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DATA IN TRANSLATION How ClOs Can Deliver What Instructional Leaders Need



For teachers, principals, and chief academic officers to do their jobs, they need timely and reliable data in one place. To deliver on those needs, CIOs must integrate potentially dozens of data sources into one easy-to-use system. But how can a CIO deliver on educators' needs while containing costs, supporting users, and stemming data security risks?

In this handbook, we'll help you answer questions like these and get schools on your way to harnessing data that translates into classroom action.



District leaders at Baltimore City Public Schools know they need to find a better way to put their data to work on behalf of students.

Today, it takes two people at central office, working full-time for two weeks each month, to produce one report of core student data (attendance, suspensions, GPA, whether a student is on track to graduate on time, etc.). It's an enormous task for something that goes to just 200 principals.

The report is shared as a PDF, which means the principals can't interact with the data once they get it. They can't disaggregate the data by classroom, to share this vital information with teachers. And they can't update the data in real time.



These limitations are the product of a larger, more **fundamental problem**:

The district, like many, simply isn't engineered to deliver data easily, and the commercial market hasn't provided the tools to solve the problem. Student data tends to sit in silos that roughly follow the school districts' organizational chart: special-education data lives with special education office, assessment data lives with the assessment division, etc.

The marketplace has offered up a wide range of data solutions to meet teachers' needs. As valuable as each one is on its own, together they often add up to a disconnected mosaic of systems, tools, and apps that were never designed to work together on the back end.



While school systems often find daunting the cost, time and effort needed to get integrated, it's a challenge they can solve. And to make district data useable for principals and teachers, it's a challenge they must solve.

In other words, integration isn't about helping districts do their job more efficiently; it's about being able to do their job period.



But the real story is what goes on in the classroom. How does a lack of integration hold back teachers and students? What are the consequences of having incomplete, out-of-date or hard-to-access data?

They aren't hard to imagine. Districts across the country are dealing with those consequences every day. Instead, let's imagine what happens in the classroom when district systems are integrated, and data is complete, current and accessible ...



It's summer. When Ms. Jones gets her class list, she checks her students' past performance, sets goals, and groups students in ways that best match her planned lessons to the students' individual needs. She also prepares for the year ahead by consulting school- and district-wide trends and best practices. School starts, and as fall progresses, Ms. Jones gauges a student's progress with formative quizzes to show what he's learned that day or week. At parent-teacher conferences, Ms. Jones uses her one-stopshop dashboard to view information from a number of different learning systems and share the student's performance, behavior and attendance data with his family.

In spring, Ms. Jones' early-warning indicators alert her when her student starts falling behind. She devises a tailored learning plan with his family and other teachers. The school principal can also use district and classroom data to identify room for instructional improvement and recommend professional development to Ms. Jones and her colleagues.

Finally, when the school year ends, Ms. Jones draws on data to support her recommendation for her student's class placement for next year.



That's the ideal: Informed choices that help individual students as individuals. But Ms. Jones can't make those choices without a CIO who can connect the dots.

This handbook is here to help.

In it, we map three core principles CIOs want to entrench in their districts, to ensure teachers have the tools they need to improve student learning. We distill the key challenges and common pitfalls that line the road to delivering on the goal. And we share the best practices for creating a district data and reporting architecture built for teachers.

Each principle is illustrated by a real-world story from a district like yours. True to life, these stories reflect the often messy, on-theground realities of education. Sometimes we stumble on our way to success.

But all of us are striving for the best ways to connect the data, so that teachers can connect with their students.



First Things First: What is EEA, and How Can It Help Schools?

Insights from *Education Enterprise Guidebook* (March 2014) by the Reform Support Network

Education is far from the only sector to bring together lots of disparate pieces into one IT environment. In fact, it's very much standard in other sectors, from manufacturing to logistics to government to food service. Some time ago, however, these other sectors began adopting enterprise resource planning (ERP) systems to tie together all their disparate pieces. Today, the education sector needs to do the same.

Education enterprise architecture (EEA) is a strategic framework that can provide the structure, plan and processes to achieve a district's vision and goals by aligning its business and program work with IT.

If a district uses a proprietary commercial off-the-shelf system for the purpose of an EEA, the CIO can end up stuck in a costly contract where the vendor owns the product (and maybe even the data) and is the only party allowed to create custom features. EEA, on the other hand, empowers the school system to prioritize and customize, to ensure it gets what it needs. The EEA concept can help education agencies implement the right technology — technology that helps deliver on their strategic goals and makes sense given their operational processes. EEA envisions a master data model and core set of principles, including:

- treating data as assets that require stewardship and common definitions
- using applications that can operate on a variety of technology platforms and are easy to use
- preserving interoperability
- **limiting technical diversity**, to minimize the costs of maintaining expertise in and connectivity among multiple environments.

By upholding these principles, EEA works to maximize resources and expertise, sustain reforms and support schools and classrooms.



PRINCIPLE #1 Maintain local control over your data



Real-World Story: Denver

Denver Public Schools started tackling data integration in earnest in the mid-2000s, making the 84,000-student district a national leader in using data for instruction. To put data to work for teachers, parents and principals, district leaders knew they needed a "data hub," a central repository into which all district data sources would feed (in this case, an operational data store, or ODS). In creating that hub, the district opted to rely on its IMS — and, according to Megan Marquez, Denver's performance management project lead, results have been mixed.

The district built portals that pull data from an array of systems into one place and put it at users' fingertips. Principals use their portals almost daily, as do some 60 percent of the district's teachers, mostly to access lesson plans and student data.

Merida Fraguada, principal at Marrama Elementary, greatly appreciates her portal's ability to put all the data she needs in one place. "The administrator portal makes it easy to see trends in the building by grade levels. The



information can prompt action, like calls to parents. We have 10 students with chronic attendance issues. Now we know exactly who these kid are and why they are consistently absent."

But Denver's data integration isn't "done." In fact, it's becoming more complex and more critical than ever, as Denver boosts personalized learning and school-level autonomy over things like curriculum and testing. "How do we keep visibility and transparency into how kids are performing?" Marquez wonders. "How do we access multiple data points that in some cases we don't even know what's being used — and still track it in ways that are helpful to teachers, parents, principals and students?"

As a data hub, Denver's IMS isn't financially or operationally sustainable over the long run. It often requires costly custom work that unduly sucks up IT staff time. So the district is still in need of an architecture nimble and integrated enough to support an increasingly decentralized and differentiated school system.



PRINCIPLE #1: Maintain local control over your data

What It Means

Put all your data in one place, so various connected systems can help teachers effortlessly, every day — answer the question: "What does each of my students need in order to improve?" Make it simple for teachers to learn from their colleagues' best practices, so all teachers can better connect with students; this knowledge only comes through easy access to data that breaks through organizational silos.

Challenges CIOs face when trying to uphold this principle:

- Connecting student data with other systems, like assessment and teacher data, can be onerous.
- Moving data manually is risky, and automation can be costly.
- Sharing information and avoiding the need to enter existing data multiple times (creating duplicate copies) is tough when each system has its own data storage and unique identification of students.



PRINCIPLE #1: Maintain local control over your data

Common pitfalls:

- Putting undue faith in instructional management systems (IMS).
- Ignoring educators' need for a wide range of teaching models, from those requiring zero digital content to ones that are all digital content.
- Assuming that because districts use different student information systems, data from instructional tools and apps can't be integrated and shared back out to meet similar education needs.

Best practices:

 Agree on what education data looks like and how it's structured. A data standard that is widely recognized and used across the sector, as well as an operational data store, are ideal for doing this.

- Connect all the data by creating a single source of truth, making the same data available across all applications in all departments.
- Follow an EEA model, which makes it simple for teachers to one-stop-shop for data across different buckets (whether the data come from one or a dozen places).
- Start with something prebuilt and community sourced, so you can avoid the guesswork involved in gathering requirements.
- Make longitudinal data organized, clean, secure, and extensible, so it's easy to report and lets you use near-term data for immediate action, adjustments, and reflective measures to see long-term trends.



PRINCIPLE #2 Let teachers choose the best tool or app for the job – without being limited by how the tools will (or won't) work together.



Real-World Story: Portland

The school system in Portland, Oregon, is actively trying to build a more teacherfriendly data world. District leaders want to be as responsive as possible to teacher needs. To that end, they want to allow teachers to take advantage of quality tools and apps — fast.

"We can't be on this pilot cycle where we hold a stakeholder group meeting for three or six months, negotiate with a vendor for six months, then pilot for a year, and then maybe two or three years down the road actually adopt a new tool," says CIO Josh Klein. When teachers identify a tool they want to try, they want to try it asap. "We need to be able to bring tools online in a matter of weeks or months, and have a very low cost to do that. And then, if they're not working, we need to be able to just cut them loose."

Klein achieves that level of responsiveness with an enterprise education architecture provided by the Ed-Fi Alliance. With standard data definitions, an ODS, and an API that allows vendors to plug in with minimal effort, Klein has created an ecosystem that affords him the speed and flexibility he wants.



Like Denver, Portland also has plans for a "learning portal." This single sign-in environment for student data, which will update automatically and offer 30 to 50 curated instructional apps (rotated in and out as fluidly as needed), promises a number of crucial benefits. For example, a teacher with an at-risk student would be able to see and adopt an intervention strategy that has proven successful with students with similar demographics. He or she might also suggest appropriate curricular materials, based on student reading lexile.

On top of these instructional benefits, Portland's solution will also help with IT workload and data protection. "On the IT side, we're under increasing burden to integrate tools to our system, since many vendors have proprietary and unique ways of uploading data into their system," Klein says. "This means lots of custom code and maintenance." Thanks to Ed-Fi's API, he can integrate vendor products without all the custom work.

Klein admits that teachers don't always know or understand the risks inherent in adopting a tool or license agreement — and they shouldn't necessarily have to. "It's our job to help protect them, the student, the family and that data," he says. "If they're using a tool that's



not set up in an enterprise way, that leads to privacy concerns." With an enterprise approach, and district data under local control, Klein can secure his whole array and not be concerned about the vulnerability of individual apps.

Finally, Klein plans to put Portland teachers in a position to have the "aha" moments that arise when compelling data points from one location are brought into context with other data. "There's a lot of good work happening, but it's in pockets and silos and not being shared enough," Klein says. He calls this a "leaky system," and ultimately he wants teachers to get feedback from apps in a standardized fashion, with information going back through the Ed-Fi ODS to be shared with other tools. "We want all our tools talking to each other, so there's this collective intelligence."



PRINCIPLE #2: Let teachers choose the best tool or app for the job – without being limited by how the tools will (or won't) work together.

What It Means

Give teachers the freedom to choose. A responsive school district will make it possible for teachers to act on their interest in the latest and best tools for their jobs.

Challenges CIOs face when trying to uphold this principle:

 Speed and security can be mutually exclusive. Onboarding new tools quickly and safely and keeping data error-free requires tight datasystem integration and planning.

Common pitfalls:

- Letting teachers choose the tools they want

 but not establishing a systematic, safe way
 of onboarding these tools. While teachers sign
 up for free apps every day, the fine print in
 their license agreements potentially opens a
 Pandora's Box of privacy concerns.
- Getting sucked into providing endless support of nightly CSV file exchanges, thanks to a lack of out-of-the-box integration.
- Trying to support and maintain numerous free apps without partnering more closely with educators to help them select tools.



PRINCIPLE #2: Let teachers choose the best tool or app for the job – without being limited by how the tools will (or won't) work together.

Best practices:

- Maintain an enterprise architecture (e.g., an ODS) that feeds apps with the data (like roster information) they need AND pulls data (results and outcomes) from the apps into a central repository, to create a more complete picture of the student's progress and needs.
- Make the safe onboarding and ongoing IT support of tools and apps part of the district's strategic planning.
- Write clear language in RFPs, stating your district's requirements for ongoing integration and alignment to an industry standard.

 Provide single sign-on to the entire suite of tools and systems teachers use, and integrate identity management to improve and unify security credentialing.



PRINCIPLE #3 Put the work and satisfaction of teachers at the center of all your data plans, from design to implementation.



Real-world story: Long Beach

"Data informs every decision we make, and it has for 20 years," says Superintendent Chris Steinhauser. A 2003 Broad Prize winner and five-time finalist (most recently in 2009), Long Beach Unified School District has consistently outperformed other high-poverty California school systems in student achievement. It's a remarkable credit to the "Long Beach Way," a district-wide strategy and culture of using data to constantly improve teaching and learning, while also supporting staff with tailored professional development opportunities.

"We sit down with teachers and we ask them, 'What kind of data would be helpful for you?" says Nader Imad Twal, program administrator. Teachers are regularly surveyed on their data needs, and they serve on district workgroups that identify unmet needs and potential solutions, procure tools that address the needs, and test the tools and solutions. "By providing teachers access to data in a way that is meaningful to them, we've been able to bridge the gap between teaching and learning."

One example is the district's approach



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to assessment reporting, which enables teachers to see — by student, standard or strand — whether a student has partially mastered or fully mastered a given standard. The reports reveal who needs to be re-taught specific content, empower teachers to create flexible student groups within the classroom, and identify student strengths and weaknesses. The district's comprehensive response-to-intervention process ensures differentiated teaching in the classroom, not just for struggling students but also those who could stand to be challenged even more. It's not unusual to find a Long Beach teacher with a stack of 30 spelling quizzes, each slightly different, tailored to

the skill level of each particular student.

Amy Pendray, professional development program specialist and former teacher, recalls how accumulated data helped one student pass a test for the first time in her life. "I had shown her the data so she knew where she was. I think, had she not seen that data, she wouldn't have understood how she was actually progressing."

Long Beach has created a homegrown data solution, with an in-house data warehouse and dashboards covering everything from attendance and discipline to staffing, budgeting, grades and



assessments. Of course, maintaining such homegrown solutions requires substantial IT resources. Through brute-force effort — and not insignificant cost — the district's in-house IT talent custom-glues data sets and data sources to provide what teachers and principals need.

Another investment the district has made is in training, which is continuous and designed on the front end, not tacked on as an afterthought. The district gives each school access to a "data coach" to help them leverage their data to do a better job. Nearly all these coaches are teachers, so they intimately understand the real-world classroom and its demands on teachers. And, just as the district has worked to personalize learning for students, Long Beach is creating a more personalized, on-demand, evidence-based professional development for teachers. It's yet another way the district seeks to use data to help teachers do their job better.

"(Our approach) breaks down the isolation of teaching," says Connie Maggee, principal of Lindbergh STEM Academy. "I can't imagine not having all this data at my fingertips. When I meet with colleagues (outside Long Beach) they shake their heads and say, 'We don't have anything like that.' I don't know what they do."



PRINCIPLE #3: Put the work and satisfaction of teachers at the center of all your data plans, from design to implementation.

What It Means

Listen to what teachers and principals say they need. And support them every step of the way, so they can make effective data-driven decisions in their classroom and school.

Challenges CIOs face when trying to uphold this principle:

- The boom in tools and apps that seek to cater to a teacher's technology needs creates data islands that are out of touch with broader instructional goals.
- It can seem like an uphill battle to secure district leadership support for prioritizing and funneling sufficient resources to IT/ instructional planning.

Common pitfalls:

- Failing to understand that technology is only one piece of the solution. Using data to improve teaching constitutes an entire culture change.
- Being lured by style over substance. An "appealing" user interface may be nice — but how quickly and easily can the UI evolve to answer new questions as they surface?



PRINCIPLE #3: Put the work and satisfaction of teachers at the center of all your data plans, from design to implementation.

Best practices:

- Build a deep partnership with instructional leaders, and make yourself accountable for their daily struggles as educators.
- Work to create a district-wide culture and strategy around data use. (But don't take educators' technology needs at face value. Tie every request for a new tool or system back to the classroom: How will it help students?)
- Probe and listen for broader themes that may change how you serve educators, and build specific action plans from there.



Integration and interoperability are not intractable challenges. They can and must be solved if CIOs are to enable teachers, principals and chief academic officers to do their jobs.

Technology and data in isolation won't drive student improvements. It's only when CIOs make it possible for teachers to use data to answer key questions each day – What is my student learning? What isn't my student learning? What's keeping my student from learning? What can I change in my practice to make sure my student learns? - that change can happen.

We hope you've found some answers and helpful tips in here. You might have some new questions, however. How do you go about implementing an EEA? Who do you turn to for help?

We'll be happy to talk through any questions, challenges, concerns and goals you have. We're all in this together. And together, we can turn data from something schools have into something they can use.



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