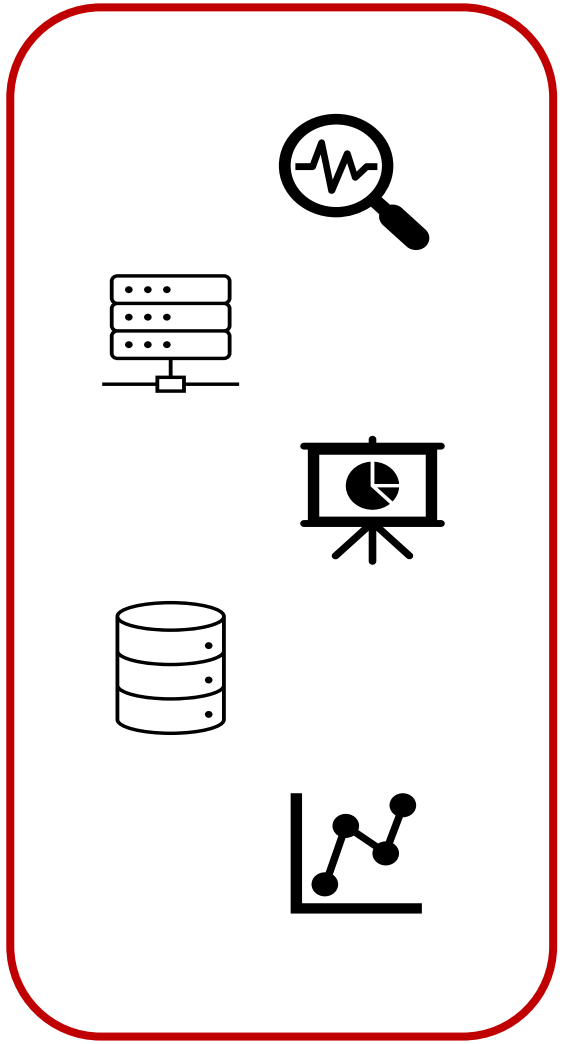
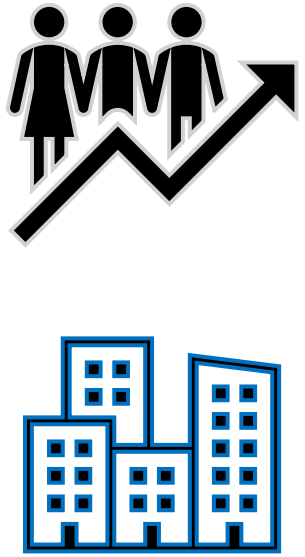
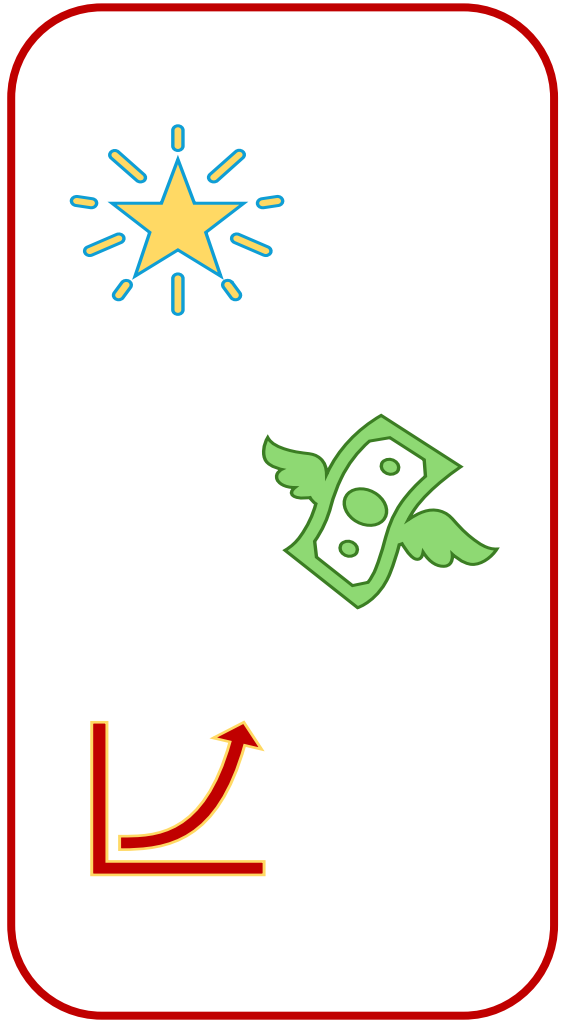
Comparison of On-Premises and Cloud Data Management

Transitioning Towards Cloud-Based Solutions

Modern Businesses Rely Heavily on Data-Driven Decisions







Importance of Data and Data Management

- In the modern digital economy, businesses now have access to an unprecedented amount of data. This **wealth of information** forms the **bedrock of intelligence** crucial for making **significant business decisions.**

- To guarantee that **employees are equipped** with the appropriate data for these decisions, it's imperative for companies to invest in data management solutions that enhance visibility, reliability, security, and scalability.

- With organizations **generating and using data** at unparalleled rates, data management solutions have become critical in navigating and understanding the immense **volumes** of information.

Strategic Pivot: The Three Vs of Data

- Businesses are increasingly defined by their ability to manage and leverage data characterized by the 3Vs: **V**olume, **V**elocity, and **V**ariety

  (a 4th V, veracity is non-negotiable as well!)

- As organizations strive to harness the strategic value of data, they encounter the **physical and logistical limitations of traditional on-premises data management** infrastructures, especially when it comes to handling high volumes of data.

- The **cloud** paradigm, with its inherent **scalability**, **flexibility**, and **efficiency**, offers a readily-implementable infrastructure that can **adapt** to the growing amount of data, without the need for extensive capital expenditures or the risk of underutilized resources.

- The shift from traditional to a cloud-based data management is not **merely a technological** upgrade but a **strategic necessity** for organizations if they wish to remain **competitive and agile** in an increasingly data-driven world.

Cloudy Yet Weathering Through Unexpected Storms

- "Cloud computing will continue to be a bastion of safety and innovation, **supporting growth during uncertain times** due to its agile, elastic and scalable nature."

- "Once applications and workloads move to the cloud they generally **stay there**, and subscription models **ensure** that spending will **continue** through the term of the contract and most likely well beyond. For these vendors, cloud spending is an annuity – **the gift that keeps on giving**."

Table 1. Worldwide Public Cloud Services End-User Spending Forecast (Millions of U.S. Dollars)

	2021	2022	2023
Cloud Business Process Services (BPaaS)	54,952	60,127	65,145
Cloud Application Infrastructure Services (PaaS)	89,910	110,677	136,408
Cloud Application Services (SaaS)	146,326	167,107	195,208
Cloud Management and Security Services	28,489	34,143	41,675
Cloud System Infrastructure Services (IaaS)	90,894	115,740	150,254
Desktop-as-a-Service (DaaS)	2,059	2,539	3,104
Total Market	**412,632**	**490,333**	**591,794**

BPaaS = business process as a service; IaaS = infrastructure as a service; PaaS = platform as a service; SaaS = software as a service

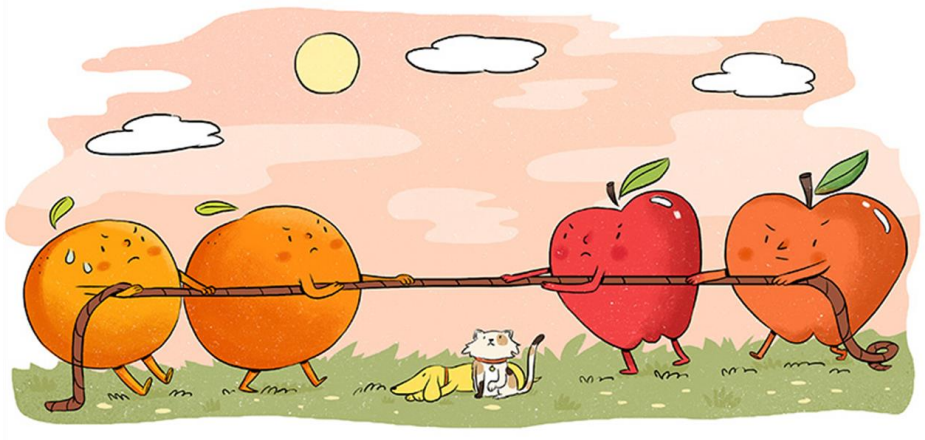
Note: Totals may not add up due to rounding.

Source: Gartner (October 2022)

Rising to the Challenge

Literally and Figuratively

Changing Landscape of Data and its Use		
On-Premises	**Feature**	**On-Cloud**
Structured, Manageable, Simple	Data Type	Unstructured, Semi-Structured
Stable and Predictable	Computing Needs	Advanced, AI/ML, real-time model deployment
Operational reports, analytics	Data Use	Globalization, remote, real-time
Sovereignty utmost important	Security	Advanced solutions allaying previously existing fears
Physical, autonomous	Control	Provided by provider, part of contract
Early-stage, controlled growth, stable business and customer base	Growth-Focus	Fast deployment, enter new markets, quickly and cheaply experiment new products/ approaches
Stable and predictable long-term needs	Costs	Pay-As-You-Go model offers $ efficiency on scale



This or That?

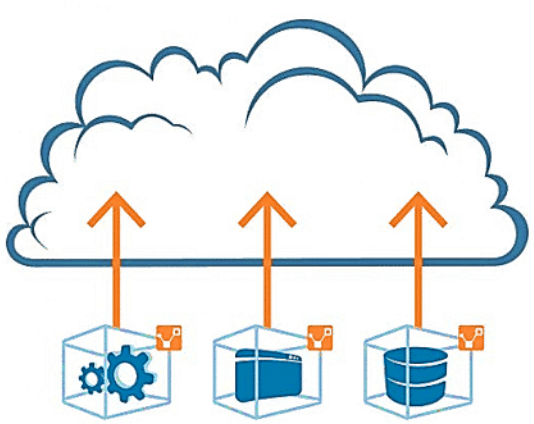
On-Premises			On-Cloud	
Pros	**Cons**	Aspect	**Pros**	**Cons**
Complete control over physical infrastructure, allows custom configurations.	High upfront investment in hardware and space; ongoing maintenance.	**Infrastructure and Maintenance**	No physical data centers; infrastructure managed by cloud provider	Dependent on provider's infrastructure decisions and changes
Predictable costs after initial investment; no costs for data access.	High initial expenditure (CapEx); ongoing costs for upgrades and maintenance.	**Co$t**	Low operational expenditure with pay-as-you-go models (OpEx)	Unpredictable costs; additional fees might apply
Customizable, without any provider constraints	Limited by existing infrastructure and tecnhical resources	**Flexibility**	High; numerous choices of resources and services	Locked-In based on provider options
Tailored to business-specific needs and regulations	Org is solely responsible for security and compliance	**Security Measures**	Benefits from provider expertise and distributed responsibilities	Heavily relies on trust- and compliance-based
Direct control	Needs continuous efforts and costs to ensure proper gov & compliance	**Governance and Compliance**	Providers offer tools and services for management of DS&G	Responsibility still lies with org to ensure provider offerings meet requirements
Major advantage where speed is non-negotiable	Challenge if fast access from multiple distributed sources needed	**Latency**	Globally distributed infrastr, edge computing, CDN aim to minimize lag	Bandwidth and connection can make-or-break

No One-Size: Unique Needs

- Both on-premise and on-cloud data management practices have their respective pros and cons. The **choice depends on a variety of factors**, including the willingness to invest and nature of data being handled.

- Primarily, a reduction or preferable absence of **third-party access and control to sensitive data** is a major driver:
  - Educational institutions
  - Research and **defense** organizations
  - Insurance agencies

- In other cases, a simpler and compact on-premise data management infrastructure will suffice, and on-cloud might be **overkill**:
  - Small and medium enterprises
  - Private, local businesses and stores



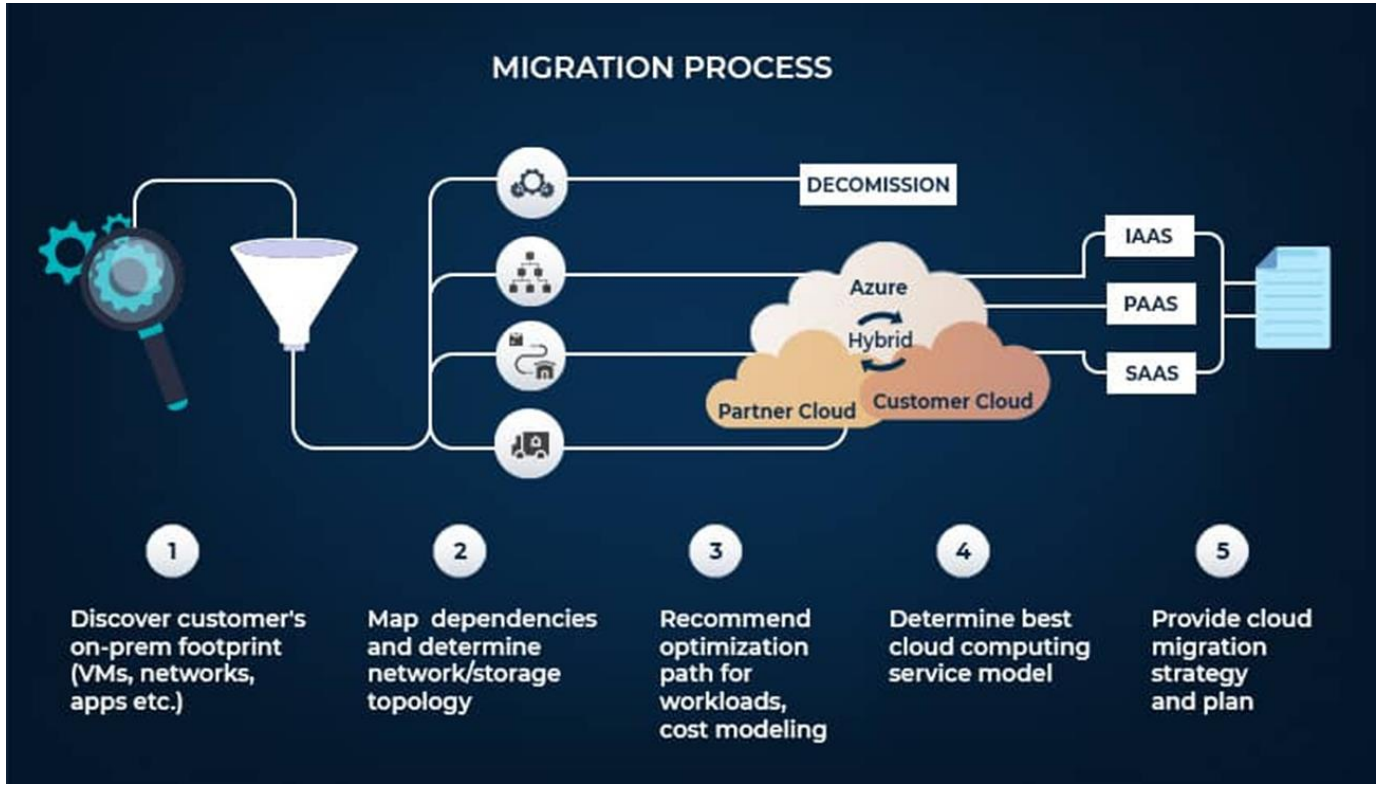
Transitioning

Digital Transformation: Cloud Migration

- Facilitates **creation** of new, or **modification** of existing business processes, culture and customer experiences to meet **changing business and market requirements**.

- **Complex process** that requires careful consideration of several **challenges** and considerations
  - Compatibility
  - Data migration
  - Security and compliance
  - Costs
  - Performance
  - Staffing and skills

** list neither comprehensive nor categorical – unique to each business and application

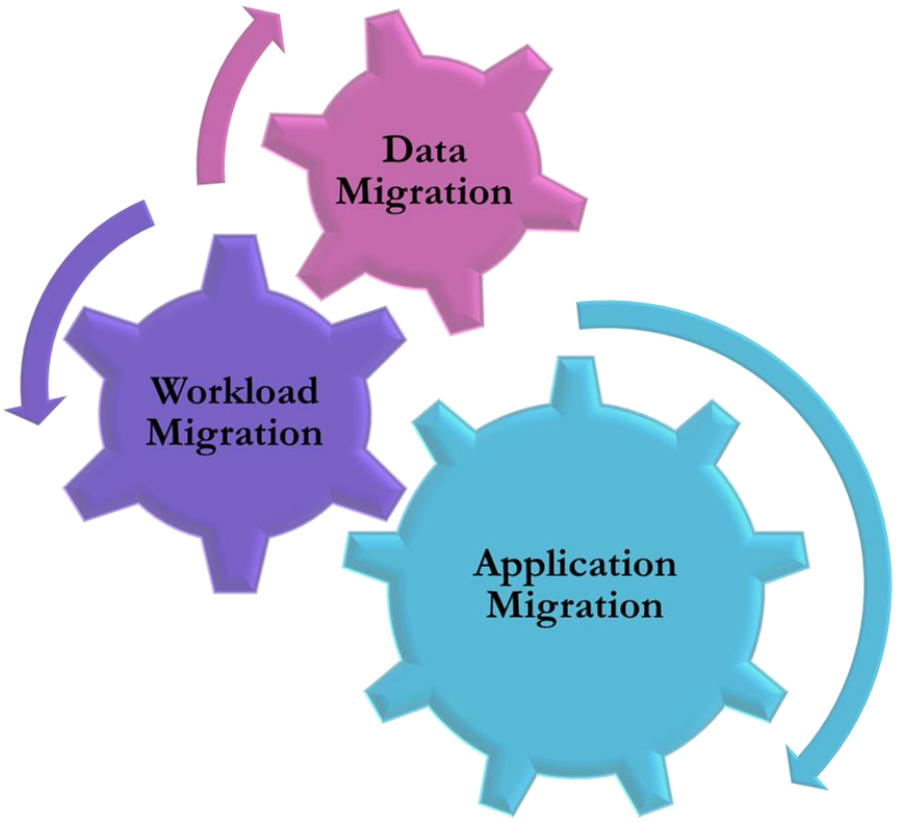


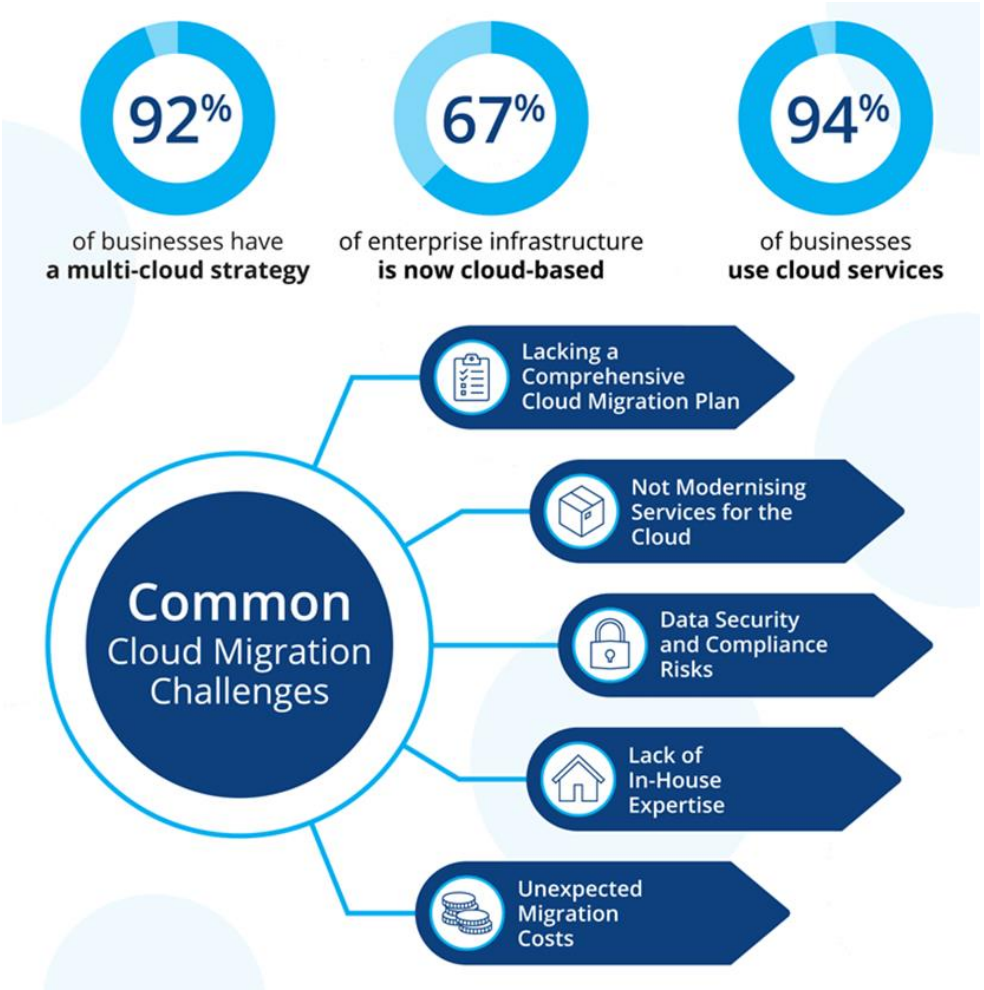
Data Governance in Cloud Migration

On-Premise	Aspect	On-Cloud
• Managed within the organization's internal networks and servers, with direct control over where and how data is stored. • Policies and procedures are developed in-house	**Data Inventory and Classification**	• Extends beyond physical servers to include cloud storage options, requiring visibility and control over data spread across multiple cloud services • Must consider cloud-specific risks, automated tools for inventory management and classification
• Implemented on internal networks, with physical and network-based security measures. • Control of user access and permissions can be IT-centralized	**Data Access and Control**	• Needs cloud-based access technology • Typically involves handling multiple cloud services as well as on-premise platforms in a unified manner
• Focused on internal data sources, uses in-house tools and policies • Limited to only what's in direct org control	**Data Quality and Integrity**	• Distributed systems need more sophisticated tools • Continuous monitoring across all platforms
• Automated or manual processes for data retention and archives • Limited by physical / space constraints	**Data Lifecycle Management**	• Automated ETL, ELT and CRUD workflows • Scalable options based on volume and need
• Within org network, controlled and managed based on business needs • Access and compliance are internally managed	**Data Flows**	• International data transfers not an issue, provided compliance with regulations • Relies on providers global framework

** Some aspects relate to on-premise handling of data quite differently if format is physical (paper/ discs)

Process, Challenges and Strategies





1. Data Security and Compliance

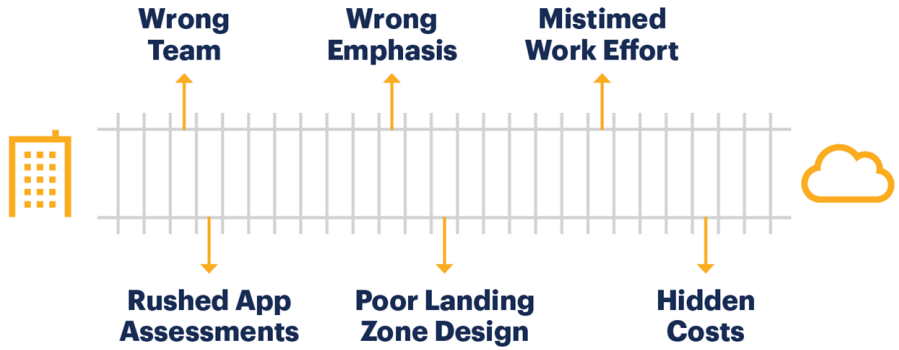
- A **bad migration strategy** could **slow** the processes down, at best. At worst, a business risks **irreversible data loss or security vulnerabilities**.
- Data compromises during the migration process or inefficient access and control over sensitive data can be a major concern.
- Most cloud services are inherently secure, but it **depends largely on the integrity of the service provider**.

Overcoming challenges:

- Running the data through a **secure** route within the **firewall** during migration
- **Encrypting** the data can add an extra layer of assurance
- Making sure that the strategy follows **industry compliance standards** : **CaaS** tools offered by provider
- Data **anonymization** or **pseudonymization** where necessary to enhance **privacy**: GDPR, CCPA compliance
- Regular security and compliance **audits** and developing an **incident response plan**

2. Cost Assessments

- A successful cloud migration can significantly **reduce operating costs in the long term**.
- Organizations can encounter **hidden costs** and expenses associated with
  - bandwidth
  - data transfer
  - Training and re-skilling
  - Vendor lock-in

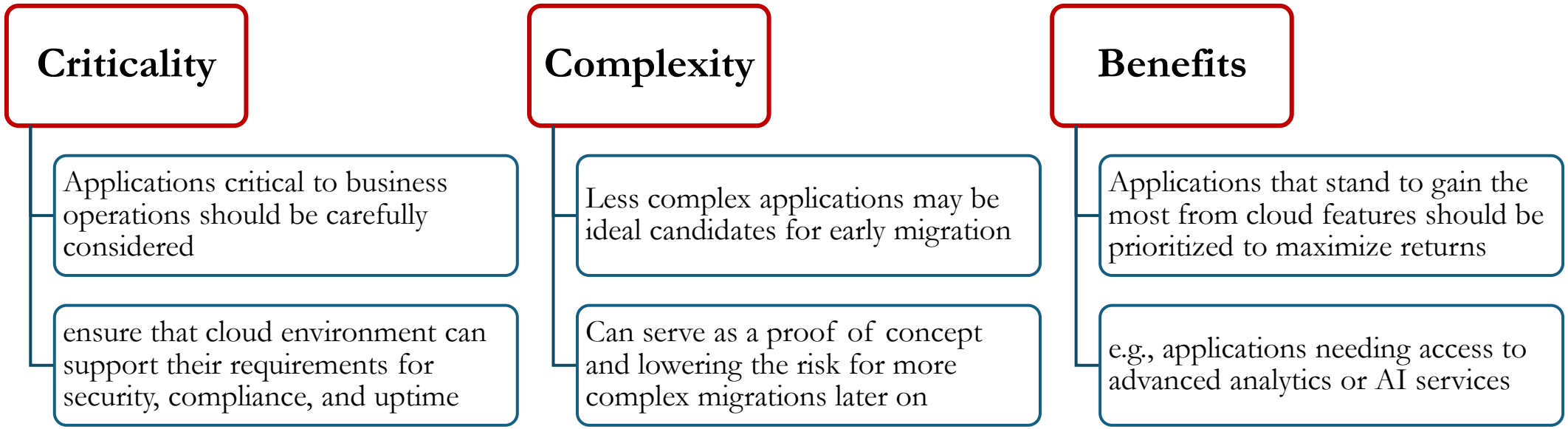


Overcoming challenges:

- Detailed **planning** and **assessment** + system **audit**
  - Evaluate necessary cloud resources based on current on-premise use
  - Use platform's pricing calculator to estimate costs more accurately
  - Choosing right size and auto-scaling to avoid paying for idle resources
- **Batch** adoption – phase-in cloud migration to spread costs over time
- Training and awareness: develop a **cost-conscious culture** across the organization
  - Current staff familiar with legacy systems
  - Ensures continuity and smooth operation during and after transition

3. Assessment and Prioritization

- Important to assess existing applications to determine their suitability for cloud migration and prioritize based on factors such as **criticality**, **complexity**, and expected **benefits**.
  - Identify current applications' architecture, dependencies, and usage patterns
  - Prioritize based on expected benefits – performance and scalability
- **Dependencies and Integration**: Applications with numerous dependencies, including external services, legacy systems, or specific hardware, present a challenge. Need to ensure that all components continue to interact seamlessly in the cloud environment.

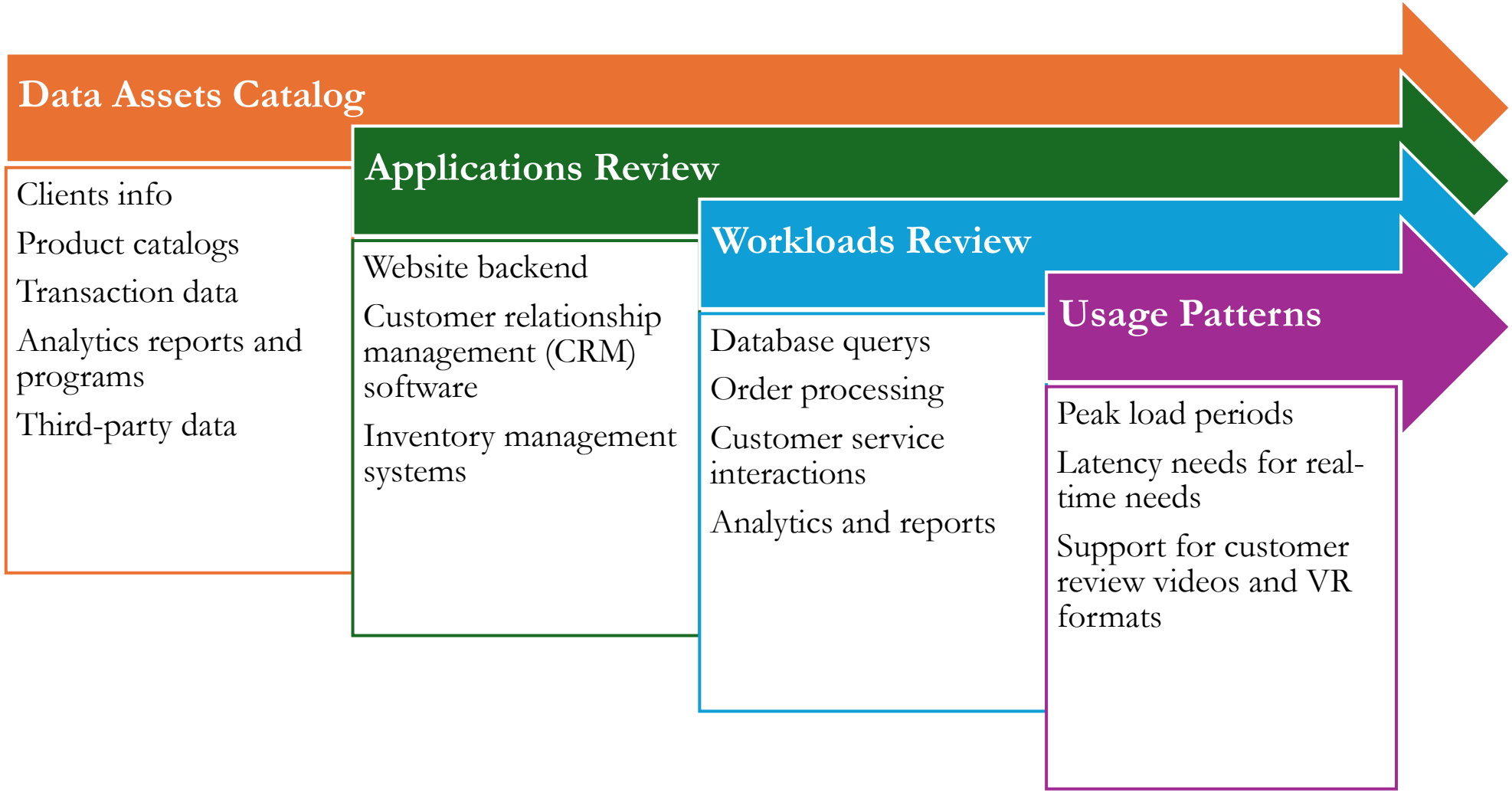


Hypothetical Case Study

MG Corp., LLC

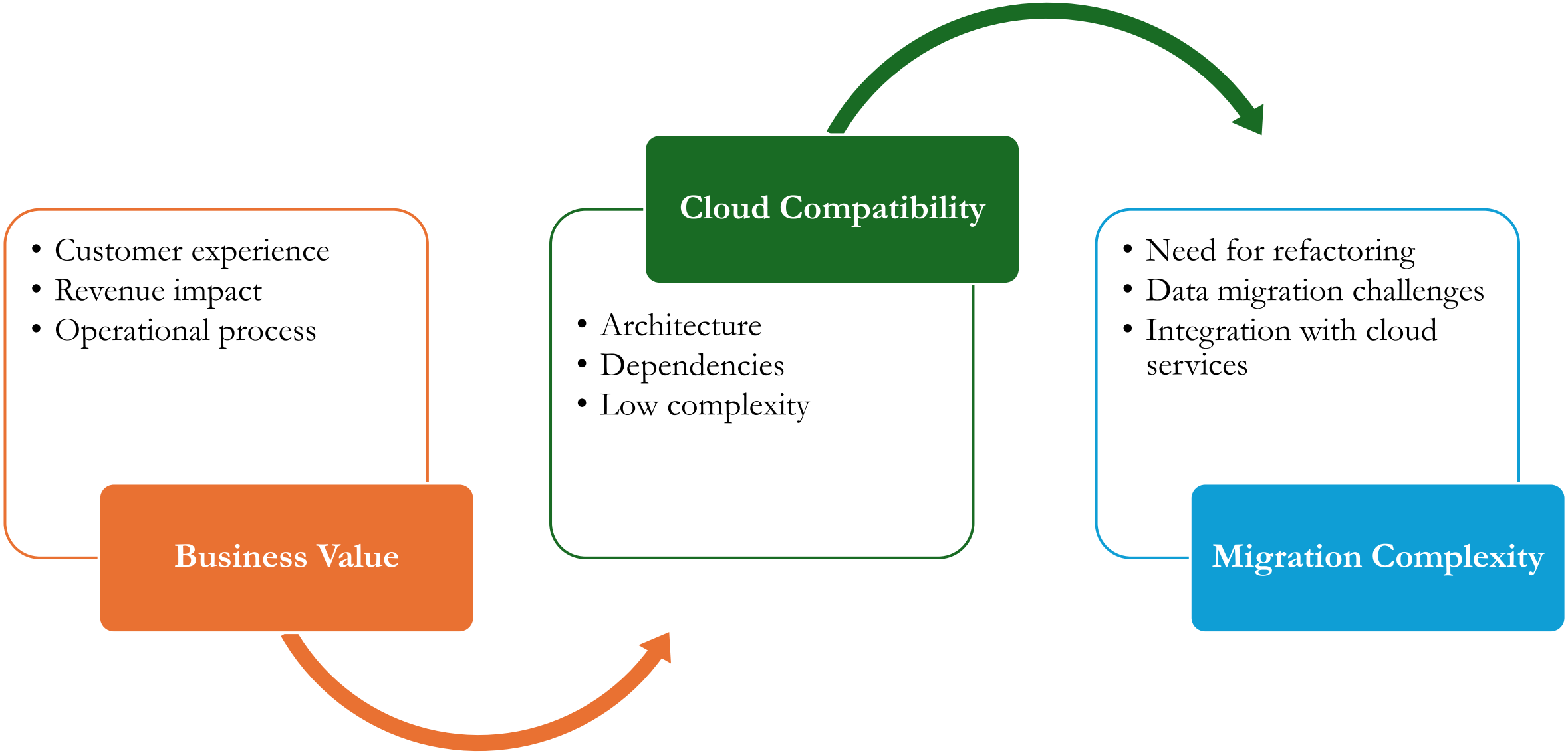
- MG Corp., is a medium-sized e-commerce retailer headquartered in Buffalo, N.Y.
- Diverse portfolio of products and has clients worldwide
- **Data Landscape:** online platform, customer data, seller data, inventory, and analytics
- **Objective**: Adaptation to market dynamics and customer expectations, enhance operational efficiency, reduce costs, and accelerate innovation
- **Scenario:**
  - Intelligent and aggressive marketing strategies paid off; resulting exponential **increase in products** as well as **customer** base
  - Website **slowdown** and **delays** from high traffic
  - Need for **faster deployment**, introduction of advanced algorithms for **demand forecasting**, **customer experience** to include new data such as virtual reality (VR)
- **Criteria:**
  - **Customer satisfaction** – while improving operational efficiency + adaptation to market dynamics
  - **Scalability –** high during peak times, and scale down during off-season
  - **Costs –** limited budget due to relatively smaller enterprise and cautious upper management
  - **Innovation –** new features, technology and predictive/analytics models

Assessing MG Corp's Current Data Infrastructure



* All steps involve business owner, data owners, stewards and IT personnel as appropriate

Identifying Migration Candidates



Checklist: Selecting Cloud Services & Migration Strategy

Cloud Infrastructure Criteria

- Scalability
- Handle peak traffic
- Fast and worldwide deployment
- Robust support
- Time and Span
- Regulatory Compliance

Choice of Cloud Products

- Services offered
- Scale options
- Security measures
- Latency needs
- Global support

Migration Steps

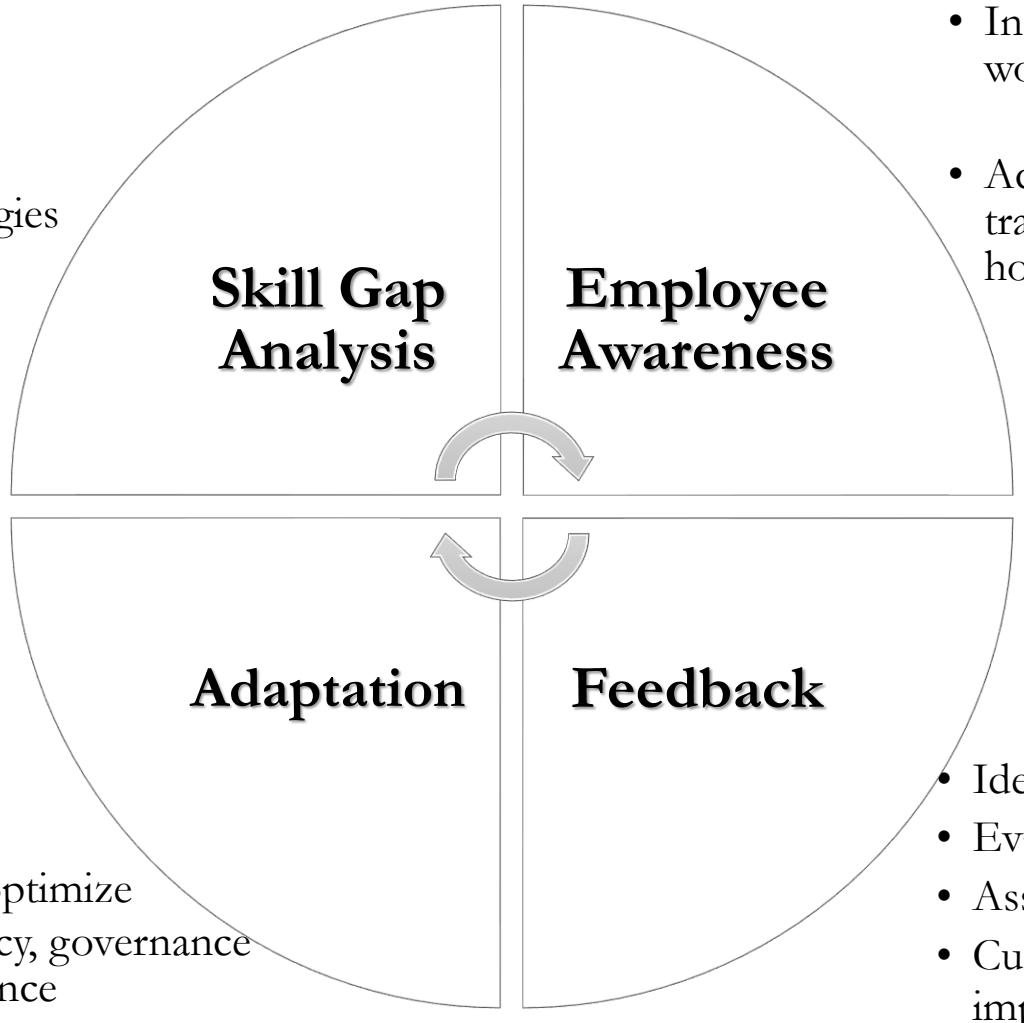
- In phases
- Cross-functional migration teams
- Data stewards' and owners' inputs + IT oversight
- Executive and strategic alignment

Execution

- Incidence response plan in place
- Disaster Recovery
- Less critical applications first
- Stand alone applications earlier
- Core applications: parallel phasing to ensure minimal interruptions

Employee Engagement and Post-Migration

- Surveys and reviews to identify training needs
- Cloud-specific technologies upskilling



- In-house training and workshops
- Access and information on training courses, materials, in-house experts

- Strategic adjustments
- Use ongoing feedback to optimize
- Continuously evaluate policy, governance and architectural performance

- Identify underutilized areas
- Evaluate areas of improvement
- Assess data accessibility and integrity
- Customer feedback and service improvement

Summary & Conclusion

- Migrating from on-premise to cloud-based data management is a critical decision that can result in improved efficiency, cost savings, and significant competitive advantage.
- From a data governance perspective, there will be a significant shift in how data is stored, accessed, and secured: inventory, compliance, lifecycle management and data flow.
- The process requires careful planning, execution, and ongoing management to fully realize its benefits.
- Each step depends on a clear understanding of the organization's goals.
- Success relies heavily on detailed preparation and an active involvement of relevant stakeholders throughout the process.

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