PowerSchool

The Need for Data as a Service (DaaS) in K-12: Bringing Disparate Data Together Securely

Removing the burden of data storage, management, processing, and operations with a fully managed, secure platform

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The Problem with Disconnected Data in K-12 Education

Data holds immense potential in K-12 education. Data is the foundation to drive systemic change, student success, and economic mobility.

Schools use multiple software programs to collect all sorts of student information—from grades and assessment scores to attendance, demographic, behavior, and social and emotional learning information. All that data could allow you to see the whole child, gain insights, and make critical decisions to help all students succeed. But accessing the data set together—in simplified views—is difficult.

"In K–12 school districts, there's ample information available to support decision-making around key operational and educational concerns—if only schools could make use of it. Too often, those who need the data can't get to it to drive mission outcomes," says Adam Stone in a recent EdTech Magazine article.

Educators and education leaders know the value of bringing data together and crave those essential insights. According to the 2023 Education Focus Report, the No. 1 challenge from K-12 district leaders is connecting data across systems, and the third-highest challenge is achieving a data analytics view of the whole child.

"Schools and districts are collecting more data about their students than ever before, with each piece telling a part of their story. But it doesn't tell the complete story. Understanding the whole child—and providing personalized learning to all students—requires creating a culture that prioritizes connecting disparate data to tell a story," says Evo Popoff and Liz Coen in "From Sight to Vision: How Data Can Contribute to Personalization and Preparedness in K-12 Education."

The Solution:

Data as a Service Brings Disparate Data Together

Just as Software as a Service (SaaS) is a cloud-based application providing access over the internet, the concept of Data as a Service (DaaS) can provide on-demand cloud access to a state or school district's disparate data—even from multiple sources. Instead of building, maintaining, managing, securing, and operating their own data infrastructure—which could take years to operationalize—education organizations can use DaaS to instantly access all the data they need in one unified platform.

A DaaS platform allows K-12 districts to eliminate data siloes, simplify data architecture, and manage all data from a single location in the cloud.

"The promise of DaaS is big: data is accessible from anywhere," says Tim Clark, VP of K-12 Programs, 1EdTech. "You don't need an extended data team to maintain it. There's flexibility, ease of use, and it's ready to be updated at any time."

Added Security

Regarding data, security is a critical concern; schools and districts are among the most popular and vulnerable targets for cyberattacks. In addition to students' personally identifiable information (PII), K-12 institutions possess personal data from employees and families and typically lack adequate cybersecurity funding and resources.

According to a recent Clever study, district leaders say their No. 1 cybersecurity challenge is a lack of dedicated cybersecurity personnel. And the CoSN 2023 State of EdTech Leadership survey indicates 66% of districts don't even have a full-time cybersecurity staff member.

With an increase in ransomware, phishing attacks, and data breaches targeting K-12 schools and districts, cybersecurity threats have shifted from a potential worst-case scenario to an everyday reality.

84% 

increase in cyberattacks in education from 2022-2023

80% 

of U.S. schools suffered ransomware attacks in 2022, making education the No. 1 target

$268k 

average payment to release data from a ransomware attack

A DaaS platform, which doesn't move data from source locations, can improve your data security. It can include built-in data governance, security, and data privacy via a web-based interface, native, ODBC and JDBC integrations and APIs. Overall, DaaS can help secure data by providing secure infrastructure, centralized data management, data encryption, access controls, data backups, and regular security updates. These security measures help protect against data breaches, theft, leaks, and other security risks.

Supporting Artificial Intelligence (AI) Initiatives

With AI initiatives becoming more common, districts must lay a strong foundation for their AI. Emerging AI vendors are innovative but may not always have the resources or expertise to prioritize data protection or provide long-term sustainable solutions. This raises concerns about the vulnerability of sensitive K-12 student data, making it paramount for decision-makers to be vigilant in their choices.

The traditional approach of "pushing your data to AI," used by most AI vendors today, implies relinquishing control and transparency, potentially at the expense of security and privacy. On the other hand, an approach of **"bringing AI to your data"** represents a more empowering and responsible alternative. Bringing AI to your data minimizes the risk of unauthorized access. This approach allows you to adopt robust security measures, safeguarding student data and the integrity of your educational institution.

What DaaS Is and How it Works

SaaS solutions eliminate the need for organizations to install, run, manage, and maintain software applications on their own hardware. Similarly, a Data as a Service (DaaS) platform removes the burden of data storage, management, processing, and operations to a fully managed, secure platform.

With DaaS, schools, districts, and state agencies don't have to build their own data platforms. Instead, they can make the most efficient and effective use of the massive amounts of data generated across their source systems. Data as a Service offers a more effective and efficient way for districts to work and achieve their strategic priorities using data as an asset. DaaS breaks down data siloes and centralizes all data in one place for maximum efficiency, including structured, semi-structured, and unstructured data.

DaaS gives K-12 education organizations access to vital data insights through a consolidated, unified architecture.

This means you get more tools to promote education equity, ensure school and district success, and help students realize their full potential.

Benefits of a DaaS platform for organizations, including K-12 states, districts, and individual schools, include:

Improve security & reliability

with secure data in a system that provides consistent and reliable data uptime

Access large amounts of data

with a purpose-built, high-performance, secure data cloud when they don't have the time, resources, or expertise to build and maintain a complex and secure data infrastructure

Save time, reduce costs

and focus on their business activities while still leveraging the benefits of insights through previously siloed, inaccessible, or underutilized data with unparalleled ease

Essentials of a Quality DaaS platform

A DaaS platform should allow K-12 districts to eliminate siloes, simplify their data architecture, and manage all data from a single location in the cloud.

While the concept of DaaS is new, here are the features you need:

1. **Ability to unify and integrate data:** A single location for secure data storage, management, and access to a district's K-12 historical data, live transactional data (such as SIS, assessments, HR, finance, surveys, and NSC data), third-party data (labor market data and data warehouse analytics), and all other data sets.

2. **Data access:** Seamless data collaboration with internal stakeholders and external partners. A DaaS platform should provide securely governed data sharing while ensuring all stakeholders have the data they need, when they need it.

3. **Data retrieval capabilities:** Access to historical, current, and future data with near-real-time data refreshes to support downstream integrations, ad hoc reporting, and research-based projects.

4. **Data security:** DaaS can eliminate legacy methods of sharing data that pose security risks and volume constraints. A secure and efficient data-sharing architecture increases collaboration with authorized internal stakeholders and external agency partners.

5. **Ability to use insights to take action:** DaaS can allow districts to realize personalized education by providing contextually relevant information that enables users to act right away, such as using student proficiencies to generate content recommendations that support stronger competency.

6. **Lay the Foundation for AI:** Consolidate all your data into one secure data lake and enable seamless execution of AI and LLM (large language models). Utilize AI/ML tools to build features, train models, and deploy AI into production.

> From the ability to unify access to our data for research and ad hoc analysis to using predictive insights for preparing our students for the workforce, Connected Intelligence will revolutionize the way we use data for mission-critical initiatives to drive our students' success.

HUGH GOURGEON | CEO and President, Challenger School

Introducing Connected Intelligence K-12 by PowerSchool:

The First Fully Managed DaaS Platform for K-12

Connected Intelligence K-12 by PowerSchool is the first fully managed DaaS platform for K-12. In an unprecedented way, this robust platform brings actionable data to key stakeholders to optimize student success.

Connected Intelligence K-12 by PowerSchool allows districts to consolidate, access, and manage their data in a single location, giving unparalleled access to all current and previous years of data, including from disparate data sources. The key is PowerSchool's prebuilt data ingestion pipelines, which provide the foundation for efficient, reliable, and scalable data.

Within Connected Intelligence K-12, data is the foundation to drive systemic change, student success, and economic mobility. Leveraging the unparalleled K-12 education technology expertise from PowerSchool, and the industry-leading infrastructure backend of strategic partners, Amazon Web Services (AWS) and the revolutionary data cloud company Snowflake, this platform is uniquely positioned to power the holistic student journey with a modernized, sustainable approach.

"Connected Intelligence mobilizes K-12 education data to drive insights and innovation for educators. Ultimately, this leads to improved learning, opportunities, and social mobility for the world's greatest asset—our children. Snowflake is proud to partner with mission-focused organizations like PowerSchool where our technology empowers the education space with scale, connectivity, and security around data," says Winston Chang, Snowflake's Chief Technology Officer for Global Public Sector.

Connected Intelligence also contributes to emerging artificial intelligence (AI) initiatives with the optimal processing of complete data at scale. The platform brings AI to your data with a secure data lake. It provides out-of-the-box, AI-driven observability with 24x7x365 support and data governance that meets FERPA requirements.

About Amazon Web Services (AWS): Making the World a Better Place Through Technology

Amazon Web Services (AWS) Worldwide Public Sector helps government, education, and nonprofit customers deploy cloud services to reduce costs, drive efficiencies, and increase innovation across the globe. Public Sector organizations of all sizes use AWS to build applications, host websites, harness big data, store information, conduct research, improve online access for citizens, and more. AWS has dedicated teams focused on helping customers pave the way for innovation and, ultimately, make the world a better place through technology.

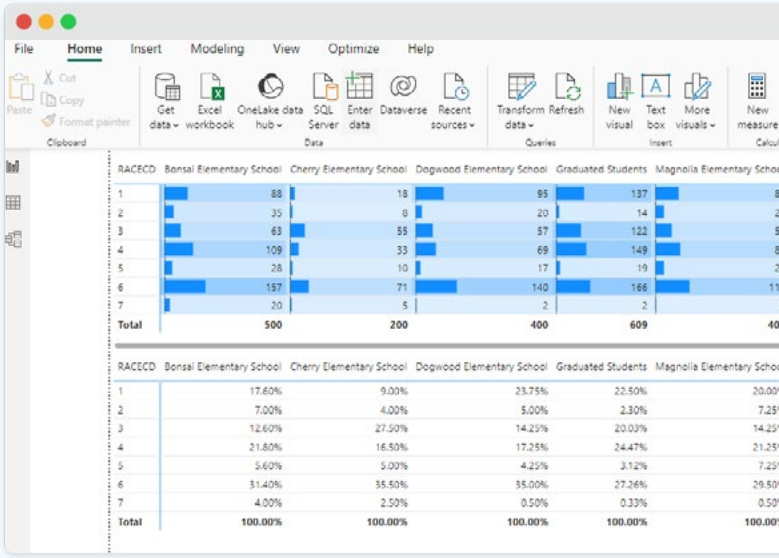
About Snowflake: Harnessing the Immense Power of the Cloud

Founded in 2012, Snowflake enables every organization to mobilize their data with Snowflake's Data Cloud. Customers use the Data Cloud to unite siloed data, discover and securely share data, and execute diverse analytic workloads. Wherever data or users live, Snowflake delivers a single data experience that spans multiple clouds and geographies.

The Snowflake platform is the innovative technology that powers the Data Cloud—the global network where Snowflake customers, partners, developers, and data providers can break down data silos and derive value from rapidly growing data sets in secure, governed, and compliant ways.

With Connected Intelligence K-12, schools, districts, and states can:

- **Centralize data** in a single integrated ecosystem
- **Provide a scalable foundation** for future growth and agility
- **Remove the burden** of data storage, management, processing, and operations from numerous locations
- **Eliminate performance bottlenecks** on transactional systems by housing transactional data in PowerSchool's data lake to optimize the processing of large volumes of data
- **Easily archive** all historical data for compliance or other reasons in a single system
- **Acquire and store** transactional data in one place in its native format
- **Reduce infrastructure costs** associated with managing separate databases, systems, and storage
- **Reduce the need** for manual data entry and integration efforts, leading to cost savings in terms of labor and operational expenses
- **House structured, semi-structured, and unstructured data;** the data lake central repository stores data in the exact format of its source, such as SIS or ERP, or even spreadsheets and PDFs
- **Leverage near-real-time data syncs** with on-demand access
- **Utilize built-in APIs, AI/ML, and visualization tools** all in one place with your data
- **Support ad hoc analysis** and one-off questions from stakeholders
- **Make reporting and compliance activities more straightforward** through consolidated data. Instead of collecting and reconciling data from various sources, organizations can generate comprehensive reports directly from the consolidated data set
- **Save time and effort** by eliminating the need to search through multiple systems or databases
- **Improve data accuracy** via system integrations that eliminate data entry and the potential for human error
- **Lay the foundation for AI** by consolidating all your data into one secure data lake, allowing you to seamlessly implement AI and LLM



State reporting used to be a challenge for us as we had to manually procure data across our multiple school systems, but implementing Connected Intelligence K-12 removed this burden, making data procurement and management very convenient.

MATT BARRETT | Director of Data and Performance
El Paso County School District 49, CO

Connected Intelligence K-12 delivers:

- **Unparalleled time-to-value**
  Within 48 hours of project kick-off, customers can start exploring and analyzing their data in a secure, customer-specific data lake set up within the Connected Intelligence platform. The DaaS platform provides education agencies with all their data and the tools needed to effectively and efficiently use their data, data warehouse, data integration, ad hoc reporting, and data visualization tools with a built-in AI/ML framework.

- **Near-real-time access**
  Connected Intelligence securely ingests data from disparate source systems, leveraging best-in-class high-performance data cloud technology, providing on-demand access to the most up-to-date results. Education agencies can immediately access data such as period attendance, behavior incidents, newly enrolled students and staff, and students requiring immediate intervention supports for timely decision-making and quicker action.

- **Solid data governance and security**
  Connected Intelligence can help secure data by providing secure infrastructure, centralized data management, data encryption, access controls, data backups, and regular security updates. These security measures help protect against data breaches, theft, leaks, and other security risks.

- **Lower costs, better access to funding**
  By using Connected Intelligence, K-12 education institutions can reduce the cost of data infrastructure and maintenance. This can free up resources that can be better served surfacing insights from the data and educational programs and initiatives by leveraging this turnkey solution.

- **Convenient, secure access to all educational data**
  Connected Intelligence provides K-12 education organizations with a unified, secured, and integrated data platform with their data from both PowerSchool and non-PowerSchool data sources, including academic performance, attendance, behavior, talent, finance, and assessments, as well as unstructured data such as PDFs. Connected Intelligence doesn't restrict the number of years or data elements and provides secure, authorized access to all years of history and all data elements.

- **Foundation for responsible AI**
  PowerSchool's approach of "bringing AI to your data" is a more empowering and responsible alternative to the traditional approach of pushing your data to AI. Connected Intelligence K-12 secures and consolidates district and state data in education's first DaaS platform, adhering to FERPA data governance regulations while providing unparalleled performance and interoperability. This leads to optimal processing of complete data at scale—an essential function of AI-ML models for schools.

Importance of Security

With stringent, hardened security protocols, PowerSchool is leading the industry in making student, staff, and school data as secure as possible.

Connected Intelligence enhances data security by:

- Eliminating legacy methods of storing and sharing data that pose security risks and volume constraints
- Providing a robust backup solution that can help maintain business continuity to combat cybersecurity threats
- Offering a secure and efficient architecture to provide a new way to collaborate with authorized internal stakeholders and external agency partners
- Protecting the security and integrity of the data and applications by investing heavily in industry-leading security protocols, security by design, end-to-end encryption, third-party penetration testing, intrusion detection, auditing, and mandatory training
- Leveraging built-in data security and privacy features of our underlying technology platform, Snowflake

With Connected Intelligence K-12, when education institutions move from on-premises to cloud hosting, they maintain access to all their backend data, ensuring a smooth and secure migration process without impacting the performance of the source system.

Industry-standard best practices for secure connectivity, data transfers, and communication provide the most secure data solution. PowerSchool invests in industry-leading security protocols to protect our customer cloud, including intrusion detection and prevention, web application firewalls, advanced endpoint protection, and 24x7x365 eyes-on-glass monitoring by our Security Operations Center.

PowerSchool's Hosting Security Model At-A-Glance

End User

Web Security

Web Traffic Protection

- TLS encryption for secured data transit
- Perimeter edge denial-of-service (DoS) prevention/mitigation

Network Security

Network Protection

- 3-Tier Architecture/internal servers isolated from the internet
- Intrusion Detection/Prevention against cybersecurity threats

Systems Security

Systems Protection

- Endpoint Detection and Response against malware/viruses
- Industry-standard AES-256 data at rest encryption

Physical Security

Physical Protection

- Physical access strictly controlled at building perimeter and data center floors
- Video surveillance, biometric identification, professional security staff

Building a DaaS Platform Yourself

VS.

Connected Intelligence K-12 by PowerSchool

Setting up an end-to-end, comprehensive, secure data platform optimized for high performance, concurrency, availability, and reliability requires a significant investment of resources.

It also demands deep expertise to build a robust, durable, and financially sustainable solution.

BUILD IT YOURSELF

Strain on Time and Resources

- **Timeline:** 2-3 years with 3x higher total cost of ownership
- **Significant time and resource investment** to manage multiple vendor contracts, including those required for managing and maintaining servers, security, networking, observability, monitoring, alerts, data management and processing, and data movement, to name a few.

VS.

CONNECTED INTELLIGENCE K-12

Quick Implementation and Stable Pricing

- **Timeline:** 48 hours (about two days) to access PowerSchool data, while other non-PowerSchool data sources are available within weeks.
- **A fixed pricing model** allows education agencies to budget more effectively without worrying about unexpected development or maintenance costs.
- **Optimized latency, performance, and cost** ensure a financially sustainable and durable system.

In looking at the type of full-time employee we needed to hire—either internally or contracting for cloud-based architects with programming and project management skills needed—we wondered if we could even get people with those specialized skillsets to come to a K-12 district when they could probably go to the private sector and make a lot more than working for us, even with great benefits. And looking at costs of consulting out that work got astronomical quickly. Even cloud storage and hosting was larger than anticipated just to make it run.

EMMA KNAPP | Continuous Improvement Coordinator
Des Moines Public Schools, IA

BUILD IT YOURSELF

Staffing and Management Challenges

- **High cost to hire and retain a team** of data engineers, product managers, network engineers, security engineers, data analysts, data scientists, and BI (Business Intelligence) developers in an environment where there is fierce competition for talent.
- **The challenge of talent attrition,** the loss of skilled employees, and their valuable knowledge and expertise can significantly impact the organization's ability to effectively use their data to maximize student performance and answer key questions for their teachers, principals, district administrators, students, boards, and communities.
- **A daunting task to handle the complexity of data infrastructure,** scaling, and maintenance. Keeping up with evolving technologies and best practices may also be challenging.

VS.

CONNECTED INTELLIGENCE K-12

Free Staff Time to Focus on Other Priorities

- **Fully managed offering** with PowerSchool responsible for best-in-class vendor selection, licenses, contracts, and relationships, ongoing development, maintenance, and support for each platform component and overall infrastructure, scalability, security, and reliability.

We had started a process to build a data warehouse about two years before Connected Intelligence K-12. As we were trying to identify long-term costs, we found that while we had the upfront capacity—because of ESSER dollars to make the investment in the actual creation of it—the estimated long-term cost and even the monthly cost, when you're trying to do all of that internally, was beyond what we had the capacity for.

JOSIE STURGIS | Director of Assessment Data
Des Moines Public Schools, IA

BUILD IT YOURSELF

Data and Technical Issues

- **Data acquisition.** There are several non-trivial considerations while dealing with disparate data sources, including the wide variety of database technologies where the source data (such as SIS, LMS, HR, finance, and special programs) is stored, such as Oracle, SQL Server, Postgres, Dynamo, MySQL, Progress, Mongo, DB2, and even some legacy databases.
- **High latency and poor performance of data transfers.** Traditional data integration methods over VPNs, using queries or exports, ODBC/JDBC drivers, firewall restrictions, throttled tunnel traffic, and network bandwidth limitations can have unacceptable delays and low performance.
- **Data reliability.** Some of the most pervasive issues include down or unreachable servers, network failures, spikes in CPU and memory, task errors, latency issues, anomalies in data freshness, distribution, volume, and schema changes.
- **Increasingly hostile digital environments** are making it progressively difficult to secure and protect data, making K-12 districts and state agencies a prime target.

VS.

CONNECTED INTELLIGENCE K-12

Secure, Accurate Data and Infrastructure

- **K-12 data connectors** for PowerSchool (and available non-PowerSchool) data sources with latency and cost-optimization considerations for each disparate database technology.
- **Native integrations** are provided with every database technology.
- **High-performance replication** allows for near-real-time data syncs into the data lake.
- **Built-in data observability** and AI/ML-based anomaly detection ensure data integrity and reliability, preventing data downtime.
- **A comprehensive data ingestion suite** supports all types of data sources, including databases, files, and API-based solutions.

Conclusion

DaaS Breaks Down Data Silos to See the Whole Child

Education leaders understand the difficulty in accessing comprehensive data and the seemingly impossible task of making a Data as a Service platform a reality. The time, investment, and long-term expertise needed isn't realistic, given the staffing and budgetary challenges already faced in K-12 education.

Connected Intelligence K-12 by PowerSchool solves that challenge, bringing on-demand cloud access to a state or school district's disparate data. Instead of struggling to build, maintain, and operate their own data infrastructure securely, education organizations can use a best-in- class DaaS platform that is already operational to access all the data they need instantly.

PowerSchool's fully managed turnkey solution is ready to connect your data sources in the first Data as a Service platform with industry-leading capabilities for data lakes, data engineering, data science, data application development, and secure data sharing—all in one platform.

See Connected Intelligence K-12 in Action

Watch a Demo

In this demo, learn how this platform gives you advanced data capabilities with easy access to centralized data, data security and governance, built-in scalability, and cost-efficiency.

PowerSchool

Personalized Education for Every Journey

www.PowerSchool.com

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