



The Data Management Association
The Premier Organization for Data Professionals Worldwide

DAMA-DMBOK

Functional Framework

Version 3.02

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About This Document

This document describes Version 3.02 of the DAMA-DMBOK Functional Framework, provided by DAMA International to help formalize the best practices of our profession.

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Revision History

Version	Date	Author	Description
1.0	March 27, 2006	Mark Mosley	The original draft of a proposal by the Chicago chapter to the DMBOK committee.
1.1	April 17, 2006	Mark Mosley	Reworded draft to serve as a proposal from the DMBOK committee to DAMA I/F.
1.2	May 3, 2006	Mark Mosley	Revision after DAMA International adoption at the 2006 Symposium in Denver, CO
1.3	June 12, 2006	Deborah Henderson	Miscellaneous revisions
2.0	April 4, 2007	Mark Mosley	Revisions reflecting changes made after DAMA International 2007 Symposium in Boston, MA
2.1	November 5, 2007	Mark Mosley	Revisions reflecting use of the term DMBOK
3.0	May 5, 2008	Mark Mosley	Restructured functions – from 9 to 10
3.0.1	June 25, 2008	Mark Mosley	Changes to detailed activities outline
3.0.2	September 10, 2008	Mark Mosley	Minor corrections and revision to the activity outline for DW/BI Management

1. Introduction

1.1. *The Data Management Profession*

In the Information Age, the Data Management function is vital to every organization. Whether known as Data Management, Data Resource Management or Enterprise Information Management, organizations increasingly recognize that the data they possess is a valuable resource. Like any valuable asset, they also recognize their data assets must be managed. Businesses, governments and other organizations are more effective when they use their data assets more effectively. The data management function seeks to effectively control and leverage data assets.

Data management is a shared responsibility between the business data stewards serving as trustees of enterprise data assets and technical data stewards serving as the expert custodians and curators for these assets. Governance of the data management function coordinates this collaboration between IT and the enterprise.

Within IT, Data Management is an emerging profession. Data management concepts and supporting technology have evolved quickly over the last thirty years.

Creating a formal, certified, recognized and respected data management profession is not an easy task. The current environment is a confusing combination of terms, methods, tools, opinion and hype. To mature the data management profession, we need professional standards:

- Standard terms and definitions
- Standard functions, processes and practices
- Standard roles and responsibilities
- Standard deliverables and metrics

These standards and best practices will help data management professionals perform more effectively. Moreover, they will also help us communicate with our teammates, managers and executives. Executives in particular need to fully understand and value data management so they can fully support, fund and staff the data management function.

DAMA, the Data Management Association, is the world's premiere professional organization for data management professionals. DAMA International and the DAMA International Foundation are developing standards for the profession.

1.2. The DAMA DMBOK Guide

DAMA International is developing a new book, The DAMA Guide to the Data Management Body of Knowledge (DAMA-DMBOK Guide). A DAMA-DMBOK Editorial Board has been formed as a working committee to guide development of the DAMA-DMBOK Guide and related publications, including The DAMA Dictionary of Data Management. The Editorial Board includes participation from local DAMA chapter members. DAMA members have volunteered to contribute and review drafts.

The entire body of knowledge about data management is quite large and constantly growing. The DAMA-DMBOK Guide will provide a definitive introduction to data management. It will present a standard industry view of data management functions, terminology and best practices, without detailing specific methods and techniques. The DAMA-DMBOK Guide will not attempt to be a complete authority on any specific data management function, but will point readers to widely recognized publications, articles and websites for further reading. The DAMA DMBOK Guide will introduce valid alternative views and industry accepted approaches where clear differences of opinion exist.

The goals of the DAMA-DMBOK Guide are:

1. To build consensus for a generally applicable view of data management functions.
2. To provide standard definitions for commonly used data management functions, deliverables, roles and other terminology.
3. To identify guiding principles for data management.
4. To overview commonly accepted good practices, widely adopted methods and techniques, and significant alternative approaches, without reference to specific technology vendors or their products.
5. To briefly identify common organizational and cultural issues.
6. To clarify the scope and boundaries of data management.
7. To guide readers to additional resources for further understanding.

Audiences for the DAMA-DMBOK Guide include:

- Certified and aspiring data management professionals.
- Other IT professionals working with data management professionals.
- Business data stewards at all levels.
- Executives with an interest in managing data as an enterprise asset.
- Knowledge workers developing an appreciation of data as an enterprise asset.
- Consultants conducting assessments of client data management functions and helping to implement and improve data management at these clients.
- Educators responsible for developing and delivering a data management curriculum.
- Researchers in the field of data management.

DAMA foresees several potential uses of the DAMA-DMBOK Guide, including:

- Informing a diverse audience about the nature and importance of data management.
- Helping build consensus within the data management community.
- Helping data stewards and data professionals understand their responsibilities.
- Provide the basis for assessments of data management effectiveness and maturity.
- Guiding efforts to implement and improve data management functions.
- Pointing readers to additional sources of knowledge about data management.
- Guiding the development and delivery of data management curriculum content for higher education.
- Suggesting areas of further research in the field of data management.
- Helping data management professionals prepare for Certified Data Management Professional (CDMP) exams.
- Assist organizations in their enterprise data strategy

The reference models for the DAMA-DMBOK Guide are the Project Management Body of Knowledge (PMBOK)¹ document published by the Project Management Institute, and the Software Engineering Body of Knowledge (SWEBOK)² document published by the IEEE.

DAMA believes the DAMA-DMBOK Guide will be well received by managers, executives and the higher education community. DAMA expects to publish the DAMA-DMBOK Guide in 2009.

1.3. The DAMA Dictionary of Data Management

The DAMA Dictionary of Data Management is a companion volume to the DAMA-DMBOK Guide, available for purchase as a CD-ROM. Originally developed as an extensive Glossary for the DAMA-DMBOK Guide, DAMA is publishing it separately due to its size and business value. Definitions for terms found in the Dictionary are consistent with their usage in the DAMA-DMBOK Guide.

¹ Trademark of the Project Management Institute

² Trademark of the IEEE

1.4. Why a Framework?

The DAMA-DMBOK Functional Framework described here exists to:

- Provide a cohesive structure for organizing the Data Management Body of Knowledge (DAMA-DMBOK Guide) document.
- Define standard terms and definitions for data management processes, roles and deliverables cited consistently throughout the DAMA-DMBOK Guide.
- Guide assessments of an organization's data management function and data strategy, and suggest and guide initiatives to implement and improve data management.

1.5. Why Version 2?

Version 1.0 of the DAMA-DMBOK Functional Framework was approved by the DAMA Executive Board in April 2006, and posted on the www.dama.org website in July 2006. Over 3000 people from around the world have since downloaded the Framework paper.

During that time, changes have been made to the framework in the course of developing the DAMA-DMBOK Guide. In Version 2, the following data management functions have been renamed:

- Data Stewardship & Governance has been renamed to simply Data Governance, in recognition of data stewardship activities and responsibilities across all nine functions
- Data Architecture & Design has been renamed to Data Architecture, Analysis & Design, to more fully describe the data modeling and specification activities.
- Database Administration has been renamed to Database Management, to more clearly separate the function from the database administrator role, given other roles participate in the Database Management function.
- Data Quality Improvement has been renamed to Data Quality Management, reflecting the broader scope of the activities within the function.
- Data Warehousing & Business Intelligence has been renamed to Data Warehousing & Business Intelligence Management, to more clearly indicate the function includes the development and support activities that enable business intelligence and does not include the business intelligence activities performed by knowledge workers.
- Unstructured Data Management has been renamed to Document, Record & Content Management, in recognition that data residing outside of databases may still exist within some degree of structure.
- Metadata Management has been renamed to Meta Data Management, in respect to trademark restrictions.

The presentation sequence of these nine functions has been changed as well:

- Data Quality Management was moved before Reference & Master Data Management, recognizing Reference & Master Data Management as a specialized form of Data Quality Management.
- Reference & Master Data Management was moved before Data Warehousing & Business Intelligence Management, recognizing its focus on data integration for operational databases which then provide the sources for data warehousing.
- Meta Data Management was moved to the ninth position, reflecting its foundational role in providing the infrastructure for other data management functions.

The following environmental elements have also been renamed:

- Goals & Objectives has been renamed to Goals & Principles, recognizing
 - 1) The DAMA-DMBOK Guide will offer directional goals for each function but not specific objectives. Objectives reflect the current measurable targets of a particular organization.
 - 2) Principles have been included with Goals, moving up from Practices to an earlier presentation position
- Process & Activities has been renamed to just Activities, recognizing that functions and activities are two types of processes.
- Principles & Practices has been renamed to Practices & Techniques, reflecting the grouping of Principles with Goals.
- Organizational & Cultural Issues has been renamed to Organization & Culture.

In addition, more detailed activities, deliverables and roles have been identified. These details should prove useful to managers, data stewards and data management professionals while the DAMA-DMBOK Guide is under development.

Finally, much of the longer introduction to the first version of the paper has been removed. While appropriate in the paper's original form as a proposal to the DAMA Executive Board, the longer introduction is no longer necessary.

1.6. Why Version 3?

Over the 12 months since April 2007, contributors and early reviewers to the DAMA-DMBOK Guide have raised additional issues.

1. The scope of the Data Architecture, Analysis and Design function was very large, and its corresponding chapter in the DAMA-DMBOK Guide was also becoming very large. In fact, Data Planning and Architecture was considered a separate function from Data Development. Data modeling techniques were used in both functions.
2. Data Development as a function was split artificially between Data Architecture, Analysis and Design and the Database Implementation activities within Database Management. It was unclear where the linkage was to the software development lifecycle (SDLC).

3. Data Development (implementation) activities were seen as a separate function from other production operational database management activities.
4. Documents & Records Management was seen as a separate function from Document Content Management, more parallel to (production) Database Operations Management activities in its support across the data lifecycle (from acquisition to purge) for unstructured data stores. Document Content Management by itself was more focused on enabling user access, in parallel with Business Intelligence Management.
5. The term Database Management was still being interpreted by many early reviewers to be a synonym for Database Administration, implying the full scope of responsibilities of Database Administrators.
6. Presentation of the Data Quality Management function seemed to fit better as the concluding function since it monitored the quality of all data, including meta data, reference and master data.

These issues became more obvious during the editing of contributor text on these topics. Version 3 resolves these issues by restructuring the DAMA-DMBOK Functional Framework from 9 functions to 10 functions:

- A new Data Development function has been defined, removing the SDLC project delivery activities from the old Data Architecture, Analysis and Design function and the old Database Management function.
- The remaining activities from the old Data Architecture, Analysis and Design function have been renamed as Data Architecture Management.
- The remaining production operational planning, control and support activities from the old Database Management function have been renamed as Database Operations Management.
- A new Documents & Records Management function has been defined, removing related activities from the scope of the old Documents, Records and Content Management function. The Documents & Records Management function includes responsibility for paper and electronic files across the data lifecycle, from acquisition to purging, in parallel with Database Operations Management.
- The name and the scope of the old Document, Records and Content Management function have now been simplified to just Document Content Management.
- Data Quality Management is now presented as the concluding function.

2. Overview

The DAMA-DMBOK Functional Framework Version 3 identifies 10 major Data Management Functions, each described through 7 Environmental Elements. The matrix below graphically presents DAMA-DMBOK Functional Framework:

Data Management Functions	Environmental Elements						
	Goals & Principles	Activities	Deliverables	Roles & Responsibilities	Technology	Practices & Techniques	Organization & Culture
Data Governance							
Data Architecture Management							
Data Development							
Database Operations Management							
Data Security Management							
Reference & Master Data Management							
Data Warehousing & Business Intelligence Management							
Document & Content Management							
Meta Data Management							
Data Quality Management							

Figure 1. The DAMA-DMBOK Functional Framework, Version 3

The matrix is just a useful way to picture the entire framework.

Each function will be addressed by a chapter in the DAMA-DMBOK Guide, and each of these chapters will discuss each of the seven elements. The extent of each discussion will vary by chapter, as appropriate to the issues involved. Each chapter will follow a consistent structure, including:

- A brief **Introduction** to the function, including definitions of key terms, a context diagram for the function, and a list of the business goals of the function.
- A description of **Concepts and Activities**, including associated deliverables, responsible roles and organizations, best practices, common procedures and techniques and supporting technology. In some chapters there is a separate Concepts and Activities section for each sub-function, and these sections are named for each sub-function.
- A **Summary** including a list restating guiding principles, a table recapping the activities, deliverables and responsibilities of the function, and a brief discussion of organizational and cultural issues
- A selective list of books and articles suggested as **Recommended Reading**.

2.1. Data Management Functions

The 10 Data Management Functions are:

- Data Governance – planning, supervision and control over data management and use
- Data Architecture Management – as an integral part of the enterprise architecture
- Data Development – analysis, design, building, testing, deployment and maintenance
- Database Operations Management – support for structured physical data assets
- Data Security Management – ensuring privacy, confidentiality and appropriate access
- Reference & Master Data Management – managing golden versions and replicas
- Data Warehousing & Business Intelligence Management – enabling access to decision support data for reporting and analysis
- Document & Content Management – storing, protecting, indexing and enabling access to data found in unstructured sources (electronic files and physical records)
- Meta Data Management – integrating, controlling and delivering meta data
- Data Quality Management – defining, monitoring and improving data quality

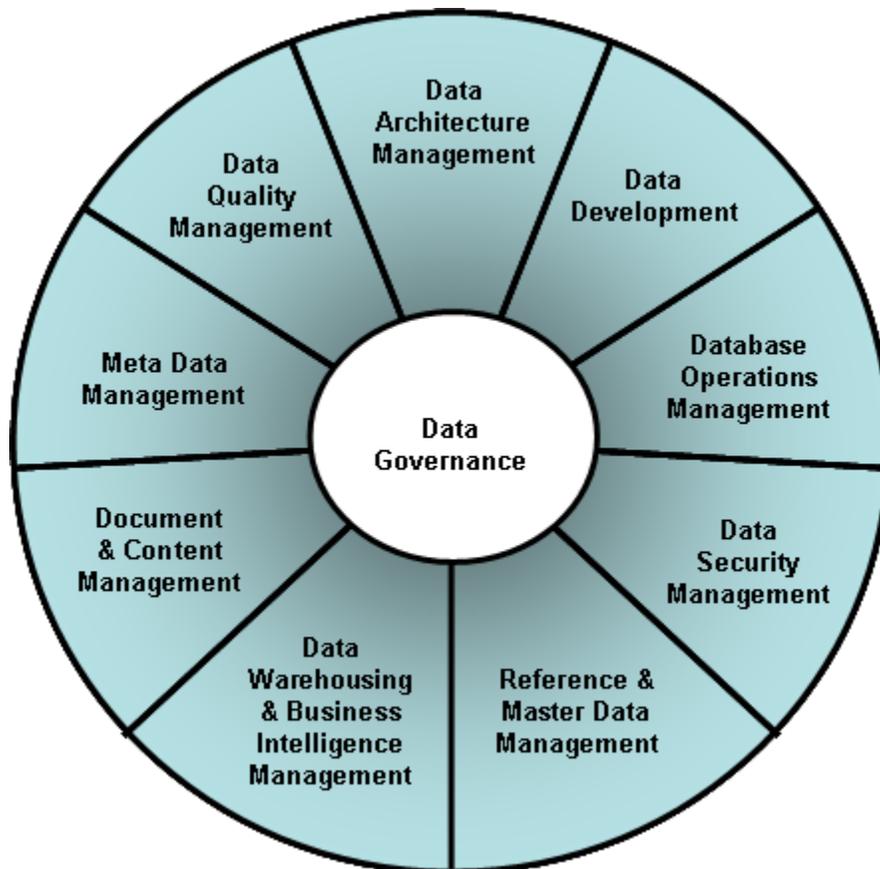


Figure 2. The 10 Data Management Functions

The diagram above presents the 10 functions alone, implying a sequence of presentation, beginning in the center, then to the 12:00 position and then moving around the circle clockwise from the 12:00 position to the 11:00 position. The diagram below gives some general sense of the scope of each function.

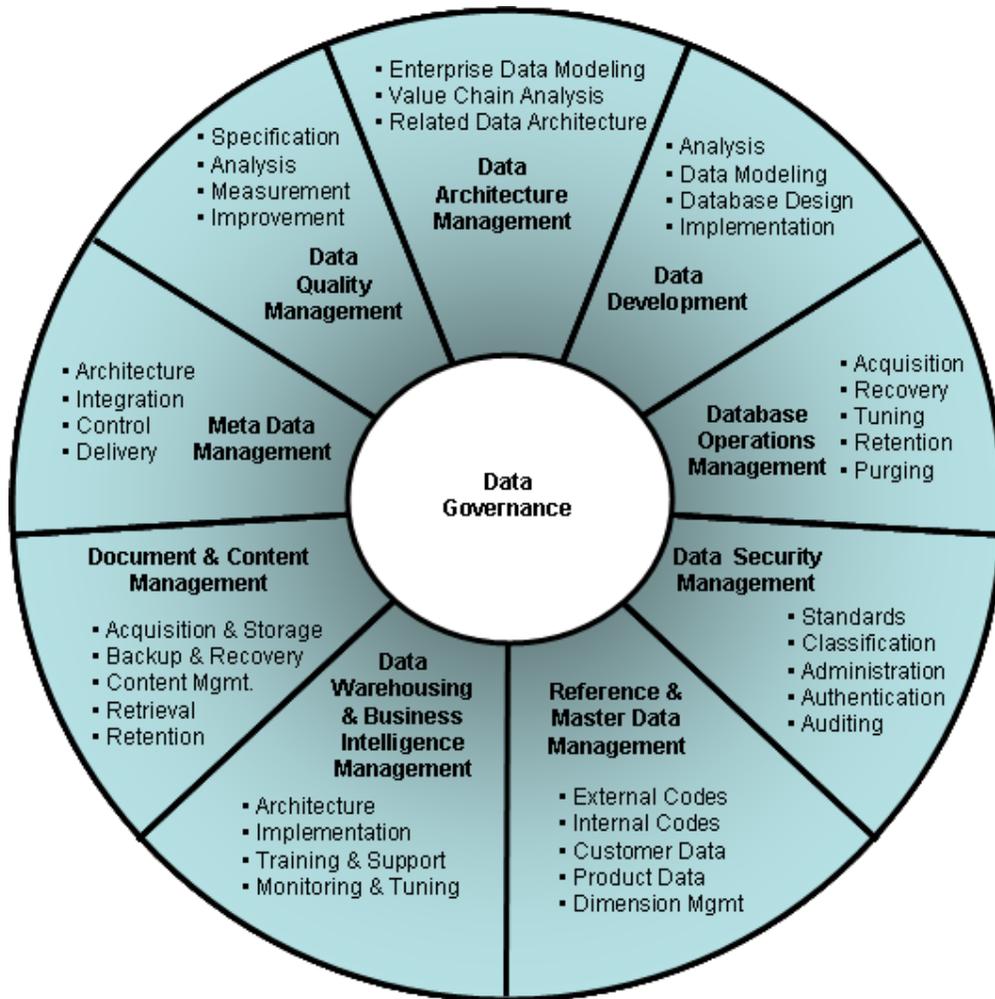


Figure 3. Data Management Functions – Scope Summary

See Section 3 for detailed lists of the activities performed within each function.

Each function is briefly defined below:

- Data Governance – The exercise of authority, control and shared decision-making (planning, monitoring and enforcement) over the management of data assets. Data Governance is high-level planning and control over data management.
- Data Architecture Management – The development and maintenance of enterprise data architecture, within the context of all enterprise architecture, and its connection with the application system solutions and projects that implement enterprise architecture.

- Data Development – The data-focused activities within the system development lifecycle (SDLC), including data modeling and data requirements analysis, design, implementation and maintenance of databases data-related solution components.
- Database Operations Management – Planning, control and support for structured data assets across the data lifecycle, from creation and acquisition through archival and purge.
- Data Security Management – Planning, implementation and control activities to ensure privacy and confidentiality and to prevent unauthorized and inappropriate data access, creation or change.
- Reference & Master Data Management – Planning, implementation and control activities to ensure consistency of contextual data values with a “golden version” of these data values.
- Data Warehousing & Business Intelligence Management – Planning, implementation and control processes to provide decision support data and support knowledge workers engaged in reporting, query and analysis.
- Document & Content Management – Planning, implementation and control activities to store, protect and access data found within electronic files and physical records (including text, graphics, image, audio, video)
- Meta Data Management – Planning, implementation and control activities to enable easy access to high quality, integrated meta data.
- Data Quality Management – Planning, implementation and control activities that apply quality management techniques to measure, assess, improve and ensure the fitness of data for use.

Each of these functions is decomposed below into activities. In a few cases, activities are grouped into sub-functions. While functions and sub-functions are named with noun phrases, activities are named with verb phrases.

2.2. Environmental Elements

The 7 Environmental Elements provide a logical and consistent way to describe each function. The elements provide a structure for:

- Consistent presentation in each DAMA-DMBOK Guide chapter.
- Organizing assessment questions, findings and recommendations.
- Guiding strategic planning for each function.

The idea of Environmental Elements is not a new one. A commonly referenced structure identifies three elements: Process, Technology and People. We believe there is too much to cover under the category of Process (Processes, Deliverables, Principles, Methods & Techniques) and People (Roles & Responsibilities, Organizational & Cultural Issues).

The Framework identifies the following 7 elements:



Figure 4. The 7 Environmental Elements

The diagram above presents the 7 elements, implying a sequence of presentation, beginning in the center and then moving clockwise around the circle from the 1:00 position to the 12:00 position. The diagram below gives a general sense of the scope of each Environmental Element.



Figure 5. Environmental Elements – Scope Summary

Our structure provides for lists of basic elements (Goals & Principles, Activities, Deliverables, Roles & Responsibilities,) before addressing and elaborating on less structured topics (Practices and Procedures, Technology, Organization & Culture).

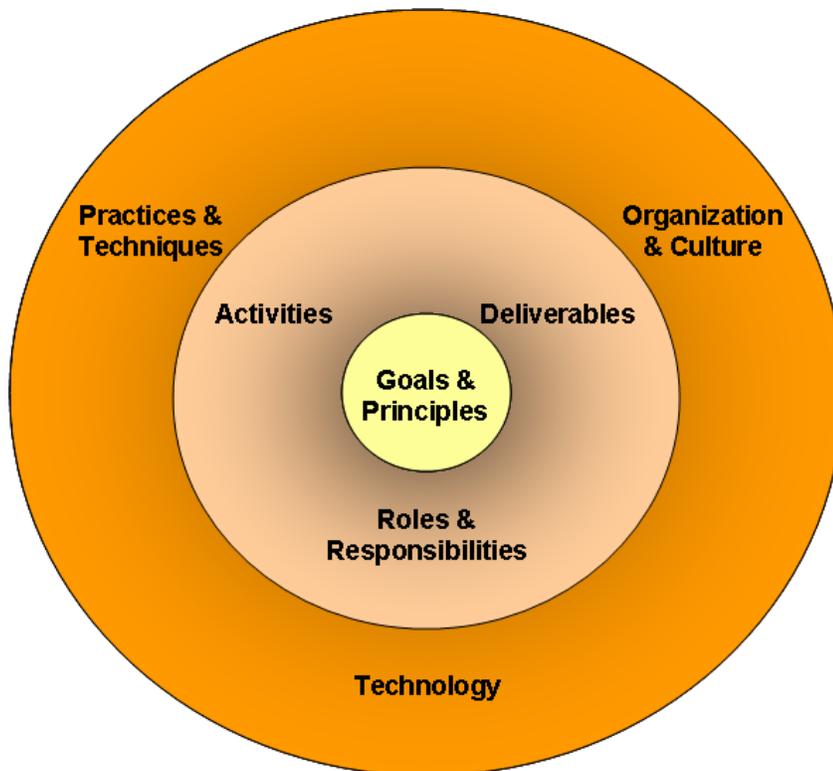


Figure 6. Basic and Supporting Environmental Elements

The basic Environmental Elements are:

- **Goals & Principles** – The directional business goals of each function and the fundamental principles that guide performance of each function.
- **Activities** – Each function is further decomposed into lower level activities. Some activities are grouped into sub-functions. Activities can be further decomposed into tasks and steps.
- **Deliverables** – The information and physical databases and documents created as interim and final outputs of each function. Some are considered essential, some are generally recommended, and others are optional depending on circumstances.
- **Roles and Responsibilities** – The business and IT roles involved in performing and supervising the function and the specific responsibilities of each role in that function. Many roles will participate in multiple functions.

The supporting Environmental Elements are:

- Practices & Procedures -- Common and popular methods and techniques used to perform the processes and produce the deliverables. May also include common conventions, best practice recommendations and alternative approaches without elaboration.
- Technology -- Categories of supporting technology (primarily software tools), standards and protocols, product selection criteria and common learning curves. In accordance with DAMA policies, specific vendors or products should not be mentioned.
- Organization and Culture -- These issues might include:
 - Management Metrics – measures of size, effort, time, cost, quality, effectiveness, productivity, success and business value
 - Critical Success Factors
 - Reporting Structures
 - Contracting Strategies
 - Budgeting and Related Resource Allocation Issues
 - Teamwork and Group Dynamics
 - Authority & Empowerment
 - Shared Values & Beliefs
 - Expectations & Attitudes
 - Personal Style & Preference Differences
 - Cultural Rites, Rituals and Symbols
 - Organizational Heritage
 - Change Management Recommendations

3. DAMA-DMBOK Functional Outline

There are 10 functions and 102 activities. Where there are more than 12 activities within a function, activities have been grouped under two or more sub-functions. Three functions have sub-functions, with 8 sub-functions overall (2, 4 and 2). Functions and sub-functions are named with noun phrases, while activities are named with verb phrases.

Each activity is categorized as belonging to one of four Activity Groups:

- **Planning Activities (P)** Activities that set the strategic and tactical course for other data management activities. Planning activities may be performed on a recurring basis.
- **Control Activities (C)** Supervisory activities performed on an on-going basis.
- **Development Activities (D)** Activities undertaken within projects and recognized as part of the systems development lifecycle (SDLC), creating data deliverables through analysis, design, building, testing and deployment.
- **Operational Activities (O)** Service and support activities performed on an on-going basis.

The outline below is subject to change as each chapter is drafted, but we expect changes to be relatively minor adjustments at this point.

1. Data Governance

1.1. Data Management Planning

- 1.1.1. Identify Strategic Enterprise Data Needs (P)
- 1.1.2. Develop & Maintain the Data Strategy (P)
- 1.1.3. Establish the Data Management Professional Organizations (P)
- 1.1.4. Identify & Appoint Data Stewards (P)
- 1.1.5. Establish Data Governance & Stewardship Organizations (P)
- 1.1.6. Develop, Review & Approve Data Policies, Standards and Procedures (P)
- 1.1.7. Review & Approve Data Architecture (P)
- 1.1.8. Plan and Sponsor Data Management Projects & Services (P)
- 1.1.9. Estimate Data Asset Value & Associated Data Management Costs (P)

1.2. Data Management Supervision & Control

- 1.2.1. Supervise the Data Management Professional Staff & Organizations (C)
- 1.2.2. Coordinate Data Governance Activities (C)
- 1.2.3. Manage & Resolve Data Related Issues (C)
- 1.2.4. Monitor & Ensure Regulatory Compliance (C)
- 1.2.5. Monitor Conformance with Data Policies, Standards and Architecture (C)
- 1.2.6. Oversee Data Management Projects & Services (C)
- 1.2.7. Communicate & Promote the Value of Data Assets (C)

2. Data Architecture Management

- 2.1. Develop & Maintain the Enterprise Data Model (P)
- 2.2. Analyze & Align With Other Business Models (P)
- 2.3. Define & Maintain the Data Technology Architecture (P) (same as 4.2.2)
- 2.4. Define & Maintain the Data Integration Architecture (P) (same as 6.2)
- 2.5. Define & Maintain the DW / BI Architecture (P) (same as 7.1.2)
- 2.6. Define & Maintain Enterprise Taxonomies (P) (same as 8.2)
- 2.7. Define & Maintain the Meta Data Architecture (P) (same as 9.2)

3. Data Development

3.1. Data Modeling, Analysis & Design

- 3.1.1. Analyze Information Requirements (D)
- 3.1.2. Develop & Maintain Conceptual Data Models (D)
- 3.1.3. Develop & Maintain Logical Data Models (D)
- 3.1.4. Develop & Maintain Physical Data Models (D)

3.2. Detailed Data Design

- 3.2.1. Design Physical Databases (D)
- 3.2.2. Design Related Data Structures (D)
- 3.2.3. Design Information Products (D)
- 3.2.4. Design Data Access Services (D)

3.3. Data Model & Design Quality Management

- 3.3.1. Develop Data Modeling & Database Design Standards (P)
- 3.3.2. Review Data Model & Database Design Quality (C)
- 3.3.3. Manage Data Model Versioning and Integration (C)

3.4. Data Implementation

- 3.4.1. Create & Maintain Development & Test Databases (D)
- 3.4.2. Create & Maintain Test Data (D)
- 3.4.3. Migrate & Convert Data
- 3.4.4. Build & Test Information Products ((D)
- 3.4.5. Build & Test Data Access Services (D)
- 3.4.6. Build & Test Data Integration Services (D)
- 3.4.7. Validate Information Requirements (D)
- 3.4.8. Prepare for Data Deployment (D)

4. Database Operations Management

4.1. Database Support

- 4.1.1. Implement & Maintain Database Environments (C)
- 4.1.2. Implement & Control Database Changes (C)
- 4.1.3. Acquire Externally Sourced Data (O)
- 4.1.4. Plan for Data Recovery (P)
- 4.1.5. Backup & Recover Data (O)
- 4.1.6. Set Database Performance Service Levels (P)
- 4.1.7. Monitor & Tune Database Performance (O)
- 4.1.8. Plan for Data Retention (P)
- 4.1.9. Archive, Retrieve and Purge Data (O)
- 4.1.10. Manage Specialized Databases (O)

4.2. Data Technology Management

- 4.2.1. Understand Data Technology Requirements (P)
- 4.2.2. Define the Data Technology Architecture (P) (same as 2.3)
- 4.2.3. Evaluate Data Technology (P)
- 4.2.4. Install & Administer Data Technology (O)
- 4.2.5. Inventory & Track Data Technology Licenses (C)
- 4.2.6. Support Data Technology Usage & Issues (O)

5. Data Security Management

- 5.1. Understand Data Privacy, Confidentiality & Security Needs (P)
- 5.2. Define Data Privacy & Confidentiality Policies & Standards (P)
- 5.3. Define Password Standards & Procedures (P)
- 5.4. Design & Implement Data Security Controls (D)
- 5.5. Manage Users, Passwords & Group Membership (C)
- 5.6. Manage Data Access Views (C)
- 5.7. Manage Data Access Permissions (C)
- 5.8. Monitor User Authentication & Access Behavior (C)
- 5.9. Classify Information Confidentiality (C)
- 5.10. Audit Data Security (C)

6. Reference & Master Data Management

- 6.1. Understand Reference & Master Data Integration Needs (P)
- 6.2. Define the Data Integration Architecture (P) (same as 2.4)
- 6.3. Implement Reference & Master Data Management Solutions (D)
- 6.4. Control Code Values & Other Reference Data (C)
- 6.5. Integrate Master Data (O)
- 6.6. Replicate Reference and Master Data (O)
- 6.7. Maintain Dimensional Hierarchies (O)

7. Data Warehousing & Business Intelligence Management

7.1. Data Warehousing & Business Intelligence Planning

- 7.1.1. Understand Business Intelligence Data Needs (P)
- 7.1.2. Define & Maintain the DW / BI Architecture (P) (same as 2.5)

7.2. Data Warehousing & Business Intelligence Implementation

- 7.2.1. Implement Data Warehouses & Data Marts (D)
- 7.2.2. Implement Business Intelligence Tools & User Interfaces (D)
- 7.2.3. Implement Enterprise Reporting (D)
- 7.2.4. Implement Management Dashboards & Scorecards (D)
- 7.2.5. Implement Analytic Applications (D)

7.3. Data Warehousing & Business Intelligence Support

- 7.4. Train Business Professionals (O)
- 7.5. Replicate & Transform Data for Business Intelligence (O)
- 7.6. Monitor & Tune Data Warehousing Processes (C)
- 7.7. Support Business Intelligence Activity (O)
- 7.8. Monitor & Tune BI Activity and Performance (C)

These activities do not include actual Business Intelligence activities performed by knowledge workers, which include:

- Perform Ad Hoc Query & Reporting
- Perform Multidimensional Analysis
- Perform Statistical Analysis
- Perform Data Mining
- Model “What If” Scenarios
- Monitor and Analyze Business Performance

8. Document & Content Management

- 8.1. Plan for Managing Electronic & Physical Documents (P)
- 8.2. Define & Maintain Enterprise Taxonomies (P) (same as 2.6)
- 8.3. Implement & Maintain Document Storage Systems (D)
- 8.4. Acquire & Store Documents (O)
- 8.5. Index Document Information Contents (O)
- 8.6. Backup & Recover Documents (O)
- 8.7. Support Document Content Analysis (O)
- 8.8. Support Document Access, Circulation & Update (O)
- 8.9. Monitor & Tune Document Retrieval Performance (C)
- 8.10. Archive, Retrieve & Purge Documents (O)
- 8.11. Audit Document & Content Management (C)

9. Meta Data Management

- 9.1. Understand Meta Data Requirements (P)
- 9.2. Define the Meta Data Architecture (P) (same as 2.7)
- 9.3. Develop & Maintain Meta Data Standards (P)
- 9.4. Implement a Managed Meta Data Environment (D)
- 9.5. Create & Maintain Meta Data (O)
- 9.6. Integrate Meta Data (C)
- 9.7. Manage Meta Data Repositories (C)
- 9.8. Distribute & Deliver Meta Data (C)
- 9.9. Support Meta Data Reporting and Analysis (O)

10. Data Quality Management

- 10.1. Develop and Promote Data Quality Awareness (O)
- 10.2. Profile, Analyze & Assess Data Quality (D)
- 10.3. Define Data Quality Requirements & Business Rules (D)
- 10.4. Test & Validate Data Quality Requirements (D)
- 10.5. Define Data Quality Metrics & Service Levels (P)
- 10.6. Measure & Monitor Data Quality (C)
- 10.7. Manage Data Quality Issues (C)
- 10.8. Correct Data Quality Defects (O)
- 10.9. Design & Implement Operational DQM Procedures (D)
- 10.10. Monitor Operational DQM Procedures & Performance (C)
- 10.11. Audit Data Quality (C)