CSIS
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Data Management Maturity Model

In partnership with the California Department of Education (CDE), CSIS is providing a Universal Supports Toolkit to serve as a proactive universal support for all Local Education Agencies (LEAs), regardless of their eligibility for CALPADS Differentiated Assistance (DA). It contains all the necessary resources to evaluate and establish remediation action plans using the Root Cause Analysis Guidebook when any district or County Office of Education (COE) becomes eligible for CALPADS DA.

Introduction—CSIS Data Management Maturity Model (CDM3)

The CSIS Data Management Maturity Model (CDM3) is a comprehensive utility designed to guide LEAs in evaluating and enhancing their data management practices.

By leveraging insights gained from the CSIS Data Management Assessment (CDMA), LEAs can use the CDM3 for selecting systematic enhancements to their current data management capabilities and identify new targeted areas for local growth.

The model provides a clear roadmap for advancing data governance and management practices, enabling LEAs to implement best practices and achieve higher levels of data maturity. With the CDM3, organizations can transform their data into a strategic asset, driving informed decision-making and fostering educational excellence.

Begin your journey towards data excellence with the CSIS Data Management Maturity Model and elevate your organization's data capabilities.

Level 1 — Initial or Ad Hoc	Level 2 — Developing	Level 3 — Structured & Documented	Level 4 — Managed & Measured	Level 5 — Optimized & Sustainable
Unaware	***Aware***	***Active***	***Controlled***	***Fully Managed***
At this level, organizational data management practices are underdeveloped and informal. Data management efforts are typically reactive rather than proactive, and standardized policies and procedures are missing. Data is often confined within divisional silos, and there may be a lack of coordination between internal departments and programs, leading to operational redundancies and inefficiencies. The organization lacks cohesive data integration strategies and fails to demonstrate a unified understanding of data governance and quality standards. There is often a lack of clearly defined data governance roles, inconsistent data practices, and minimal use of specialized hardware and software for managing data. The mostly reactive and ad-hoc nature of current data management practices will increase the organizational risk of developing insufficient data privacy and security measures.	At the Developing level, organizations are beginning to recognize the importance of modern data management and are taking initial steps to address deficiencies in their current operational data practices. Efforts to establish standardized data processes and governance structures are underway, though these initiatives may lack consistency and comprehensive organizational support. Organizations at this level may have begun defining data specific roles and responsibilities while initiating and aligning departmental data strategies with local goals. These efforts are likely fragmented, with progress often limited to specific areas rather than a unified organizational approach. As a result, the organization is in the nascent stages of improving data literacy, structuring data quality, privacy and security measures, and fully integrating data management into the broader organizational business processes. Data silos still exist within the organization, although there may be early efforts working to manage data across these silos. The organization recognizes modern data management practices, but the pace of change remains slow or minimal.	At the Structured & Documented level, an organization has typically developed and implemented at least a subset of standardized data management processes and procedures within the organization. There is a commitment to ensuring that data management practices are improved and consistently aligned with local organizational goals. Data quality practices have matured, with some centralized data management and automated processes being well-established. Organizations at this level have effectively integrated data management into their operations, embracing data-driven processes and adopting a proactive approach to the routine management of their data. Additionally, there is a continuous focus on enhancing data literacy throughout the organization, ensuring that all staff can understand and use data effectively for carrying out their duties. Strategic data asset management is prioritized, and advanced data privacy and security protocols are in place to protect and manage the data asset lifecycle responsibly.	At the Managed & Measured level, an organization leverages data-driven insights to inform strategic decisions and drive operational improvements. Data management processes are not only standardized across the organization but are also continuously measured and optimized based on quantitative metrics. Organizations at this level make advanced use of data analytics, visualization, and predictive modeling, ensuring that data is a central component of decision-making processes. Continuous improvement mechanisms are in place, allowing for ongoing refinement of data management practices. Robust data security and privacy practices are maintained, with regular quantitative assessments to ensure these practices meet evolving standards. Data management is deeply integrated into strategic planning and decision-making, characterized by organizational agility and a culture of data innovation. Advanced data governance frameworks support these efforts, ensuring that data is managed as a strategic asset, and the organization can quickly adapt to changing business needs through data-driven approaches.	At the Optimized & Sustainable level, an organization is distinguished by its capacity to use data as a driver of innovation, to inform strategic decisions, and sustain an operational advantage. Data management practices are not static; they are continuously refined and improved through the adoption of emerging technologies and methodologies. The organization is highly agile, capable of rapidly adapting data strategies to meet evolving compliance requirements and seize new opportunities. Organizations at this level are adaptive, evolving in response to new data types, sources, and technologies while ensuring ongoing compliance and data integrity. They epitomize the highest standards in data management, fostering a data-driven culture led by example from the top leadership. Holistic data management and integration are achieved, utilizing advanced analytics to support decision-making and prioritizing continuous improvement and innovation. Data management practices are deeply aligned with organizational objectives and goals, with emerging technologies leveraged to maintain a competitive edge. Adaptive governance frameworks are in place, enabling the organization to stay at the forefront of innovation and ensure that data remains a strategic asset.
Key Characteristics	**Key Characteristics**	**Key Characteristics**	**Key Characteristics**	**Key Characteristics**
Informal or ad hoc processes for managing student, staff, and operational data.	**Emerging data governance and data quality practices**, with some standards in place.	**Documented data governance and data quality management policies, standards, and procedures** within the district.	**Advanced data analytics and visualization capabilities**, enabling stakeholders to derive deeper insights from the district's data assets.	**Data-driven culture and leadership**, where district administrators and stakeholders consistently use data to inform decision-making and drive continuous improvement.
Unclear ownership and responsibility of organizational data assets throughout the school or district.	**Increased awareness among district leadership** of the importance of effective data management and its impact on decision-making.	**Centralized data management and integration** points (data warehouse or unified platform) that facilitate data sharing and reporting.	**Predictive modeling and forecasting techniques** used to anticipate trends, identify potential challenges, and inform strategic decision-making.	**Holistic data management and integration**, with a unified and comprehensive approach to data governance, data quality, and data architecture across the entire school district.
Limited organizational awareness of data governance concepts and their importance in an educational agency.	**Early standards like data definitions, documented business rules, and report formats** witin the organization, but inconsistencies remain.	**Automated data collection, processing, and reporting capabilities**, reducing manual efforts and improving efficiency.	**Data-driven continuous improvement processes**, where data is used to identify areas for optimization and drive ongoing enhancements to district operations.	**Advanced data analytics and visualization capabilities**, enabling stakeholders to derive deep insights, predict trends, and prescribe actions to support student success and operational efficiency.
Minimal use of specialized software applications for enabling centralized data management, data processing, and addressing data quality concerns.	**Improved data integration and accessibility**, with efforts to connect disparate data systems and provide a more holistic view of district information.	**Data-driven decision-making processes embedded throughout the district**, with stakeholders regularly using data to inform strategic and operational decisions.	**Robust data security and privacy practices**, including comprehensive data protection measures, incident response plans, and compliance with relevant regulations.	**Continuous innovation and improvement** of data management practices, processes, and technologies to enhance data quality, accessibility, and the value derived from data assets.
Reactive data management activities, with a focus on addressing immediate needs rather than collaborative proactive planning.	**Growing awareness of data governance principles and their relevance to the education sector**, but implementation is still in the early stages.	**Proactive approach to data management**, with a focus on anticipating and addressing data-related challenges before they become problems.	**Quantitative and qualitative assessment** of data management practices, with regular evaluations and benchmarking against industry standards and best practices.	**Data management practices that are fully aligned with the district's overall strategic objectives and goals**, ensuring data is a key enabler for achieving organizational priorities.
Limited implementation of data governance, data quality, and data integrity practices.	**Emerging efforts to formalize data management practices**, such as establishing data stewardship roles and responsibilities.	**Integrated systems and processes for managing data** across different departments and functions, breaking down silos and promoting a holistic view of district information.	**Continuous improvement of data management processes**, with a focus on enhancing data quality, accessibility, and governance.	**Widespread use of data analytics and visualization tools** to drive tangible business outcomes, such as improved student outcomes, operational efficiency, and resource allocation.

Siloed data systems with minimal integration, leading to data silos, manual data duplication, and inconsistent information across the district.	**Some individuals or teams begin taking on data management duties** with their newly established roles defined.	**Increased focus on data quality and consistency**, with established data validation, cleansing, and verification practices.	**Integration of data management and governance initiatives** into the district's strategic planning and decision-making processes, ensuring data is a key consideration for all major initiatives.	**Data governance that is fully integrated** and an essential part of the district's culture, with well-established policies, roles, and responsibilities that are consistently applied.
Skills lacking within data team, exhibiting a clear need for training and professional development in data literacy, technical competencies and sub-disciplines.	**Growing recognition of the value of data governance** and its potential to improve data-driven decision-making and operational efficiency.	**Incorporating data management practices and principles** into the daily operations and workflows of the district, ensuring data is treated as a strategic asset.	**Ability to track progress and demonstrate the tangible value of data management and governance efforts**, using metrics and key performance indicators.	**Data management is viewed as a strategic business initiative** that is critical to the district's overall success and transformation.
Inconsistent privacy and security measures in place to protect sensitive student and staff data due to the reactive nature of meeting organizational data needs.	**Many data management efforts are still fragmented**, with some departments, programs, or schools taking the lead while others lag behind.	**Established data literacy communication and training programs** to build the data-related skills and knowledge of district personnel, from administrators to teachers and support staff.	**Mature data management and governance frameworks**, with well-defined policies, roles, and responsibilities that are consistently applied across the district.	**Leveraging emerging technologies**, such as artificial intelligence, machine learning, and the Internet of Things, to enhance data collection, analysis, and decision-making capabilities.
Inconsistent data definitions, business rules, and reporting methods across departments, programs, and systems, resulting in conflicting data and a lack of trust in the data integrity.	**Initial alignment of data strategy** with the district's overall strategic goals and objectives, but the connection is not yet fully integrated.	**Strategic data asset management**, with a clear understanding of the district's data inventory, its value, and the appropriate use and governance of each data set.	**Organizational agility enabled by data**, where stakeholders can quickly access, analyze, and act on information to respond to changing needs and emerging challenges.	**Predictive and prescriptive analytics used** to anticipate challenges, identify opportunities, and recommend actions to improve student learning, operational efficiency, and resource utilization.
	Beginnings of data literacy programs to enhance the data-related skills and knowledge of district personnel.	**Advanced data privacy and security measures**, including role-based access controls, data encryption, and comprehensive incident response and recovery plans.	**Culture of data innovation**, where district personnel are encouraged to explore new ways of leveraging data to drive improvements and support student success.	**Data literacy embedded across the organization**, with all district personnel possessing the skills and knowledge to effectively access, interpret, and utilize data in their daily work.
	Data privacy and security measures becoming more structured, with some policies and controls in place to protect sensitive student and staff information.		**Data stewardship, data quality management, and data lifecycle management practices** that are deeply embedded within the organization.	**Adaptive and proactive data governance**, where policies, processes, and practices are continuously evaluated and updated to address evolving data-related risks, regulations, and strategic priorities.
Evidence & Artifacts	**Evidence & Artifacts**	**Evidence & Artifacts**	**Evidence & Artifacts**	**Evidence & Artifacts**
• No formally declared vision of unified data governance framework or strategy	• Data quality monitoring reports	• Comprehensive data governance framework	• Data management performance dashboards	• Data management strategic plan
• Absence of documented data management policies and procedures.	• Job Descriptions include some data management responsibilities	• Job Descriptions align with modern data management practices and information system specific requirements	• Advanced data analytics and visualization tools	• Embedded data-driven decision-making across the organization
• Missing standard procedures for common data collection, storage, and procesing tasks	• Data dictionaries	• Data integration and data warehouse documentation	• Data-driven decision-making frameworks	• Data-driven innovation and research initiatives
• Scattered data sources and independent systems	• Data standards documentation	• Data Processing flowcharts and diagrams	• Oversight and monitoring is in place for reviewing changes in processes, procedures and documentation	• Continuous improvement of data management and analytics practices
• Inconsistent data definitions and formats	• Centralized data repository (e.g., data warehouse)	• Business Process flowcharts and diagrams for data-intensive business processes	• Data management maturity assessment reports	• Compliance with state and federal data reporting standards
• Lack of cohesive vision and associated policies	• Standardized data definitions and formats	• Data dashboard and reporting templates	• Public mechanisms for stakeholders to access and interact with data (e.g., dashboards, reports)	• Intelligent data management and self-service capabilities
• Lack of professional development in data domains	• Some internal data governance policies published	• Established data quality standards and metrics	• Integrated data architecture (e.g., data lake, data mesh)	
• Failure to meet state & rederal reporting requirements	• Data Management training materials	• Data lineage and metadata management	• Predictive and prescriptive analytics capabilities (managing via leading / lagging indicators)	
• Data inaccuracies are commonplace		• Data Management roles are clearly defined, regularly communicated, and officially recognized		
Core Activities	**Core Activities**	**Core Activities**	**Core Activities**	**Core Activities**
• Identify, support, and maintain key data sources and systems.	Definine organizational data governance roles and responsibilities	Implement data-centric roles and responsibilities	Conduct routine data management maturity assessments	Establish data management as a core competency
• Conduct scoped data inventory to increase awareness and gain a shared perspective of the current state.	Implement data quality improvement initiatives	Develop data analytics and visualization capabilities	Implement data management performance metrics	Foster a data-driven culture and data literacy
• Ad-hoc data collection and storage operations are documented and reproducible.	Provide data literacy training for staff	Integrate data management into strategic planning	Aligning data management with strategic objectives	Collaborate with state and federal agencies on data initiatives
• Shared responsibilities for critical data processing and analysis tasks.	Automate data extraction, transformation, and loading processes	Frequent (e.g., weekly or monthly) data quality monitoring and improvement	Continuous data quality monitoring and improvement (e.g., daily or real-time)	Real-time data processing and analysis
• Inconsistent reporting and decision-making	Scheduled reporting and dashboards	Enterprise-wide data analysis and reporting	Proactive data-driven insights and recommendations	
• Communicate routine status/metrics with stakeholders	Department-level data analysis and decision-making	Data-driven decision-making processes	Automated decision-making and process optimization	
		Annual Review (minimum) of critical data processes		

Criteria for Progression	Criteria for Progression	Criteria for Progression	Criteria for Progression	Criteria for Sustaining
The organization should establish foundational data management practices and policies, including formal documentation and clear data governance roles. It should also facilitate improved data coordination between internal stakeholders, implement proactive data integration strategies, and encourage consistent data practices. Investing in data management software solutions, providing employee training, and developing formal data privacy and security protocols are essential steps for progression. • Create formal documentation for data management procedures. • Detail data governance structures and data quality standards. • Foster better coordination and communication between departments. • Implement initial steps toward data integration strategies. • Encourage consistent data practices across the organization. • Assign clear data governance roles and responsibilities. • Form a data governance committee to oversee efforts. • Invest in basic technology tools to support data management activities. • Provide training for employees on data management best practices. • Develop formal policies and protocols for data privacy and security.	To advance to the next level, the LEA must standardize the data management practices it has started to develop, ensuring consistent implementation across departments, and begin using data more systematically for decision-making. Annual data privacy confidentiality practices training. • **Document policies** related to Data Governance, Data Management strategies, and Data standards. • **Combine high-value data sources** into centralized resources (data warehouse or unified platform). Local data and/or partner agency data. •**Develop data reporting and analysis capabilities** that support the ability to perform basic data analysis. • **Develop and Implement data quality control measures** to ensure data accuracy, completeness, and consistency, such as data validation and cleansing. • **Establish formal procedures** for reporting data quality issues as they are discovered.	To progress to the next level, the LEA needs to ensure these standardized processes are being continuously monitored and optimized based on performance metrics. Additionally, the organization should start innovating with data to drive strategic decisions. Staff possess data oriented certifications. • **Adopt board policies related to Data Governance**, Data Management strategies, and Data standards. • **Automate data collection and integration processes** to reduce manual effort and improve efficiency. • **Establish a continuous improvement cycle that uses data to identify areas for improvement**, implement changes, and measure the impact of those changes. • **Align data use with the organization's strategic goals and objectives** to ensure that data is being used effectively to support decision-making. • **Advanced Metrics/KPIs** aligned with business objectives and reviewed on recurring basis.	To advance to the next level, organizations must innovate and transform their operations using data analytics and insights. This includes leveraging advanced analytics, predictive modeling, and artificial intelligence to drive business value and achieve strategic objectives. • **Embed data-driven culture and practices** across the organization, including leadership, staff, and stakeholders. • **Continuously evaluate and optimize data management practices** to ensure they are efficient, effective, and aligned with the organization's goals. • **Demonstrate sustainable and scalable data management practices that can be maintained** and adapted to changing needs and circumstances.	As the highest level of maturity, the focus is on sustaining leadership in data management through ongoing innovation, research, and development. These organizations continuously explore and implement new data technologies, practices, and analysis techniques to drive outcomes. • **Communication of timely facts in the form of high-value data points relevant.** • **Regularly train and upskill staff to stay current with the latest data management practices, tools, and technologies.** Encouraging a culture of continuous learning and innovation is crucial. • **Organize hackathons, innovation labs, and collaborative projects that explore new data management techniques and technologies.** This helps by keeping the organization ahead in adopting cutting-edge solutions by evolving and innovating. • **Continuously update data governance policies to reflect changes in regulations, technologies, and organizational needs.** Ensure these policies are enforced effectively across the organization. • **Stay up-to-date with industry trends and best practices** by participating in industry conferences, workshops, and online forums to stay current with the latest developments in data management and analytics. • **Implement systems for real-time monitoring of data quality issues**. Automated tools will help in promptly identifying and rectifying data inaccuracies and inconsistencies.
Activities for Progression	**Activities for Progression**	**Activities for Progression**	**Activities for Progression**	**Sustaining**
Begin to establish a fundamental understanding of key Data Management principles amongst key leadership. **Identify and document data sources** including both internal and external sources, along with associated attributes (data types, formats, characteristics etc.) **Establish standards and processes for collecting, storing, and organizing** data in a secure manner. **Start assigning specific data-related roles and responsibilities** to local data team members.	**Document policies** related to Data Governance, Data Management strategies, and Data standards. **Combine high-value data sources** into centralized resources (data warehouse or unified platform). Local data and/or partner agency data. **Develop data reporting and analysis capabilities** that support the ability to perform basic data analysis. **Develop and Implement data quality control measures** to ensure data accuracy, completeness, and consistency, such as data validation and cleansing. **Establish formal procedures** for reporting data quality issues as they are discovered.	**Adopt board policies related to Data Governance**, Data Management strategies, and Data standards **Automate data collection and integration processes** to reduce manual effort and improve efficiency. **Establish a continuous improvement cycle that uses data to identify areas for improvement**, implement changes, and measure the impact of those changes. **Align data use with the organization's strategic goals and objectives** to ensure that data is being used effectively to support decision-making. **Advanced Metrics/KPIs** aligned with business objectives and reviewed on recurring basis.	**Embed data-driven culture and practices** across the organization, including leadership, staff, and stakeholders. **Continuously evaluate and optimize data management practices** to ensure they are efficient, effective, and aligned with the organization's goals. **Demonstrate sustainable and scalable data management practices that can be maintained** and adapted to changing needs and circumstances.	**Regularly train and upskill staff to stay current with the latest data management practices, tools, and technologies.** Encouraging a culture of continuous learning and innovation is crucial. **Organize hackathons, innovation labs, and collaborative projects that explore new data management techniques and technologies.** This helps by keeping the organization ahead in adopting cutting-edge solutions by evolving and innovating. **Continuously update data governance policies to reflect changes in regulations, technologies, and organizational needs**. Ensure these policies are enforced effectively across the organization. **Stay up-to-date with industry trends and best practices** by participating in industry conferences, workshops, and online forums to stay current with the latest developments in data management and analytics. **Implement systems for real-time monitoring of data quality issues.** Automated tools will help in promptly identifying and rectifying data inaccuracies and inconsistencies.