



Improving Data Collection for Implementation Success of the No Child Left Behind Act

Executive Summary

The passage of the *No Child Left Behind Act* (NCLB) increases the demand for more immediate access to high-quality education data across the pK-12 education enterprise. The bulk of information needed to respond to these and other federal reporting requirements are initially captured in local schools and district offices to support local operations and decision-making. Data are subsequently moved through state information systems to the USED. Federal, state and local dependence on the quality and availability of education data to inform decision-making has never been higher. SIF is providing both the comprehensive data set and the transaction choreography necessary to enable the collection and movement of education data to support local, state and federal reporting.

The No Child Left Behind Act

On January 8, 2002, President Bush signed into law the *No Child Left Behind (NCLB) Act of 2002*. The Act outlined four basic education reform principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that have been proven to work.

NCLB substantially restructured and revised many federal education programs. NCLB testing and reporting requirements extend the 1993 Elementary and Secondary Education Act (ESEA) accountability reforms that focus on math and reading. NCLB included yearly state testing in grades 3-8, participation in the National Assessment of Educational Progress (NAEP), more stringent definitions of adequate yearly progress (AYP), and remedies/penalties/rewards for schools, districts and states based upon AYP results. NCLB is breaking new ground by requiring the collection of data that describe school effectiveness through measurements of student progress and staff effectiveness.

The data points necessary to make these determinations come from across the pK-12 enterprise -- from student enrollment by socio-economic status, from student performance on standardized tests disaggregated by race and ethnicity, and from class schedules, staff qualifications and teaching assignments.

Data Inaccessibility

In many school systems, most of this data is maintained in a variety of unconnected software applications and the required data import/export is time-consuming and costly. These applications are often purchased by different departments within a school or district, resulting in data "silos" that mirror the school and district organizational structure. (See Fig. 1.)

The impact of NCLB is that schools, districts, and states must draw their data out of these disparate applications in order to respond to the new requirements imposed by NCLB's 'horizontal questions.' These 'horizontal questions' cut across both the software and organizational silos. (Figure 2)



Fig 1. Traditional PK-12 Vertical

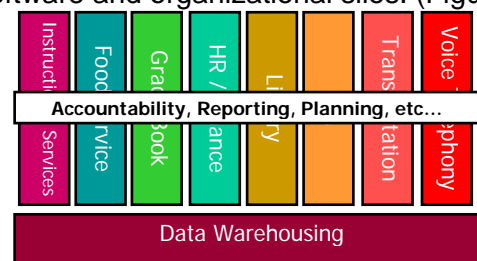


Fig 2. 'Horizontal Questions'



Schools Interoperability Framework enables data mobility

The Schools Interoperability Framework (SIF) is a non-profit technical standards association. SIF is comprised of over 150 education companies, school districts, the U.S and state departments of education, regional service agencies and other educational institutions collaborating to develop technology standards that dramatically improves the overall efficiency of administration in pK-12 schools, particularly in the areas of data entry and data management. SIF provides a framework for sharing data that enables educational institutions to better utilize technology solutions. The members of SIF are jointly building the set of rules and definitions to enable pK-12 software applications to share data quickly, dynamically and securely.

The SIF Specification (www.sifinfo.org/specification.asp) enables data to move among software applications to support 'horizontal interoperability'. Horizontal interoperability allows school administrators and educators to streamline data management and create a true 'information management system' bringing together all of their disparate data repositories through a platform-independent, vendor-neutral communications architecture based on open standards.

SIF has done this through the creation of the "SIF Zone", the logical grouping of software applications that allow SIF to work. (Fig. 3)

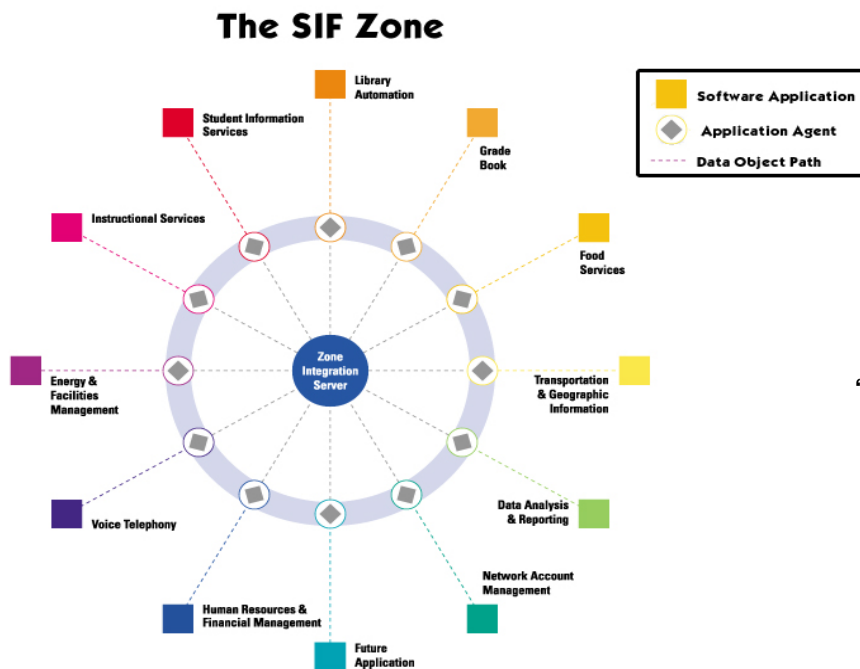


Figure 3
"SIF Zone"

There are four elements that make up a SIF Zone:

1. Software Application

- Any software application chosen by and implemented in a school or district.

2. SIF Data Object

- A set of information shared by software applications using the rules of the SIF Specification.
- Data Objects are shared through SIF messages and use standard XML notation.

3. SIF Agent

- A software program that serves as the intermediary between the software application and the SIF Zone. SIF agents are usually provided by the developer of the software application.
- An Agent is able to publish messages when events occur in its application, react to incoming events, and request data and process responses from other applications.



4. ZIS (Zone Integration Server)

- The ZIS acts as the central communication point in a SIF Zone.
- The ZIS keeps track of all the agents interacting within the Zone and manages the transactions between and among Agents.
- The ZIS enables SIF Agents to provide data, subscribe/publish events, request data and respond to requests.
- The ZIS is also responsible for all access control and routing within the Zone.

In most school systems today, data is entered multiple times in each application leading to great amounts of effort, time, cost and inefficiency. SIF “works” when a SIF Agent (connected into a software application) sends a message to the ZIS with information that another software application needs. The ZIS forwards that information on to the requesting application through the receiving application’s Agent. The ZIS’ role as a “third-party message handler” means that the SIF framework is easily expandable, very reliable and relatively straightforward for software companies to write Agents.

Solutions

Creating a unified system to move data offers tremendous advantages for school management. By moving data quickly and accurately, costly and redundant data entry is eliminated, freeing staff to focus on delivering services directly to students. In addition, because all of the data is based on the same source, changes are distributed quickly. This guarantees that everyone has access to the most current and accurate data available (Figure 4).

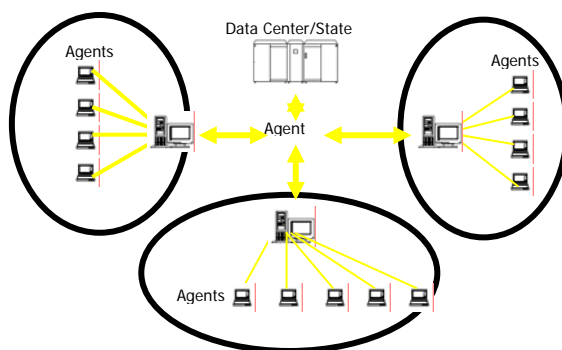
<u>New Student Registering for Enrollment into:</u>	
*Student Information System	*Directory Service Application
*ID Card System	*Library Automation System
*Cafeteria Management System	
Typical School	SIF School
- 49 minute task	- 4 minute task
- 10 times data entered	- 1 time data entry
45 minutes/student X 18,000 students= 6 FTE's!	
1/10th the Time – 1/10th the Risk	

**Figure 4
Actual
District
SIF
Example**

With budget constraints and increasing federal and state accountability requirements, operational efficiency and the ability to generate valid and timely reporting will be critical to the successful operation of a school or district. By taking a systematic approach to data management and implementing SIF-enabled software to support those systems, schools can redirect resources and staff from redundant data-centric tasks to valuable child-centered education.

The underlying premise of SIF - creating a uniform and unified data system - can act as the catalyst to the kind of management review and business reengineering in education that many private sector businesses undertook a decade or more ago. By looking at their management and operational systems from a data perspective, businesses were able to implement technology to increase efficiency/productivity and improve their operations. SIF offers the same opportunity to schools today.

SIF provides the delivery architecture and the data set that states and school districts can use to move data from the local level to the state level quickly, dynamically and securely. Because the SIF framework supports both 'real-time' event-based messaging, as well as a 'request and response' model that is asynchronous, there are a variety of ways in which this district-to-state communication could occur. The ability of a school or district to use SIF to move data from the local school system to a state or federal system for reporting is what we term 'vertical interoperability' (Figure 5).



**Figure 5
Vertical
Reporting**

Just as the exact configuration of a local Zone will vary depending upon the business requirements of the local school or district, so the models for vertical interoperability vary as well. For example, Fig. 5 offers one model of district-to-state 'vertical interoperability'. This model envisions 'horizontal' zones at each of the state's school districts and the state's data warehouse system SIF-enabled with its own Agent. This model would follow the current reporting model, with automation reducing the school and district reporting burden and supporting data cleansing and validation at the state level.

Because SIF is already fostering 'horizontal interoperability' within the school or district, it is possible to enable 'vertical interoperability' to support state and federal reporting without imposing a significant additional burden on the local schools or districts. SIF-enabled vertical interoperability will reduce the amount of time and effort necessary to collect and report school data - eliminating much of the current reporting burden (Figure 6).

<u>Wyoming State Reallocation from State Reporting</u>	
✓	Eliminate 23 Aggregate Reports
✓	Reduce 8 hours per school per report
✓	Reduce 16 hours per district per report = 70,000 hours school staff = 18,000 hours district staff = \$1,760,000 est. state report savings

**Figure 6
Actual
State
SIF
Example**

Improved Data Quality

The 'horizontal interoperability' that SIF enables leads to more accurate data at the local level. More accurate local data increases the data quality supplied through 'vertical interoperability' and the decisions made using this data at each level are better informed. Because this model uses local school or district software applications to supply data directly to the state or regional office, the data is inherently 'cleaner' than it might otherwise be. The data being used for reporting is the same data that is used by local school officials for their daily school management – an incentive to keep the data as accurate as possible. Accurate local data improves the quality of statistics in state-level aggregations. Thus, a cycle of data integrity is created as the relevance of the data to each level is enhanced.

Conclusion

The result of the joint efforts of a broad cross-section of vendors and educators, the SIF Specification was developed to enable data interoperability among pK-12 software applications. This platform-independent, vendor-neutral 'horizontal interoperability' helps schools and districts streamline their data management and improve their data quality. By implementing SIF, schools can reap the benefits of improved data mobility today and prepare for enhanced 'vertical interoperability' in the near future.