



DECISION
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SOLUTIONS

Transforming K-12 education with analytics

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Improving results with
student-centric, data-
driven decision making

Using analytics to reduce drop-out rates, improve academic results and engage parents and students is transforming K-12 education. Putting information to work to improve day-to-day decision making by teachers, administrators and even students, is the next wave of K-12 innovation.

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Optimal decisions about every student

Transparency, accountability and efficiency

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Maximizing results

challenges and opportunities

“We needed a smart system where we could share real-time student information and identify where we are successful, and where we are not.”

David K. Akridge, Executive Manager of Information Technology Services, Mobile County Schools

“Analytics helps school districts improve learning by turning existing operational information into new, usable insights that help schools ensure the highest level of student success.”

Rob Dolan, Worldwide Cognos Software Public Sector Industry Market Segment Manager, IBM

The successful education of our young people is critical to the future welfare of our economy and our society. Our fundamental challenge is to help each student succeed. To do so, we must recognize each student’s potential. A clear picture of student performance and effective, early intervention are essential to prevent deteriorating progress from becoming irreversible failure. We entrust this crucial task to school districts across the country. Yet these same school districts are being challenged to meet higher expectations with fewer resources. Larger classes make it more difficult to know children personally. Yearly budget reviews and the constant pressure to manage costs mean districts must focus on effective programs while demonstrating financial transparency and accountability.

School districts require new tools and new approaches. The systematic application of analytics can help districts meet their challenges and reveal new ways to boost student performance. While analytics may seem out of reach to some, both technically and organizationally, districts just like yours are successfully using analytics today. They are using analytics for early intervention, boosting academic results, and lowering drop-out rates. Any district can embark on this journey, and use analytics to educate students more effectively.

To illustrate, consider the challenge of high school graduation, a key area of focus in the No Child Left Behind Act and in school districts across the country.

Maximizing results

Increase student graduation rates

K-12 school districts are held accountable for their high school graduation rates—how many students drop out or fail to graduate after completing school. Tracking and understanding graduation rates is crucial. Getting more students to graduate, and doing so reliably, is always top of mind. Keeping children in school and ensuring that they are going to meet their graduation requirements are core operational requirements for districts across the country.

Maximize student academic results

Just getting students through the system and out the door is not enough. It is critical to ensure that students graduate having fulfilled their potential—maximizing their educational results. And every student is different, with unique skills, needs and potential. Building on these skills, meeting these needs and fulfilling that potential is not something that can be done in a one-time planning session: it must be built brick-by-brick in classrooms and schools every day.

Use educational resources effectively

While everyone likes to say that education is their most important priority, school districts must achieve their results with limited budgets. When economic times are hard, school districts must do more with less. Making the most of limited resources, and showing that the resources provided have been effectively used, is a must.

Maximizing the number of students who graduate, and ensuring that they graduate with the best possible results, means doing more than being responsive to problems—it means being proactive. And making the most of often limited resources means targeting those resources effectively. But this is often easier said than done.

Intervene early enough

When it comes to drop-out rates the critical issue is early intervention—can you intervene in a student's life early enough to make a difference? But which students are at risk? Over-age kids, those old for their grade, can be at risk but some are thriving in their grade having been held back years ago. Kids not performing at grade level can be at risk, but the child who has been improving steadily is not at risk the way a child whose grades have suddenly dropped off might be.

Accurately identifying the students who are at risk and making sure they are identified early enough for programs to have an impact makes all the difference. And not just for children at risk: identifying the students who will need support to meet their potential, spotting holes in graduation requirements in time to close them, and engaging parents productively all take time too.

Identify programs for each student

Even if you can spot the students who need help in time to make a difference, you still need to find the right resources for them. With limited program space and constrained resources, districts must be sure that a program will benefit a student and must find the right mix of programs to make a difference cost-effectively.

The success or failure of these programs must be measured also. Districts do not have the resources to try every approach, every kind of program. Those that succeed must be put to work widely while those that do not justify their cost must be identified and replaced quickly.

Bring together a single perspective

From a practical point of view, all of these activities are supported by disconnected, siloed applications. The fact that a student is in an academic intervention program for math skills is tracked in one system. The money spent on that particular academic intervention versus an

Maximizing results

alternative one is tracked in a different system. The results of that intervention on a particular student are tracked in a third system and the overall effectiveness of the program is tracked in a fourth. Each of these perspectives is valid, but do not represent the student-centric perspective that is required.

K-12 school districts can transform themselves using analytics, boosting academic results and lowering drop-out rates. In the next section we'll see how this transformation can be achieved.



Transformation

improving outcomes with
student-centric decisions

“To keep a student in school through graduation, it’s important that that student is successful and can grow and learn at their pace with those techniques that are successful for them. The concept of analytics allows the instructional delivery team to find the combinations that will work for that individual student.”

Mark Mason, Partner with DecisionEd Group

“We can show a financial return from reduced costs just by improving our reporting process. But the real return for a school district comes from graduating more, and better prepared students.”

David K. Akridge, Executive Manager of Information Technology Services Mobile County Schools

For school districts to meet these challenges and deliver on these opportunities, they must embark on a journey. Each step on that journey moves them closer to delivering a personalized, data-driven learning path for each student. No district is going to get there in one step and each step must pay for itself—in terms of reduced costs or improved student results. But by taking the information they have and focusing on how it can enable data-driven and student-centric decision making, districts can transform their operations and their results.

Each step on this journey—integrating disparate data sources to give a complete picture, pushing analysis from the district level to schools and teachers, making predictions and taking action, and ultimately personalizing education—creates value and improves outcomes. Each district will have a different journey but no matter where a district finds itself today, it can set out to take steps that will improve outcomes for its students.

Transformation—a journey to better outcomes

Create a complete picture

The first step on this journey is to create a complete picture. You must securely integrate disparate data sources to provide a complete picture, paid for by improved reporting and lower IT costs. This complete picture must focus on integrating information around students. You need a full picture for each student: How are they performing? What about attendance or behavior issues? What interventions have been employed in the past for this student and how did they work for this student? What are his or her actual strengths and weaknesses within a content area?

By integrating data about students, you can easily and dynamically aggregate and summarize to understand schools, the district as a whole and much more. With a student-centric approach, you can compare schools even as students are moving between schools. Within many districts 30% of students move between schools in the course of a school year. With data aggregated around students, you can manage the roll-ups you need to understand schools, programs and districts dynamically and continually.

Integrating data around students and building an information architecture to deliver reports, dashboards, and analysis quickly and easily delivers cost reductions and efficiency gains in time-consuming accountability and transparency reporting. Whether it is handling No Child Left Behind reporting, demonstrating compliance with

state mandates or easing internal reporting on student populations, an integrated information architecture is a good investment.

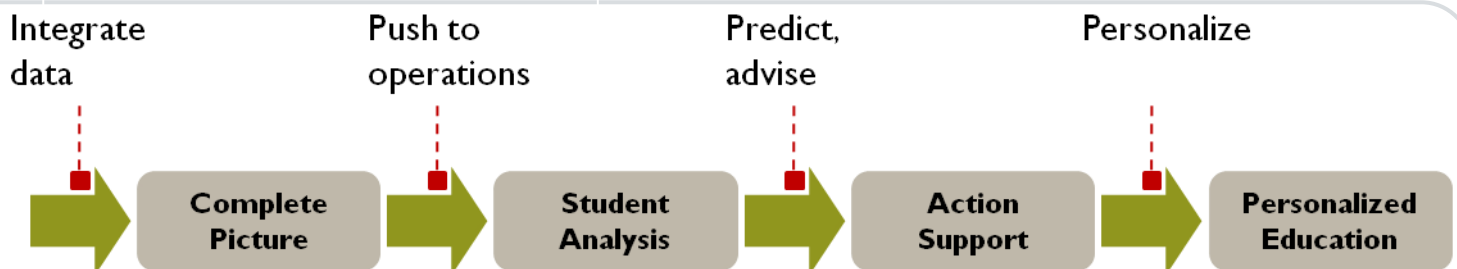
THE MOBILE COUNTY PUBLIC SCHOOL system, for instance, had data spread across many databases, turning even simple report generation into a complex and expensive process. Reports would take weeks to develop and consumed scarce IT resources. With an enterprise data warehouse to pull the disparate data sources together, administrators can get information on their 63,000 students at the touch of a finger. With reporting simplified and automated, administrators and IT can focus on higher value tasks.

Analysis for schools and teachers

An integrated information architecture is also a foundation for operational improvement. You can turn this data around and deliver it to administrators and teachers so they can apply it in their day-to-day operations.

ONCE MOBILE COUNTY had its system up and running they realized how much more was possible. Instead of just using the data they had collected for compliance reporting, they saw the opportunity to transform their day-to-day operations. Pushing accurate, timely information on operational effectiveness to district and school administrators lets them gauge how well their schools are delivering education programs and monitor the entire academic lifecycle of each student.

The transformation journey



Transformation—a journey to better outcomes

Like Mobile County, districts can use this information to improve the decisions that make a difference: Is this student at risk? Is this student a fit for this program? Is this program working for this student? What is the next best action for each student?

THE SCHOOL DISTRICT OF PALM BEACH COUNTY, the eleventh-largest district in the United States, has more than 200 schools serving over 160,000 students. Reports were often too late to effectively make decisions that supported student achievement and they lacked granular data for meaningful root-cause analysis. Giving the district's 12,000 teachers access to their students' achievement, attendance and behavioral data effected a cultural transformation—educators now make data-driven decisions about educational programming. Principals and teachers use this data to personalize instruction for students to improve their performance. And it works: the district has been the only urban school district in Florida to earn a grade of “A” for five consecutive years.

Districts can do more than just improve student decisions; they can improve program decisions too. Integrated student-centric information can be used to analyze different styles of intervention and understand delivery models so they can be compared and contrasted. For instance, does dual or co-teaching work better for a particular student or group of students? How about mixing special ed students with general ed? Does scheduling math as several days of intensive study work better than lessons every day? Understanding which models work for which students can be used to make better decisions about programs, about student interventions and about overall curriculum and program design.

Giving teachers and administrators the facts about student performance helps them help their students. It also helps them engage parents. Long known as one of the prime drivers of student success, engaging parents in educational decisions can be a challenge for teachers. With the specific facts at their fingertips and analysis

showing exactly what the issue is and what needs to be done, teachers can engage parents with much greater specificity, improving the odds of a successful intervention.

Deliver action, not just analysis

Pushing information to administrators and teachers allows them to make better decisions every day. But you can do more than just provide decision support, you can move to action support. Instead of just presenting information, you can recommend action based on what has worked for similar students in the past. You can predict the likely outcome of an intervention or the results a student is likely to attain if there is no intervention. Predict which classes they might fail to complete in time for graduation, for example, and show how their schedule could be changed to address this. Embedding these kinds of action-oriented, predictive analytics means that operational decisions are more than data-driven, they are optimized at a micro level—one decision at a time.

ANOTHER SCHOOL DISTRICT with more than 20,000 students at all grade levels uses the data it collects (student demographics, grades, state assessment scores and academic progress) to do more. Automated analysis of these results predicts student performance on state tests. So when a student takes a math assessment early in the school year, teachers and administrators can immediately see where she is struggling. The program predicts what the child's math score will be on state tests so teachers can see the areas where the student needs the most help. Instead of waiting for a poor result, they can quickly intervene by individualizing instruction to the needs of each student. Thanks to this kind of student-centric, data-driven intervention the district achieved a 13-14 point increase in students meeting or exceeding state standards in just five years.

Transformation—a journey to better outcomes

THE HAMILTON COUNTY DEPARTMENT OF EDUCATION, which oversees nine K-12 school districts with 40,000 students and 6,700 employees, had a similar experience. Students were scoring below state target levels and dropping out, but it was difficult to pinpoint why from the summary-level reports supplied by the state. When administrators systematically analyzed their data, they discovered that the strongest predictor of student attrition is age. Sixty-three percent of Hamilton County high school students who are two to three standard deviations older than other students in their grade drop out. Knowing which students were most at risk, knowing where to focus, they reduced the drop-out rate by a third. And this same analysis builds models that predict the level of performance for individual students so teachers know where to focus.

With this kind of systematic and defined analysis and actions, you can put performance management tools to work analyzing decisions and decision effectiveness. Analyzing the effectiveness of the decisions themselves helps identify what is working and quickly identify something that is not.

Personalize education

The final step on this journey is to bring students into the picture by giving them access to this information, and to the analytic insight based on it, so they too can make better decisions. By adding in new data sources, such as the achievements of students post-graduation, students can be given better tools to help them plan their own education. The colleges that graduating seniors attended and how well they did there, for instance, can be matched with their behavior in school to help students see where they are tracking and what they could do to change those outcomes. Bringing information into the models about how students fare after high school, , means that school districts can see how to fully prepare their students for life, not just for graduation.

Teachers and students together can use analytics to develop truly personalized programs for each student. Automated analytics and smart systems can deliver optimized decisions about the education of each and every student at scale.



Next steps

use information to
transform education

Data mining and analysis “have allowed our educators to put a face on every number and the personalization of the data has resulted in the best No Child Left Behind results in our history!”

**Dr. Kirk Kelly, Director of Testing and Accountability
Hamilton County Department of Education**

Any school district, no matter what its current use of information might be, can move toward student-centric, data-driven decision making. Those at the beginning of the journey can look at integrating data not just to ease reporting, but to enable teachers and administrators to make better decisions. Those with a solid information platform can look to data mining and predictive analytics, moving from decision support to action support. They can build models, as one district did, that let them look at second or third graders and predict their seventh grade math scores. The most advanced can help students take more responsibility for their own education—like the district that gave students their own dashboards and analysis so they could see how they were tracking and participate in decisions about their own education.

And analytics can do more. School districts can use analytics to find the students with the potential to excel and to determine what it takes to help them do so. They can optimize their operations at every level—student, class, department, school and district. Everyone from counselors to parents, school board members to students, can make better, more data-driven decisions using analytics.

School districts must show a return on the investments they make. But this return is measured in students graduated, in potential fulfilled. The data that districts possess can be put to work to generate this return.

About Decision Management Solutions

Decision Management Solutions provides consulting and implementation services for all aspects of decision management. Decision Management improves business performance by identifying the key decisions that drive value in your business and improving on those decisions by optimizing your organization's assets: expertise, data and existing systems.

Our end-to-end, decisions-based approaches and methodologies address key business priorities, such as cost competitiveness, differentiation, customer retention and growth. We offer an array of consulting services for companies, ranging from advice about adopting decision management strategies to tactical support for successful implementation projects.

Decision Management Solutions is led by James Taylor, a leading expert in decision management. James has over 20 years experience in developing software and is the foremost thinker and writer on decision management. James has experience in all aspects of the design, development, marketing and use of advanced technology. He has consistently developed approaches, tools, processes and platforms that others can use to build more effective information systems. In addition, Decision Management Solutions has an extensive network of industry and implementation partners.

More information is available at

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