IES SLDS Grant Considerations
State Policy Questions

This paper is part of a series drafted in collaboration between Alvarez & Marsal Public Sector Services, LLC and the Council of Chief State School Officers in the interest of highlighting strategic considerations for state education agencies (SEAs) pursuing 2023 State Longitudinal Data Systems (SLDS) grants. They are organized based on the priority areas and key features of the 2023 application guidelines and address some major themes and challenges for states seeking to expand or develop their longitudinal data systems in alignment with these guidelines.

Problem Statement

Today, SLDS teams must manage a growing backlog of requests for data to answer specific research or policy questions, including important questions that inform efforts to improve education outcomes. High demand for data or increasingly complex data and analysis requests are often derailed by limited capacity to deliver as traditional delivery approaches can be complicated and often require lots of people, processes and technology. The consequence of this backlog is real: pre-school, K-12 and post-secondary students miss opportunities to learn in environments or programs where success has been informed by, or proven, with data.

Grant Summary

Applicants for the 2023 SLDS grant program from the Institute of Education Sciences (IES) have an opportunity to request funds related to **State Policy Questions**. For this grant priority area, applicants are asked to describe how they will build out the ability and capacity for SEA and local education agency (LEA) users to explore policy questions that will inform their work to improve pre-school, K-12 and postsecondary outcomes. Applicants are directed to use data that already exists within or is linked to their SLDS. Example investments in this area include assessments of policies and programs; state partnerships to expand SEA capacity to analyze data and develop reports that can inform policies and programs; or improved researcher access to data through enhanced systems for providing restricted use data licenses and other mechanisms that facilitate research. All investment approaches should connect to efforts to improve education outcomes with consideration for the needs of at-risk students.
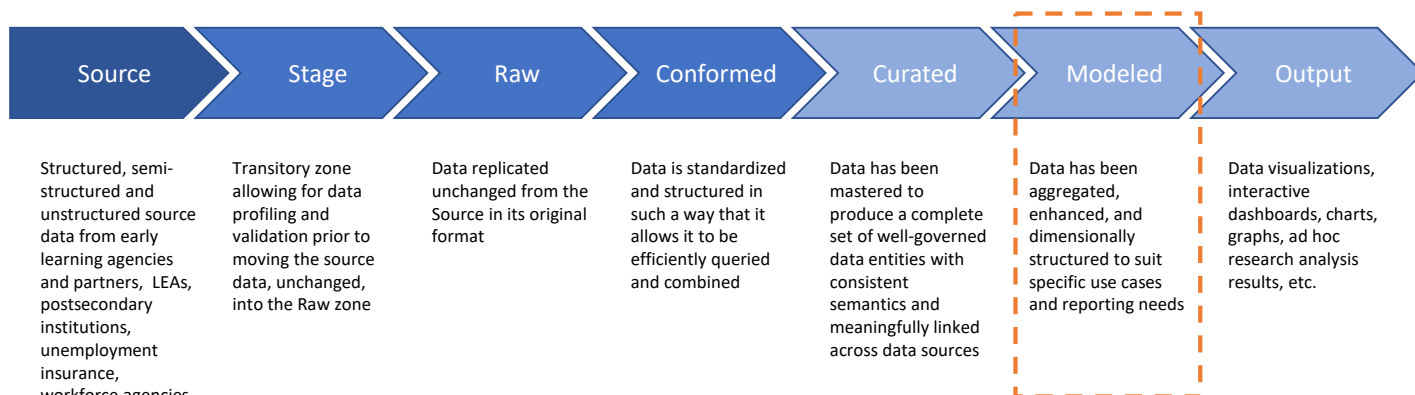
How Should States Think About This?

With this SLDS grant priority area, there is opportunity to increase capacity to explore policy questions using data. States that apply should demonstrate how their investment will deliver this capacity to benefit SEAs' and LEAs' ability to explore important policy questions. States might simply seek to add capacity for the task of processing data for evaluation, in line with their current practices. But for many states adjusting their current practices and improving their ability to organize, access and publish data for SEAs and LEAs to use may be more effective. SLDS leadership should consider efforts to modernize their data management – taking a "data as a product" approach to organize data and metadata in consistent, managed environments that reflect requirements for ad hoc and exploratory analysis as well as production of defined data products that are needed by various constituents, including LEAs and SEAs.

In many current SLDS, there are personnel focused on responding to policy and learning outcome-related questions. They query the large scale SLDS data store to create data aggregations to provide insights, which takes time and effort – to understand the data needs, engage governance processes, build aggregations, and produce insight and/or package a report for delivery. Issues, bottlenecks and missed opportunities arise because the rate of demand and the velocity of change in data needs outpaces the SLDS team's ability to construct custom aggregations from the main data store.

To better manage the rate and variability of demand, SLDS should not just try to keep pace simply by updating their main data store to match – or adding analyst "arms and legs" to match demand. Instead, they should consider creating intermediate aggregations of data (similar to a data mart) that can be managed as products to better meet LEA and SEA demands. This practice focuses on creating greater "grain sizes" of data that are grouped with logic within a domain, for example: grouping LEA enrollment data and graduation data with select data on tutoring programs – a focus for many policy questions post-COVID.

The image below illustrates a modern data pipeline showing the difference between traditional practice and the data product practice. In the traditional approach, data is ingested, stored, and curated and then awaits demand, including ad hoc requests as well as regular reports. With each different request or use case, data must be modeled to produce outputs. The better approach is to have modeled data already structured to meet patterns of demand to minimize turn time and complexity.

Source	Stage	Raw	Conformed	Curated	Modeled	Output
Structured, semi-structured and unstructured source data from early learning agencies and partners, LEAs, postsecondary institutions, unemployment insurance, workforce agencies	Transitory zone allowing for data profiling and validation prior to moving the source data, unchanged, into the Raw zone	Data replicated unchanged from the Source in its original format	Data is standardized and structured in such a way that it allows it to be efficiently queried and combined	Data has been mastered to produce a complete set of well-governed data entities with consistent semantics and meaningfully linked across data sources	Data has been aggregated, enhanced, and dimensionally structured to suit specific use cases and reporting needs	Data visualizations, interactive dashboards, charts, graphs, ad hoc research analysis results, etc.

Data as a product refers to a practice for managing data through a lifecycle of launch, grow, maintain and retire in context of well understood needs of data users. Rather than building aggregation logic into each and every SLDS response, the focus shifts to identifying patterns of data aggregations that can be used to respond to multiple like-requests and then developing and monitoring those aggregations over time and retiring them when they are no longer used. This capability to connect data products to customer needs is central to the data product manager function. Data product managers should engage with customers to understand and monitor their questions, document user requirements, set product performance measures, and inform design decisions for data aggregations, managing the overall portfolio of data products. Ideally, data product managers could even focus on monitoring data product innovations, staying engaged with the field and peer organizations in an effort to anticipate user needs. This product management capability could be complemented by agile development practices that can more easily translate data product requirements into operations.

For many SLDS, this practice of working with data products will not require changes to infrastructure: commonly needed aggregation logic may already exist and can be identified by reviewing past policy questions or data requests. What may be new is a shift to a product management mindset for shaping a portfolio of products. In thinking through their funding request for capacity to explore LEA and SEA policy questions, applicants should consider how they can start the work to create their data aggregations to better serve future data users and realize benefits that include:

- Better alignment with user needs: A focus on a closer connection and monitoring of users and their evolving needs positions the SLDS team to be more proactive – staying abreast of current topics and harvesting insights

from customer interactions in order to proactively perform pertinent analysis of data sets or readying of relevant data.

- **Faster speed / tighter turnaround:** The opportunity to find patterns in data requests can guide the team to regularly update their data models and tools, making it faster to fulfill many types of data requests.
- **Improved quality and accuracy:** Consider embedding metrics into data products, storing derived values so logic can be more easily maintained, establishing processes for creating multi-purpose curated datasets and other ways to improve quality and accuracy in publishing data.
- **Lower system complexity:** This practice simplifies the processing pipeline by normalizing data models to streamline downstream analysis. Upstream, performing common data transformations and aggregations creates pre-calculated datasets that can be reused for different modeling purposes.
- **Potential for greater innovation:** More advanced data product management can introduce or leverage changes to infrastructure as well, including automation of data transformations or user self-service.

Questions to Consider

1. **Do you have personnel with the capacity to start (or develop skills necessary for) operating with a product management mindset?** Are they positioned to engage with users to understand customer needs and work with the rest of the SLDS team to identify data model designs based on patterns? Are you able to build a data product management framework – establishing data product selection, prioritization, lifecycle management, and customer support?

2. **Do you have the ability to easily build intermediate data aggregations in your environment?** Can you establish standards for use and re-use, with documentation and metrics to help guide and monitor personnel who are working with these aggregations or products?

3. **Do you have an LEA or SEA partner (or stakeholder with similar needs or objectives related to outcomes) who can work with you to pilot capabilities?** Can they provide policy or program questions that will help inform your development of data products? Can they provide feedback on your process to respond accurately and efficiently using more modern data management practices?

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