

INTERNAL AUDIT REPORT

2021

**GAP ANALYSIS – SCDOT
DATA MANAGEMENT
MATURITY ASSESSMENT**



**INTERNAL AUDIT
SERVICES**

May 28, 2021

4 ENGAGEMENT OVERVIEW

4.1 BACKGROUND

In every organization, data is used by users, processes, and business activities to make decisions and achieve objectives. Unmanaged Data-related risk creeps in when organizations lose control of the data's accuracy, reliability, and security – this may result in not capitalizing opportunities or worse failing to meet goals and objectives due to poor data quality and trust.

Data governance is a strategic approach to maintaining and managing data to safeguard its quality and veracity. Data exists in many different formats; however, information occurs when data is made meaningful. A tagline heard during the evaluation was, “The Agency is data rich and information poor.” The successful transformation of data into information will drive the Agency's achievement of goals, and a successful data governance program will guide the Agency on this journey. The purpose of data governance is to reduce duplicate and redundant data, strengthen trust in the quality of data for decision-making, and manage risk in the use and sharing of data.

Effective data governance frameworks should include the following:

- Consistent data policies, procedures, and documentation across an entity
- Formal roles and responsibilities
- Methods for documenting data business processes
- Clear data protection requirements

The Agency understands a growing need to improve the quality and consistency of its data management to improve decision-making capabilities, to address stakeholder concerns such as data reliability, and to meet state standards for data protection.

Internally, there are isolated efforts to address some of these concerns at the program level. However, this approach leads to “stovepipes” which can address a set of specific needs, but do not tackle Agency-wide goals and interests. Within each “stovepipe”, fragmented and inconsistent implementation of the data governance principles often results from the lack of a generally accepted approach to data governance. This can result in a lack of standardization and creates an expectation gap for data quality and accuracy across the Agency between data owners and end-users.

4.2 OBJECTIVE

Management's objective within the data governance activity is to develop a strategic approach to managing SCDOT's data by:

- Determining an unbiased and mutually agreed upon data governance goals.

- Setting an achievable pathway to implement data governance through actionable steps.
- Monitoring program level conformance and adoption of data governance principles.

Our engagement objective was to facilitate with management the development of:

- A gap assessment comparing the Agency's current level of data governance maturity and the desired maturity for the Agency.
- Determining the Agency's desired maturity level for data governance.
- A path forward to achieve desired data maturity level.

4.3 SCOPE

The analysis included a holistic sample of the Agency's data systems by engaging the data owners of the selected systems and evaluating the data owners' self-assessment of the current data governance maturity level.

4.4 APPROACH

IAS developed educational materials, online surveys, and online collaboration spaces to address the requisites of this evaluation. This included over 100 participants, nearly 250 submitted assessment surveys, and several collaborative meetings with the participants. To view survey questionnaire, please see Appendix A.

The collected data was aggregated and analyzed by:

- Division
 - Engineering
 - Finance and Administration
 - Intermodal Planning
- Department
 - See Agency's internal documentation for listing
- Component (*Core data governance competencies*)
 - Awareness
 - Formalization
 - Metadata
 - Stewardship
 - Data Quality
 - Master Data
- Dimension (*Subdivided core competencies to focus on component maturity*)
 - People
 - Policy
 - Capability

Data Maturity Scale

Maturity Level	Label	Description
1	Initial	Data management processes are usually ad hoc, and the environment is not stable. Success reflects the competence of individuals within the organization, rather than the use of proven processes. Organizations often produce products and services that work, they frequently exceed the budget and schedule of their projects.
2	Managed	Successes are repeatable, but the data management processes may not repeat for all the data systems in the organization. When repeatable data management practices are in place, Data is managed and maintained according to documented plans.
3	Defined	A set of standard data management processes are used to establish consistency across the organization. The standards, process descriptions and procedures for data management are tailored to meet the organization's data management goals and objectives.
4	Quantitatively Managed	A set of defined quantitative quality goals for both data management process and data life-cycle. Data management process performance is monitored using Key Performance Indicators (KPI) and other quantitative techniques.
5	Optimizing	Quantitative process-improvement objectives for the organization are firmly established and continually revised to reflect changing business objectives, and used as criteria in managing process improvement.

Collaboration Process: IAS generally followed the Capability Maturity Model (CMM) workshop process, which is an industry best practice standard for measuring and evaluating maturity levels. Additionally, the above Data Maturity Scale is based on the Office of Management and Enterprise Services (OMES) Data Governance Maturity Model. To view OMES' Data Governance Maturity Model, please see Appendix B.

Gap Identification and Mitigation: The breadth and depth of data governance can make implementation time consuming and resource intensive. While it is the Agency's intent to fully implement a best practice data governance framework, this engagement was designed to drive Agency's resources towards gaps with the greatest impact toward achieving the Agency's desired future state or maturity level for data governance.

5 GAP ANALYSIS RESULTS

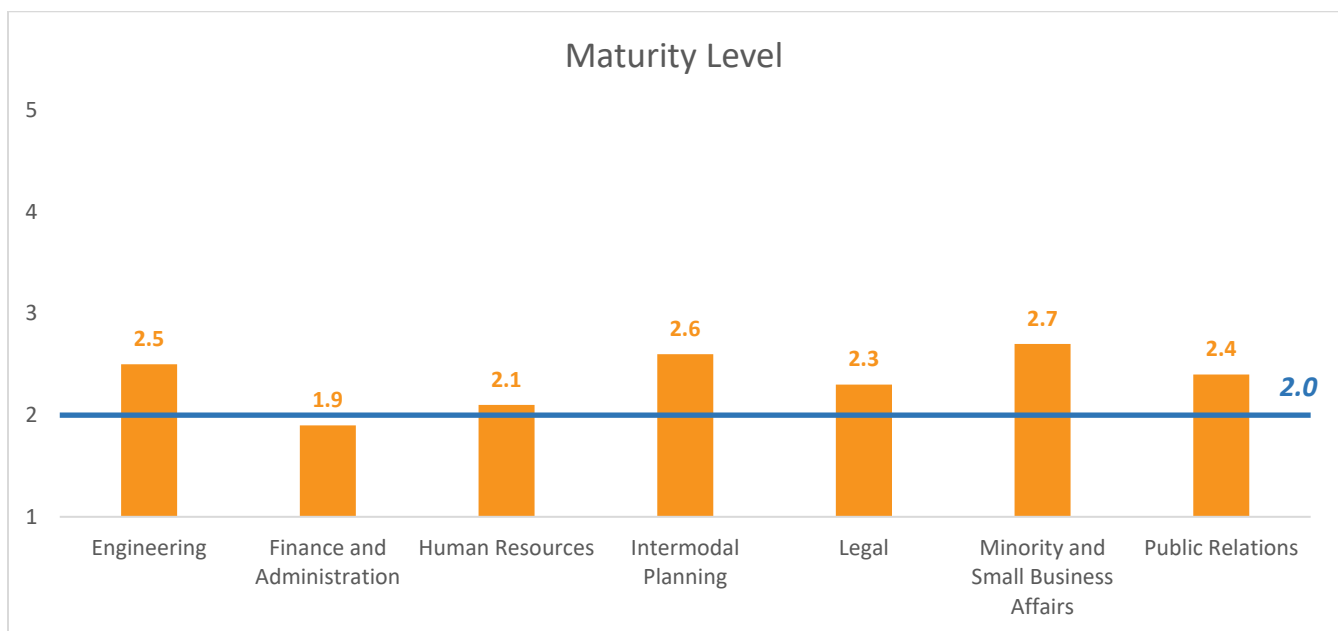
5.1 Data Maturity Overview

Purpose: To assure that the right data is available at the right time and that the data is accurate and in the correct format to meet business needs.

Self-Assessment: It was evident in the early phase of the evaluation that the Agency has not formally documented a data management policy which would clearly defines the Agency’s data governance strategy and specify the standards for processing, storing, and organizing data. When a policy is fully implemented, it should provide a common framework used agency-wide to improve the accuracy, consistency, and reliability of the data across the Agency.

In perspective of the evaluation, we believe that the lack of a defined strategy and methodology skewed the self-assessment results. The self-assessment stated that, without an approved data management policy, user responses should not be above the “2 – Managed” maturity level. However, we had many respond they were “5 – optimizing” level. With this observation, we conceded that, in certain silos, there was an inherent awareness of data management shortcomings. Within those silos, they adopted by practice some critical data management principles. Thus, their higher rating was reflective of their department adopting an internal practice rather than to an agency-wide policy as the question anticipated.

The self-assessment attempted to gauge the Agency’s data maturity based on three distinct dimensions: people, policy, and capability. Instead of showing each individual dimension, this is the average of the dimension scores by division.



Note, the survey did indicate that without an Agency data management policy the reported score should not exceed “2 – Managed”.

We anticipated all of the scores to be less than “2 – Managed” because the Agency did not have an approved data management policy. The self-assessment showed that the departments believe they have matured on average to the “managed” state without first having an Agency policy to measure or anchor their maturity level.

The “2-managed” state, by definition, does indicate that the process is successful in a decentralized manner without standardization. However, the first condition as defined by the CMM is to have an organization-wide data management policy to govern actions and activities to be at the “3-defined” level (see definition above in the data maturity scale). We believe that staff may have an inflated view of the data management capability. The belief is that the Agency wants to achieve a consistent and repeatable data management process throughout all data systems – especially when these systems are interconnected up or down stream. Thus, management should consider this inflated view as a potential challenge when prescribing a path forward, as some areas may not see the need for a more formalized data management process.

Collaboration: We believe the Agency is committed to implementing a data governance program because, during the course of this evaluation, the Deputy Secretary for Finance and Administration along with the CIO championed for and hired a Data Governance Officer. During the collaboration meetings, we cooperatively identified multiple areas for improvement. This will be discussed in detail in the accompanying report “Data Management Path Forward”.

Conclusion: Prior to the evaluation, the Agency had not invested its resources (time, budget, and other resources) into the development and implementation of a centralized data governance program, which would include a data management policy and corresponding controls. It is our opinion that the Agency is strategically taking clearly identified steps toward achieving at least level “3 -Defined” maturity. The newly hired Data Governance Officer is working toward the development of a data management policy and taking actions to inventory and categorize the Agency’s data asset.

5.2 PRIORITY GAP IMPROVEMENTS AND RECOMMENDATIONS

We collaborated with several functional areas on the development of improvements and recommendations for remediating each priority gap. Those improvements and recommendations were discussed with SCDOT Executive Leaders.

5.3 DEVELOPMENT OF MANAGEMENT PATH FORWARD

We facilitated management’s development of Path Forward Plans to improve the data governance program with practical, cost-effective solutions. These improvements, if effectively implemented, are expected to increase the overall value of the Agency’s data asset by improving data quality for decision making.

We will follow up with management on the implementation of the proposed paths forward on an ongoing basis and provide SCDOT leadership with periodic reports on the status of management movements and whether those activities were effectively and timely implemented to increase the overall value of the Agency’s data asset.

5.4 REPORTING OF CONFIDENTIAL INFORMATION

Due to the confidential nature of information security, the improvements, recommendations, and path forward plans are not included in this report. This information is not considered or deemed “public record” in accordance with the SC Freedom of Information Act pursuant to SC Code of Laws Section 30-4-20 (c) which states that information relating to security plans and devices proposed, adopted, installed, or utilized by a public body, other than amounts expended for adoption, implementation, or installation of these plans and devices, is required to be closed to the public and is not considered to be made open to the public under the provisions of this act.

6.1 Appendix A

Data Maturity Assessment

Data Maturity Assessment Introduction

You have been identified by SCDOT leadership as a data stakeholder, who is uniquely positioned to answer questions about the challenges and opportunities impacting data management in your department, division, and/or across the organization.

Please complete the following assessment based on your experience in managing data at SCDOT.

The results of this assessment will serve as a starting point for setting SMART data maturity improvement goals.

Data Maturity Assessment

Background

* First and Last Name

* Title

* Name and Title of Supervisor

* Division

* What is the name of your Department or District. For example: Pre-construction, Road data services, Procurement, District 5

Please list the sub area or areas that you work in.

For example:

A program manager for an RPG in pre-construction might only need to list program management;
An RPG manager may need to list several sub areas such as: program management, geo-tech, hydro, roadway, and structural.

You will be asked to complete an assessment for each area that you list here.

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>

If you need more than 8 sub areas, contact Amanda Newell for assistance. newellak@scdot.org

Data Maturity Assessment

Sub area 1

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R1 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Metadata

* The extent to which development and maintenance of metadata is a cross functional role and responsibility. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata tools and technology are consistent and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Stewardship

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship tools and technology are available and accessible.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools and technology are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Sub area 2

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R2 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Metadata

* The extent to which development and maintenance of metadata is a cross functional activity. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata are consistently collected, consolidated and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Stewardship

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship documentation is accessible and consolidated.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Sub area 3

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R3 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

* The extent to which development and maintenance of metadata is a cross functional activity. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata are consistently collected, consolidated and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Stewardship

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship documentation is accessible and consolidated.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Sub area 4

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R4 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Metadata

* The extent to which development and maintenance of metadata is a cross functional activity. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata are consistently collected, consolidated and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Stewardship

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship documentation is accessible and consolidated.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Sub area 5

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R5 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Metadata

* The extent to which development and maintenance of metadata is a cross functional activity. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata are consistently collected, consolidated and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship documentation is accessible and consolidated.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Sub area 6

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R6 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Metadata

* The extent to which development and maintenance of metadata is a cross functional activity. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata are consistently collected, consolidated and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Stewardship

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship documentation is accessible and consolidated.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Sub area 7

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R7 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Metadata

* The extent to which development and maintenance of metadata is a cross functional activity. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata are consistently collected, consolidated and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Stewardship

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship documentation is accessible and consolidated.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Sub area 8

Maturity Scale

Maturity Level	Description
1 Initial	<ul style="list-style-type: none">• Roles and responsibilities not formally defined.• Procedures and processes developed on an as needed basis (usually ad hoc and in silos).• Success reflects the competence of individuals within the organization.
2 Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards may be documented for some divisions but are not centralized or standardized across the organization.• Success is repeatable in areas where processes are implemented.
3 Defined	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented and standardized across the organization.• Standard and documented processes establish consistency across the organization.
4 Quantitatively Managed	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized and understood across the organization.• Processes are quantitatively measured and controlled.
5 Optimizing	<ul style="list-style-type: none">• Policies, procedures, and/or standards are documented, standardized, and understood across the organization and the culture supports continuous improvement of the status quo.• Quantitative performance indicators and process-improvement objectives are firmly established and continually revised to reflect changing business objectives.

{{ Q6.R8 }}

Consider the following when responding to questions:

1. Do all areas of the organization address same or similar situations the same way?
2. Does the organization have a standardized set of policies and procedures that all areas of the organization follow for same or similar work?
3. Does the organization have consistent tools, and technology across the organization that is used for same or similar work.

If the answer to these questions is NO - the maturity level can not be scored above a 2.

Select SCDOTs current data maturity level for each of the following statements.

Awareness

* The extent to which stakeholders are aware of their data management roles and responsibilities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of documented data governance policies, procedures or practices.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which stakeholders are aware of data management tools and technologies.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimized

Please reference documentation for any question scored as a 3 or above.

Formalization

* The extent to which data governance roles and responsibilities have been defined.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data governance policies and procedures are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data management tools and technologies support data governance.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Metadata

* The extent to which development and maintenance of metadata is a cross functional activity. (IT and business area working together)

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata creation and maintenance policies are formally defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which metadata are consistently collected, consolidated and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Stewardship

* The extent to which data stewardship roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data stewardship documentation is accessible and consolidated.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Quality

* The extent to which data quality roles and responsibilities have been defined and assigned.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which data quality tools are used to support data management activities.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Master Data

* The extent to which master data management concepts and benefits are understood.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data policies and procedures have been defined, implemented and enforced.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

* The extent to which master data tools and technology are accessible and available.

- 1 - Initial
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

Please reference documentation for any question scored as a 3 or above.

Data Maturity Assessment

Feedback

Other Feedback

DATA GOVERNANCE MATURITY MODEL



This document provides two examples of maturity assessment tools. These tools can be used to assess the maturity level of an organization's data governance program and to develop goals to guide the work of the organization's data governance program.



This document and the tools included herein are largely adapted from the University of Stanford's Data Governance Maturity Model and the October 17, 2011, Data Governance at Stanford Newsletter published by the University of Stanford. Additionally, the maturity levels were borrowed from "The IBM Data Governance Council Maturity Model: Building a roadmap for effective data governance."

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Purpose of a Data Governance Maturity Model

A maturity model is one of the most valuable tools available for planning and sustaining a new strategic program. Like the data governance (DG) program itself, the DG maturity model should be customized around the unique goals, priorities and competencies of the organization. The model included below is the model developed by Stanford University's Data Governance Office. It can be customized to meet the needs of your organization.

A maturity model is a tool that is used to develop, assess and refine an expansive program. Because measurement of performance simply through return on investment (ROI) or reduction of cost is inappropriate for data governance programs, another method must be constructed to assess effectiveness. The Stanford Maturity Measurement Tool offers a robust qualitative assessment along with quantitative measures to ensure a thorough DG assessment is possible.

A significant benefit of utilizing a maturity model is that it can consistently measure the state of a program over time. A DG program crosses functional boundaries and has a life span measured in years rather than months. Stable metrics facilitate presentation of the DG program's accomplishments to the sponsors, ensuring the sustainability of the program and demonstration to the participants that their efforts are driving organizational change.

The design of the maturity model also influences the strategic direction of the program. A maturity model is made up of levels describing possible states of the organization where the highest levels define a vision of the optimal future state.

Because the full implementation and maturation of a DG program is a multiyear effort, the intermediate maturity states can be used to construct a program roadmap. The model not only facilitates assessment of the DG program, but also focuses attention on specific areas where actionable opportunities can be addressed rapidly (Stanford, 2011).

Overview of the Data Governance Maturity Model

The Stanford Maturity Measurement Tool contains both qualitative and quantitative metrics to track the growth of the DG practice throughout the organization.

Qualitative aspects describe characteristics of the organization at various levels of maturity. Because these are inherently subjective, the model is enriched with quantitative metrics that count activities performed, program participants and artifacts developed.

Each component-dimension's (more on this below) qualitative scale ranges from level one, representing the initial state of a data governance program, to level five, representing the objective of DG in that area of focus. An in-depth description of each qualitative maturity level is provided in the next section. The quantitative metrics are numeric measures that become applicable at each level of maturity and may be used at all maturity levels moving forward. Advancement through qualitative maturity levels can take place over a long time; quantitative metrics provide the ability to monitor intrastage growth through more granular measures (Stanford, 2011).

The Maturity Levels

Developed by the Software Engineering Institute (SEI) in 1984, the Capability Maturity Model (CMM) is a methodology used to develop and refine an organization's software development process and it can be easily applied to an organization's DG program and processes. The CMM describes a five-level graduated path that provides a framework for prioritizing actions, a starting point, a common language and a method to measure progress. Ultimately, this structured collection of elements offers a steady, measurable progression to the final desired state of fully mature processes (IBM, 2007).

Characteristics of Maturity Levels



At **Maturity Level 1 (Initial)**, processes are usually ad hoc, and the environment is not stable. Success reflects the competence of individuals within the organization, rather than the use of proven processes. While Maturity Level 1 organizations often produce products and services that work, they frequently exceed the budget and schedule of their projects (IBM, 2007).

At **Maturity Level 2 (Managed)**, successes are repeatable, but the processes may not repeat for all the projects in the organization. Basic project management helps track costs and schedules, while process discipline helps ensure that existing practices are retained. When these practices are in place, projects are performed and managed according to their documented plans, yet there is still a risk for exceeding cost and time estimates (IBM, 2007).

At **Maturity Level 3 (Defined)**, the organization's set of standard processes are used to establish consistency across the organization. The standards, process descriptions and procedures for a project are tailored from the organization's set of standard processes to suit a particular project or organizational unit (IBM, 2007).

At **Maturity Level 4 (Quantitatively Managed)**, organizations set quantitative quality goals for both process and maintenance. Selected sub-processes significantly contribute to overall process performance and are controlled using statistical and other quantitative techniques (IBM, 2007).

At **Maturity Level 5 (Optimizing)**, quantitative process-improvement objectives for the organization are firmly established and continually revised to reflect changing business objectives, and used as criteria in managing process improvement (IBM, 2007).

The Component-Dimensions

The Stanford Maturity Measurement Tool focuses both on foundational and project aspects of DG. The **foundational components** (Awareness, Formalization and Metadata) of the maturity model focus on measuring core DG competencies and development of critical program resources.

- **Awareness:** The extent to which individuals within the organization have knowledge of the roles, rules, and technologies associated with the data governance program.
- **Formalization:** The extent to which roles are structured in an organization and the activities of the employees are governed by rules and procedures.
- **Metadata:** Data that 1) describes other data and IT assets (such as databases, tables and applications) by relating essential business and technical information and 2) facilitates the consistent understanding of the characteristics and usage of data. Technical metadata describes data elements and other IT assets as well as their use, representation, context and interrelations. Business metadata answers who, what, where, when, why and how for users of the data and other IT assets.

The **project components** (Stewardship, Data Quality and Master Data) measure how effectively DG concepts are applied in the course of funded projects (Stanford, 2011).

- **Stewardship:** The formalization of accountability for the definition, usage, and quality standards of specific data assets within a defined organizational scope.
- **Data Quality:** The continuous process for defining the parameters for specifying acceptable levels of data quality to meet business needs, and for ensuring that data quality meets these levels. (DMBOK, DAMA)
- **Master Data:** Business-critical data that is highly shared across the organization. Master data are often codified data, data describing the structure of the organization or key data entities (such as “employee”).

Three **dimensions** (People, Policies and Capabilities) further subdivide each of the six maturity components, focusing on specific aspects of component maturation.

- **People:** Roles and organization structures.
- **Policies:** Development, auditing and enforcement of data policies, standards and best practices.
- **Capabilities:** Enabling technologies and techniques.

It is imperative that the maturity model is finalized and adopted early in the rollout of the DG program and remains stable throughout its life. Thoughtful input from across the organization will help assure the model’s long-term fitness (Stanford, 2011).

The Data Governance Maturity Model

Guiding Questions for Each Component-Dimension

(Stanford, 2013)

Foundational	People	Policies	Capabilities
Awareness	What awareness do people have about their role within the data governance program?	What awareness is there of data governance policies, standards and best practices?	What awareness is there of data governance enabling capabilities that have been purchased or developed?
Formalization	How developed is the data governance organization and which roles are filled to support data governance activities?	To what degree are data governance policies formally defined, implemented and enforced?	How developed is the toolset that supports data governance activities and how consistently is that toolset utilized?
Metadata	What level of cross-functional participation is there in the development and maintenance of metadata?	To what degree are metadata creation and maintenance policies formally defined, implemented and enforced?	What capabilities are in place to actively manage metadata at various levels of maturity?

Project	People	Policies	Capabilities
Stewardship	What awareness do people have about their role within the data governance program?	What awareness is there of data governance policies, standards and best practices?	What awareness is there of data governance enabling capabilities that have been purchased or developed?
Data Quality	How developed is the data governance organization and which roles are filled to support data governance activities?	To what degree are data governance policies formally defined, implemented and enforced?	How developed is the toolset that supports data governance activities and how consistently is that toolset utilized?
Master Data	To what degree has a formal master data management organization been developed and assigned consistent responsibilities across data domains?	To what degree are metadata creation and maintenance policies formally defined, implemented and enforced?	What capabilities are in place to actively manage metadata at various levels of maturity?

The Stanford Data Governance Maturity Measurement Tool

Data Governance Foundational Component Maturity											
	Awareness			Formalization			Metadata				
	People	Policies	Capabilities	People	Policies	Capabilities	People	Policies	Capabilities		
1	Limited awareness of purpose or value of DG program.	Most existing data policies are undocumented and there may be inconsistent understanding of data policies within a department.	Little awareness of DG capabilities and technologies.	1	No defined roles related to DG.	No formal DG policies.	Classes of DG capabilities are not defined.	1	Limited understanding of types and value of metadata.	No metadata related policies.	Metadata is inconsistently collected and rarely consolidated outside of project artifacts.
2	Executives are aware of existence of program. Little knowledge of program outside upper management.	Existing policies are documented but not consistently maintained, available or consistent between departments.	A small subset of the organization understands the general classes of DG capabilities and technologies.	2	DG roles and responsibilities have been defined and vetted with program sponsors.	High-level DG meta-policies are defined and distributed.	Classes of DG capabilities are defined and homegrown technical solutions are used within some organizational functions.	2	Roles responsible for production of technical metadata on structured data are defined during system design.	Metadata best practices are produced and made available. Most best-practices are focused on the metadata associated with structured data.	Metadata templates are adopted to provide some consistency in content and format of captured metadata. Metadata is consolidated and available from a single portal. Capabilities focus on capture of metadata of structured content.
3	Executives understand how DG benefits/impacts their portion of the organization, knowledge workers are aware of program, Executives actively promote DG within their groups.	Common data policies are documented and available through a common portal. Most stakeholders are aware of existence of data policies that may impact them.	A small subset of the organization is aware of the specific DG capabilities that are available at the organization.	3	Some roles are filled to support DG needs and participants clearly understand responsibilities associated with their roles.	Data policies around the governance of specific data are defined and distributed as best practices.	Homegrown technical solutions are adopted as best practices for some classes of capabilities and made available throughout the institution.	3	The responsibility for developing institutional business definitions and storing them in a central repository is assigned to and continually performed by subject matter experts.	Policies requiring the development of new metadata as part of system development (usually focused on structured data) are adopted as official data policies.	The collection of metadata on structured content is automated and scheduled extracts are performed for selected systems.
4	Executives understand long-term DG strategy and their part in it. Knowledge workers understand how DG impacts/benefits their portion of the organization. Executives actively promote DG beyond the immediate group.	All data policies are available through a common portal and stakeholders are actively notified whenever policies are added, updated or modified.	A targeted audience has been identified and a significant portion of that audience is aware of the DG capabilities that are available at the organization.	4	DG roles are organized into reusable schemas which are designed to support specific data and functional characteristics. There is broad (but inconsistent) participation in DG.	Data policies become official organization data policies and compliance with approved data policies is audited.	All defined classes of DG capabilities have an available solution.	4	Metadata collection/validation responsibilities assigned to named individuals for all projects.	Policies requiring the regular auditing of metadata in specified systems are adopted as official organization data policies and metadata development as part of system development is enforced.	A centralized metadata store becomes the primary location for all institutional metadata. Metadata is automatically collected from most relational database management systems and vendor packaged systems.
5	Both executives and knowledge workers understand their role in the long-term evolution of DG. Knowledge workers actively promote DG.	A history of all data policies are maintained through a common portal and all stakeholders are made part of the policy development process.	A significant portion of the targeted audience understands how to utilize relevant DG capabilities that are available at the organization.	5	DG organizational schemas are filled as defined, meet regularly and document activities.	Compliance with official organization data policies is actively enforced by a governing body.	All defined classes of DG capabilities are mandatory for assigned systems or critical data.	5	A dedicated metadata management group is created to strategically advance metadata capabilities and more effectively leverage existing metadata.	Metadata policy covers both structured and unstructured (non-tabular) data and is enforced.	A metadata solution provides a single point of access to federated metadata resources including both structured and unstructured data.

Data Governance Project Component Maturity									
Maturity Level	Stewardship			Data Quality			Master Data		
	People	Policies	Capabilities	People	Policies	Capabilities	People	Policies	Capabilities
	1	Almost no well-defined DG or stewardship roles or responsibilities. Data requirements are driven by the application development team.	Limited stewardship policies documented.	Limited stewardship capabilities are available.	1 Individuals perform ad hoc data quality efforts as needed and manually fix identified data issues. Identification of data issues is based off its usability for a specific business task.	Data quality efforts are infrequent and driven by specific business needs. These efforts are usually large one-time data cleansing efforts.	Data quality is done on an ad hoc basis usually using SQL and Excel.	1 Inconsistent understanding of concepts and benefits of Master Data Management.	No formal policies defining what data are considered institutional master data.
2	Business analysts drive data requirements during design process. Definition of stewardship roles and responsibilities is limited.	Policies around stewardship defined within a functional area.	A centralized location exists for consolidation of and/or access to stewardship related documentation.	2 A small group of individuals are trained in and perform profiling to assess data quality of existing systems to establish a baseline or justify a data quality project. Downstream usage of the data is considered in issue identification process.	Best practices have been defined for some data quality related activities and followed inconsistently.	Basic data profiling tools are adopted and available for use anywhere in the system development lifecycle.	2 Stakeholders for specific master data domains are identified and consulted to develop basic definition and model of master data.	Institutional master data domains are defined and the systems storing master data are documented. Usage of master data in these systems is actively being documented.	Master data are identified and manually managed and provisioned via extracts, file transfers or manual uploads.
3	All stewardship roles and structures are defined and filled but are still functionally siloed.	Stewardship policies are consistent between functions and areas.	Workflow capabilities are implemented for the vetting and approval of institutional definition, business metadata and approval of other stewardship related documentation.	3 People are assigned to assess and ensure data quality within the scope of each project.	Profiling and development of data quality standards are adopted as part of the standard application development lifecycle and become scheduled activities on project plans.	Data quality reporting capabilities are implemented and available to any system.	3 Owners of institutional master data are identified and drive resolution of various perspectives of master data. Owners establish and run master data boards to support maintenance and data issue mediation.	Institutional master data perspectives are resolved and documented.	Master data are provisioned through services but management capabilities are still largely manual.
4	The stewardship structures include representatives from multiple business functions.	Stewardship teams self-audit compliance with policies.	Stewardship dashboards report data quality levels and data exceptions to support the auditing of stewardship effectiveness.	4 Data quality experts are identified throughout the organization and are engaged in all data quality improvement projects.	Data quality best practices are adopted as official organization data policies.	Data quality issue remediation is integrated into quality reporting platform.	4 Master Data Management boards take responsibility for reviewing the use of their master data in the application development process.	Compliance with master data usage policies and standards is enforced. Synchronization frequency with master data hub at system owner's discretion.	Multiple single domain master data hubs handle provisioning and management of master data.
5	The stewardship board includes representatives from all relevant institutional functions.	Compliance with stewardship policies are enforced for key institutional data.	A common stewardship dashboard enables managed issue remediation as part of data quality reporting and data exception reporting.	5 A data quality competency center is funded and charged with continually assessing and improving data quality outside of the system development lifecycle.	Compliance with official organization data quality is tracked and reported on centrally.	Data quality remediation is implemented on both data at rest (in databases) and data in flight (in ETL and as messages between systems).	5 Master Data Management boards take responsibility for enforcing master data policies around their own master data across the organization.	Compliance with master data synchronization policy is enforced.	Multidomain master data hub handles all provisioning and management of master data.

The Stanford Data Governance Quantitative Measurement Tool

Data Governance Foundational Components									
	People		Policies		Capabilities				
	Qualitative	Quantitative	Qualitative	Quantitative	Qualitative	Quantitative			
Awareness	1	Limited awareness of purpose or value of DG program	1	Most existing data policies are undocumented and there may be inconsistent understanding of data policies within a department.	1	Little awareness of DG capabilities and technologies.			
	2	Executives are aware of existence of program. Little knowledge of program outside upper management	2	Existing policies are documented but not consistently maintained, available or consistent between departments.	2	A small subset of the organization understands the general classes of DG capabilities and technologies.	Training sessions on DG capabilities and technologies.		
	3	Executives understand how DG benefits/impacts their portion of the organization, knowledge workers are aware of program. Executives actively promote DG within their groups.	3	Common data policies documented and available through a common portal. Most stakeholders are aware of data policies that may impact them.	3	A small subset of the organization is aware of the specific DG capabilities that are available at the organization.			
	4	Executives understand long-term DG strategy and their part in it. Knowledge workers understand how DG impacts/benefits their portion of the organization. Executives actively promote DG beyond the immediate group.	4	All data policies are available through a common portal and stakeholders are actively notified whenever policies are added, updated or modified.	4	A targeted audience has been identified and a significant portion of that audience is aware of the DG capabilities that are available at the organization.			
	5	Both executives and knowledge workers understand their role in the long-term evolution of DG. Knowledge workers actively promote DG.	5	A history of all data policies are maintained through a common portal and all stakeholders are made part of the policy development process.	5	A significant portion of the targeted audience understands how to utilize relevant DG capabilities that are available at the organization.	Training sessions on usage of DG technologies and capabilities (person*tech trained)		
Formalization	People		Policies		Capabilities				
	1	No defined roles related to DG.	1	No formal DG policies.	1	Classes of DG capabilities are not defined.			
	2	DG roles and responsibilities have been defined and vetted with program sponsors.	2	High-level DG meta-policies are defined and distributed.	2	Classes of DG capabilities are defined and homegrown technical solutions are used within some organizational functions.	DG capabilities with solutions by functional area. Reuse of technical solutions by functional area.		
	3	Some roles are filled to support DG needs and participants clearly understand responsibilities associated with their roles.	3	Data policies around the governance of specific data are defined and distributed as best practices.	3	Homegrown technical solutions are adopted as best practices for some classes of capabilities and made available throughout the institution.	Capabilities approved as organization recommended solutions.		
	4	DG roles are organized into reusable schemas which are designed to support specific data and functional characteristics. There is broad (but inconsistent) participation in DG.	4	Data policies become official organization data policies and compliance with approved data policies is audited.	4	All defined classes of DG capabilities have an available solution.	Usage of standard solutions by project. Uses of non-standard solutions by project.		
5	DG organizational schemas are filled as defined, meet regularly and document activities.	5	Staff from each defined schema meets to plan. Minutes produced.	5	Compliance with official organization data policies is actively enforced by a DG body.	Number of exceptions to official data policies (lower is better).	5	All defined classes of DG capabilities are mandatory for assigned systems or critical data.	Use of non-standard solutions by project (lower is better).

Metadata	People		Policies		Capabilities	
	Qualitative	Quantitative	Qualitative	Quantitative	Qualitative	Quantitative
	1	No defined roles related to DG.		1	No formal DG policies	1
2	DG roles and responsibilities have been defined and vetted with program sponsors.		2	High-level DG meta-policies are defined and distributed.	2	Classes of DG capabilities are defined and homegrown technical solutions are used within some organizational functions.
3	Some roles are filled to support DG needs and participants clearly understand responsibilities associated with their roles.	Participants in approved roles.	3	Data policies around the governance of specific data are defined and distributed as best practices.	3	Homegrown technical solutions are adopted as best practices for some classes of capabilities and made available throughout the institution.
4	DG roles are organized into reusable schemas which are designed to support specific data and functional characteristics. There is broad (but inconsistent) participation in DG.	Program areas in compliance with defined schemas. Percent of roles filled.	4	Data policies become official organization data policies and compliance with approved data policies is audited.	4	All defined classes of DG capabilities have an available solution.
5	DG organizational schemas are filled as defined, meet regularly and document activities.	Staff from each defined schema meets to plan. Minutes produced.	5	Compliance with official organization data policies is actively enforced by a governing body.	5	All defined classes of DG capabilities are mandatory for assigned systems or critical data.
						Usage of standard solutions by project. Uses of non-standard solutions by project.
						Usage of non-standard solutions by project (lower is better). No use of solution by project.

Data Governance Project Components							
Stewardship	People		Policies		Capabilities		
	Qualitative	Quantitative	Qualitative	Quantitative	Qualitative	Quantitative	
	1	Few well-defined stewardship roles or responsibilities. Data requirements driven by the development team.		1	Limited stewardship policies documented.	1	Limited stewardship capabilities are available.
2	Business analysts drive data requirements during design process. Definition of stewardship roles and responsibilities is limited.	Projects with explicit data design.	2	Policies around stewardship defined within a functional area.	2	A centralized location exists for consolidation of and/or access to stewardship related documentation.	
3	All stewardship roles and structures are defined and filled but are still functionally siloed.	Stewards, participants in stewardship boards, stewardship board meetings.	3	Stewardship policies are consistent between functions and areas.	3	Workflow capabilities are implemented for the vetting and approval of institutional definition, business metadata and stewardship related documentation.	
4	The stewardship structures include representatives from multiple business functions.	Functional areas represented on stewardship boards.	4	Stewardship teams self-audit compliance with policies.	4	Stewardship dashboards report data quality levels and data exceptions to support the auditing of stewardship effectiveness.	
5	The stewardship board includes representatives from all relevant institutional functions.	Boards with AS and business representation.	5	Compliance with stewardship policies are enforced for key institutional data.	5	A common stewardship dashboard enables managed issue remediation as part of data quality reporting and data exception reporting.	
Data Quality	People		Policies		Capabilities		
	Qualitative	Quantitative	Qualitative	Quantitative	Qualitative	Quantitative	
	1	Individuals perform ad hoc data quality efforts as needed and manually fix identified data issues. Identification of data issues is based off its usability for a specific business task.	Data quality implies quality in terms of formally defined definitions of fit-for-use data.	1	Data quality efforts are infrequent and driven by specific business needs. These efforts are usually large one-time data cleansing efforts.	1	Data quality is done on an ad hoc basis usually using SQL and Excel.
	2	A small group of individuals are trained in and perform profiling to assess data quality of existing systems to establish a baseline or justify a data quality project. Downstream usage of the data is considered in issue identification process.	Individuals trained in profiling, systems profiled, tables profiled, elements profiled. Profiles resulting in recommendations, recommendations spawning projects.	2	Best practices have been defined for some data quality related activities and followed inconsistently.	2	Basic data profiling tools are adopted and available for use anywhere in the system development lifecycle.
	3	People are assigned to assess and ensure data quality within the scope of each project.	Projects with data quality roles assigned. Data quality fixes at project level issues documented and approved.	3	Profiling and development of data quality standards are adopted as part of the standard application development lifecycle and become scheduled activities on project plans.	3	Data quality reporting capabilities are implemented and available to any system.
4	Data quality experts are identified throughout the organization and are engaged in all data quality improvement projects.	Systems analyzed, tables analyzed, elements analyzed. Recommendations proposed and spawning data quality remediation.	4	Data quality best practices are adopted as official organization data policies.	4	Data quality issue remediation is integrated into quality reporting platform.	

	5	A data quality competency center is funded and charged with continually assessing and improving data quality outside of the system development lifecycle.	Return on investment of data quality competency center. System team endorsements.	5	Compliance with official organization data quality is tracked and reported on centrally.	Exceptions to official data quality policies (lower is better).	5	Data quality remediation is implemented on both data at rest (in databases) and data in flight (in ETL and as messages between systems).	Systems without data quality reporting, and/or remediation (lower is better). Interfaces without reporting and/or remediation (lower is better).
Master Data	People			Policies			Capabilities		
		Qualitative	Quantitative		Qualitative	Quantitative		Qualitative	Quantitative
	1	Inconsistent understanding of concepts and benefits of Master Data Management.		1	No formal policies defining what data are considered institutional master data.		1	There is limited management of master data.	
	2	Stakeholders for specific master data domains are identified and consulted to develop basic definition and model of master data.	Stakeholders identified. Stakeholders' agreements in place.	2	Institutional master data domains are defined and the systems storing master data are documented. Usage of master data in these systems is actively being documented.	Master data entities identified. Functions consulted. Perspectives identified.	2	Master data are identified and manually managed and provisioned via extracts, file transfers or manual uploads.	Systems using master data by transport method.
	3	Owners of institutional master data are identified and drive resolution of various perspectives of master data. Owners establish and run master data boards to support maintenance and data issue mediation.	Approved owners, stakeholders with input.	3	Institutional master data perspectives are resolved and documented.	Master data models approved. Distinct perspectives of master data entities (lower is better).	3	Master data are provisioned through services but management capabilities are still largely manual.	Systems using master data via services.
	4	Master Data Management boards take responsibility for reviewing the use of their master data in the application development process.	Boards taking review responsibility.	4	Compliance with master data usage policies and standards is enforced. Synchronization frequency with master data hub at system owner's discretion.	Results of audit.	4	Multiple single domain master data hubs handle provisioning and management of master data.	Master data hubs. Master data hub capability score.
	5	Master Data Management boards take responsibility for enforcing master data policies around their own master data across the organization.	Boards taking enforcement responsibility.	5	Compliance with master data synchronization policy is enforced.	Results of audit.	5	Multidomain master data hub handles all provisioning and management of master data.	Master data hubs (lower is better). Master data hub score (lower is better).

Data Governance Maturity Model Qualitative Score Card

To gauge the maturity of the qualitative aspects of an organization’s data governance program, use the table below to record your score in each Component-Dimension then calculate the average of each row and column. The average attained across each Component and Dimension is the maturity level of your organization in each respective area.

An organization’s initial assessment should be done as early in the DG program as possible – during the planning phase is ideal. At the time of the initial assessment, it should be determined how frequently the DG program will be assessed moving forward. The frequency of assessments may depend on many factors, including the resources available to the DG program, or how mature the DG program is at the time of the initial assessment. It is recommended that the DG program be assessed at least annually.

Foundational	People	Policies	Capabilities	Average
Awareness	2	2	2	2
Formalization	1	2	1	1.3
Metadata	2	1	1	1.3
Average	1.6	1.6	1.3	
Project	People	Policies	Capabilities	Average
Stewardship	2	1	1	1.3
Data Quality	2	2	1	1.6
Master Data	1	1	1	1
Average	1.6	1.3	1	

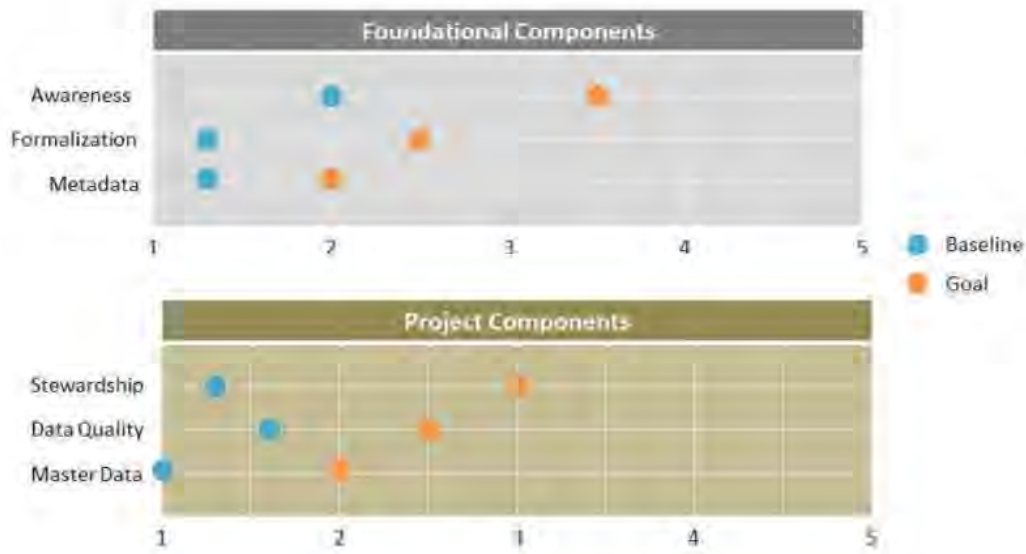
Using the Maturity Model to Plot for Success

Assessing the baseline maturity of the DG program and setting short-term and long-term goals during the initiation phase coupled with on-going assessment of the Component-Dimensions allows an organization to create a road map to a successful DG program.

At the time of the initial assessment, the organization’s executive leadership and/or data governance board should set maturity goals. These goals should be a mix of short- and long-term and they should be aligned with the DG program’s maturity assessment schedule.

Depending on the needs and maturity level of the organization's DG program, the goals may focus on one particular Component-Dimension, or they may span all Component-Dimensions. In order to ensure the DG program continues to mature over time, goals should be actionable and measurable.

To create the roadmap, create a scatter chart similar to the example shown below. Plot the baseline maturity levels of each component, which are based on the results of the initial maturity assessment, and the maturity goals for each component established by the executive leadership and/or data governance board. According to the schedule agreed upon at the initial assessment, use the maturity model tool again to assess the data governance program and plot those scores to see how close the program is to meeting its goals, or if the goals have been met and new ones need to be established.



Summary

A maturity model is a valuable tool to establish, sustain and gain support for the data governance program. Establishing a maturity model during the planning or initiation phase of the program and reassessing the program on a regular schedule makes creating goals and tracking progress toward them simple.

Because the data needs and associated structures of organizations vary so greatly, it is important to customize the maturity model to meet the specific needs of your organization. Not all organizations will need or have adequate resources to complete a maturity model as in-depth as the Stanford Maturity Measurement Tool. In Appendix A we have provided the Basic Maturity Assessment which is a boiled down version of the Stanford model. This tool uses the same score card and works on the same premise of identifying maturity levels based on existing processes and structures, however, there is one metric for each component-dimension that should be scored on a sliding scale of 1-5, rather than a single metric for each maturity level in each component-dimension.

Choosing and customizing a maturity model and then using it regularly are key to establishing a successful, long-lasting DG program.

Appendix A. The Basic Maturity Assessment

The Basic Maturity Assessment is a condensed version of the Stanford Maturity Measurement Tool which uses the same 1-5 maturity scale and score card. An organization with limited resources or that is very early in the design phase of building an IT and data governance program may find this assessment tool more appropriate to start the program building process.

Like the Stanford Tool, this model focuses both on foundational and project aspects of DG. The **foundational components** (Awareness, Formalization and Metadata) of the maturity model focus on measuring core DG competencies and development of critical program resources. The **project components** (Stewardship, Data Quality and Master Data) measure how effectively DG concepts are applied in the course of funded projects.

Additionally, it includes the three **dimensions** (People, Policies and Capabilities) which further subdivide each of the six maturity components, focusing on specific aspects of component maturation.

Whether your organization uses the Stanford Maturity Measurement Tool or the Basic Maturity Assessment, it is imperative that the maturity model you choose is finalized and adopted early in the rollout of the DG program. Depending on where your organization is in the process of standing up the data governance program, it may be most appropriate to use the Basic Maturity Assessment to measure the baseline maturity of and resources available to the organization. Then, as the data governance program is fleshed out, perhaps you will find that a more robust maturity assessment is needed. In that case, because they are both based on the same component-dimensions, you can easily transition from using the Basic Maturity Assessment to using the full Stanford Maturity Measurement Tool.

Regardless of which tool you choose to use, or if you choose to use a combination of both, thoughtful input from across the organization will help assure the model's usefulness and long-term fitness.

Data Governance Foundational Components Maturity		
Component: Awareness - The extent to which individuals within the organization have knowledge of the roles, rules and technologies associated with the data governance program.		
Dimension	Objective	Rating
People	Are executives, employees and stakeholders aware of the purpose or value of the DG program?	1 2 3 4 5
Policies	Are existing data policies documented, consistently maintained and available to stakeholders?	1 2 3 4 5
Capabilities	Are stakeholders aware of the specific DG capabilities that are available at the organization?	1 2 3 4 5
Component: Formalization - The extent to which roles are structured in an organization and the activities of the employees are governed by rules and procedures.		
Dimension	Objective	Rating
People	Have DG roles and responsibilities been defined and vetted with program sponsors?	1 2 3 4 5
Policies	Are data policies around the governance of specific data defined as best practices?	1 2 3 4 5
Capabilities	Are classes of DG capabilities defined and is there an available solution?	1 2 3 4 5
Component: Metadata - Technical metadata describes data elements and other IT assets as well as their use, representation, context and interrelations. Business metadata answers who, what, where, when, why and how for users of the data and other IT assets.		
Dimension	Objective	Rating
People	Do executives, employees or stakeholders have understanding of types and values of metadata?	1 2 3 4 5
Policies	Are metadata best practices produced and made available?	1 2 3 4 5
Capabilities	Is metadata consistently collected, consolidated and available from a single portal?	1 2 3 4 5
Data Governance Project Components Maturity		
Component: Stewardship - The formalization of accountability for the definition, usage and quality standards of specific data assets within a defined organizational scope.		
Dimension	Objective	Rating
People	Have DG or stewardship roles and responsibilities been defined within the organization?	1 2 3 4 5
Policies	Have policies around data stewardship been defined within a functional area?	1 2 3 4 5
Capabilities	Does a centralized location exist for consolidation of and/or access to stewardship related documentation?	1 2 3 4 5
Component: Data Quality - The continuous process for defining the parameters for specifying acceptable levels of data quality to meet business needs, and for ensuring that data quality meets these levels.		
Dimension	Objective	Rating
People	Are people assigned to assess and ensure data quality within the scope of each project?	1 2 3 4 5

Policies	Have data quality best practices been defined and adopted as official organizational data policies?	1 2 3 4 5
Capabilities	Have basic data profiling tools been made available for use anywhere in the system development lifecycle?	1 2 3 4 5
Component: Master Data - Business-critical data that is highly shared across the organization. Master data are often codified data, data describing the structure of the organization or key data entities.		
Dimension	Objective	Rating
People	Is there consistent understanding among stakeholders of the concepts and benefits of master data?	1 2 3 4 5
Policies	Are there formal policies that define what data are considered institutional master data?	1 2 3 4 5
Capabilities	Are master data identified, managed and provisioned?	1 2 3 4 5

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