A Catalog of Data Governance Maturity Indicators Derived from the DAMA-DMBOK

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Abstract. *- Data Governance has become essential for ensuring the quality, security, and proper management of organizational data. Although the DAMA-DMBOK provides comprehensive guidance for implementing Data Governance, it is not an implementation methodology, as it does not define execution stages or maturity levels for the adoption of its recommendations. Based on a systematic analysis of the DAMA-DMBOK, this paper proposes a catalog of 36 Data Governance maturity indicators organized according to its eleven knowledge areas and classified into strategic, organizational, and technical dimensions. The proposed catalog provides a structured foundation for developing Data Governance maturity assessment methods.*

1. Introduction

Data Governance establishes policies, roles, processes, and standards to ensure data are managed securely and consistently while remaining aligned with organizational objectives [Janssen et al. 2020]. As organizations increasingly rely on data to support their operations and decision-making processes, Data Governance has become a key component for ensuring data quality, security, and regulatory compliance [Belghith et al. 2021].

To support the implementation of Data Governance, organizations commonly adopt methodologies and frameworks that provide guidance for achieving organizational objectives [DAMA International 2017, Paulk et al. 1993, CMMI Institute 2025, ISACA 2019, International Organization for Standardization 2017]. In this context, the DAMA-DMBOK is one of the most widely adopted references for Data Governance and Data Management [Santos et al. 2025, Ferro et al. 2026, Ferro et al. 2027]. It organizes the discipline into eleven knowledge areas and provides a comprehensive set of recommended practices covering strategic, organizational, and technical aspects of data management. These practices can be translated into indicators that support both the implementation of Data Governance and the assessment of an organization's Data Governance maturity level.

Assessing the Data Governance maturity level is important for organizations to understand the current stage of development of their Data Governance practices [Ferro et al. 2026]. To support such assessments, indicators can provide an objective means of analyzing the maturity level of an organization. Although the DAMA-DMBOK describes numerous recommended practices that can be translated into maturity indicators, it does not explicitly organize them into a structured catalog. Consequently, there

is currently no catalog of Data Governance maturity indicators derived from the DAMA-DMBOK that can be directly used to support maturity assessment initiatives.

This paper addresses this gap by proposing a catalog of Data Governance maturity indicators derived from the DAMA-DMBOK. The proposed catalog organizes the identified indicators according to the DAMA-DMBOK knowledge areas and classifies them into three dimensions: Strategic, Organizational, and Technical. This classification provides additional insight into the primary organizational dimension supported by each indicator and highlights that some indicators contribute simultaneously to more than one dimension of Data Governance. The resulting catalog therefore provides a structured foundation for the development of Data Governance maturity assessment methods and may support future initiatives related to organizational diagnosis. Furthermore, this work contributes by (i) systematically organizing the recommended practices described in the DAMA-DMBOK into a catalog of maturity indicators, (ii) classifying these indicators according to the Strategic, Organizational, and Technical dimensions of Data Governance, and (iii) providing a reusable foundation for the development of future maturity assessment methods.

The proposed dimensions represent complementary perspectives of Data Governance. The strategic dimension refers to high-level decisions that align Data Governance with organizational objectives and compliance requirements, including the definition of policies, guidelines, and strategies. The organizational dimension encompasses the governance structure, roles, responsibilities, and processes required for effective data management. In turn, the technical dimension comprises the technological resources that support the implementation of Data Governance, including tools, platforms, and mechanisms for data management, control, security, and quality.

The remainder of this paper is organized as follows. Section 2 reviews the main concepts related to Data Governance, the DAMA-DMBOK framework, and Data Governance maturity assessment. Section 3 presents the proposed catalog of Data Governance maturity indicators derived from the DAMA-DMBOK. Section 4 discusses the proposed taxonomy and its potential applications in maturity assessment initiatives. Finally, Section 5 concludes the paper and outlines directions for future work.

2. Background

This section reviews the concepts that provide the foundation for the proposed catalog. Section 2.1 presents the main Data Governance frameworks and standards, while Section 2.2 discusses Data Governance maturity assessment.

2.1. Data Governance Frameworks and Standards

Data Governance implementation is commonly supported by established frameworks, standards, and maturity models that provide guidance for organizing data management practices and improving organizational capabilities. Among the most frequently adopted references are the DAMA-DMBOK, COBIT, CMMI, ISO/IEC 330xx, and the IBM Data Governance Council Maturity Model [DAMA International 2017, ISACA 2019, Paulk et al. 1993, International Organization for Standardization 2017, IBM 2007]. Among these references, the DAMA-DMBOK stands out as one of the most comprehensive and widely adopted bodies of knowledge for Data Governance and Data Management [Santos et al. 2025].

The DAMA-DMBOK organizes Data Governance and Data Management into eleven knowledge areas and describes recommended practices related to the planning, implementation, operation, and control of organizational data assets [DAMA International 2017]. Unlike maturity models, however, the DAMA-DMBOK focuses on providing guidance for implementing data management and governance practices rather than defining a formal maturity assessment model. These recommended practices constitute a comprehensive reference for organizations seeking to establish or improve their Data Governance initiatives.

Table 1 summarizes the eleven DAMA-DMBOK knowledge areas and their primary purposes. Together, these areas cover the strategic, organizational, and technical capabilities required to manage data as a valuable organizational asset. For each knowledge area, the DAMA-DMBOK describes a set of recommended practices that can be translated into maturity indicators, which constitute the basis for the catalog proposed in this paper.

Table 1. Knowledge areas defined in the DAMA-DMBOK.

Knowledge Area	Primary Purpose
Data Governance	Defines decision rights, policies, roles, responsibilities, and accountability for managing organizational data.
Data Architecture	Defines the organizational data architecture, promoting consistency, integration, and alignment with business objectives.
Data Modeling and Design	Specifies conceptual, logical, and physical data models that support organizational information requirements.
Data Storage and Operations	Supports the storage, maintenance, availability, backup, recovery, and operational management of organizational data.
Data Security	Protects data assets by ensuring confidentiality, integrity, availability, privacy, and access control.
Data Integration and Interoperability	Enables consistent data exchange and integration across systems and organizational boundaries.
Document and Content Management	Manages structured and unstructured content throughout its lifecycle.
Reference and Master Data	Maintains consistent, authoritative, and shared business data across organizational processes.
Data Warehousing and Business Intelligence	Supports analytical processing, reporting, and decision-making through integrated data repositories.
Metadata	Manages data definitions, descriptions, lineage, and context to improve data understanding and reuse.
Data Quality	Ensures that data satisfy organizational requirements regarding accuracy, completeness, consistency, and timeliness.

2.2. Data Governance Maturity Assessment

Several studies have proposed or applied maturity assessment models related to Data Governance in different application domains, including healthcare, manufacturing,

public administration, higher education, blockchain, and master data management [Al-Dossari and Sumaili 2021, Ribeiro et al. 2024, Endra et al. 2024, Verdi et al. 2024, Schmuck and Georgescu 2025, Karisma and Tehrani 2023, Gokalp et al. 2021, Corallo et al. 2023, Silva et al. 2021].

Although these studies differ in terms of maturity levels, assessment criteria, and application domains, they share a common objective: supporting organizations in diagnosing their current maturity level and identifying opportunities for improvement. Table 2 summarizes representative studies and their respective application domains.

Table 2. Representative studies on Data Governance maturity assessment.

Study	Application domain
[Al-Dossari and Sumaili 2021]	Public and private organizations
[Ribeiro et al. 2024]	Interorganizational Data Governance
[Endra et al. 2024]	Public administration
[Verdi et al. 2024]	Higher education
[Schmuck and Georgescu 2025]	Master Data Management
[Gokalp et al. 2021]	Manufacturing
[Karisma and Tehrani 2023]	Blockchain and data protection

As shown in Table 2, Data Governance maturity assessment has been investigated in a wide range of application domains. Despite differences in organizational context, most studies define their own assessment dimensions, questionnaires, and indicators according to the objectives of each application domain. Consequently, interoperability between assessment methods remains limited, and comparisons across organizations are still difficult.

3. Catalog of Data Governance Maturity Indicators

The proposed catalog was constructed through a systematic examination of the recommended practices described in the DAMA-DMBOK. The analysis covered the eleven DAMA-DMBOK knowledge areas, selecting practices that represent observable organizational capabilities, artifacts, or mechanisms and that can be objectively verified within an organization. During the analysis, practices expressing the same or conceptually equivalent organizational capability were consolidated into a single maturity indicator whenever their distinction did not provide additional assessment value. This consolidation reduced conceptual redundancy while preserving the original intent of the DAMA-DMBOK recommendations. The resulting catalog comprises 36 maturity indicators that express the DAMA-DMBOK recommended practices as observable elements that support Data Governance maturity assessments. The complete catalog, including the proposed indicators and their definitions, is presented in Table 3.

Table 3. Definitions of the 36 proposed Data Governance maturity indicators.

Indicator	Definition
Area 1 – Data Governance	
1. Data Governance Strategy and Policies	Existence of a formal Data Governance strategy supported by documented policies that define organizational objectives, guiding principles, governance rules, and responsibilities for managing data throughout its lifecycle.

Table 3 (continued)

Indicator	Definition
2. Data Governance Roadmap	Existence of a documented roadmap defining priorities, initiatives, milestones, and the planned evolution of Data Governance.
3. Operating Framework	Existence of an organizational framework defining governance structures, roles, responsibilities, decision-making bodies, and accountability mechanisms for Data Governance.
4. Data Value Recognition	Organizational recognition of data as a strategic asset that supports decision-making, innovation, and business value creation.
Area 2 – Data Architecture	
5. Data Architecture	Existence of an enterprise data architecture that organizes data assets and aligns them with business objectives and information needs.
6. Data Flows	Documentation and management of data flows across organizational processes, applications, and information systems.
7. Enterprise Data Model	Existence of an enterprise-wide data model representing the organization's core business entities and their relationships.
8. Architecture Implementation Roadmap	Existence of a structured roadmap for implementing, maintaining, and evolving the enterprise data architecture.
Area 3 – Data Modeling and Design	
9. Data Models	Existence of conceptual, logical, and physical data models that accurately represent organizational information requirements.
10. Database Schema	Existence of well-defined and consistently maintained logical and physical database schemas supporting organizational applications.
11. Modeling Standards and Notation	Adoption of standardized methodologies, conventions, and notations for designing and documenting data models.
Area 4 – Data Storage and Operations	
12. Database Environment	Existence of a reliable database infrastructure supporting data storage, availability, maintenance, backup, recovery, and operational management.
13. Business Continuity Plan	Existence of documented plans and procedures ensuring data availability and business continuity during operational disruptions.
14. Database Technology Evaluation Criteria	Definition of organizational criteria for selecting, evaluating, adopting, and maintaining database technologies.
Area 5 – Data Security	
15. Data Security Policies	Existence of formal policies governing the protection, security, and appropriate use of organizational data.
16. Data Privacy and Confidentiality Standards	Adoption of standards ensuring compliance with privacy, confidentiality, and applicable regulatory requirements.
17. User Authentication Mechanisms	Implementation of secure authentication mechanisms to control and protect access to organizational data.
Area 6 – Data Integration and Interoperability	
18. Data Exchange Specifications	Definition of standardized specifications, formats, and protocols for exchanging data between organizational systems.
19. Data Integration and Interoperability Architecture	Existence of an architectural approach supporting consistent integration and interoperability among heterogeneous information systems.
20. CEP Thresholds and Alerts	Definition of thresholds, business rules, and alert mechanisms based on Complex Event Processing (CEP) to monitor data integration events and support the timely detection of anomalies and operational conditions.
21. Data Services	Availability of standardized data services, such as APIs and service interfaces, for accessing, sharing, and integrating organizational data.
Area 7 – Document and Content Management	
22. Content and Records Management Strategy and Policies	Existence of a formal strategy supported by documented policies governing the management of documents, records, and digital content throughout their lifecycle.
23. Content Repository	Availability of a centralized repository for storing, organizing, preserving, and managing organizational content.
Area 8 – Reference and Master Data	
24. Master and Reference Data Requirements	Definition of organizational requirements governing the creation, maintenance, and management of master and reference data.
25. Data Models and Integration Patterns	Adoption of standardized data models and integration patterns supporting consistent management of master and reference data.
26. Reliable Master and Reference Data	Availability of accurate, consistent, authoritative, and trustworthy master and reference data across organizational systems.
Area 9 – Data Warehousing and Business Intelligence	

Table 3 (continued)

Indicator	Definition
27. Data Warehousing and Business Intelligence Architecture	Existence of an architecture supporting data warehousing, analytical processing, reporting, and business intelligence capabilities.
28. Learning and Adoption Plan	Existence of a structured plan supporting user training, adoption, and effective utilization of data warehousing and business intelligence solutions.
29. Production Support Processes	Definition of operational processes for maintaining, monitoring, and supporting production data warehousing and business intelligence environments.
Area 10 – Metadata	
30. Metadata Strategy	Existence of a formal strategy defining objectives, principles, and responsibilities for metadata management.
31. Metadata Standards and Integration	Adoption of standardized metadata definitions, classifications, naming conventions, and integration mechanisms ensuring metadata consistency across organizational systems.
32. Metadata Architecture	Existence of an architecture defining how metadata are structured, managed, maintained, and governed throughout the organization.
33. Metadata Repository	Availability of a centralized repository for storing, managing, and providing access to organizational metadata.
Area 11 – Data Quality	
34. Data Quality Strategy and Policies	Existence of a formal strategy supported by documented policies defining organizational objectives, principles, and responsibilities for data quality management.
35. Data Quality Management Procedures	Existence of documented procedures for measuring, monitoring, correcting, and continuously improving data quality.
36. Data Quality Program	Existence of an institutionalized program coordinating and promoting continuous data quality improvement initiatives across the organization.

Table 4 summarizes the distribution of the proposed indicators across the eleven DAMA-DMBOK knowledge areas. The number of indicators ranges from two to four per knowledge area. This balanced distribution reflects the comprehensive coverage of the DAMA-DMBOK while avoiding unnecessary redundancy through the consolidation of conceptually overlapping organizational capabilities.

Table 4. Distribution of cataloged indicators across the DAMA-DMBOK knowledge areas.

Area	Knowledge Area	Indicators
1	Data Governance	4
2	Data Architecture	4
3	Data Modeling and Design	3
4	Data Storage and Operations	3
5	Data Security	3
6	Data Integration and Interoperability	4
7	Document and Content Management	2
8	Reference and Master Data	3
9	Data Warehousing and Business Intelligence	3
10	Metadata	4
11	Data Quality	3
	Total	**36**

Table 5 presents the proposed catalog, classifying each indicator according to the Strategic (S), Organizational (O), and Technical (T) dimensions of Data Governance. This classification highlights the primary organizational perspective addressed by each indicator and provides an additional analytical view of the catalog, supporting its interpretation and future application in Data Governance maturity assessments.

Table 5. Catalog of Data Governance maturity indicators. S, O, and T denote the Strategic, Organizational, and Technical dimensions, respectively.

Area	Indicator	S	O	T
1	Data Governance Strategy and Policies	✓	✓	
1	Data Governance Roadmap	✓	✓	
1	Operating Framework		✓	
1	Data Value Recognition	✓	✓	
2	Data Architecture	✓		✓
2	Data Flows		✓	✓
2	Enterprise Data Model		✓	✓
2	Architecture Implementation Roadmap	✓	✓	
3	Data Models		✓	✓
3	Database Schema			✓
3	Modeling Standards and Notation		✓	✓
4	Database Environment			✓
4	Business Continuity Plan	✓	✓	
4	Database Technology Evaluation Criteria		✓	✓
5	Data Security Policies	✓	✓	
5	Data Privacy and Confidentiality Standards	✓	✓	✓
5	User Authentication Mechanisms			✓
6	Data Exchange Specifications		✓	✓
6	Data Integration and Interoperability Architecture	✓		✓
6	CEP Thresholds and Alerts		✓	✓
6	Data Services			✓
7	Content and Records Management Strategy and Policies	✓	✓	
7	Content Repository			✓
8	Master and Reference Data Requirements	✓	✓	
8	Data Models and Integration Patterns		✓	✓
8	Reliable Master and Reference Data		✓	✓
9	Data Warehousing and Business Intelligence Architecture	✓		✓
9	Learning and Adoption Plan	✓	✓	
9	Production Support Processes		✓	✓
10	Metadata Strategy	✓	✓	
10	Metadata Standards and Integration	✓	✓	✓
10	Metadata Architecture	✓		✓
10	Metadata Repository			✓
11	Data Quality Strategy and Policies	✓	✓	
11	Data Quality Management Procedures		✓	✓
11	Data Quality Program	✓	✓	

4. Discussion

This article proposes a structured catalog of Data Governance maturity indicators derived from the DAMA-DMBOK. Unlike existing maturity assessment approaches that typically define proprietary indicators according to specific organizational contexts, the proposed catalog preserves the conceptual structure of the DAMA-DMBOK while translating its recommended practices into measurable organizational indicators. Consequently, the catalog may serve as a common reference for the development of Data Governance maturity assessment methods based on the DAMA-DMBOK.

An initial observation concerns the balanced distribution of indicators across the

eleven DAMA-DMBOK knowledge areas. As presented in Table 4, every knowledge area is represented by between two and four indicators. This distribution suggests that Data Governance maturity should not be assessed by emphasizing isolated domains, but rather by considering the different organizational capabilities described throughout the DAMA-DMBOK.

A second contribution of this work is the classification of each indicator according to the Strategic, Organizational, and Technical dimensions of Data Governance. Although the DAMA-DMBOK organizes its recommended practices according to knowledge areas, it does not explicitly characterize the organizational dimension primarily supported by each practice. The proposed classification complements the original framework by providing an additional perspective for interpreting the role of each indicator during maturity assessment.

The adopted classification also highlights the multidisciplinary nature of Data Governance. Several indicators were intentionally classified into more than one dimension because they simultaneously represent strategic decisions, organizational practices, and technological capabilities. For example, Data Governance Strategy and Policies, Metadata Standards and Integration, and Data Privacy and Confidentiality Standards contribute to multiple dimensions by combining governance principles with organizational processes and technical implementation mechanisms. This observation reinforces that Data Governance maturity should not be assessed through isolated organizational perspectives, since strategic, organizational, and technical capabilities are inherently interconnected.

Another interesting observation emerged during the analysis of the proposed catalog. Although the indicators were derived independently from different DAMA-DMBOK knowledge areas, many of them naturally represent organizational artifacts that recur across multiple knowledge areas. These recurring artifacts include strategies (e.g., *Data Governance Strategy and Policies* and *Metadata Strategy*), policies (e.g., *Data Security Policies* and *Data Quality Strategy and Policies*), architectures (e.g., *Metadata Architecture* and *Data Warehousing and Business Intelligence Architecture*), models (e.g., *Enterprise Data Model*), repositories (e.g., *Content Repository* and *Metadata Repository*), and operational processes (e.g., *Production Support Processes* and *Data Quality Management Procedures*). This observation suggests that organizational maturity is strongly associated with the institutionalization of these artifacts rather than exclusively with technological capabilities.

Finally, the proposed catalog provides a structured foundation for future maturity assessment initiatives. Researchers may employ the catalog as a basis for defining questionnaires, assessment instruments, or maturity models, while practitioners may use it as a reference for evaluating the implementation of Data Governance practices within their organizations. Furthermore, the proposed classification may support future studies investigating the relative contribution of strategic, organizational, and technical practices to Data Governance maturity.

5. Conclusion

This article proposes a structured catalog of Data Governance maturity indicators derived from the DAMA-DMBOK. The development of this catalog was based on a systematic

analysis of the recommended practices described in the DAMA-DMBOK, with the aim of addressing the gap identified in the literature. As a result, a set of maturity indicators was obtained, organized according to the eleven knowledge areas of the DAMA-DMBOK. In addition, the proposed catalog introduces a complementary classification that categorizes each indicator according to the Strategic, Organizational, and Technical dimensions of Data Governance. Together, these contributions provide a structured foundation for the development of Data Governance maturity assessment methods based on the DAMA-DMBOK.

The proposed catalog comprises 36 maturity indicators distributed across the eleven DAMA-DMBOK knowledge areas. Among them, 18 indicators were classified as Strategic, 26 as Organizational, and 23 as Technical, with several indicators simultaneously belonging to more than one dimension. The resulting catalog demonstrates that Data Governance maturity extends beyond technological capabilities, encompassing organizational structures, governance processes, policies, strategies, and other organizational artifacts required to effectively manage data as a strategic organizational asset.

As future work, the proposed catalog should be empirically validated by developing and applying assessment instruments capable of objectively assessing the proposed maturity indicators within organizational contexts. Such instruments may employ evidence-based questionnaires, structured interviews, document analysis, or other systematic data collection techniques to evaluate the implementation of the proposed indicators. In addition, software tools may be developed to automate and support Data Governance maturity assessments based on the proposed catalog of indicators.

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