

A Performance Review of the Arizona Education Learning and Assessment System: AELAS

Submitted to the Arizona Department of Education
and the Arizona Department of Administration by
WestEd and CELT

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EXECUTIVE SUMMARY

INTRODUCTION

This report documents a performance review of the Arizona Education Learning and Assessment System (AELAS) by an independent evaluator as required by *Arizona Revised Statutes (ARS) 15-249* (see Appendix A). WestEd and CELT were hired by the Arizona Department of Administration (ADOA) to serve as that independent evaluator. In that role, they analyzed and made recommendations regarding:

1. All work conducted in support of the AELAS initiatives with the primary intent to determine whether the activities of the Department were properly executed and targeted towards the objectives as stated in ARS 15-249.
2. The ADE (Arizona Department of Education) Strategic Implementation Plan to determine whether the Department's AELAS plan component fulfills the intent of ARS 15-249.

To accomplish these objectives, WestEd and CELT reviewed and analyzed extensive documentation related to AELAS and interviewed a diverse set of stakeholders. Additionally, our team responded to a further request made by ADE leadership necessitated by a significant cut to the AELAS budget after our work had begun. That generated a third objective for this work, to advise regarding:

3. Strategies for implementing AELAS with a reduced budget.

In response, our team paid particular attention to the work plan, staffing, budget, and timeline to provide ADE with concrete suggestions about how to prioritize components and continue to move forward.

The report describes our methods, findings and recommendations to ADE. It includes findings related to the current Student Accountability Information System (SAIS); findings about AELAS; a financial analysis; identification of internal and external ADE issues; usage and stakeholder satisfaction indicators; and an executive summary.

The project director from WestEd and lead evaluator from CELT discussed work to date with, and received feedback from, ADE and ADOA leadership on August 22, 2013, with the final report to be delivered by September 3, 2013.

Ultimately, the objective of the report is to provide ADE and ADOA with formative and constructive information about AELAS, its implementation and functioning as well as stakeholder observations, and to help guide ADE's and ADOA's strategic plans. The report is also intended to provide to ADE actionable steps, through a series of recommendations tied to specific findings, to which the Department can respond. The report, therefore, can be used as a metric against which measurable progress can be tracked.

COMMENDATIONS, FINDINGS, RECOMMENDATIONS AND KEY MESSAGES

Our analysis of AELAS produced four types of outcomes: (a) commendations for laudable work; (b) findings which provide a synopsis of the information from the interviews and document reviews; (c) recommendations based on the collected information and placed into the evolving context in which AELAS is functioning; and (d) three key collective messages essential to continued success. This executive summary provides an overview of the commendations, recommendations and key messages. Detailed findings appear in the main body of the report to support commentary about particular components of the AELAS project.

The following commendations are important achievements to date and set the tone for the continued work needed to establish AELAS within the state's education community:

1. ADE is to be commended for its broad-reaching vision for a data system that will potentially impact all levels of the education system, from the state to the classroom. The vision for this system puts in the hands of educators the data most needed at the local level to inform relevant and essential instructional decisions, while also providing more high-level data to building, district, and state leadership. Through this work ADE has met the scope of work outlined in ARS 15-249 and used the legislation as a platform for a comprehensive system that is designed to meet the required accountability purposes and deliver information to support effective teaching and learning.
2. ADE has developed an enterprise architecture approach for AELAS that is service-oriented, enlightened by emerging best practices and trends in education, and supported by the local education agencies (LEAs, i.e. school districts and charter schools), as well as the business community. Its capacity to link innovation in education and technology with a customer service orientation around a single source of the truth will increase the system capability, data quality, and use of information and services available through AELAS.
3. ADE has adopted several key disciplines around enterprise architecture and has staffed the position of enterprise architect. ADE leads most other states in the adoption of this important discipline for enacting reform, with only a few state agencies making similar progress (Washington, the District of Columbia, Tennessee, North Carolina, and Louisiana). Enterprise architecture is an essential discipline for managing the work associated with a complex system such as AELAS.
4. ADE has hired and/or contracted for high-quality IT staff and consultants with the knowledge and skills to effectively use the established application development methodologies, standards, and frameworks. This caliber of expertise will be a real asset with AELAS development and implementation.

5. ADE has worked diligently to establish an effective project management office and a project oversight process. Weekly meetings of the project managers enable issue resolutions and cross-communication.
6. ADE has reached out to a diverse group of stakeholders to gain an understanding of their needs and their support for the AELAS/SAIS efforts. Hence, leaders from the highest levels in ADE and the state, including important business leaders, are committed to the AELAS and SAIS work and serve as champions for the initiatives.
7. ADE is piloting the opt-in and statewide longitudinal data system (SLDS) with a small but representative subset of districts to obtain essential input from key consumers and long-term buy-in and support as these systems scale up across the state. Maricopa County Education Service Agency (MCESA) has provided a successful pilot and been an avid supporter to ADE for the formative assessment and educator observation tool. The K–12 SLDS dashboard pilots have been completed in 11 districts.
8. ADE is moving aggressively to fill a need expressed by the state and districts for improved data systems and has developed a business case for AELAS that has the endorsement of Gartner¹. During this development phase, ADE researched models from states around the country and incorporated their best practices and lessons learned.
9. ADE has established and is using strong application development methodologies, standards, and frameworks. This is a major accomplishment that puts ADE's IT group in a good position to roll out well-designed and high quality systems—a critical prerequisite for a successful AELAS. A key accomplishment has been the substantial improvements ADE has made to SAIS performance over the past two years that have increased the level of confidence in ADE's IT department among the school districts.

Based on a wide audience of stakeholder interviews and comprehensive document analysis, we developed the following recommendations:

1. Staying on course with the full scope of work for AELAS, which includes opt-in components, is important to successfully achieving both the legislative intent for establishing a robust data collection and reporting system and the classroom need for quality information to support effective teaching and learning. Our experience shows that the reporting of data to state agencies for compliance reasons, when there is no subsequent benefit or use of those data by the districts and schools, results in generally poor quality data. Providing systems and dashboards that help schools and teachers use data for improving classroom instruction will help ensure that the data are not only accurate but useful. This will ultimately result in better quality data for ADE, which is the spirit and intent of the legislation. It is recommended that ADE continue to pursue the current scope for AELAS.

¹ An information technology research firm.

2. A business architecture (e.g., vision, goals, processes, policies, and use cases) for an integrated learning enterprise system that includes the functionality found in student information systems (SIS), instructional improvement systems (IIS), and individualized education programs (IEP) systems is needed. It is recommended that using an education business architecture model, ADE work to define an integrated system of processes, data, and applications built around the planned real-time operational data store (ODS).
3. It is recommended that ADE clearly address and communicate AELAS/SAIS/SLDS costs and budget within fully developed project plans, deliverables, costs, funding sources, interdependencies and schedules.
4. Improved communication to diverse audiences, including educators, policymakers and other stakeholder groups is strongly recommended using strategies such as recruiting champions from all sectors across the state and providing “talking points” to them as well as use-case vignettes, one page overviews and longer briefs (avoiding technical jargon) and working closely with public information officers in local education and partner agencies to disseminate information. Engage a professional communications person or agency outside of the IT organization to lead the communications efforts.
5. It is recommended that ADE continue to establish the data governance process by effective use of data stewards and the development of data standards for key AELAS systems, prioritizing the SIS data categories. Using the guidance of national education standards, such as the Common Education Data Standards (CEDS) developed through the Council of Chief State School Officers, will ensure that such data as discipline and attendance can be standardized and agreed upon by the districts to derive data quality benefits from using a common SIS.
6. It is further recommended to continue to reduce the level of redundancy of data collections and to implement the plan for reducing the data collections recently developed with the districts. It is important to be transparent and explicit about the frequency of and expectations for data upload, and communicate these changes on a timeline that allows districts (and their vendors) to make needed adjustments. Also, the use of a roster verification tool and process for the teacher-student data connection is recommended. Such a tool is currently being piloted by the ADE. This will improve reliability and build credibility among the teachers for the quality of the data linkages.
7. A key recommendation of this report is to establish a not-for-profit organizing structure that is separate from, but endorsed by, the legislature and ADE, to engage the districts and charter schools more in the leadership, support (technical and programmatic), risk management, and coordination of the opt-in components of AELAS. This group would be responsible for managing the ongoing operations (or contracts for software as a service) of

the opt-in AELAS components including the specification and contracting for the components and the cost and revenue model.

8. It is recommended that ADE provide ongoing training to improve the capacity of educators to use data. The focus should be on system training and data literacy. This would include reaching out to Arizona State University, Northern Arizona University, the University of Arizona and other partners in higher education to work with them to have data use included in course offerings.
9. A recommendation to ensure adoption throughout the state includes consideration for smaller LEAs. This has started and should continue to be expanded by working with the small and rural districts and charter schools on their technology readiness with a focus on sufficient technological infrastructure and bandwidth to implement AELAS and future online assessments.
10. A comprehensive, long-term approach to planning for AELAS is recommended with continued consultation with ADE stakeholders and users. Building upon the initial needs analysis and expanding opportunities for feedback into an ongoing continuous improvement process will support this. Thus, it is recommended that there be periodic and ongoing needs analyses throughout the course of the development and implementation processes. Another key long-term strategy is the prioritization of partnerships with the business community to leverage their expertise and support.

These recommended actions should be taken to effectively and efficiently address challenges and institutionalize the direction, support structures, and capacity needed for the long-term success of AELAS and SAIS. Three over-arching, consistent messages from the findings and recommendations are summarized here:

1. The overall direction for the types of systems and services to be offered to districts is good and would connect resources focused on increased student learning. The scope of AELAS meets the requirements of ARS 15-249 and is enhanced by the inclusion of the data system infrastructure (single source of the truth) and opt-in components for local districts and schools. ADE has done a good job of preparing the IT department processes and methodologies needed to support such a system, while additional work is needed on clear and concise communications and marketing.
2. The challenges associated with the full implementation of all of the components cross major categories and represent a significant commitment. While such challenges are typical of IT implementations, including the AELAS projects, there is an additional issue with the opt-in components where the ADE does not have the authority to significantly affect local decisions. Areas such as funding, stakeholder awareness and buy-in, employee/leadership turnover, communications and change management, organizational capacity, infrastructure

(especially at the local level), data quality, vendor product/service maturity levels and business/organizational readiness (especially at the local level) need to be monitored and coordinated with ongoing guidance from leadership. The project management work and oversight needs to continue as priorities with clearly shared responsibility both across ADE programs and among local education and partner agencies.

3. The understanding and interpretation of AELAS by stakeholders across the state varies greatly. A shared, common vision of AELAS, grounded in the foundation developed by ADE, needs to be created and broadly communicated. This vision must be supported by stakeholders including the governor and key members of the legislature, business community and LEA community.

CONCLUSION

ADE has conceptualized a far-reaching, groundbreaking, data system that has the potential to serve multiple and important functions. It can collect and provide the needed accountability data required by the federal government as well as the more local accountability data that ADE, policymakers, and other stakeholders need to make high-level decisions. Many states are beginning to do this through their state longitudinal data systems. The strength of AELAS lies in its range of data, from statewide accountability data to more locally relevant, real-time data. The strategies to address the challenges and costs inherent in the development and implementation of this laudable solution are available, but time is of the essence. Broad support and agreement on the prioritization of next steps is needed.

Putting in the hands of teachers and local administrators such data that can directly inform and impact the teaching and learning process is both innovative and commendable. These are the kind of data that can stimulate school, classroom, and individual continuous improvement and would be a major contribution to the districts, schools and students served by ADE. This has the potential benefit to support concepts such as personalized and competency based learning, response to intervention, advanced placement and parental involvement. Going from vision to reality, ADE needs to closely and continuously listen within ADE to both program experts and IT, outside ADE with business and community partners and especially among LEAs with the teachers and administrators who will use and benefit from AELAS.

FULL REPORT

This report provides a comprehensive picture of a performance review of the Arizona Education and Learning Accountability System (AELAS). It is based on a large number of interviews and focus groups as well as an intensive document review. The report is separated into twelve sections. In the first two sections, we provide information about the statute that funded the AELAS project and the data collection process we used to review the data system in accordance with the statute. The body of the report reflects the various components of the performance review. In each case findings and recommendations are described. The final two sections outline commendations to Arizona Department of Education (ADE) about particular exemplary aspects of the work. The report concludes with a summary of the findings and possible next steps. Three appendices are also included. The first outlines information about *Arizona Revised Statute* (ARS) 15-249. The second provides a summary of the findings and recommendations. The final appendix provides examples of support from not-for-profit agencies.

BACKGROUND

ARS 15-249

In 2010, the Arizona Legislature approved HB 2733 with bipartisan support, now classified as ARS 15-249 and ARS 15-249.01, which led to the creation of the AELAS and a data governance commission. ARS 15-249 required the data governance commission to:

develop and implement the education learning and accountability system to collect, compile, maintain and report student level data for students attending public, educational institutions that provide instruction to pupils in preschool programs, kindergarten programs, grade one through twelve and postsecondary educational programs in [Arizona].²

The Statute required the system to accomplish three main goals:

1. Maintain longitudinal, student level data, including student demographic, grade level, assessment, teacher assignment and other data required to meet state and federal reporting requirements.
2. Incorporate the student accountability information system prescribed in chapter 9, article 8 of [the] title.
3. Be accessible through commonly used internet web browsers to carry out the data collection, compilation and reporting duties prescribed in this title.³

The student accountability information system prescribed in chapter 9, article 8 is divided into five sections:

² <http://www.azleg.gov/legtext/49leg/2r/bills/hb2733h.htm>

³ <http://www.azleg.gov/FormatDocument.asp?inDoc=/ars/15/00249.htm&Title=15&DocType=ARS>

1. Student accountability information system
2. Timeline: student level data; definition
3. Student level data: confidentiality
4. Arizona e-learning task force; duties
5. Education database; pupil privacy⁴

Although ARS 15-249 offers general guidance and requirements for the creation of a learning and accountability system, it leaves most of the details up to the system's architects.

PURPOSE, SCOPE AND METHODOLOGY FOR THE AELAS PERFORMANCE REVIEW

The Arizona Department of Administration (ADOA) hired WestEd and CELT to conduct a performance review of AELAS by interviewing stakeholders and staff and reviewing extensive and relevant documentation. The first objective of this review was to “review, analyze, and make recommendations regarding all work conducted in support of the AELAS initiatives with the primary intent to determine whether the activities of the Department were properly executed and targeted towards the objectives as stated in ARS 15-249.” The second objective was to “review, analyze, and make recommendations regarding ADE’s Strategic Implementation Plan to determine whether the Department’s AELAS plan component fulfills the intent of ARS 15-249.”

These two objectives comprised the original intent of the AELAS performance review. ADE leadership made an additional request of the AELAS review team during our data collection process. After the team began conducting face-to-face interviews with ADE, a significant cut was made to AELAS funding. Leadership asked the team to advise ADE for recommendations on how to deal with the budget shortfall. As a result, particular attention was given to the work plan, staffing, budget, and timeline to be able to provide ADE with concrete suggestions about how prioritize components and continue to make progress.

The report covers: findings about the current student accountability information system (SAIS); findings about AELAS; financial analysis; internal and external ADE issues; usage and stakeholder satisfaction; commendations and recommendations. In addition to providing this report, the project director from WestEd and lead evaluator from CELT were present to discuss and receive feedback on the report in person to ADE and ADOA leadership on August 22, 2013, with the final report to be delivered by September 3, 2013. Ultimately, the objective of the report is to provide ADE and ADOA with formative and constructive information about the system, its implementation, its functioning, and stakeholders’ perceptions about the system which will help guide ADE and ADOA’s strategic plans and implementation moving forward.

To accomplish the two objectives of the performance review, WestEd and CELT undertook two activities. First, all documentation related to AELAS was collected by ADE and stored on ADE’s secure EduAccess website. WestEd and CELT staff then read and analyzed the documents, which totaled a few thousand pages of material. The documents pertained to a variety of topics, including; the AELAS business case; current initiatives; historical review; organization of ADE; processes;

⁴ <http://www.azleg.gov/arizonarevisedstatutes.asp?title=15>

production services and infrastructure; roadmap; stakeholders; statutes, studies, and reports; and other project-related materials. Second, ADE and ADOA staff amassed a list of diverse stakeholders as candidates for interviews or participants in focus groups. Over 100 individuals were identified and interviewed between June 3 and July 19, 2013, with the majority of interviews taking place over the last two weeks of June. A small number of those identified as respondents agreed to the interviews but then withdrew or were unavailable at the scheduled time.

Among the respondents included were representatives from: the ADE executive team; ADE program areas; ADE information technology (IT) staff; a wide variety of education committees and education-oriented organizations; local educational agency administrators, and educators; business, higher education and community partners; and legislators and policymakers. Some interviews were conducted in person and others were conducted by phone or conferencing media. Some interviews were individual or two-person meetings, whereas others were conducted in focus groups of two or more respondents. In almost all instances, two members of the team were present for each interview or focus group. The team often conducted research on the interviewees and briefed one another prior to each interview in order to best identify which questions were most pertinent to the interviewee and which sections of the protocol would be the most beneficial to prioritize. The typical interviews, which ranged in length from 20 minutes to an hour-and-a-half, were conducted using semi-structured protocols that were customized according to the role of the respondent. The scheduler from ADE worked to send the protocol to the interviewees ahead of their interviews so that respondents could think critically about the questions prior to discussing them with the team. This led to more in-depth and thoughtful discussions. Whenever there was potential ambiguity concerning a response, document, or issue, the team discussed the matter and reached a common interpretation. The team maintained regular communication with ADE and ADOA throughout the entire process, asking pertinent staff follow up questions and for more information as needed. This report is a culmination of all findings from document reviews, interviews, and communication with ADE and ADOA staff.

AELAS STRATEGIC ALIGNMENT

ADE'S VISION FOR AELAS

According to ADE's website, the enactment of ARS 15-249 required ADE to "deliver a real-time, web-based system that provides actionable information to teachers and administrators that can be used to improve student outcomes."⁵ ADE's vision for AELAS, outlined in the Department's business case for AELAS, is wide-ranging and covers areas including meeting federal and state reporting objectives, providing teachers timely access to information, adopting and maintaining an educator model framework for evaluation, and saving local education agencies (LEAs) money both by reducing the cost of their current data systems and saving time and effort needed to report data. ADE estimates that \$110 million is being wasted each year in the state because of the lack of a quality data system. One of the main features of ADE's proposed AELAS system is an opt-in model, whereby LEAs would not be required to purchase the AELAS system as long as they can still report necessary data to the state.

⁵ <http://www.azed.gov/aelas/>

ALIGNMENT WITH ADE STRATEGIC PLAN

The development of a state-of-the-art data system is well aligned to both ADE's FY 2013–14 strategic plan⁶ and their FY 2014-2018 five year strategic plan⁷. Establishing a high-quality data system is essential to meet three of the four goals stated in both plans. Table 2 lists those goals.

Table 2. ADE's Strategic Plan Goals

FY 2013–14 Plan	Goal #1: Provide Support Services to Schools to Influence Higher Student Achievement.
	Goal #2: Enhance Efficiency & Effectiveness to Reduce Administrative Burdens on Schools.
	Goal #3: Provide Outstanding Services that will Promote Great Schools, Excellent Teachers, and Successful Students.
FY 2014–18 Plan	Strategic Issue #1: Increase Student Achievement (K–12).
	Strategic Issue #2: Strengthen Customer Relationships.
	Strategic Issue #3: Enhance Process Efficiency and Effectiveness.

A well developed state data system would allow ADE to strengthen support for the LEAs by providing teachers and leaders with quality tools to increase student achievement. A user-friendly system would allow schools and districts to enhance their efficiency by limiting the time and effort needed to report data to the state.

ALIGNMENT WITH THE GOVERNOR'S EDUCATION REFORM PLAN

In addition to meeting ADE's strategic plans, the development of a high-quality data system is critical to meet the Governor's Education Reform Plan⁸. In her plan, the Governor outlines four pillars for reform: Data Use, Standards and Assessment, Great Teachers and Leaders and Support for Struggling Schools. To address the four pillars, the Governor calls a statewide data system "essential" to provide "both the storage and delivery mechanisms for key information needed for data use by stakeholders." (p. 6). The plan goes on to say that the data system must "seamlessly link P–12 and higher education with other agencies such as labor, commerce, health, etc." (p.8).

Findings:

LEA leaders whom we interviewed expressed clear and similar visions for AELAS; however, other interviewees, both internal and external to ADE, had varied understandings of what ADE's specific objectives were with regards to AELAS.

Despite some conflicting opinions as to whether AELAS was the right option for the state's data system needs, there was strong confidence that if any Department of Education administration had the IT skills and ability to create a quality data system, it was the current administration. Those interviewed were pleased with the progress that this ADE administration has made repairing SAIS and building confidence in the Department's technological capabilities.

⁶ <http://www.azed.gov/strategic-planning/current-year-plan/>

⁷ <http://www.azed.gov/strategic-planning/5-year-plan/>

⁸ <http://tinyurl.com/m2roual>

Recommendations:

ADE leadership needs to:

- More clearly and concisely articulate their vision for and purposes of AELAS to stakeholders, both internal and external to the department.
- Continue to support the efforts of the IT department in ADE to build the skills, processes, methodologies and architecture necessary for AELAS.

AELAS ALIGNMENT TO ARS 15-249

The majority of people we interviewed were not familiar with ARS 15-249. But those who had knowledge of the legislation frequently expressed the opinion that AELAS went beyond the scope of the ARS, generally believing that AELAS should be a statewide longitudinal data system (SLDS) and SAIS only, and should not include either a learning management or an opt-in component. Yet others believed that the system should be both a learning management and an accountability system, emphasizing the “L” (learning) in AELAS. Since the statute does not offer many specifics about what should and should not be in the learning and accountability system, it is understandable that stakeholders would have differing interpretations, and it is a subject that should be discussed in more depth among key stakeholders. Further, the closer stakeholders are to the classroom, the more interest in and request for the learning management capacities. Therefore, responses tend to be role-based.

Findings:

There is not a consensus among those interviewed that the current AELAS scope is required to meet the legislated requirements for ARS 15-249. In part, this may be due to a lack of familiarity with the statute in contrast to what they see as desired functionalities.

It is the opinion of the review team that the scope of the AELAS system goes beyond what a strict interpretation of ARS 15-249 requires, especially with regard to the opt-in component. Nonetheless, there are good reasons why the widened scope is important to successfully achieving the intent of the legislation. Our experience shows that the reporting of data to state agencies for compliance reasons, when there is no subsequent benefit or use of those data by the districts and schools, results in generally poor quality data. It also results in the perception that the data lack utility and therefore will not be used effectively. Providing systems and dashboards that help schools and teachers use data for improving classroom instruction will help ensure that the data are not only accurate but are also useful. This will ultimately result in better quality, useful data for ADE, which is the spirit and intent of the legislation.

Recommendations:

We recommend that ADE:

- Continue to pursue the currently defined scope for AELAS by ADE.

- Clearly and concisely articulate their vision and rationale to stakeholders, both internal and external to the department.

STAKEHOLDER AWARENESS AND BUY-IN

ADE STAKEHOLDER AWARENESS

Those interviewed from ADE had varying levels of knowledge of the AELAS system, but all supported the idea of what they knew about AELAS. Staff from different departments spoke highly of ADE's attempt to reach out to LEAs and seek feedback from them. However, often they did not feel that ADE staff had been given the same opportunity for input. There were concerns about internal transparency and that various ADE staff had different knowledge of the vision and timelines for AELAS. Since ADE staff from nearly all departments and programs work closely with the LEAs, it is imperative that all ADE staff have the same understanding of AELAS. Messaging and communication around AELAS need to be consistent from all of the departments and program areas to the LEAs about AELAS.

While different ADE departments have their own specific issues which should be addressed early in the creation of the system, most respondents stated that timely and accurate data is the most pressing need. There was a common caution among those interviewed that if AELAS were to experience the same types of post-development add-ons as SAIS, then the timeliness and accuracy of the data would be compromised.

Findings:

Staff was concerned that if they are not given a forum to learn about the details of AELAS and to provide feedback on the front end, then the new system would be jeopardized. If they could not provide their feedback early on in the development, pieces would have to retroactively be built onto AELAS as happened with SAIS. This could lead AELAS to experience many of the past inefficiencies of SAIS.

Recommendations:

In order for agency-wide buy-in to be possible, ADE staff should:

- Be provided with a forum in which to give feedback.
- Be provided with regular updates about the vision for and development of AELAS and common talking points for messaging.

AWARENESS AMONG THE GOVERNOR'S OFFICE, ADOA STAFF AND LEGISLATORS

The Governor's office, ADOA staff, and legislators from both the Arizona House and Senate agreed that developing a high-quality data system was important to the success of education in Arizona. Some people interviewed believed that the creation of a high-quality statewide data system was one of the most critical actions that could be taken to improve the state's education system. More interviewees were generally supportive of the idea, but not sure how big of a priority it should be given as compared to other competing educational priorities. This could be due to varying

knowledge about the vision for AELAS, and the progress in the development of the system that has been made to date. Often people interviewed expressed a lack of knowledge about AELAS and because of this were unable to provide detailed responses to key questions. Some felt that they did not know enough about the technology of a data system, while others were unfamiliar with many of the potential benefits of a data system, and unaware of the specific goals of the AELAS system. Furthermore, many expressed a lack of knowledge as to what progress had been made by ADE on AELAS creation and development, and what the specific costs associated with the project were.

The policymakers interviewed were concerned about the costs of the system, as they were all adamant about the importance of being fiscally prudent. Many admitted to having little knowledge of how much a data system should cost, but were of the opinion that the amount requested by ADE sounded high. Some also believed that pieces of the system were already out there and could be acquired for less money than it would cost to build internally. Still, others were not confident that any investment in a new system should be made until SAIS was fixed.

Findings:

Nearly every policymaker interviewed made clear a desire for a high-quality data system and seemed open to the possibility of supporting AELAS if provided more information about the system and given a forum to have questions and concerns addressed.

Some policymakers shared that they have asked ADE for additional information but have not yet received it.

Recommendations:

In order to maximize buy-in among the policymakers, ADE should:

- Provide them with more detailed information on the purpose of the system, the vision, how the data are to be used, what data will be included, and fiscal data. This includes one-pagers which provide information on the scope of work, timelines, accomplishments to date, and additional budget information.
- Prioritize responding to policymaker's questions and requests for information by naming an ADE staff member with knowledge about AELAS to serve as a point of contact for the policymakers and by conducting meetings with policymakers and legislative education committees.

AWARENESS AMONG LEAS

Interviewees from LEAs (including charter LEAs), institutions of higher education, and other governmental organizations were all very supportive of the development of a high-quality data system. However, with the exception of district leadership from pilot LEAs, few of these interviewees had anything more than a basic knowledge of AELAS or were able to speak to specifics of the system. Some interviewees from rural districts or small, independent charter schools expressed concern about having the technological infrastructure or staff capacity to make use of a statewide data system, but were nevertheless receptive to the possibility that it could be a useful tool. Several people interviewed commented that the state's high rate of migrant students has previously

led to difficulties with reporting students and paying schools, and that a new system must be amenable to the unique populations in the state. One person interviewed suggested that the state seek input from companies that create health care data systems. Since individuals often move from doctor to doctor, health systems are well equipped to have health records follow the patient, and those companies could provide important feedback on how to make AELAS more amenable to the transient student population.

BUY-IN WITH OTHER STAKEHOLDERS

The need for a high quality data system expands beyond state offices and educational organizations. Interviewees representing a range of organizations including the business community, and policy and advocacy organizations were strongly in agreement about the benefits of a high-quality data system. Members of the business community were among the most adamant of those interviewed about the need for a statewide data system, and expressed the greatest support for such a data system. Like representatives of governmental and other public agencies, the members of the business community were familiar with AELAS at the policy-level, but often not with the specifications and technical applications of the system. Rather than focusing on the specifics of AELAS, their interest was generally on creating a data system that will improve education delivery, create a more qualified workforce, and enable Arizona to move into 21st century information and technology. Expressing strong support of the system development, members of the business community are key partners in the development of the AELAS system. They not only are influential, but also have a solid understanding of both the need and challenges of this work. These partnerships are instrumental in moving the development of the system forward.

Summary Finding for Stakeholder Awareness and Buy-in:

In no uncertain terms, the creation of a state-of-the-art data system is something that is coveted by leaders from across the state, and is essential for the plans, goals, and objectives of countless Arizona business and education organizations and entities. However, as previously mentioned the vast majority of those interviewed were unclear as to specifically what is in AELAS, and were unable to thoughtfully weigh in on how AELAS specifically aligned with strategic plans.

Summary Recommendations for Stakeholder Awareness and Buy-in:

ADE should establish a multi-pronged communication strategy that can be customized to specific audiences:

- For the district stakeholders, having someone from ADE who comes from a district and can speak in their terms about AELAS would be a recommended strategy. Having the ADE staffer accompanied by a current educator who can speak knowledgeably about the system from experience would also be an asset.
- For policymakers, the message should demonstrate the need for the system and for adequate resources. ADE should identify and use individuals around the state as eloquent spokespersons for the system.

- A set of concise one-page synopses about AELAS for different audiences should be prepared. Longer five-pagers also should be developed with additional customized information.

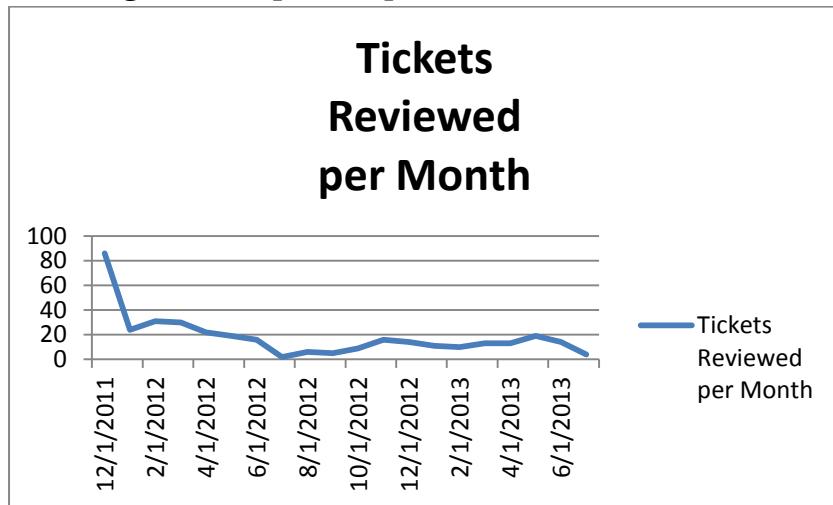
CURRENT SAIS SYSTEM

ADE has made substantial improvements to SAIS performance over the past two years and has increased school district personnel's confidence in ADE's IT department. District interviewees reported that the SAIS system performance improved over the past two years in terms of response time and system availability. ADE provided data that supported these claims.

Overall, district interviewees reported satisfaction with the progress made to date on SAIS performance; however, these same interviewees noted that there is much work remaining to be done to improve the data upload and correction process. Interviewees also expressed concern about the time needed for data collection and issues around redundancy of data and data collection.

The number of SAIS help desk tickets created per month has dropped over time, leveling off at 20 or fewer (Figure 1). This reflects a positive move toward better understanding of the data submittal process and better system operations.

Figure 1. Drop in Help Desk Ticket Submissions



The number of records that have been rejected has dropped in the past year but remains high, reflecting an ongoing issue with quality data from the districts (Figure 2). Record failures (due to internal ADE processing) have reduced and stabilized, indicating improvements in the SAIS processing of the district records (Figure 3).

Figure 2. Change in Number of Records Rejected

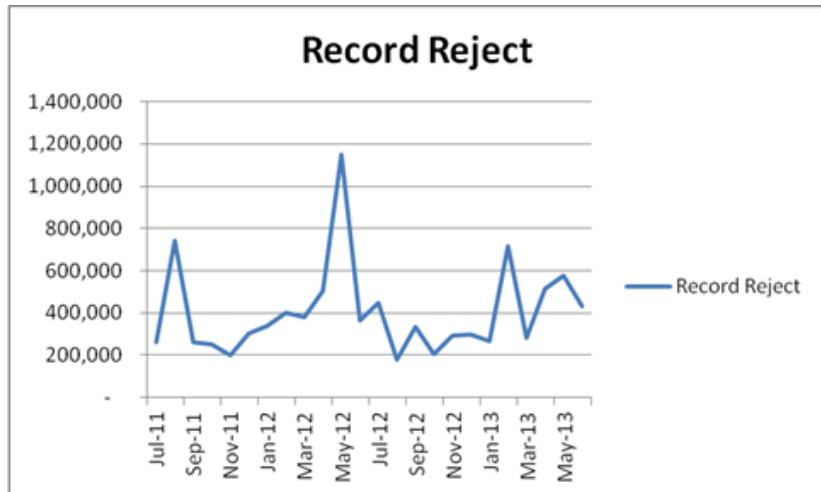
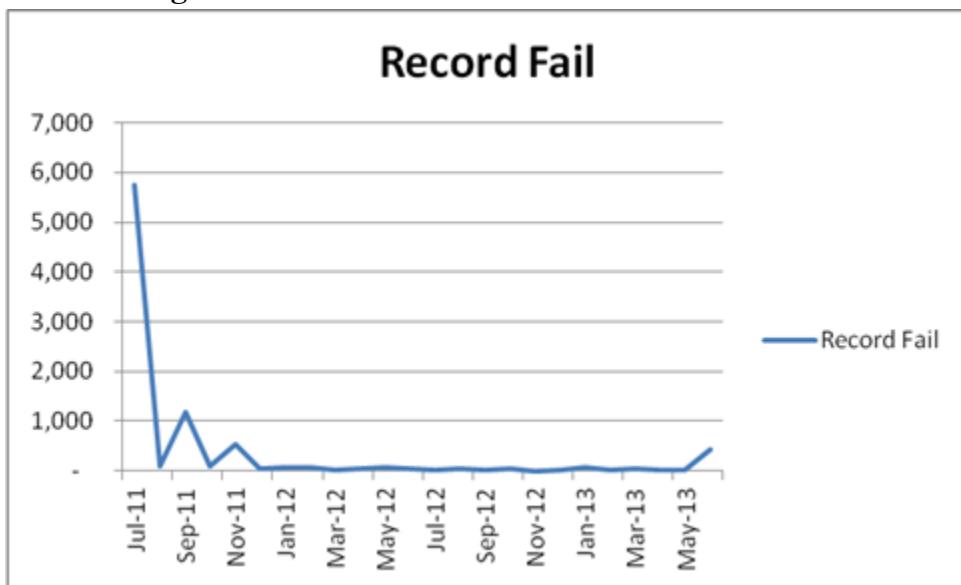


Figure 3. Reduction in Number of Record Failures



District interviewees noted that they do not benefit greatly from the data in SAIS today, as their own student information systems already have the data that SAIS provides including their own average daily membership (ADM) counts.

Charter school interviewees noted that they *are* heavily dependent on SAIS data reports because they do *not* have their own student information systems. They further expressed concerns for the timeliness of the process, since their current year funding is tied to SAIS reports. Delays in getting SAIS funding data create serious cash flow concerns for the charter schools. This concern is more a function of the state policy for charter school funding and the design of SAIS around these policies.

ADE has made progress toward strengthening the teacher-student-course data connections. This is important work with a great deal of downstream uses, some of which are high-stakes such as evaluations.

Findings:

Challenges exist regarding the level of redundancy in the current data collection processes for SAIS.

Before they can be used for any high-stakes purposes such as determining educator effectiveness, ADE teacher-student data connections will require a high level of confidence on the part of educators as regards the quality of these links. Such confidence will be challenging to achieve with the history of SAIS.

ADE staff report, that while there have been significant improvements in SAIS performance, the current SAIS system is on an unsupportable platform and may fail at any time resulting in serious costs and federal reporting issues. While it is not within the scope of this work to delve deeply into the technical underpinnings of SAIS to verify this finding, the reasons provided by the ADE staff for this significant concern were very credible.

Recommendations:

Given that SAIS may fail at any time, it is very important that ADE:

- Establish a strategy to move away from SAIS as soon as possible. Before any development work begins on a new system, ADE leadership should consider initiating a policy, legislative, and process review of the current SAIS business architecture, rather than creating a new SAIS that repeats the same processes and policies. This should not be an IT responsibility, but rather a policy responsibility. IT should be involved and can help document the decisions and guide the discussion where more specificity is required. This work should begin immediately, as it is on the critical path of a SAIS rewrite that must be done because of the vulnerability of the current SAIS platform.
- Continue the work to establish a rules engine for data checking and cleansing and consider extending the use of this tool to the districts to allow them to nightly check the local data entered by schools into their student information systems on the previous day. This is an essential step toward achieving high accuracy of the data. Also, continue its work to establish a roster verification tool and process for the teacher-student data connection prior to any high-stakes use of these data. This will build credibility among the teachers for the quality of the linkages at the state level, which is critical to their acceptance of any use of such data in their evaluation process.
- Continue to examine carefully the level of redundancy of data collections and to consolidate efforts where possible.

AELAS WORK IN PROGRESS

GOVERNANCE

Leaders at very high levels in ADE and the state, including important business leaders, are committed to the success of AELAS, SLDS and SAIS. Many of these participate on the various governance structures that regularly oversee the ADE progress on these systems. The governance structures that oversee AELAS are not unlike those found in other states for such projects; however the ADE did appear to have more external oversight than our team has been accustomed to seeing.

The ADE has an internal data governance process that is continuing to evolve and mature. The ADE has had two data conferences where data governance and data collections were discussed. These were well received by the districts.

Findings:

The ADE internal data governance process is getting traction from a combined top-down and bottom-up effort. However, it has not reached a level of maturity, visibility, or widespread acceptance that is required for the AELAS efforts to reap their full benefit. As examples:

- Data standards around key data categories for the SIS are needed before a state-supported SIS (Opt-in model) can achieve the full benefits from data consistency and quality; and
- Agreement among all of the ADE groups that administer assessments is needed before the benefits of the AELAS assessment engine can be fully leveraged.

Recommendations:

ADE should:

- Continue to build and strengthen the data governance process and develop data standards for the key SIS data categories such as discipline, truancy, excused and unexcused absences.
- Prior to rollout and as part of training activities, use the data stewards for these data categories to determine these standards.
- Engage the data stewards for the assessment program areas to come to consensus on how to leverage the AELAS assessment engine, the ADE data warehouse and ADE dashboards collectively in a well-designed instructional improvement system.

PROJECT OVERSIGHT

ADE has established a project management office and a project oversight process of bi-weekly meetings of the project managers that foster issue resolutions and cross-communication. The

practices around the project office and project status reporting and issues management seemed strong and engaged the right level within ADE.

The process that ADE followed in the writing and selection of the vendors for AELAS appeared to follow a number of promising practices:

- Where possible, ADE borrowed strategies and designs from other states to lower costs and challenges. This included such strategies and designs as the Georgia data hub tunnel (components thereof), the Georgia SLDS dashboard designs and the use of Ed-Fi as an operational data store.
- The requirements stated in the request for proposals (RFP) were thorough and borrowed language from other states with similar projects.
- The districts have been engaged in the development of the RFP requirements.
- The costs seen in the best and final offers are within reasonable range of what other states are seeing for comparable systems.

The Instructional Support Tools RFP for the content management system (CMS), learning management system (LMS) and professional development (PD) administration was issued and cancelled due to contract restrictions. Some of these components are being developed internally (the CMS) and have potential for cost-sharing with other states.

Findings:

The requirements gathering for the AELAS opt-in systems, for example the student information system (SIS), while heavily engaging district focus groups, seemed to not have enough emphasis on understanding each individual process. Focus sessions could be designed around these processes, with the focus group makeup carefully selected to have important and knowledgeable subject matter experts (or process owners) and program areas. Examples include involving more principals and assistant principals for scheduling and grade book processes; involving special education professionals to determine what data are being pulled and how; involving research and evaluation staff for formulas and data needed for accountability.

As of the date of the onsite interviews, ADE had not determined what districts will be part of the selection process for the SIS.

There is no sponsor for the SIS (or any of its major components or processes such as secondary school scheduling) beyond the IT department. It is important that IT not be viewed as the sponsor and owner of the AELAS opt-in systems.

Because Arizona is not a centralized state, the districts are left to individually decide on how some of the opt-in systems in AELAS will work and be configured. This is an “open-ended” business architecture that may result in some of the AELAS components not being fully utilized at the district and classroom level and not being sufficiently consistent across the state. For example, with the educator evaluation effort, there is no program-area sponsor to drive consistency and districts are left to choose the system (True North Logic (TNL) or Teachscape), the framework, the standards

and the rubrics themselves. This could drive up implementation and training costs and make the data across districts different to such a degree as to inhibit statewide data gathering and reporting in this area. Educator evaluation data for Arizona will not likely have the consistency across districts like what other states have accomplished, (e.g., in GA or NC where statewide implementations were directed by the state, with rubrics, evaluation standards and consistent training).

Recommendations:

In order to support SIS usage among the districts, ADE should:

- Establish non-IT process owners who can understand the SIS processes and tools and support the districts effectively.
- Be more thorough in the selection of the focus groups to ensure that the range of subject matter experts is sufficient to represent all processes being automated by the opt-in components, such as the SIS. ADE should be included as one of the process owners, as they are appointed.
- Establish the strategy for selecting districts for inclusion in the SIS selection process and define their role in this process.
- Identify sponsors in ADE for the components of AELAS. Use them to champion their systems, drive consistency of practice, develop data standards, and provide ongoing training and support. For the SIS, since it represents multiple functions such as grade book, scheduling and attendance, it may be practical to have multiple sponsors or process owners that coincide with the corresponding data owners.

RISK MANAGEMENT

ADE is conducting the opt-in and SLDS pilots with a small but representative subset of districts to obtain essential input from key consumers and long-term buy-in and support as these systems scale up across the state. This is an effective risk mitigation strategy. MCESA has provided a successful pilot and been an avid supporter to ADE for the formative assessment and educator observation tool.

Findings:

ADE is taking on challenges for systems in AELAS that are beyond their control to manage and support. These are primarily regarding the opt-in components (SIS, CMS, LMS, assessment system), whose functions, requirements, operations and usage are controlled by the districts. Many of the critical success factors for these systems are beyond the influence of ADE, such as change management at the classroom and school level, teacher and principal buy-in and use, infrastructure within the district and schools, and end user devices. While a more centrally managed state such as North Carolina might take on these roles, it is problematic for a local control state such as Arizona.

While the individual AELAS projects that are currently in flight appear to be manageable, the challenges associated with the full implementation of all of the AELAS opt-in components are large and cross all major categories such as funding, stakeholder awareness and buy-in, employee/leadership turnover, communications and change management, organizational capacity, infrastructure (especially at the local level), data quality, vendor product/service maturity levels and business/organizational readiness (especially at the local level).

There is a considerable challenge for AELAS related to the lack of infrastructure and end-user devices in the districts, schools and classrooms. There is a wide variability of technical readiness for such a system across the state. While the ADE can be successful in their implementation of AELAS, the districts and schools may be restricted in getting the full value from AELAS because of such local issues.

Recommendations:

ADE should:

- Establish an LEA (district and charters) leadership group to engage them more in the leadership, support (technical and programmatic), risk management, and coordination of the opt-in components through a not-for-profit organizing structure separate from ADE. It would:
 - Establish the not-for-profit entity to manage the effort going forward;
 - Establish the cost and revenue model for the AELAS opt-in components and manage the financials;
 - Establish a change management and data migration plan for LEAs and charters
 - Address the infrastructure issues at the LEAs;
 - Be responsible for the specification, selection and contracting for the opt-in components;
 - Be responsible for managing the ongoing operations (or contracts for software as a service) of the opt-in AELAS components; and
 - Reach out to the small, rural, and charter schools to support them in maintaining sufficient technological infrastructure and bandwidth to implement AELAS.

Appendix C contains information regarding such service agencies in other states.

- Work on addressing the infrastructure needs of the districts:
 - Define a strategy for addressing the infrastructure needs of the districts;
 - Develop a self-certification process in collaboration with LEAs, such as the Virginia model, for districts and charter schools to determine their level of readiness for implementation and identify those areas needing further work and resources;

- Reach out to the small, rural districts and charter schools to identify where there is insufficient technological infrastructure and bandwidth to implement AELAS and flag them as at-risk for fully realizing the benefits of AELAS; and
- Establish the state's roles (through policy or guidelines) for addressing these shortfalls.

RESOURCE MANAGEMENT

ADE has hired and/or contracted for high-quality IT staff and consultants with the knowledge and skills to effectively use the established application development methodologies, standards and frameworks. As with most states that are dealing with Race to the Top, resources are strained and pushed to the limits of personal productivity. ADE has done a good job of bringing on talented staff and contractors to help meet the work demands for SAIS, AELAS, and SLDS, but sustaining this resource and transitioning them to long term support is an issue.

Findings:

Long term staffing and sustainability for the organization currently in place is a serious challenge.

As mentioned earlier in the report, not enough of the department and its program areas are engaged in the AELAS effort at this point. The effort is too “technology centric” to support wide-spread adoption by program areas in ADE and in the schools and classrooms.

The institutional knowledge gained by the existing staff and contractors is in jeopardy of being lost over time. It is understandable to rely on short-term contractors to fill the needed expertise gaps, but sustainable institutional knowledge is a critical need for the future.

Recommendations:

ADE should:

- Plan for attrition. With vagaries in funding from year to year it is highly likely that the staff and skills that currently are on board for the AELAS, SAIS, and SLDS work will seek other sources of employment. Cross-training, good documentation, and ownership by the program areas for the data, application system functionality and processes will go a long way to mitigate the effects of attrition among the IT staff. Also, the work done already by the ADE IT team around the use of phase gates, documentation and methodologies can help to mitigate the effects of attrition and should be continued.
- Organize meetings for other ADE staff to participate in where the staff members have the opportunity to learn about AELAS, provide their feedback, and become more involved in the development of the system.

- Over time, convert appropriate contract employee positions to regular employee positions, as the need for special contracted skills/knowledge diminishes and is replaced by the need for more long-term support personnel.
- Seek a stable funding source for these resources. This approach has been used successfully in states such as Georgia.

METHODOLOGY

ADE has adopted some of the key disciplines around enterprise architecture and has staffed the position of enterprise architect. ADE leads most other states in their adoption of this important discipline for enacting reform, with only a few notable other state agency examples making similar progress (Washington, Washington DC, Tennessee, North Carolina, and Louisiana). Enterprise architecture is an essential discipline for managing the work associated with a complex system such as AELAS.

ADE has established and is using application development methodologies, standards and frameworks. This is a major accomplishment that puts ADE's IT group in a good position to roll out well-documented and high quality systems—an *essential* prerequisite for a successful AELAS and SAIS rewrite.

Findings:

There has been substantial work and cost expended to lay a foundation for AELAS that is not being seen and understood. This work includes things such as improved staffing and expertise, enhanced methodologies and procedures, and better project management methodologies and tools. This work did not get reported in a lot of the interviews when asked for examples of success.

The application development and architecture methodologies developed and in use by ADE for AELAS, SAIS, and SLDS were impressive. The documentation was thorough and professional. The understanding and buy in from the staff for these disciplines was notable.

Testing and System Performance. While the SAIS business sponsors work closely with developers and quality assurance (QA) for production testing and implementation, the interview team was of the understanding that there was not currently a formal, auditable process whereby SAIS business sponsors sign off on production loads and QA.

Requirements Gathering. The methods for gathering and documenting requirements and the documentation created seemed thorough and professional. However, the methodology is not systemic enough in the identification of processes and process owners and the engagement of these owners in establishing the process definitions and functional requirements.

Sponsorship and Program-Area Engagement. School Finance and Accounting is heavily engaged in the SAIS work, and this group's relationship with others working on SAIS is positive. The Research and Evaluation Department also works closely with IT and its staff uses the SAIS data to a large degree.

We did not see evidence beyond these groups that there is the involvement needed to ensure that the systems have a good business architecture established and that the vision, strategies, services, processes, policies, and recommended practices are connected from ADE to the districts and into the classrooms.

The individual projects within AELAS appear to be well managed with risks addressed, and it is likely that each individual project will be successful. The real concern is that the vision, the full potential of AELAS will not be realized—e.g., the whole will not solidify into something more than a collection of parts. This will be more of a failing of integration at the level of the business architecture, exacerbated by the fact that Arizona is a strong local control state. Some examples include: the TNL project’s lack of a true business architecture; the lack of data owners and standards for the SIS; the lack of sponsors and process owners for the LMS, CMS, and assessment systems to make these support an integrated process; and the lack of process clarity to bridge among the SIS, LMS, and IEP systems and data structures.

The IT department needs to insure that its staff communicates changes and updates to the system in a more organized fashion. Internally, change management seemed to be well coordinated. However, there did not appear to be a standard way of communicating to the end users the changes that are being made to the systems.

Recommendations:

ADE should:

- Continue to support the efforts of the IT department in ADE to build the skills, processes, methodologies and architecture necessary for AELAS.
- Establish ADE sponsors for each of the AELAS functional areas and engage the sponsors, process owners, representatives from the LEAs and data stewards in the establishment of a business architecture for instructional improvement.
- Focus on the business architecture (e.g., processes, policies and use cases) for an integrated learning enterprise system that includes the functionality found in SIS, IIS, and IEP systems. Use such practices as the Centers of Excellence and the MCESA pilot to help create this business architecture.
- Continue to evolve and develop the concept of separating data and applications through the operational data store (ODS) as the single source of the truth. Move away from the idea of acquiring monolithic systems that are standalone and in silos with data structures tightly woven into the applications. Instead, develop a more integrated system of apps built around an ODS. Rely on the business architecture to drive the integration, rather than solely the information and application architectures. Engage sponsors outside of ADE’s IT group to drive this business architecture. Strengthen the connection between processes and process owners and the development of functional requirements.

- Ensure that there is an auditable process whereby the SAIS business sponsors sign off on production loads and QA. At the proper time, request an internal audit of the SAIS ADM process and accompanying LEA funding allocation process.
- Establish the industry-standard technology change management practices that carry the change notification to all appropriate system users.

SYSTEMS ARCHITECTURE

ADE has developed a vision of an applications and information architecture that is comprehensive, service oriented, enlightened by emerging best practices and trends in education, and supported by the school districts and business community. The approach of using an operational data store as a “single source of the truth” and as an integration platform is one that other states and school districts are adopting as a practice. We strongly support this architectural approach.

Findings:

ADE’s design considerations have recently been modified to accommodate the potential for supporting a diverse array of end user devices that might be found in a school or district, especially as bring-your-own-device (BYOD) strategies begin to be deployed.

Where possible and support exists, ADE’s preference is to buy versus build as long as the total cost of ownership (TCO) is cost effective. Building applications is not a core strength that they plan to develop/maintain. This means they need strong integration skills and strong integration bus and service architectures as well as a sound data architecture.

ADE is focusing on CEDS (Common Education Data Standards) for standardizing data elements and option sets and Ed-Fi⁹ for the operational data store and data transport layer.

Recommendations:

ADE should:

- Continue to develop the user interfaces (UI) to include responsive design to ensure a broader adoption by giving access to tablets and phones, and include this capability in future RFP language.
- Continue the data integration project using Ed-Fi as the key component as a viable approach to minimizing integration costs going forward.

⁹ See <http://www.ed-fi.org/about-the-ed-fi-alliance/>. Ed-Fi is a data standard and suite of tools that provides applications for the consolidation of diverse sources of data for K-12 educational data.

DATA ACCESS, QUALITY, AND SECURITY

Findings:

ADE currently has a data dictionary. The dictionary does not however see regular use by the data stewards and IT staff to foster master data management, data sharing, increased transparency, reductions of data collections and better standardization of the data elements.

The data standards needed for some of the opt-in systems, especially the SIS, are not in place.

Data Migration Strategy and Plans. ADE lacked evidence of data migration planning for the opt-in components. The data integration platform plays a key role in this, but much work remains to be done before this is a usable approach. Vendor adoption strategies for the data ingestion process and tools also need to be developed.

The topic of data privacy/security concerns surfaced in some interviews. This is relevant to SAIS, but more so to the broader AELAS future data collection strategy and the opt-in components. Interviewees expressed concern regarding what data are being collected and for what purposes. This is consistent with emerging concerns on a broader (national) level around privacy issues related to large data repositories hosted in the cloud and student data being used for vendor profit/gain.

Recommendations

(See also the recommendations under governance.)

ADE should:

- Continue to build upon the data governance process and use the data dictionary as a critical tool to capture and maintain metadata for driving better master data management.
- Develop data standards for opt-in systems, particularly the SIS.
- Look for opportunities to benefit from and share with other states. Data mapping of the wide range of LEA source systems of record for ingestion into Ed-Fi and the subsequent data extraction, data loading and error correction required is a great deal of effort and expense. Other states and school districts are moving forward to adopt Ed-Fi, and as a consequence these data mappings and extractions will be developed by multiple organizations.
- Better articulate steps underway to protect data privacy in order to manage perceptions and expectations.
- Craft messaging to help clarify and confirm that personally identifiable data will be protected, FERPA requirements will be met, AELAS applications will be FERPA compliant

and the value from such data will return to the districts and schools to inform instructional practice and increase student achievement.

FINANCIAL ANALYSIS

BUSINESS CASE – OPT IN COMPONENTS OF AELAS

ADE has developed a business case for AELAS that has the endorsement of Gartner. The AELAS business case identified \$87.8 million for LEA opt-in investment over 5 years and \$69.7 million for ADE investment over the same 5 years for a total of \$157.5 million.

The West Ed/CELT team reviewed costs from similar efforts in other states representing a *roughly* similar scope of work as the LEA opt-in investment. No state, that we are aware of, has a similarly broad scope for these district components. Comparing costs and scope across states is somewhat informative but at best was like comparing apples and oranges. Additionally, data that we gained access to regarding the 5-year total cost of ownership for a large LEA for an SIS implementation revealed that the district anticipated, and presented to its board, a total cost of \$30 million for this single system. This would argue that the \$87.8 million statewide cost for 9 systems is perhaps too conservative.

Findings:

The conclusion the West-Ed/CELT team reached is that opt-in costs shown in the business case are within reason. A great deal more work on project planning, clarity around deliverables, roles and strategies is required before the opt-in costs can be stated any more definitively.

Regarding the savings identified in the business case for the opt-in components, the costs that the smaller districts reported that they are currently paying for systems in the nine (9) opt-in categories are much higher than should be expected. While the opt-in strategy will address some of this over time, a shorter path to realizing savings is to bid these systems at the state level and provide a procurement list from which districts can select.

Recommendations:

ADE should:

- Continue to refine and update the cost model for AELAS as actual costs are known and as projects are further defined and scoped.
- Pursue on an expedited schedule a state procurement list for districts to select from for such systems as SIS, IEP and IIS. That way, even if a district elects not to participate in the opt-in components, at least there is a vendor procurement list that has competitive pricing from which they can choose.
- Offer guidance/professional development to districts on procurement practices to help them better negotiate pricing for procurements in the future.

BUSINESS CASE – ADE CORE SYSTEMS OF AELAS

Commenting on the costs for ADE core systems replacement is more difficult as these systems, especially SAIS, are unique to the state and represent legislative rules and policies that are specific to Arizona. Also, some of the strategies represented by these costs are unique and ground-breaking among the states. There are no comparison efforts that we are aware of for some of the strategies such as:

- Statewide ODS with real-time data feeds to and from multiple LEA source systems.
- Rules engine for data cleansing to improve data quality in a more dynamic and flexible method.
- Data mapping and ingestion processes provided across multiple LEA source systems.

Findings:

The AELAS, SAIS, and SLDS project costs, actual spend to date, funding sources and future costs are not well understood by the key stakeholders, governing bodies and legislature. This is a complex project, and the costs and funding structures are difficult to convey and to comprehend. This lack of understanding will make it more challenging over time to advocate for continuing expenditures.

The budgeted \$5.3 million for IT operations for 2014 is low compared to a recent Gartner study conducted on behalf of the State of Washington Office of the Superintendent of Public Instruction. This study cites a range of \$5.7 to \$6.8 million for peer state (e.g., Washington peer state) agencies for 2013.

The FY 2014 AELAS appropriation (\$7 million) does not provide the money to sustain the aggressive schedule that was planned for AELAS rollout, and will delay some of the benefits anticipated in the business plan.

The long-term sustainability for a system such as AELAS in Arizona is a serious issue. Funding streams can be in danger of being reduced or eliminated each year. Staffing for the full project and long-term ongoing support is unknown at this point.

Recommendations:

ADE should:

- Develop a comprehensive plan for the full implementation of AELAS and the SAIS rewrite. It would include each of the projects and their accompanying resource needs, funding requirements, stakeholder resources, district resources, major deliverables and milestones over a multi-year period, and likely funding sources and funding gaps.
- Outline all of the projects (in progress and to be launched), the scope/deliverables, schedules, sponsors and team members, costs, and funding source. Be transparent as regards the AELAS/SAIS/SLDS budget, publishing its planned budget to date, actual spend to date, burn rate, percent complete by project for all efforts associated with these efforts, and sources of funding.

- Plan to increase the line item for IT operations in the 2015 budget to be more in line with peer-state expenditures, with additional consideration for support for the AELAS components that come online.
- Create an alternate schedule for the AELAS rollout and include specific information about how the FY 2014 appropriation impacts it.
- Consider funding, managing and supporting the opt-in components of AELAS through a not-for-profit entity outside of ADE, given the gap between requested and actual approved budget for the AELAS appropriation, and the uncertainty this implies for future year budgets.

LOCAL ISSUES

The biggest local issue concerns the technological infrastructure for the state's small schools and districts. Many of the respondents from rural and small districts were concerned about whether they must have a technological infrastructure that could support AELAS. In particularly rural areas, there is a bandwidth problem that would need to be addressed to ensure effective use of the system. The small districts also noted that general technology is lacking and would make the implementation problematic. Charter schools also expressed their apprehension about having sufficient technology to support the system. The technology extends to the human capacity needed to support AELAS. That is, charter schools tend not to have sufficient technical support staff to maintain the technology surrounding AELAS.

Another local issue is cost. Respondents in the small districts and charter schools expressed concern about the disproportional costs they perceive will be levied on them for use of AELAS. However, the plan for AELAS is that through the AELAS Opt-in system offering, small districts will be able to gain integrated systems hosted in a cloud environment at a lower implementation and licensing cost, based on architecture, business case/cost sheet and cost of current products procured.

Findings:

Small rural districts and charter schools may lack the technologies and resources necessary to implement AELAS.

Recommendation:

ADE should:

- Develop strategies to mitigate the infrastructure issues that LEAs are likely to encounter. Such strategies might include outreach to the business community for some of the needed resources.

DATA LITERACY AND TRAINING

The issue of data literacy is one of which some staff are acutely aware. Representatives particularly from the highest levels of ADE and the programmatic staff recognize that end users must be data literate; that is, they must know how to use data effectively and appropriately to inform their practice. ADE also knows that data literacy is a major potential barrier to use and that many educators across the state lack data-related skills and knowledge. One ADE respondent recommended partnering with the state institutions of higher education, such as Arizona State University, Northern Arizona University, and the University of Arizona (those that produce the majority of the educators in the state) to begin to introduce courses in which data use could be taught. District-level respondents noted that data literacy also is a problem among their staff. Their belief is that often teachers, and at times, administrators, have only a passing understanding of data use that is limited to test results.

Both pre-service (teacher preparation programs) and in-service (district and school) professional development lack sufficient training on data use. While there has been limited training on data systems, additional data literacy professional development is needed. End users certainly need to know how to access and use the system, as well as understand its basic functions and utility. But without fundamental data literacy, ADE will have novice data users. Training is an imperative, not only for the district users, but for all users.

Findings:

Many end users may not be sufficiently knowledgeable about how to use data; that is data literacy will be an issue. Data literacy here includes general data use to inform and impact educators' practice, not just the capacity to use the technologies.

Recommendations:

ADE should:

- Reach out to the state's institutions of higher education and their schools of education to impress upon them the need to include data use coursework in their curricula or to integrate data concepts into existing courses to prepare future educators.
- Reach out to schools of education or existing professional development providers that specialize in data use to provide quality in-service opportunities to enhance educators' data literacy.
- Draw on expertise from knowledgeable local educators to help with training on the technologies so ADE can better communicate with end users.

COMMENDATIONS AND KEY MESSAGES

Based on the stakeholder interviews and document review, the following commendations were developed and are important achievements to date. These set the tone for the continued work needed to establish AELAS within the state's education community.

1. ADE is to be commended for its broad-reaching vision for a data system that will potentially impact all levels of the education system, from the state to the classroom. The vision for this system puts in the hands of educators the data most needed at the local level to inform relevant and essential instructional decisions, while also providing more high-level data to building, district, and state leadership. Through this work ADE has met the scope of work outlined in ARS 15-249 and used the legislation as a platform for a comprehensive system that is designed to meet the required accountability purposes and deliver information to support effective teaching and learning.
2. ADE has developed an enterprise architecture approach for AELAS that is service-oriented, enlightened by emerging best practices and trends in education, and supported by the local education agencies (LEAs, i.e. school districts and charter schools), as well as the business community. Being able to link innovation in education and technology with a customer service orientation around a single source of the truth will increase the system capability, data quality, and use of information and services available through AELAS.
3. ADE has adopted several key disciplines around enterprise architecture and has staffed the position of enterprise architect. ADE leads most other states in the adoption of this important discipline for enacting reform, with only a few state agencies making similar progress (Washington, the District of Columbia, Tennessee, North Carolina, and Louisiana). Enterprise architecture is an essential discipline for managing the work associated with a complex system such as AELAS.
4. ADE has hired and/or contracted for high-quality IT staff and consultants with the knowledge and skills to effectively use the established application development methodologies, standards, and frameworks. This caliber of expertise will be a real asset with AELAS development and implementation.
5. ADE has worked diligently to establish an effective project management office and a project oversight process. Weekly meetings of the project managers enable issue resolutions and cross-communication.
6. ADE has reached out to a diverse group of stakeholders to gain an understanding of their needs and their support for the AELAS/SAIS efforts. Hence, leaders from the highest levels in ADE and the state, including important business leaders, are committed to the AELAS and SAIS work and serve as champions for the initiatives.

7. ADE is piloting the opt-in and statewide longitudinal data system (SLDS) with a small but representative subset of districts to obtain essential input from key consumers and long-term buy-in and support as these systems scale up across the state. Maricopa County Education Service Agency (MCESA) has provided a successful pilot and been an avid supporter to ADE for the formative assessment and educator observation tool. The K–12 SLDS dashboard pilots have been completed in 11 districts.
8. ADE is moving aggressively to fill a need expressed by the state and districts for improved data systems and has developed a business case for AELAS that has the endorsement of Gartner. During this development phase, ADE researched models from states around the country and incorporated their best practices and lessons learned.
9. ADE has established and is using strong application development methodologies, standards, and frameworks. This is a major accomplishment that puts ADE's IT group in a good position to roll out well-designed and high quality systems—a critical prerequisite for a successful AELAS. A key accomplishment has been the substantial improvements ADE has made to SAIS performance over the past two years that have increased the level of confidence in ADE's IT department among the school districts.

Building on the commendable work to date, the recommended actions should be taken to effectively and efficiently address challenges and institutionalize the direction, support structures, and capacity needed for the long-term success of AELAS and SAIS. Three over-arching, consistent messages from the findings and recommendations are summarized here:

1. The overall direction for the types of systems and services to be offered to districts is good and would connect resources focused on increased student learning. The scope of AELAS meets the requirements of ARS 15-249 and is enhanced by the inclusion of the data system infrastructure (single source of the truth) and opt-in components for local districts and schools. ADE has done a good job of preparing the IT department processes and methodologies needed to support such a system, while additional work is needed on clear and concise communications and marketing.
2. The challenges associated with the full implementation of all of the components crosses major categories and represent a significant commitment. While such challenges are typical of IT implementations, including the AELAS projects, there is an additional issue with the opt-in components where the ADE does not have the authority to significantly affect local decisions. Areas such as funding, stakeholder awareness and buy-in, employee/leadership turnover, communications and change management, organizational capacity, infrastructure (especially at the local level), data quality, vendor product/service maturity levels and business/organizational readiness (especially at the local level) need to be monitored and coordinated with ongoing guidance from leadership. The project management work and oversight needs to continue as

priorities with clearly shared responsibility both across ADE programs and among local education and partner agencies.

3. The understanding and interpretation of AELAS by stakeholders across the state varies greatly. A shared, common vision of AELAS, grounded in the foundation developed by ADE, needs to be created and broadly communicated. This vision must be supported by stakeholders including the governor and key members of the legislature, business community and LEA community.

CONCLUSION

ADE has conceptualized a far-reaching, groundbreaking, data system that has the potential to serve multiple and important functions. It can collect and provide the needed accountability data required by the federal government as well as the more local accountability data that ADE, policymakers, and other stakeholders need to make high-level decisions. Many states are beginning to do this through their state longitudinal data systems. The strength of AELAS lies in its range of data, from statewide accountability data to more locally relevant, real-time data. The strategies to address the challenges and costs inherent in the development and implementation of this laudable solution are available, but time is of the essence. Broad support and agreement on the prioritization of next steps is needed.

Putting in the hands of teachers and local administrators such data that can directly inform and impact the teaching and learning process is both innovative and commendable. These are the kind of data that can stimulate school, classroom, and individual continuous improvement and would be a major contribution to the districts, schools and students served by ADE. This has the potential benefit to support concepts such as personalized and competency based learning, response to intervention, advanced placement and parental involvement. Going from vision to reality, ADE needs to closely and continuously listen within ADE to both IT and program experts, outside ADE with business and community partners and especially among LEAs with the teachers and administrators who will use and benefit from AELAS.

APPENDIX A:

ARS 15-249

15-249. Department of education; education learning and accountability system; reports; reviews

A. Subject to appropriation of state monies, or receipt of federal monies, private donations or grants from any lawful public or private source for this purpose, the department of education, in coordination with the data governance commission established by section 15-249.01, shall develop and implement the education learning and accountability system to collect, compile, maintain and report student level data for students attending public educational institutions that provide instruction to pupils in preschool programs, kindergarten programs, grades one through twelve and postsecondary educational programs in this state.

B. The education learning and accountability system shall:

1. Maintain longitudinal, student level data, including student demographic, grade level, assessment, teacher assignment and other data required to meet state and federal reporting requirements.
2. Incorporate the student accountability information system prescribed in chapter 9, article 8 of this title.
3. Be accessible through commonly used internet web browsers to carry out the data collection, compilation and reporting duties prescribed in this title.

C. The department of education may contract with a third party to carry out the purposes of this section.

D. The department of education, in coordination with the data governance commission, shall develop a detailed plan to develop and implement the education learning and accountability system.

E. The department of education shall present the plan developed pursuant to subsection D of this section to the state board of education for review and approval. The department of education shall continue to provide quarterly reports to the state board of education, or on request, for review and approval of the state board of education, on the development and implementation of the education learning and accountability system. All reports provided shall include progress and expenditures to date, timelines and cost estimates for completion.

F. Any contract awarded pursuant to subsection C of this section shall allow the superintendent of public instruction to renew the contracts for two subsequent periods of not more than three years each and shall prescribe the circumstances under which the superintendent of public instruction may terminate the contracts. The contracts shall allow this state to cancel any contract at any time after the first year of operation, without penalty to this state, on ninety days' written notice and shall require the contractor to be in compliance at all times with state and federal law.

G. Any contract awarded pursuant to subsection C of this section may provide for annual contract price or cost adjustments, except that any adjustments may be made only once each year effective on the anniversary of the contract's effective date. Any adjustment made pursuant to the terms of the contract must be applied to the total payments made to the contractor for the previous contract year and shall not exceed the percentage change in the average consumer price index as published by the United States department of labor, bureau of labor statistics between that figure for the latest calendar year and the next previous calendar year. Any price or cost adjustments that are different than those authorized in this subsection may be made only if the legislature specifically authorizes the adjustments and appropriates monies for that purpose, if required.

H. The superintendent of public instruction shall not award a contract pursuant to this section unless:

1. The superintendent of public instruction receives an acceptable proposal pursuant to any request for proposals. For the purposes of this paragraph, "acceptable proposal" means a proposal that substantially meets all of the requirements or conditions prescribed in this section and in the request for proposals.
 2. The proposal offers a level and quality of services that equal or exceed the services that would be provided by this state.
 3. The contractor provides audited financial statements for the previous five years, or for each year that the contractor has been in operation if fewer than five years, and provides other financial information as requested.
- I. The sovereign immunity of this state does not apply to any contractor who is a party to any contract pursuant to this section. The contractor or any agent of the contractor may not plead the defense of sovereign immunity in any action arising out of the performance of the contract.
- J. The terms of any contract pursuant to this section are subject to review by the joint legislative budget committee before placement of any advertisement that solicits a response to a request for proposals. Any proposed modification or amendment to the contract is subject to prior review by the joint legislative budget committee.
- K. During the first year of operation under a contract executed pursuant to this section, the contracting entity shall submit monthly reports to the department of education as prescribed by the department. After the first year of operation under the contract, the contracting entity shall submit quarterly reports to the department as prescribed by the department.
- L. At the end of the second year of a contract executed pursuant to this section, an independent evaluator selected by the superintendent of public instruction shall conduct and complete a performance review to determine if the contracting entity has met the goals specified in the contract. The independent evaluator shall submit a report of the independent evaluator's findings to the governor, the president of the senate and the speaker of the house of representatives on or before May 1, and shall provide a copy of this report to the secretary of state.

APPENDIX B:

TABLE OF FINDINGS AND RECOMMENDATIONS

Findings	Recommendations
AELAS STRATEGIC ALIGNMENT	
ALIGNMENT WITH THE GOVERNOR'S EDUCATION REFORM PLAN	
LEA leaders whom we interviewed expressed clear and similar visions for AELAS; however, other interviewees, both internal and external to ADE, had varied understandings of what ADE's specific objectives were with regards to AELAS.	ADE leadership needs to do more to clearly and concisely articulate their vision and rationale to stakeholders, both internal and external to the department.
Despite some conflicting opinions as to whether AELAS was the right option for the state's data system needs, there was strong confidence that if any Department of Education administration had the IT skills and ability to create a quality data system, it was the current administration. Those interviewed were pleased with the progress that this ADE administration has made repairing SAIS and building confidence in the Department's technological capabilities.	Continue to support the efforts of the IT department in ADE to build the skills, processes, methodologies and architecture necessary for AELAS.
AELAS ALIGNMENT TO ARS 15-249	
There is not a consensus among those interviewed that the current AELAS scope is required to meet the legislated requirements for ARS 15-249.	ADE leadership needs to clearly and concisely articulate their vision and rationale to stakeholders, both internal and external to the department.
It is the opinion of the team that the scope of the AELAS system goes beyond what a strict interpretation of ARS 15-249 requires, especially as regards the opt-in component. Nonetheless, there are good reasons why the widened scope is important to successfully achieving the intent of the legislation. Our experience shows that the reporting of data to state agencies for compliance reasons, when there is no subsequent benefit or use of those data by the districts and schools, results in generally poor quality data. Providing systems and dashboards that help schools and teachers use data for improving classroom instruction will help ensure that the data are not only accurate but useful. This will ultimately result in better quality, useful	We recommend that ADE continue to pursue the currently defined scope for AELAS.

Findings	Recommendations
data for ADE, which is the spirit and intent of the legislation.	
STAKEHOLDER AWARENESS AND BUY-IN: ADE STAKEHOLDER AWARENESS	
STAKEHOLDER AWARENESS AND BUY-IN:	
AWARENESS AMONG THE GOVERNOR'S OFFICE, ADOA STAFF, AND LEGISLATORS	
Nearly every policymaker interviewed made clear a desire for a high-quality data system and seemed open to the possibility of supporting AELAS if provided more information about the system and given a forum to have questions and concerns addressed.	The team believes that buy-in among the policymakers can be increased, but only if the policymakers are provided more detailed information. This includes one-pagers which provide information on the scope of work, timelines, accomplishments to date, and additional budget information.
Some policymakers shared that they have asked ADE for additional information but have not yet received it.	Prioritize responding to policymaker's questions and requests for information by naming an ADE staff member with knowledge about AELAS to serve as a point of contact for the policymakers and by conducting meetings with policymakers and legislative education committees.
STAKEHOLDER AWARENESS AND BUY-IN: AMONG LEAs AND OTHER STAKEHOLDERS	
In no uncertain terms, the creation of a state-of-the-art data system is something that is coveted by leaders from across the state, and is essential for the plans, goals, and objectives of countless Arizona business and education organizations and entities. However, as previously mentioned the vast majority of those interviewed were unclear as to specifically what is in AELAS, and were unable to thoughtfully weigh in on how AELAS specifically aligned with strategic plans.	<p>Establish a multi-pronged communication strategy that can be customized to specific audiences.</p> <p>For the district stakeholders, having someone from ADE who comes from a district and can speak in their terms about AELAS would be a recommended strategy. Having the ADE staffer accompanied by a current educator who can speak knowledgably about the system from experience would also be an asset.</p> <p>For policymakers, the message should demonstrate the need for the system and for adequate resources. ADE should identify and use individuals around the state as eloquent spokespersons for the system.</p>

Findings	Recommendations
	<p>A set of concise one-page synopses about AELAS for different audiences should be prepared. Longer five-pagers also should be developed with additional customized information.</p>
THE CURRENT SAIS SYSTEM	
<p>Challenges exist regarding the level of redundancy in the current data collect processes for SAIS.</p>	<p>Continue to examine carefully the level of redundancy of data collections and to consolidate efforts where possible.</p>
<p>Before they can be used for any high-stakes purposes such as determining educator effectiveness, ADE teacher-student data connections will require a high level of confidence on the part of educators as regards the quality of these links. Such confidence will be difficult to achieve with the history of SAIS.</p>	<p>ADE is pursuing as a part of AELAS the design and implementation of a rules engine for cleansing data prior to uploading data into storage. We recommend that ADE continue the work to establish a rules engine for data checking and cleansing and consider extending the use of this tool to the districts to allow them to nightly check the local data entered by schools into their student information systems on the previous day. This is an essential step toward achieving high accuracy of the data.</p> <p>Continue work to establish a roster verification tool and process for the teacher-student data connection prior to any high-stakes use of these data. This will build credibility among the teachers for the quality of the linkages at the state level, which is critical to their acceptance of any use of such data in their evaluation process.</p>
<p>ADE staff report, that while there have been significant improvements in SAIS performance, the current SAIS system is on an unsupportable platform and may fail at any time, resulting in serious costs and federal reporting issues. While it is not within the scope of this work to delve deeply into the technical underpinnings of SAIS to verify this finding, the reasons provided by the ADE staff for this very significant concern were very credible.</p>	<p>Given that SAIS may fail at any time, it is very important that ADE establish a strategy to move away from this system as soon as possible. Before any development work begins on a new system, ADE leadership should consider initiating a policy, legislative, and process review of the current SAIS business architecture, rather than creating a new SAIS that repeats the same processes and policies. This should not be an IT exercise, but rather a policy exercise. IT should be involved and can help to document the decisions and guide the discussion where more specificity is required. This work should begin immediately, as it is on the critical path of a SAIS rewrite that must be done because of the vulnerability of the current SAIS platform.</p>

Findings	Recommendations
AELAS WORK IN PROGRESS: GOVERNANCE	
<p>The ADE internal data governance process is getting traction from a combined top-down and bottom-up effort. However, it has not reached a level of maturity, visibility, or widespread acceptance that is required for the AELAS efforts to reap their full benefit.</p>	<p>Continue to build and strengthen the data governance process and develop data standards for the key SIS data categories such as discipline, truancy, excused and unexcused absences.</p> <p>Use the data stewards for these data categories to engage the LEA data stewards in determining these standards. Do this prior to rollout of the SIS and make this part of the training. (More information below on using Ed-Fi and CEDS as guides for these standards.)</p> <p>Similarly engage the data stewards for the assessment program areas to come to consensus on how to leverage the AELAS assessment engine, the ADE data warehouse and ADE dashboards in a comprehensive assessment strategy within the overall instructional improvement system.</p>
AELAS WORK IN PROGRESS: PROJECT OVERSIGHT	
<p>The requirements gathering for the AELAS opt-in systems (e.g., the SIS), while heavily engaging district focus groups, seemed to not have enough emphasis on understanding each individual processes. Focus sessions could be designed around these processes, with the focus group makeup carefully selected to have important and knowledgeable subject matter experts (or process owners) and program areas. Examples include involving more principals and assistant principals for scheduling and grade book processes; involving special education professionals to determine what data are being pulled and how; involving research and evaluation staff for formulas and data needed for accountability.</p>	<p>If ADE is to support the SIS usage among the districts, it is important that the Department establish non-IT process owners who can understand the SIS processes and tools and support the districts effectively.</p> <p>Be more thorough in the selection of the focus groups to ensure that the range of subject matter experts is sufficient to represent all processes being automated by the opt-in components, such as the SIS. ADE should be included as one of the process owners, as they are appointed.</p>
<p>As of the date of the onsite interviews, ADE had not determined what districts will be part of the selection process for the SIS.</p>	<p>Establish the strategy for selecting districts for inclusion in the SIS selection process and define their role in this process.</p>
<p>There is no sponsor for the SIS (or any of its major components or processes such as secondary school scheduling) beyond the IT department. It is important that IT not be viewed as the sponsor and owner of the AELAS opt-in systems.</p>	<p>Identify sponsors in ADE for the components of AELAS. Use them to champion their systems, drive consistency of practice, develop data standards, and provide ongoing training and support. For the SIS, since it represents multiple functions such as grade book, scheduling and</p>

Findings	Recommendations
<p>Because Arizona is not a centralized state, the districts are left to individually decide on how some of the opt-in systems in AELAS will work and be configured. This is an “open-ended” business architecture that may result in some of the AELAS components not being fully utilized at the district and classroom level and not being sufficiently consistent across the state. For example, with the educator evaluation effort, there is no program-area sponsor to drive consistency and districts are left to choose the system (True North Logic (TNL) or Teachscape), the framework, the standards and the rubrics themselves. This could drive up implementation and training costs and make the data across districts different to such a degree as to inhibit statewide data gathering and reporting in this area. Educator evaluation data for Arizona will not likely have the consistency across districts like what other states have accomplished, (e.g., in GA or NC where statewide implementations were directed by the state, with rubrics, evaluation standards and consistent training).</p>	<p>attendance, it may be practical to have multiple sponsors or process owners that coincide with the corresponding data owners.</p>
AELAS WORK IN PROGRESS: RISK MANAGEMENT	
<p>ADE is taking on challenges for systems in AELAS that are beyond their control to manage and support. These are primarily regarding the opt-in components (SIS, CMS, LMS, assessment system), whose functions, requirements, operations and usage are controlled by the districts. Many of the critical success factors for these systems are beyond the influence of ADE, such as change management at the classroom and school level, teacher and principal buy-in and use, infrastructure within the district and schools, and end user devices. While a more centrally managed state such as North Carolina might take on these roles, it is problematic for a local control</p> <p>While the challenges associated with the individual AELAS projects that are currently in flight appear to be manageable, the challenges associated with the full implementation of all of</p>	<p>Establish an LEA leadership group to engage the LEAs (districts and charter schools) more in the leadership support (technical and programmatic), risk management and coordination of the opt-in components through a not-for-profit organizing structure separate from ADE. Use this group to take on such tasks as:</p> <ul style="list-style-type: none"> ○ Establish the not-for-profit entity to manage this going forward. ○ Establish the cost and revenue model for the AELAS opt-in components and manage the financials. ○ Establish a change management and data migration plan for LEAs and charters. ○ Address the infrastructure issues at the LEAs. ○ Be responsible for the specification, selection and contracting for the opt-in components. ○ Be responsible for managing the ongoing

Findings	Recommendations
<p>the AELAS opt-in components are large and cross all major categories such as funding, stakeholder awareness and buy-in, employee/ leadership turnover, communications and change management, organizational capacity, infrastructure (especially at the local level), data quality, vendor product/service maturity levels and business/organizational readiness (especially at the local level).state such as Arizona.</p>	<ul style="list-style-type: none"> o operations (or contracts for software as a service) of the opt-in AELAS components. o Reach out to the small, rural, and charter schools to encourage them to maintain sufficient technological infrastructure and bandwidth to implement AELAS.
<p>There is a considerable challenge for AELAS related to the lack of infrastructure and end-user devices in the districts, schools and classrooms. There is a wide variability of technical readiness for such a system across the state. While the ADE can be successful in their implementation of AELAS, the districts and schools may be restricted in getting the full value from AELAS because of such local issues.</p>	<p>Work on a strategy for addressing the infrastructure needs of the districts.</p> <ul style="list-style-type: none"> o Define a strategy for addressing the infrastructure needs of the districts. o Develop a self-certification process in collaboration with LEAs, such as the Virginia model, for districts and charter schools to determine their level of readiness for implementation and identify those areas needing further work and resources. o Reach out to the small, rural districts and charter schools to identify where there is insufficient technological infrastructure and bandwidth to implement AELAS. Flag these organizations as at risk for fully realizing the benefits of AELAS. o Establish the state's roles (through policy or guidelines) for addressing these shortfalls.
AELAS WORK IN PROGRESS: RESOURCE MANAGEMENT	
<p>Long term staffing and sustainability for the organization currently in place is a serious challenge.</p>	<p>Plan for attrition. With vagaries in funding from year to year it is highly likely that the staff and skills that currently are on board for the AELAS, SAIS, and SLDS work will seek other sources of employment.</p> <p>Cross-training, good documentation and ownership by the program areas for the data, application system functionality and processes will go a long way to mitigate the effects of attrition among the IT staff.</p> <p>Also, the work done already by the ADE IT team around the use of Phase gates, documentation and methodologies can help to mitigate the effects of attrition and should be</p>

Findings	Recommendations
As mentioned earlier in the report, not enough of the department and its program areas are engaged in the AELAS effort at this point. The effort is too “technology centric” to enjoy widespread adoption by program areas in ADE and in the schools and classrooms.	continued. Organize meetings for other ADE staff to participate in where the staff members have the opportunity to learn about AELAS, provide their feedback, and become more involved in the development of the system.
The institutional knowledge gained by the existing staff and contractors is in jeopardy of being lost over time.	Over time, convert key contract employee positions to regular employee positions, as the need for special contracted skills/knowledge diminishes and is replaced by the need for more long-term support personnel. Seek a stable funding source for these resources.
AELAS WORK IN PROGRESS: METHODOLOGY	
There has been substantial work and cost expended to lay a foundation for AELAS that is not being seen and understood. This work includes things such as improved staffing and expertise, enhanced methodologies and procedures, and better project management methodologies and tools. This work did not get reported in a lot of the interviews when asked for examples of success.	Continue to support the efforts of the IT department in ADE to build the skills, processes, methodologies and architecture necessary for AELAS.
The application development and architecture methodologies developed and in apparent use by ADE for AELAS, SAIS, and SLDS were impressive. The documentation was thorough and professional. The understanding and buy in from the staff for these disciplines was similarly impressive. The business architecture however, has not been sufficiently developed.	Establish ADE sponsors for each of the AELAS functional areas and engage the sponsors, process owners and data stewards in the establishment of a business architecture for instructional improvement.
While the individual projects within AELAS seem to be well managed in terms of challenges, and the likelihood that any particular individual project will be successful is good, there is a real challenge that the vision, the full potential of AELAS will not be realized—e.g., the whole will not congeal into something more than a collection of parts. This will be more of a failing of integration at the level of the business architecture. Some examples include: the TNL project’s lack of a true business architecture; the	Focus on the business architecture (e.g., processes, policies and use cases) for an integrated learning enterprise system that includes the functionality found in SIS, IIS, and IEP systems. Use such practices as the Centers of Excellence and the MCESA pilot to help create this business architecture. Establish SAIS business sponsors sign off on production loads and QA. At the proper time, request an internal audit of the SAIS ADM process and accompanying LEA funding allocation process.

Findings	Recommendations
lack of data owners and standards for the SIS; the lack of sponsors and process owners ¹⁰ for the LMS, CMS, and assessment systems to make these support an integrated process; and lack of process clarity to bridge among the SIS, LMS, and IEP systems and data structures.	
The IT department needs to insure that its staff communicates changes and updates to the system in a more organized fashion. Internally, change management seemed to be well coordinated. However, there did not appear to be a standard way of communicating to the end users the changes that are being made to the systems.	Establish the industry-standard technology change management practices that carry the change notification to all appropriate system users.
AELAS WORK IN PROGRESS: SYSTEMS ARCHITECTURE	
ADE's design considerations have recently been modified to accommodate the potential for supporting a diverse array of end user devices that might be found in a school or district, especially as bring-your-own-device (BYOD) strategies begin to be deployed.	Continue to develop the user interfaces (UI) to include responsive design to ensure a broader adoption by giving access to tablets and phones. Include this capability in future RFP language.
<p>Where possible and support exists, ADE's preference is to buy versus build as long as the total cost of ownership (TCO) is cost effective. Building applications is not a core strength that they plan to develop/maintain. This means they need strong integration skills and strong integration business and service architectures as well as a sound data architecture.</p> <p>ADE is focusing on CEDS (Common Education Data Standards) for standardizing data elements and option sets and Ed-Fi¹¹ for the operational data store and data transport layer.</p>	Continue the data integration project using Ed-Fi as the key component as a viable approach to minimizing integration costs going forward.
AELAS WORK IN PROGRESS: DATA ACCESS, QUALITY, AND SECURITY	
ADE currently has a data dictionary. The dictionary does not however see regular use by the data stewards and IT staff to foster master data management, data sharing, reducing data collections and better standardization of the data	Continue to build upon the data governance process and use the data dictionary as a critical tool to capture and maintain metadata for driving better master data management.

¹⁰ This issue has been resolved since the data collection.

¹¹ See <http://www.ed-fi.org/about-the-ed-fi-alliance/>. Ed-Fi is a data standard and suite of tools that provides applications for the consolidation of diverse sources of data for K-12 educational data.

Findings	Recommendations
elements.	
The data standards needed for some of the opt-in systems, especially the SIS, are not in place.	Develop data standards for opt-in systems, particularly the SIS.
ADE lacked evidence of data migration planning for the opt-in components. The data integration platform plays a key role in this, but much work remains to be done before this is a usable approach. Vendor adoption strategies for the data ingestion process and tools also need to be developed.	Data mapping of the wide range of LEA source systems of record for ingestion into Ed-Fi and the subsequent data extraction, data loading and error correction required is a great deal of effort and expense. Other states and school districts are moving forward to adopt Ed-Fi, and as a consequence these data mappings and extractions will be developed by multiple organizations. Look for opportunities to benefit and share from these other efforts.
The topic of data privacy/security concerns surfaced in some interviews. This is relevant to SAIS, but more so to the broader AELAS future data collection strategy and the opt-in components. Interviewees expressed concern regarding what data are being collected and for what purposes. This is consistent with emerging concerns on a broader (national) level around privacy issues related to large data repositories hosted in the cloud and student data being used for vendor profit/gain.	Concerns about data privacy and use are taken very seriously by the ADE, but stronger efforts and communications to help manage perceptions and expectations are needed. Better articulate steps underway to protect data privacy in order to manage perceptions and expectations. Messaging should be crafted to help clarify and confirm that personally identifiable data will be protected, FERPA requirements will be met, and the value from such data will return to the districts and schools to inform instructional practice and increase student achievement.
FINANCIAL ANALYSIS: BUSINESS CASE – OPT IN COMPONENTS OF AELAS	
The conclusion the West-Ed/CELT team reached is that opt-in costs shown in the business case are within reason. A great deal more work on project planning, clarity around deliverables, roles and strategies is required before the opt-in costs can be stated any more definitively.	Continue to refine and update the cost model for AELAS as actual costs are known and as projects are further defined and scoped.
Regarding the savings identified in the business case for the opt-in components, the costs that the smaller districts reported that they are currently paying for systems in the nine (9) opt-in categories are much higher than should be expected. While the opt-in strategy will address some of this over time, a shorter path to realizing savings is to bid these systems at the state level and provide a procurement list from which districts can select.	Pursue on an expedited schedule a state procurement list for districts to select from for such systems as SIS, IEP, and IIS. Offer guidance/professional development to districts on procurement practices to help them better negotiate pricing for procurements in the future.

Findings	Recommendations
FINANCIAL ANALYSIS: BUSINESS CASE – ADE CORE SYSTEMS OF AELAS	
<p>The AELAS, SAIS, and SLDS project costs, actual spend to date, funding sources and future costs are not well understood by the key stakeholders, governing bodies and legislature. This is a complex project, and the costs and funding structures are difficult to convey and to comprehend. This lack of understanding will make it more and more difficult over time to advocate for continuing expenditures.</p>	<p>Develop a comprehensive plan for the full implementation of AELAS and the SAIS rewrite. Such a plan would include each of the projects and their accompanying resource needs, funding requirements, stakeholder resources, district resources, and major deliverables and milestones over a multi-year period. Funding sources and funding gaps should also be identified.</p> <p>Outline all of the projects (in progress and to be launched), the scope/deliverables, schedules, sponsors and team members, costs, and funding sources.</p> <p>Be transparent as regards the AELAS/SAIS/SLDS budget. Publish the planned budget to date, actual spend to date, burn rate, percent complete by project for all efforts associated with these efforts. Include the source of the funding.</p>
<p>The budgeted \$5.3 million for IT operations for 2014 is low compared to a recent Gartner study conducted on behalf of the State of Washington Office of the Superintendent of Public Instruction. This study cites a range of \$5.7 to \$6.8 million for peer state (e.g., Washington peer state) agencies for 2013.</p>	<p>For 2015 budget planning, plan to increase the line item for IT operations to be more in line with peer-state expenditures, with additional consideration for support for the AELAS components that come online.</p>
<p>The FY 2014 AELAS Appropriation (\$7 million) does not provide the money to sustain the aggressive schedule that was planned for AELAS rollout, and will delay some of the benefits anticipated in the business plan.</p>	<p>Create an alternate schedule for the AELAS rollout. Provide specific information about how the FY 2014 Appropriation impacts the rollout plan for AELAS.</p>
<p>The long-term sustainability for a system such as AELAS in Arizona is a serious issue. Funding streams can be in danger of being reduced or eliminated each year. Staffing for the full project and long-term ongoing support is unknown at this point.</p>	<p>In light of the gap between requested and actual approved budget for the AELAS appropriation, and the uncertainty this implies for future year budgets, consider funding, managing and supporting the opt-in components of AELAS through a not-for-profit entity outside of ADE.</p>
LOCAL ISSUES	
<p>Small and rural districts may lack the technologies and resources necessary to implement AELAS.</p>	<p>Develop strategies to mitigate the infrastructure issues that the small and rural districts are likely to encounter. Such strategies might include outreach to the business community for some of the needed resources.</p>

Findings	Recommendations
DATA LITERACY AND TRAINING	
<p>Many end users may not be sufficiently knowledgeable about how to use data; that is data literacy will be an issue. Data literacy here includes general data use to inform educators' practice, not just the capacity to use the technologies.</p>	<p>Reach out to the state's institutions of higher education and their schools of education to impress upon them the need to include data use course in their curricula or to integrate data concepts into existing courses. This will help to prepare future educators.</p> <p>Reach out to schools of education or existing professional development providers that specialize in data use to provide quality in-service opportunities to enhance educators' data literacy.</p> <p>Training on the technologies should include knowledgeable educators who can help ADE to better communicate with the end users.</p>

APPENDIX C:

EXAMPLES OF NOT-FOR-PROFIT SERVICE AGENCIES IN OTHER STATES

Several states across the country use not-for-profit organizations in various forms to support LEA work, including providing computer systems and assistance with data usage and state reporting. They are similar in that they do not have taxing power and generally rely on state and federal formula funds as well as membership fees from participating districts.

Ohio – Educational Service Centers (ESCs) – For Ohio school districts, ESCs provide a range of functions, including hosting the SIS for school districts. Some of the ESCs even branch out to offer assistance to districts beyond the state. Since ESCs have no legal taxing or bonding authority, they must depend on revenues from member districts, from the state as prescribed in law, through contracted services to districts, and from competition for grants and state funding.

Pennsylvania Intermediate Units (IUs) – These are funded by school districts, state and federal program specific funding and grants. IUs do not have the power to tax. Annual budgets of the intermediate unit must be approved by a majority of the school boards in the districts it serves.

Georgia – Regional Educational Service Agencies (RESAs) – these are funded by the State Board of Education, state formula funds and fees from local school districts which match state funds at an 80/20 state/local ration.

West Virginia – Regional Education Service Agencies (RESAs) – these are established and governed by the WV Board of Education.

New York State – Boards of Cooperative Educational Services (BOCES) – these were formed in 1948 by the NY state legislature to provide shared programs and services to school districts. The roles of the BOCES have evolved over time, and today include providing hosting data systems for schools and LEAs and assisting LEAs with state reporting. <http://www.boces.org/wps/portal/BOCESofNYS>