TOPIC

Introduction to Data Management Maturity Models

PRESENTED TO:
Webinar

July 28, 2016
Today’s Agenda

Introduction to Data Management Maturity Models

<table>
<thead>
<tr>
<th>Agenda Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of the key points from the first Webinar</td>
</tr>
<tr>
<td>Overview of Capability Maturity Models</td>
</tr>
<tr>
<td>Discussion of Data Management Maturity (DMM) Model</td>
</tr>
<tr>
<td>Discussion of Data Management Capability Assessment Model (DCAM)</td>
</tr>
<tr>
<td>Model Usage Considerations</td>
</tr>
</tbody>
</table>
Data Management Maturity: Defined

Data Management

- The business functions that develop data, and/or execute plans, policies, practices and projects that control, protect, deliver and enhance the value of data.

Data Management Maturity

- The ability of an organization to **precisely define**, easily integrate, protect, effectively retrieve, and deliver data that is **fit for purpose** for both internal applications and external purposes.

Metadata is data too, and is required to be proactively managed
Current State of Data Management Maturity

Data Management Maturity is relatively new, and without it, quality is generally poor

• Virtually no formal measures of data management maturity, though some measures of data management program implementation
  • No more than ~ 33% of organizations have an active, formal data management program at some level of implementation\(^1\)
  • Nearly 50% of existing formal data management programs are 1 year old or less\(^1\)

• Data Quality measures as a proxy for mature data management activities indicate strong need for improvements
  • Measured data quality is reported to indicated ~25-30 percent of organizations have data quality issues\(^2\)
  • Amount of companies reporting data quality issues is increasing\(^2\)

• Business demand and regulatory pressures are driving recognition that data management is a business issue and needs to be improved under formalized programs
  • Business demand for Master Data Management, Data Science and Predictive Analytics require foundational improvement for pro-active management of data from origination through the entire data flow and lifecycle
  • Industry regulations are requiring certain data governance and oversight capabilities
  • Surveys show measured improvements in the ability to reduce risk, increase business agility and increase revenue through formalizing a data management program\(^3\)

3. Forrester report "Top Performers Appoint Chief Data Officers", 2015
Mature Data Management Program Success Matrix

With these you will achieve...

Data Management Strategy
Governance Structure
Data Quality Strategy
Funded Implementation
Operational Control Environment

Data Management Strategy
Governance Structure
Data Quality Strategy
Funded Implementation
Operational Control Environment

Data Management Strategy
Governance Structure
Data Quality Strategy
Funded Implementation
Operational Control Environment

Data Management Strategy
Governance Structure
Data Quality Strategy
Funded Implementation
Operational Control Environment

...this

Data Fit for Purpose
Confusion
Dissatisfaction
Exasperation
Frustration
Inconsistency
Capability and Maturity Models
Capability and Maturity Models – what are these things?

• Designed on the premise that the quality of a system or product is highly influenced by the quality of the process used to develop and maintain it

• Compendium of objective statements of activities designed to provide guidance for organizations to progress along a measured path of improvements for a particular set of business activities
  • Typically ~5 levels of increasing capability or maturity
  • Developed over a period of time leveraging subject matter experts with a range of experience
  • Designed to be universally applicable for any type or size of organization

• Define the what, not the how
“All Models are Wrong, But Some are Useful”  
George Box, Statistician, 1978

Subject of a paper written for a Statistics Workshop, arguing that the existing ‘real world’ “cannot be exactly represented in a model”, but that models can still be “illuminating and useful”

• As true for Capability and Maturity Models as it is for statistical models

• Capability Maturity Models used since early 1990’s
  • First CMM commercially developed by Carnegie Mellon University through funding DoD, related to software engineering
  • CMMI Model currently used globally by thousands of organizations of all types and sizes

• Organizational Applicability
  • Requires detailed understanding of the expectations articulated in the models
  • Requires understanding of the goals, rationale of the activities
  • Ability to interpret the models to the specific culture and needs of the organization

• Content is presented in a topical structure, not an operational or implementation sequence
How Models are used

• Capability versus Maturity
  • Capability. The **validated achievement** of performing individual functions
  • Maturity. A defined level of relative collective capabilities within a specific domain of work, and **degree of optimization of the capabilities**

• Useful for benchmarking
  • Objective measurements of achievement provide measurements of organizational capabilities or maturity
  • Useful for tracking progress of improvement objectives
  • Useful to compare against peers

• Different levels of assessment
  • Affirmation/sentiment-based assessment. “**I believe we do that.**” Useful for initial benchmarking and gap analysis
  • Evidence-based assessment. **Objective, third-party evaluation of direct evidence** of the execution of each activity statement in the model. Required for formal reporting and benchmarking against peers
Measuring Data Management Maturity

**DMM℠**

- Released by CMMI Institute in 2014
- Designed to encompass all facets of data management

- Released by the Enterprise Data Management (EDM) Council in 2015
- Designed to guide organizations to a mature data management program

Kingland is the only firm currently certified to consult on both models
Data Management Maturity (DMM\textsuperscript{SM}) Model
DMM Model History

March 2009; EDM Council and Kingland Systems pitch concept to SEI (Developer and steward of CMM/CMMI at the time)

Sep 2010; EDM Council initial working group formed for content development

Feb 2012; content turned over to SEI (now CMMI Institute) for transition into an objective model

Feb 2013; Initial model completed and pilot engagements initiated (Microsoft engaged in 1st pilot)

2013 – 2014; Model underwent 3 additional major revisions and Peer Review, Pilot engagements continued

August 2014 V1.0 released
Data Management Maturity (DMM℠) Model

Guidance for complete data management continuum

- Over 400 functional statements of practice
- Focuses on the ‘state of activities’ vs. state of the art
- Infrastructure support practices for organizational instantiation
DMM Model Process Area Construct

- **Purpose**: Business purpose of the Process Area
  - **Introductory Text**: Intent of the PA, synopsis of activities, context
  - **Goal(s) of the Process Area**: Goals to be achieved through execution of practices
  - **Core Questions for the process area**: Probing questions for self awareness
  - **Functional Statements (Levels 1-5)**: Objective statements of DM practices expected within the PA, organized by capability level
  - **Example Work Products**: Identification of typical of work products/assets used or generated by the activities

**Key**
- **Explanatory Model Components**: Required for Model compliance
DMM Levels

Designed to provide guidance for, and the ability to measure, increased data management maturity across all aspects of data management.

DM processes are **regularly improved and optimized** based on changing organizational goals – we are **seen as leaders** in data management.

DM practices are managed and **governed through quantitative measures** of process performance.

DM practices are **aligned** with strategic organizational goals and **standardized across all areas**.

Activities are **deliberate, documented and performed consistently** at the Business unit.

Activities are **Informal and ad hoc**. Dependent on heroic efforts and lots of cleansing.

Level 1: Performed
Level 2: Managed
Level 3: Defined
Level 4: Measured
Level 5: Optimized

Quality: Risk
Reuse: Ad hoc
Functional Practices

**Functional Practice Statements**
- Statements designed specifically to describe functional capabilities within the topical subject of the Process Area (PA)
  - Example, from **Data Integration** Process Area

3.3 **A standard process is established and followed to create and verify data precedence rules with business users based on use cases, requirements, and selected triggers.**

Often, multiple sources contribute to data integration into a single logical destination, such as operational systems contributing to a data warehouse. In these instances, it can be expected that more than one source may contribute data that is the same or similar to data from other sources. In this example, during the final ETL process that feeds the single repository, it is necessary to establish and apply precedence and conformance rules to guide the final integration.

The results of performing **Data Lifecycle Management** practices provide input to this process area by helping to understand the use and need of the organization’s data.

- Functional statements of higher level build on lower level practice expectations
- Level 3 functional statements were designed as minimum target state
Infrastructure Support Practices (ISPs)

**Infrastructure Support Practices**
- Activities designed to enable and sustain the manifestation of the process area activities into the culture across the organization
- Part of the control ecosystem
- Every practice expected as part of every Process Area at the designated levels

**Level 2**
1. Establish an organizational policy
2. Plan the process
3. Provide the resources
4. Assign responsibility
5. Train the people
6. Control the work products
7. Identify and involve relevant stakeholders
8. Monitor and control the process
9. Objectively evaluate adherence
10. Review status with higher level management

**Level 3**
1. Establish and maintain Standards
2. Provide assets that support the use of the standard processes
3. Plan and monitor the process using a Defined Process
4. Collect Process-related experiences to support future use
DMM Capability and Maturity Requirements

**Capability Measures**
- Scored by Process Area (PA)
- All capability statements within a PA up through a particular level
  - Example; Capability level 3 in the *Data Profiling* Process Area requires performance of all level 1, level 2, and level 3 practice statements in the PA

**Maturity Measures**
- Scored by Process Area (PA), by category or whole model
- All capability statements within a PA up through a particular level, **plus** fully implemented across all ISPs for the appropriate level
Data Management Capability Assessment Model (DCAM™)
DCAM History

March 2009; Origin with the pitch for a maturity model to SEI (Developer and steward of CMM/CMMI at the time)

Sep 2010; EDM Council initial working group formed for content development

Feb 2012; content turned over to SEI (now CMMI Institute) for transition into the DMM Model

Jan 2014; Work initiated by EDM Council on DCAM. Desire for a different type of model

2014 – 2015; Model underwent 3 major revisions and Peer Review. Pilot engagements with banks

July, 2015 V1.1 released
Data Management Capability Assessment Model (DCAM™)

Guidance for data management program

- Focused on capabilities to establish, enable and sustain a mature data management program
- 37 prescribed capabilities with 115 sub capabilities
- Measurement criteria leading to an optimized program
DCAM Component Construct

**Definition**

Definition of the Category

**Purpose**

Business purpose of the Category

**Introduction**

Intent of the category synopsis of activities, context

**Goal(s) of the Component**

Goals to be achieved through execution of guidance

**Core Questions for the Component**

Probing questions for self awareness

**Capability Statements**

Assertive statement describing a target state

**Sub-Capability Statements**

Activity necessary to achieve the capability

**Capability Objectives**

Objective, testable statements to determine whether the sub-capability is in place
Capabilities, Sub-capabilities and Capability Objectives

**Capability Statements**
- Affirmatively worded statement of the state of something that should exist

**Sub-capability Statements**
- Singularly focused statement of the fact of something that must be accomplished or in place in order to achieve the parent capability statement
- Includes amplifying narrative and capability objectives
- Accomplishment is measured based on Sub-capabilities

---

**Example from Data Management Strategy**

<table>
<thead>
<tr>
<th>Capability Statement</th>
<th>Sub capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Data management strategy (DMS) is specified and shared with relevant stakeholders</td>
<td></td>
</tr>
<tr>
<td>1.1.1. The DMS is developed</td>
<td></td>
</tr>
<tr>
<td>The data management strategy needs to be documented in collaboration with the full spectrum of business, technology and operations management.</td>
<td></td>
</tr>
<tr>
<td>Capability Objectives</td>
<td></td>
</tr>
<tr>
<td>• DMS has been documented</td>
<td></td>
</tr>
<tr>
<td>• DMS has been aligned with business, technology and operations.</td>
<td></td>
</tr>
<tr>
<td>• DMS has been published to all relevant stakeholders.</td>
<td></td>
</tr>
<tr>
<td>1.1.2. The DMS is aligned with the high-level organizational objectives</td>
<td></td>
</tr>
<tr>
<td>High level organizational objectives are those identified by executive management as organizational goals (i.e.: the organizational objective is to improve customer support and services).</td>
<td></td>
</tr>
<tr>
<td>Capability Objectives</td>
<td></td>
</tr>
<tr>
<td>• DMS is fully mapped to and aligned with the high-level organizational objectives.</td>
<td></td>
</tr>
<tr>
<td>• DMS is approved by the executive committee and relevant stakeholders.</td>
<td></td>
</tr>
<tr>
<td>• Process is established to ensure the future alignment of the DMS to organizational objectives.</td>
<td></td>
</tr>
</tbody>
</table>
DCAM Implementation Levels

Designed to provide guidance for, and measure, the journey towards implementation of a control environment supporting data management.

Initial target → Controls Implemented

Deliberate changes are occurring to enhance the program.
The strategy, processes and controls for the governance program are in place and being followed.

Controls validated

Stakeholders have validated the documented guidance.

A strategy to develop process and controls is underway, with documentation started.

Controls in development

Awareness of needs, concepts and conversations about how

Controls Conceptualized

Not Initiated

Things happen (sometimes), no defined process or controls
DCAM Capability Measures

**Capability Measures**
- Scored at Sub-capability level
- Roll-up to capability and component levels
- Each Sub-capability has defined criteria for each level
  - Not all are scored to level 6 (Enhanced)

**Examples from Business Case and Data Governance components**

<table>
<thead>
<tr>
<th>2.2.2. The DM funding model is aligned with the business process of the organization</th>
<th>Not Initiated</th>
<th>In Process (Conceptual)</th>
<th>In Process (Developmental)</th>
<th>In Process (Defined)</th>
<th>Capability Achieved</th>
<th>Capability Enhanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no alignment of the funding model with business processes</td>
<td>The relationship between the data management funding model and the organizational business processes is being debated</td>
<td>The alignment of the funding model with the business processes of the organization and discussions about the funding model type (centralized vs. federated) are under review by stakeholders</td>
<td>The data management funding model addresses current year budget cycle. Multi-year budget considerations are being finalized by program stakeholders</td>
<td>The data management funding model is mapped to a multi-year implementation plan</td>
<td>Data management funding is integrated into operations as a sustainable corporate function</td>
<td></td>
</tr>
</tbody>
</table>

| 4.7.3. Data governance is aligned with external data usage policy and standards | Not Initiated | In Process (Conceptual) | In Process (Developmental) | In Process (Defined) | Policy and procedures for third party usage are not in place | Policies and procedures for third party data usage are being defined and shared with involved stakeholders | Policies and procedures for 3rd party usage is verified | Policies and procedures for 3rd party usage is implemented and operational | NA |


Model Usage Considerations
DMM Model v DCAM

Both models address expectations for data governance and stewardship, but have substantial differences.

Focus on **program development and implementation**

Measures **level of program implementation**

Specific activity guidance for **all aspects impacting data Management**, including data management program

Measures **level of capabilities** across the organization

---

**DCAM**

Designed to measure progress towards full implementation of a data management program

**DMM Model**

Designed to provide detailed guidance via a ladder of increased capabilities across all activities

Both models support use as a means to measure current state and objective measurements of progress for the content guidance contained in the respective models.
Data Management Cycle

Work defined by the top components are intended to drive the activities performed by the bottom components

Things that drive work efforts, **guiding common understanding** of the objectives, rules, expectations and definitions.

Performing activities to **ensure that the data is fit for purpose and consistent** with the objectives, rules, expectations and definitions.

Things that **ensure execution is accomplished consistently** according to the objectives, rules, expectations and definitions.

Performing the day-to-day operational activities **according to stewardship and governance guidance**.
DMM Model v DCAM

**DCAM**
- Focus on **program development and implementation**
- Measures **level of program implementation**

**DMM**
- Specific activity guidance for **all aspects impacting data Management**, including data management program
- Measures **level of capabilities** across the organization

The guidance and controls from the data management program should inform and influence all the day-to-day activities of data management.
Key Considerations About the Models

- Both models help clarify roles of stakeholders and reinforce collaboration between business and IT through shared understanding
- Both models provide guidance on necessary components of data governance and a data management program
- “Which Model should I use”?
  - Not an easy, binary decision.
    - Current state
    - Primary organizational driver
    - Intended use for the model chosen
    - Level organizational buy-in and support
    - Ease of accepting change
    - Organizational size and complexity
    - Operational expertise related to all things ‘data management’
    - Types of data domains (DCAM written predominately for financial services)
- Three bears soup problem; DCAM is 55 pages, DMM is 230 pages
  - Both require training and expertise to fully understand and apply to be ‘just right’

**DCAM**
- Focused on measuring towards implementation of a program
- Solely interested in the program content and implementation
- EDM Council membership

**DMM**
- Evaluates specific organizational capabilities for being in performed
- Program expectations interspersed throughout the model, injected into certain operational expectations
How the Models are Being Used

• Self-directed
  • Acquire and read the model
  • Self-assess gap analysis
  • Initiate improvement plans

• Training
  • Identifying necessary participants in the organization
  • Education on model expectations
  • Establishing shared understanding and vision

• Workshops
  • Same as Training, plus…
  • Focused discussions on content within organizational context
  • Affirmation-based baseline and gap analysis for clear path forward

• Assessments
  • Program scope validation
  • Affirmation-based for indicative gap assessment
  • Evidence-based assessment for unambiguous risk posture against expected capabilities
  • Identified strengths and weaknesses
  • Formalized benchmark for peer comparison (if evidence based) or improvement initiatives
Next Webinar

Last in the series

- Deeper dive into scoping your use of the models
  - Which model and what type of use

- Case study discussions of different organizations use of the models
  - Large enterprise B2B example
  - Mid-sized financial industry example
  - Small, focused data repository example

- Discussions of specific values achieved
Thank you.
Kingland Systems. Discover the Confidence of Knowing.

Our clients know that Kingland Systems delivers faster, smarter, more reliable solutions.

**INDUSTRY SOLUTIONS**
Kingland has been delivering Industry-specific solutions to leading global enterprises for more than 23 years.

**SOLUTION PLATFORM**
The Kingland Strategic Solution Platform means continuously smarter technology to deliver today and into the future.

**EXPERT SERVICES**
Kingland brings deep data and software expertise to every solution, helping you realize benefits swiftly — and with less risk.