



The Data Management Association
The Premier Organization for Data Professionals Worldwide

DAMA-DMBOK

Functional Framework

Version 2.1

October 29, 2007



Table of Contents

Table of Contents	1
About This Document	1
Revision History	1
1. Introduction	2
1.1. The Data Management Profession	2
1.2. The DAMA DMBOK Guide	3
1.3. The DAMA Dictionary of Data Management	4
1.4. Why a Framework?	5
1.5. Why Version 2?	5
2. Overview	7
2.1. Data Management Functions	8
2.2. Environmental Elements	9
3. DAMA-DMBOK Functional Outline	13

About This Document

This document describes Version 2.1 of the DAMA-DMBOK Functional Framework, provided by DAMA International as an aid to help formalize the best practices of our profession.

Deborah Henderson
 VP Education Services, DAMA International
 President, DAMA Foundation

Mark Mosley
 DMBOK Editor
 DAMA International / DAMA Foundation

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 10, 2006	Deborah Henderson	Recommended revisions for DMBOK committee adoption.
1.2	April 17, 2006	Mark Mosley	Reworded draft to serve as a proposal from the DMBOK committee to DAMA I/F.
1.3	April 20, 2006	Mark Mosley	Revision after Chicago DAMA adoption.
1.4	May 3, 2006	Mark Mosley	Revision after DAMA International adoption at the 2006 Symposium in Denver, CO
1.5	June 12, 2006	Deborah Henderson	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

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 and the DAMA International Foundation is developing a new book, The DAMA Guide to the Data Management Body of Knowledge (DAMA-DMBOK Guide, a trademark of DAMA International). A DAMA-DMBOK Editorial Board has been formed as a working committee to guide development of the DAMA-DMBOK Guide and related publications, including a 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 2008.

1.3. The DAMA Dictionary of Data Management

The DAMA Dictionary of Data Management is a companion volume to the DAMA-DMBOK Guide. 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.

DAMA expects to publish the DAMA Dictionary of Data Management in 2007.

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 1000 people from around the world have downloaded the Framework paper over the past eight months.

During that time, changes have been made to the framework in the course of developing the DAMA-DMBOK Guide.

In particular, 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 for the current audience of this paper – DAMA members and other parties interested in the contents of the DAMA-DMBOK Framework, and in using it to guide their organization's data management initiatives.

2.Overview

The DAMA-DMBOK Functional Framework identifies 9 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, Analysis & Design							
Database Management							
Data Security Management							
Data Quality Management							
Reference & Master Data Management							
Data Warehousing & Business Intelligence Management							
Document, Record & Content Management							
Meta Data Management							

Figure 1. The DAMA-DMBOK Functional Framework

The matrix is 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

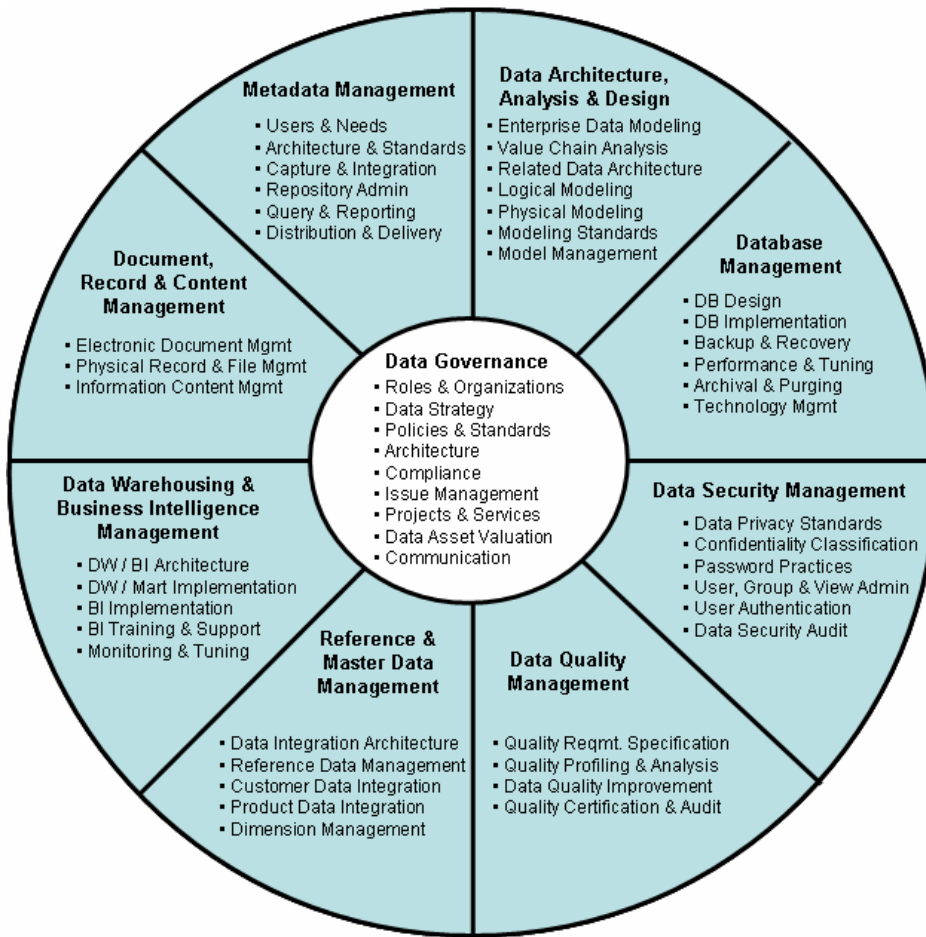
The 9 Data Management Functions are:

- Data Governance – planning, supervision and control over data management and use
- Data Architecture, Analysis & Design – data modeling and specification
- Database Management – database design, implementation and support
- Data Security Management – ensuring privacy, confidentiality and appropriate access
- Data Quality Management – defining, monitoring and improving data quality
- Reference & Master Data Management – managing golden versions and replicas
- Data Warehousing & Business Intelligence Management – enabling reporting and analysis
- Document, Record & Content Management – managing data outside of databases
- Meta Data Management – integrating, controlling and providing meta data



Figure 2. The 9 Data Management Functions

The diagram above presents the 9 functions alone, implying a sequence of presentation, beginning in the center and then moving clockwise around the circle from the 1:00 position to the 11:00 position. The diagram below gives some general sense of the scope of each function.



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

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).

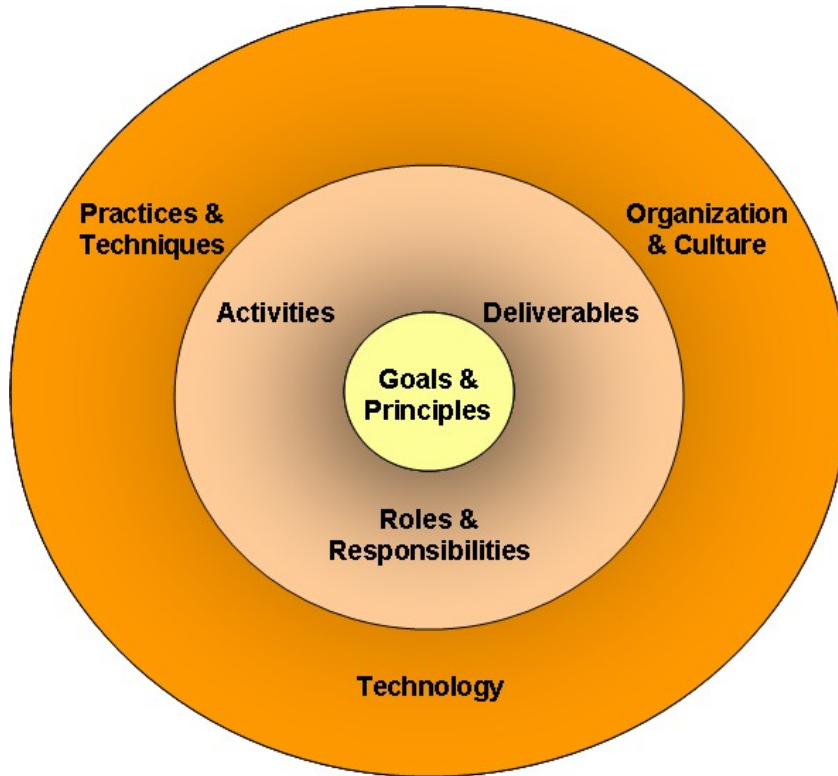


Figure 6. Basic and Supporting Environmental Elements

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
- seem to be too general for our efforts – instead I recommend one list of General Management texts for these topics at the end of the book.

3.DAMA-DMBOK Functional Outline

This section presents the outline of functions, sub-functions and activities. Functions and sub-functions are named with noun phrases, while activities are named with verb phrases. In addition, each activity is categorized into one of four activity groups:

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 recognized as part of the development lifecycle (SDLC), systems deliverables through analysis, creating data testing and deployment. design, building,
- **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 and Maintain the Data Strategy (P)
- 1.1.3. Establish the Data Management Professional Organizations (P)
- 1.1.4. Identify and Appoint Data Stewards (P)
- 1.1.5. Establish Data Governance & Stewardship Organizations (P)
- 1.1.6. Develop, Review and Approve Data Policies, Standards and Procedures (P)
- 1.1.7. Review and Approve Data Architecture (P)
- 1.1.8. Plan and Sponsor Data Management Projects and Services (P)
- 1.1.9. Estimate Data Asset Value and Associated Costs (P)

1.2.Data Management Supervision and Control

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

2. Data Architecture, Analysis and Design

2.1. Enterprise Data Architecture

- 2.1.1. Develop the Enterprise Data Model (P)
- 2.1.2. Align with Other Business Models (P)
- 2.1.3. Define the Database Architecture (P) (same as 3.3.2)
- 2.1.4. Define the Data Integration / MDM Architecture (P) (same as 6.2)
- 2.1.5. Define the Data Warehouse / BI Architecture (P) (same as 7.2)
- 2.1.6. Define the Metadata Architecture (P) (same as 9.2)
- 2.1.7. Define Enterprise Taxonomies and Namespaces (P)

2.2. Data Modeling and Specification

- 2.2.1. Define Information Needs (D)
- 2.2.2. Develop and Maintain Logical Data Models (D)
- 2.2.3. Develop and Maintain Physical Data Models (D)

2.3. Data Model Quality Management

- 2.3.1. Develop Data Modeling Standards (P)
- 2.3.2. Review Data Model Quality (C)
- 2.3.3. Manage Data Model Versioning and Integration (C)

3. Database Management

3.1. Database Development

- 3.1.1. Define Database Design Standards (P)
- 3.1.2. Design Physical Databases (D)
- 3.1.3. Review Database Design Quality (C)
- 3.1.4. Develop Data Access Services (D)
- 3.1.5. Develop Information Products (D)
- 3.1.6. Implement Development / Test Database Changes (C)
- 3.1.7. Create and Maintain Test Data (D)
- 3.1.8. Migrate and Convert Data (D)
- 3.1.9. Test and Validate Data Requirements (D)

3.2. Database Production Support

- 3.2.1. Implement Production Database Changes (C)
- 3.2.2. Obtain Externally Sourced Data (O)
- 3.2.3. Plan for Data Recovery (P)
- 3.2.4. Backup and Recover Data (O)
- 3.2.5. Set Database Performance Service Levels (P)
- 3.2.6. Monitor & Tune Database Performance (O)
- 3.2.7. Plan for Data Retention (P)
- 3.2.8. Archive, Retrieve and Purge Data (O)
- 3.2.9. Manage Specialized Databases (O)

3.3. Data Technology Management

- 3.3.1. Understand Data Technology Requirements (P)
- 3.3.2. Define the Database Architecture (P) (same as 2.1.3)
- 3.3.3. Implement and Maintain Database Environments (C)
- 3.3.4. Evaluate Data Technology (P)
- 3.3.5. Install and Administer Data Technology (O)
- 3.3.6. Inventory & Track Data Technology Licenses (C)
- 3.3.7. Support Data Technology Usage & Issues (O)

4. Data Security Management

- 4.1. Understand Data Privacy, Confidentiality and Security Needs (P)
- 4.2. Define Data Privacy and Confidentiality Standards (P)
- 4.3. Define Password Standards and Procedures (P)
- 4.4. Implement Data Security Controls (D)
- 4.5. Manage Users, Passwords and Group Membership (C)
- 4.6. Manage Data Access Views (C)
- 4.7. Manage Data Access Permissions (C)
- 4.8. Monitor User Authentication and Access Behavior (C)
- 4.9. Classify Information Confidentiality (C)
- 4.10. Audit Data Security (C)

5. Data Quality Management

- 5.1. Develop and Promote Data Quality Awareness (O)
- 5.2. Define Data Quality Metrics (P)
- 5.3. Define Data Quality Requirements and Business Rules (D)
- 5.4. Analyze / Profile / Measure / Monitor Data Quality (C)
- 5.5. Set Data Quality Service Levels (P)
- 5.6. Certify Data Quality (C)
- 5.7. Identify, Escalate and Resolve Data Quality Issues (C)
- 5.8. Conduct Clean-up Campaigns (O)
- 5.9. Design and Implement Operational DQM Procedures (D)
- 5.10. Monitor Operational DQM Procedures (C)
- 5.11. Test and Validate Data Quality Requirements (D)
- 5.12. Audit Data Quality (C)

6. Reference and Master Data Management

- 6.1. Understand Reference & Master Data Integration Needs (P)
- 6.2. Define the Data Integration / MDM Architecture (P) (same as 2.1.4)
- 6.3. Implement Reference and Master Data Management Solutions (D)
- 6.4. Control Code Values and 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 and Business Intelligence Management

- 7.1.Understand Business Intelligence Data Needs (P)
- 7.2.Define the Data Warehouse / BI Architecture (P) (same as 2.1.5)
- 7.3.Implement Data Warehouses and Data Marts (D)
- 7.4.Implement Business Intelligence Tools and User Interfaces (D)
- 7.5.Implement Enterprise Reporting (D)
- 7.6.Implement Management Dashboards and Scorecards (D)
- 7.7.Implement Analytic Applications (D)
- 7.8.Train Business Professionals (O)
- 7.9.Replicate and Transform Data for Business Intelligence (O)
- 7.10.Monitor and Tune Data Warehousing Processes (C)
- 7.11.Support Business Intelligence Activity (O)
- 7.12.Monitor and 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, Record and Content Management

- 8.1.Manage Electronic Documents (text, graphics, image, audio, video)
- 8.2.Manage Physical Records (paper, fiche)
- 8.3.Manage Information Content (search engine indexes, taxonomies, XML namespaces, report and document format standards)

9. Meta Data Management

- 9.1.Understand Meta Data Requirements (P)
- 9.2.Define the Meta Data Architecture (P) (same as 2.1.6)
- 9.3.Develop and Maintain Meta Data Standards (P)
- 9.4.Implement a Managed Meta Data Environment (D)
- 9.5.Create, Capture, Store and Maintain Meta Data (O)
- 9.6.Maintain Meta Data Source Data Stores
- 9.7.Extract, Reconcile, Integrate and Share Meta Data (C)
- 9.8.Manage the Meta Data Repository (C)
- 9.9.Query, Report and Analyze Metadata (O)
- 9.10.Manage Meta Data Distribution and Delivery to
Glossaries, Directories and Other Meta Data Marts (C)