DQC Data Quality Campaign

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Purpose Drives Design

Functions of a Statewide Longitudinal Data System

Over the past two decades, nearly every state has built a statewide longitudinal data system (SLDS) that securely brings together individual-level P–20W data over time. These integrated data systems have enormous potential to be used to improve education and workforce outcomes. But not every system is designed to work in the same way or serve the same functions. Even two "good" SLDSs may not look the same because they can be designed with different goals in mind.

SLDSs can serve up to three broad functions: public reports and dashboards, research and analytics, and support for individuals. Right now, most SLDSs are designed to support public reports and dashboards and/or enable research and analytics, while few are designed to enable direct support to individuals—such as students, job seekers, or families—through timely, personalized access to data.

All three functions are essential and address different people's data access needs. Each function requires different considerations for infrastructure, data governance, legal frameworks, and ongoing investments. For a state's SLDS to effectively support any or all of the three functions, **state policymakers should purposefully shape the design of the system** with the users, required infrastructure, appropriate governance structure, and intended data use in mind. When a system's function is aligned with these drivers, it can effectively enable access to the data that people need to make education and workforce decisions.

The Data Quality Campaign's vision illustrates how access to data enables people—individuals, the public, and policymakers—to make education and workforce decisions. This vision and the use cases it lays out can help data and policy leaders have conversations about their state's data access goals as they build or modernize their data systems and determine which functions to prioritize accordingly. The function that a state chooses drives which use case leaders can implement. If a state chooses to not develop all three functions, it limits who can benefit from the system.

Three Functions of an SLDS

An SLDS's function isn't innate—it's the product of how policymakers design priorities, governance, infrastructure, and staffing for the system. The decisions that policymakers make about how these systems are designed affect everything from who can access the data to how useful the data really is for purposes beyond compliance reporting. State data systems can be designed for up to three functions:

PUBLIC REPORTS & DASHBOARDS	RESEARCH & ANALYTICS	SUPPORT FOR INDIVIDUALS
Data visualizations, dashboards, required reports	Program evaluations, research studies, outcome analyses	Tailored, secure dashboards and reports that enable individual-level insights

Public Reports and Dashboards

Systems designed to enable public reports and dashboards allow public users to explore learner and earner experiences and outcomes over time. These systems are designed to prioritize data transparency and accessibility and are typically used to populate data visualization tools. They often receive data from state or local agencies annually, in a format aligned to accountability reporting requirements.

STATE EXAMPLE

The **Kentucky Center for Statistics (KYSTATS)** is the managing entity of Kentucky's SLDS and is designed to provide transparent and consistent information to policymakers, state agencies, and the general public. KYSTATS's purpose, outlined in its establishing legislation, is to collect data and generate "timely reports about student performance" that guide the improvement of education and training programs. KYSTATS routinely updates and makes publicly available more than 25 reports and tools about high school and postsecondary outcomes, adult education, early childhood workforce statistics, and labor market demands, among other topics. KYSTATS is also designed to fulfill the research and analytics function, and it fulfills roughly 400 external research requests every year.

Research and Analytics

Systems designed for research and analytics are used to prioritize internal research projects and make longitudinal cross-agency data securely available to individuals or groups conducting a study (e.g., those affiliated with a data-contributing agency, a non–data-contributing agency, a postsecondary institution, or an external organization). These systems typically receive data on an annual basis, but they might also be used to pull together data at other times to fulfill specific research requests that are relevant to state priorities.

STATE EXAMPLE

The **Maryland Longitudinal Data System (MLDS) Center** is designed to support external research requests as well as conduct research at the direction of internal decisionmakers. Establishing legislation states that the MLDS Center must fulfill "information and data requests" and "approved public information requests" as well as "conduct research using timely and accurate student data and workforce data." The MLDS Center maintains a publicly accessible repository of research products that use MLDS data. The MLDS Center is also designed to fulfill the public reports and dashboards function.

Support for Individuals

Systems designed to support individuals are used by state agency, regional, and local leaders to provide personalized services that help people access education and public programs. Examples of these supports and services include personalized college advising tools or platforms that help individuals determine their eligibility and apply for public benefits like the Supplemental Nutrition Assistance Program. These data systems require more frequent and interoperable linked data that can be shared with service providers and individuals to help make decisions, secure interfaces that can bring data together across different state agencies, and a data governance model that includes community voices to elevate public priorities.

STATE EXAMPLE

The **California Cradle-to-Career Data System (C2C)** is designed to support tools that help individuals make informed decisions and ease transitions to and through education and the workforce. The system is statutorily required to support financial aid programs; streamline the college application; and enable leaders to provide support to students, parents, and educators navigating the postsecondary and workforce landscape. C2C works closely with CaliforniaColleges.edu to equip students with information on their college and career options and help them determine if the courses they've taken align with eligibility requirements at public four-year institutions in the state. C2C is also designed to fulfill the public reports and dashboards function.

Providing More Than One Function

An SLDS can be designed to fulfill more than one of these functions. A recent Education Commission of the States survey of 27 SLDS leaders found that most states design their SLDSs to blend public reporting and research functions—and some are starting to prioritize supporting individuals as well. All 27 states identified research and analytics as a very important or important function of their SLDS, 26 identified public reports that support accountability and illuminate outcomes, and 10 identified providing personalized services to individuals so they can access education and public services. As state leaders continue to modernize SLDSs over time, they should consider how expansions to their SLDS's charge, funding, and staffing can better support all three functions.

No single function of an SLDS is more important than the others. **State policymakers should develop all three functions by either designing and using the SLDS to directly fulfill all three or, if the SLDS is designed to fulfill only one or two, ensuring that contributing agencies are able to use the system to fulfill the remaining functions.** In many states, the state entity overseeing the management of the SLDS will fulfill one or multiple functions directly. But in cases where this entity isn't directly providing all functions *through* the SLDS, the system should, at the very least, be designed so that other agencies can fulfill all functions *with* the SLDS because **effectively supporting all functions requires quality, linked data**.

For example, K–12, postsecondary, and workforce data systems alone can be used to fulfill the valuable sector-specific functions of public reporting, analytics, and individual services, but they do not house the linked data required to enable dashboards, tools, research, and services that enable insights that span the P–20W continuum or determine how effective education and public services are improving outcomes years beyond service delivery. Because the SLDS connects data from multiple agencies across multiple points within individuals' education and workforce journeys, state agency leaders can use the SLDS to support sector-specific efforts by uncovering the longitudinal insights needed to support individuals at every step.

How Do States Determine an SLDS's Function?

How state policymakers design, build, and modernize their state's SLDS depends on the functions they want to prioritize. Decisions about what functions the SLDS should fulfill shape what data is housed in the system and how often it's updated, how the state's different agency heads work together, the skills needed among the staff who manage the system, and the projects those staff members prioritize. For example, systems designed to support individuals require data sharing in near real-time while systems designed for public reporting and dashboards may be able to function effectively with annual submissions. The function of a state's SLDS emerges from state goals, enacting legislation, governance, mission and vision, and audience. Policymakers' answers to four primary questions drive the function(s) of their state's SLDS:

- Who should be able to access and use the data, and what should they be able to do with it?
- How should the data be collected, managed, and stored?
- Who decides what data is collected and how it's used?
- What products and supports must the system enable to meet the data needs of its users?

DEMAND: Who should be able to access and use the data, and what should they be able to do with it?

How leaders approach collecting data, setting goals for the SLDS, and defining the SLDS's intended audience will differ depending on the function.

- Systems designed for **public reporting and dashboards** enable the SLDS managing entity to produce public information and format datasets in ways that allow external parties to create their own reports or web-based tools. These systems require multiagency linked data and report aggregate-level data to agencies, policymakers, institutions, and the public.
- Systems designed for **research and analytics** enable detailed analyses of learner and worker outcomes. These systems require linked data that can be de-identified and shared for specific purposes via a secure mechanism (such as a secure data enclave) with researchers who have a data sharing agreement in place. These systems may also require researchers to complete an Institutional Review Board application and share presentations and results with the state.
- Systems designed to provide **support for individuals** enable access to public services and help individuals understand their opportunities. These systems require interoperable, linked data that is updated more frequently and can be shared with service providers and individuals to help them make decisions.

INFRASTRUCTURE: How should the data be collected, managed, and stored?

The types of data that SLDSs house; how frequently that data is updated; and the quality standards, definitions, and security requirements will differ depending on the function.

- Systems designed for **public reporting and dashboards** receive at least annually—in alignment with timing for reporting requirements—data that can be matched across state agencies and used for accountability reporting. Data definitions are typically aligned with accountability reporting requirements or widely accepted standards so the data can be compared to similar reports at the federal, state, and institutional levels. Beyond securely storing this data, the office that houses the SLDS uses the data from these systems to operate public websites that include visualization tools and downloadable aggregate data files.
- Systems designed for **research and analytics** receive at least annually data that can be matched across state agencies and used to answer questions associated with the state's research agenda. Participating agencies may share additional data to fulfill approved data requests. These systems enable researchers to access data in a secure environment where they also may be able to upload additional datasets and merge those datasets with system data depending on data sharing agreements and infrastructure.
- Systems designed to provide **support for individuals** receive data from school districts and other local agencies in near real-time and from statewide source systems (e.g., K–12, postsecondary, or workforce systems) more than once a year to verify the identity of individuals and match across sources. Because data definitions—such as whether an individual is considered to be in foster care—align with service delivery processes, individuals' records must match across state data sources at a high rate for these programs to be effective.

All SLDSs, regardless of function, must include mechanisms to evaluate data for completeness, accuracy, and consistency over time. The SLDS's managing entity should implement security requirements that protect the system from unauthorized access and limit who can view sensitive data. Agencies managing SLDSs that enable researcher access should also ensure that data is destroyed after external research studies are completed.

DATA GOVERNANCE: Who decides what data is collected and how it's used?

Depending on the function, an SLDS's governance structure, data sharing agreements, and staffing responsibilities will differ.

- Systems designed for **public reporting and dashboards** are often authorized by legislation that enables SLDS center staff to support descriptive analyses, fulfill reporting requirements, and create descriptive statistics and data visualizations and tools for public use. Data sharing agreements among data providers rarely change due to the nature of the data needed for reporting.
- Systems designed for **research and analytics** are often authorized by legislation that enables staff to support complex analyses, focus research on priority populations, support researchers in navigating the research request process, and fulfill approved research requests. Data sharing agreements for these systems are often standardized and customizable to streamline external research requests.
- Systems designed to provide **support for individuals** are often authorized by legislation that enables staff to provide individual-level data to support service delivery, document service delivery tool usage, and create data visualizations. Data sharing agreements provide consent for the managing entity to link information and share it with specific people at specific entities, such as counselors at a high school, in support of service delivery.

Effective SLDSs that support any of the three functions are often authorized by legislation that outlines data sharing processes, funding sources, staffing allocation, and governance structure. Regardless of function, all SLDS managing entities should outline their use cases and privacy policies and employ the staff needed to receive, match, store, and display information securely. SLDSs supporting any of the three functions should be governed by bodies that include leadership-level representatives from data contributors and provide opportunities for input from the public and data users.

SUPPORTING USE: What products and supports must the system enable to meet the data needs of its users?

Data access points and user needs often depend on the SLDS's function.

- Systems designed for **public reporting and dashboards** are used to produce dashboards, query tools, reports, and downloadable aggregate data files to support users. These products are easy to understand, include technical notes, and are typically written in plain language. The managing entity monitors use of dashboards and reports and ensures that they are generated and updated in a timely manner.
- Systems designed for **research and analytics** are used to produce research reports, as well as provide status updates and information on research requests and the data request process. To aid researchers, the agencies managing these systems also publish data dictionaries and research methodologies that support consistency across analyses. The managing entity monitors the timeliness of fulfilling data requests, the degree to which data is being accessed, and who is accessing the data.
- Systems designed to provide **support for individuals** are used to produce dashboards, safely share information with authorized parties to support service delivery such as tutoring and program enrollment, and support training for people who will use service delivery tools. The managing entity formats information in alignment with service delivery processes so information can be exchanged between source systems without requiring individuals to enter data. Systems designed to provide support for individuals can be used to understand the impact of service delivery tools and identify ways to improve the source information.

All states, regardless of their SLDS's function, should be transparent about state data use, access, and security.

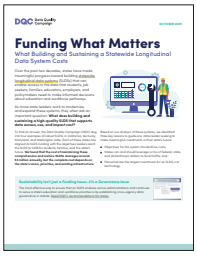
Design Drives Sustainability

Education and workforce data systems aren't locked into their initial functionality; they can and should continue to modernize and serve new communities and purposes. When policymakers design their state's SLDS to fulfill clear functions, they can build data systems that align with state education and workforce goals; are created through shared, intentional decisionmaking among state actors; are funded sustainably; foster trust through public engagement; and are flexible to keep up with changing technology.

ACKNOWLEDGMENT

This brief draws from *Defining Modern, User-Centered State Longitudinal Data System Design*, a framework collaboratively developed by Actionable Intelligence for Social Policy, the Data Quality Campaign, Education Commission of the States, and WestEd's Data Integration Support Center.

Additional Resources



Funding What Matters: What Building and Sustaining a Statewide Longitudinal Data System Costs: This resource explores what it costs for states to build and sustain a high-quality SLDS. The answer: it depends, but maintaining a comprehensive and mature SLDS averages around $3 million annually. The full brief includes three key lessons to guide state leaders seeking to invest in their state's future.

What Now? A Vision to Transform State Data Systems to Inform People's Pathways through Education and the Workforce: This suite of resources describes the types of data access that people need to successfully navigate decisions through education and the workforce, details six use cases in which SLDSs are necessary to support decisionmaking, and describes clear actions that state and federal leaders can take to make this vision a reality.