Eduventures℠

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REPORT

Making Sense of the Data

Overview of the K-12 Data Management and Analysis Market

Introduction

Every school day, districts throughout the country collect millions of data elements from administrators, teachers, and various staff members. These data elements range from student test scores to textbook expenditures. As districts pull their data elements together to deliver, at minimum, yearly reports to their governing states, they often discover it is a complex, time-consuming, and costly process. Most states would describe their data collection process similarly. States typically receive data from districts in a variety of often incompatible electronic formats.

There are exceptions, though. A select group of proactive districts and states have implemented data management and analysis (DMA) systems, which allow states and districts to efficiently manage and analyze large quantities of student and operational data. In addition to achieving legislative compliance, these states and districts are realizing that DMA systems can also drive operational efficiencies, and most importantly facilitate positive educational impacts, such as:

- Narrowing achievement gaps;
- Sharing best practices;
- Improving teacher quality; and
- Increasing the role of data in everyday education decisions.

INSIDE

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Making Sense of the Data provides state and district administrators with an overview of the data management and analysis market. The report highlights key drivers that are causing states and districts to allocate dwindling budget dollars to these critical systems. It provides a framework for considering DMA systems, and provides clarity around each of the system components in terms of definitions, state and district challenges, vendor approaches, and issues to consider. Additionally, *Making Sense of the Data* gives administrators a detailed look into vendor strategies in this emerging marketplace, highlighting where these vendors have come from, where they are now, and where they are going.

Additionally, the report provides several key takeaways for vendors currently operating or considering operating in this market segment. The DMA system model creates a common ground against which vendors can position their offerings with respect to one another. Vendors will gain a deeper understanding of the promising $145 million data management and analysis market opportunity, including the ways in which vendors have entered and grown in this market, and which pieces of the market have experienced the most maturity. Additionally, the report highlights 23 businesses that are currently operating in the data management and analysis market, including vendors that have a history in the segment and those that are currently securing their first clients.

Benefits of Data Management and Analysis Systems

Historical Drivers of State Reporting

During the last two decades, state and district administrators have witnessed an increase in their educational data reporting responsibilities — states have had to increase data flow to the federal government, and districts have increased data flow to their state departments of education. Two connected forces have driven this reporting growth:

- The federal government ties state educational funds to state delivery of educational demographic data to the National Center for Educational Statistics (NCES); and
- State governments tie district funding to state-specific funding formulas based on district demographic data.

States and Districts Face New Data Challenges — Few Are Prepared

States are still required to manage the collection of NCES data from districts. But, as a result of the reauthorization of the Elementary and Secondary School Act or the "No Child Left Behind" Act (NCLB), states now have additional data management responsibilities; states are required not only to manage the collection of state and district data, but also to analyze that data. Specifically, NCLB data management and analysis responsibilities for states include:

- *Calculating adequate yearly progress (AYP)* — AYP is a student performance improvement calculation that includes statistically reliable improvement data for 95 percent of students in every school district. States are required to organize this data by student subgroups (e.g., special needs, ethnicity, limited English proficiency, migrant status).
- *Reporting teacher quality* — Under NCLB, all public school teachers by 2005-6 must be "highly qualified," according to minimum federal standards and additional state standards. States must be able to report educational background and certification information for every teacher in the state.

Through NCLB, administrators are responsible for monitoring and enabling student and teacher performance improvement. If administrators fail to provide the necessary evidence of improvement, their districts face several repercussions:

- Reallocating a portion of their Title 1 dollars to support supplemental services programs;
- Reallocating student funding for students who exercise transfer options; and
- Restructuring schools.

States and districts clearly need an effective technology infrastructure to meet NCLB's data management and analysis expectations, but only a small percentage is prepared. An effective data management and analysis technology infrastructure demands a well-conceived and robust technology architecture for collecting, organizing, and applying analysis to data. Although many states and districts are unprepared technologically, the majority of administrators are gaining an understanding of the need for technology solutions to facilitate effective data management and analysis.

While technology forms a critical piece of successful data management and analysis, an organizational understanding of the appropriate use of data is equally, if not more, important. Most states and districts that have invested in these technologies have had to undergo significant shifts in the way they use data to drive student and operational improvement. States and districts currently examining technologies to meet NCLB data management and analysis demands will likely also need to transform their approach to the use of educational data.

Lack of Preparation for NCLB Can Be Costly

States and districts that invest in technology and skill development to address NCLB attempt to mitigate the potential costs associated with non-compliance; in addition, they are also striving to avoid unnecessary expenditures associated with ineffective technologies and failed opportunities to enhance student performance. However, states and districts that do not make these investments often find themselves bearing additional costs — and consequences — in meeting academic objectives.

These additional costs fall into two categories: data management costs, which are associated with the collection, organization, and quality of institutional data, and data analysis costs, which are associated with manipulating data to uncover trends and patterns and using that analysis to drive school improvements.

Data Management Costs

All states and most districts have some semblance of a data management system. The average system is relatively unsophisticated and often composed of a number of spreadsheets, databases, and paper reports that are loosely connected through various interfaces and internal patches. Additional state and district expenditures are incurred primarily through additional maintenance requirements and staff time to manage data capture and storage.

- *Programming and continual system maintenance* — Within most data management systems, a single education data element flows through approximately two dozen transfer points, from data entry at the school level to report presentation at the state level. At each transfer point, states and districts incur costs (e.g, coding system interfaces, upgrading and maintaining applications); for example, several districts in Georgia have reported that each

spends in excess of 500 person-hours annually to link and maintain links for various district applications. Moreover, many states and districts still rely on manual data management processes; individuals transfer data from one system to another, which introduces the potential for human error and increases the potential for data quality control problems.

- *Additional staff to collect and manage data* — Administrators whose states and districts lack robust data management technologies often compensate by hiring additional staff to ensure the collection and management of data. These staff members expend time on a number of activities (e.g., designing data collection architectures, programming, integrating systems, entering data) that the implementation of effective data management technologies could minimize.

Data Analysis Costs

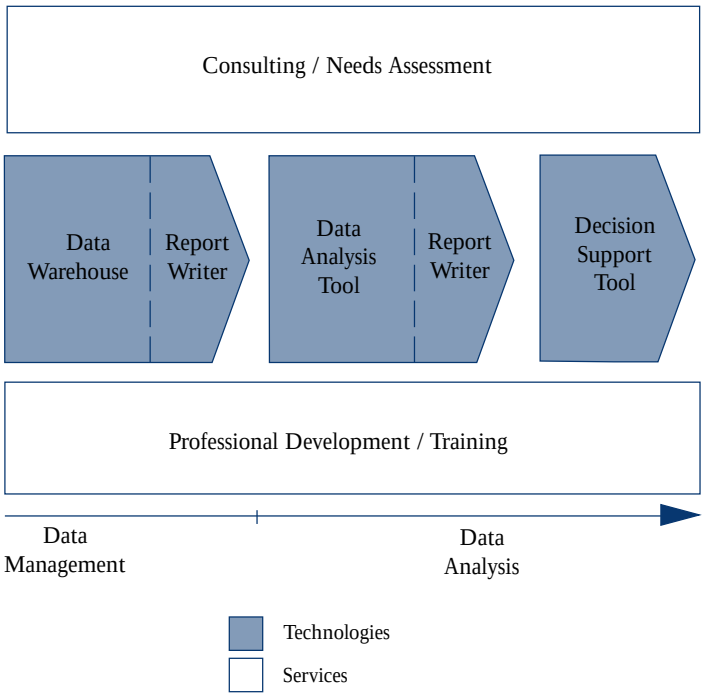
Most states and districts do not possess a technology-based data analysis system. Rather, most states and districts employ a small staff of professionals to analyze school data; these individuals are generally forced to compile data from various spreadsheets and databases to draw conclusions on student and operational performance and to recommend improvement strategies. Limited data analysis resources limit the speed and effectiveness with which districts can drive academic and operational improvements.

- *Missed opportunities to drive student improvement and operational efficiencies* — Districts lacking data analysis systems often fail to uncover and address critical issues that occur at the school level; the limited time and resources of a district's data analysis professionals proves constraining to granular analysis of student performance (e.g., performance trends among ESL students in the sixth grade). Districts run the risk of missing important opportunities to boost student achievement and achieve operational efficiencies.
- *Inability to trust data analysis* — Data analysis is only as strong as the quality of data that it is derived from. However, many states' and districts' existing data management and analysis systems do not adequately cleanse and validate data that is gathered at the district level, which is often collected from dozens of applications, databases, spreadsheets, and documents. This situation increases the likelihood for erroneous data and can raise concerns about the quality of decisions that administrators make based on data.

States and Districts Should Consider Investing in Specialized Technologies and Services

State and districts are increasingly investing in data management and analysis systems to minimize the risk of NCLB non-compliance and to increase the opportunity to improve academic and operational performance and decision making. Figure 1 highlights Eduventures' data management and analysis (DMA) system framework, which includes both technology and service components.

FIGURE 1: DATA MANAGEMENT AND ANALYSIS SYSTEM FRAMEWORK



A comprehensive DMA system allows administrators to tackle the challenges of NCLB, identify operational efficiencies, and drive improvements in student performance. School and district data is stored in a data warehouse from which reports can be generated. Educators employ data analysis tools to evaluate system data, and these tools are typically integrated with tools that deliver reports for individuals. Finally, decision support tools help district stakeholders understand how to act on the trends and issues highlighted by the data analysis tools. Initial system needs assessment and consulting services, as well as ongoing professional development for district administrators and educators, are integral to the success of the technologies.

DMA Systems Can Have a Significant Educational Impact

NCLB compliance and improved operational efficiencies are important considerations for states and districts evaluating technology investments; however, a demonstrated impact on improving educational performance lies at the heart of any school investment in new technologies. As a result, the measure of the success of a DMA system is the impact that it has on student achievement. States and districts that implement DMA systems successfully are better positioned to achieve several key academic objectives:

- *Narrow achievement gaps* — With effective DMA systems, states and districts can more easily analyze performance data by important student sub-groups, challenge assumptions about inequity factors, and address problems at the school and classroom levels. Numerous states and districts report having been surprised when confronted with finer assessment of their data facilitated by a DMA system. For example, education leaders in Minnesota were stunned to discover that its state student achievement gap was one of the largest in the country. The ability to closely monitor achievement gaps is the first step in minimizing them.
- *Share best practices* — DMA systems can help users identify pockets of administrator, teacher, and student performance excellence and facilitate the sharing of best practices in one school or classroom with other schools and educators. For example, school administrators in one North Carolina district used the district's DMA system to match students who were struggling with specific reading concepts with teachers who had demonstrated excellence in teaching those concepts.
- *Improve teacher quality* — Districts can employ DMA systems to highlight specific and targeted professional development needs of district staff and make better staff development investments. For example, a large district in Arizona uses the student performance data drawn from its DMA system to design and develop the district's portfolio of professional development offerings for the year.
- *Increase role of data in education decisions* — A DMA system allows administrators and teachers to adopt a proactive approach to curriculum design and development. A top-performing middle school in Tennessee is using its DMA system to create an environment that places a premium on scientific analysis of data to drive instructional decisions. Teachers are expected to analyze student data on a weekly basis and to modify curricula and instructional strategies in response to their analysis. This approach has led to a heightened sense of professionalism among teachers and staff within the school.

States and Districts Should Examine DMA Systems and Vendors

States and districts face a number of related data management and analysis challenges. States must have the ability to compile and analyze vast amounts of data from districts in an efficient, timely manner, while ensuring data quality for federal reporting and state educational improvement. Districts must streamline data reporting capabilities, while simultaneously using this data to drive instructional and operational improvements at school and classroom levels.

Data management and analysis technologies and services provide states and districts with the resources to address these challenges. The following section contains analysis of DMA system components, and outlines critical issues that administrators should keep in mind when deciding to invest in these systems.

Data Management and Analysis System Components

States and Districts Require Specific Components to Address their Needs

A comprehensive data management and analysis system has several components that address the needs of states and districts. Figure 1 details the five solution components (i.e., consulting/needs assessment, data warehouse, data analysis, decision support, and professional development/training).

Data warehouses and report writers are critical to managing the quality and presentation of large quantities of data for NCLB compliance, while data analysis and decision support tools enable users to draw insightful and actionable conclusions from the data they gather. These conclusions allow states and districts to react quickly and effectively to changing education conditions, like student performance and school budgeting. State and district administrators must keep in mind that data analysis and decision support tools are only as valuable as the underlying data. Therefore, data management, through integrated databases and eventually a data warehouse solution, is a critical element of an effective DMA system.

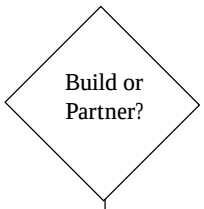
States and districts that seek to use data effectively to drive decisions not only need the right technologies in place, but also need to educate users to employ data appropriately. Consulting and needs assessment services assist states and districts in developing a strategic approach to building a data management and analysis technology infrastructure that will meet future, and often unanticipated, needs. Professional development and training services, which provide ongoing support and strategies for users of DMA technologies, drive higher usage patterns and more effective data analysis.

Key Question for States and Districts — Build or Partner?

At the outset of creating or redesigning a DMA system, state and/or district administrators must decide the most effective method of assembling the necessary components of a sustainable system to achieve their objectives. The first concern that administrators need to address is what they want their system to help them achieve. Secondly, administrators must determine whether to invest in the internal development of a DMA system and its components, to partner with a vendor in the creation of a system, or some combination of the two. Finally, administrators should consider the timeframe within which they want to — or need to — launch a solution. By addressing these three variables, administrators will clarify the decision-making process.

Administrators should consider three decision variables when developing their DMA system design and implementation strategies: available competencies, available resources, and time sensitivity (Figure 2). Analyzing these variables from both a short-term and a long-term perspective will help administrators determine when it is

FIGURE 2: BUILD/PARTNER DECISION VARIABLES



	Available Competencies	Available Resources	Time Sensitivity
Short-Term Considerations	In what areas does the state/district possess the skills and expertise to create or redesign a DMA system or components of one?	Does the state/district have the financial and human resources to build and manage a DMA system or components of one?	How quickly does the school need to develop and launch or improve its DMA system?
Long-Term Considerations	To what extent does the state/district anticipate developing internal expertise and competencies for running a DMA system?	Can the state/district commit sufficient resources over time to manage, maintain, and improve a DMA system?	Does the state/district have specific milestone targets that it needs to achieve over time?

feasible to build system components internally and when it is more appropriate to partner with vendors.

States and Districts Benefit from Vendor Experience and Competencies

Some states (e.g., New York, Pennsylvania) and districts (e.g., Maryville, TN) have chosen to build systems and/or develop internal competencies in significant areas of their DMA system. Visionary and proactive states and districts such as these sought to uncover the value of educational data they collected well before the enactment of NCLB. Although these organizations built competencies in data management and analysis, they also quickly realized that managing internal control of data, maintaining technologies, and providing continual training is a challenging management task.

Administrators seeking to build and manage a DMA system internally are faced with many challenges. A key factor influencing the internal development of a successful DMA system is the caliber and quality of leadership overseeing such an initiative. Administrators must clearly communicate the long-term DMA system vision and possess a team with a sound understanding and skill base in data management and

analysis technologies, applications, and training requirements. Unfortunately, many states and districts do not possess and/or struggle to retain a team of internal professionals to oversee these activities.

Collectively, education-focused data management and analysis companies such as EDmin, eScholar, and TetraData have invested millions of dollars over the past several years to support the development of their data management and analysis technologies and services. Moreover, global companies such as IBM, Standard and Poor's, and SAS are applying their extensive private and public sector expertise in data warehousing and business intelligence solutions to the education market. As a result, administrators can evaluate solutions from numerous firms that possess deep expertise in the design and delivery of data management and analysis systems, expertise that most states and districts would be hard-pressed to match.

Vendor Partnerships Are Wise Investments

Some administrators argue that with tightening technology budgets, investments in a DMA system should be for internal development through IT departments and technology experts. In reality, though, most systems built internally lack sophisticated technology infrastructures and data collection processes that allow the system to grow with the needs of the state and/or district. States and districts, for the most part, do not possess the DMA expertise of most vendors. Moreover, the intellectual property of internally built DMA systems often resides with only a few IT professionals and can result in potentially costly and challenging long-term maintenance management issues.

States and districts are finding that partnering with vendors to develop an appropriate DMA system can be more cost efficient than developing a system internally. Vendors bear the financial burden of ongoing technology development and improvement costs, taking the pressure off of districts. Working with vendors enables states and districts to streamline their DMA investments, mitigating the costs associated with the unpredictability of the development and maintenance of these systems.

The cost to define and implement a DMA system can range considerably based on the level of customization and technology integration required, the time sensitivity of system implementations, and the complexity of the state or district's existing data sets. However, vendors are acutely aware of the current pressure on state and district educational technology budgets.

States and Districts Can Accelerate System Launch by Working with Vendors

States and district administrators can expect internal development of a robust DMA system to require two to ten years, depending on the size and complexity of the

existing data sets and the projected data management and analysis needs. On the other hand, vendors have experienced most of the challenges that states and districts tend to encounter in building a DMA system; this breadth of experience allows vendors to operate in a more efficient timeframe than those states and districts attempting to develop an internal solution. In general, most vendors have a defined consulting/needs assessment, implementation, and training cycle that can range from three months to two years, depending on several factors (e.g., budget and project scale).

It is important to note, however, that vendors often specialize in particular DMA system components. Therefore, while a data warehouse vendor might take five months to complete an implementation cycle, a data analysis and decision support tool vendor might require an additional six months to complete implementation. The exception to this á la carte/product-based approach is a full DMA system design and implementation. In both cases, vendor implementation models generally provide more rapid deployment compared to an internally designed and implemented DMA system.

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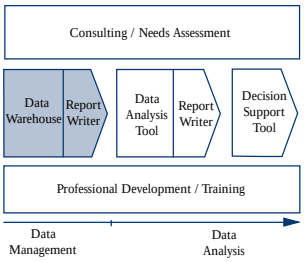
In the sections that follow, Eduventures reviews the three technology components of a DMA system (i.e., data warehouse, data analysis tools, and decision support tools) and the two service components (i.e., consulting/needs assessment and professional development/training). Each component section provides a component definition, assesses the value proposition of the particular technology and/or service, highlights challenges faced by states and districts, details trends among leading vendors, and provides additional issues for administrators to consider.

Administrators should be aware that while data management and analysis issues and challenges faced at the state and district level are in many cases parallel, they are often quite different in scale. With that in mind, a careful reading of each component section should be accompanied by the understanding that only a handful of the vendors in the following pages are equipped to fulfill large contracts at the state level. As such, the majority of vendors concentrate their sales efforts on district contracts.

Data Warehouse

Definition



A data warehouse refers to an organized central storage area for data elements that are pulled from various databases and/or reports. A data warehouse receives validated data from an extraction, transformation, and loading tool (ETL), which is the interface between the databases/reports and the data warehouse. After it is populated with data, a data warehouse often spins off smaller subject-specific databases called data marts for reporting purposes. Data warehouses typically offer an integrated reporting tool that allows users to run periodic pre-formatted and customized reports. Figures 3 and 4 illustrate a schematic of both state and district data warehouses and the link between the two.

FIGURE 3: DISTRICT DATA WAREHOUSE SOLUTION

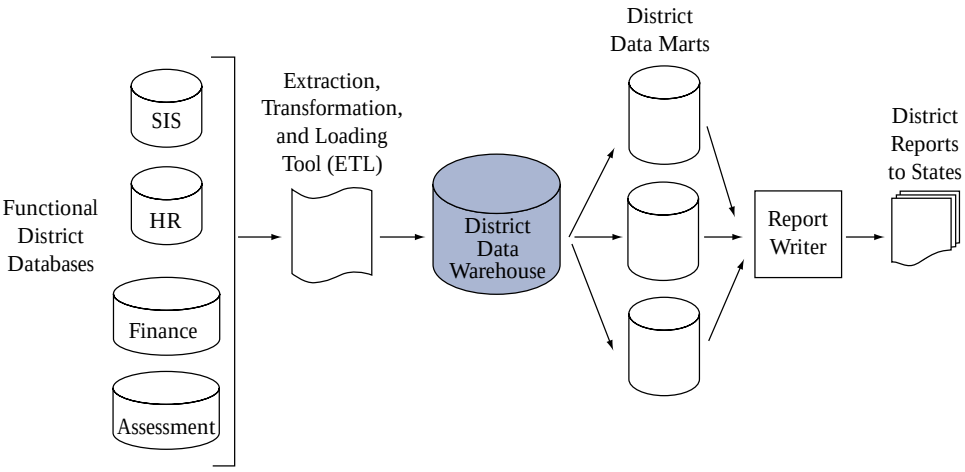
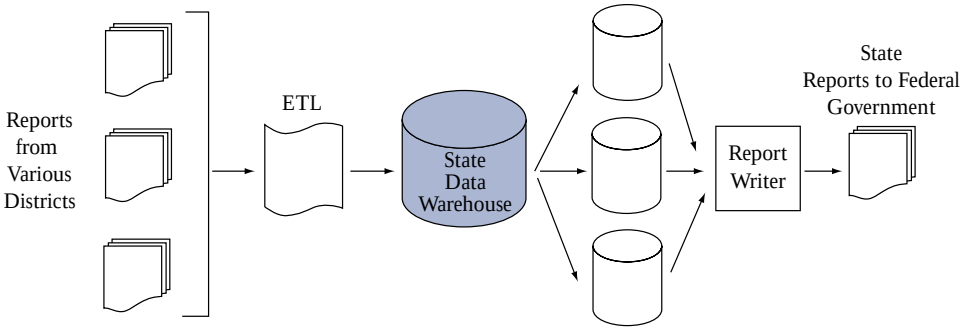


FIGURE 4: STATE DATA WAREHOUSE SOLUTION



Data Warehouse Value Proposition

A well-designed and well-built data warehouse serves as the foundational layer for a strong DMA system. As data elements pass through an ETL, they are combed for errors, validated, and cleansed, which improves the quality of the data. Additionally, data elements are organized in an architecture that has been mapped out to best serve the client's analysis and reporting needs. States and districts that have clean and organized data can more efficiently and effectively run queries, perform detailed analysis, and develop reports on the data captured.

A data warehouse can also assist states and districts in better managing their data management and analysis costs. Data warehouse solutions that extract and cleanse data minimize several costly activities such as manually merging data sets from various databases for reporting purposes, performing quality control audits on captured data, and maintaining and coding costly application interfaces.

Report writers that are integrated with data warehouses also provide states and districts with significant value and cost savings. Administrators can save time and resources by setting up report writers to run reports periodically and by running and presenting queries that aggregate and disaggregate data by user-defined criteria. Districts report running queries in a matter of minutes that would have required months of analysis without a data warehouse and integrated report writer. Integrated report writers also minimize the need for states and districts to purchase complex reporting solutions that require upfront and ongoing integration services and staff training.

State & District Challenges

Many states are struggling to design efficient and effective data collection processes for their data warehouses; a critical stage in the collection process involves receiving accurate data from districts. However, district-level data — inputted on a daily basis by a wide variety of district administrators, educators, and staff — often contain redundancies, format inconsistencies, and errors that must be rectified by districts before being sent to the state. Districts must invest in data management technologies to cleanse and validate their data, and states need to establish a plan that ensures that districts pass along standardized, accurate, and clean data in a timely fashion.

Most states and districts struggle to aggregate data in a consistent electronic format. District-level educators input data into diverse applications that are often written in different program languages, which makes aggregating district data from these applications a costly integration task; this cost is then often compounded when vendors deliver new versions of their applications. Subsequently, state-level administrators typically receive district-level data in a variety of electronic formats. States

must then convert this inconsistent array of data into a formatted and organized data set that will allow administrators to conduct analysis on millions of data elements. These challenges can make state data transformation an extremely costly and time-consuming task.[1]

Vendor Solutions

Businesses have relied on data warehousing technologies for the past decade to enable business process improvements and operational efficiencies. As such, data warehouse technologies are the most developed and time-tested component of a DMA system. Although the technologies are robust and well-developed, most data warehouse vendors active in the K-12 marketplace agree that the K-12 education segment has the most complex and error-ridden data sets and collection processes among all private and public sector market segments. As a result, vendors delivering K-12 data warehousing solutions must be able to tackle the formidable challenge of identifying, extracting, validating, cleansing, and transforming large sets of data into a consistent, usable format.

Vendors Target Various Contract Sizes

Data warehouse vendors tend to focus on one of three specific market segments: states and large districts (fewer than 25,000 students), mid-size districts (7,500-25,000 students), and small districts (more than 7,500 students). Large-scale service providers, such as IBM Business Consulting Services, SAS, and Bearing Point, generally focus on state-wide contracts and large district opportunities. These vendors possess a high level of data management experience and have established relationships with numerous technology partners to deliver comprehensive data management and analysis solutions. However, these service providers are occasionally invited to participate as a subcontractor to technology firms, such as TetraData, in mid-size and small district contracts.

Education-focused data warehouse vendors, such as TetraData and eScholar, typically concentrate on securing relationships with mid-size districts. While these firms' data warehouse technologies are scalable and sufficiently robust for the largest districts, these companies do not have the resources to continually compete with large service providers (e.g., IBM, Bearing Point) in fulfilling large district- and state-level contracts.

Smaller vendors, such as EDsmart, generally offer solutions that lack the customization, functionality, and services of their education-focused counterparts (e.g., TetraData, eScholar). In most cases, these vendors appeal to small districts with

[1] The federal government has recognized the importance of consistency in the electronic format of data and has established the Performance-Based Data Management Initiative (PBDMI) to address these issues. PBDMI is awarding each state grant dollars and consulting services to create standardization around data formats for districts. The initiative aims to create a process whereby district data that is channeled to states can then easily flow to the federal government in a consistent format.

limited budgets. However, SAS, which is similar to IBM Business Consulting Services and more accustomed to working with larger districts, has begun to target smaller districts by offering affordable, low-service, externally hosted data warehouse solutions.

Vendors Offer Various Product and Service Mixes

Vendors also differ in their emphasis on data warehousing as a technology-oriented solution as compared to a service-oriented solution. Companies like SAS, TetraData, and eScholar offer full-scale data warehouse solutions that employ highly technical ETL technologies and merge operational and student data into one central location. These companies offer complementary initial and ongoing services, either through internal service groups or in conjunction with a service partner, to ensure effective implementation and use of their data warehouse. On the other hand, service-oriented companies (e.g., IBM, Bearing Point) offer districts and states proprietary data management and analysis methodologies, but typically partner with K-12 focused and commercial vendors for data warehousing technologies.

Data warehouse vendors' consulting-implementation-training cycles generally range from two months to one year. A district's size, complexity of its data, number of functional applications, and level of customization are inputs that determine a vendor's timeframe — the more complex and customized the application, the longer the vendor will need to complete the cycle. Most vendors recognize that approximately 80 percent of data warehouse implementation time includes cleansing the existing data and transforming it into a consistent and usable format.

Issues to Consider

Districts considering the launch of a data warehouse initiative should ensure that their functional databases are reliable and collect the appropriate data elements. Of the various databases, districts must first ensure possession of a strong student information system (SIS). SISs collect much of the critical student-focused information that will reside within the data warehouse.

Administrators should keep in mind that a data warehouse in and of itself will not improve the performance of schools. A data warehouse manages, cleans, and organizes vast quantities of data. However, state, district, and school improvement derives from careful analysis of that data. Therefore, selecting a data warehouse vendor that places a premium on data quality will have a direct impact on the quality of data analysis that states and districts can conduct.

State and district data management projects vary in scope. Some initiatives focus on capturing, cleansing, and organizing only academic data; other initiatives emphasize a wider range of school data, including academic and operational (e.g., human

resources, financial, and transportation) data. While administrators with a vision of merging academic and operational data often invest in a data warehouse as a starting point of a DMA system, those administrators whose focus is primarily analyzing student achievement data often employ a different strategy. A number of these districts have invested in online assessment solutions, which house student assessment results within a database. These districts often bypass a data warehouse solution, opting to analyze assessment data manually or through a connected data analysis tool.

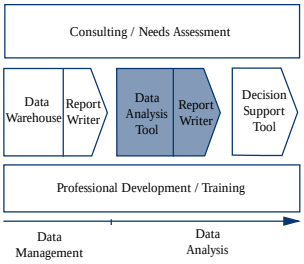
Districts opting to forgo implementing a data warehouse in the short term often meet their immediate goals through an assessment platform and database. However, these districts do not achieve the long-term benefits of a data warehouse, which include expanding the quantity of possible queries, and achieving an organized and consistent data architecture.

A data warehouse is a long-term investment for states and districts; as such, administrators should partner with vendors that can provide the right mix of guidance and customization to achieve their goals. Additionally, administrators should evaluate the long-term business viability of the vendor. This issue is especially relevant with smaller vendors, whose ability to support their platform in the long-term is inherently riskier than that of a large, well-established provider. From a technology standpoint, administrators evaluating vendors should also consider the following issues:

- What data elements can the warehouse store?
- Is the solution scalable and reliable?
- To what extent is the data in the data warehouse secured?
- Is the data warehouse built on solid technology?
- Is it easy to query the data?

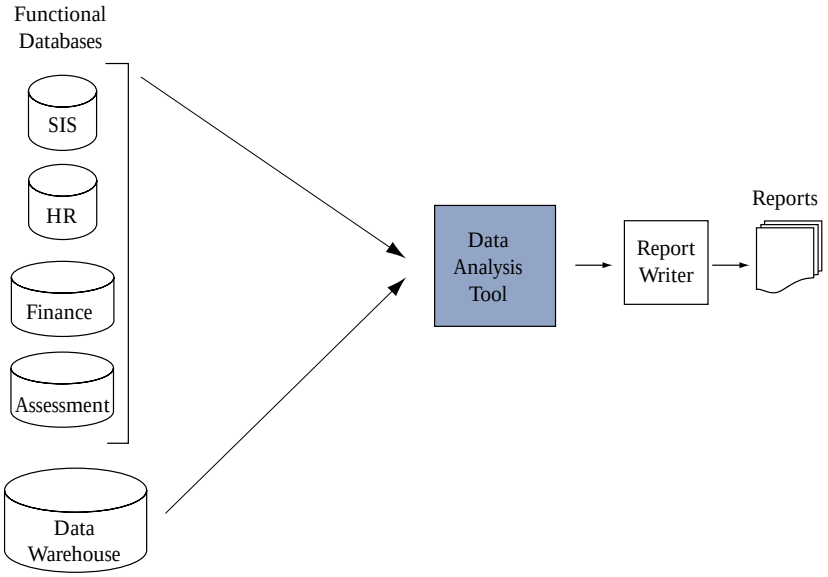
Data Analysis Tools

Definition



Data analysis tools include software applications that conduct mining, forecasting, and statistical analysis of student and operational data that reside in a data warehouse and/or functional databases. Data analysis tools, through various algorithms, rankings, and comparisons, can highlight specific trends and findings for state and district administrators and educators. Similar to many data warehouse solutions, data analysis tools typically have integrated reporting tools that enable periodic and ad-hoc reporting (Figure 5).

FIGURE 5: DATA ANALYSIS PROCESS



Data Analysis Tool Value Proposition

Data analysis tools provide value to states and districts in several ways. Perhaps most importantly, these tools help short-staffed state and district data analysis departments by facilitating rapid, sophisticated analysis of millions of data elements to identify student and operational performance patterns, gaps, and forecasts. Data analysis tools give limited staff — typically ranging from one full-time employee in smaller and mid-sized districts to approximately ten employees at the state level —

the ability to conduct detailed analysis efficiently and accurately, boosting staff productivity and the value of the underlying data. In addition, data analysis tools enable users to evaluate a program's (e.g., special education) cost-effectiveness; benchmark and examine yearly student progress; and spot student, teacher, and administrative trends (e.g., increased absences of certain student populations).

From a compliance standpoint, data analysis tools also assist states and districts. With the annual reporting requirements of NCLB, states need tools that can perform calculations on large amounts of data to derive AYP metrics in a timely fashion. Additionally, data analysis tools can help states monitor, regulate, and analyze districts' and schools' responses to performance improvement failures.

However, data analysis tools only provide value when the underlying data is accurate and in a consistent format. Therefore, states and districts will achieve the most benefit from a data analysis tool when it is pulling data elements that have been validated and cleansed from a data warehouse or functional databases.

State & District Challenges

Currently, most states and districts have volumes of data, but a low level of internal data analysis experience and resources. Some states and districts are hiring additional data analysts to enhance their capabilities in this area; however, in many cases, these states and districts are still struggling to understand the types of analysis and metrics that are most important and relevant to achieving student and school improvements. Many states and districts also find in-depth data analysis efforts limited by technology constraints; data housed in different formats and databases limits users' ability to cross-reference and correlate data easily.

States have approached data analysis in different ways. Most states employ a decentralized data analysis approach, whereby states encourage districts to analyze their own data sets to achieve student and operational improvements. The major drawback to this model is that individual districts allocate varying levels of resources to data analysis, causing substantial inequities in data analysis among districts within the same state.

Some states take a more centralized data analysis approach. While this is somewhat more efficient, internal processing can create a number of challenges. New York and Pennsylvania both employ a model in which district data flows to regional data centers where it is analyzed and presented back to the districts. States that pursue this type of centralized data analysis model take 24 months, on average, to provide feedback to constituent districts. By that time, the data has lost much of its relevance in terms of influencing the districts' ability to make proactive adjustments to students' learning environments.

Vendor Solutions

The majority of data analysis companies provide tools that enable state and district administrators and staff to conduct their own data analyses. However, a small number of vendors, including SAS and S&P School Evaluation Services, provide outsourced data analysis services to states and districts.

Companies that provide states and districts with technology tools to conduct data analysis internally differ in terms of their focus on education markets and their level of technological sophistication. Companies like Cognos, Brio, and SPSS deliver highly flexible business intelligence and reporting tools that allow users to conduct many levels and variations of analysis on existing data sets. These vendors have developed, tested, and honed their products primarily in private-sector industries, and their products are largely industry agnostic. While these tools possess tremendous functionality, their features far exceed the needs of the K-12 education community; states and districts partnering with these vendors will gain extremely flexible data analysis tools, but ones requiring a high-level of proficiency in data analysis strategies among potential users.

Data analysis vendors that specialize in the K-12 education market provide a more focused alternative to firms delivering generic business intelligence tools. Vendors such as EDmin, TetraData, and SchoolNet view K-12 education as their primary market and have developed a keen understanding of analysis metrics that drive state and district improvement through close collaboration and experience with K-12 clients. For example, most of these companies consult with states and districts before system implementation to determine and suggest the most critical success metrics to monitor year-over-year improvement.

Both EDmin and SchoolNet were founded to capitalize on the K-12 data analysis opportunity. However, TetraData developed data analysis technologies as a complement to its data warehousing competency, offering customers an integrated data management and analysis solution.

Companies that offer data analysis tools approach integration with data warehouses differently. Some companies, including business intelligence vendors, often partner for their data warehouse technologies (e.g., Cognos partners with eScholar). As with any partnership, these pose potential long-term integration risks as both vendors continually develop their products separately, but must maintain one integrated solution for their clients. Other data analysis vendors tie their platforms directly to functional databases (e.g., SIS, assessment, finance), bypassing the need to integrate with data warehouse solutions. By employing this model, vendors have been able to achieve real-time analysis of data, encouraging highly proactive users. Most data warehouses do not allow real-time analysis, since the data is refreshed periodically —

from once every day to once every several months. In addition to its proactive nature, the real-time model is more affordable than one that depends on a costly data warehouse. However, the model does not fully address the issues of enterprise-wide data management and cleansing — benefits of a data warehouse.

Both SAS and Standard & Poor's conduct data analysis by applying proprietary algorithms and methodologies to states' and districts' data sets. These service providers retrieve data from their customers, analyze the data, and report findings back to the customers. SAS employs a proprietary methodology called value-added analysis that uses longitudinal data from each individual student to conduct student improvement analyses and to measure the impact of each teacher on each child. Standard & Poor's outsourced data analysis solution employs a framework that draws heavily on student performance and financial data in analyzing school and student performance. While these outsourced solutions alleviate some of the data analysis challenges faced by states and districts, they lack the flexibility and real-time nature of technology-based data analysis tools.

Issues to Consider

In many cases, states and districts are not yet ready for data analysis solutions, as they focus on more immediate needs around reporting and NCLB compliance issues. As a result, they are working to establish strong data management platforms, in the form of student information systems, assessment platforms, and/or data warehouse solutions. Once states and districts complete these platform implementations, attention should turn to data analysis tools. In evaluating options for a data analysis solution, administrators should have a clear understanding of the state's and/or district's performance goals from an educational and operational perspective — the clearer the understanding, the more informed the buying decision.

In sifting through the various vendor models, administrators have several decisions to address. Administrators need to consider the degree of flexibility needed in their data analysis solution, which is influenced by legislative issues and shifting state and district educational priorities. While business intelligence tools offer high flexibility, K-12 specific vendors offer high market expertise.

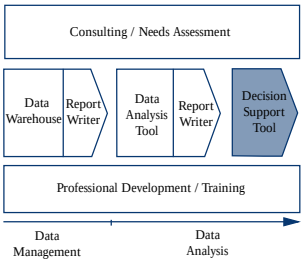
Administrators need to consider whether they are looking for an integrated solution, in which the data warehouse and analysis tools are seamless, or a best-in-breed solution, in which applications are patched together. There are inherent integration risks with the patchwork approach; however, it allows greater flexibility and choice of individual applications.

Administrators must consider whether they plan to conduct data analysis in-house or whether the vendor should provide data analysis. Conducting analysis in-house requires a certain degree of expertise in examining data, offers a larger menu of

analysis options, and allows for more frequent data analysis. Many districts throughout the country opting for in-house data analysis are examining the possibility of building new data analysis roles within their central administration offices or individual schools. Outsourced data analysis, while oftentimes financially advantageous, is typically performed on a periodic basis.

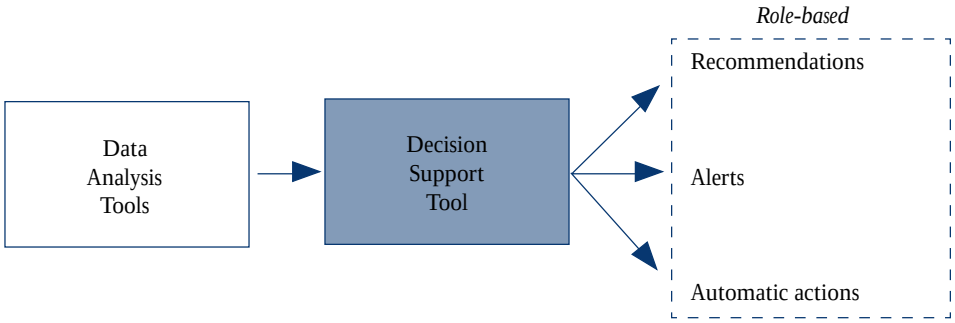
Decision Support Tools

Definition



Decision support tools recommend and prescribe corrective measures to help administrators and educators address problems highlighted by data analysis tools. These tools typically align with communication tools and provide recommendations, real-time alerts, and automatic actions for administrators, teachers, and staff. For example, a decision support tool might customize a learning plan for a particular group of students or suggest to an administrator that he/she pursue a particular budget decision (Figure 6).

FIGURE 6: DECISION SUPPORT PROCESS



Decision Support Tool Value Proposition

States and districts that implement and utilize decision support tools foster a culture of continuous improvement. Decision support tools create immediacy around important state, district, and school issues, and promote proactive responses by administration and staff to academic and operational performance issues as they arise. This sense of proactive responses enables states and districts to employ a problem-solving approach to issues as they arise.

State & District Challenges

States and districts that implement data analysis tools often find that these tools deliver a wealth of analytical capabilities. These same states and districts also discover that they often still lack effective strategies to solve the problems that these tools highlight. For example, an analysis tool might reveal to an administrator that his/her district has 20 critical issues to address (e.g., an ineffective eighth-grade textbook,

professional development offerings, and certain groups of students underperforming in algebra). In this scenario, the district becomes aware of many challenges; however, district administration must then prioritize challenges, delegate responsibilities, help create effective solutions, and measure the success of these solutions.

Schools and districts often have difficulty addressing academic and operational challenges in a consistent and measured fashion, due to high administrative and staff turnover. Today's high level of superintendent, principal, and teacher turnover creates organizations that unfortunately have difficulty in sustaining improvement processes, given the constant change of leadership and staff. States and districts need sets of consistent processes that lead to improvement, and that can be tested and refined over time, regardless of the rate of administrative and staff turnover.

Vendor Solutions

Of the three major technology components in a DMA system, decision support tools are the most embryonic in development and usage. As a result, only a handful of companies, including EDmin and SchoolNet, provide these applications to districts.

Decision support vendors generally engage in a high level of consultative services to support districts and states, which typically possess several critical success metrics that they monitor during the year. Therefore, companies like EDmin and SchoolNet must customize each implementation to align the tools with the priorities of the specific district or state. As vendors incorporate these metrics into parameters of a solution, a clear understanding of the organizational chart of the customer is critical; this knowledge allows vendors to design communication tools and/or portals that deliver the appropriate message(s) to the relevant administrator(s), educator(s), and/or staff.

Decision support vendors often partner with other educational service providers to deliver the professional development, assessment, and curriculum solutions necessary to remediate educator and/or student gaps. For example, a district administrator may receive an alert that eighth grade teachers require additional professional development in a particular subject area; if the district does not have access to these resources internally, the decision support tool will direct the district to its professional development partner. Furthermore, the decision support tool often has the capability of measuring the success of that professional development course based on teacher and student performance improvements.

In addition to decision support vendors like EDmin and SchoolNet, IBM Business Consulting Services offers decision support platforms through its business intelligence partners. The firm's proprietary Learning Alignment Model maps out the key

roles and responsibilities of various organizational stakeholders in a K-12 district, and subsequently IBM's solution delivers personalized role-based decision support through a combination of business intelligence and communication tools.

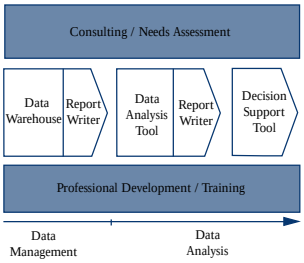
Issues to Consider

Like data analysis tools, the success of decision support tools relies on the quality of the underlying data. Therefore, states and districts that invest in these solutions must have assurance that their data is reliable — whether the data is first cleansed by a data warehouse, or the decision support tool applies sophisticated extraction, loading, and transforming techniques when pulling data directly from functional databases.

Administrators examining decision support tools should also be aware that as state and district priorities shift to keep in line with legislative changes and best practices, so must the parameters of their decision support platform. As a result, states and districts examining these systems should consider the financial repercussions of internally maintaining a decision support system through times of rapidly shifting priorities.

Consulting/Needs Assessment & Professional Development/Training Services

Definition



Consulting/needs assessment includes pre-implementation services that identify clients' technological, data, educational, and organizational needs and goals. Professional development and training services include in-school, off-site, and/or online software training and professional development sessions; these services help DMA system users learn effective, appropriate strategies for applying educational data to support and facilitate improved student outcomes. Because these components of DMA systems are just beginning to define themselves, both service components are being considered together.

Services Value Proposition

Administrators and educators cannot effectively leverage data management and analysis technologies without clearly understanding how to derive value from the data that is captured and analyzed by these technologies. Administrators who have led data management and analysis initiatives stress that the most challenging part of the process is transforming the way in which administrators, educators, and staff view and use data to inform academic and operational decisions. Vendors that provide strong consulting/needs assessment services at a project's outset design technology solutions that tie to key state and district goals — both short-term and long-term. As a result, a high level of upfront consulting services often leads to a more sustainable system.

Professional development and training services encourage effective use of a DMA system and the data and analysis that is enabled by the system. Additionally, these services often serve as a forum for DMA system users to share best practices and lessons learned. Both consulting and professional development services play a critical role in helping administrators and educators extract insights and value from the raw data.

State & District Challenges

Most states and districts that are shifting to a data-driven approach to decision-making have to make a considerable transition in the way that they view and use data. The majority of state and district operating environments throughout the country are not accustomed to integrating data analysis into their everyday operations. This shift in mindset presents several challenges; one of which is that administrators who favor the concept of data management and analysis need to have a thorough understanding of how to use data. Additionally, teaching staff are often

hesitant to adopt new methods of student and teaching analysis without the right supporting ingredients — full staff consensus, ease of use of technology, and immediately visible impacts on the success of their classrooms. Educating administrators and staff is a complex undertaking — one that is often delayed because districts do not have a sufficient number of trainers to encourage usage among the staff. One major urban district said that it took four years to get 70 percent of the district staff on board with data management and analysis system.

Vendor Solutions

Most vendors active in the data management and analysis markets have concentrated on developing technology solutions for states and districts. However, with numerous technology-based data management and analysis solutions available in the marketplace, vendors are attempting to differentiate themselves by increasing their emphasis on both consulting and professional development services. Additionally, a number of service-based firms have recently moved aggressively into the space to support states' and districts' consulting and professional development needs.

Technology-based DMA vendors provide a range of consulting and professional development services, often influenced by the level of customization required by their solution. For example, IBM Business Consulting Services engages in extensive consulting services to support implementation of its Learning Alignment Model, while eScholar, which delivers a very structured and defined data warehouse product, provides limited consulting and professional development services.

As a rule of thumb, the closer a DMA technology gets to the classroom, the more professional development services a vendor will need to make available. For example, only a few key district employees need to understand how to work within a data warehouse environment; however, numerous administrators, educators, and staff will use a vendor's data analysis tools and will likely require professional development resources to facilitate their adoption and accelerate their understanding of the tools.

A number of pure-play service providers are also active in the data management and analysis marketplace; many are newer entrants seeking to capitalize on the accountability and data-driven decision-making trends catalyzed by the passage of NCLB. Companies such as ETS, Co-nect, and New American Schools are aggressively developing and launching a variety of data management and analysis services (e.g., strategic planning, professional development, curriculum alignment) and are exploring opportunities to partner with those technology vendors seeking to deliver more comprehensive DMA solutions to states and districts.

Issues to Consider

Administrators who engage vendors in consulting services must pay careful attention to the differing perspectives of the vendor. Technology vendors that offer specific

components of a DMA system will provide consulting around the implementation and integration of that specific component; however, they will be less equipped to provide thorough strategic consulting around all issues of a DMA system (i.e., data management, data analysis, decision support, and professional development). On the other hand, administrators who engage full-solution vendors in upfront consulting services may find that these vendors have a broader long-term perspective of the implementation of a client's DMA system.

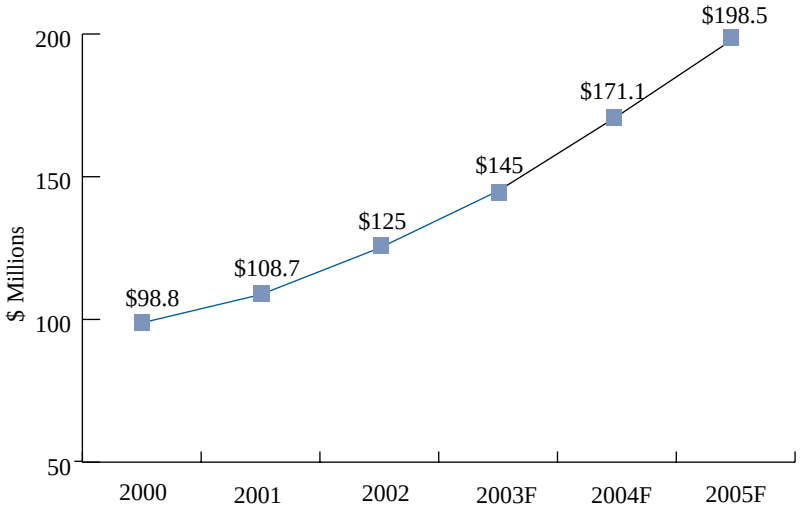
States and districts that receive professional development services typically employ a "train the trainer" model. Administrators utilizing this model must first examine its viability within given states and/or districts. Often, states and districts must employ creative strategies to train large constituencies and maintain their skill bases, especially given high turnover. Additionally, administrators should have a clear understanding of the vendor experience in the K-12 market, as that experience often drives the quality of professional development and training services that vendors offer.

The Vendor Landscape

Technology Budget Straps Loosening for DMA System Expenditures

While districts have pulled back on technology hardware spending, enterprise software and services expenditures have increased. The enterprise software and services market is composed of enterprise resource planning solutions, student information systems, systems integration services, and data management and analysis software and services. Of the four segments, the data management and analysis segment has experienced the highest growth rate over the last two years, and Eduventures anticipates that NCLB pressures will continue to drive investments by states and districts in this market segment (Figure 7).

FIGURE 7: REVENUES FOR DATA MANAGEMENT AND ANALYSIS MARKET SEGMENT (2000-2005F)



Most states will increase spending on data management and analysis over the next several years. On average, states spend $1-6 million annually on data management and analysis systems, but Eduventures' research indicates that most states remain far from where they want to be in terms of data management and analysis capabilities. Currently, 10 states collect all NCLB-required pieces of data from all of their districts; 21 states have implemented unique student identifiers — numbers that are

critical for tracking student data, especially in areas of large migrant student populations; and 20 states can break down student performance data by NCLB-mandated subgroups. States will need to address these data management infrastructure issues over the next several years, which suggests that data management and analysis systems will achieve significant growth at the state level.

Districts will also increase spending on data management and analysis systems during the next several years. Districts will allocate budget dollars based on a number of factors including district size, level of technology infrastructure, and quantity of data collected. On average, district DMA systems range in price from $3-15 per student per year depending on the sophistication and scope of the solution. This per student range generally correlates to annual contract values of between $75,000 and $2 million.

While small (fewer than 7,500 students) and mid-sized (7,500-25,000 students) districts are spending more dollars on DMA systems in aggregate than large districts (more than 25,000 students), a higher percentage of large districts are investing in these solutions. Large districts typically have more reporting and data management challenges than small ones; these challenges are especially acute in large, urban districts that tend to have highly transitory student and teacher populations. Eduventures anticipates that a significant number of the more than 75 percent of districts that have not yet invested in data management and analysis systems will be allocating financial resources for them in the coming years.

DMA Vendors Target Specific Market Segments

Vendors selling their products and services into the data management and analysis market strategically target their customers based on a number of factors including company size, development resources, number and strength of partner relationships, experience in market segment, reach of sales channel, future strategic direction, and customer service resources. Moreover, vendors are capitalizing on market niches that are emerging as a result of the geographic, academic, and financial diversity and complexity of states and districts. Vendors catering to market niches can develop a solution that closely aligns with the needs of specific types of states and districts. Based on these factors, the vendor landscape can be broken into three categories: large-scope players, steady competitors, and new entrants and small-scope vendors (Table 1).

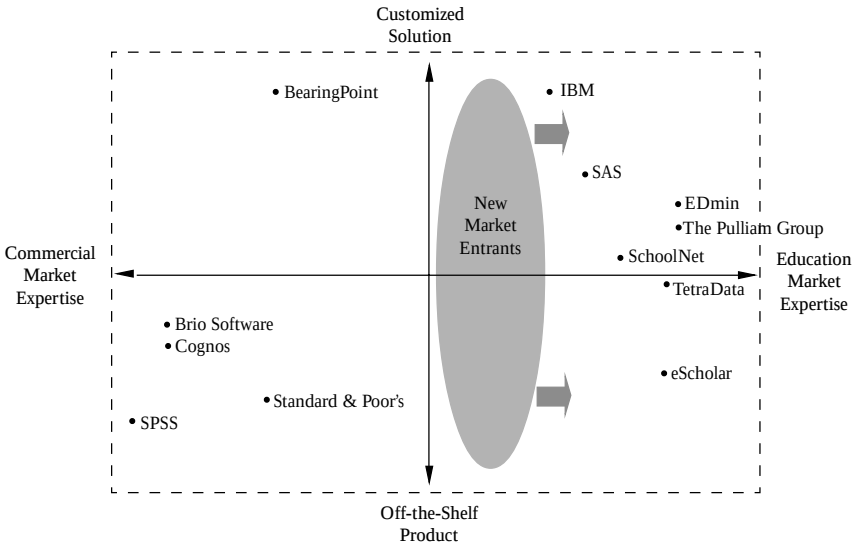
TABLE 1: VENDOR SEGMENTATION

Vendor Categories	Target Customers	Sample Vendors	Estimated DMA Revenue Ranges	2003 Estimated Revenues
Large-Scope Players	*Primary* States and large districts (>25,000 students) *Secondary* Mid-size districts (7,500-25,000 students)	Bearing Point, EDmin, IBM, SAS	$10-25M per vendor	$85M
Middle Market Providers	*Primary* Mid-size districts *Secondary* Large districts, consortia of small districts, and small districts (<7,500 students)	eScholar, SchoolNet, TetraData	$5-10M per vendor	$40M
New Entrants and Small-Scope Vendors	*Primary* Small districts *Secondary* Mid-sized districts	Confluent, EDsmart, Turnleaf,	Less than $5M per vendor	$20M
			Total For-Profit Data Management and Analysis Revenues	$145M

Vendors' Origins and Business Models: Key to Understanding Positioning

Vendors delivering K-12 data management and analysis solutions have approached the market from different positions. A number of companies, including Brio Software, Cognos, and Standard & Poor's, have targeted the K-12 environment after extensive experience serving customers in commercial markets; however, the majority of companies currently serving this market have their origins in K-12 data management and analysis. Additionally, vendors are employing differing business models within the data management and analysis market. Some companies seek to provide states and districts with highly customized, service-oriented solutions (e.g., IBM, BearingPoint), while others are delivering more off-the-shelf software products (Figure 8).

FIGURE 8: VENDOR STRATEGIC POSITIONING PLOT



Vendor Origins

Companies originally focused on commercial markets have taken one of two approaches to serving K-12 customers. Some firms (e.g., IBM, SAS) have developed significant K-12 education expertise through development of K-12-specific products and services; others have remained generalists (e.g., SPSS, Brio) and have not made a significant commitment to build strong K-12 market expertise. Although companies like SPSS and Brio have not attempted to modify their solutions to address K-12 market considerations, they often play a significant role in the market due to their technical expertise and the sophistication of their products.

Companies that have historically targeted K-12 districts often have a better understanding of the idiosyncrasies of the K-12 market. While their technologies may not always appear as sophisticated as those of vendors rooted in serving corporate and government markets, their solutions often are more aligned with and appropriate to K-12 customers' needs. Vendors with deep experience in the K-12 market, such as eScholar and The Pullium Group, have a history of K-12 data management and analysis experience, which they have leveraged into the development of their offerings. At the same time, education-focused firms that entered the market recently or in response to NCLB are generally not as far along in their product and service maturity as those vendors whose solutions pre-date NCLB.

Vendor Business Models

Vendors whose solutions focus primarily on the commercial market have built robust technologies and service methodologies driven by the demands of their primary clients — businesses. Commercial market service providers (e.g., IBM

Business Consulting Services, BearingPoint) derive only a small portion of their overall revenue from K-12 education. This small portion typically drives them to engage in large-scale, highly customized contracts within large districts and states. IBM's highly customizable solution acts as the "glue" that pulls various software pieces together. However, product-based companies, such as Brio and SPSS, have chosen to outsource the majority of implementation and integration services to service-based companies.

Like commercial vendors, K-12-focused companies have chosen different business models. While companies such as The Pullium Group emphasize customizing solutions to specific districts, others such as eScholar focus on delivering clearly defined data management products. K-12 product-based technology vendors, like their commercial counterparts, often partner with larger service providers, such as IBM, to deliver customized consulting.

New Market Entrants Continue to Arrive at a Rapid Pace

Vendors have entered the data management and analysis market at different stages in the market's development. For example, while companies like EDmin and TetraData have a long history of serving this market that precedes the enactment of NCLB, new entrants such as New American Schools and Co-nect represent recent post-NCLB market entrants.

The majority of new market entrants are vendors whose traditional core offering (e.g., assessment, professional development, student information systems) is in some fashion adjacent to the K-12 data management and analysis market. Thus, each vendor approaches the market from a different angle. For example, New American Schools brings its expertise in comprehensive school reform to bear in its budding DMA solution. However, regardless of a new entrant's experience in the K-12 education market, each vendor will experience a steep learning curve throughout its first wave of contracts.

Ultimately, the vendors that are most in tune with the needs of educators will succeed — whether those vendors have a legacy and experience with DMA systems or are new market entrants that have a legacy in the K-12 market and the capability to effectively apply their experience to the data management and analysis market segment.

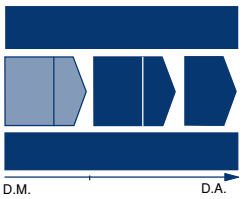
On the following pages, Eduventures assesses the capabilities of three leading organizations delivering data management and analysis technologies and services and provides brief snapshots of 20 additional vendors. This evaluation is designed to help educators draw distinctions between notable providers and gain a better understanding of each firm's value proposition; it is not intended as a comprehensive assessment

of each firm's products and services. Eduventures applies the following qualifiers to highlight vendors' capabilities in each component of the data management and analysis system:

- *Core Offering* — Denotes area of focus in which the vendor has attained a high level of experience and expertise; the organization has typically invested significant resources in developing this capability and its brand reputation may be built around it.
- *Possesses Capability* — Denotes area that augments a vendor's core offering(s) and in which it has demonstrated that it can deliver value to customers.
- *Minimal Capability/Does Not Offer* — Denotes area in which an organization has not developed explicit competencies; in some cases, an organization may be exploring these areas, but it has yet to release a specific offering.
- P *Partners for Capability* — Denotes area in which an organization partners with another provider to enhance and/or add capabilities. In some cases, vendors that possess a certain capability also partner for that capability.

The vendors highlighted on pages the following pages are constantly evolving their offerings and capabilities to meet the needs of existing and prospective clients; the graphics included on the pages 34-46 represent a static view of a dynamic process.

EDmin: Virtual EDucation



Core Offering
Possesses Capability
Minimal Capability\ Does Not Offer
P Partners for Capability

Business Description

Founded in 1989, EDmin focuses exclusively on K-12 education performance improvement through its data analysis and decision support platform and related consulting and professional development services. The company's Virtual EDucation decision support platform can be customized to deliver real-time analysis metrics, based on student performance aligned to standards and district operations. EDmin has partnerships with a number of educational vendors that provide professional development, content, and assessment prescriptive solutions. EDmin targets small, mid-sized, and large districts, and has also secured several state-level contracts.

Strengths

- Delivers sophisticated role-based decision support tools
- Customizes analysis and decision support tools to specific state and district educational priorities
- Possesses extensive experience serving customers in the K-12 market
- Offers technology that allows multiple users to simultaneously have access to personalized real-time data analysis

Challenges

- Continue to build strong partnership agreements with content, professional development, and assessment providers
- Identify additional state-level sales opportunities for the company's decision support solutions

Key Partnerships

- Scantron (Assessment)
- Hewlett-Packard (Distribution)
- Classroom Connect (Online professional development)
- Microsoft Class Server (Content)

Revenue Range

$10-25 million

Key Customers

- Hillsborough County, FL
- Jefferson County School District, CO
- Lake Washington School District, WA
- New Mexico Department of Education
- Montgomery County Public Schools, MD

Contact

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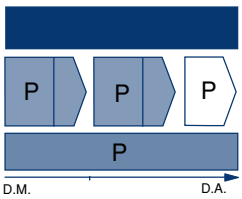
IBM Business Consulting Services: IBM Insight at School



Core Offering
Possesses Capability
Minimal Capability\ Does Not Offer
P Partners for Capability

Business Description

IBM's Insight at School is a comprehensive service offering that combines IBM's consulting/needs assessment, systems integration, and training services with third-party data management and analysis technologies. IBM partners with a number of leading application vendors and integrates these systems into a full-scale DMA system. IBM's system architecture is based on its trademarked Learning Alignment Model, which maps to the needs of all educational stakeholders and delivers customized user interfaces through a portal technology. IBM targets primarily large district and state-level contracts.

Strengths

- Possesses dedicated K-12 education consulting team with extensive market expertise
- Secures large-scale projects at the district and state levels
- Merges student performance data with administrative and operational data to perform complex data analysis
- Applies IBM's extensive business consulting experience to education clients

Challenges

- Continue to win and retain large, service-intensive customer accounts in a challenging K-12 budget climate
- Identify strategies for capturing opportunities among smaller districts cost-effectively

Key Partnerships

- TetraData (Data warehouse)
- Oracle (Data warehouse)
- SAS (Data warehouse)
- Hyperion (Data modeling)
- Business Objects (Business intelligence/data analysis)
- Cognos (Business intelligence/data analysis)
- Microstrategy (Business intelligence/data analysis)
- Otis Educational Systems (ETL)

Revenue Range

$10-25 million

Key Customers

- Broward County Public Schools, FL
- Cleveland Municipal School District, OH
- Elizabeth Board of Education, NJ
- Community Consolidated School District #15, IL
- Prince Williams County Schools, VA
- Trenton Public Schools, NJ

Contact

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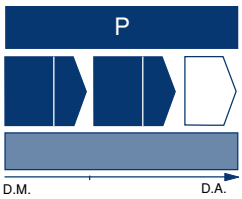
TetraData: Ease-E



Core Offering
Possesses Capability
Minimal Capability\ Does Not Offer
P Partners for Capability

Business Description

Founded in 1997, TetraData delivers K-12-specific data warehouse and analysis tool technologies and related services to school districts. Although TetraData's core competency is in data warehouse technologies, the company has recently developed several data analysis products and related professional development services. The company's solutions are available in both a client-server and an application service provider model. TetraData targets large and mid-sized districts and has secured a state-level data warehousing contract in North Dakota.

Strengths

- Possesses highly scalable data warehouse technology
- Has developed expertise in data warehousing consulting services
- Continues to expand solution by developing data analysis tools and services
- Provides seamless link between data warehouse and data analysis tools

Challenges

- Continue to evolve and develop consistent and systematic architecture for data warehouse product
- Establish greater brand awareness around data analysis suite and accompanying professional development services

Key Partnerships

- NDI Solutions (Consulting)
- IBM (Consulting)
- Otis Educational Systems (ETL)

Revenue Range

$5-10 million

Key Customers

- Akron Public Schools, OH
- Alliance of Regional Education Service Centers, CT
- Columbia Public Schools, MO
- Greenville County School District, SC
- North Dakota Department of Instruction

Contact

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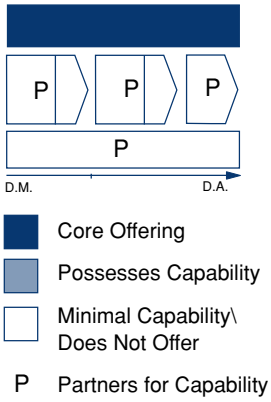
Large-Scope Players ($10-25 million in revenues)

Bearing Point

Business Description: BearingPoint is a multinational consulting and systems integration firm that specializes in customized large district and state data warehousing and application implementation and integration. The firm typically partners with education-focused and commercial technology application vendors.



K-12 DMA Revenues: $10-25 million

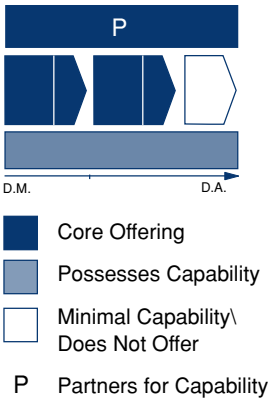
Selected Partners: Oracle (Data warehouse)

Selected Customers: Maryland State Department of Education
Oregon Department of Education

Website: www.bearingpoint.com

SAS

Business Description: Born out of SAS's experience in the corporate sector, SAS's Education Performance Management platform provides data warehousing, reporting, and analysis technologies and services. The company's student performance analysis tool is based on value-added analysis, in which each student's progress is analyzed individually, rather than in cohorts. The company focuses on large district and state contracts.



K-12 DMA Revenues: $10-25 million

Selected Partners: IBM Business Consulting Services (Implementation)

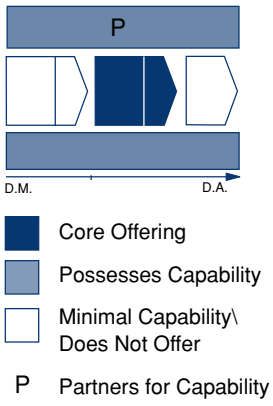
Selected Customers: Allen Independent School District, TX
Cary Academy, NC
Poway Unified School District, CA
Wake County Public School District, NC

Website: www.sas.com

Middle Market Players ($5-10 million in revenues)

Brio (Hyperion)

Business Description: Brio (Hyperion) is one of the world's largest companies focused solely on business performance management. The company has brought its focus on business intelligence and reporting in the private and public sectors to the K-12 education market. Brio typically partners with larger integration firms for implementation into large school districts and states.



K-12 DMA Revenues: $5-10 million

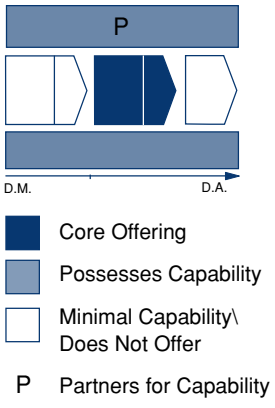
Selected Partners: eScholar (Data warehouse)
IBM Business Consulting Services (Implementation)

Selected Customers: Broward County School District, FL

Website: www.brio.com

Cognos

Business Description: Cognos is widely recognized by the public sector for its business intelligence and reporting applications. The company has leveraged its business expertise to provide analysis tools to several large K-12 districts. Additionally, Cognos' reporting and analysis tools are used by several data warehouse providers.



K-12 DMA Revenues: $5-10 million

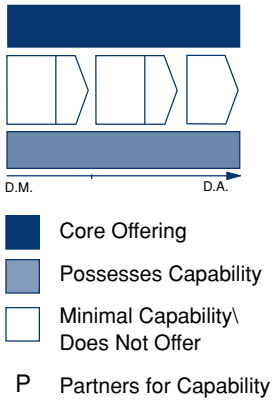
Selected Partners: eScholar (Data warehouse)
IBM Business Consulting Services (Implementation)

Selected Customers: New York City Department of Education, NY

Website: www.cognos.com

Evaluation Software Publishing

Business Description: Evaluation Software Publishing is a ten-year-old consulting firm that contracts with states to help define and plan state requirements for data collection and accountability solutions. The company has contracted with several states and the U.S. Department of Education.



K-12 DMA Revenues: $5-10 million

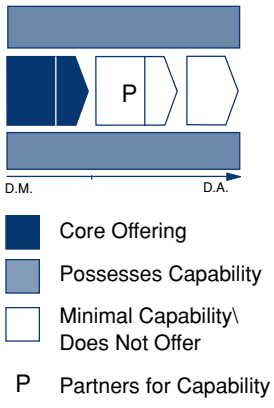
Selected Partners: None

Selected Customers: Council of Chief State School Officers
National Center for Education Statistics
Nevada Department of Education
San Antonio Independent School District, TX
U.S. Department of Education, Division of Policy and Planning

Website: www.evalsoft.com

eScholar

Business Description: EScholar is a K-12 data warehousing technology and services provider. The company partners with several reporting and analysis firms to fill out its solution. EScholar has implemented data warehouses in several hundred school districts that range in size from the largest U.S. districts to smaller districts.



K-12 DMA Revenues: $5-10 million

Selected Partners: Brio, Cognos, Business Objects, SPSS (Business intelligence and reporting)
SchoolNet (Data analysis)

Selected Customers Buffalo Public Schools, NY
Albany City School District, NY
Fort Wayne Community Schools, NJ

Website: www.escholar.com

Public Consulting Group, Inc.

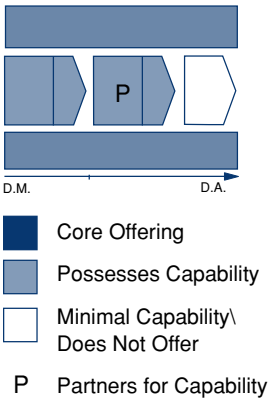
Business Description: Public Consulting Group is a services firm that focuses on improving operations within public sector agencies. Its education practice delivers ASP data management and analysis solutions focusing on the special education market.

K-12 DMA Revenues: $5-10 million

Selected Partners: Crystal Decisions (Data analysis and reporting)

Selected Customers: Boston Public Schools, MA
Minneapolis Public Schools, MN
San Francisco Unified School District, CA

Website: www.pcgus.com



The Pulliam Group

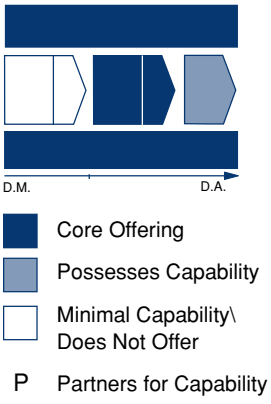
Business Description: The Pulliam Group provides technologies that utilize student achievement data to drive instructional practices. The company provides professional development and consulting, and specializes in special education and underperforming students. The company's data analysis tools focus solely on student assessment data and not operational data. The Pulliam Group targets primarily mid-size districts.

K-12 DMA Revenues: $5-10 million

Selected Partners: None

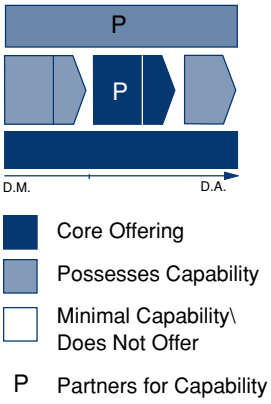
Selected Customers: Desert Sands School District, CA

Website: www.pulliamgroup.com



SchoolNet

Business Description: SchoolNet provides K-12-specific reporting and analysis technologies and services to districts. The company also provides curriculum standards alignment tools and communication/collaboration tools. SchoolNet offers a basic data warehouse technology, but partners with eScholar to serve clients with more complex data warehouse needs. The company targets primarily mid-size school districts.



K-12 DMA Revenues: $1-5 million

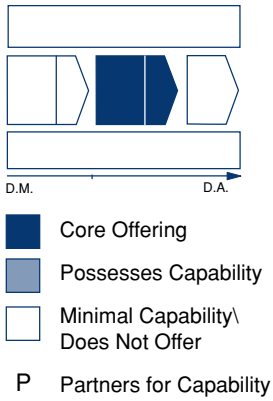
Selected Partners: eScholar (Data warehouse)
The Princeton Review (Assessment)
New American Schools (Consulting)

Selected Customers: Maricopa County School District, AZ
Beaufort County School District, SC
Reynoldsburg City School District, OH

Website: www.schoolnet.com

Standard & Poor's School Evaluation Services

Business Description: Standard & Poor's is a financial information firm that has created its School Evaluation Services business as an outsourced data analysis provider. The company partners with states and applies a proprietary methodology to create detailed analysis of educational data focusing on financial, demographic, and educational trends and indicators.



K-12 DMA Revenues: $5-10 million

Selected Partners: None

Selected Customers: Pennsylvania State Department of Education
Michigan State Department of Education

Website: www.ses.standardandpoors.com

New Entrants and Small-Scope Vendors (less than $5 million)

Co-nect

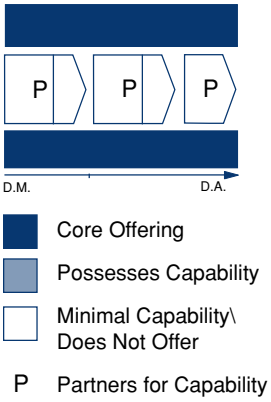
Business Description: Co-nect is a professional development firm that focuses on school improvement. The company recently launched a service called Dataflow, which offers training and professional development for using data in the classroom to identify professional development opportunities and improve teaching.

K-12 DMA Revenues: Less than $1 million

Selected Partners: Not available

Selected Customers: Not available

Website: www.co-nect.net



Confluent Technologies

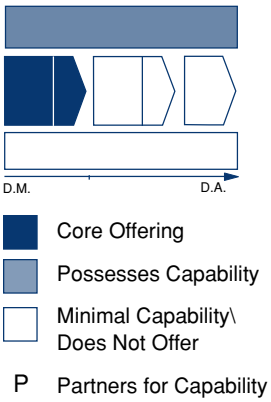
Business Description: Confluent Technologies provides data aggregation and analysis technologies for multiple industries. The company has a small education business that focuses primarily on small to mid-size districts.

K-12 DMA Revenues: Less than $1 million

Selected Partners: Not available

Selected Customers: Not available

Website: www.confluenttech.com



EDsmart

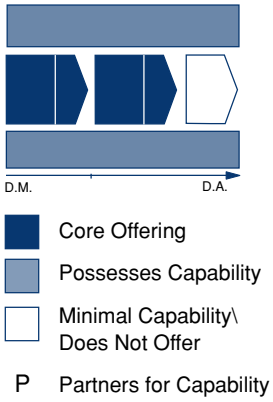
Business Description: EDsmart is a provider of data warehouse and data analysis applications. The company primarily targets small to mid-size districts.

K-12 DMA Revenues: Less than $1 million

Selected Partners: None

Selected Customers: Laconia Public Schools, NH
East Hartford Public Schools, CT
Winchester Public Schools, CT

Website: www.edsmartinc.com



Educational Testing Services (ETS)

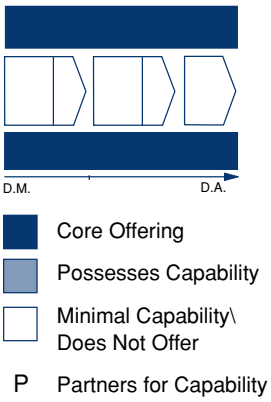
Business Description: ETS is a testing and measurement organization that conducts ongoing educational research. The organization's Pathwise professional development services provide workbooks that focus on using data to improve district, school, and classroom effectiveness.

K-12 DMA Revenues: Less than $1 million

Selected Partners: Not available

Selected Customers: Not available

Website: www.ets.org



New American Schools

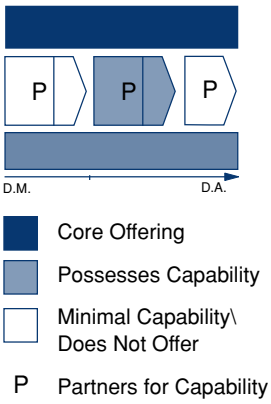
Business Description: New American Schools is a provider of professional services and investment in K-12. The company has recently developed a strategic consulting service centered on the use of data within schools — particularly public districts and charter school networks.

K-12 DMA Revenues: Less than $1 million

Selected Partners: SchoolNet (Data analysis)

Selected Customers: Pittsburgh School District, PA
Knowledge Is Power Program (KIPP)

Website: www.naschools.com



Otis Education Systems

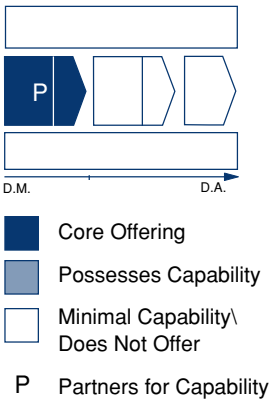
Business Description: Otis Education Systems provides an extraction, transformation, and loading technology that is embedded in many K-12 data warehouses, including those of TetraData and eScholar. Additionally, the company contracts with states and districts to assist with vertical integration of data.

K-12 DMA Revenues: Less than $1 million

Selected Partners: TetraData, eScholar, IBM Business Consulting Services (Data warehouse)

Selected Customers Clovis Unified School District, CA

Website: www.otised.com



Sagebrush Corporation

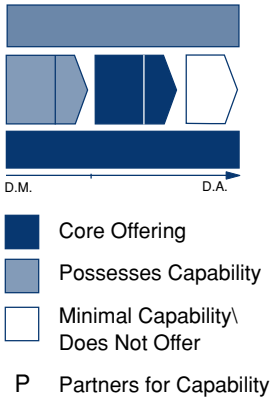
Business Description: Sagebrush, which primarily provides library services and search technologies, recently released a data management and analysis tool with training services.

K-12 DMA Revenues: Less than $1 million

Selected Partners: SwiftKnowledge (Software development)

Selected Customers: Not available

Website: www.sagebrushcorp.com



SPSS

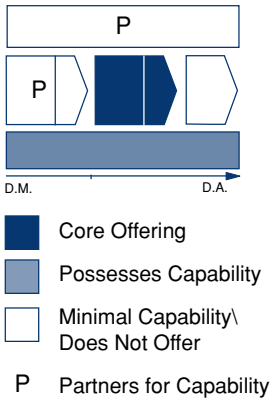
Business Description: SPSS provides statistical analysis applications that are used by corporations and the public sector. The software is also used by districts for data analysis.

K-12 DMA Revenues: $1-5 million

Selected Partners: eScholar (Data warehouse)

Selected Customers: Not available

Website: www.spss.com



Turnleaf

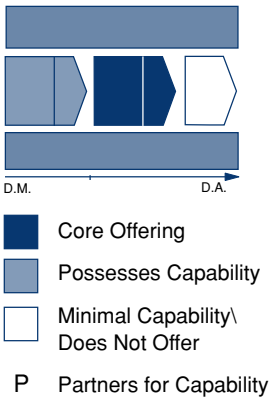
Business Description: Turnleaf merges student demographic data and assessment results to conduct data analysis. The company focuses primarily on small districts.

K-12 DMA Revenues: Less than $1 million

Selected Partners: Not available

Selected Customers: Harrison School District Two, CO
Hesperia Unified School District, CA
Santa Rosa County School District, FL
St. John's County School District, FL

Website: www.turnleaf.com



U.S. Open e-Learning Consortium

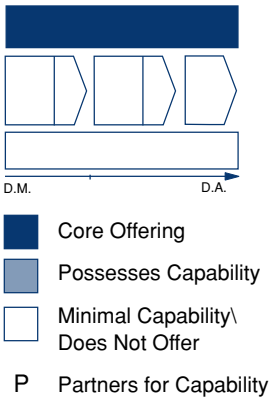
Business Description: The U.S. Open e-Learning Consortium is an organization that promotes the use of standardized, statewide data management and analysis platform architectures. The organization offers technical consulting to states attempting to create uniform data collection standards.

K-12 DMA Revenues: Less than $1 million

Selected Partners: Not available

Selected Customers: Not available

Website: www.ctlt.org/projects/us_open_e_learning



Conclusion

The 2001 reauthorization of the Elementary and Secondary Education Act or NCLB incorporated dramatic changes to previous ESEA reauthorizations, and has stirred up no shortage of controversy. The law has brought accountability and data to the forefront, and has driven states and districts to invest in applications that accurately track and analyze student data.

Congress reauthorizes the Elementary and Secondary Education Act, on average, once every four to six years. Regardless of the outcome of the next reauthorization, NCLB will have served as a catalyst to bring states and districts to a new performance measurement plateau. Within the next several years, most states and districts will have implemented systems from which they can measure, analyze, and direct the performance improvement of individual students, teachers, and administrators. Some view DMA systems as a critical new plateau in the improvement of the educational system — a plateau that allows administrators to tackle head-on the questions and analyses that have heretofore been difficult or impossible to address reliably. These questions include some of the most pressing educational concerns in the U.S., including examining the issue of achievement gaps among various groups of students.

Sensing a strong market opportunity, vendors are jockeying aggressively to position themselves in this market segment. Additionally, conversations with vendors that currently do not offer data management and analysis products and/or services inevitably lead to their inquiries about how they can get involved in this expanding market segment; professional development, tutoring, curriculum, and assessment vendors alike are exploring opportunities in the data management and analysis market segment. Thus, while private sector players will continue to bring high levels of creativity and innovative solutions to the K-12 data management and analysis market, the continued deluge of new market entrants may temporarily muddy the market segment. But, over the next year, market forces should begin to standardize offerings, at which point market players and bystanders can expect to see evidence of market segment consolidation.

Administrators will continue to address several issues in regards to state and district data management and analysis. Administrators must carefully consider what DMA system components they need to accomplish their NCLB-compliance goals and beyond. Once they have clarified their DMA components needs, administrators must navigate the barrage of marketing messages from vendors with slightly differentiated value propositions. States and districts will ultimately place the role of developing and maintaining DMA systems in the hands of the vendors through working partnerships. These partnerships have proven and will continue to prove more effective alternatives to the internal creation of data management and analysis systems.

Appendix A: Research Methodology

Making Sense of the Data: Overview of the Data Management and Analysis Market is based on interviews and discussions with senior executives of data management and analysis businesses, administrators and educators at K-12 districts and state departments of education, and other industry participants. A list of primary research participants can be found on page 50. In addition, Eduventures benefited from an extensive collection of secondary research that is available on this topic from K-12 publications, educational organizations, company data and press releases, association and consortia publications, and other information sources. Appendix B includes a selection of additional resources that readers may want to consider.

Eduventures' analysis is based on data and information provided by the businesses themselves, as well as secondary sources. Additionally, Eduventures leverages proprietary data and resources that it has developed over the course of its ten-year history serving the pre-K-12, postsecondary, and corporate learning markets. While Eduventures has made efforts to verify and cross-check the data, the information provided by participating businesses and institutions is generally unaudited and may have been compiled employing differing methodologies and definitions.

A preliminary draft of this report was completed in October 2003 and distributed to participating organizations. While some organizations provided clarifications and updates, all opinions and views expressed herein remain those of Eduventures, and Eduventures alone.

Appendix B: Additional Sources

Armstrong, Jane and Katy Anthes. "Identifying the Factors, Conditions and Policies that Support Schools' Use of Data for Decisionmaking and School Improvement: Summary of Findings." Education Commission of the States. April 2001. www.ecs.org/ecsmain.asp?page=/html/IssuesK12.asp

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Levinson, Eliot. "Data Warehousing and Management Tools." *SuperTech News.* BLE Group, Vol. 2 #2, May 2003. www.blegroup.com/supertechnews/may03.htm

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- "Schools Discovering Riches in Data." June 12, 2002. www.edweek.org/ew/newstory.cfm?slug=40data.h21
- "Education Scholars Finding New 'Value' in Student Test Data." November 2002. www.edweek.org/ew/newstory.cfm?slug=12value.h22
- "States' Plans Likely to Test ESEA Pliancy." February 19, 2003. www.edweek.org/ew/ewstory.cfm?slug=23account.h22
- "Education Department Accepts Variety of Strategies." June 18, 2003. www.edweek.com/ew/ewstory.cfm?slug=41account-s1.h22

Serim, Ferdi. *No More Flying Blind: Using Data-Driven Decision Making to Guide Student Learning*. Consortium for School Networking.
www.cosn.org

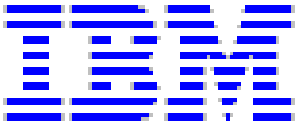
Stein, Matt. "Federal Legislation Sparks New Developments in Data-Driven Decision-Making." *The Education Economy*. Eduventures. Number 139, March 5, 2003.
www.eduventures.com/news/education_economy/archive/
education_economy_139.cfm

Appendix C: Acknowledgments

Eduventures would like to thank individuals in the following organizations who generously shared their time and insights:

Battelle for Kids
BLE Group
Co-nect
EDmin
Education Testing Services
EduSoft
eScholar
Evaluation Software Publishers
GoalView
IBM Global Services
Otis Educational Systems
Maryville Middle School, TN
New American Schools
Rochester Public School District, NY
Sagebrush Corporation
SAS
SAS Institute
SchoolNet
TetraData
U.S. Department of Education
U.S. Open eLearning Consortium

In addition, Eduventures would like to thank the following partners for their cooperation in supporting this research:



Making Sense of the Data

Overview of the K-12 Data Management and Analysis Market

By Matt Stein, Analyst

About Eduventures

Eduventures is the leading, independent research firm dedicated exclusively to the coverage and service of learning markets. We help organizations thrive in the new education economy. Our research, advisory services, and executive strategy conferences provide clients with a broad and deep knowledge of key industry metrics, emerging trends, and breaking news in the pre-K-12, postsecondary, corporate training, and consumer markets. Additional information can be found at www.eduventures.com.

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