CDMP Chapter 1

Chapter 1: Data Management.

1. Introduction

Data is now universally acknowledged as a vital enterprise asset, providing insights into customers, products, services, and operations. However, despite its recognition, many organizations do not actively manage data as a valuable resource from which continuous value can be derived. Managing data effectively requires careful planning, coordination, and leadership, as well as technical and business processes to ensure its lifecycle is managed from inception to disposal.

Data management, as defined in the DAMA-DMBOK, encompasses the policies, procedures, and practices necessary to control, protect, deliver, and enhance the value of data and information throughout its lifecycle. This involves technical roles from IT as well as non-technical roles from business functions to ensure that data is high-quality, secure, and used to meet organizational objectives. With data being compared to assets such as currency or oil, organizations are recognizing that proper management can lead to significant competitive advantages.

1.1 Business Drivers

Data and information have become essential business drivers, enabling organizations to make informed decisions, improve processes, and create innovative products. Organizations with well-managed, high-quality data are better positioned to make accurate decisions. On the other hand, organizations that fail to manage their data effectively face missed opportunities, inefficiencies, and regulatory risks.

With the rapid shift to a data-driven economy, organizations are increasingly relying on data governance, big data, and analytics to deliver business value. These business drivers mandate an approach that integrates data management into the strategic

goals of the organization, allowing for smarter decision-making and faster responses to market changes.

1.2 Goals

Data management aims to ensure that data is effectively utilized for business purposes while maintaining its integrity and security. Key goals include:

- Satisfying stakeholders' information needs
- Ensuring data integrity, confidentiality, and quality
- Preventing unauthorized access or manipulation
- Maximizing data value through strategic initiatives and decision-making

By aligning data management with business goals, organizations can derive greater value from their data assets and achieve operational efficiencies.

2. Essential Concepts

2.1 Data

Data refers to raw facts and figures that are gathered and stored for processing. It can include anything from numbers and measurements to text and images. Data is the foundation of organizational decision-making, forming the basis for analysis and insights that lead to informed actions.

2.2 Data and Information

Data is raw, unprocessed information. When processed and organized, it becomes information, which provides context and meaning to the raw data. Organizations rely on both data and information to support decision-making processes, with data forming the base and information providing insights into the context of that data.

2.3 Data as an Organizational Asset

Organizations are increasingly viewing data as a critical asset, comparable to financial or physical resources. However, unlike physical assets, data is non-depletable, meaning that it can be used by multiple individuals simultaneously without losing its value. This unique characteristic makes it essential to properly govern and manage data to ensure it provides ongoing value.

2.4 Data Management Principles

Several key principles guide effective data management:

- **Data is an Asset**: Organizations must recognize data as a valuable asset that needs to be governed and protected.
- **Economic Value of Data**: Properly managed data has measurable economic value, which can be harnessed through effective governance and management.
- **Quality Assurance**: Ensuring that data is accurate, consistent, and timely is critical to effective decision-making.
- **Cross-Functional Collaboration**: Data management requires input and coordination across multiple departments, including IT, legal, and business units.
- **Enterprise Alignment**: Data management practices should align with organizational goals to deliver maximum value.

2.5 Data Management Challenges

Data management faces unique challenges compared to other forms of asset management. Some of the key challenges include:

2.5.1 Data Differs from Other Assets

Unlike physical assets, data can be used repeatedly without being consumed. This means that managing data requires different strategies and approaches to those used in managing traditional resources.

2.5.2 Data Valuation

Assigning value to data is difficult, as its value can change depending on how it is used, its quality, and the context in which it is analyzed. Emerging methods are being developed to standardize data valuation, but it remains a complex task.

2.5.3 Data Quality

Ensuring that data is of high quality is essential for effective decision-making. Poor-quality data can lead to operational inefficiencies, financial losses, and compliance risks.

2.5.4 Planning for Better Data

Data management requires ongoing planning and the implementation of data governance and architecture to ensure that data is well-organized and of high quality.

2.5.5 Metadata and Data Management

Metadata—data that describes other data—plays a critical role in organizing and managing data. Metadata helps users understand the context, usage, and relationships of data within an organization.

2.5.6 Data Management is Cross-Functional

Effective data management involves collaboration between multiple teams across an organization, from business functions to IT, to ensure that data is effectively governed and used.

2.5.7 Establishing an Enterprise Perspective

Data management must be aligned with the overall strategic goals of the organization. Without this alignment, data management efforts can become fragmented and fail to deliver value.

2.5.8 Accounting for Other Perspectives

When managing data, it is essential to account for both internal and external perspectives, including customer needs, regulatory requirements, and industry standards.

2.5.9 The Data Lifecycle

The data lifecycle consists of the stages data goes through from its creation to its disposal. Each stage must be actively managed to ensure data remains useful, secure, and compliant with regulations.

2.5.10 Different Types of Data

Data can be structured (organized in a defined format such as databases), unstructured (text, emails, etc.), or semi-structured (XML, JSON). Each type requires different management approaches.

2.5.11 Data and Risk

Managing data involves mitigating risks such as data breaches, unauthorized access, and loss. Ensuring the security and privacy of data is a key aspect of data management.

2.5.12 Data Management and Technology

Advances in technology have had a significant impact on data management, with new tools and platforms emerging to help organizations manage data more effectively.

2.5.13 Effective Data Management Requires Leadership and Commitment

Strong leadership and commitment from top management are necessary for establishing and maintaining effective data management practices.

2.6 Data Management Strategy

A comprehensive data management strategy is essential to align data management practices with organizational goals. This strategy should define clear policies, governance frameworks, and processes for managing data across its lifecycle. By implementing a robust strategy, organizations can ensure their data management efforts are focused and effective.

3. Data Management Frameworks

3.1 Strategic Alignment Model

The **Strategic Alignment Model (SAM)**, developed by Henderson and Venkatraman in 1999, provides a comprehensive way to view the relationship between data and business strategy. This model highlights how an organization's information systems

strategy aligns with its overall business strategy. The core focus of SAM is on the interaction between data and business processes.

The model includes four key domains:

- **Business Strategy**: Refers to the overall strategy of the business, including market positioning, customer relationships, and value creation.
- **IT Strategy**: Relates to the technology infrastructure that supports business operations and data management.
- **Organizational Infrastructure and Processes**: Focuses on how the business organizes its activities, resources, and people to meet strategic goals.
- **IT Infrastructure and Processes**: Deals with the physical systems and technologies that support data management and access.

SAM helps organizations understand how to optimize data usage in alignment with business goals. For example, organizations with a focus on innovation may prioritize data analytics and research capabilities, while those focused on customer service may invest more in data quality and integration.

3.2 The Amsterdam Information Model

The **Amsterdam Information Model (AIM)**, also known as the 9-cell model, provides a strategic view of business and IT alignment. The model emphasizes a middle layer, addressing planning and architecture to bridge the gap between business strategy and operational execution. This model acknowledges the complexity of information systems and recognizes the need for structured communication between business and IT functions.

AIM identifies several pillars crucial for information governance and data quality, ensuring that both tactical and strategic aspects of data management are accounted

for. The model encourages organizations to focus on information architecture, planning, and business operations alignment.

3.3 The DAMA-DMBOK Framework

The **DAMA-DMBOK Framework** provides a comprehensive view of the functions required for effective data management. At its core, this framework is represented visually as the **DAMA Wheel**, which depicts the eleven knowledge areas of data management:

- **Data Governance**
- **Data Architecture**
- **Data Modeling and Design**
- **Data Storage and Operations**
- **Data Security**
- **Data Integration and Interoperability**
- **Document and Content Management**
- **Reference and Master Data**
- **Data Warehousing and Business Intelligence**
- **Metadata**
- **Data Quality**

Each knowledge area within the DAMA Wheel is essential for mature data management practices. The **Environmental Factors Hexagon** complements the DAMA Wheel by illustrating the interaction between people, processes, and technology, ensuring that data management goals align with organizational objectives.

3.4 DMBOK Pyramid (Aiken)

Peter Aiken's **DMBOK Pyramid** model emphasizes the hierarchy of data management practices. At the base of the pyramid are foundational activities such as data modeling, metadata management, and data quality assurance. These core functions provide the structure necessary to advance to more complex tasks like business intelligence and data analytics.

Aiken's model encourages organizations to build strong foundational practices before advancing into higher-level data management activities. It suggests that without a strong foundation in core areas like data quality and governance, advanced analytics and data science efforts will struggle to produce reliable results.

3.5 DAMA Data Management Framework Evolved

The evolved **DAMA Data Management Framework** reflects recent advances in data management practices and technology. It integrates the core activities outlined in the DAMA Wheel and places greater emphasis on modern data practices, such as data science, big data, and predictive analytics.

The updated framework highlights how core functions like data governance, architecture, and quality management support emerging practices in data monetization, artificial intelligence (AI), and machine learning (ML). It also underscores the importance of integrating these new technologies within the broader scope of enterprise data management.

4. DAMA and the DMBOK

DAMA International created the **DAMA-DMBOK** as a structured framework for data management professionals. The **DMBOK** is designed to:

- Provide a functional framework for implementing enterprise data management practices
- Establish a common vocabulary for discussing data management principles and best practices
- Serve as a comprehensive reference for data management certifications, such as the Certified Data Management Professional (CDMP)

The **DMBOK** is structured around the eleven knowledge areas discussed earlier, and each chapter within the book focuses on a specific area. For example, Chapter 3 focuses on **Data Governance**, which provides oversight and guidance on how data is managed across the enterprise. Other chapters address topics like data architecture, data security, and metadata management.

This framework serves as the backbone for data management professionals, guiding the implementation of best practices across various industries

Important Notes:

1. Data as an Organizational Asset: ISO Standard for Asset Management

- ISO 55000/55001 is the international standard concerned with asset management, which applies to data as an asset.
- ISO 27001 covers information security management, while ISO 8000 and ISO 25000 focus on data quality and software quality, respectively.

2. Data Management Goals (DMBoK)

- A key goal of Data Management is to ensure that data can be used effectively to add value to the enterprise.

- Goals must focus on enabling data to drive business value and not merely on legislative or technical constraints.

3. Data Management Disciplines

- The following are recognized disciplines of Data Management:
    - Data Quality Management
    - Document and Content Management
    - Data Security Management
    - Data Governance
- Data Virtualization is not listed as a discipline in the DAMA DMBoK.

4. DAMA Wheel Contents

- The DAMA Wheel contains Knowledge Areas that cover the entire spectrum of data management practices.
- These knowledge areas are distinct from processes or specific initiatives and focus on core competencies in data management.

5. SMART Objectives

- SMART stands for:
    - Specific
    - Measurable
    - Achievable

    - Realistic
    - Timely
- This acronym helps guide objective-setting in projects and programs, ensuring goals are clear and actionable.

6. Data Management Goals (DMBoK)

- Data Management goals include ensuring data quality, security, and availability.
- Understanding process needs of the enterprise is not specifically listed as a data management goal.

7. ROT Data (DMBoK)

- ROT stands for data that is:
    - Redundant
    - Obsolete
    - Trivial
- The goal is to minimize ROT data to improve data quality and efficiency.

8. Definition of Information

- Information is defined as data in context. It gains value when it is organized and processed to support decision-making.

9. Data as a Unique Asset

- Data differs from other assets because it can be used yet still retain value, meaning it can be reused without depleting its utility.

10. Environmental Components of Data Management

- Practices & Techniques are valid environmental components in the context of data management, guiding how data is handled and maintained.

11. DMBoK Knowledge Areas

- Big Data & Data Science is not a separate knowledge area in DMBoK v2.
- Core areas include Data Governance, Master & Reference Data Management, Data Quality, and Data Security.

12. Producer of the DMBoK

- The Data Management Association (DAMA) is responsible for producing the DMBoK, which provides a comprehensive guide to data management practices.

13. Components of a Data Management Strategy

- Identifying individuals for Data Management roles is not a component of a Data Management strategy.
- Core components include a compelling vision, role descriptions, a business case, and an implementation roadmap.

14. Maintaining Stakeholder Commitment

- Data Management professionals maintain stakeholder commitment through continuous communication, education, and promotion of the value of data and information assets.

15. Enterprise Data Standards

- Data standards should promote consistent results but must be reviewed and updated periodically to remain relevant and effective.

16. Why Information Needs to Be Managed

- Information is an asset of the organization and needs to be managed to ensure it delivers value and is protected.

17. Information Lifecycle

- The Information Lifecycle exists beyond the Systems Delivery Lifecycle and applies to data management throughout the entire lifecycle, from creation to disposal.

18. Outsourcing Information Management

- When outsourcing information management, organizations can transfer control but not accountability, ensuring they retain ultimate responsibility for data compliance and security.

19. Causes of Data Redundancy or ROT

- Poor data management practices and various other issues, such as server errors or human error, lead to data redundancy or "data rot."

20. Definition of the Data Lifecycle

- The data lifecycle represents the path along which data moves from its point of origin to usage, storage, and disposal, encompassing the management of data through its entire existence.

21. Components of the Strategic Alignment Model

- Stakeholder Management is not part of the Strategic Alignment Model.
- The model includes Business Strategy, IT Strategy, Information Systems, and Organization and Process.

22. Common Stages in the Lifecycle of Information Assets (DMBoK)

- Common stages include Plan, Specify, Enable, Create and Acquire, Maintain & Use, Archive & Retrieve, and Purge, representing the lifecycle management of data.

23. Advanced Data Practices (DMBoK)

- Advanced data practices include:
  - Analytics
  - Mining
  - Big Data
  - Warehousing
- Data Quality is not considered an advanced practice; it is foundational in data management.

24. Parts of the Data Lifecycle in the SDLC (DMBoK)

- The parts of the Data Lifecycle integral to the Systems Development Lifecycle (SDLC) include Plan, Specify, Enable, among others that focus on data creation, usage, and disposal.