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Carlson Analytics Maturity Model Overview

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Understanding the Model

Advances in computing technologies, information systems, big data and analytics, augmented intelligence offer organizations an unprecedented opportunity to improve their business processes and create greater value for various stakeholders. But to realize the true potential of data-driven decision-making, organizations benefit from assessing their analytics strengths and identifying improvement opportunities. Doing so allows executives to invest wisely in their core data analytics capabilities. The Carlson Analytics Maturity Model (CAMM) described here is a framework designed to undertake an *unbiased, research-driven, holistic* survey-based evaluation of an organization or a business unit's data analytics capabilities.

The ACMM framework is designed to help answer the following questions:

- *How mature are your organization's data analytics capabilities?*
- *Where and how should you focus to improve the analytics capabilities of your organization?*

The "organization" in this context can be defined based on the scope of the evaluation. For example, it can refer to the entire enterprise – which would work best for a mid-sized or small organization. On the other hand, a large organization might choose to define the scope of the analysis as a single business unit.

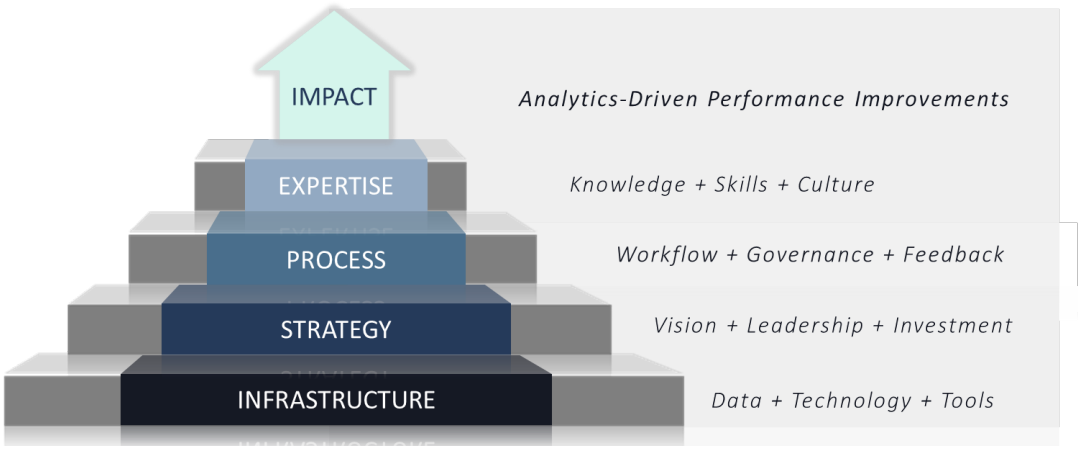


Figure: Evaluation Dimensions of the Carlson Analytics Maturity Model

The CAMM assesses maturity in terms of:

(i) **Infrastructure** (data, technology, tools) – How does the organization collect, organize, and use data to improve organizational performance with data analytics?

(ii) **Strategy** (vision, leadership support, investment) – How does the organization assess needs, allocate resources, and measure performance for analytics initiatives?
(iii) **Processes** (workforce development, governance, feedback) – How does the organization create a workforce to effectively and ethically employ analytics capabilities?

(iv) **Expertise** (knowledge, skills, culture) – How well does the organization undertake data engineering, exploratory analytics, predictive modeling, causal inference, and prescriptive analytics?

(v) **Impact** – How well an organization has defined and tracked performance metrics to demonstrate measurable improvements in the results and outcomes?

Figure: Benefits of Using Carlson Analytics Maturity Assessment

Organizations can use the CAMM in the following three ways:

1) **Self-assessment:** Organizations can answer the process, methods, and results questions to identify gaps in current analytics capacities.

2) **Leadership support:** Functional analytics leaders (Chief Data Officers, Chief Information Officers, etc.) can use the CAMM to convince senior leadership of the commitment and resources necessary to realize value from analytics initiatives.

3) **Formal assessment, benchmarking, and next-steps identification:** Senior leaders can engage the MISRC and other partners to assess and score analytics capacities. The MISRC can provide insight on industry-specific best practices and a road map to build near and long term analytics capabilities.

Preparing for the Assessment

MISRC works closely with the client organization to create a personalized timeline for the assessment. The key steps of the assessment process are:

(1) **Scoping** – Defines the scope of evaluation by identifying all the business unit(s) or functional units (e.g., supply chain, enterprise reporting) within a large organization that will be evaluated.
(2) **Participant Identification** – Identifies key participants and stakeholders who will be providing inputs to the online survey questionnaire and follow-up interviews.
(3) **Online Survey** – Initial data is gathered using an online survey sent to the key participants. The survey logic is designed to limit questions asked to the participants based on their self-identified roles to maximize efficiency in gathering the relevant information.
(4) **Expert Review** – MISRC faculty will review and discuss the survey responses internally to make a preliminary assessment and identify areas where follow-up interviews are needed.
(5) **Follow-up interviews** – MISRC faculty and their assistants will conduct 1-on-1 interviews with select participants, as necessary, either in-person or virtually.
(6) **Final Report** – MISRC faculty will evaluate all the data gathered to complete assessment and make final recommendation to the client in a detailed report.

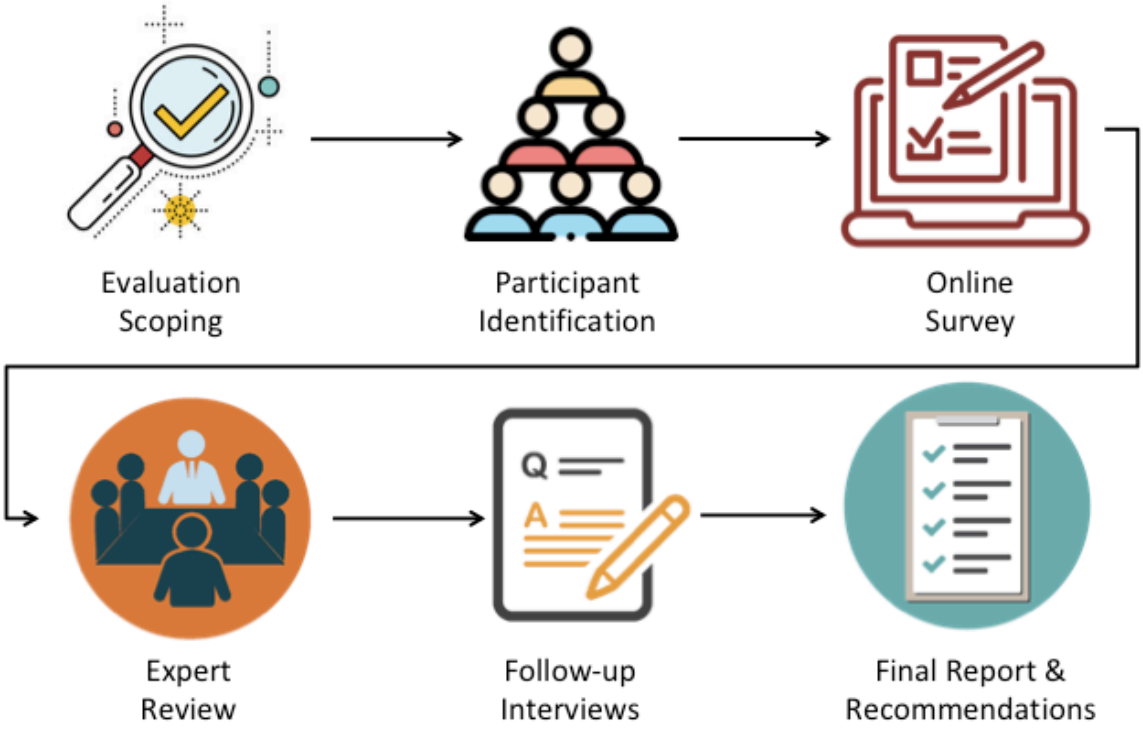


Figure: Steps of Carlson Analytics Maturity Assessment

Scoring and Report

The final report provides detailed evaluation on several dimensions, e.g., process maturity, analytics expertise, ROI tracking. The responses to the questionnaire will be used to score these dimensions and to provide specific recommendations to the client.

For example, to assess process maturity, we evaluate the degree to which the corresponding process has been formalized, standardized, deployed, and integrated across the relevant business units in an organization. We classify the processes into 5 different levels (and corresponding stages), namely: Level 1 – Ideation, Level 2 – Initialization, Level 3 – Standardization, Level 4 – Deployment, Level 5 – Transformation. The criteria for this classification are formalized in Table 1.

Criteria for Evaluating Maturity of Analytics Support Processes		
Level	**Stage**	**Description**
1	**Ideation**	*Ad hoc* discussion, planning, and/or documentation of *analytic process*[1].
2	**Initialization**	*Formal process*[2] applied to at least one analytics project Process has been documented with discrete, measurable steps. Processes may differ across departs, units, and deployments.

[1] ***Analytics process***es support the capabilities outlined in the framework categories. Examples of analytics processes include a process to identify analytics opportunities, a process to assess value of analytics initiatives, and a process to prioritize analytics investments.
[2] ***Formal processes*** are documented processes with discrete, measurable steps.

3	**Standardization**	*Standard process*[3] has been deployed across multiple analytic projects and capabilities. Processes are *assessed for effectiveness*.
4	**Deployment**	Standard process *fully deployed* to all relevant units of the organization. Process identifies *significant gaps* and *prioritizes next actions* for improvement.
5	**Transformation**	Fully deployed and *integrated process*[4] that support ongoing development of enterprise analytic capabilities. Multiple *cycles of improvement* to the process are evident.

Table 1. Criteria for Evaluating Maturity of Analytics Support Processes

Examples of Using the Criteria for Process Maturity Evaluation

Below we provide some illustrative examples of how the criteria for process maturity can be applied to assign a level and stage to a process based on the description provided by an organization in response to the related questions.

Example: Cat 2.A.ii Skills Development and Deployment How do you translate requirements into actions? What are your key long and short-term action plans for analytics. How do you translate broad capability needs into discrete projects?		
Level	**Stage**	**Description**
3	**Standardization**	*Standard process* has been deployed across multiple analytic projects and capabilities. Processes are *assessed for effectiveness*. **The organization's marketing team has a process to train all personnel in digital analytics. This involves quarterly hands-on workshops, and online training. The marketing team assesses each member's level of training and makes adjustments to the individual training plans. This process has been adopted as a standard across the organization has is currently being implemented in the HR division.**
Score	3	**Note:** There is a formal process in place, it has been adopted for standardization, though has not been yet been deployed to another business unit. The process is assessed for effectiveness and the assessment informs improvements to the process.

Example Grid of Process Maturity Scores

An example outcome of the evaluation with a full grid of process maturity scores for the various types of analytics-related processes is presented below in Table 2.

[3] ***Standard processes*** are formal processes that have been adopted by the firm for deployment across the organization.
[4] I***ntegrated processes*** share personnel, steps, data, and or communication. For example, an organization might have Cat 1.B.ii Resource Allocation integrated with Cat 1.A.ii Analytics Roadmap if the results from the analytics roadmap are used as an input for the resource allocation. Such an integrated process may include automatic data feeds between systems supporting the two processes. In addition, process steps may be shared, such as the process to identify and weigh assessment criteria. Integrations among Cat1.A.i. Needs Identification and Cat.1.B.i Business Value might also be relevant in this scenario.

Evaluation Dimension			Level	Score
Strategy, Investment, & Performance	Analytics Strategy	Needs Identification	Standardization	3
		Analytics Strategy Roadmap	Standardization	3
		Analytics Strategy Implementation	Initialization	2
	Analytics Investments	Business Value	Deployment	4
		Resource Allocation	Deployment	4
		Risk Assessment	Standardization	
	Analytics Performance	Business Performa		
		An		
	Workforce Devel			
			ment	4
			Initialization	2
			Ideation	1
			nce	Ideation	1
Architecture, & Data Analysis		Data Acquisition	Standardization	3
		Data Requirements	Deployment	4
		Data Roadmap	Initialization	2
	Data Architecture	Hardware Infrastructure	Standardization	3
		Software & Tools	Initialization	2
		Data Models	Initialization	2
	Data Analysis	Model Selection	Deployment	4

Table 2. An example of all the process maturity scores awarded to an organization.

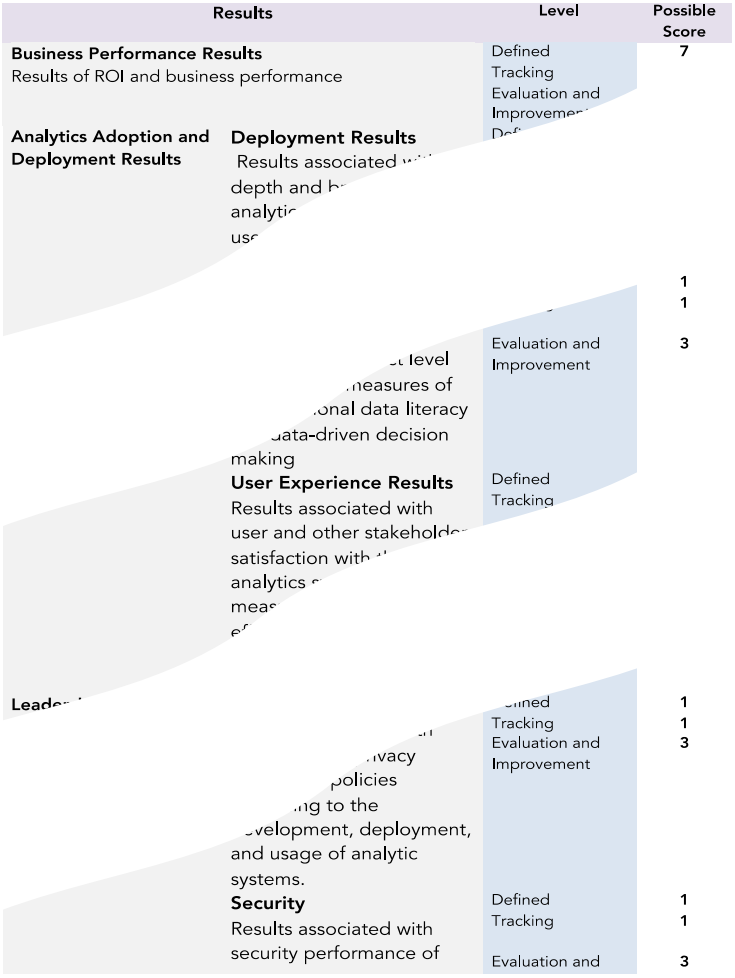
The analytics expertise level within the organization will be evaluated along the five dimensions shown below. The resulting scores will be used to classify the methodological expertise level as one of the following five levels: Low, Moderately Low, Moderate, High, and Very High. Each of these levels will be represented with an intuitive color-coding in the score sheet and accompanied with comments on areas of improvement in each dimension (ref. Table 3).

Methods	Level	Comments
Data Engineering	**High**	
Exploratory Analytics	**Moderate**	
Predictive Analytics	**Moderate**	
Causal Inference	**Moderately Low**	
Prescriptive Analytics	**Low**	
Total Score (out of 100):		

Table 3. Example Score Sheet of Methodological Expertise

The Impact assessment portion of the final report will evaluate the effectiveness of the analytics initiatives undertaken by an organization in terms of the measurable improvements in the results and outcomes. It involves identifying how the organization's analytics capabilities have impacted some key dimensions – (1) Business performance results, (2) Analytics adoption and deployment results, and (3) Leadership, governance, and ethics results. An example-scoring template provided in Table 4. In particular, the scoring system evaluates whether an organization has defined key performance metrics, tracked these metrics, and demonstrated evidence of performance improvements with the implementation of analytics-driven decision making.

Questionnaire & Scoring Template for Result Evaluation



Results		Level	Possible Score
Business Performance Results Results of ROI and business performance		Defined Tracking Evaluation and Improvement	7
Analytics Adoption and Deployment Results	**Deployment Results** Results associated with depth and breadth of analytics use		1 1
	level measures of onal data literacy data-driven decision making	Evaluation and Improvement	3
	User Experience Results Results associated with user and other stakeholder satisfaction with analytics measures	Defined Tracking	1 1
Leader		Defined Tracking Evaluation and Improvement	1 1 3
	privacy policies ing to the development, deployment, and usage of analytic systems.		
	Security Results associated with security performance of	Defined Tracking Evaluation and	1 1 3

Table 4. Questionnaire & Scoring Template for Result Evaluation

Overall Scoring System

Using the three sets of questionnaires, an organization will receive a score out of 300 (i.e., 100 for methodological expertise, 135 for process maturity, and 65 for results and outcomes). The total score that an organization gets will be used to assign an overall analytics maturity level. As shown in Table 5, there will be five levels for this overall analytics capability: (1) Low, (2) Moderately Low, (3) Moderate, (4) High, and (5) Advanced.

Analytics Capability Maturity Level	Total Score
Low	0 - 50
Moderately Low	51 - 100
Moderate	101 - 150
High	150 - 225
Advanced	226 - 300

Table 5. Total score needed to attain different analytics maturity levels

The final report will also contain specific guidance and recommendations from MISRC faculty to help clients assess their current capabilities and identify opportunities for further improvements.