

Data Warehousing Solution Helps Western New York State Improve Student Performance



Industry

Primary and Secondary (K-12) Education

Institution

Western New York Regional Information Center (WNYRIC)

Erie 1 Board of Cooperative Educational Services, New York State, USA

Solution Providers

- Cognos Incorporated
- eScholar, LLC
- Oracle Corporation
- Sun Microsystems, Inc.

Key Challenge

Utilize technology for data analysis to improve student performance.

Key Solutions

- Cognos Series 7, Version 2 (7.1)
- eScholar 5.0
- Oracle 8i
- Solaris™ 8 Operating Environment
- Sun Enterprise™ 420R
- 4 UltraSPARC(R) II 450 MHz processors
- 2 Sun StorEdge™ A1000 arrays

Primary and secondary educators in school districts worldwide face demanding and often cumbersome requirements to report academic progress, and this task is not getting any easier. To keep up with state and provincial standards and other objectives, including the U.S. Department of Education's No Child Left Behind Act (NCLB), districts require robust systems to access data.

Several years ago the Western New York Regional Information Center (WNYRIC), one of 12 such centers within New York State's Department of Education, faced the challenge of providing a data-driven decision support system. The result was a secure and reliable data warehouse system that facilitates continuous assessment of student achievement and performance—executed through eScholar™, a data warehouse solution designed specifically to meet the needs of primary and secondary education, running on Sun Microsystems hardware.

Cooperating on the cutting edge

WNYRIC supports 250,000 students in 100 school districts across five regional public education service organizations in the westernmost section of New York State, including the Erie 1 Board of Cooperative Educational Services (Erie 1 BOCES). Like its 11 counterpart centers across the state, WNYRIC works cooperatively with its component school districts. All centers have a role to play in delivering cutting-edge information technology services to individual districts through an expansive telecommunications network.

In the mid-1990s, district superintendents in western New York knew they had to begin making instructional decisions based on data, rather than hunches. That's when WNYRIC went to work on the project. The greatest challenge was to assemble information from multiple student and special education data management systems, most of which are building based, along with test data from publishers and local test scoring systems. The process continues to be a challenge, but the benefits far outweigh the technical complications.

By 1999 all 12 regional information center directors recognized the value in finding a vendor with an existing product that could help them advance their data warehouse initiative. The directors selected eScholar, the most widely used data warehouse solution for primary and secondary school systems in the United States today. Currently serving some 800 school districts around the country, eScholar integrates and cleanses data from a wide variety of sources, providing educators with critical, decision-making intelligence and reporting capabilities. The eScholar solution is built entirely around open standards, and can be easily scaled and customized to meet the needs of almost any size district—from as small as 800 students to as large as a million or more students.

The analysis capabilities of the WNYRIC warehouse malleable data views and reports provide districts with a data-driven foundation for instructional improvement.

“The best practice for data analysis endorsed by educators, administrators, and psychometricians around the state is related to Item Response Theory. The data warehouse provides educators with the tools to conduct this type of analysis including a review of the item difficulty for each question and their corresponding standard and sub-skill. Basing curriculum decisions on statistically relevant data helps school administrators initiate the essential conversations with teachers needed to positively impact student learning,” said Jenifer Gilson, WNYRIC manager of Test Scoring, Assessment, and Analysis.

Key requirements

WNYRIC decided on a UNIX® platform largely because of its need for a secure system. Because student data is extremely confidential, security is a huge issue for a school district. Other factors in the UNIX decision were overall performance, ease of maintenance and scalability. The center wanted to emulate the success of the e-commerce sector. It sought a vendor with a big stake in that sector with its platform, which is one reason it decided on Oracle for its database. Oracle’s solid partnership with Sun was a factor in the selection of Sun as the hardware vendor.

Josh Blair, WNYRIC database administrator, was aware of Sun’s reputation for equipment support and reliability. “We

found that reputation to be richly deserved, and the stability of the product has been unbelievable,” he said. Blair praised Sun’s support team. “We’ve taken advantage of the hardware and software support lines, as well as using some of the educational services. They and their local partner, ServerWare Corporation, have all been extremely responsive and helpful,” he said.

The project started out small, beginning with a subset of data, and then handling more data with the implementation of eScholar. “As we grew, we easily scaled up by adding drive storage to the base system and an additional network card,” said Blair.

WNYRIC’s current base unit is a Sun Enterprise™ 420R system with four UltraSPARC® II 450 MHz processors with 4 gigabytes of memory; and two Sun StorEdge™ A1000 drive arrays allowing over 300 gigabytes of storage. The equipment has met WNYRIC’s needs for the past five years and is expected to provide sufficient scalability for several more years.

Along with the Solaris™ 8 Operating Environment, WNYRIC is running Oracle 8i and eScholar 5.0. In addition, the center is running Cognos Series 7 Version 2 (7.1), a front-end reporting tool that is used to access the database.

Success and growth

At conception, only a few of the component school districts participated in the WNYRIC Data Warehouse service that housed grade 4 and 8 Mathematics and English Language Arts assessment data. Over the years, however, understanding of the value of data analysis

grew, as did the number of districts in the service. Currently, the WNYRIC supports 98 percent of the districts in the region. The center has continued to expand past its initial requirements, allowing for more and more complex data analysis. The center has added kindergarten through 12th grade assessments, which include local, New York State Regents, and other standardized tests.

In addition to assessment analysis, WNYRIC develops views and reports accommodating the school districts’ concerns around early literacy, academic intervention services and special education, as well as customized projects for school districts. Ultimately, there is no limit to the types of analysis that can be performed. One day data analysis facilitated by eScholar on Sun may assist districts in determining whether attendance makes a difference, whether kids perform better when they’re in a lunch program, or whether parents’ level of education affects achievement.

“We know that the teacher student relationship is fundamental to learning,” said Richard Doster, director of the Western New York Regional Information Center at Erie 1 BOCES.

“Educators in our region are routinely using the data warehouse not only to try to get at the root causes of inadequate student performance but also to target staff development and resource allocation to improve that performance. With the help of Sun Microsystems and our other vendors, we are succeeding in enhancing the teaching-learning process,” he said.

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Sun Java Enterprise System Software

Software	Purpose
Directory Server	For storing and managing identity profiles, access privileges, application and network resource information.
Identity Server	Manage secure access to Web and non Web-based applications.
Directory Proxy Server	Secure firewall-like services, designed for large numbers of users, protects against directory "denial of service" attacks, routes requests from clients to appropriate directory server.
Application Server	A high performance, small footprint, J2EE™ platform suitable for broad deployment of application services and Web services.
Message Queue	Affordable, standards-based messaging solution, connects software together to form one efficient enterprise.
Web Server	Secure deployment platform for all types of Web applications.
Portal Server	User, policy and identity management for security, single sign-on and access capabilities with personalization, aggregation, security, integration, mobile access, and search.
Calendar Server	Manages and coordinates appointments, events, tasks, and resources with a Web-based interface that is accessible anytime, anywhere from any Web-enabled device.
Messaging Server	Provides secure, reliable messaging services for entire communities of students, teachers, administrators, and parents.
Instant Messaging	Secure, real-time communication and collaboration such as chat, conferences, alerts, news, polls and file transfers.
Sun Cluster	Manage application services, optimizing both the availability and scalability for service continuity at lower cost and risk.
Meta Directory	Consolidate and integrate identity information throughout the enterprise into a single profile.
Integration Server	Integrate packaged, custom, legacy, and new Java applications to run on multiple operating systems across multiple communication protocols within the enterprise.

