

Agency Chief Data Officer Coordination with Records Management Programs

Records Management Assessment Report

National Archives and Records Administration March 2022

AGENCY CHIEF DATA OFFICER COORDINATION WITH RECORDS MANAGEMENT PROGRAMS RECORDS MANAGEMENT ASSESSMENT REPORT

INTRODUCTION

The National Archives and Records Administration (NARA), based on authority granted by 44 United States Code (U.S.C.) 2904(c)¹, is responsible for assessing the proper management of records in all media within federal agencies to protect rights, assure government accountability, and preserve and make available records of enduring value. Under this authority, NARA conducts records management oversight of federal agencies, including agency inspections and assessments. An assessment is a multi-agency evaluation of a specific topic, issue, or activity affecting records management (RM) processes, procedures, or policies.

In FY 2021, NARA conducted an assessment of Chief Data Officer (CDO) coordination with federal agency RM programs that are in varying stages of implementing the *Foundations for Evidence-Based Policymaking Act of 2018* (H.R. 4174)² ("Evidence Act") and Office of Management and Budget (OMB) Memorandum M-19-23, *Phase 1 Implementation of the Foundations for Evidence-Based Policymaking Act of 2018: Learning Agendas, Personnel, and Planning Guidance*. In particular, NARA was interested in the relationship and linkages between RM and the CDO as the new CDO role and responsibilities are being planned, established, and implemented across federal agencies. Towards this end, NARA reviewed applicable laws, regulations, policies and guidance regarding data management/data governance and RM (see Appendix A for definitions of data-specific terms).

CONTEXT AND FRAMEWORK

There are several laws, regulations, and memoranda that provide context and a framework for the management and governance of data and records, some of which are detailed below.

Data Management Mandates

The Evidence Act, which includes the OPEN Government Data Act, requires departments and agencies identified in the Chief Financial Officers Act of 1990 (H.R. 5687)³ to designate a CDO who shall be responsible for lifecycle data management. Additionally, each department or agency is required to submit annually to OMB and Congress a plan for identifying and addressing policy questions relevant to their respective programs, policies, and regulations. Agencies are currently responding to requirements for governance bodies outlined in M-19-23, requiring agencies to establish a Data Governance Body. The Data Governance Body must be chaired by the CDO with participation from relevant senior-level staff that, according to the Memorandum, may include the agency's Senior Agency Official for Records Management (SAORM) who has a defined role in the governance process. Some agencies interpret M-19-23 as requiring the SAORM to be a member of the Data Governance Body. In addition, as part of

¹ For all 44 U.S.C. Chapter 29, <u>https://www.archives.gov/about/laws#nara</u>.

² See https://www.congress.gov/bill/115th-congress/house-bill/4174 for more information on the *Evidence Act*.

³ https://www.congress.gov/bill/101st-congress/house-bill/5687.

the lifecycle data management responsibilities noted in M-19-23, OMB also expects agency CDOs to carry out records management,⁴ a responsibility usually carried out by the person(s) overseeing an agency's RM program as specified in 36 CFR 1220.34(a). This person is often known as the Agency Records Officer (ARO).

On June 4, 2019, OMB published Memorandum M-19-18, Federal Data Strategy — A Framework for Consistency⁵, which provides a government-wide vision for how agencies should manage and use federal data by 2030. M-19-18 requires agencies to implement the Federal Data Strategy by meeting the requirements of annual government-wide Action Plans and to identify and prioritize practice-related steps for a given year, along with target timeframes and responsible entities. The 2021 Action Plan⁶, which identifies specific actions to be taken to meet the Federal Data Strategy, calls for the federal government to replicate, accelerate, and scale leading practices related to government data, including steps to:

- Provide consistent, reliable, and privacy-preserving access to federal government data to the public, businesses, and researchers for commercial and other public purposes;
- Fill gaps in government capacity and knowledge;
- Increase the sharing and use of data for federal decision-making and operational needs;
- Make federal data more findable and discoverable through rich descriptions and metadata;
- Utilize data and operational maturity models and evidence-based planning assessments;
- Provide data-management tools and protocols for secure data access for state, local, tribal, and territorial governments; and
- Plan for secondary data uses from the outset, through re-identification risk assessments, stakeholder engagement, and sufficient information to assess fitness for use.

Federal Agency Requirements for Managing Electronic Records

Temporary and permanent electronic records often coexist within agencies and are found in a variety of systems, platforms, and technologies. Agencies must manage all electronic records, whether they are in approved or known IT systems, storage devices or drives, desktop productivity applications, collaborative spaces, social media, text messaging applications, or anywhere else. Below are some of the applicable laws, regulations, and other guidance regarding the management of electronic records:

- 44 U.S.C. Chapter 31⁷
- 36 Code of Federal Regulations (CFR)⁸, specifically 36 CFR 1236 for electronic records management
- OMB/NARA Transition to Electronic Records (M-19-21)⁹

 $^{^4~}See~\underline{https://www.whitehouse.gov/wp-content/uploads/2019/07/M-19-23.pdf},~page~24.$

⁵ https://www.whitehouse.gov/wp-content/uploads/2019/06/M-19-18.pdf.

⁶ https://strategy.data.gov/2021/action-plan/.

⁷ https://uscode.house.gov/view.xhtml?path=/prelim@title44/chapter31&edition=prelim.

⁸ https://www.ecfr.gov/current/title-36/chapter-XII/subchapter-B.

https://www.archives.gov/files/records-mgmt/policy/m-19-21-transition-to-federal-records.pdf.

- OMB Circular A-130, Managing Information as a Strategic Resource¹⁰
- Universal Electronic Records Management (ERM) Requirements¹¹

ASSESSMENT SCOPE & OBJECTIVES

NARA limited the scope of this assessment to the role of the CDO and its interaction and collaboration with an agency's RM program. This was not intended to be a comprehensive assessment or evaluation of an agency's RM program or its data management activities.

NARA had several objectives it wanted to achieve in conducting this assessment, including:

- Understanding the organizational placement, role, and responsibilities of a CDO;
- Determining existing or planned linkages between the role of agency CDOs and RM;
- Improving NARA's external guidance, policies, and training regarding the relationship between CDOs and RM; and
- Bringing awareness to the importance of cooperation and inclusion within and among the two disciplines.

PARTICIPANTS

Six agencies voluntarily participated in this assessment, each demonstrating varying levels of maturity in the implementation of the *Evidence Act* and collaboration with their RM programs. The six agencies include:

- Department of Justice (DOJ)
- Department of Transportation (DOT)
- Federal Energy Regulatory Commission (FERC)
- Federal Retirement Thrift Investment Board (FRTIB)
- National Archives and Records Administration (NARA)
- Social Security Administration (SSA)

These agencies represent a subset of large- and medium-sized agencies. In addition, FERC and the DOT CDOs serve on the federal CDO Council¹² as the Small Agency Representative and the Council Vice-Chair, respectively, which provided additional insight into the activities of the CDO Council and within federal agencies.

¹⁰ https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/OMB/circulars/a130/a130revised.pdf. See also https://records-express.blogs.archives.gov/sites/default/files/omb/assets/OMB/circulars/a130/a130revised.pdf. See

¹¹ https://www.archives.gov/records-mgmt/policy/universalermrequirements.

¹² The Council's vision is to improve government mission achievement and increase the benefits to the Nation through improvement in the management, use, protection, dissemination, and generation of data in government decision-making and operations. The Council is set to sunset in January 2025. For more information about this Council, see https://www.cdo.gov/about-us/.

METHODOLOGY

Participants submitted to NARA relevant documentation, including organizational charts, policies, procedures, and directives, concerning the designation and establishment of the CDO role and overall data management at their agencies. NARA then interviewed each agency about its CDO role and activities, the current state of data management at their agency, and current and/or future plans to incorporate and collaborate with the agency's RM program. This report summarizes NARA's observations gathered during the agency interviews and contains recommendations for improving relationships between agency CDOs and their RM programs, as well as elevating the importance of managing data and records simultaneously by embedding RM practices, regulations, and policies into DM processes.

As this report covers an emerging topic where there are few applicable RM regulations and requirements, there are no specific findings and recommendations for the participating agencies. Instead, this report provides observations relevant to both the records and data communities, with general recommendations for both agencies and NARA on areas where further consideration or exploration is warranted.

AGENCY CDO COLLABORATION AND COORDINATION WITH RM PROGRAMS

Federal RM ensures that records are identified, organized, can be found when needed, and are kept as long as necessary to support the needs of the government and the public. NARA assists federal agencies in determining which government records must be kept and which may be destroyed, as required by the Federal Records Act and related legislation and regulations.

As part of the federal data mandates mentioned above, agency data management programs must provide authority over data through data governance and stewardship. This will help to achieve consistent access to and delivery of data across data subject areas and data structure types in the organization to meet the requirements of all applications and business processes.

A common view of records and data implies that physical and digital assets are two distinct structures. But in terms of compliance, business operational requirements, and continuity, the two structures or formats are equally valuable and interrelated. Today, most records and data are created and maintained electronically. The volume will continue to grow as the government transitions to being fully electronic in line with the requirements of M-19-21 and to improve government efficiency. Additionally, the federal regulatory requirements that govern the management of physical records and electronic data/records are the same. As a result, data and records are interrelated and should be managed, regardless of format. Focusing on the domains of RM and data management, each could be interpreted to quite literally mean the same thing. Through the interviews, NARA found that the existing gaps are a matter of perception and definition, functions and status. As agencies develop and implement the *Evidence Act*, previous perceptions that RM and data management are different disciplines distinct from each other should now be viewed as related fields requiring collaboration, reciprocity, and tighter integration within agency information management frameworks.

The linkages between RM and data management provide agencies an opportunity to leverage both programs and promote efficient operational and programmatic objectives. Some of these areas include:

- Lifecycle Management
- Stewardship
- Governance
- Risk Management
- Contingency Planning
- Transparency
- Legal
- Compliance

Records Management and Data Management Linkages

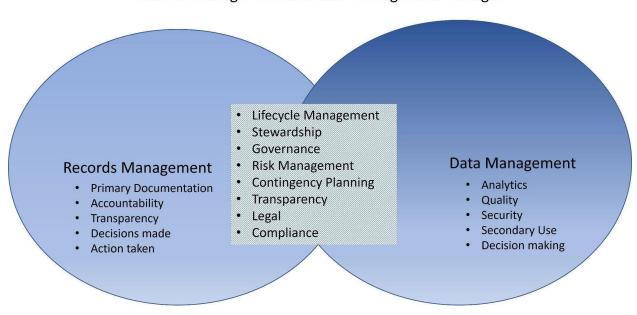


Figure 1: Side-by-Side Comparison of RM and DM and Areas for Collaboration and Coordination

Effective implementation of agency mission activities requires efficient access to a broad range of scientific, technical, regulatory and administrative data across the federal government, including those that meet the definition of a record. ¹³ The volume and complexity of this data continues to grow rapidly and requires intellectual control to be effectively used. The participating agencies are currently practicing varied levels of effective data management and records management. In order to direct and coordinate such management throughout their agencies, a comprehensive approach is needed. Data governance strategies implemented through the CDO role with RM collaboration and coordination should aid in meeting the long-term needs of the agencies and improve on their complementary goal of ensuring that records, including data, are authentically captured, used, maintained, and preserved throughout the records lifecycle. The majority of the agency CDOs have limited engagement and collaboration with

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¹³ 44 U.S.C. 3301.

agency RM programs, although most include the agency Senior Agency Officials for Records Management (SAORM) and/or the ARO as members of their Data Governance Body (DGB).

The remainder of this report summarizes how the connections are, or should be made, and observations and recommendations based on the comments and responses of the participating agencies.

Chief Data Officer Role

Five out of the six agencies have a designated CDO, the majority of which were hired within the past two years. The one exception was still recruiting for the position. Several CDOs had years of experience performing data management prior to their formal designation as the agency CDO per the *Evidence Act*.

While the majority of CDOs participating in this assessment have received agency onboarding training that includes RM basics in addition to other topics, and/or their annual required basic RM training, additional role-based training did not exist. Such training would enhance the understanding of RM and its benefits to data governance.

The CDOs interviewed generally see their role as implementing the data management lifecycle as part of the *Evidence Act*. Some of the duties discussed included:

- Standardizing and streamlining existing federated enterprise-wide data management in order to better leverage the information;
- Managing data assets, including data inventories, which identify the sources of data, where the datasets are being maintained, their content, and how they are being used;
- Getting the right processes, the right services, and the right talent in place to improve business practices;
- Closing data gaps;
- Aligning data governance in agency components to the department level (where applicable);
- Communicating and collaborating with stakeholders on data strategy;
- Establishing an analytic platform;
- Turning data into information by creating a data-driven culture where data and metrics can be used to make better decisions; and
- Establishing a data stewardship framework.

Agency Data Governance

Agency CDOs have a common vision and goals for data governance. As part of M-19-18 requirements, the majority of the agencies have developed and documented data governance strategies, frameworks, and/or policies that provide a road map for structuring decisions about how data will be collected, used, analyzed, maintained, safeguarded, and shared. Documenting this relationship in data strategy and policy is also important and aids in its implementation. Most of the agencies included some level of coordination with RM programs or compliance with RM policies, although two agencies made no mention of records or the RM program. Some have the CDO and other data stakeholders working with RM programs to determine data retention. One agency included compliance with statutory, regulatory and agency policy regarding data and a

requirement that data is maintained for records management. Others specifically state that any IT solutions used for data management must comply with RM policies and standards throughout the data lifecycle. While most of the agencies have documented coordination or compliance with RM, this has not yet been consistently implemented or fully realized.

Participating agency CDOs recognize the importance of obtaining support through communication and relationship-building. Agencies were required by M-19-23 to establish an inclusive and empowered DGB by September 30, 2019, to be chaired by the Chief Data Officer. Coordination and collaboration with all agency information management disciplines is key and should include the RM program, which is responsible for managing the agency's records and information. The majority of the agencies include agency SAORMs and/or AROs in data governance decision-making as part of their CDO-chaired DGBs or Data Teams.

Intellectual Control

Maintaining intellectual control through data stewardship was another area of focus. Data stewardship is a component of a data management program that assigns decision rights and accountabilities to facilitate the management of people, processes, and tools for the lifecycle administration of data. Regardless of how this is done, maintaining stewardship of an agency's data and information is vital to having intellectual control of that information (i.e., knowing what exists, where, in what formats, etc.).

Agencies described varying approaches and levels of implementation of data stewardship programs. Some agencies were already in the process of implementation, while others were still discussing their plans for such a program. Of those already implementing, one agency assigned data stewards by office, not by individuals. This agency also stopped use of the term "data ownership" to deter individuals from believing they owned the data as opposed to the agency. Another agency stated that data stewards were not specifically designated because, in practice, data stewards existed by default due to the nature of their mission and their work processes. This agency thought that the management and stewardship of data (and RM) throughout the data lifecycle was conducted on a daily basis, whether the staff knew it or not. One agency wanted to see the role formalized and included in performance plans, not just as 'another duty as assigned.'

In some cases, agency data stewards were also Records Custodians or Liaisons who, in addition to their mission work, coordinated with and served as the liaison between their office and the agency's RM program. As the data subject matter experts (SME), they were thought to be in the best position to provide their RM program with the required information for scheduling records and for maintaining overall intellectual control of the records. Based on these discussions, NARA believes that there are strong ties between Data Stewardship and RM staffing roles and encourages agencies to consider both when creating and defining such positions.

Past and Current Initiatives

Agency CDOs have been focused on communication and strategic planning regarding the requirements of the *Evidence Act*. Most agencies have decentralized components with individual component data governance activities. Several agencies have started data governance activities that include early development of data governance templates, establishing a data governance council or board at the senior executive levels and implementing Federal Data Strategy Action Plans. Some agencies are in the process of acquiring or testing data management tools to support the data governance program. One agency has begun to implement a data stewardship framework.

While some of the agencies were still in the planning phase of data governance, others were moving into the resourcing and implementation phase. The following are data governance initiatives that were started in the past or are planned for the near future:

- Outreach, coordination and collaboration with component agencies and offices
- Creating and implementing data governance frameworks
- Procuring, piloting and implementing data analytics platforms with dashboards
- Planning and implementing Federal Data Strategy Action Plan initiatives
- Inventorying and cataloging agency data
- Conducting data assessments

RM, as a firmly established program with requirements already in place, should be utilized to help build or enhance the emerging data governance programs.

Current Coordination with RM

DGBs or councils are usually a cross-functional, executive-level group, representing all business and technical stakeholders that prioritize initiatives, align resources, make policy decisions and define the data management strategy for the organization. Similar to federal RM programs, a compliant, effective, and efficient DM program requires:

- Senior management support at the highest levels;
- A clear definition of program objectives, responsibilities, and authorities;
- Allocation of sufficient resources to administer the program;
- Assignment of the program to an appropriate office within the agency's organizational structure:
- Continuous training for records and information management staff; and
- Regular internal evaluations to monitor compliance and program effectiveness.

The majority of the participating CDOs see the linkages between data management and RM and discussed wanting to build on these relationships in the future. Most of the agencies interviewed had coordinated and collaborated with other information management disciplines, including RM, and this approach was documented in agency data policy and/or strategic plans. Collaboration has also come in the form of RM personnel serving on the DGBs and in leadership capacities.

The idea that both disciplines have similar principles and themes was mentioned several times over the course of our interviews. Both need to know what they have and the volume, where and how it is maintained, for how long it must be maintained, and ensure appropriate access to that

information. In many ways, data management and RM work in tandem toward their respective goals and objectives. While the disciplines may have similar themes, they often have different processes. For example, only two agencies collaborated with their RM programs in creating comprehensive data inventories. ¹⁴ Both disciplines are required to maintain inventories ¹⁵, but the CDOs mentioned that the information gathered for each may be different and serve different purposes. The CDOs and AROs also voiced concerns over the reuse of data to create new data, and its implications for data management and RM. Working together on such issues should result in more effective outcomes, and may reduce some duplication of effort. Another example is the determination of data retention. It is important that both disciplines work together to determine how long the data is needed for business purposes, not only to comply with NARA-approved agency records schedules, but because maintaining data longer than necessary makes the search for timely information more difficult. Understanding these foundational connections, whether phrasing it in terms of compliance or a business value proposition, may be key in building on those relationships in the future. These are both challenges and opportunities that NARA will monitor and facilitate where feasible as Data Governance programs mature.

In a similar vein, several agencies mentioned that awareness of and familiarity with the principles and terminology of both disciplines were important and improved the respect that the CDO and ARO had for each other, as well as enhanced their overall collaboration. Several AROs had an Information Technology (IT) background, and several CDOs were familiar with the role of RM and associated terminology. In a sense, they could 'speak each other's' language.' This may require agencies to revisit the traditional knowledge and skill sets required by data management and RM staff.

RECOMMENDATIONS FOR AGENCIES

To benefit all agencies that are planning and implementing CDO roles and responsibilities, this assessment makes the following recommendations:

Coordinate, collaborate and/or integrate RM with data governance programs

One possible approach to facilitating data management and RM collaboration and coordination is the designation of an RM policy advisor role within an existing or newly created DGB or council. This approach facilitates collaboration and coordination as part of an authoritative decision-making body that is empowered and accountable for the activities within RM and data management organizations. Another approach is to incorporate RM into data management stewardship programs. For example, an agency may choose to designate a data steward as a records liaison to the ARO, thus incorporating the requirements of both into daily business activities.

¹⁴ The second title of the *Evidence Act*, the *OPEN Government Data Act*, requires agencies to develop and maintain comprehensive data inventories. See https://www.congress.gov/bill/115th-congress/house-bill/4174 for more information

¹⁵ Agency RM programs are required to maintain records inventories per <u>36 CFR 1225.12(b)</u>. See also <u>36 CFR 1222, Subpart B.</u>

While approaches may vary due to agency business requirements and scale, it is important for agencies to formalize and guide behavior over the definition, production and usage of data to manage risk, compliance, and improve quality and usability of data assets. In line with this, data governance and RM programs should include collaboration and coordination as a standard tool in the overall management of the data lifecycle.

AROs and SAORMs routinely engage CDOs and agency data governance programs

Agency RM programs should be poised to assist an agency's data governance program in accomplishing action items through different roles and responsibilities. AROs and SAORMs should engage, collaborate and coordinate with the CDO to support meeting those action items. For example, as part of the *Federal Data Strategy Action Plan for 2021*¹⁶, the following high-level action items were established:

- Identify Data Needs to Answer Priority Agency Questions
- Constitute a Diverse Data Governance Body
- Assess Data and Related Infrastructure Maturity
- Identify Opportunities to Increase Staff Data Skills
- Identify Priority Data Assets for Agency Open Data Plans
- Publish and Update Data Inventories

Within these action items are opportunities for AROs and/or SAORMs to assist the CDO in different roles within the data governance program to establish and implement policies, practices, and standards for maximizing the value and impact of data and records management.

Provide role-based RM training for CDOs and data governance staff

CDOs and other data governance program staff need additional, more targeted RM training. Participating CDOs indicated that they received their agency's annual RM basic training, but nothing specific to their role or position. Participating CDOs mentioned that their staff were unclear on records retention rules regarding their data. Providing additional role-based training for these staff would greatly improve awareness and understanding of RM as it relates to data governance, and improve engagement between the two disciplines.

 $[\]underline{^{16}}\underline{^{https://strategy.data.gov/assets/docs/2021-Federal-Data-Strategy-Action-Plan.pdf}.$

Support ARO professional development in data governance

It is essential that AROs understand the larger world of data management and information governance in order to make sure that RM is integrated within data governance programs. Having a general background in data management principles will aid the AROs in seeing the whole information governance picture as well as enable them to speak the language, so to speak, of the data governance profession using the terms and principles of that discipline. By gaining a shared understanding of each other's principles and processes, the AROs and CDOs can build on their mutual and/or similar mission goals and objectives while still meeting the requirements of both.

WHAT NARA WILL DO

NARA is positioned to engage on this topic with agencies developing and implementing data management and data governance through the recently created CDO role. Additionally, NARA can utilize this opportunity to address NARA strategic out-year planning as it relates to managing federal electronic records. As discussed in this assessment report, there are existing drivers to not only provide that data management, data governance, and data/records lifecycle piece, but an opportunity for NARA to inject the value proposition of RM and how RM and data management overlap from a governance perspective. When opportunities arise for early engagement in this area, NARA can provide leadership in bridging the gap between data governance and RM while ensuring that its own regulatory drivers to manage electronic records are addressed early in the development lifecycle. This includes not only systems but managing data, which is a subset of systems development. This report recommends that NARA consider the following initiatives to meet this challenge:

- Expand discussion around the need for RM coordination and/or integration with data management.
- Develop role-based RM training, specifically for CDOs and/or data management staff.
- Develop and conduct RM briefings or presentations for senior agency executives and DGB meetings.
- Publish guidance and share best practices for ARO and CDO coordination/collaboration.

CONCLUSION

NARA believes that RM requirements and expertise are important for ensuring that the management and use of data and information resources complies with federal RM statutes and regulations.

Record Management

- 44 U.S.C. Chapter 31
- 36 Code of Federal Regulations (CFR), specifically 36 CFR 1236 for electronic records management
- · NARA Basic Laws and Authorities
- OMB/NARA Transition to Electronic Records (M-19-21)
- OMB Circular A-130, Managing Information as a Strategic Resource
- Universal Electronic Records Management (ERM) Requirements

Data Management

- Foundations for Evidence-Based Policymaking Act of 2018 (H.R. 4174) ("Evidence Act")
- OMB Memorandum M-19-23, Phase 1 Implementation of the Foundations for Evidence-Based Policymaking Act of 2018: Learning Agendas, Personnel, and Planning Guidance
- · OPEN Government Data Act
- OMB Memorandum M-19-18, Federal Data Strategy A Framework for Consistency

Figure 2: Legal Authorities and Drivers of RM and DM

NARA also believes that RM policies and principles, when integrated with data management, will improve the lifecycle management of all agency information. Since agencies are in the early stages of establishing data governance programs, now is the time for agencies to establish data governance with RM program collaboration and coordination, and to begin the integration of the two disciplines.

Appendix A Definitions of Data-Specific Terms Cited

<u>Data</u>: A re-interpretable representation of information in a formalized manner suitable for communication, interpretation or processing. Electronically stored information or recordings and analog formats. Examples include documents, databases, and audio/visual recordings of events. (www.dama.org)

<u>Data Asset</u>: Any entity that is comprised of data. For example, a database is a data asset that is comprised of data records. A data asset may be a system or application output file, database, document, or web page. A data asset also includes a service that may be provided to access data from an application. For example, a service that returns individual records from a database would be a data asset. (nist.gov)

<u>Data Governance</u>: Data governance is a collection of processes, roles, policies, standards, and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals. It establishes the processes and responsibilities that ensure the quality and security of the data used across an organization. Data governance defines who can take what action, upon what data, in what situations, using what methods. Data management also refers to the management of the full data lifecycle needs of an organization. Data governance is the core component of data management, tying together nine other disciplines, such as data quality, reference and master data management, data security, database operations, metadata management, and data warehousing. (www.gartner.com)

<u>Data Management</u>: Data management is the authority over data that consists of the practices, architectural techniques, and tools for achieving consistent access to and delivery of data across the spectrum of data subject areas and data structure types in the organization, to meet the data consumption requirements of all applications and business processes. (www.gartner.com)

<u>Data Stewardship</u>: Accountability and responsibility for data and processes that ensure effective control and use of data assets. Stewardship can be formalized through job titles and descriptions, or it can be a less formal function driven by people trying to help an organization manage the lifecycle and get value from its data. (www.dataversity.net and https://www.dama.org)



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