Cost-utility Analysis of Student Information System Implementation Models

Summary Report for Kansas State Department of Education

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Contents

Executive Summary

This report summarizes findings from a study conducted by Kansas State Department of Education (KSDE) in collaboration with Teachers College, Columbia University, on the resource requirements, cost implications and stakeholder preferences for six different models of implementing a student information system (SIS) across the State of Kansas. The models differ in three substantial ways:

- whether districts continue to choose their own SIS vendors or all use one state-contracted vendor;
- whether district SISs connect to a centralized data store that KSDE would develop;
- whether the model eliminates the need for district data to be uploaded manually to KSDE's systems for state and federal reporting purposes.

Table 1 summarizes the characteristics of each of the six models and the average preference ratings reported by districts. Costs to all districts across Kansas over 10 years are shown assuming PowerSchool is the state-contracted vendor.

Table 1. Characteristics, Costs and District Preference Ratings for Six Models of SIS Implementation across the State of Kansas

	Districts choose own SIS vendor	District SISs connect to centralized data store	Eliminates need to upload data manually	Preference rating from districts (0-10)*	Costs over 10 years**
Model 1 (Status quo): Maintain current system: districts choose own SIS vendors, hosting is local, no central data store	✓	×	×	7.09	$147mm
Model 2: Districts choose own SIS vendors, local hosting, each SIS connects to a central data store	✓	✓	✓	7.56	$95mm
Model 3: Districts choose own SIS vendors or state-contracted vendor, local hosting, each SIS connects to a central data store	✓	✓	✓	7.12	$92mm
Model 4: Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect	×	×	×	3.47	$162mm
Model 5: Single state-selected vendor, local hosting, central data store to which all districts connect	×	✓	✓	4.16	$109mm
Model 6: Single state-selected vendor, central hosting	×	[N/A - Central hosting eliminates need for centralized data store]	✓	4.22	$109mm

** Source is the March 2018 SIS Survey completed by 168 Kansas districts representing 64% of Kansas students*

***Costs are shown here assuming PowerSchool is the state-contracted vendor*

The results of the study are presented in a cost-utility analysis which combines the estimated costs and savings to districts of each implementation model with the districts' average preference ratings for the models. The options are ranked by cost-utility ratios, a return on investment (ROI) metric defined as costs per unit of stakeholder satisfaction. The analysis does not include costs or savings to KSDE, for example, the costs of developing a centralized data store or savings due to reduced personnel time on data management and corrections. These costs and savings should be estimated and considered in conjunction with those for districts in order to evaluate the overall costs to Kansas of each implementation model.

Costs of SIS Implementation Models

Kansas districts currently use eight different SIS vendors and pay base license fees averaging $8.36 per student. Small districts pay the highest SIS costs per student - $16.05 compared with $4.92 paid by Kansas' largest district. Districts spend an average of 0.36 hours and $18.57 in personnel time per student per year uploading data to KSDE's systems for state and federal reporting. We estimate that Kansas districts collectively spend approximately $13 mm per year or $147 mm over 10 years on base license fees for their SISs and personnel time to upload data to KSDE.

If KSDE develops a centralized data store to which all district SISs must connect, district personnel will no longer need to upload data to KSDE manually: the data will automatically synchronize with KSDE's systems on a regular basis. Assuming staff time can be reassigned from manual data uploading to other productive purposes, districts will enjoy substantial savings. Our base case analysis assumes that 50% of these savings will be fully realized, which translates into per student savings of $9.29 per year. This results in collective costs to districts falling to $91mm-$95mm over 10 years from $147mm.

If KSDE contracts with a single SIS vendor, districts will pay lower base license fees than at present, especially the smaller districts, again resulting in substantial savings. However, switching to a new vendor will incur start-up fees and require significant time and resources in Year 1 to train personnel on the new system, migrate data from one system to the other, and build buy-in among end users of the SIS in schools and district offices. As a result, if KSDE mandates that all districts switch to a single SIS vendor but does not automate data uploading to its systems, district costs would actually be higher over 10 years than under the current model: $161mm-$163mm. Adding a centralized data store, or hosting the statewide system centrally, would allow savings from personnel time to offset the costs of switching to a new vendor, resulting in costs over 10 years of $109mm-$111mm instead of the current $147mm.

Overall, our analysis indicates that ROI over a 10-year period will depend substantially on the extent to which automating data uploads to KSDE allows time savings to be translated into cost savings, i.e., whether staff can be reassigned to other productive purposes.

Stakeholder preferences

Districts indicated that they prefer implementation models in which they can choose their own SIS vendors (Models 1-3) to those in which a state-contracted vendor must be used (Models 4-6). They also prefer models which eliminate manual uploads to those that do not (i.e., they prefer Models 2 and 3 to Model 1, and they prefer Models 5 and 6 to Model 4).

Conclusion

The models providing the greatest ROI over 10 years are those in which each district can either choose its own SIS vendor or opt into a state-contracted vendor, and connect to a centralized data store (Models 2 and 3). These two models not only earned the highest preference ratings from districts, but also resulted in collective costs to districts that are over $50mm lower over 10 years than current costs.

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's goals for improving the current system include:

- Increasing the consistency and accuracy of data collected across districts in order to produce reliable and high quality reports
- 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
- Increasing the speed at which KSDE receives data and can process them to provide up-to-date, timely and actionable reports to districts
- Reducing SIS license costs paid by individual districts by negotiating with vendors at the state level.

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 each district's SIS to a centralized, statewide data store, *or*
- Offering districts the choice between using a statewide vendor and continuing with their current vendors provided they connect to the centralized data store.

During 2017-18, KSDE worked with Teachers College, Columbia University to investigate the pros and cons of various possible models for implementing a student information system (SIS) across the state and to establish the resource requirements and cost implications of each one. KSDE identified the following six possible models of SIS implementation, including the current model:

Six Possible Models of SIS Implementation

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

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

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

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

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

6: Single state-selected vendor, central hosting

KSDE and Teachers College sought input from Kansas districts, SIS vendors, and other state education agencies on the pros and cons of each model, the costs of implementation and the potential benefits.

An earlier report from Teachers College, **Pros and Cons of Various SIS Implementation Models** (January 2018), summarized findings from interviews with personnel at five Kansas school districts[1] and the CIO's at two state education agencies. District office personnel[2] were asked about their current and future SIS needs and the resource requirements to operate them, 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. The January 2018 report concluded that, 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, Kansas districts may be reluctant to convert from their existing vendors to a state-contracted vendor. Instead, they may prefer to maintain local control over the configuration of their SIS. However, the possibility that a centralized data store would eliminate the need to upload data manually to KSDE was appealing to districts.

Input from the five districts was used to develop a comprehensive survey about student information systems. The SIS Survey was sent to the superintendent and technology coordinator at all 286 Kansas districts in March 2018; 168 districts (representing 64% of Kansas students) responded providing detailed information about:

- the features and costs of their current systems
- services provided by their current SIS vendors and associated fees
- satisfaction level with their SIS vendor
- ratings of the six models of SIS implementation and factors that influenced the ratings
- pros and cons of each of the 6 models
- training requirements if a new SIS were adopted
- the time burden of state and federal reporting.

Information collected during the district and CIO interviews, from the March 2018 SIS Survey, and from KSDE's 2017 Superintendents' Survey was used to estimate the resource requirements, costs and potential benefits of implementing the six different SIS models. The data are summarized in a cost-utility analysis reported here which ranks the models in terms of costs per unit of stakeholder satisfaction.

Current SIS Vendors in Kansas Districts

According to the 2017 Superintendents' Survey (answered by all 286 districts), districts in Kansas were using one of nine SIS vendors. Four of these nine were used by only one district each and, in one of these cases, the district was in the process of switching to another vendor. Table 2 shows the percentages of all 286 districts and 489,958 students using each of the vendors in October 2017 and the satisfaction ratings for each vendor reported by the 168 districts responding to the March 2018 SIS Survey.

[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.

[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.

Table 2: SIS Vendors Used by Kansas Districts in October 2017 and District Satisfaction Ratings

SIS Vendor	Number of districts using vendor	% of 286 districts using vendor	Number of students using vendor	% of 489,958 students using vendor	Average satisfaction rating* (0-10)
PowerSchool	164	57%	161,538	33%	8.2
Go.edustar	58	20%	20,756	4%	7.5
Skyward	37	13%	143,989	29%	8.9
Infinite Campus	20	7%	38,117	8%	8.1
Synergy	3	1%	102,141	21%	7.7
Schoolmaster	1	0%	708	0%	8.0
PRO/STAR	1	0%	241	0%	-
SASI/Pearson	1	0%	531	0%	-
Silk SIS*	1	0%	21,937	4%	-
Total	**286**	**100%**	**489,958**	**100%**	**8.1**

** From March 2018 SIS Survey*
***This district is moving to Infinite Campus*

According to the 2017 Superintendents' Survey, the most commonly used SIS vendors in Kansas, by district count, are PowerSchool (57% of districts), Go.edustar (20% of districts) and Skyward (13% of districts). The results of the March 2018 SIS survey indicate very similar percentages suggesting that the sample of 168 districts responding to the survey represent Kansas districts as a whole with respect to SIS vendor. By student count, PowerSchool serves the most students in Kansas, 33%, while Skyward serves 29% and Synergy serves 21%.

Three of the seven large districts (> 10,000 students) in Kansas use Synergy, two use Skyward, one uses PowerSchool and one uses Silk SIS, but is switching to Infinite Campus as Silk is no longer supported by the vendor. All medium-sized Kansas districts use four of the vendors: PowerSchool (55% of the medium-sized districts), Skyward (28%), Infinite Campus (13%) or Go.edustar (4%). Go.edustar is more likely to be adopted by small districts, while Skyward is more likely to be used by medium and large districts. Only three districts use Synergy and they are all large.

Overall, Kansas districts responding to the March 2018 SIS Survey report being quite satisfied with their current SIS, with an average rating of 8.1 out of 10. Skyward earned the highest satisfaction rating (8.9), followed by PowerSchool (8.2) and Infinite Campus (8.1). Go.edustar earned the lowest satisfaction rating (7.5).

Cost Implications of Different SIS Implementation Models

To estimate the costs to Kansas districts of implementing each of the six possible SIS models, we considered a number of inputs, some of which are only required for some implementation models, and some of which would only apply to districts which switch SIS vendors ("switchers"). In addition, if KSDE selects one of the vendors already used by some districts to serve as the statewide vendor, the number of districts affected by switching costs would depend on which vendor is chosen. To limit the possible permutations, we estimated costs under two alternative scenarios:

Scenario 1: PowerSchool is chosen as the statewide vendor: this is the most widely-used vendor in Kansas serving 57% of districts and 33% of students, so this choice would incur the least switching costs. PowerSchool also earned the second highest average satisfaction rating (8.2/10) from districts currently using it.

Scenario 2: Skyward is chosen as the statewide vendor: this is currently used by 13% percent of districts and 29% of students. This SIS earned the highest average satisfaction ratio (8.9/10) among all SISs used in Kansas. In addition, two districts interviewed for this study were familiar with several different SISs and found that Skyward best facilitated state reporting.

Costs to Consider

District level costs:

All districts:

- Annual base license fees for SIS
- Annual fees for additional SIS features/functions and other integrating services
- Time burden for uploading data for state/federal reporting

Switchers only:

- Start-up fee
- Personnel training on new system
- Data migration from old SIS to new
- Building buy-in for the new system

KSDE costs:

- Establishing a data warehouse
- Additional support and reporting personnel
- Project management to consider different models and vendors, for data gathering from districts and vendors, procurement and RFI process

Additional potential savings could arise:

- If a centralized data store/centrally hosted system eliminates the need for districts to pay for data backups and off-site storage;
- If KSDE takes responsibility for technical support for a statewide SIS, eliminating the need for individual districts to provide or procure their own technical support.

In this analysis, we focus only on the district level costs. Considerations regarding potential costs and savings for KSDE are described in Appendix 3. To provide an overall picture of the financial implications of each SIS implementation model, costs and savings to KSDE under each model should be estimated and combined with the estimates this report provides on costs and savings to districts.

Cost Estimates (See Tables 3a and 3b)

Note: *While we report results based on a set of assumptions that we believe are reasonable given the information we have available, many of these assumptions can be varied in the accompanying spreadsheet to this report "SIS Models Cost-utility Analysis.xlsx" so that readers can see how changing the assumptions affects the overall results. For example, in all models, we assume that base license fees for the SIS increase by 1% each year, but this can be increased or decreased based on what is actually negotiated with vendors.*

This section describes findings regarding costs and savings associated with each SIS Implementation model over a 10-year period and a brief explanation of how we arrived at the estimates reported. Further details are in Appendices 1 and 2.

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

For a 10-year period, the costs to districts of the current model of SIS implementation are $300 per student or $147mm for the whole state.

To evaluate districts' costs and savings associated with each of the six different SIS implementation models over 10 years, we started with the current model (Model 1) as the baseline and made the following assumptions:

- Base license fees per student are $8.36 per student in Year 1.
- License fees increase by 1% per year.
- No districts switch SIS vendors during the 10-year period.
- District personnel spend an average of 0.36 hours per student per year[3] manually uploading data to KSDE for state and federal reporting, which equates to personnel costs of $18.57[4] per student per year.
- Personnel costs increase by 3% per year.

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

For a 10-year period, Model 2 costs districts $194 per student or $95mm total across the state.

For Model 2 in which district SISs must connect to a centralized data store, we assumed that:

- Schoolmaster, PRO/STAR and SASI/Pearson would not build the capacity to connect to a centralized data store as they each serve only one district and it would most likely not be cost-effective for them to do so.
- The three affected districts would switch to one of the other vendors and, for simplicity, we assume they switch to PowerSchool in Scenario 1 and pay the average fee per student of other Kansas PowerSchool users ($8.83).

[3] Based on data reported by Kansas districts in the March 2018 SIS Survey

[4] Using a national average hourly rate of $33.64 for Database and Systems Administrators (https://www.bls.gov/oes/current/naics4_611100.htm#43-0000) with a national average fringe benefits rate for K-12 school employees of 53.37% (http://www.bls.gov/news.release/ecec.t04.htm).

- Similarly, for Scenario 2 we assume the three districts switch to Skyward and pay the average fee per student of other Kansas Skyward users ($7.25).
- Start-up fees in Year 1 for switchers under both scenarios are calculated assuming that annual base license fees represent 15% of the start-up fees.
- Data migration and personnel training cost $74.18 per student being switched to a new SIS vendor in Year 1[5].
- The introduction of a centralized data store allows 50% of the costs of personnel time for manual data uploads to KSDE to be repurposed productively, representing savings of $9.29 per student in Year 1 and increasing 3% in each consecutive year.

Over a 10-year period, Model 2 costs districts $106 less per student than Model 1, which amounts to $52mm lower costs across the state.

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

For a 10-year period, Model 3 costs districts $187 per student or $92mm for the whole state under Scenario 1 (in which PowerSchool is the state-contracted vendor) and $193 per student or $95mm for the whole state under Scenario 2 (in which Skyward is the state-contracted vendor).

Model 3 is the same as Model 2 in that districts can use any SIS vendor that will connect to a centralized data store, but it also includes the option for districts to switch to a state-contracted SIS vendor. Assumptions are the same as for Model 2 except that:

- In addition to the three districts switching from Schoolmaster, PRO/STAR and SASI/Pearson, 20% of students from other districts are switched to the state-contracted vendor from other vendors, except for Synergy[6].
- Switchers will pay a lower base license fee of $4.92 per student in Year 1, based on the rate currently paid by Kansas' largest district.
- Current users of whichever vendor is selected as the state-contracted vendor (PowerSchool in Scenario 1 and Skyward in Scenario 2) will pay the lower $4.92 rate.

Over a 10-year period, Model 3 is the least costly among the six models, reducing current costs to districts by $107-$113 per student, which amounts to $52-$55mm in cost reductions across the state.

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

For a 10-year period, Model 4 costs districts $330 per student or $162mm for the whole state under Scenario 1 (in which PowerSchool is the state-contracted vendor) and $334 per student or $163mm for the whole state under Scenario 2 (in which Skyward is the state-contracted vendor).

Under Model 4, switching costs will be high as many districts will be required to switch to the state-contracted vendor. Because there is no centralized data store in this model, there are no offsetting savings from elimination of personnel time to upload data. Assumptions regarding start-up fees, and

[5] This assumption is based on detailed interview and training schedule data collected from several Kansas districts in 2017-18.

[6] We assume that none of the three districts using Synergy will switch if given the option because they are large districts which are satisfied with their SIS and the upheaval necessary in order to switch would be daunting.

training and migration costs per student are the same as in Models 2 and 3, but we make one different assumption:

- The base license fee for all users of the state-contracted vendor will drop to $4.50 per student in Year 1.

Despite the lower base license costs, the absence of personnel time savings result in this model incurring the highest overall costs among all six models: $30-$35 per student more than the current model, amounting to approximately $15mm in additional costs across the state.

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

For a 10-year period under Scenario 1, Model 5 results in costs of $223 per student or $109mm across the state. Under Scenario 2, the costs are $227 per student or $111mm across the state.

Under Model 5, switching costs will again be high as many districts will need to switch to the state-contracted vendor. Assumptions about costs are the same as in Model 4 but are partially offset by savings from elimination of personnel time to upload data as in Models 2 and 3.

Overall, Model 5 costs districts approximately $75 less per student over 10 years than the current model, which amounts to over $35mm in cost reductions across the state.

Model 6: Single state-selected vendor, central hosting

For a 10-year period under Scenario 1, Model 6 results in costs of $223 per student or $109mm across the state. Under Scenario 2, the costs are $227 per student or $111mm across the state.

District costs and savings associated with Model 6 are estimated to be the same as in Model 5 although a centralized data store is replaced in Model 6 with central hosting of the SIS. In practice, differences between the models may arise as a result of local vs. central hosting.

Table 3a. Costs to Kansas School Districts of Different SIS Implementation Models

Scenario 1 in which **PowerSchool** is chosen as the statewide vendor

	SIS Implementation Model	Start-up fees for switchers Year 1	Annual license fee per year	Training, migration, buy-in costs Year 1	Personnel costs to upload data per year	Total per student Year 1	Total for 10 years per student	Total for 10 years whole state
1	Maintain current system: districts choose own SIS vendors, hosting is local, no central data store	$-	$8.36	$-	$18.57	$26.93	$300.39	**$147.2mm**
2	Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store	$0.17	$8.34	$0.22	$9.29	$18.02	$194.13	**$95.1mm**
3	Districts choose own SIS vendors or a state-contracted vendor, hosting is local but each SIS must connect to a central data store	$4.19	$6.64	$7.03	$9.29	$27.15	$187.12	**$91.7mm**
4	Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect	$20.11	$4.50	$49.72	$18.57	$92.91	$329.84	**$161.6mm**
5	Single state-selected vendor, local hosting, central data store to which all districts connect	$20.11	$4.50	$49.72	$9.29	$83.62	$223.38	**$109.4mm**
6	Single state-selected vendor, central hosting	$20.11	$4.50	$49.72	$9.29	$83.62	$223.38	**$109.4mm**

Table 3b. Costs to Kansas School Districts of Different SIS Implementation Models

Scenario 2 in which **Skyward** is chosen as the statewide vendor

	SIS Implementation Model	Start-up fees for switchers Year 1	Annual license fee per year	Training, migration, buy-in costs Year 1	Personnel costs to upload data per year	Total per student Year 1	Total for 10 years per student	Total for 10 years whole state
1	Maintain current system: districts choose own SIS vendors, hosting is local, no central data store	$-	$8.36	$-	$18.57	$26.93	$300.39	**$147.2mm**
2	Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store	$0.17	$8.34	$0.22	$9.29	$18.02	$194.08	**$95.1mm**
3	Districts choose own SIS vendors or a state-contracted vendor, hosting is local but each SIS must connect to a central data store	$4.84	$7.12	$7.56	$9.29	$28.81	$193.35	**$94.7mm**
4	Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect	$21.18	$4.50	$52.38	$18.57	$96.64	$333.57	**$163.4mm**
5	Single state-selected vendor, local hosting, central data store to which all districts connect	$21.18	$4.50	$52.38	$9.29	$87.35	$227.11	**$111.3mm**
6	Single state-selected vendor, central hosting	$21.18	$4.50	$52.38	$9.29	$87.35	$227.11	**$111.3mm**

District Preferences for Different Models of SIS Implementation ("Utility")

Responses to the March 2018 SIS Survey showed that implementation models that allow each district to choose its own SIS vendor are rated much higher than models that require all districts to use a single statewide SIS vendor (See Table 4). The highest-rated model among the six possibilities was Model 2 in which each district chooses its own SIS vendor and determines which services or features are purchased (average rating 7.56/10). However, all Kansas SIS vendors would be required to comply with a KSDE application programming interface (API) which would allow for data to synchronize, in near real time, between the local SIS and a KSDE-hosted data warehouse. This would reduce the amount of data manually uploaded to KSDE.

A model in which districts have the choice of a state-contracted vendor or sticking with their own SIS and connecting to a centralized data store via API earned the second highest rating, (7.12/10) but not much higher than the current system (7.09/10). Models in which all districts must use one vendor received ratings between 3.47 and 4.22 suggesting that they would be met with resistance from many districts. Views on the establishment of a statewide vendor were quite polarized.

Table 4. District Ratings of each SIS Implementation Model

SIS implementation model	Average rating from districts (0-10)
1: Maintain current system: districts choose own SIS vendors, hosting is local, no central data store	7.09
2: Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store	**7.56**
3: Districts choose own SIS vendors or a state-contracted vendor, hosting is local but each SIS must connect to a central data store	7.12
4: Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect	3.47
5: Single state-selected vendor, local hosting, central data store to which all districts connect	4.16
6: Single state-selected vendor, central hosting	4.22

Note: Source is the March 2018 SIS Survey

Districts were invited to indicate which factors influenced their preference ratings for each SIS implementation model. Table 5 indicates that the most important factors influencing model ratings were "Local control to choose the district's SIS vendor" and "Minimize need for manual upload of data for state/federal reporting purposes." These are consistent with districts' overall preference for Models 2 and 3 which satisfy both factors. On average, none of the seven factors were unimportant.

Table 5. Factors Influencing District Ratings of Possible SIS Implementation Models and Importance of Each Factor (0 = not at all important, 10 = extremely important)

Factors influencing district ratings of possible SIS implementation models	Importance to districts (0-10)
Local control to choose the district's SIS vendor (Models 1, 2, 3)	8.0
Minimize need for manual upload of data for state/federal reporting purposes (Models 2, 3, 5, 6)	8.0
Decrease the amount of time and costs for IT support and state/federal reporting (Models 2, 3, 5, 6)	7.1
Potential lower licensing costs per student (Models 3, 4, 5, 6)	7.1
The ability, should the district choose, to buy in to a State system to reduce costs for licensing and technical support (Model 3)	6.8
Don't want to change (Models 1, 2, 3)	6.4
Ability for KSDE to provide actionable data dashboards to districts and parents (Models 2, 3, 5, 6)	6.4

Cost-utility Rankings

Combining the cost estimates with the utility ratings for each model provides cost-utility ratios which can be used to rank the options in terms of cost per unit of stakeholder satisfaction. The option with the lowest cost-utility ratio provides the best return on investment, i.e., it costs least per unit of stakeholder satisfaction. Table 6 shows the results for Scenario 1 in which PowerSchool is selected as the state-contracted vendor. Model 2 - under which districts choose their own SIS vendors, hosting is local but each SIS must connect to a central data store - earns first place in the ranking. This is followed in order by Models 3, 1 (status quo), 6, 5 and 4. A similar analysis for Scenario 2 in which Skyward is the state-selected vendor yields the same rankings.

Table 6. Costs, Utility, Cost-utility Ratios and Rankings for SIS Implementation Models

SIS Implementation Model	Total Costs for 10 years: whole state	Utility Ratings from districts	Cost-utility ratio	Rank
Model 2: Districts choose own SIS vendors, hosting is local but each SIS must connect to a central data store	$95.1mm	7.56	$12.58mm	1
Model 3: Districts choose own SIS vendors or a state-contracted vendor, hosting is local but each SIS must connect to a central data store	$91.7mm	7.12	$12.87mm	2
Model 1: Maintain current system: districts choose own SIS vendors, hosting is local, no central data store	$147.2mm	7.09	$20.75mm	3
Model 6: Single state-selected vendor, central hosting	$109.4mm	4.22	$25.92mm	4
Model 5: Single state-selected vendor, local hosting, central data store to which all districts connect	$109.4mm	4.16	$26.34mm	5
Model 4: Single state-selected vendor, local hosting, manual uploads, no central data store to which districts must connect	$161.6mm	3.47	$46.62mm	6

Conclusion

Stakeholder preferences and cost-utility ratios suggest that KSDE should continue to allow districts to choose their own SIS vendors but develop a centralized data store and require that all districts connect to this data store. Beyond the benefit of improving data quality and consistency, this move will result in significant savings to all districts as a result of reduced time spent uploading data to KSDE's systems. To further reduce costs to districts, KSDE could consider selecting a SIS vendor that can provide opt-in services at a bulk pricing rate to districts across the state. Small districts would be the primary beneficiaries of this option. However, given that districts reported a greater preference for a model that did not offer an opt-in to a state-contracted vendor, we recommend that KSDE poll districts to establish whether enough districts would take advantage of this opportunity to allow KSDE to negotiate a significantly lower license fee. Furthermore, before deciding a course of action, KSDE should investigate cost implications for its own budget of building a centralized data store and/or contracting with a statewide SIS vendor.

References

Arizona Department of Education (ADE). (2013). Arizona Education Learning and Accountability System (AELAS) Business Case. Version 1.5. http://www.azed.gov/information-technology/files/2017/02/30-aelas-business-case.pdf

Nebraska Department of Education (NDE). (2014). Nebraska Education Data Systems Legislative Study. https://www.education.ne.gov/wp-content/uploads/2017/07/NEDataSystemsLegislativeStudyLoRes.pdf

Appendix 1: Assumptions Used for Cost Estimates

1) There are 489,958 student in Kansas based on numbers reported in the October 2017 Superintendent's Survey.
2) Based on data collected in the October 2017 Superintendent's Survey, the average base license fee per student for a SIS is $8.36.
3) Start-up fees for switchers are calculated as a percentage of their new base license fees. Only the switchers will pay this: formula is (No. of switchers*(expected base license fee per student/0.15)) and then divide by 489,958 to spread across all Kansas students.
4) If KSDE contracted with a statewide vendor and this was mandated for use by all districts (Models 4, 5 and 6), base license fees for all districts would drop to $4.50 per student (based on what North Carolina's state education agency pays for a statewide SIS).
5) If switching to a state-contracted vendor is optional, the base license fees drop to $4.92 per student, assuming that fewer districts will switch and resulting in a smaller expected discount. This is the per student cost currently paid by the largest Kansas district as reported in the March 2018 SIS Survey and October 2017 Superintendent's Survey.
6) Costs of additional features and functions are assumed unchanged overall because, for any one particular district that switches, the costs of additional features may go up or down depending on whether a state-contracted SIS offers more or fewer functions and integrated services than the district's original SIS.
7) If districts are given the option (but not the mandate) to switch to PowerSchool or Skyward (Models 2 and 3), we assume that 20% of students would be switched from other vendors, except that none of the 3 large districts currently using Synergy would switch. These three large districts are all currently quite satisfied with their SIS and we believe it unlikely they would willingly undertake the upheaval necessary to switch.
8) For Models 2 and 3, switchers to PowerSchool or Skyward would pay the same base license fee per student as the average license fee paid for the vendor across all *current* users in Kansas ($8.83 per student for PowerSchool and $7.25 per student for Skyward).
9) If districts continue to choose their own vendors, but these vendors must comply with a central data store (Models 2 and 3), the four vendors serving only one district each (Schoolmaster, PRO/STAR, SASI/Pearson and Silk SIS) would not find it worthwhile to spend the resources to comply with the data warehouse. The district using Silk is already switching to Infinite Campus and students in this district are included in the Infinite Campus count. The other three districts will switch to PowerSchool or Skyward.
10) We assumed uniform costs per student of personnel training and data migration across districts and vendors, $74.18 per student in total.

Training cost per student	$61.26
Data migration cost per student	$12.92

11) Based on district reports in the March 2018 SIS Survey, we assumed that school and district personnel spend 0.36 hours per student per year on data uploading to KSDE for state and federal reporting.
12) In our base case, we assumed that 50% of the 0.36 hours could be repurposed to productive uses, resulting in 50% of the costs of this personnel time being saved.
13) We assumed an annual inflation rate of 3% for personnel costs.
14) We assumed an annual inflation rate of 1% for SIS licensing fees.

Appendix 2: Details on District Costs Estimated

District SIS Start-up Fees

Start-up fees are one-time costs that are incurred only when a new SIS is acquired. District personnel we interviewed could rarely recall the actual start-up fees from the distant past but KSDE's CIO and district personnel estimated that annual license fees are approximately 15% of the start-up fees. We therefore started with the data we had on annual license fees and calculated the start-up fees from that base. Under models that involve a state-contracted SIS vendor, these fees could be negotiated by KSDE but they would still accrue to the individual districts.

District Base License Fees for SIS

Based on data from the March 2018 SIS Survey, Kansas districts pay an average of $11,977 in base license fees per year for their SIS, with small districts averaging around $5,000, medium districts around $18,000 and large districts around $130,000. While the average SIS license fee per student in Kansas, as reported in the October 2017 Superintendent's Survey is $8.36, this number varies with district size, decreasing as size increases, as might be expected due to economies of scale. The largest district pays $4.92 per student, while medium districts (1,000 -10,000 students) pay an average of $8.86 per student, and small districts (<1,000 students) pay an average of $16.05 per student. Costs also vary a great deal across districts within the same size category.

Table A1. District SIS Costs for Base License Fee

District size	No. of students served	Average cost per district*	Average cost per student**
Small	<1,000	$5,355	$16.05
Medium	1,000 - 10,000	$17,823	$8.86
Large	>10,000	$131,065	$5.64
All districts	489,958	$11,977	$8.36

**Source is March 2018 SIS Survey completed by 168 Kansas districts*

***Source is October 2017 Superintendent's Survey completed by 286 Kansas districts*

Responses to the March 2018 SIS Survey indicated that 78% of districts feel that the overall cost of their SIS per student is fair or better. Only three districts felt that the cost of their SIS is way too high for what it does and 21% felt the costs are a little too high. Small districts were the most likely to indicate that costs were too high, with over a quarter of districts serving under 1,000 students indicating that their SIS license fees are too high.

Base license fees are likely to decrease if a single vendor serves the entire state. One of the state education agency CIO's interviewed (from North Carolina) indicated that his state pays $4.42 per student for a statewide SIS. We approximated this to $4.50 for our calculation for Kansas. Assuming there are 489,958 public school students in Kansas[7], the difference between $8.36 and $4.50 per student would represent approximately $1.9 mm per year in savings.

District Fees for Additional SIS Features/Functions and Other Integrating Services

Of the districts responding to the March 2018 SIS Survey, 52% indicated that they pay additional fees beyond the base license fees for their SIS. This suggests that, if KSDE contracts with a SIS vendor on behalf of districts across the state, some districts are likely to need additional features beyond the

[7] Based on responses to October 2017 Superintendent's Survey completed by all 286 Kansas school districts.

standard package negotiated, while others may not need features that are included. Districts reported paying for the following additional features in 2017-18:

- Food service
- School-based activity accounting
- Student management
- Fee tracking
- Family access
- Educator gradebook
- Health records
- Graduation requirements
- Family access third party interface
- School Interoperability Framework (SIF)
- Textbook tracking

Almost one third of Kansas districts pay fees for a food service feature on top of the base SIS license fee, and 28% pay fees for school-based activity accounting. On average, the student management feature costs the most per student beyond the base license fee ($8.50), followed by school-based activity accounting ($5.19).

For any one particular district, the costs of additional features may go up or down depending on whether a state-contracted SIS offers more or fewer functions and integrated services than the district's original SIS. Responses to the March 2018 SIS Survey showed that large districts pay few additional fees for SIS features and functions, perhaps because they negotiate these as part of the base license fee. Medium-sized districts are the most likely to pay additional fees for SIS features and functions with food service, fee tracking, and school based activity accounting functions being bought by over a quarter of the medium-sized districts. Most features and functions (8 out of the 11 listed above) cost less per student as district size increased. For six items, medium-sized districts paid half or less per student of the fees paid by small districts. SIF license fees went up as district size increased, as did the family access third party interface annual license fee.

District Costs for Personnel Training, Data Migration, Buy-in for Changing to a New Vendor

If KSDE contracts with a statewide SIS vendor, any district that does not already work with this vendor's SIS and therefore needs to switch would need to expend additional resources to build buy-in among users, train personnel, and migrate data from the current system.

Training: If a new SIS is adopted, many staff members at the district offices and schools will need to be trained at considerable cost in Year 1. We estimated costs of training based on detailed data collected from four Kansas districts (three medium and one large) who were either currently undergoing a switch or had records of training schedules/costs from past switches. These costs ranged from $31 per student to $112, averaging $61.26 per student. Training costs varied depending on factors such as the number of staff needing to be trained, with economies of scale as staff size increases; the number of hours scheduled per person; on whether training is delivered in person or online; and whether a train-the-trainer model is used instead of direct training from the vendor. Because some of these factors increase training costs and some decrease them, there was no clear pattern on how per-student costs of training vary. We therefore averaged the training costs across the four districts and apply the average of $61.26 to all districts in our analysis.

Some training costs will be incurred each year, regardless of whether a switch occurs, either because new users need to be trained or new SIS modules are introduced. 29% of the districts responding to the

March 2018 SIS Survey reported that they pay for vendor-provided training for district SIS users (e.g., IT/Tech staff, data entry personnel, teachers, administrators) on top of the base license fee. The training costs average $1,200/year per district or the equivalent of $2.01 per student. A small number of districts (2%) pay additional fees for vendor-provided SIS training for parents and students, at an average total cost of $500/year or $1.43 per student. We do not include these ongoing costs in our comparative analysis because they are unlikely to change substantially across models.

Data Migration and Building Buy-in for the New SIS: Costs of $12.62 per student for migrating data to a new SIS were estimated primarily using information from two Kansas districts (one medium and one large) that had either recently undertaken data migration or were in the midst of doing so. Costs include personnel time to migrate or convert existing data from the current system to the new one; to plan and design reports; and to meet with principals and other staff members to communicate the changes, address concerns, and build buy-in. In addition, server upgrades are likely to be required. Migration can extend over many months: the large district we interviewed about this topic indicated that two people were each spending nine months to migrate data, assisted by the vendor's project management system which sends automatic emails to notify when to undertake which tasks.

If a new SIS initially operates in parallel with the existing SIS in order to ease the transition, this temporarily requires double data entry, and therefore more time, from district personnel. In addition, it implies the need for technical support for two systems and an overlap in the licensing period.

District Time Burden for Uploading Data for State and Federal Reporting

Districts responding to the March 2018 SIS Survey reported spending an average of 645 hours per year on state reporting, not including the time to validate the data. The mean number of hours by district size was: 447 for small districts, 856 for medium districts, and 2,729 for large districts. Applying these numbers to all 286 districts, this amounts to 175,675 hours per year, or 0.36 hours per student. Using a national average hourly rate of $33.64 for Database and Systems Administrators[8] with a national average fringe benefits rate for K-12 school employees of 53.37%,[9] the costs of this personnel time across Kansas districts are $9.06mm. If a statewide vendor were contracted and centrally hosted, or if all district vendors were required to connect to a centralized data store, the time burden for manual uploads should be eliminated and substantial funds saved if the personnel time can be redirected in productive ways.

As a comparison, prior to the adoption of a statewide data standard in Nebraska, Nebraskan districts submitted annual collections of data to support accountability to Nebraska Department of Education (NDE) using a combination of automated and manual methods. An estimated 655,200 hours were spent by districts preparing the required collections for each year's accountability data submission (NDE, 2014). Nebraska has 245 public school districts, 1,040 schools and 315,542 students, suggesting that the average time required to prepare and submit records per student was 2.08 hours. However, this number most likely includes time spent to validate the data before submission. Arizona Department of Education (ADE), which oversees 691 districts, reports an estimated 500,000 hours per year for district personnel time on data management and corrections (ADE, 2013). With 1,077,063 students, this suggests 0.46 hours per student. These estimates from other states suggest that 0.36 hours per student estimated for Kansas is at least a reasonable and perhaps a low estimate.

[8] https://www.bls.gov/oes/current/naics4_611100.htm#43-0000
[9] http://www.bls.gov/news.release/ecec.t04.htm

Appendix 3: Considerations for Costs and Savings to KSDE

In addition to the financial consequences for districts, KSDE must estimate the impact of each implementation model on its own resources and budget. Several considerations are noted below. Estimates for KSDE could be added to the accompanying spreadsheet to indicate total costs/savings to both KSDE and districts.

Guidance on potential costs to KSDE may be found in NDE 2014 Appendix H which provides a complete budget estimate for 3 years to overhaul the Nebraska education data infrastructure (approximately $14mm per year). Note that in the cost-benefit analysis presented in the NDE study, these infrastructure costs are only included for 3 years, but it is highly unlikely that these costs would disappear entirely after 3 years. ADE 2013 also estimates costs to the SEA in moving towards an integrated learning and accountability data system across the State of Arizona.

Costs to KSDE of Establishing a Data Warehouse

In the event Kansas chooses to build a centralized, statewide, data store to which all district SISs would connect via an API, KSDE would incur the costs of paying vendors or consultants to develop and help set up the new system; build internal capacity for the new system; provide a vendor sandbox to develop the new system; create an aggregated reporting data mart from which external reports could be automatically generated; and develop, train and sustain a virtual support team to work with the educational service units and districts for training, onboarding, and testing of the new system. KSDE's infrastructure costs would initially increase for hardware (e.g., servers) and licensing (e.g., cloud hosting) in order to temporarily maintain both manual uploads and an API. However, once the new system was fully rolled out, these costs should fall below the current level.

The API would most likely be created by the SIS vendors who are serving enough districts in Kansas to make it worth their expense.

If KSDE chooses to implement a single, centrally-hosted statewide SIS, it would incur costs during the migration phase to support and process data from two parallel systems.

Costs to KSDE of Additional Support and Reporting Personnel

If KSDE chooses to create a centralized data store to which districts would connect from a variety of SISs using an API, KSDE would initially need to reallocate current staff time away from SIS enhancements and upgrades to establish the new system and to address interoperability challenges between a variety of systems. Longer term, staff time would be reallocated to focus on data reporting rather than collection.

KSDE would need to dedicate several personnel to support a statewide SIS although it is likely that existing personnel could redirect their time from managing data collection issues arising across multiple vendors to improving reporting from a single vendor.

One of the state education agency CIO's interviewed estimated that his agency spends $70,000-$80,000 every few years on SIS training provided by the statewide vendor when a new feature or module is introduced. In addition, the SEA develops online training resources such as guides and short videos that are easily accessible by all districts.

If districts were given the option to use a state-contracted vendor or continue with their current SIS, KSDE costs could increase due to the need to maintain both the new statewide system and the current manual data collection systems.

Based on information from the CIO of another SEA that supports a statewide SIS for 245 districts, support should be provided at three levels:

Tier 1: The SEA dedicates three FTEs from the Customer Support Center to answer all initial phone calls/online tickets related to the SIS and to provide troubleshooting.

Tier 2: The SEA employs five full-time personnel as Subject Matter Experts (SMEs) for the SIS who provide the next layer of support and who work directly with the vendor. Each SME has a specialization, e.g., business analytics, training, or communication. If there is a new feature to add to the SIS, the SMEs set the requirements, direct the vendor's work, test the new feature and provide training modules. The communication SME maintains the SEA's SIS website and keeps it up to date with information for the districts. The SEA schedules a maintenance weekend once per month to provide software updates.

Tier 3: Support from the SIS vendor is the last layer of support, for example if a bug is found in the software.

Costs to KSDE of Project Management to Consider Different SIS Implementation Models and Vendors, Data Gathering from Districts and Vendors, Procurement and RFI Process

Several individuals at KSDE must spend a considerable amount of time on the question of whether and how to implement a statewide SIS or a centralized data store to which all district SISs would connect. This process would most likely include the Director and Assistant Director of IT and a number of consultants. If districts are invited to participate in a SIS Advisory or Selection Committee, the time to participate in the procurement and evaluation process and travel costs would also need to be considered. A committee might include 15-20 district representatives and while most meetings could be held virtually, it is likely that 1-2 days of in-person closed sessions would be necessary for vendor presentations.

Data Management and Correction

In addition to the time spent by school and district personnel on data management and correction, Arizona's Department of Education (2013) estimated that its own SEA personnel spend an estimated 568,000 hours per year on data management and correction. KSDE should consider the amount of time its own personnel dedicate to these activities and factor potential personnel time savings from the potential SIS implementation models into overall cost considerations. Either requiring SISs to comply with an API or having all districts use a single vendor would help standardize data formats and eventually reduce the amount of time spent by both districts and KSDE in correcting errors. This would allow more time to improve the quality of the data and find ways to use it to impact teaching and learning and to implement continuous improvements efforts.

Data-backups and Off-site Storage

20% of districts responding to the March 2018 SIS survey reported that they pay for data backups and off-site storage, averaging $4,430 per district or $4.72 per student. With a centralized data store, these additional back-ups would most likely be unnecessary resulting in potential estimated savings to districts of $463,000 (20% x 489,958 students x $4.72). However, KSDE is likely to need to assume the costs of data back-up and storage for a centralized store.

14% of districts indicated that they pay additional fees for vendor-provided support to technical personnel for troubleshooting (contractual or on ad hoc basis), including a user help desk, averaging $4,908 per district or $2.53 per student. If a statewide vendor were contracted and KSDE provided the

technical support, districts could save an estimated $173,000 (14% x 489,958 students x $2.53). The costs would shift to KSDE but may amount to less per student.

Procurement and Contract Administration

If KSDE contracted a state-wide SIS vendor, districts should incur fewer costs for procurement and administration of contracts as these functions would be centralized. Costs to KSDE should be lower on a per student basis.

Other Benefits of a Centralized Data Store or Statewide System

For models that allow districts to choose their own vendor and connect to a central data store, districts would be able to switch vendors more easily than at present because data formats would be standardized across all vendors and the data would be held in the central data store.

If a statewide SIS were implemented, student transfers between districts would be streamlined because the data would automatically follow the student registration.