PROJECT UNICORN

State of the Sector Report

2021 Report

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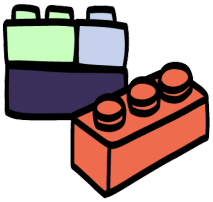
Survey Findings

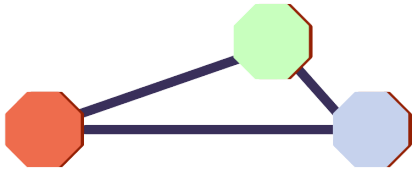
Data interoperability, defined as the seamless, secure, and controlled exchange of data between applications, isn't something educators think about on a day-to-day basis. The technical underpinnings that make interoperability work are invisible to the user. Like electricity, plumbing, or the highways we drive, it's not particularly "sexy." Even though most educators can recite chapter and verse the challenges caused by the lack of data interoperability, including the endless nights creating spreadsheets or the entry of grades into three different systems, they may not recognize interoperability as the solution. It's akin to broadband internet access: you don't know what you've been missing until you have it, but once you've had it, it's hard to live without.

Data interoperability is the seamless, secure, and controlled exchange of data between applications.

Data interoperability plays a prominent but often silent role in our everyday lives. It's behind the ability to use our Bluetooth earbuds to connect to our computers, phones, or tablets, regardless of the manufacturer. That's only possible because Bluetooth is a widely accepted

and adopted interoperable standard. It's also behind the ability to withdraw money from any ATM, even when we don't have an account at that bank. That's only possible because of industry agreement and a financial interoperability standard.





One analogy to the lack of interoperable standards in education is to consider LEGO bricks, Lincoln Logs, and Tinker Toys. All three toys work well within their own ecosystems: LEGO bricks work with LEGO bricks, Tinker Toys work with Tinker Toys, and Lincoln Logs work with other Lincoln Logs. However, you'll run into trouble if you try to mix a LEGO with Lincoln Logs or Tinker Toys to build a house. You might be able to create some custom-built connectors with the help of a 3D printer that would allow you to use them together. Still, it would be complicated, expensive, inconvenient, prone to error/failure, and not easily scalable.

It's much the same when you consider different types of district-level data storage systems, like student information systems (SIS) or learning management systems (LMS). While data may look the same in the user interface of an application, how it is stored can vary tremendously among systems. Those custom-built connectors that you might have created are undocumented, proprietary, and potentially risky to deploy. This makes it difficult to securely combine data from different sources and present or analyze it in a meaningful, easily understandable way.

Interoperable, standards-aligned data systems store commonly defined data and/or make it easily available to users in an agreed-upon format. Data stored using commonly defined standards mean the same thing even when it is housed in different systems. This allows school systems to combine data from separate systems easily (e.g., SIS data, LMS data, attendance data, assessment data, discipline/behavior data, etc.) to view and analyze it in one place.

For example, interoperability can make it easier for educators to view information from multiple source systems—such as student grades, standardized test scores, attendance, discipline/behavior history, and IEP information—in a single dashboard. Interoperability creates efficiencies and reduces complexities and costs while allowing users to toggle from an individual student record to a whole class. This way, they can view individual data points as part of a larger context and identify trends or patterns that help them better support students. The alternative to a single visualization might be logging into five different

systems, downloading data into spreadsheets, and manually manipulating the data to view it in one place. Interoperability empowers educators to look at the whole student picture, not just a tiny piece of it.

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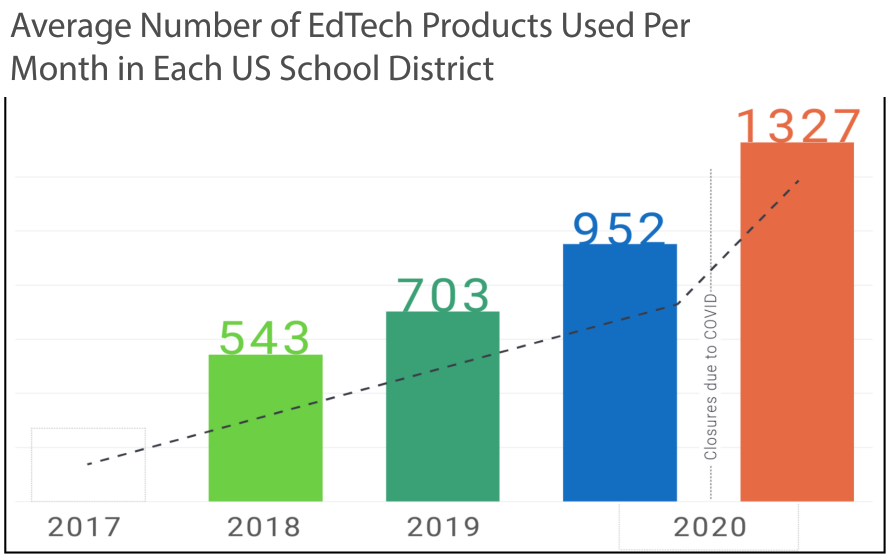
The School System Data Survey

Project Unicorn's School System Data Survey (SSDS) was developed in the spring of 2021 during the COVID-19 pandemic—a crisis which laid bare the need for interoperable data systems. The use of edtech tools to support distance and hybrid learning skyrocketed.

According to a LearnPlatform analysis of the average number of edtech products used per month in U.S. school districts with over 1,000 students, the average district used 1,327 technology tools last spring, including more than 70 different math and English Language Arts (ELA) edtech tools; more than one LMS; and more than one Single Sign-on Provider.



Attribution: LearnPlatform. Sample is of US districts with more than 1000 students. Significant expansion of Edtech use post COVID. Of the 1327, school districts averaged engagement with more than 70 different math and ELA Edtech tools; More than 1 LMS; More than 1 Single Sign-on Provider

How could school systems easily identify what edtech tools were in use and rapidly deploy access to new tools and devices? How could schools track attendance in an online or hybrid environment? How could schools analyze student performance utilizing different forms of assessment? How could they quickly identify students who were falling behind and needed extra support?

Never before had school systems been so flush with data that they could not use. The information they needed to analyze was stored using dozens of different naming conventions in dozens of different systems. Yet, relatively few school systems have skilled education data analysts on staff, and even fewer have skilled data engineers capable of doing custom data integration work, especially in smaller and under-resourced school systems. Interoperable data systems would not have instantly solved these problems, but they would have made finding and developing solutions easier. States and school systems that had interoperable data systems in place before the pandemic found it much easier to pivot and identify solutions to the problems they encountered, hidden in the terabytes of data stored in various information systems. Unfortunately, these organizations are still in the minority, but progress is being made.

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Project Unicorn, an initiative of the non-profit organization InnovateEDU, is a coalition of 16 education organizations working to address the challenge of data interoperability in K-12 education. Steering Committee members include Access For Learning (A4L), Common Education Data Standards (CEDS), Council for Chief State School Officers (CCSSO), Council for Great City Schools (CGCS), Center for Democracy and Technology (CDT), Common Sense Media, Consortium for School Networking (CoSN), Data Quality Campaign (DQC), Digital Promise, Ed-Fi, Future of Privacy Forum (FPF), The Bill & Melinda Gates Foundation, Getting Smart, International Society for Technology in Education (ISTE), The Michael & Susan Dell Foundation, and Software and Information Industry Association (SIIA). Recognizing that this challenge was too complex for any one organization to address individually, the coalition members began working together in 2017 to support and promote the use of data interoperability through a wide range of activities. Working side by side, they jointly developed the first-ever School System Data Survey (SSDS), upon which this report is based.

insight into the state of the education sector concerning data interoperability and privacy. It is our hope that by administering the survey annually, we will be able to track data interoperability trends and growth across the field and regularly report on the state of the sector. Survey data will also be used to identify areas in which LEAs need technical assistance and inform the development of targeted supports to move the field forward. Organizations on the Steering Committee will use this data to coordinate efforts, provide appropriate support, and focus efforts on the highest need or potential areas.

The Project Unicorn School Network Pledge is a school system commitment to advocate for, adopt, and integrate interoperable data standards in their data infrastructure.

In this initial report, 9 key findings emerged:

- *School systems that have signed the Project Unicorn Pledge scored higher than non-pledge signatories in all domains (and in some areas, significantly higher). Districts that signed the pledge reported more advanced data practices and/or capabilities than non-pledge signatories.*
- *Many district leaders are not familiar with interoperability standards and/or how they might be used in their school system.*
- *Larger and more urban districts tended to score higher on the survey than smaller and more rural ones.*
- *Among the six survey domains, governance was indicated as the domain with the least support and resources. This domain is the largest challenge area for school systems and needs the most technical support.*
- *School systems that have established procurement practices around technology tools are more mature in their interoperability standards and protecting student data privacy.*
- *School systems are slightly more aware of privacy needs than interoperability needs, but an understanding of their importance generally comes hand in hand.*
- *Districts indicated a desire to engage in data-driven decision-making but indicated a lack of capacity for implementation.*
- *Funding is a substantial challenge for implementing data system modernization, including interoperability and privacy.*
- *School systems cite privacy and interoperability planning as one of their most substantial technical assistance needs. Other needs include developing procurement plans and processes.*

This report will explore the School System Data Survey results and what it means for the field. We'll also suggest the next steps for a path forward and our hope for a future in which every school system can bring together and analyze the vast quantities of educational data that remains presently trapped in siloed systems while protecting student privacy and ensuring data security to improve educational outcomes for all students.

About the Survey

The School System Data Survey evaluated each respondent's maturity in six domains of skills and actions needed to achieve interoperable data systems: Leadership and Vision, Governance, Technology and Infrastructure Landscape, Procurement, Implementation Fidelity, and Impact on Educational Environment. Each domain was assigned a total number of points based on the number and type of questions asked. The domain-level percentages listed throughout the report are based on the total number of points possible in each domain. Data in this report is based on the responses of 97 Local Education Agencies (LEAs) and 11 Regional Education Service Agencies. Additional details of the survey methodology can be found in Appendix A.

The domains are defined as follows:

1. **Leadership and Vision:** This domain addresses the importance of culture and expectation-setting around interoperability and privacy. All levels of the district and state leadership should drive and support the work through actions, beliefs, values, equity, allocation of resources, and goals.
2. **Governance:** This domain includes both IT and data governance. It includes creating policies, processes, and standards to manage, utilize, value, and protect data organization-wide. This domain focuses on people, policy, processes, and equity and ensures transparency in the school system's technology and data.
3. **Technology and Infrastructure Landscape:** This domain includes network infrastructure, architecture, data management, implementation capabilities, security, and privacy. It addresses the current state of a school system's technology infrastructure, distinct from people and processes.
4. **Procurement:** This domain centers how the acquisition and implementation of products, software and services can enable or hinder good data interoperability and privacy practices. Procurement processes help ensure purchased products meet the school system needs, and are highly effective at driving interoperability and privacy best practices more broadly in the sector.

5. **Implementation Fidelity:** This domain addresses project execution, problem identification and solutions, and the reliability of completed work. It helps school systems assess whether they have the skills, resources, and competencies necessary to move forward with data interoperability and privacy work.
6. **Impact on Educational Environment:** The domain ensures a strong connection between interoperability and privacy work and the impact on the overall educational environment. It addresses how this work fits into larger school system goals, whether data systems are used to support educational and operational goals and how success is evaluated.

The way we have ordered this report creates a point of view—one we want to disclose fully. Project Unicorn has worked with over 100 districts over hundreds of hours, providing support and direction. We have found that generally, the ability to develop a plan, adopt an interoperability and privacy strategy, and have success is dependent on sequencing change. Many of our resources point to step-by-step guides which contemplate change as a multi-step, team-driven process that takes years. Over the last three years, districts that support their leadership and articulate a clear vision, even with turnover, have lasting and sustainable results.

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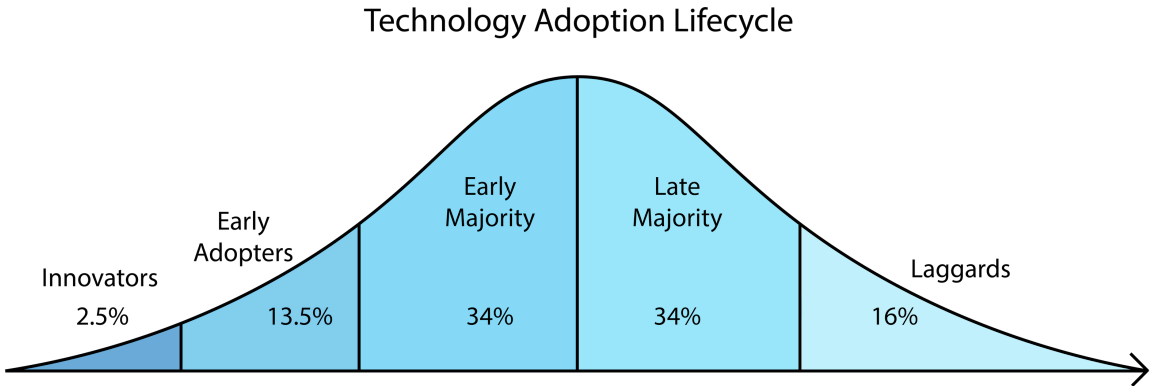
We present the domains in the report in this order. However, they were not ordered this way on the survey because we know that maturity in the Leadership and Vision domain is a prerequisite for success in all technology initiatives. Each of these domains plays a key role in the success of a school system's interoperability journey. Still, Leadership and Vision are the lynchpins for success, along with a long-term commitment to interoperability efforts. The Project Unicorn School Network Pledge was developed as a signal of this commitment.

To put the survey results in context, it is helpful to understand the technology adoption lifecycle, a sociological model originally developed by Everett Rogers that describes the adoption or acceptance of a new product or innovation over time. According to the model, the first group of people to use new technology are "innovators," followed by a larger group of "early adopters." Next, come the "early majority" and "late majority," followed by the "laggards," who are resistant to new technology adoption.



Based on the survey results, the K-12 sector as a whole is on the far left side of the interoperability adoption curve - in most cases, they have not yet even started. Project Unicorn pledge signatories scored higher on the survey than non-signatories, indicating they are among the “early adopters” who benefit from the support resources available through the Project Unicorn community. However, there is much work to be done. There are school systems leveraging interoperability in powerful ways, but they are still in the minority. Many school system leaders are not yet familiar with interoperability standards, indicating that awareness-raising efforts are needed. In addition, the goal of leveraging data interoperability is in itself a multi-year journey. Once a school system decides to move forward with interoperability, it may take several years to develop the prerequisite maturity levels in individual domains required for a successful implementation, including changing policies, procurement mechanisms, or even translating impacts to the classroom.

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Survey results indicate that school systems that have started their interoperability journey—even relatively early in the process—are comparatively more mature in their IT management capabilities than districts that have not. Therefore, a variety of technical assistance strategies are needed to move the field forward as a whole. These strategies range from continued awareness-building (for both technical and non-technical school system leaders) to technical assistance addressing challenge areas identified by the survey (such as governance, planning, and procurement) to customized data architecture, engineering, and procurement guidance. In addition, it is important to recognize that large, urban districts have different needs than small, rural ones. The goal of Project Unicorn is to help school systems move further along the interoperability adoption curve, whatever their starting point, with the goal of “moving the needle” more broadly.

The level and types of support needed can be categorized in the following matrix of support and need. The vertical axis addresses the phases of interoperability adoption (Exploring, Planning, Initial Adoption, Replicating, and Leading) and the level of effort required for school systems to engage with those supports. As a district becomes more sophisticated in its implementation of interoperability and privacy best practices, the type of assistance they require becomes more specialized and requires a higher degree of support. It is important to note that more advanced districts can play an important mentorship role for those exploring, planning, and pursuing an initial adoption. At each phase of the interoperability adoption continuum and within each survey domain, school systems need to target technical assistance that addresses the following:

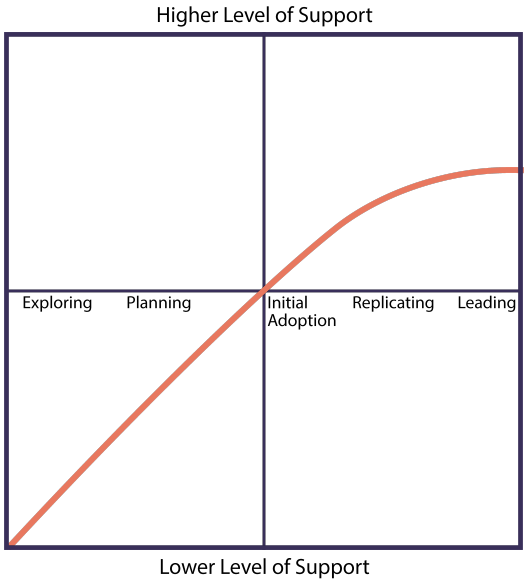
1. Specific action steps required to move forward;
2. Variations in individual district capacity;
3. The needs of different district stakeholders (e.g., superintendents, chief academic officers, chief technology officers, district data professionals, teachers, students, and parents).

Support For Small Districts

For smaller districts with limited IT and data management staff, implementing data interoperability can be a challenge. In New York, many smaller districts can do so with the support of Regional Information Centers (RICs). There are 12 RICs in New York state, organized under the Board of Cooperative Educational Services (BOCES), which support more than 95% of public school districts.

Recognizing the need for data management services, the 12 RICs collaborated to create RIC One, a single API based on the SIF Unity xPress Roster that provides fast, simple, and secure integration between a district's student information system multiple applications, including assessment, instructional and administrative applications. RIC One is a web service and data hub built on the CEDS data model, supporting interoperability for products that have adopted SIF, Ed-Fi, and other data frameworks. Some RICS offer additional custom data hosting and management services. In addition to the RIC One API, the RICs also provide Data Privacy and Security services (DPSS), providing districts with tools, resources, and training to help districts address their privacy and security challenges.

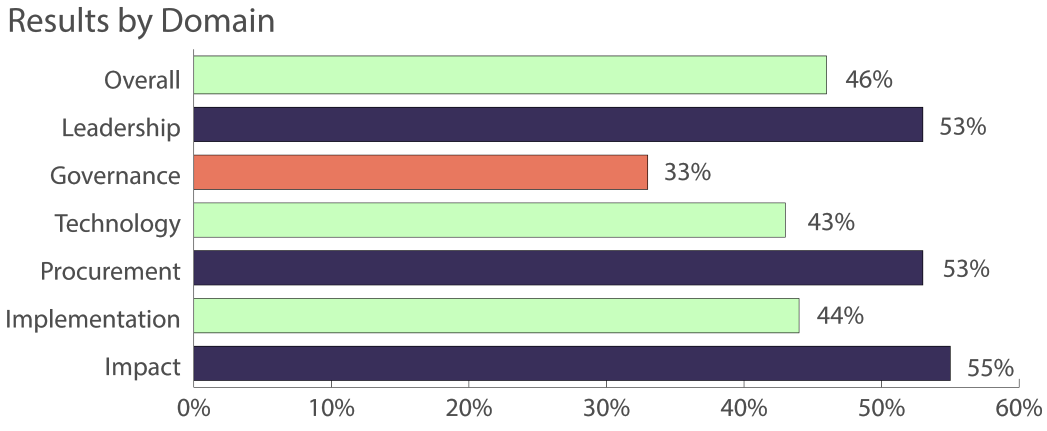
By regionalizing services, the RICs make a wider range of data integration services available to school districts, no matter the size. These cooperative relationships increase individual district buying power and promote consistent technical standards statewide. Data cooperatives are a growing trend for meeting capacity issues when pursuing data interoperability and a modernization agenda, including the California CORE and Florida CODE.



Survey Findings

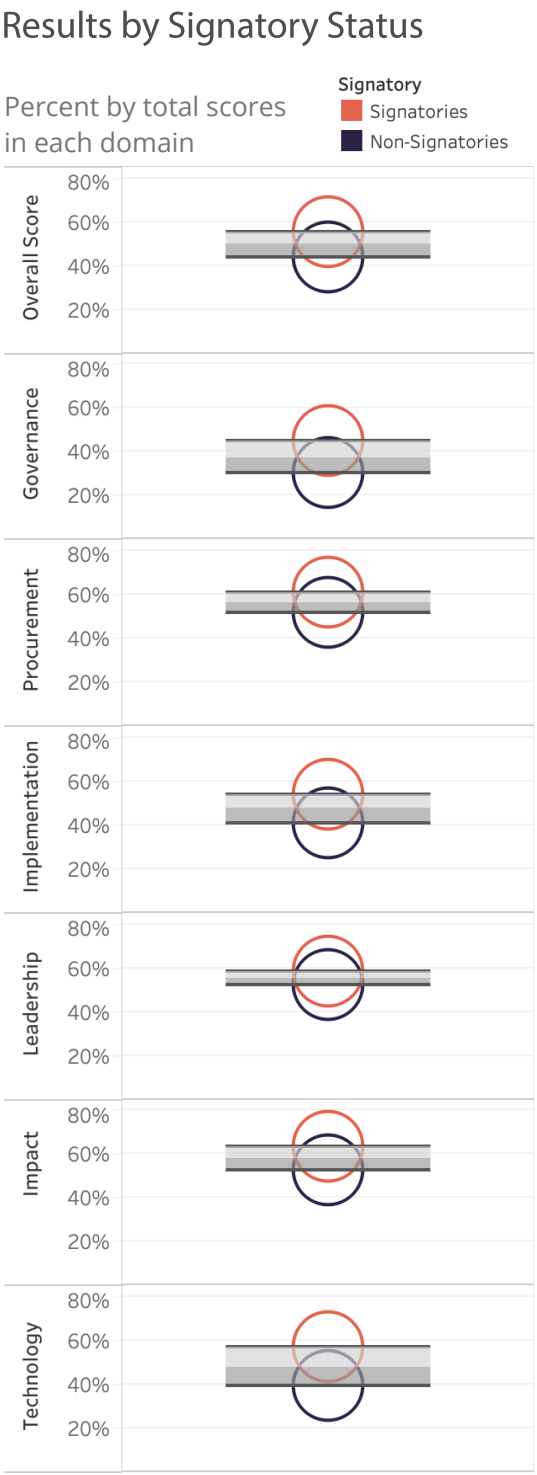
Key insights from our analysis of SSDS include:

- Out of the six domains measured, Governance was the greatest challenge area for survey respondents. On average, respondents only received 33% of the total possible points in this domain.
- The next highest-need priorities across domains were for Technology and Infrastructure Landscape (43% of possible points) and Implementation Fidelity (44% of possible points).
- The domains indicating greater LEA capacity were Impact on Educational Environment (55% of possible points), Procurement (53% of possible points), and Leadership and Vision (53% of possible points).



The Impact of Project Unicorn

Project Unicorn has a significant impact on the K-12 sector in terms of awareness building and providing technical support for data interoperability. Although only 21% of the total survey respondents had signed the Project Unicorn pledge, pledge signatory responses indicated greater capacity within every domain. Signatories scored nearly 12 percentage points higher on the survey overall, receiving an average of 55% of the total points possible versus 44% for non-signatories. This indicates significantly more proficiency and capacity across domains. This was especially true in the domains in which survey responses indicated greater challenges, including Governance (signatories received 45% of possible points, versus 30% average for non-signatories) and Technology and Infrastructure Landscape (signatories received an average of 56% of possible points, versus 39% for non-signatories).



The collaborative, partnership approach between organizations that focus on different education stakeholders working to improve interoperability in the K-12 sector is making a difference. In the same way that breaking down internal organizational silos can improve communication, uncover efficiencies, and facilitate innovation, so can cross-sector collaboration.

Domain Level Analysis: Leadership and Vision

Leadership and vision are critical to the success of any education technology initiative. Technology in and of itself does not improve educational outcomes. It is how it is used that makes a difference.

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Successful initiatives require both a project champion and cross-departmental collaboration. Just as data interoperability makes it possible to bring together siloed education data to see the "big picture," strong leadership is needed to break down organizational silos and ensure that technology projects meet all stakeholders' needs.

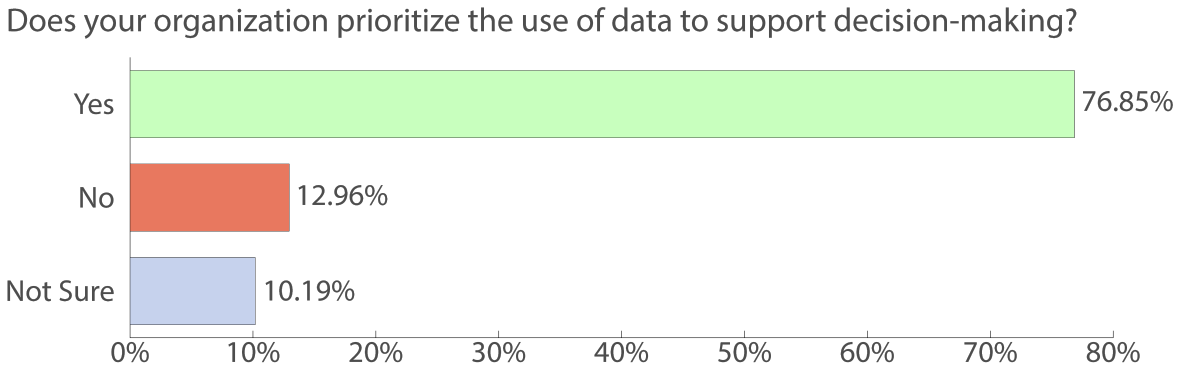
Although 77% of survey respondents indicated that their organization prioritizes data to support decision-making, only 41% said that they had defined a governing strategy or protocol to support decision-making.

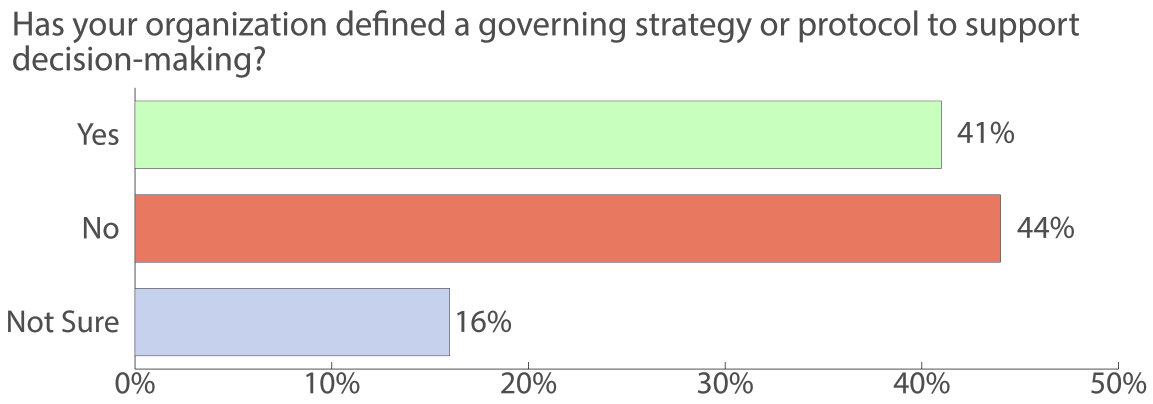
Coalition for Data Privacy and Interoperability

Building on the awareness and momentum generated from Project Unicorn, The Coalition for Data Privacy and Interoperability launched in the past 18 months to drive the adoption and implementation of data interoperability best practices within member organizations who are part of Unicorn. This group of education leadership organizations, including the Council of the Great City Schools (CGCS), the Council of Chief State School Officers (CCSSO), and the International Society of Technology in Education (ISTE), is mobilizing their members and constituents to prioritize data interoperability and privacy in edtech procurement in coordination with Project Unicorn. The coalition's three-year strategy includes these objectives:

- **Develop and implement a model procurement policy and framework** for SEAs and LEAs promoting effective procurement practices for interoperable and privacy-compliant solutions.
- **Develop and disseminate a national edtech registry**, the Learning Technology Directory, to allow companies to share product information on public repositories such as the EdSurge Product Index, including their position and compliance on interoperability and privacy industry standards and criteria publicly.
- **Develop and implement a future-readiness and modernization program** to address the readiness and modernization needs of SEAs and LEAs, with a specific focus on interoperability and privacy.
- **Establish an industry council of edtech solution providers** to ensure provider voice and input and help identify solutions that enable vendors to more effectively develop interoperable and privacy-driven solutions.

Coalition members are working closely with other Project Unicorn Steering Committee members, including CoSN and Digital Promise, to ensure alignment.





Questions asking about the ability of the school system leadership team to articulate challenges about privacy and interoperability averaged a score of around five on a scale of one to 10, demonstrating a need for increased awareness-building—not just for technical staff, but for academic and operational leaders. This was also the case with questions about the leadership team's ability to describe how improving interoperability and privacy could support one or more of their key strategic priorities, including educational equity. In both cases, privacy was ranked slightly higher, suggesting that systems better understand and prioritize privacy versus interoperability, but not dramatically so.

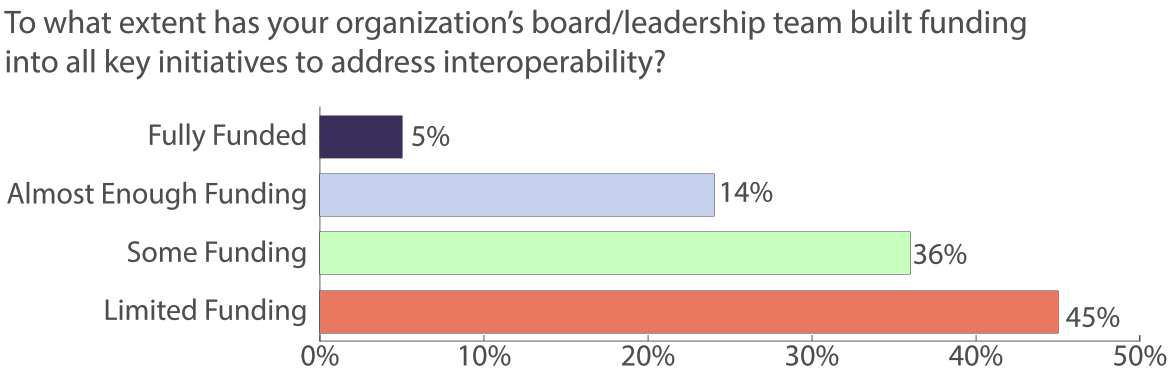
Multi-District Collaboration

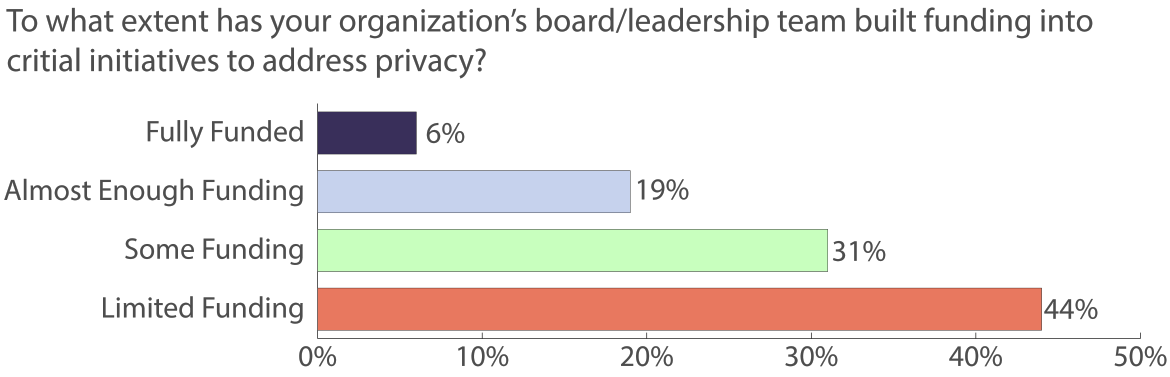
California CORE is a group of eight California school districts—Fresno, Garden Grove, Los Angeles Unified, Long Beach Unified, Oakland Unified, Sacramento City Unified, San Francisco Unified, and Santa Ana Unified—that are working to improve student achievement by fostering meaningful collaboration and learning across districts. The collaborative represents 1,800 schools, over 56,000 educators, and 1 million students and seeks to foster continuous growth and improvement in member districts. The CORE provides a powerful example of a growing trend: consortiums of districts banding together to build data infrastructure and pursue a data modernization strategy.

Recognizing the importance of data to their mission, California CORE partnered with non-profit consulting firm Education Analytics to develop a common data platform that leverages the Ed-Fi standards. The shared data architecture, part of the CORE Data Collaborative, provides members with school and district data dashboards with performance benchmarked against peer districts. Available metrics include academic achievement, academic growth, high school readiness, graduation, chronic absence, suspension rates, English Learner redesignation rates, social-emotional skills, and student/staff/family climate surveys.

Based on the initiative's success, the CORE Data Collaborative opened up access to their data and support systems so that every California LEA could join. The success of the Data Collaborative is not solely based on technology. However, the group creates opportunities for educators across urban, suburban, and rural districts to work together, in-person and online, to compare data and research across districts and get a clearer picture of strengths and challenges. The CORE Data Collaborative is supported by a research partnership with Policy Analysis for California Education (PACE) to provide real-time, research-based feedback that improves student learning, informs policy, and provides breakthrough findings of school improvement.

Although most survey respondents indicated that their organizations prioritize data to support decision-making, they indicated that funding for data initiatives was a challenge. Only 19% of respondents indicated that interoperability projects were fully or almost fully funded, and only 26% of respondents indicated that privacy projects were fully or almost funded. In the survey, districts indicated that having a plan leads to a higher rate of success. We can assume that parts of this planning include financial sustainability. A key lever for this work would be to promote financial planning and project planning to achieve sustainable implementation. CoSN's SmartIT resources and Interoperability Toolkit can help school system leaders calculate costs and plan for sustainability.





Importantly, respondents reported that only 12% of interoperability projects and 4% of privacy projects were fully or almost fully funded in rural areas. This disparity in access to resources may partly explain why larger and more urban districts tended to score higher on the survey overall than smaller and more rural ones.

Project Unicorn pledge signatories scored slightly higher on questions in this domain. Eighty-seven percent of signatories indicated that their organization prioritizes data to support decision-making, 10 points higher than non-signatories. However, only 44% said that their organization had defined a governing strategy or protocol to support decision-making. While still lower than the number prioritizing this data, this was an improvement over non-signatories.

Responses to questions asking about the ability of the school system leadership team to articulate challenges about privacy and interoperability were about a half a point higher. Interestingly, only 13% of Project Unicorn pledge signatories indicated that interoperability projects were fully or almost fully funded, while 30% reported that privacy projects were fully funded or almost fully funded. This would suggest that funding for data modernization and privacy is a challenge across the board.

Small Districts, Big Collaboration

The Florida Collaborative on Operational Data for Educators (FL CODE) is a non-profit collaborative founded to make multiple sources of attendance, discipline, grades, and assessment data available for educators in one location. It joins a growing list of state-level or regional data consortiums powering interoperability implementations, greatly reducing costs, and strengthening collaboration. The organization is hosted by the North East Florida Educational Consortium (NEFEC), a regional, non-profit educational service agency (ESA) established to provide cooperative services to small and rural member districts.

There are currently 20 district members of FL CODE, each of whom is provided with modified versions of the Ed-Fi operational data store and dashboards that have been customized to store and report Florida data. This enables education agencies to connect and maintain secure data systems more easily and cost-effectively. The work doesn't stop with technology, though; FL CODE works to address capacity issues in districts. The organization hosts an annual Summit that provides educators and technologists opportunities to collaborate and share best practices. Session topics are geared towards cross-disciplinary teams and include discussions on human capital systems, data quality, student progress, visualizations, Ed-Fi technology, and others.

Why This Matters

Although most school systems reported that they prioritize data to support decision-making, there appears to be a stark disconnect between the school system's desire and capacity to do so.

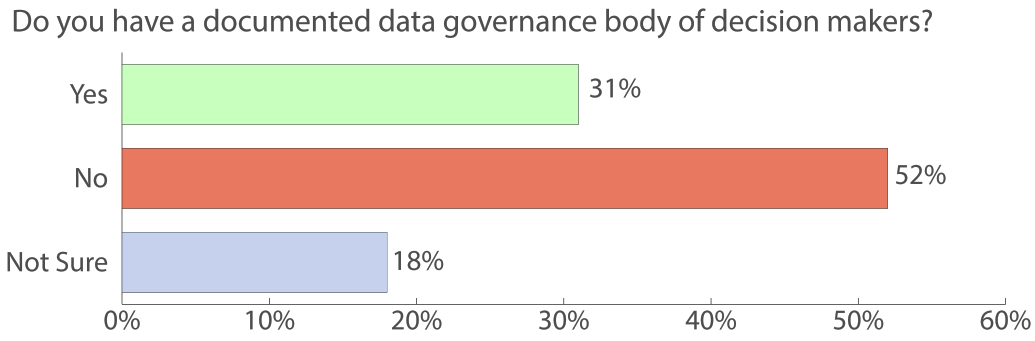
Survey results suggest a significant demand for data modernization in the field but not enough money to pay for it. A July 2021 Center on Reinventing Public Education report analyzing the Elementary and Secondary School Emergency Relief (ESSER) funding plans of 100 large and urban districts found that 40% planned to invest in technology.[1] Still, it is unclear what percentage of those funds will go towards data infrastructure improvements, including interoperability.

1 Dusseault, Bree, and Travis PIllow. “First Look at ESSER Priorities: Districts Are Placing Their Bets on What They Know.” First Look at ESSER Priorities: Districts Are Placing Their Bets on What They Know | Center on Reinventing Public Education, 15 July 2021, www.crpe.org/thelens/first-look-esser-priorities-districts-are-placing-their-bets-what-they-know.

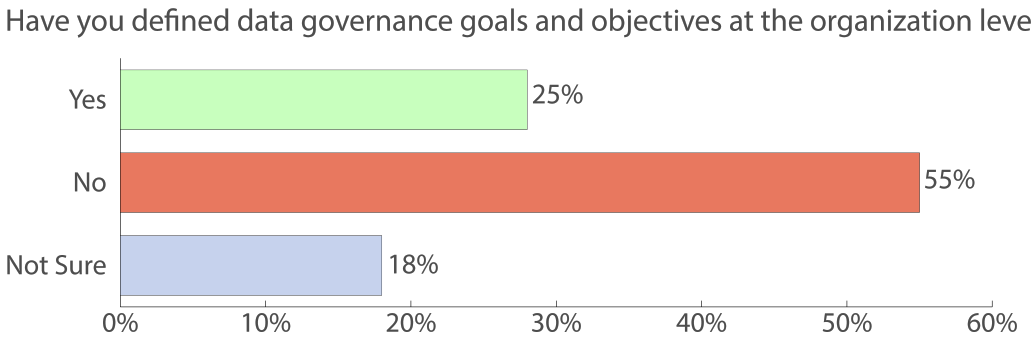
The sector needs to continue educating the field about the importance of interoperability and data privacy, as it affects their budgets and productivity for the entire learning community. It is also critical to develop the leadership and staff capacity necessary for effective data-driven decision-making.

Domain Level Analysis: Governance

Data governance was the greatest challenge area among survey respondents. Only 31% of survey respondents indicated they had a documented data governance body of decision makers, with 18% saying they were unsure.

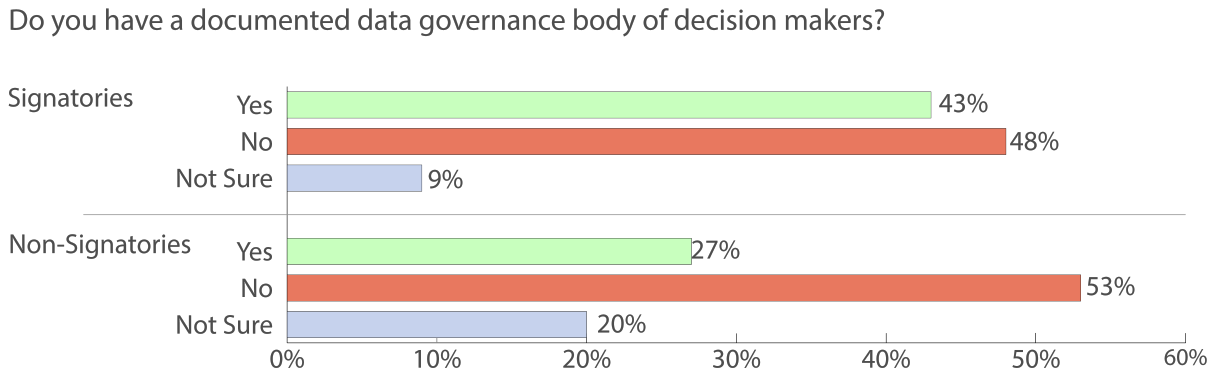


Only 28% of respondents indicated that they had defined data governance goals at the organization level, with an additional 18% being unsure.

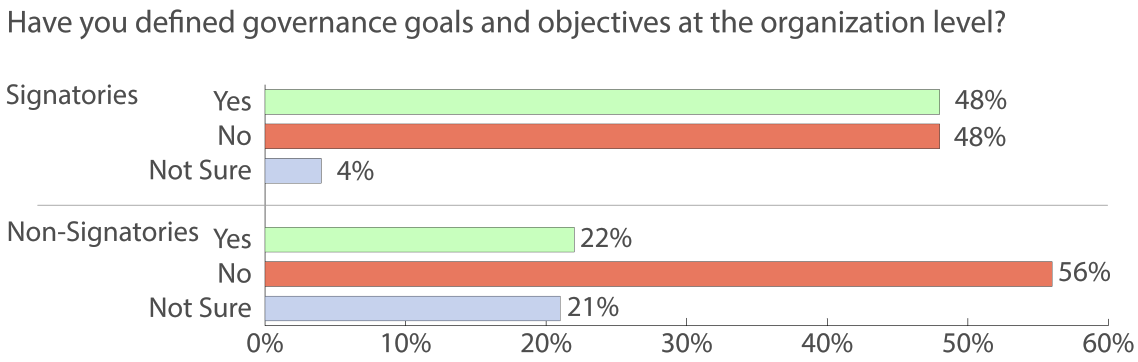


When asked if their organization had an established enterprise data governance process, respondents on average only selected 2.7 out of 11 possible examples of evidence.

Data governance scores were somewhat higher among Project Unicorn Pledge signatories. Forty-three percent had a documented data governance body of decision makers, compared to 27% of non-signatories.



48% of pledge signatories indicated that they had defined data governance goals at the organization level, compared to 22% of non-signatories. And when asked if their organization had an established enterprise data governance process, pledge signatories on average only selected 4.2 out of 11 possible examples of evidence, such as a data dictionary or data governance policy set by leadership.



Why This Matters

Understanding what data you have, how it is stored, where it is managed, and how it is used is foundational to building and leveraging interoperable data systems.

There is a saying among data professionals that sums up the importance of data governance: Garbage in, garbage out. Data governance helps ensure that an organization's data have the same meaning, measure, and quality in all systems. This results in more accurate data, lower data management costs, increased educational and business efficiencies, improved data privacy and security, and ultimately better decision-making. It includes both a human component (empowering people to make and implement decisions, policies, processes, and standards) and technical solutions, such as implementing row-level security and role-based permission structures.

Data governance policies, procedures, and tactics should be right-sized to fit a district's human and technical capacity, and school systems should leverage technical tools when possible to automate time-consuming manual processes such as identity access management.

Every Person is a Data Steward

Raytown Quality Schools in Raytown, Missouri, serves over 8,500 students in 18 schools. Over the last 15 years, Raytown Quality Schools has gone through a data governance and security transformation that exemplifies strong data governance practices.

When Melissa Tebbenkamp, Chief Information Officer for Raytown Quality Schools, first joined the district in 2006, the data center was a wall of wires with few security measures in place. Tebbenkamp is a believer in the mentality of "go slow to go fast," and Raytown Quality Schools overhauled the system by layering the process of data and IT transformation over several years.

She started by focusing on the physical security of systems. Then, she moved on to focusing on resources like staff and software and building partnerships between technology and instructional teams: an investment that proved to be invaluable. Finally, the path had been laid to take on a variety of nuanced topics, including contracts, data work, and access control. "It took two to two and a half years just to build up the fundamental infrastructure that was needed," Tebbenkamp says. "Without that, data governance is all for naught."

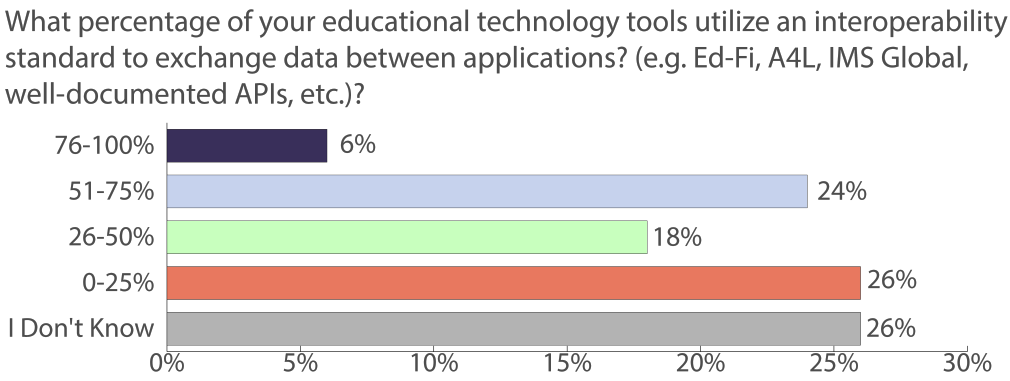
In 2016, the governor of Missouri released an audit of school data security risks and stressed the need to prioritize security. With a head start on this work, Raytown Quality Schools released the first version of its Data Governance Manual in 2017: a 40+ page document detailing the district's data governance policies which proved integral to managing the system's security. The effort devoted to building this infrastructure step-by-step was recognized formally when Raytown Quality Schools was nationally recognized for its work and was awarded the Trusted Learning Environment Seal from COSN. The journey is not yet over; Raytown is continually improving its data and privacy practices and is now focusing on implementing two-factor authentication for every application.

Underlying the success of Raytown Quality Schools' work in data governance and security is prioritizing data governance by leadership. This has been key in establishing a culture where all stakeholders understand the importance of security and build trusted relationships between leadership, IT, and instructional teams. Core elements of success rely on these relationships: for instance, all new teachers in the district spend a dedicated 90 minutes on the topic of data governance when they join. "Every person in the district is a data steward because they all touch data, even students. And everyone is responsible for the data that they touch," says Tebbenkamp. This cohesive effort has allowed Raytown Quality Schools to achieve secure data access across the district.

Domain Level Analysis: Technology and Infrastructure Landscape

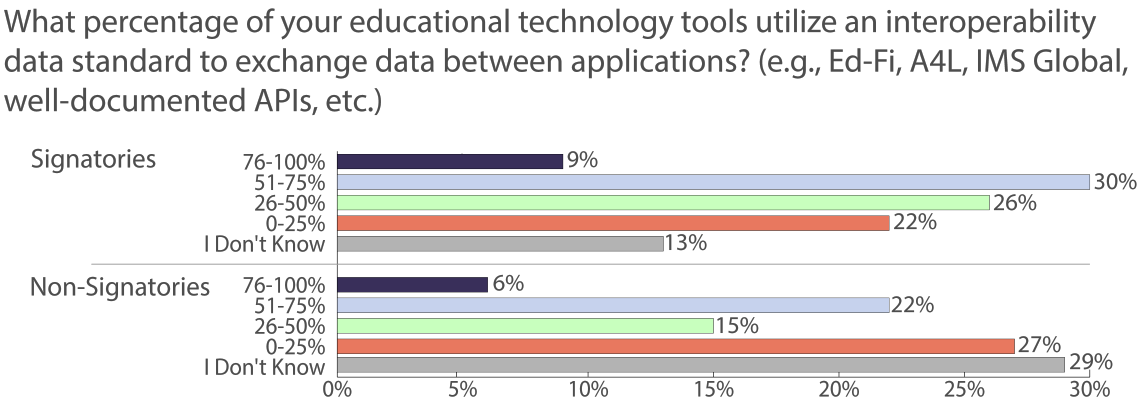
Technology and Infrastructure was another challenge area identified by the survey. Lack of familiarity with and use of data and interoperability standards, including appropriate use cases, was consistent in the Technology section.

Over 50% of respondents either used a standard less than 25% of the time or were unsure how often they used it. Only 31% of respondents indicated that they utilize standards 51% of the time or more, and only 6% indicated that they utilize standards 75% of the time or more. Efforts to provide technical assistance for the sector should focus on awareness building, clarity of interoperability within domains, and better use-case understanding for data standard choice. In addition, districts need information on multi-use case standards and models. Not all technology should or will be able to utilize a data standard.



When asked what interoperability standards were utilized, the most commonly used standard was Ed-Fi (28%), followed by IMS (19%), xAPI (16%), A4L (9%), and CEDS (5%).

On the whole, Project Unicorn signatories scored noticeably higher than the survey average in this section. More than half of non-signatories responding to the survey (56%) indicated that they used a standard less than 25% of the time or were unsure of how often they used a standard. However, this decreased to 35% among signatories. Thirty-nine percent of signatories indicated that they utilize an interoperability data standard 51% of the time or more, and 9% indicated that they utilize an interoperability data standard 76% of the time or more.



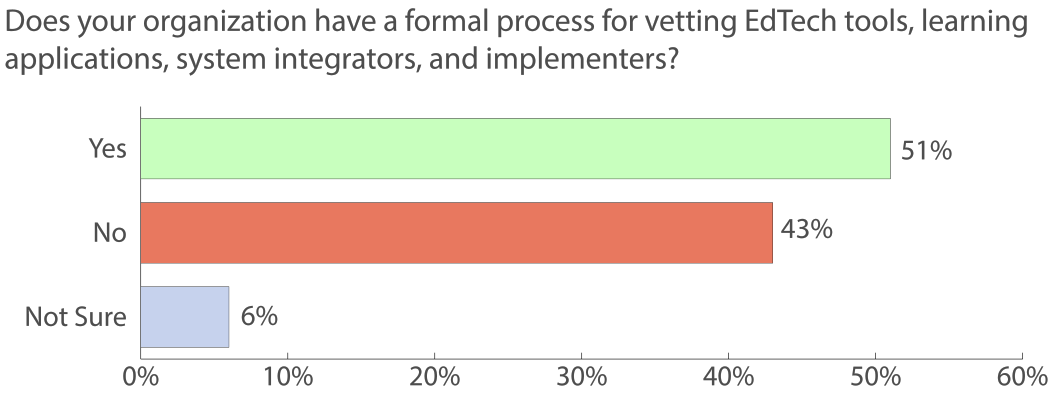
Signatories were more likely to regularly engage external organizations for security audits (43% vs. the survey average of 31%) and to conduct these audits more frequently. They also scored higher when asked to rate how well they differentiate and control data access for different users, with an average score of 7.4 on a scale of 1-10, compared to 6.3 for all survey respondents. In addition, pledge signatories also indicated that they were more likely to train users on student data privacy (65% reported vs. 39% overall).

Why This Matters

Although K-12 school systems are using data and interoperability standards, work needs to focus on awareness and building staff capacity to use them. The fact that pledge signatories scored higher on questions about data privacy and security seems to indicate that districts leveraging data standards have more mature privacy and cybersecurity postures more broadly. This is especially meaningful given the growing cybersecurity threats facing the K-12 sector and the corresponding risk to student data privacy.

Domain Level Analysis: Procurement

The procurement process can play an important role in ensuring that edtech purchases fulfill user needs, protect student data privacy, and meet data interoperability requirements. Although overall survey responses tended to be higher in this domain than others, it is still an area of growth for many school systems. Only 51% of survey respondents indicated that they had a formal process for vetting edtech tools, learning applications, system integrators, and implementers, while 6% were unsure.



Of those with a formal process, 84% always or usually factored interoperability standards into the process, and 96% always or usually factored privacy standards into the process. This indicates that school systems that have established procurement practices around technology tools are more mature in their use of interoperability standards and protecting student data privacy.

Procurement domain scores were higher among respondents who were Project Unicorn pledge signatories. A notable majority of 78% indicated they had a formal process for vetting edtech tools, learning applications, system

Procurement in Action

At the Metropolitan School District of Steuben County in Angola, Indiana, an efficient and inclusive procurement process is a key aspect of ensuring that the district's edtech tools are effective and interoperable. Chantell Manahan started as a teacher in the district and experienced firsthand the frustrations of using different applications that didn't work well together. Each year, as a teacher, she spent countless hours hand rostering about 180 students for curriculum products herself. When she took on the role of Technology Director, she was interested in how technology could transform education and save teachers' time. "Those were my pain points," Manahan says, "and teachers shared them in the district. I wanted to solve those problems and make tech easier for students."

For Manahan, establishing a formal, documented procurement process for the MSD of Steuben County was a key step in making this happen. The process relies on two main components: using a data-driven approach to purchasing decisions and building a cross-district team to focus on procurement. Creating an interoperable ecosystem can only happen when tools work together: whether in their export format or alignment to a standard. Procurement guidelines are essential in ensuring that new products prioritize data interoperability (for instance, being certified by data standards), protect student data, and work within the district's ecosystem of tools.

The district now analyzes technology usage among its applications annually to determine how often resources are being used and how well they are doing their job. "The budget is finite in K12, so the question is where do priorities lie," Manahan says. "We need to sustain the use of the products that are functioning, and also get a hard look at what products we have that we are not using. We're taking a deep dive into those analytics." In addition to using data to drive this decision-making, her team also talked to teachers throughout the district via surveys and small group meetings, asking educators one-on-one what tools they were using and collecting their candid feedback about their effectiveness.

integrators, and implementers. In comparison, only 44% of non-signatories had a formal process for vetting tools.

Why This Matters

Although the field has made enormous progress over the last three years, school systems need technical assistance around edtech procurement and interoperability. Districts must identify the exact standards they need—including the correct standards version—when purchasing edtech products. This means carefully defining technical requirements before purchasing a product. Because some vendors charge school systems for providing data in a standardized format by default, the procurement process is also when school systems should clarify expectations and negotiate contract language accordingly. Adding interoperability requirements to RFPs also incentivizes vendors to incorporate interoperable standards as part of their product design. Additionally, districts can add language to RFPs, which prohibits vendors from charging extra fees for the export of standards-aligned data, a growing practice in the industry which is driving up costs to districts.

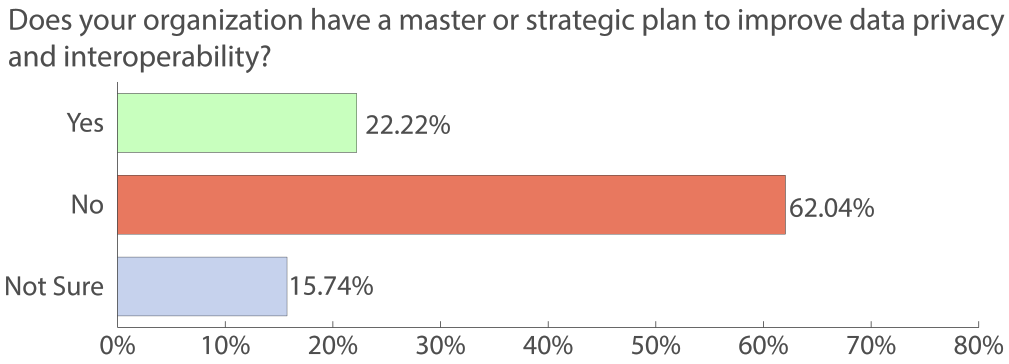
Procurement in Action, cont.

With limited resources for technology, budgeting for tech tools can be extremely complex. Manahan has been through the process of making tough decisions about procurement. Even among products that have been popular with her staff, she has to evaluate trade-offs and consider what features are most valuable based on what is already in the district's ecosystem and if the tool interoperates with others. At times, these conversations can be hard to have. But by using a data-driven approach to procurement, Manahan has ensured that her team's decisions are backed by evidence and that the district's resources are being used effectively.

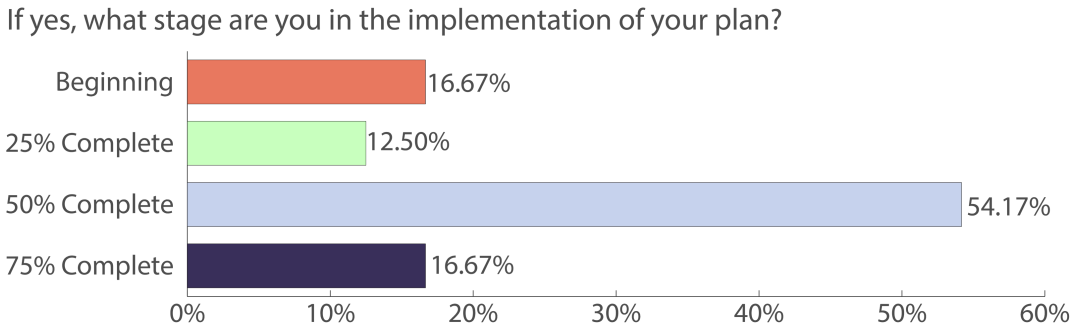
Building a process was essential, but engaging people in the change management needed for this work to take hold. To ensure the district ensures that procurement decisions are data-driven and that they are a collaborative effort, Manahan enlisted all levels of leadership within the district. As Manahan established a formal process for procurement, with set deadlines about when requests must be made and reviewed, she also engaged the department. Hence, they had an awareness of the process and ownership of it. The district's CFO, business office, superintendent, and curriculum leaders all have ownership built into the process, as do teachers. The timeline within the review process includes iterations for tech requests, allowing teachers and other staff to request an evaluation of a tech tool, get feedback from the IT team, and follow up accordingly. The time, collaboration, and commitment that the MSD of Steuben County has invested in its procurement process have ultimately created a system where tools are effective, purchasing is efficient, and the procurement process (and the people engaged in it) are champions for interoperability.

Domain Level Analysis: Implementation Fidelity

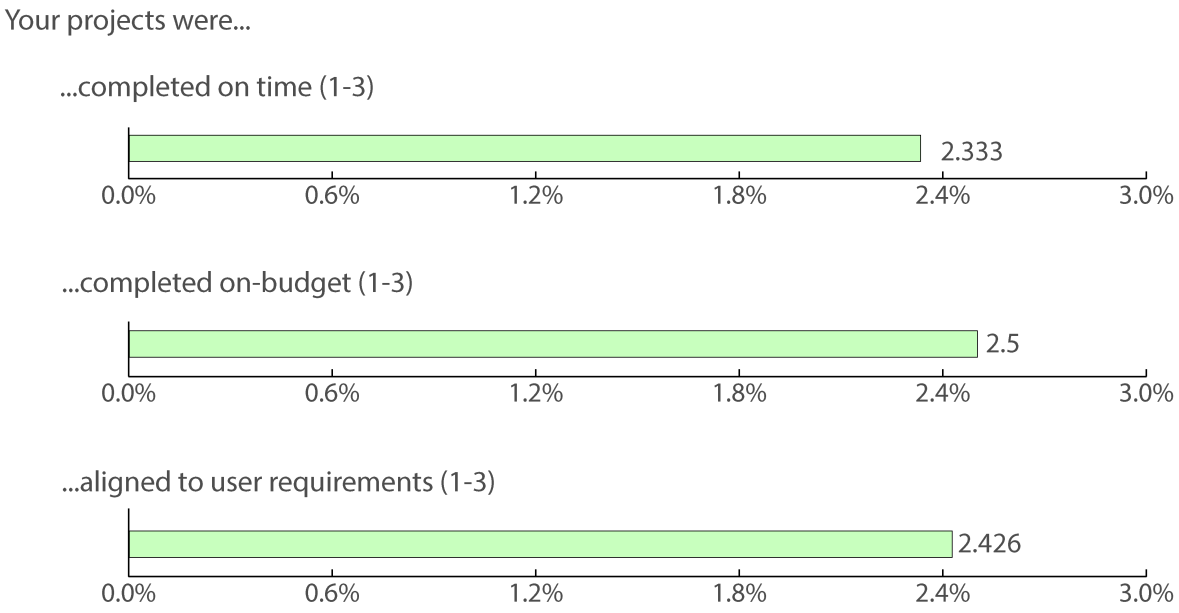
Implementation fidelity was another challenge area for school systems responding to the survey. Only 22% of respondents indicated that they have a plan for improving data privacy and interoperability, and 16% were unsure if a plan existed. The remainder (62%) did not have a plan.



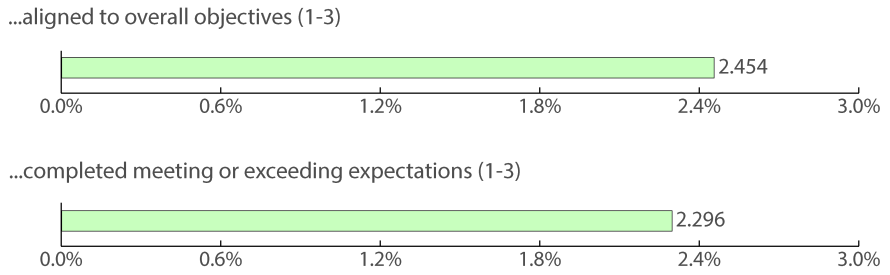
Of the 22% that did have a plan, the majority indicated that they were 50% complete with their plan.

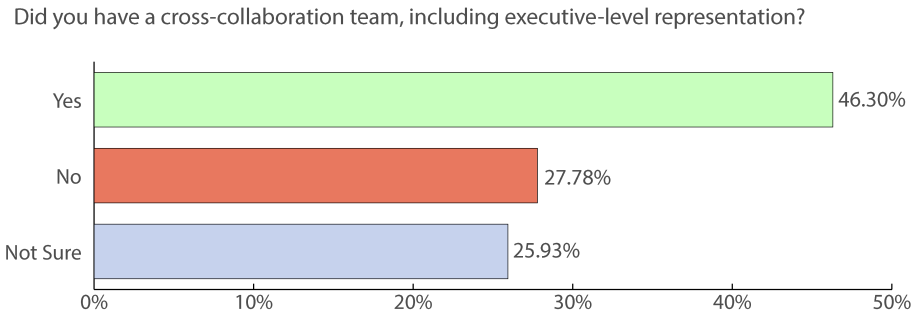


Respondents ranked their projects highly in terms of being on time, on budget, aligned to user requirements, aligned to overall objectives, and completed meeting or exceeding expectations. Additionally, 46% of respondents had a cross-collaborative team, including executive-level representation.



Implementation fidelity is another area in which Project Unicorn Pledge signatories scored considerably higher than survey respondents as a whole. Forty-three percent of signatories report having a plan for improving data privacy and interoperability, and 65% of signatories report having a cross-collaborative team including executive-level representation.





Why This Matters

The contrast between these responses suggests that while projects were well-carried out once implemented, creating project plans around interoperability and privacy in the first place is a challenge. School systems that prioritize privacy and interoperability to the point that they can develop project plans tend to carry them through. School systems need support and targeted technical assistance with privacy and interoperability initiative planning.

Multiple Teams Working Together

Highline Public Schools in Washington State serve around 18,000 students in grades K-12. The district has over 40 schools and employs more than 2,000 staff members. Highline is committed to focusing on student and staff strengths and uses a human-centered approach to design systems with data interoperability at their core. The district is currently in the process of creating a new data system using research and design principles that specifically speak to their use case and motto: “EVERY STUDENT in Highline Public Schools is known by name, strength, and need, and graduates prepared for the future they choose.”

The anchoring question for Highline's design work was: "What would a strengths-based profile for teachers and students look like?” Staff considered what data elements were needed for the profiles and how they should intersect. To view information from multiple systems, they brought data together in an operational data store. Recognizing the complexity of the transition and the need to use multiple interoperability standards. they created a three-year implementation plan.

Domain Level Analysis: Impact on Educational Environment

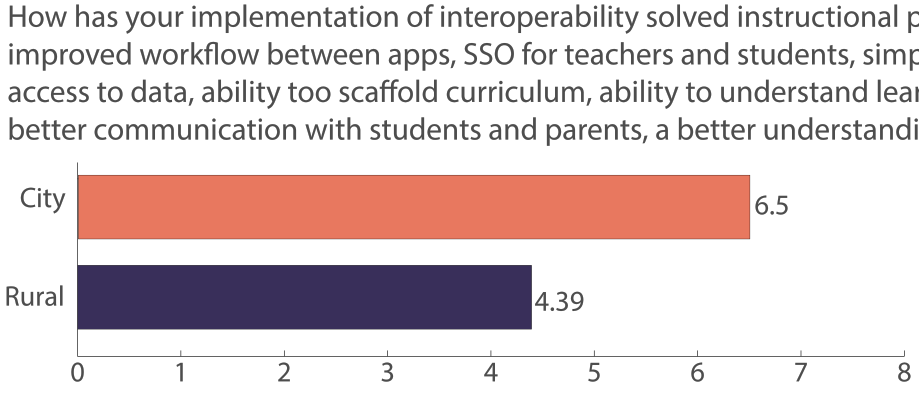
On a scale of one to 10, responses around the impact of interoperability hovered at five across the entire pool of survey respondents. However, these questions were ranked lower among rural school systems than in urban school systems. The average score of rural how their interoperability implementation solved instructional pain points was 4.4, instead of 6.5 for urban systems.

Multiple Teams Working Together, cont.

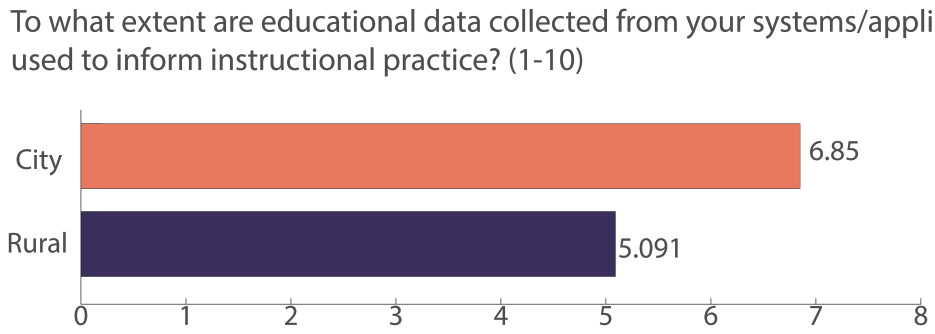
In year one, Highline assessed their existing data resources and determined what data was still needed. They defined their goals and assembled a cross-departmental team to identify needs and design the profiles, which included data and assessment, community partnerships, technical services, communications, human resources, and technology. With this solid foundation, Highline received a grant from the Bill and Melinda Gates Foundation to complete the project.

Now in year two, the district building a plan to collect data that was not already housed in their systems for career planning and employee engagement. In year three, Highline will launch the first phase of profiles with metrics that provide a holistic view of students and staff and a dashboard displaying available community resources. Highline is prioritizing input from stakeholders during each of these project stages.

Highline Public Schools' interoperability success has been based on the development of a well-defined plan with a cross-functional team, and focus on what Rebekah Kim, Executive Director of Teaching, Learning, and Leadership refers to as the "human element of the work": fostering data literacy across the district. At Highline, multiple teams have come together to work alongside the Data and Assessment and Technology team. "We want teachers to have agency in what they bring to the profile", says Kim. "You can have a CTO or data team sit together to come up with a plan, but if they aren't collaborating with various departments and stakeholders and providing what is needed to become data literate it isn't as impactful."



Rural systems rated the extent to which data was used to improve instructional practice at 5.1 instead of 6.9 for urban systems.



Why This Matters

Larger and more urban school systems tended to score higher on the survey overall than smaller and more rural school systems. Larger school systems tend to have commensurately larger technology staff and budgets, giving them more staff capacity to implement data interoperability. Because they make bigger purchases, larger school systems also have more leverage with vendors during the procurement process, making it easier for them to require vendors to align to interoperability standards. Support organizations should tailor technical assistance to meet the needs of districts of all sizes and education service agencies.

Creating Seamless Student Transitions

During the COVID-19 pandemic, districts were forced quickly transition from in-person schooling to remote and hybrid models. At Hinsdale Township High School District 86 in Hinsdale, Illinois, they were ready for these massive shifts, and credit their data interoperability work as one of the keys to success.

By implementing interoperability between SIS and LMS systems, the district ensured that data can flow easily between school registration and course scheduling systems to their Canvas learning management system. When the need for hybrid models that combined in-person and virtual learning arose due to COVID-19, Hinsdale quickly broke students up into smaller cohorts to allow for social distancing within the building. According to Chief Information Officer Keith Bockwoldt, this was made possible by having accurate data flow into the district's scheduling software. The pivot to smaller class sizes helped minimize instructional loss from missed school time.

Hinsdale also put new student success centers into place this year to help mitigate pandemic-related instructional loss. The centers are run by counselors, deans, teachers, and other staff who use comprehensive data dashboards to get information on students' academic progress. Information including course grades, attendance, and curricular data feed a dashboard created using the 5Lab analytics tool. The dashboard includes a Response to Intervention (RTI) model that schools can use to determine what academic interventions students need. This model has gone district-wide at Hinsdale, ensuring that every student has a pathway to success.

Hinsdale's team received many new data requests during the pandemic. Thanks to their investment in interoperable standards, data security and privacy, they were able to meet the challenges of the moment. "It was a tremendous amount of work," he says, "but it was also a tremendous success from the team. Dealing with a pandemic is hard enough, and being able to pull the data to show where we needed to adjust course was critical."

The Future of Interoperability in K-12

In the 2021 CoSN Edtech Trends report, IT leaders listed interoperability as one of their top three unmet technology needs. Although progress has been made, the field as a whole is in the “early adopter” phase of the technology adoption lifecycle. New, innovative technologies that can leverage the power of interoperability—including large-scale data analytics, machine learning, and artificial intelligence—are being championed by the federal government and philanthropic sectors for use in K-12 education. However, for these technologies to make large-scale impacts, the field as a whole must progress towards the right of the technology adoption curve.

> ***For these technologies to make large-scale impacts, the field as a whole must progress towards the right of the technology adoption curve.***

To move the needle for K-12 interoperability, the sector must address the following opportunities and challenges.

Opportunities

- **Districts interested in advancing interoperability and privacy best practices should sign the Project Unicorn pledge to gain access to resources and additional assistance.** School systems that have signed the Project Unicorn pledge scored higher than non-pledge signatories in all domains - in some areas, significantly higher. The Project Unicorn initiative is making a difference through both awareness building and technical support. Member organizations must continue to raise awareness of the benefits of interoperable data systems in the field and provide targeted programs, guidance, and other educational resources to support school system personnel.

- **Districts may not even know what tools they are using. Starting with a tool and data inventory can be an important first step in understanding their digital ecosystem.** Less than a third of the sector inventories their EdTech tools annually and is aware of what tools are being used in their district. Knowing what tools are being used on their network is key for districts to understand their technology needs.

- **Technical assistance for interoperability and privacy should be focused on developing a plan to advance interoperability and privacy.** More than 60% of respondents did not have a plan to advance interoperability and privacy in their districts, while those who did achieved substantial success in completing their plan and advancing their objectives.

- **Planning activities with school systems on privacy and interoperability yielded exceptional results.** School districts with a plan demonstrated a much higher level of sophistication, sustainability planning, and follow-through. This assistance should be targeted towards individual district needs, taking into account variations in a human and technical capacity.

- **The sector must engage in data governance capacity building to lay the foundation for interoperability and protect student data privacy.** Data governance is a foundational requirement for interoperable data systems, but it was the lowest-scoring survey domain. The data analytics made possible by interoperability are only as accurate and meaningful as the data they rely on. The field needs targeted technical assistance addressing the specific data governance challenges of districts, regardless of size.

- **Districts need awareness-raising and tactical training in both privacy and interoperability. These two areas represent opportunities for focus in technical assistance.** School systems are slightly more aware of privacy needs than interoperability needs, but the numbers are fairly close. Policymakers and other sector stakeholders must make funding and training resources available to support both.

- **A limited number of districts are using multiple standards to meet a variety of use cases. There is an opportunity for more multi-standard models to be developed.** A small group of districts is using multiple standards within their ecosystem, most commonly Ed-Fi and IMS. Project Unicorn signatories tended to be heavily represented among those who use multiple standards within a district.

- **Procurement remains a major lever for districts to drive interoperability adoption and articulate demand for vendor compliance with standards and privacy requirements.** Only 53% of districts indicated that they have formal procurement policies, but 98% included interoperability standards when they did. School systems that have established technology procurement practices are more mature in using interoperability standards and protecting student data privacy. The sector must provide technical assistance around EdTech procurement for districts of all sizes, emphasizing the cross-department nature of technology purchasing and the need for including interoperability, privacy, and security requirements during the process.

Challenges

- **Advances in technology, like cloud infrastructure, will only advance interoperability so far. Human capacity and skills must be built.** The sector needs to build capacity in the field, especially for smaller, more rural districts with limited IT staff. Regional education services agencies can play an important role in this effort by consolidating demand and providing interoperability services for smaller districts.

- **Access to training, knowledge, and resources for interoperability and privacy mirrors the national digital literacy divide.** Rural and smaller districts remain significantly under-resourced for funding, training resources, and technical assistance for implementing interoperability and privacy best practices. Developing and promoting the availability of free training modules and materials, such as Digital Promise's Data Ready Playbook, could help.

- **Standards adoption and awareness for districts remain a challenge.** Less than 50% of non-signatory districts were able to articulate the use of interoperability standards in 25% more of their tools. At the same time, a quarter of respondents did not know about interoperability standards adoption in their district.

- **Privacy is a significant concern for district leaders, but only 20% of rural districts indicate they are training teachers on data privacy.** While more than 50% of respondents indicated that they had active initiatives on privacy in their district, less than 20% of rural and smaller districts had adequate knowledge and resources to train their staff. Developing and promoting the availability of free and low-cost training modules and materials, such as those provided by the Future of Privacy Forum, Center for Democracy and Technology (CDT), and the Student Data Privacy Consortium (SDPC), could be very valuable.

Interoperability in Title I Schools

CPSI, Ltd. helps school districts use data effectively by building interoperable systems which leverage a variety of data - from rosters to assessment data to attendance and more - across the entire district in real time.

CPSI also helps states leverage interoperability to provide crucial services, such as the disbursement of funds to students and families receiving free and reduced lunch. Using Google Cloud and the JSON data-interchange format, CPSI worked with the Oklahoma State Department of Education and the Oklahoma Department of Health Services to automatically send data between the agencies, enabling the disbursement of over $54 million a month in funds to those in need. The implementation involves three vendors and three different state agencies. As an interagency project, getting all of the cogs in line for truly interoperable data required ample management.

CPSI provides the State Student Information System, called the Wave, for the Oklahoma State Department of Education (SDE). It is used by every district in the state for automated data reporting from the Local Education Agencies (LEAs) to the State. CPSI recently moved the entire Wave Data System into a full Microsoft cloud environment and converted several applications to use the cloud.

The initial use case was to create a system to inform the Oklahoma Department of Health Services (DHS) about education data collected by the State Department of Education in the Wave. The funding was provided by a grant program with the U.S. Department of Education for the “Pandemic Electronic Benefit Transfer”, or PEBT.

The State Department of Education had three major goals for the project: 1. Create a way to easily get data to DHS, 2. Ensure the accuracy of the data, and 3. Effectively and accurately disperse the money to those who need it. The agencies decided to engage with a state initiative to create a Google hub and spoke model that allows the agencies to share data efficiently in the Google Cloud Platform. The Oklahoma State Department of Education also added additional cloud native data practices that allows the Wave data to easily and accurately interface with other agencies within the state. Partners on the project included the Oklahoma State Department of Education, Oklahoma Department of Health Services, Oklahoma Office of Management and Enterprise Services, CPSI, Ltd., Google, and SpringML.

The result is a prime example of how a state can leverage interoperability between data systems and agencies to deliver results and needed resources.

- **Interoperability is an equity issue.** Smaller and more rural districts are much less likely to be implementing interoperability. Regardless of size or location, all districts should be empowered to leverage the power of interoperable data systems for the benefit of students. The field must develop context-specific solutions addressing the unique challenges of individual districts. Educational service agencies, which support many small and rural districts, can play a key role in helping to level the playing field.

- **Data-driven decision-making requires a robust technical and human infrastructure.** The survey revealed a disconnect between the desire for data-driven decision-making and the school system's capacity for doing so. The sector must educate education leaders and policymakers on the foundational requirements for robust data infrastructure building, emphasizing building both technical and human capacity.

- **Funding is a significant challenge for data modernization.** We must educate the field about how ARP ESSER funding can be used for data modernization. The sector should educate policymakers and decision-makers at both the state and federal levels about the need for data modernization and implementation support.

- **Many district leaders are not familiar with interoperability standards and/or how they might be used in their school system.** Continued outreach and education efforts are necessary to raise awareness of interoperability standards and how they can be leveraged to improve educational outcomes. These efforts should be targeted to different stakeholder audiences (i.e., IT/Data leadership, Chief Academic Officers, Superintendents, Purchasing and Business Officers, etc.)

Next Steps for Project Unicorn

The challenges of moving the K-12 sector towards increased data interoperability are complex, multifaceted, and cannot be addressed with “one size fits all” solutions. Although there is some overlap, the Project Unicorn steering committee organizations serve different stakeholder audiences and have different areas of expertise. These organizations have committed to working cooperatively, not competitively, to prevent resource duplication and ensure a consistent support experience for the field. By collaborating on a commonly defined assessment framework and utilizing this framework to develop more in-depth support resources targeted at specific audiences, the steering committee organizations hope to provide clarity to the field and a smoother support experience for all stakeholders. This, in turn, will help move the sector towards the widespread adoption of interoperability more quickly.

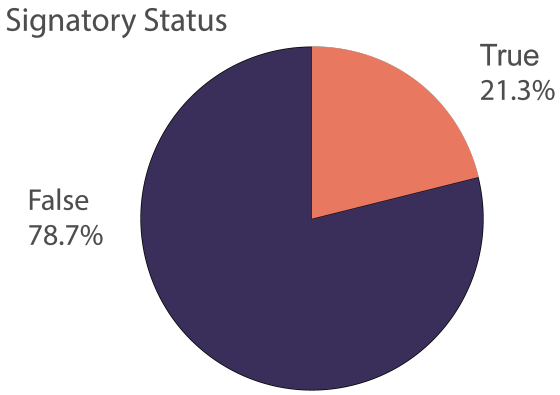
Project Unicorn serves as the “connective tissue” between these organizations, ensuring ongoing collaboration, communication, and resource alignment. One could describe Project Unicorn’s role in the K-12 interoperability space as that of an air traffic controller, ensuring organizations don’t collide, contradict, or duplicate one another’s efforts. When a school system or vendor reaches out to Project Unicorn for assistance, we can either provide direct technical assistance or refer them to individuals, organizations, and resources that can help. This cooperative effort is unique in the sector—and unique in its impact.

When a school system or vendor reaches out to Project Unicorn for assistance, we can either provide direct technical assistance or refer them to others that can help.

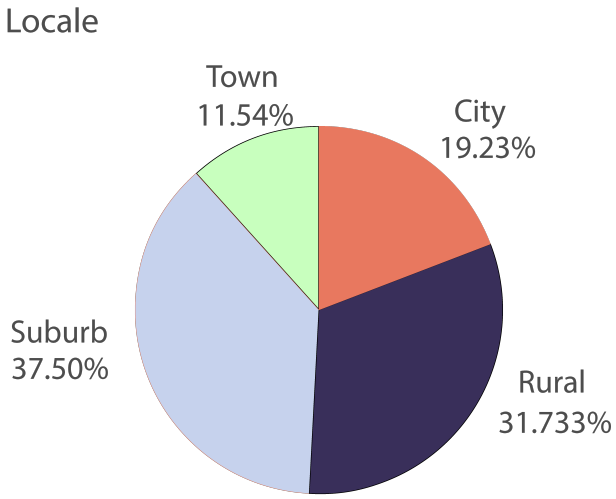
Collective problems require collective action to solve them. The nascent state of data interoperability in K-12 education, as compared to other industries such as finance and health care, is a collective problem with many facets. It is a complex, challenging problem, but not unsolvable. Through collaboration, cooperation, and community building, we can exponentially increase the impact of individual organization efforts.

Appendix

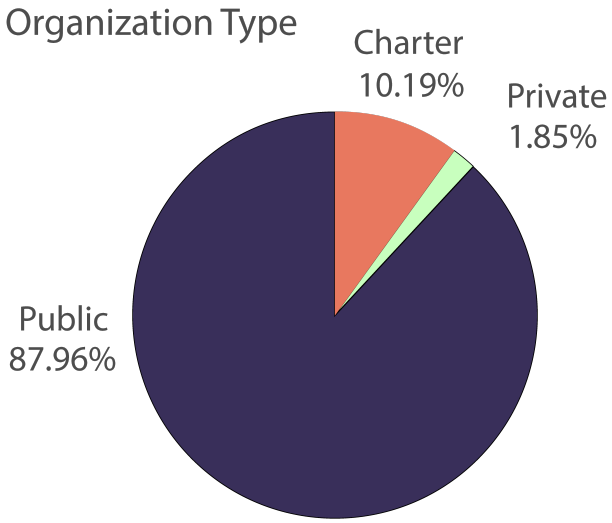
Data in this report is based on the responses of 97 Local Education Agencies (LEAs) and 11 Regional Education Service Agencies. Forty different states were represented, with Illinois (nine responses), Washington (seven responses), and California (six responses) having the highest number of responses. Survey outreach was targeted to school districts across the country, the majority of which had not engaged with Project Unicorn in the past. Eighty-eight percent of respondents indicated that they found out about the survey through email outreach by Project Unicorn. While 21.3% of respondents had signed the Project Unicorn pledge, 78.7% of respondents had not yet signed the pledge or engaged with Project Unicorn.



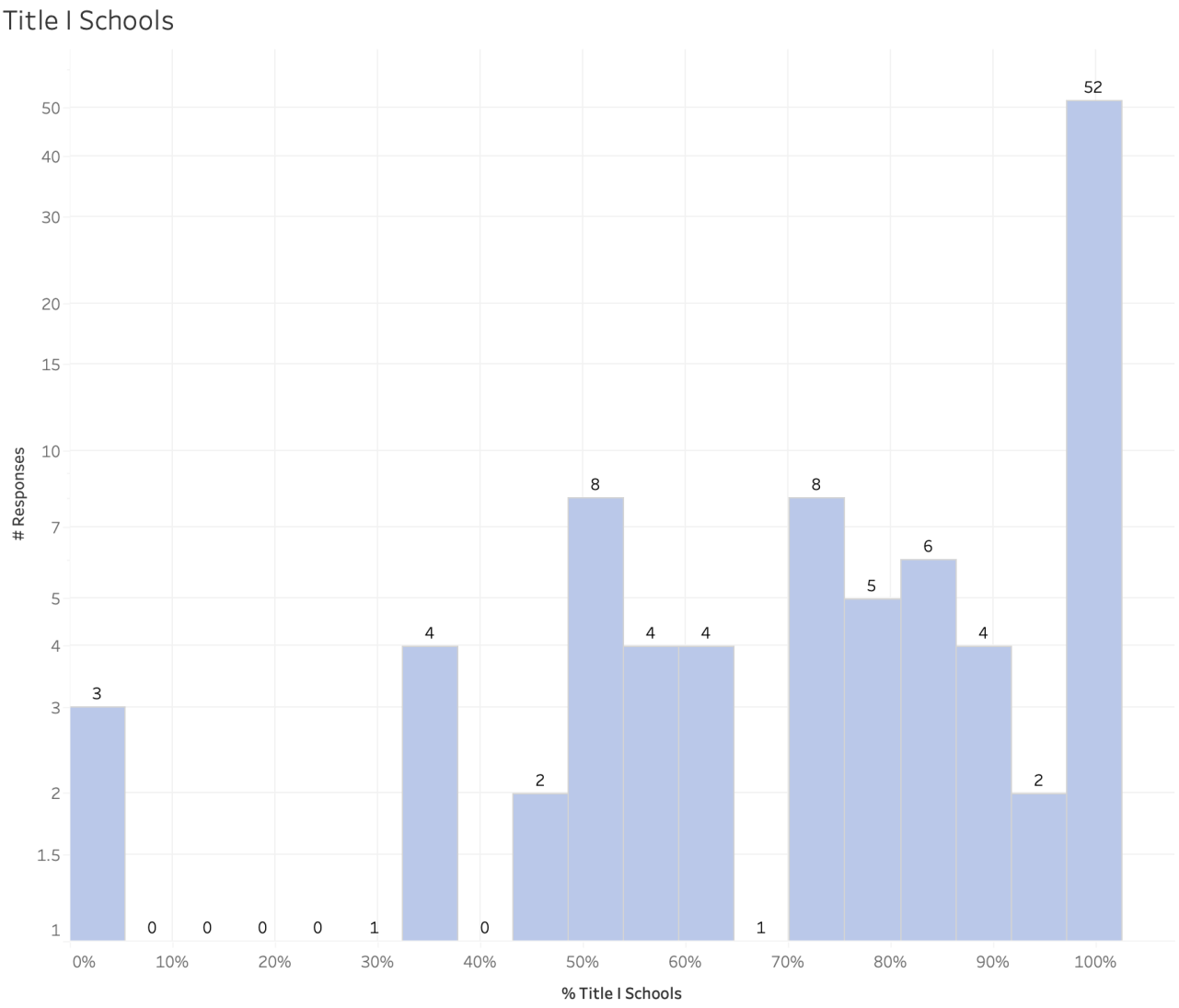
Survey responses were varied by locale, as defined by the National Center for Education Statistics (NCES). Broken down, 37.5% of responses were from suburban school systems, 31.7% were from rural school systems, 19.2% were from city school systems, and 11.5% were from town school systems.



The majority (88%) of survey respondents were from public school systems. 10.2% were from from charter school systems, and 1.8% from private school systems.



Responses also varied by the number of Title I schools represented in each system, ranging from 0-100%. A significant number of responses came from school systems with 97-100% Title I Schools.



Score Calculation/Methodology

Each question on the survey was scored according to a weighted system.

- **Core** questions describing a major component within that domain were assigned possible point values between five and 10. For example, in the procurement domain:
  - Does your organization have a formal process for vetting EdTech tools, learning applications, system integrators, and implementers? (Yes / No / Not sure)
- **Supporting** questions that provided additional information for certain core questions were given weights of 0.5 or 0.25. For example, in the Technology and Infrastructure Landscape domain, a core question is: Does your organization offer training around

student data privacy? (Yes / No / Not sure), and the supporting question (only asked if the answer is yes) is:
    - *Is training on technology and/or privacy offered to: (Check all that apply): Teachers, IT staff, Families, Students, Administrators, Support staff.*
      (Each option checked received 0.5 points.)
- The full list of survey questions and scoring guide with possible point values is available here.

The overall survey score and scores within each domain were calculated based on the percentage of points earned out of the total possible number of points possible within that domain. Overall, survey respondents scored 46% of all possible points on the entire survey.

Demographic Trends

Survey respondents represented a wide range of demographics, including urban-centric locale, percentage of Title I schools in the school system, and percentage of students of color in the school system.

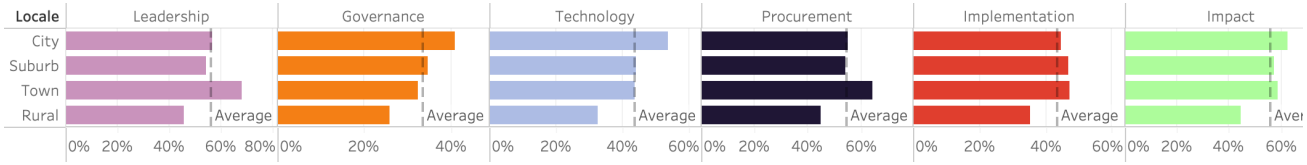
All data is based on data from the National Center for Education Statistics (NCES) for the 2019-20 school year (the most recent that is available). Further information about the National Center for Education Statistics' classification of urban-centric locales is available here.

According to the NCES, a "locale classification is a general geographic indicator that describes the type of area where a school is located. NCES classifies all territory in the U.S. into four types—Rural, Town, Suburban, and City, and each type is divided into three subtypes based on population size or proximity to populated areas. The classifications rely on standard urban and rural designations defined by the U.S. Census Bureau, and each type of locale is either urban or rural in its entirety."

Comparing survey scores across overall scores and domain areas showed that there was not a strong correlation between Title I school percentage and survey scores. There was a relationship between percentage of students of color in a district and survey scores, with districts with a higher percentage of students of color trending with higher survey scores, particularly in the Impact, Implementation, and Technology domains. This relationship could potentially be tied to schools with a higher population of students (which tended to score higher) having a higher percentage of students of color.

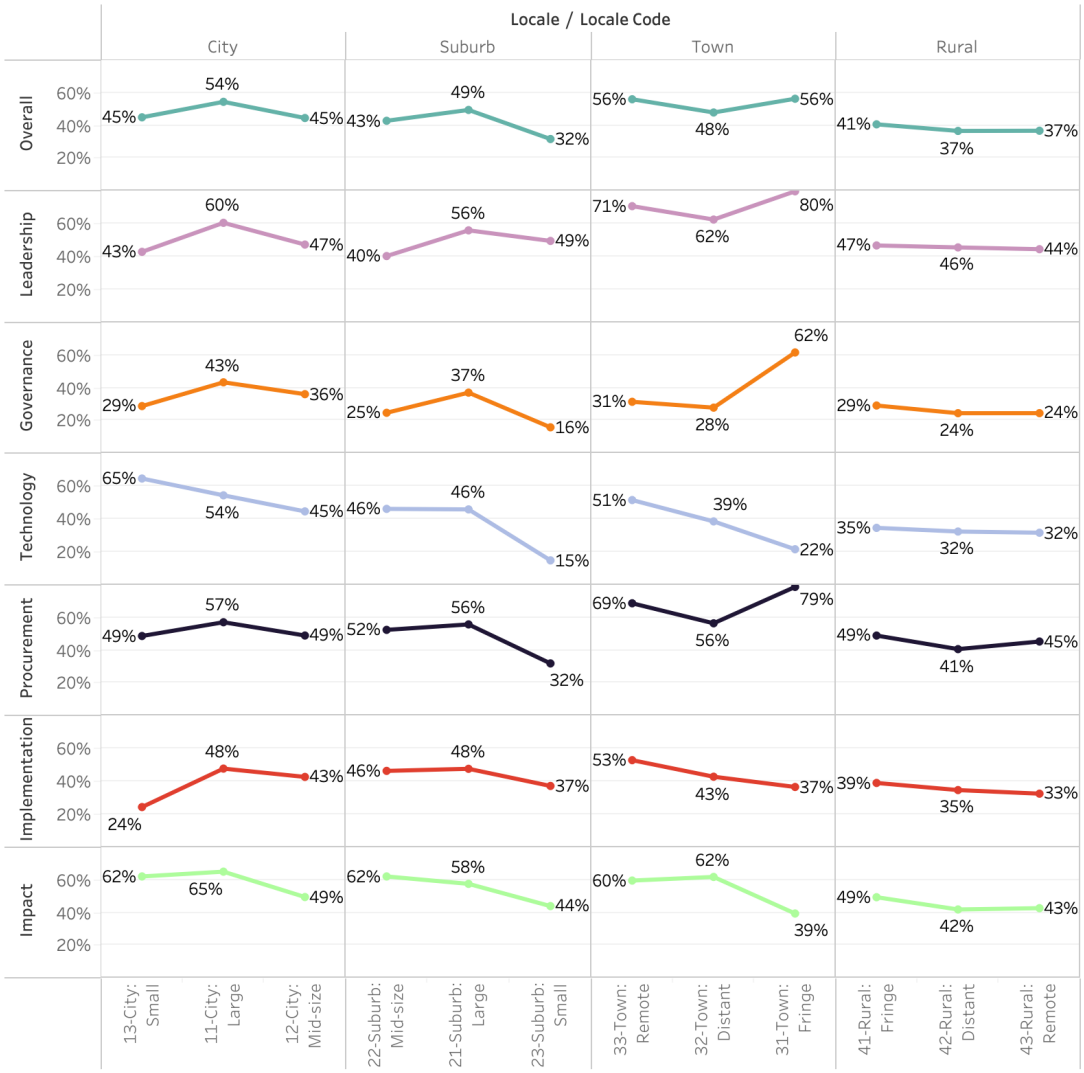
With the NCES's locale classification, there are clear patterns in survey responses that cities and towns had the highest scores, and rural areas had the lowest scores: average scores for rural areas were between 10 and 21 percentage points lower on average than cities.

Domain Scores by Locale



Further breaking down population within locale, a similar trend appears that systems in more populous areas generally received higher scores.

Domain Scores by Locale Code



These trends also appear when looking at the population of students in a school system. Particularly when focusing on populations of up to 20,000 students (and removing a small number of very large districts that may skew results), there was a significant increase in technology, procurement, implementation, and impact outcomes for districts with a higher number of students.

This may suggest that while there are of course a variety of factors influencing how equipped a school system is to pursue interoperability, in general, the budget of a larger district is more equipped to make an investment in infrastructure that enables better outcomes.