

Data Management Practices in Multinational Enterprise: Strategic Frameworks, Lifecycle Approaches, and Maturity Evaluation Based on the GB/T 36073-2018 Assessment Model

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Abstract: This article explores the critical role of effective data management in multinational enterprises (MNEs) amid challenges like data silos, quality issues, and compliance risks. Utilizing the GB/T 36073-2018 assessment model, it presents a strategic framework for enhancing data governance, quality, and security. The discussion includes practical recommendations and highlights emerging trends such as artificial intelligence and ethical data practices, offering insights for MNEs to leverage data as a strategic asset for competitive advantage.

Keywords: Data Management; Strategic Framework; Maturity Evaluation.

1. Introduction

Data management is essential for ensuring the security, confidentiality, accuracy, and availability of data throughout its lifecycle. It involves various activities, including data collection, storage, processing, and utilization, while emphasizing quality assurance and compliance. In today's data-driven environment, effective data management is recognized as a vital asset that influences an enterprise's competitiveness.

In the context of globalization, multinational enterprises (MNEs) encounter a myriad of complex challenges that complicate their data management efforts. Specifically, MNEs often grapple with:

Data Silos: In many organizations, data is isolated in separate systems or departments, making it difficult to access and share information across the organization, hindering collaboration and impeding informed decision-making [1].

Data Defects: The accuracy, completeness, consistency, and reliability of data are crucial for effective operations. Poor quality data can result in misguided decisions, operational inefficiencies, and ultimately, a negative impact on the organization's bottom line.

Compliance Risks: With legal regulations becoming more stringent, ensuring that an organization's data practices comply with all applicable laws, regulations, and industry standards is of paramount importance. Non-compliance can lead to severe penalties, reputational damage, and loss of customer trust [7].

To address these challenges, MNEs must establish a robust data management framework that enhances governance and leverages data as a strategic asset.

GB/T 36073-2018 (Data Capability Maturity Model, DCMM) serves as the first national standard for data management in China [1], providing both theoretical support

and practical guidance for data governance in MNEs. This model outlines a structured approach to assessing and improving data management practices, enabling organizations to navigate the complexities of data governance more effectively.

The objective of this article is to explore the practical paths for MNEs in data governance, management planning, and lifecycle management, offering insights and actionable recommendations based on the GB/T 36073-2018 model to enhance data management in a complex global landscape.

2. Core Elements of Data Management

Data management is crucial for multinational enterprises (MNEs) to ensure effective decision-making, compliance, and operational efficiency. Proper data management practices enable organizations to leverage data as a strategic asset, driving innovation and competitive advantage.

The GB/T 36073-2018 assessment model provides a structured framework for evaluating and improving data management practices within organizations [1]. It helps organizations assess their capabilities and identify improvement areas across key dimensions, including data governance, lifecycle management, quality, and security, enabling benchmarking against industry standards.

2.1. Data Governance Framework

Data governance is a critical component of effective data management, particularly for multinational enterprises (MNEs) operating in diverse regulatory environments and complex organizational structures. A robust data governance framework ensures that data is managed as a strategic asset, aligning data management practices with business objectives and compliance requirements [6]. The key elements of a Data Governance Framework include [8]:

Table 1. Key Elements of Data Governance Framework

| Element | Description |
|----------------------------|---|
| Roles and Responsibilities | Defined roles such as data stewards, data owners, and governance committees responsible for data management. |
| Data Policies | Established guidelines governing data access, usage, sharing, and retention across the organization. |
| Data Asset Catalog | A centralized repository that provides visibility into the organization's data assets and their usage. |
| Data Quality Standards | Criteria and metrics for ensuring the accuracy, consistency, and reliability of data. |
| Data Security Measures | Policies and practices to protect sensitive data and ensure privacy compliance. |
| Training and Awareness | Programs to educate employees about data governance policies, roles, and best practices. |
| Master Data Management | Processes and tools for managing critical data entities to ensure consistency and accuracy across the organization. |
| Data Standards Management | Establishing and maintaining data standards to ensure uniformity and interoperability of data across systems. |
| Data Analysis Support | Providing tools and frameworks to facilitate data analysis, enabling informed decision-making and strategic insights [4]. |

As organizations increasingly recognize the critical role of data governance in managing their data as a strategic asset, it becomes essential to not only establish a robust framework but also to implement effective practices that ensure its success.

2.1.1. Governance Objectives and Role Allocation

1) Define Clear Governance Objectives: Organizations should set specific, measurable, achievable, relevant, and time-bound (SMART) objectives for their data governance initiatives [6]. For example, a multinational retail company like Walmart has established governance objectives that focus on improving data quality and compliance across its global operations. By setting a goal to reduce data errors by 30% within a year, Walmart can track progress and make necessary adjustments to its data governance strategies.

2) Role Allocation and Accountability: Clearly defining roles and responsibilities is crucial for effective data governance. For instance, a financial services firm like JPMorgan Chase has appointed data stewards within each business unit who are responsible for managing data quality and compliance. These stewards work closely with data owners and governance committees to ensure that data management practices align with the organization's overall strategy. This role allocation fosters accountability and ensures that data governance is integrated into daily operations.

3) Establish a Governance Committee: Forming a cross-functional governance committee that includes representatives from IT, compliance, legal, and business units can enhance collaboration and decision-making. For example, Procter & Gamble has a data governance council that meets regularly to review data policies, assess compliance risks, and address data-related challenges. This committee structure allows for diverse perspectives and ensures that data governance aligns with business objectives.

2.1.2. Data Asset Catalog and Business Collaboration

1) Develop a Comprehensive Data Asset Catalog: Organizations should create a centralized data asset catalog that provides visibility into all data assets, including their sources, formats, and usage [2]. For example, the healthcare provider Kaiser Permanente has implemented a data asset catalog that links clinical data to business processes, enabling healthcare professionals to easily access relevant data for patient care. This catalog not only improves data discovery but also enhances the understanding of how data supports business objectives.

2) Facilitate Cross-Departmental Collaboration:

Encouraging collaboration between data management teams and business units is essential for effective data governance. For instance, the technology company IBM has established cross-functional teams that include data scientists, business analysts, and IT professionals to work on data-driven projects. By fostering collaboration, IBM ensures that data initiatives are closely aligned with business needs, leading to more effective data utilization and improved decision-making.

3) Implement Data Stewardship Programs: Organizations should establish data stewardship programs that empower business users to take ownership of data quality and governance. For example, the consumer goods company Unilever has implemented a data stewardship program where business users are trained to manage data quality within their departments. This approach not only enhances data quality but also promotes a culture of accountability and collaboration across the organization.

4) Leverage Technology for Collaboration: Utilizing technology platforms that facilitate data sharing and collaboration can enhance the effectiveness of data governance. For instance, Microsoft's Azure Data Catalog allows organizations to register, discover, and manage data assets in a collaborative environment. By providing a user-friendly interface for data discovery, organizations can lower the barrier to understanding system data and promote collaboration among teams.

While the best practices outlined in this section provide valuable guidance for establishing an effective data governance framework, it is essential to recognize that each multinational enterprise (MNE) operates within its own unique context. Factors such as industry, organizational structure, regulatory environment, and cultural considerations can significantly influence the effectiveness of data governance strategies. Therefore, MNEs must conduct thorough assessments of their specific circumstances and challenges to develop governance strategies that are not only aligned with best practices but also tailored to their individual needs.

2.2. Data Lifecycle Management

Effective data lifecycle management is essential for multinational enterprises (MNEs) to ensure that their data is properly created, stored, utilized, and disposed of throughout its lifecycle. The DCC (Digital Curation Centre) Lifecycle Model provides a comprehensive framework for understanding the stages involved in managing digital data. This model outlines eight stages [13]:

Table 2. Data Lifecycle Stages

| Stage | Description |
|---------------------------|---|
| 1. Conceptualization | Define the purpose and scope of the data collection, identifying research questions and data types needed. |
| 2. Creation | Generate or collect the actual data through various methods, documenting the data creation process. |
| 3. Evaluation | Assess the quality, relevance, and completeness of the data to ensure it meets required standards. |
| 4. Preservation | Implement strategies for long-term data storage, backup, and protection, along with creating metadata. |
| 5. Sharing | Make the data available for sharing with others, ensuring appropriate access controls and licensing. |
| 6. Reuse | Utilize the shared data for further research or applications, providing clear documentation for effective reuse. |
| 7. Review | Assess the impact and effectiveness of data management practices, using feedback for improvements. |
| 8. Retention and Disposal | Decide on the retention or disposal of data, determining which data to keep for long-term use and which to delete or archive. |

However, in real-world practices, MNEs can simplify the data lifecycle into four key stages:

(1) Data Creation and Collection

In diverse environments, MNEs utilize various methods for data collection, including:

Surveys and Questionnaires: Organizations gather quantitative and qualitative data from customers and stakeholders through structured surveys, such as a global consumer goods company assessing customer preferences.

Sensor Data: MNEs collect real-time data from sensors and IoT devices in manufacturing and logistics, like an automotive manufacturer monitoring production line performance.

Social Media and Web Analytics: MNEs utilize social media and web analytics to track customer behavior and engagement, enabling brands to analyze consumer sentiment and trends.

Transactional Data: Data from business transactions, such as sales records, is vital for MNEs. For example, an e-commerce platform analyzes transactional data to optimize inventory management.

(2) Data Storage and Maintenance

Once data is created or collected, it must be stored and maintained effectively. Best practices for data storage solutions include:

Cloud Storage: Utilizing cloud-based storage solutions allows MNEs to scale their data storage needs efficiently. For example, companies like Amazon and Google offer cloud services that provide secure and flexible storage options, enabling organizations to access data from anywhere.

Data Redundancy: Implementing data redundancy strategies, such as regular backups and replication, ensures that data is protected against loss or corruption. MNEs should establish automated backup processes to safeguard critical data.

Data Encryption: To enhance data security, MNEs should employ encryption techniques for sensitive data both at rest and in transit [3]. This protects data from unauthorized access and ensures compliance with data protection regulations.

Regular Maintenance: Conducting regular audits and maintenance of data storage systems helps identify and resolve issues promptly. MNEs should establish protocols for monitoring data integrity and performance.

(3) Data Usage and Sharing

Effective data utilization across borders is crucial for MNEs to leverage their data as a strategic asset. Strategies for effective data utilization include:

Data Governance Policies: Clear data governance policies ensure responsible data use and regulatory compliance. For instance, a pharmaceutical company may protect patient information while allowing researchers access to anonymized

data.

Cross-Functional Collaboration: Promoting collaboration among departments enhances data utilization. A global technology firm might form cross-functional teams of data scientists, marketing analysts, and product managers to share insights and drive data-driven decisions.

Data Integration Tools: Data integration tools facilitate seamless data sharing across systems. For example, MNEs can use ETL (Extract, Transform, Load) tools to consolidate data from various sources for comprehensive analysis.

(4) Data Archiving and Disposal

The final stage of the data lifecycle involves data archiving and secure disposal. The importance of data archiving and secure disposal methods includes:

Data Archiving: Archiving infrequently used data is essential for compliance and historical analysis. MNEs should implement secure archiving solutions for easy retrieval.

Secure Disposal: Proper disposal of unnecessary data is critical to prevent unauthorized access. MNEs should follow protocols like data wiping or physical destruction of storage devices to ensure sensitive information is irretrievable.

Compliance with Regulations: Adhering to data retention and disposal regulations is vital to avoid legal penalties. Organizations must establish clear policies for retention periods and ensure compliance with applicable laws and standards.

2.3. Data Quality and Data Security

Data quality is a measure of the condition of data based on factors such as accuracy, completeness, consistency, and reliability. To maintain high data quality, MNEs can implement quality assessment metrics and improvement processes, including:

(1) **Quality Assessment Metrics:** Organizations should establish specific metrics to evaluate data quality. Common metrics include:

Accuracy: The degree to which data correctly represents the real-world entities it describes.

Completeness: The extent to which all required data is present and accounted for.

Consistency: The uniformity of data across different datasets and systems.

Timeliness: The degree to which data is up-to-date and available when needed.

(2) **Standardized Validation Rules:** Implementing standardized validation rules helps ensure that data meets established quality criteria. For example, organizations can create rules that check for missing values, format consistency, and logical relationships between data fields.

(3) **DARS Method:** The Data Assessment and Review

System (DARS) is a structured approach to evaluating and improving data quality. The DARS method involves:

Data Profiling: Analyzing data to understand its structure, content, and quality issues.

Assessment: Evaluating data against predefined quality metrics and identifying areas for improvement.

Remediation: Implementing corrective actions to address identified quality issues, such as data cleansing or enrichment.

Monitoring: Continuously monitoring data quality over time to ensure ongoing compliance with quality standards.

By adopting these quality assessment metrics and improvement processes, MNEs can enhance the reliability and usability of their data, ultimately supporting better decision-making and operational efficiency.

Data security is critical for protecting sensitive information from unauthorized access, breaches, and other threats [3]. MNEs should implement comprehensive data security strategies that encompass access control, encryption, and compliance with relevant regulations. Key components include:

(1) **Access Control:** Implementing robust access control measures ensures that only authorized personnel can access sensitive data. Best practices for access control include:

Role-Based Access Control (RBAC): Assigning access permissions based on user roles within the organization. For example, a financial analyst may have access to financial data, while a marketing team member may only access customer engagement data.

Least Privilege Principle: Granting users the minimum level of access necessary to perform their job functions. This reduces the risk of unauthorized access to sensitive information.

(2) **Encryption:** Encrypting data both at rest and in transit is essential for protecting sensitive information from unauthorized access. Encryption transforms data into a coded format that can only be read by authorized users with the appropriate decryption keys. For instance, MNEs can use encryption protocols such as AES (Advanced Encryption Standard) to secure sensitive customer data stored in databases.

(3) **Compliance with Regulations:** Adhering to data protection regulations, such as GDPR (General Data Protection Regulation) and HIPAA (Health Insurance Portability and Accountability Act), is crucial for MNEs to avoid legal penalties and protect customer trust. Organizations should establish clear data security policies that align with regulatory requirements and ensure that all employees are trained on compliance practices.

(4) **Security Practices and Principles:** MNEs should adopt security best practices and principles to enhance their overall data security posture. Key practices include:

Regular Security Audits: Conducting periodic security audits to identify vulnerabilities and assess the effectiveness of security measures.

Incident Response Planning: Developing and implementing an incident response plan to address potential data breaches or security incidents promptly.

Employee Training: Providing ongoing training to employees on data security awareness, including recognizing phishing attempts and following secure data handling practices.

In conclusion, maintaining high data quality and implementing robust data security strategies are essential for MNEs to protect their data assets and ensure compliance with

regulations. By focusing on quality assessment metrics, improvement processes, and comprehensive security measures, organizations can enhance their data management efforts and safeguard sensitive information.

3. Technical Solutions

3.1. Enterprise-level Data Architecture and Data Platform

Establishing an enterprise-level data architecture is paramount for multinational enterprises (MNEs) as it lays the foundation for effective data management across diverse geographical locations and business units [12]. In today's data-driven landscape, a robust data architecture is crucial for effective data management, enabling seamless integration, high data quality, and strong governance. By centralizing data storage and processing, MNEs can eliminate data silos, providing stakeholders with consistent and accurate information that enhances operational efficiency and fosters collaboration.

Moreover, aligning data architecture with business strategies is essential for organizational success. A strategic architecture allows MNEs to quickly respond to market changes and customer needs, leveraging data as a strategic asset to drive innovation and gain a competitive advantage.

To achieve these benefits, MNEs must invest in a comprehensive data platform that includes data lakes for scalable storage, ETL processes for integration, and advanced analytics tools for actionable insights. A well-structured data platform ensures that data architecture meets current needs and adapts to future challenges.

Data platform can be visualized in terms of several layers, each serving a distinct purpose:

Data Source Layer: This layer encompasses all data sources, including internal systems (e.g., ERP, CRM) and external sources (e.g., social media, third-party data providers). It is essential to identify and catalog these sources to understand the data landscape.

Data Ingestion Layer: This layer is responsible for collecting and ingesting data from various sources into the data platform. Tools for data ingestion may include batch processing tools, real-time streaming technologies, and APIs.

Data Storage Layer: The data storage layer is where data is stored for analysis and reporting.

Data Processing Layer: This layer involves the processing and transformation of data to make it suitable for analysis. Key technologies include:

Data Access Layer: This layer provides access to data for analytics and reporting. It includes business intelligence tools (e.g., Tableau, Power BI) and data visualization platforms that allow users to create reports and dashboards.

Data Governance Layer: This layer encompasses the policies, procedures, and tools for managing data governance, quality, and security. It ensures that data is managed consistently and complies with regulations.

In the phase of deploying the data platform, selecting the right tools is crucial for building an effective data architecture. Here are some key considerations for tool selection [10]:

Data Lake Solutions: Consider platforms like Amazon S3, Azure Data Lake Storage, or Google Cloud Storage for scalable and cost-effective data lake solutions. These platforms support the storage of vast amounts of data in various formats.

Cloud Computing: Cloud computing offers flexibility and

scalability for data architecture. Platforms like AWS, Microsoft Azure, and Google Cloud provide a range of services for data storage, processing, and analytics, allowing MNEs to scale their infrastructure as needed [11].

ETL Tools: Choose ETL tools that align with the organization's data integration needs. Popular options include:

Informatica PowerCenter: A comprehensive ETL tool with robust data integration capabilities.

Talend: An open-source ETL tool that offers flexibility and ease of use.

Apache NiFi: A data flow automation tool that supports real-time data ingestion and processing.

Data Processing Frameworks: For large-scale data processing, consider using:

Apache Spark: A powerful distributed processing framework that supports batch and stream processing.

Apache Flink: A stream processing framework that excels in real-time data analytics.

Business Intelligence Tools: Select BI tools that enable users to visualize and analyze data effectively [9].

When selecting tools for data architecture, MNEs should consider the following best practices:

Assess Business Needs: Understand the specific data management requirements of the organization and choose tools that align with those needs.

Evaluate Scalability: Ensure that the selected tools can scale with the organization's data growth and evolving business demands.

Consider Integration Capabilities: Choose tools that can easily integrate with existing systems and data sources to facilitate seamless data flow.

Prioritize User Experience: Select tools that are user-friendly and provide adequate training and support to ensure successful adoption by employees.

3.2. Metadata Management

In multinational enterprises (MNEs), metadata management is essential for enhancing data governance, quality, and usability. Often described as "data about data," metadata provides critical context for understanding the origin, structure, and meaning of data assets. Effective metadata management enables MNEs to navigate complex data landscapes, ensuring data is accessible and interpretable across regions and business units.

By implementing robust metadata practices, MNEs can improve data discovery, ensure regulatory compliance, and foster team collaboration. Ultimately, effective metadata management supports informed decision-making and drives strategic initiatives by providing stakeholders with reliable and relevant data.

A comprehensive metadata management framework consists of several key components:

Metadata Repository: A centralized storage for metadata definitions and relationships, serving as a single source of truth for easy access and understanding of data assets.

Data Governance: Policies and procedures for managing metadata, ensuring accuracy, consistency, and security while fostering accountability within the organization.

Metadata Quality Management: Processes for monitoring and improving metadata quality through profiling, validation, and enrichment to maintain completeness and accuracy.

Metadata Discovery and Lineage: Tools that enable users to discover metadata and track the origin, transformations, and usage of data assets across systems.

User Access and Collaboration: User-friendly interfaces and collaboration tools that enhance metadata usability through search functionalities, dashboards, and reporting.

To create an effective metadata management system, organizations can leverage various tools and technologies:

Metadata Management Tools: Solutions such as Apache Atlas, Collibra, and Informatica Enterprise Data Catalog provide comprehensive features for metadata discovery, governance, and lineage tracking. These tools enable organizations to centralize their metadata and facilitate collaboration among users.

Data Integration Platforms: Tools like Talend and Microsoft Azure Data Factory can help in the extraction, transformation, and loading (ETL) of data while capturing metadata during the process. This ensures that metadata is automatically updated as data flows through the system.

Data Quality Tools: Implementing data quality tools such as Talend Data Quality or Informatica Data Quality can enhance the accuracy and completeness of metadata by profiling and cleansing data before it is ingested into the metadata repository.

Collaboration Platforms: Utilizing collaboration tools like Confluence or SharePoint can facilitate communication and knowledge sharing among teams, allowing them to contribute to and utilize metadata effectively.

Furthermore, MNEs should adopt standardized data exchange formats (e.g., XML, JSON) and protocols to ensure consistent metadata sharing and integration across systems, enhancing interoperability and minimizing data discrepancies. In specific domains, industry standards like HL7 and FHIR facilitate consistent data exchange in specific domains, promoting interoperability among organizations.

Regular audits of data exchange practices and metadata quality are essential for identifying improvement areas and ensuring compliance with standards. By prioritizing metadata management and standardization, MNEs can enhance their data management capabilities, improve data quality, and support better decision-making across the organization.

4. Implementation Strategies and Maturity Evaluation

4.1. Data Management Plan (DMP)

A Data Management Plan (DMP) serves as a foundational document that articulates the strategies and methodologies for managing data throughout its lifecycle within multinational enterprises (MNEs). The DMP encompasses several critical components:

Data Description: This section characterizes the data to be collected, including types, formats, sources, and intended uses. A thorough description ensures stakeholders understand the data's relevance to organizational objectives and compliance.

Metadata Templates: Standardized metadata templates are essential for effective data management, providing context for data discovery and interoperability. The DMP should include fields like data creator, creation date, format, and access rights to enhance usability and governance.

Sharing Policies: The DMP must outline clear data sharing policies that comply with funding agency requirements, such as those from NASA and NSF. These policies should specify conditions for sharing data with external stakeholders, data use restrictions, and security mechanisms, along with examples of successful data sharing initiatives to promote

best practices.

To ensure the DMP remains relevant and effective, organizations should implement a continuous update mechanism based on dynamic documentation principles. This involves regularly reviewing and revising the DMP to reflect changes in data management practices, regulations, and organizational priorities. Establishing a systematic review schedule and assigning maintenance responsibilities will help keep the DMP aligned with the organization's data landscape.

4.2. Maturity Model (DMM)

The evaluation of data management maturity can be effectively conducted using the Data Management Maturity (DMM) model, which comprises a five-level assessment framework:

Execution: Organizations engage in basic data management activities without formal processes, resulting in reactive efforts and inefficiencies.

Management: Structured management practices begin to emerge, defining roles and responsibilities and transitioning from ad-hoc to organized approaches with some policies in place.

Definition: Clear data management processes and standards are articulated, with critical documentation and governance frameworks established to ensure consistency and compliance.

Measurement: Metrics and key performance indicators (KPIs) are implemented to assess data management effectiveness, with continuous monitoring to identify improvement areas.

Optimization: The focus shifts to continuous optimization through iterative improvements, leveraging advanced analytics and feedback to refine data management strategies and foster excellence.

Organizations should conduct self-assessments using the DMM model to evaluate their maturity level. This can be enhanced through community assessments, allowing collaboration with peers to share insights and best practices. By identifying gaps in data management capabilities, organizations can create targeted improvement pathways that align with their strategic objectives and strengthen overall data governance.

4.3. Change Management and Habit Formation

To cultivate a culture of effective data management, organizations should adopt an incremental practice adoption strategy. This approach involves introducing one new data management practice each month, allowing teams to gradually integrate these practices into their workflows. By focusing on manageable changes, organizations can mitigate resistance and foster buy-in from employees, ultimately leading to sustained improvements in data management.

Fostering a collaborative environment is essential for the successful implementation of data management practices. Organizations should promote a community-driven model that encourages teamwork and knowledge sharing across departments. This can be achieved through regular workshops, training sessions, and collaborative projects that bring together employees from diverse backgrounds. By nurturing a culture of collaboration and shared responsibility, organizations can enhance their data management capabilities and create a collective commitment to data stewardship.

5. Future Trends and Challenges

As multinational enterprises (MNEs) navigate the evolving data management landscape, key trends and challenges are emerging that will shape the future of data quality, privacy, and standardization.

First, the integration of artificial intelligence (AI) into data quality management is poised to revolutionize how organizations ensure the accuracy, consistency, and reliability of their data [5]. AI-powered predictive models can identify anomalies and automate data cleansing, significantly reducing manual effort. These tools continuously adapt to new data, enhancing quality and enabling informed decision-making.

Second, as data collection expands, the importance of privacy protection and ethical considerations grows. The increasing reliance on personal data for analytics and decision-making raises significant ethical questions regarding consent, data ownership, and the potential for misuse [14]. Organizations must navigate complex regulatory environments, such as the General Data Protection Regulation (GDPR) in Europe, which mandates strict guidelines for data handling and user privacy. MNEs must establish clear ethical frameworks for data usage to build trust and ensure accountability.

Third, the demand for standardization in data management practices is increasing, particularly for cross-domain collaboration. Developing standardized query languages, such as those proposed by the World Wide Web Consortium (W3C), facilitates interoperability and seamless data exchange. By fostering partnerships and common standards, MNEs can enhance their data management capabilities and drive innovation.

In conclusion, the future of data management in MNEs will be influenced by AI integration, ethical data practices, and the need for standardization and collaboration. By proactively addressing these trends, organizations can position themselves for success in a data-centric world.

6. Summary

In today's data-driven world, effective data management is paramount for MNEs to maintain competitiveness and ensure compliance across diverse regulatory landscapes. This article has explored the strategic frameworks, lifecycle approaches, and maturity evaluation models that MNEs can adopt to enhance their data management practices. By addressing challenges such as data silos, quality issues, and compliance risks, organizations can leverage data as a vital asset that drives innovation and operational efficiency.

As we navigate the complexities of data governance, it is essential for both industry and academia to collaborate in building an open, safe, and efficient data ecosystem. Such collaboration will foster the development of best practices, innovative solutions, and standardized frameworks that can benefit all stakeholders. By working together, we can ensure that data management not only supports organizational goals but also contributes to a sustainable and responsible data landscape that benefits society as a whole.

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