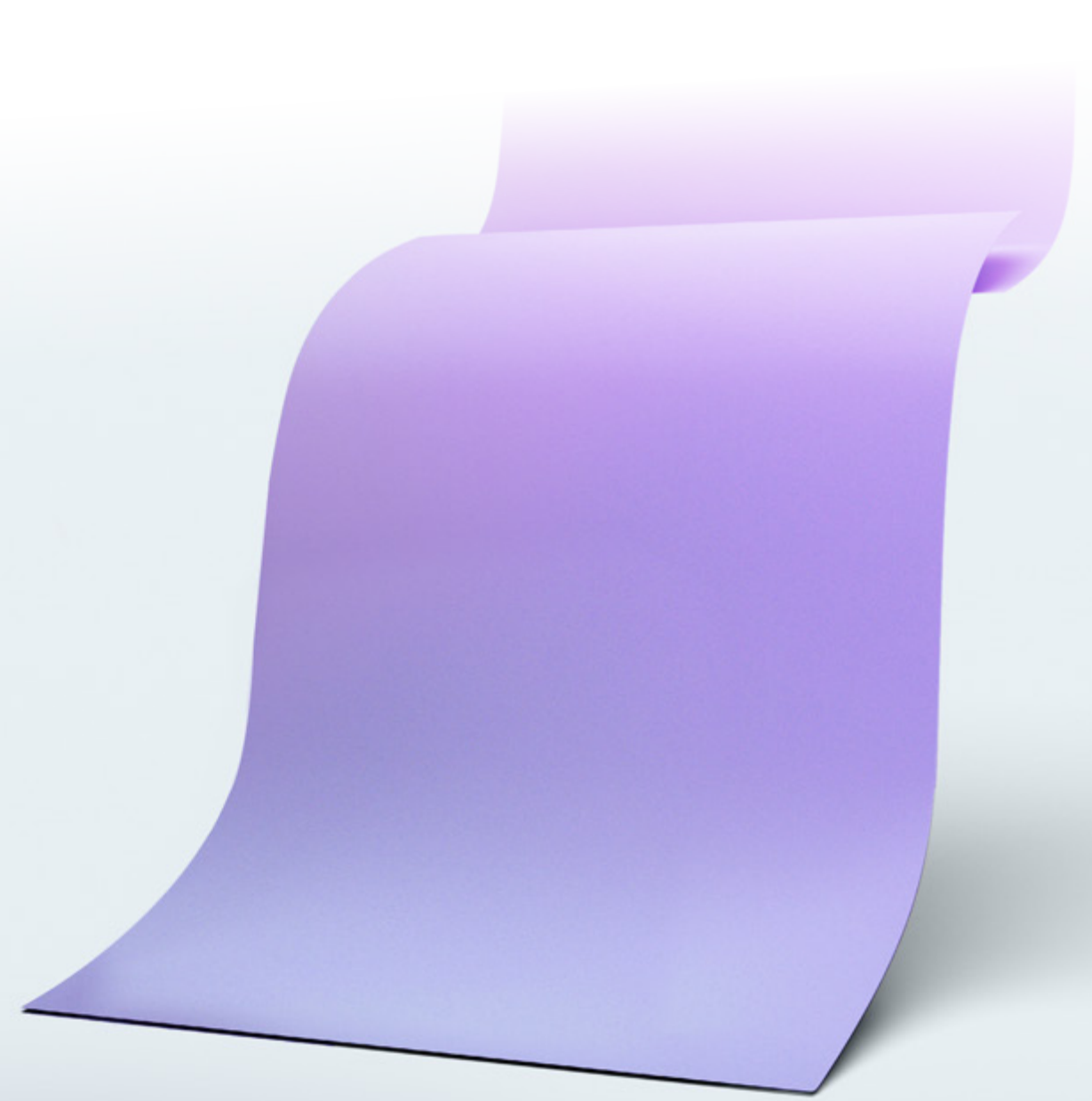
- Assess your current data maturity and capability to understand strengths, weaknesses, gaps, and opportunities
- Develop a comprehensive data strategy aligned with your business strategy
- Select CSP(s)
- Develop the appropriate architecture and roadmap

Figure 2: Steps to transform data on cloud

STEP 01: Set the stage

The first step in this journey is to evaluate your current data platform and its strengths and weaknesses. The gap(s) between this as-is assessment and the future desired state will help determine the key components for your new data strategy. There is no single data migration strategy that works for every organization, but the more successful migrations are those following a well-developed enterprise data strategy. This means simultaneously understanding the baseline characteristics needed by the data foundation to help deliver the targeted business outcomes while meeting necessary performance and security requirements. Not all data will have the same value in the cloud, so it's important to stratify and prioritize the portfolio in a way that realizes the most value from the migration as quickly as possible. This means balancing factors like strategic business relevance to your industry against its migration complexity and risk. This process will reveal the quick wins for the migration, plus a prioritized portfolio for planning potential future migration waves. [Accenture's 7Rs approach](#) provides a framework for systematically determining the appropriate target state disposition, be it re-host, re-platform or re-factor – for current data, processing, and consumption workloads.

Selecting the appropriate cloud service provider (CSP) is critical. While each hyperscaler offers the infrastructure and data platforms needed to develop a data foundation and various supporting services, choosing the CSP(s) that best fit your needs can depend on a number of parameters. This decision can be driven by strategic elements such as technology fit with the company's current IT estate or the potential for strategic alliances. Conversely, the decision may be driven by more tactical aspects such as technical feature and function strengths (e.g., analytics) or geographic fit to support data sovereignty requirements. Choosing the right CSP(s) will ensure your data migration is designed with the broader strategic business objectives in mind, prioritized to accelerate value, executed with the support of the appropriate tools and skills, and then optimized quickly to capture higher order levels of value while mitigating risk.





Once you've defined priorities and target state dispositions with your CSP(s) of choice, you need to develop an architecture (Figure 1) that helps to deliver the required capabilities and performance. It's critical to understand all the interdependencies between architecture, data, and applications, creating "families" of related workloads which need to be migrated together. It's also important to understand that not all aspects of a modern cloud foundation can be developed at once. So, creating a roadmap of capabilities for immediate development and those that will be introduced over time will enable the enterprise to extract value today while laying the groundwork for even greater value in the future.

STEP 02:

Make the Move

Migrate and Modernize

Once a thoroughly considered plan aligned to the business strategy is in place, it's time to execute the data migration. To help accelerate the secure transition to cloud with confidence and minimize disruption to business as usual requires leveraging your experienced providers, applying industrialized capabilities and addressing security from the start. That means maximizing automation and using organizational structures like a dedicated migration factory, as well as migration tooling leveraging AI, to drive the journey all the way from source to destination. As such, it's important to develop reusable frameworks for data ingestion, ETL, metadata, data quality, security, and orchestration. Further, use of configuration-driven frameworks allow for the rapid ingestions, integration and processing of data for broad consumption. Many companies look to the hyperscalers or providers such as Accenture to help accomplish this, leveraging their experience and know-how to identify potential barriers and overcome them. Automated tools like Accenture's [myNav®](#) can be critical in providing a higher degree of certainty that your migration will succeed at pace.

Today, security and compliance risk are ever-present concerns. As a result, it pays to be thoughtful about data need, use, access, encryption, and storage for now and the future. With this in mind, security teams should be intimately involved in a migration from the very beginning. That includes defining platform-level and application-level controls, approving cloud architecture choices, and identifying the candidates for native security automation.



The extent of modernization needed to support an agile data foundation is entirely dependent on its unique context. The more modernization to current data, processing and consumption workloads you do, the greater the ultimate value you can achieve. But, equally, the greater the cost, time, and complexity you'll need to manage. If a database has an application tied to it, modernizing the two together should be a given. But you should also think about the bigger data picture, including any analytics platforms you're using to generate business or customer insights. These may need to be modernized in the cloud too.

When it comes to data, there are two principal modernization approaches to consider. The first is driven by use case—define your particular analytics objectives and migrate and modernize the supporting data sets accordingly. The second is driven by future value to the business—identify the key data sets in the business, consolidating and structuring disparate data sets in the cloud with the confidence they will be central to your potential future analytics needs, irrespective of present use cases.

The advanced data analytics and automation tools available on cloud can shape data to fit nearly any type of application or use case—at scale. Data on cloud also allows you to take advantage of these advanced cloud-based tools and capabilities and deliver the power of a modernized data foundation, and the value it can bring to everyone in your organization.

STEP 03:

Operate and Optimize

Managing a modern cloud-based data foundation is inherently different than for traditional on-premise models. For example, standardization and automation become critical components. Continuous optimization is also necessary because constant change is one of the defining qualities of being in the cloud. For data to be used as valued capital across your enterprise, people must trust the data. Ensuring data quality and trustworthiness has long been one of the main challenges for companies, especially as the volume and diversity of data grows over time. That's because the way companies traditionally managed data was human-led and not easily scalable. Cloud can be much more secure than a proprietary data center, but security teams need the skills and tools to do so on each cloud platform the organization is using. For many, leveraging the security expertise of an external provider and the cloud provider will be key to getting data security improved.



MODERN DATA ON CLOUD IN ACTION

A multi-national quick service restaurant needed to build a cloud data platform across vendors to provide the franchisees with insights on their people to drive operational improvements and enable business growth, allow its human resources team to quickly and securely access people data at scale, while establishing legal separation between the company's data and that of its franchisees. They migrated legacy data using a "lift & shift" approach and consolidated more than 14 disparate source systems into a scalable, cloud-native data foundation. They built a metadata-driven ingestion framework using native Spark to onboard data without custom coding to create robust quality reporting. Today, they have an enterprise people platform with cross-domain data capturing all aspects of employee hiring, training, day-to-day operations, wages and retention. The solution handles half a billion records of data from over 30,000+ restaurants on a daily basis. It also helps to connect the dots on employee hiring, training and satisfaction, stores performance metrics, and understand the impact of employee turnover on business profit and loss.

CONCLUSION:

Business growth & transformation can start with a modern data foundation on cloud

The most fertile ground for exponential value is realized when you leverage data to reinvent your business, develop new industry business models, apply advanced technologies, and drive new levels of value through your partner ecosystem. Remember, data's worth depends on its accessibility and application. To harness the power of data, companies should first take steps to modernize their data foundation in the cloud so customers, suppliers and employees can operate with data at their fingertips.

If you want your company to operate with speed, agility and scale, empower human ingenuity, enrich customer relationships, tap into new markets and compete effectively, now is the time to embrace a modern data foundation on cloud. In short, modernizing your data foundation and running your data, associated processes and consumption workloads on the cloud is the key to transforming your business to grow, innovate and generate sustainable value.

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