**Pros and Cons of Various SIS Implementation Models**

Summary Report for Kansas State Department of Education

*January 2018*

**Introduction**

The Kansas State Department of Education (KSDE) and Kansas State Board of Education (KSBE) are considering how best to support all Kansas school districts in collecting and reporting data to fulfill KSBE’s mission to prepare Kansas students for lifelong success through rigorous, quality academic instruction, career training, and character development according to each student's gifts and talents. Specifically, they are seeking solutions for implementing actionable and dynamic data systems (ADDS) to improve data access, timeliness and quality while reducing cost and burden on Kansas schools. KSDE is currently working with researchers at Teachers College, Columbia University to investigate the pros and cons of various possible solutions and to establish the resource requirements and cost implications of implementing each solution across the state.

KSDE has identified six possible models of implementing student information systems (SISs), including the current model, and is gathering input from Kansas districts, SIS vendors, and other states on the pros and cons of each model, the costs of implementation and the potential benefits. This report summarizes the findings regarding the pros and cons of SIS models from interviews conducted by KSDE and Teachers College with two state CIOs and personnel from five Kansas school districts.

**Current Model of SIS Implementation in Kansas and Possible Improvements**

Each district in Kansas is currently free to choose its own SIS vendor and to decide whether the data will be stored locally on a server or by the vendor “in the cloud,” i.e., at an offsite server via the Internet. Each district chooses what kinds of data to collect and in what format in order to create reports for local accountability and decision-making purposes. Because different vendors and districts configure their SISs differently, the data vary in format across districts. However, all districts are required to submit certain data in specified formats to KSDE for state and federal reporting purposes.

Data required for state and federal reporting are entered manually into the SIS by district building and central office personnel. Reports are prepared and submitted periodically to KSDE by district office personnel who validate the data, correct errors and manually upload the reports to KSDE. District office personnel must ensure that the data are in the specific format needed for submission to KSDE before uploading, otherwise the reports are rejected by KSDE personnel and must be corrected by district office staff before re-submission.

In some cases, the data are not corrected in the source system (i.e., within the local district’s SIS) but only in the report being prepared for submission. In these situations, the errors remain in the source system and must be corrected each time a new report is generated. In cases where the district’s SIS data format diverges in many ways from the KSDE specifications, this situation leads to inefficiency in use of time and leaves a great deal of room for human error.

Each time KSDE decides to change a reporting requirement, districts must either reconfigure their data format in the SIS, or find a workaround while preparing the relevant report. The latter may be more likely if the new state requirement is at odds with a local reporting requirement.

Goals for improving the current system include:

1. Increasing the consistency and accuracy of data collected across districts in order to produce reliable and high quality reports
2. Eliminating the burden of manual uploads for state reporting by implementing a system in which district data are standardized and automatically pulled into a centralized data store on a daily or real-time basis
3. Increasing the speed at which KSDE receives data and can process them to provide up-to-date, timely and actionable reports to districts
4. Reducing the SIS license costs paid by individual districts by negotiating with vendors at the state level.

**Possible Models of SIS Implementation**

These goals could be achieved to varying degrees by pursuing one of the following actions:

* Requiring all districts to use the same SIS vendor, OR
* Requiring all districts to use vendors which develop the software capability to connect the district’s SIS to a centralized, state-wide data store, OR
* Offering districts the choice between using a state-wide vendor and continuing with their current vendors provided they connect to the centralized data store.

Building from these alternatives, KSDE has identified five possible ways in which SISs could be implemented across the state in addition to the current model, yielding six options for consideration. Option 1 is to maintain the current model of SIS implementation in Kansas. This was described on page 1 above but can be summarized as follows:

**Option 1: Maintain current system: districts choose own SIS vendors, hosting is local, no central data store**

If significant improvements to the current model are to be realized, the other five options described below should be considered. Initially, a decision must be made as to whether all Kansas districts should be required to use the same, state-selected SIS vendor or should continue to be free to choose their own SIS vendor.

If districts are permitted to continue choosing their own SIS vendors, KSDE could create a central data store and require each SIS vendor serving a Kansas district to develop the capability to standardize the district’s data and transmit it automatically to the central data store. KSDE would need to provide the SIS vendors with a detailed specification for the data format that will be compatible with the central data store. In the future, each time KSDE requires a change in reporting, all vendors must modify the connecting software. While the vendors may be willing to create the initial software without charge, they may charge districts or KSDE for later changes. This model constitutes Option 2:

**Option 2: Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store**

A variation on Option 2 would be for KSDE to contract at the state level with one particular vendor and give each district the choice of continuing with its existing vendor (provided the vendor builds the connectivity to the central data store) or switch to the state-contracted vendor. This yields Option 3:

**Option 3: Districts choose own SIS vendors or a state-contracted vendor, hosting is local but each SIS must connect to a central data store**

If Kansas decides to shift all districts to a single vendor, this would require any district not currently using the state-selected vendor to contract with the state-selected vendor, pay new start-up fees, transfer all their current and historical SIS data to a new system, and train all SIS users in how to use the new system.

Depending on where the data are hosted and how they are relayed to KSDE, there are three alternative models of implementing SISs across the state with a single vendor. Firstly, districts could continue to host their data locally and upload them manually to KSDE’s systems. KSDE would not build a central data store to which the individual SISs would connect. This yields Option 4:

**Option 4: Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect**

Secondly, districts could continue to host their data locally (or ask the vendor to host them on their behalf in the cloud) but KSDE would build the central data store and the state-selected vendor would develop the capability to connect all districts to the central data store. This is Option 5:

**Option 5 Single state-selected vendor, local hosting, central data store to which all districts connect**

A final option would be for KSDE to host the data centrally, or ask the vendor to do so. This would eliminate the need to build a special interface to transmit the data from each district to the state. This is Option 6:

**Option 6: Single state-selected vendor, central hosting**

The charts below summarize the main features of each of the SIS implementation models being considered.

**Current SIS Implementation Model in Kansas**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Option** | **Model description** | **Each district can choose its own vendor** | **KSDE offers districts the choice of a state-contracted vendor** | **SIS is hosted locally or by vendor on behalf of district** | **SIS is centrally hosted by vendor or KSDE** | **Manual uploads required for state reporting** | **Automatic submission of reports** |
| **1** | ***Current model in Kansas:***  Each district chooses its own SIS vendor. Each district determines services or features purchased. Manual data uploads and data entry required for state and federal reporting. | √ | × | √ | × | √ | × |

**SIS Implementation Options in which Districts Choose their Own Vendors**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Option** | **Model description** | **Each district can choose its own vendor** | **KSDE offers districts the choice of a state-contracted vendor** | **SIS is hosted locally or by vendor on behalf of district** | **SIS is centrally hosted by vendor or KSDE** | **Manual uploads required for state reporting** | **Automatic submission of reports** |
| 2 | ***Same as 1 with connection to central data store:***  Each district chooses its own SIS vendor. Each district determines services or features purchased. All Kansas SIS vendors would be required to comply with a KSDE application programming interface (API) which would allow for data to sync, in near real time, between the local SIS and a KSDE-hosted Data Warehouse. Would reduce amount of data manually uploaded to KSDE. | √ | × | √ | × | × | √ |
| 3 | ***Same as 2 with additional option to use a state-contracted vendor:***  Each district chooses its own SIS vendor or could choose to use a state-contracted vendor. All Kansas SIS vendors would be required to comply with a KSDE application programming interface (API) provided by a state vendor. This would allow for data to sync in real time between the local SIS and a cloud-hosted state system. Would reduce amount of data manually uploaded to KSDE. | √ | √ | √ | × | × | √ |

**SIS Implementation Options in which Districts All Use the Same Vendor**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Option** | **Model description** | **Each district can choose its own vendor** | **KSDE offers districts the choice of a state-contracted vendor** | **SIS is hosted locally or by vendor on behalf of district** | **SIS is centrally hosted by vendor or KSDE** | **Manual uploads required for state reporting** | **Automatic submission of reports** |
| 4 | ***One vendor for all, no central data store***  All districts would use the same SIS vendor contracted to offer the same base features and services to each district. The SIS would be hosted locally by the districts or the vendor. Districts could add additional services beyond the base license at additional local costs. Manual data uploads and data entry required for state and federal reporting. | × | N/A | √ | × | √ | × |
| 5 | ***Same as 4 with connection to central data store***  All districts would use a single shared statewide SIS vendor offering the same base features and services. The statewide SIS vendor could be hosted locally, or provisioned per district in the cloud. Districts could add additional services beyond the base license at additional local costs. Statewide vendor would be required to comply with a KSDE application programming interface (API) which would allow for data to sync, in near real time, between the local SIS and a KSDE-hosted Data Warehouse. Would reduce amount of data manually uploaded to KSDE. | × | N/A | √ | × | × | √ |
| 6 | ***Same as 5 but hosted centrally, no API needed***  All districts would use the same SIS vendor contracted to offer the same base features and services to each district. SIS would be hosted by KSDE or by the statewide SIS vendor. Districts could add additional services beyond the base license at additional local costs. Would reduce amount of data manually uploaded to KSDE. | × | N/A | × | √ | × | √ |

**Interviews to Collect District Perspectives on Pros and Cons of Possible Implementation Models**

Between November and December 2017, five Kansas school districts[[1]](#footnote-1) participated in a pilot survey and follow-up telephone interviews about their current and future SIS needs and the resource requirements to operate them. District office personnel[[2]](#footnote-2) were asked to discuss the pros and cons of the current model of SIS implementation across the state and to comment on the five other possible models of SIS implementation that KSDE is considering. Each of the five districts currently uses a different SIS vendor and one is in the process of shifting to a new vendor.

The pros and cons identified by the five districts regarding different possibilities for SIS implementation are detailed below. Key takeaways include:

* Most districts expressed a strong desire to maintain local choice over which SIS vendor they use so that the SIS can be configured to meet the unique needs of the district.
* Districts welcomed the prospect of eliminating manual uploads of data to KSDE for reporting purposes although some pointed out that the most time-intensive work is entering and validating the data before submitting to KSDE.
* Districts were averse to the prospect of being forced to convert to a new SIS due to the expense and enormous effort required to build buy-in from users for the change, train staff to use the new system, migrate data from an old system to a new one, and ensure that the new system provides the reports needed by the district’s local users, in addition to state and federal reports.
* Reflecting these preferences, districts generally appeared most amenable to the option to keep their own vendor and connect to a central data store for automatic data transfer. They were least enthusiastic about the possibility of a statewide SIS hosted centrally by KSDE.

**Pros and Cons Identified by Five Kansas School Districts for Possible Models of SIS Implementation**

The pros and cons are reported as they relate to different decision points:

* Districts can continue to choose own vendor
* Single state-selected vendor for all districts
* Local hosting with no connectivity to a central data store
* Local hosting with connectivity to a central data store
* Central hosting.

Local choice of vendor

Pros

* Allows individual district choice of SIS vendor
* Freedom to customize SIS to each district’s needs and procedures
* Avoids effort required to convert to a new mandated system, e.g., data migration, training to learn a new system, building user buy-in for change

Cons

* Inconsistent data formats across districts leading to difficulties standardizing for state and federal reporting
* Data cannot be exchanged easily between districts
* Too many different vendors for KSDE to provide support for all of them
* Expensive for some districts and sometimes a long wait to fix problems

Applies to:

Option 1: Maintain current system: districts choose own SIS vendors, hosting is local, no central data store

Option 2: Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store

Option 3: Districts choose own SIS vendors or a state-contracted vendor, hosting is local but each SIS must connect to a central data store

Single state-selected vendor across the state

Pros

* This works well for districts already using the state-selected vendor
* Lower license costs for districts due to state-negotiated license fees
* Districts still have the choice to purchase add-on features beyond base features covered by state-negotiated license fee
* All districts would have data formatted and stored the same way
* Data can be exchanged easily between districts
* Only one vendor would need to adjust SIS to accommodate new information requests from state/legislature/federal government
* Professional development on SIS would be the same for all districts
* Larger user base will lead to better support being offered
* Continuity for KSDE

Cons

* Eliminates local choice: districts argue that they are unique and need the flexibility to institute policies and procedures that benefit their particular students and staff
* Loss of district flexibility to manage SIS configuration for office and gradebook use
* For districts that have to switch to a new vendor because they currently use one that is different from the state-selected vendor there will be new start-up fees
* Smaller districts may not be able to afford costs of a switch
* Additional local cost for features not covered by state-negotiated license fee
* For districts that have to switch to a new vendor because they currently use one that is different from the state-selected vendor, implementation, data migration, change management and professional development will be time-consuming and expensive, especially for large districts
* Individual districts could be resentful and users might direct any frustrations with SIS towards state

Applies to:

Option 4: Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect

Option 5: Single state-selected vendor, local hosting, central data store to which all districts connect

Option 6: Single state-selected vendor, central hosting

Local hosting with no connectivity to a central data store

Pros

* No effort required to build central data store and develop connectivity between districts and central data store
* With a locally-hosted system districts can each access their SIS without WAN connectivity

Cons

* Districts have to upload data manually for state reporting
* Data inconsistencies will persist

Applies to:

Option 1: Maintain current system: districts choose own SIS vendors, hosting is local, no central data store

Option 4: Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect

Local hosting with connectivity to a central data store (via an API)

Pros

* Reduces time spent on manually submitting state reports
* Shifts pressure onto the software provider to ensure data flow back and forth without error
* State can take snapshots of data without having to reach out to districts
* With a locally-hosted system can access the SIS without WAN connectivity

Cons

* Effort and resources required by KSDE and vendors to develop and implement software to connect local SISs to central data store
* Districts must store data in standardized format for automatic retrieval into central data store
* Limits local choice of vendor to those able to interface with the central data store and may therefore require some districts to switch vendors

Applies to:

Option 2: Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store

Option 3: Districts choose own SIS vendors or a state-contracted vendor, hosting is local but each SIS must connect to a central data store

Option 5: Single state-selected vendor, local hosting, central data store to which all districts connect

Central hosting

Pros

* The state would be responsible for program functionality and support
* No need to develop software to connect each district SIS to the state

Cons

* Reliability of software access and support would be in question
* Concerns about timeliness on the system
* Districts that integrate multiple systems might not be able to execute integrations without impacting other districts
* Internet outages or bandwidth problems could be an issue with cloud-based hosting, resulting in schools not being able to maintain data

Applies to:

Option 6: Single state-selected vendor, central hosting

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**Pros and Cons of Different SIS Implementation Models based on State CIO Interviews**

In addition to the five Kansas districts, two state CIOs were interviewed in late 2017, one from a state which mandates that all districts use a single vendor (State A) and one from a state which requires all districts to abide by the same data standards and have their SISs connect automatically and in real time to a state data store (State B).

State A pays for each district to have an “instance” of the SIS and they are all connected by a central data store which updates in real time. Districts have the option to purchase a local copy of the SIS which synchronizes nightly to the state system. This option is mainly used by larger districts. Districts can also purchase additional features and functions that are not included in the package offered by the state but these must be approved by the state. This model is closest to Option 5 described above (Option 5: Single state-selected vendor, local hosting, central data store to which all districts connect) except that, in Kansas, each district would pay for the SIS itself. State A has had this system in place for many years and the shift to a single vendor paid for by the state was mandated by the state legislature.

In State B, each district can choose its own vendor provided the vendor is certified in meeting the required data standards and has developed the software necessary to connect to the state data store. Most, but not all, districts in State B were able to keep their existing vendor when this requirement was instituted 3-4 years ago. This model is essentially Option 2 above (Option 2: Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store).

Both states’ models require initial and ongoing resources to be provided at the state level. Both are expected to improve the quality and accuracy of the data provided by the districts and to make up-to-date data immediately available to the state. This reduces the amount of time the state spends checking for data errors and requesting corrections from districts, allows the state to provide timely reports back to the districts that can be used to improve teaching and learning, and streamlines the fulfillment of state and federal reporting requirements.

According to the State A CIO, State A’s model (Single state-selected vendor, local hosting, central data store to which all districts connect) provides several **advantages** related to efficiency and costs:

* The State Department of Education can report ESSA-required data directly to the U.S. Department of Education without much burden on the districts. This is especially beneficial for school districts that have the fewest resources.
* Uniform reporting: it is easy for the state to provide a state report card.
* The costs per student are much lower because of state-negotiated pricing. The state estimated that large school districts which purchase the same features for themselves pay 50%-60% more per student compared to the state system.
* Districts can focus on data quality and rely on the state to manage and support the SIS. They do not need to test or update new modules. Problems with the SIS are reported to the state for troubleshooting.
* The state can efficiently provide training and guidance relevant to all districts because only one SIS vendor is being used.

State A’s CIO identified three main **disadvantages** of State A’s model:

* Some districts, especially larger ones, want autonomy from the state, e.g., to create their own reports for building principals rather than use those produced by the statewide SIS.
* If there is a problem at the company hosting the central data store, the whole system goes down and everyone is affected. A robust infrastructure is needed to host a centralized data store.
* Exposure to one SIS vendor. Contracts should be written to ensure that the hosting companies (e.g., Amazon, Microsoft) have the obligation to provide customers with access to their data even if the SIS vendor goes out of business.

State B’s CIO listed the following **advantages** to State B’s system:

* Most districts could keep their existing SIS.
* Eliminates manual uploads of data to the state thereby reducing reporting time.
* All districts, except the largest which already had very low pricing, could benefit from lower license fees due to state-negotiated prices.
* Speeds up data collection processes for reporting purposes, e.g., to the legislature or federal government.
* Allows state to provide an up-to-date teacher dashboard for every teacher in the state.
* Data accuracy checks by districts are now continuous. Previously they were concentrated in a single period before manual submission.
* Allows the state to provide professional development and support more efficiently as there are fewer different SIS systems being used.
* Allows for action research on the impact of specific educational interventions on student outcomes by facilitating the comparison of student performance among those who partake in an intervention with those who do not.
* Maintains competition among SIS vendors in the state and forces them to give up proprietary data models that deter customers from switching to another vendor.
* If a district wants to switch vendors, its data are easy to move because they can simply be downloaded from the data store and are in a standardized format that other state-compatible vendors can accept without modifications.
* Vendors can now access standardized data that makes it easier to build dashboards and other applications that are applicable to all districts across the state.

State B’s CIO identified four main **disadvantages** of State B’s model:

* It requires an investment by vendors and significant amounts of time to build the software (a kind of Application Programming Interface or API) that allows the districts to connect to the state data store. However, as several states have now instituted this requirement, the software for one state can be modified for another without starting from scratch.
* Need ongoing funding at the state level to maintain connectivity for multiple vendors to central data store. The support and management required to maintain interoperability with other systems is high.
* During the transition period when old and new systems are running in parallel, the support workload for state SIS personnel and the data storage needs double. District personnel also have extra work to compare old and new data submissions.
* State Department of Education staff must be “retooled” to build capacity to support the software required to connect district SISs to the central data store.

**Words of Advice from State CIOs**

State A’s CIO cautioned against a “big bang” approach for switching from one SIS to another and recommended bringing districts on board gradually and also running old and new SIS systems in parallel for some period of time (around one year).

State B’s CIO stressed the importance of continuous and frequent communication with both stakeholders and vendors and of managing expectations by letting districts know how much time and effort a change will require. The CIO noted that face-to-face communication is particularly helpful in assuring stakeholders that future benefits are worth the initial pain of change. He also suggested involving districts who are most likely to object to change in early pilot explorations so that they can be part of the decision-making process and help identify solutions that are palatable to all districts.

State A’s CIO noted that whether the SIS has an impact on student outcomes is more likely to be related to the functions it offers rather than whether the system is centralized or decentralized across the state. He suggested, for example, that an alert system used in another state where he worked previously which sent messages to parents about grades and student absences led to a slight improvement in grades and attendance.

**Conclusions**

While there are clear advantages to implementing a statewide SIS in terms of improving the consistency of data across the state and the ease with which data can be submitted and accessed for state and federal reporting purposes, this initial feedback-gathering process suggests that districts may be reluctant to convert from their existing vendors to a state-selected vendor. They may prefer to maintain local control over the configuration of their SIS. Some may also prefer to store the data locally rather than risk temporarily losing access if Internet connectivity fails.

It is apparent that converting from one SIS to another entails significant costs for districts. Unless the state provides monetary incentives to districts for such a switch, the time, effort and expense of converting would present substantial obstacles to moving all districts to one vendor. KSDE would also need to provide a clear vision of how the new system would contribute to improving educational outcomes for students in the future in order to convince educators, parents and taxpayers of its benefits. In the absence of the ability to subsidize the costs of switching to a new vendor, the prospect of allowing districts to maintain their own vendors but connect to a central data store appears to be more palatable and feasible. This solution may, however, result in more effort being expended by KSDE in maintaining the system instead of being able to focus on ways in which to apply the data to improving educational outcomes, which is ultimately the long term goal of such a move.

**Next Steps**

Input on the six models of SIS implementation will be solicited from all Kansas districts through a survey to be administered by KSDE in early 2018. This survey has been piloted with the five districts interviewed for this preliminary study and adjustments were made based on their feedback. The information collected from this survey will be aggregated and a summary of results will be reported back to Kansas schools and to KSBE. The results will help inform a recommendation by KSDE to KSBE as to whether and how to move forward with a decision to improve the current model of SIS implementation across the State of Kansas.

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1. The five districts included one serving approximately 1,000 students, two districts serving approximately 6,000 students and two districts serving over 20,000 students. [↑](#footnote-ref-1)
2. Personnel participating in the 1 -1 ½ hour telephone interviews were: a Superintendent, Director of Student Learning, Director of Technology, SIS Administrator, Coordinator of Technology, Assistant Director of Technology and Information Services, Student Systems Manager, Executive Director of Technology, and a SIS Manager. [↑](#footnote-ref-2)