## Unlocking SLDS Data
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The Data Quality Campaign website reports that robust statewide longitudinal data systems (SLDS) are vital to creating a culture of continuous improvement in schools and that states have done a tremendous amount of work over the last 10 years to build critical data systems. Many of these efforts yielded systems that are integrated into the technical infrastructure among the various sectors (pre-K, K12, college, university), have single student identifiers, and some have successfully joined data from other sources, such as Department of Labor records. However, much of this data is not useful, usable, nor actionable. The next step is to unlock this data to make it available to tell the full story of a student's academic progress and understand the impact of a state's educational system on student subpopulations of interest. To accomplish our goals, we need to move the focus from the data to the users.

How to Unlock SLDS Data? In our experience, SLDSs have been developed in ways that perpetuate the siloes of K-12 and higher education data. However, research agendas are driven by education stakeholders' needs and questions that often require studies to track students from one sector to another and into the workforce. SLDS leaders need to make sure state data systems can effectively and efficiently respond to within and across sector questions. Most SLDS systems seem to have an infrastructure in place to store and link Pre-K, K12, postsecondary, and workforce data. However, we have learned that given the way some SLDSs have been designed, they do not efficiently and effectively facilitate cross-sector reporting and, therefore, cannot easily address many of the most crucial research questions: those addressing student transitions. There are rarely transition metrics and few systems can help explicate how cohorts of students progress from the beginning of their educational journey to their exit from education and entry into the labor market.

A Two-Pronged Problem. SLDS's capacity to address a complete research agenda is limited by two missing technical aspects. First, although states may have a linkable student identifier across all educational data sectors, sector-based data sets are not structurally connected due to the complexity of drawing data from multiple sources. Thus, any transition metrics created are one-off solutions, requiring expertise in all data domains and specialized database programming resources. This is inefficient and not sustainable. Second, the data silos are set up to efficiently capture and manage data, but there are no business logic and rules available to be applied to mine the information in these silos. It is impossible to make use of an SLDS with siloed data to respond to a wide set of varied questions, including important questions about how students transition across sectors.

SLDS Starting Point: Cross-sector siloed data reporting limits research, sustainability
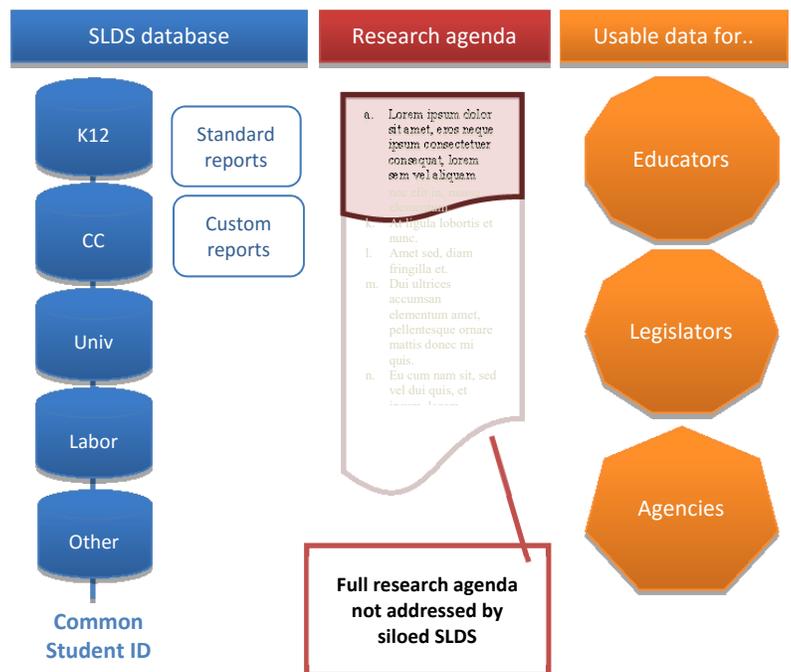
The Solution. With guidance from SLDS users, IEBC designed, developed, and implemented an analytical layer solution by creating cross-sector data tables to support reporting and metric development using business rules. The process was client-driven—rules were defined in regular meetings with the SLDS operators. The resulting fact tables bring together often disparate and dispersed data elements and weave them into an efficient storage unit so the SLDS can now tell a story. We bring data together along with business rules to create an end-to-end summary of each student's education experience across the sectors. The contents of these fact tables are designed to directly address the research agenda.

To implement a workable solution that can be rolled out over time, we prioritize the research questions and related supporting development is tackled in phases. IEBC employs two technologies to enable this phased approach. First, the fact table design is inherently expandable. As work in secondary phases ensues, new elements can be developed to fill in details in the fact tables for each student's end-to-end education story. Second, we assist our clients to utilize a system common in software development to organize and document the work. This system, a cloud-based software application, is loaded with the definition of each data element at the start of each phase. Some definitions are accompanied by programming rules to complete entry into the fact table. For example, the conditions whereby a student can graduate high school may be determined by more factors than course completion; and in cases like this, the rules could be defined and refined through an iterative development process until the accurate application of the rule to the data is finalized. IEBC provides the expertise to support this development process that is state-adaptable and customizable to stakeholder needs.
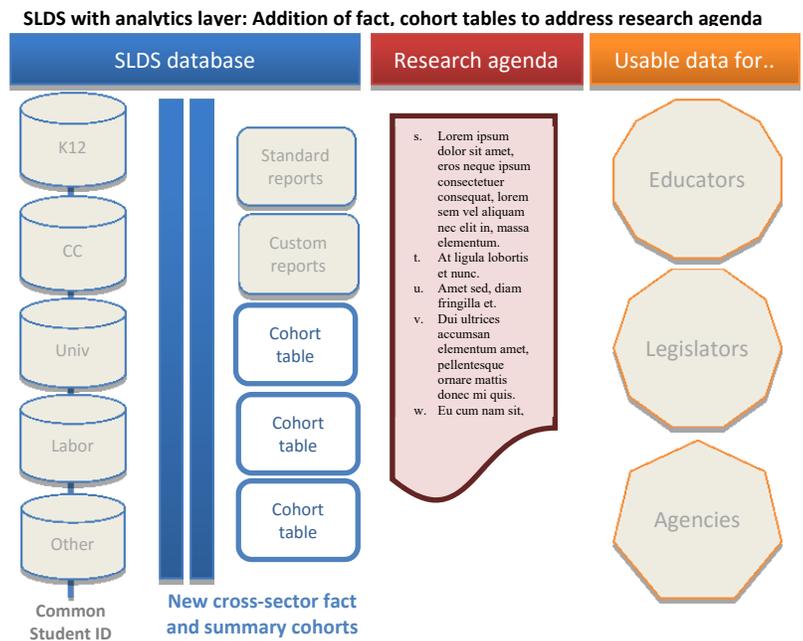
Who We Are. The Institute for Evidence Based Change (IEBC) was developed to help schools, colleges and universities use information to improve student outcomes. It emerged out of the California Partnership to Achieve Student Success (Cal-PASS) that the principals founded in 1998. As one of the first voluntary, longitudinal, state data systems in the country, our goal was not only about having a robust data set, but rather focused on the use of the linked data to understand student progress, barriers, and achievement within and across the sectors. Because of the success of Cal-PASS, other states employed the experts at IEBC to help them start similar systems in Hawai'i and the Gulf Coast region of Texas. IEBC was also commissioned to assist with other data-centered efforts such as a project for the Woodrow Wilson Foundation's Early College High School program and by the Irvine Foundation to create the first data system for California's Linked Learning program. In addition, we were able to conduct special studies with partners such as UC Berkeley, funded by the Stuart Foundation, to link educational data to social welfare data and report the first large-scale research of foster youth's academic progress and outcomes. All of these efforts involved tracking students across educational sectors. We have learned that there is strong evidence that linking data within and across sectors can help stakeholders understand and develop high impact changes in policy and practice.

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