# Special Review of the AzEDS Implementation Options

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

**Date:  May 14, 2015**

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## Introduction

This report was written specifically to address changes in direction for the AzEDS project, a critical component to the larger AELAS system. The AELAS system is a comprehensive and complex change to how the State of Arizona exchanges information between the Arizona Department of Education (ADE) and school districts (local education agencies) and uses that information to improve student outcomes. Readers are encouraged to review the quarterly WestEd/CELT AELAS reports for a broader perspective on overall AELAS progress.

## Background

The fall 2014 AELAS report from West Ed/CELT referenced a disconcerting finding of the visit, which was:

> "… the schedule delay in replacing the SAIS data collections with the Ed-Fi API structure. Publication of the Ed-Fi REST API specifications and Operational Data Store (ODS) database schema is significantly behind schedule. But more importantly, work on the design of the data loading and validation processes has not begun yet.  The design of this "middle" component (data validation and loading) to take the API data and transform and prepare it for use in the financial payment systems is behind schedule. The ADE has realized over time that this middle component is far more complex than earlier anticipated.  This process is intended to leverage the "real-time" transfer of SIS data through the Ed-Fi APIs to the ADE for use in reducing the burden of state reporting and also subsequently provide this same real-time data back to the classroom teacher. This "middle-component" work has not yet started, and will not start until late December 2014.  Completion is estimated to be in FY 2016.  As a result, the schedule for testing, piloting and turning off the old SAIS data transfer and getting off of the old servers, SQL systems and Windows XP desktops will likely extend until the end of FY 16. This will of necessity delay the time when the current SAIS data collections will be turned off for the district and will likely erode confidence and support for AELAS.  This is one key area where the comprehensive AELAS project plan and schedule is not complete.  A clear plan, schedule and communication strategy needs to be established as soon as possible to manage the expectations of the districts."

Again, in the December 2014 report, the West Ed/CELT team noted:

> "The criticality of implementing the processes to gather, validate and store data via AzEDS was noted in the last report. During this review the ADE IT team shared their conceptual architecture for AzEDS, which is significant progress since the last report. The amount of work to be completed for implementation by next fiscal year is immense. The planning issues raised in the last report appear to be addressed, at least at a conceptual level.  However, the bigger concern and work effort are in developing the

<u>business rules and logic for extracting and validating the data</u>.  Monitoring of the planned work until its completion is very important."


In the April 2015 report, the West Ed/CELT team noted in the report:

> "These AELAS projects, OEM and AzEDS, must be completed and implemented for the new data collection process to begin. This work is the foundation for Classroom Site Fund (CSF) distribution calculations. "Completion" of the work includes the technical as well as the set-up and configuration work that must be completed by the finance group and data stewards.  In addition to populating the OEM, there is a pressing need to develop, pilot, and implement the necessary business rules, and to understand their potential impact on district operations as the July 2015 transition occurs.  There needs to be a formal contingency plan to address the scenario when districts cannot get their data clean enough to pass the business rules or they do not have an Ed-Fi capable SIS.  The go-live date is a mere three months away and these business rules are essential.  <u>The recommendation would be to delay the transition until the business rules are defined and in place and the OEM complete</u>.  The IT team is working on a migration plan."

Very soon after the April 2015 report, the ADE shared with the West Ed/CELT team a plan for mitigating the risks and delays associated with the AzEDS project.  The department requested that the West Ed/CELT team render an opinion on the dual system approach, as outlined in Figures 1 and 2 below.
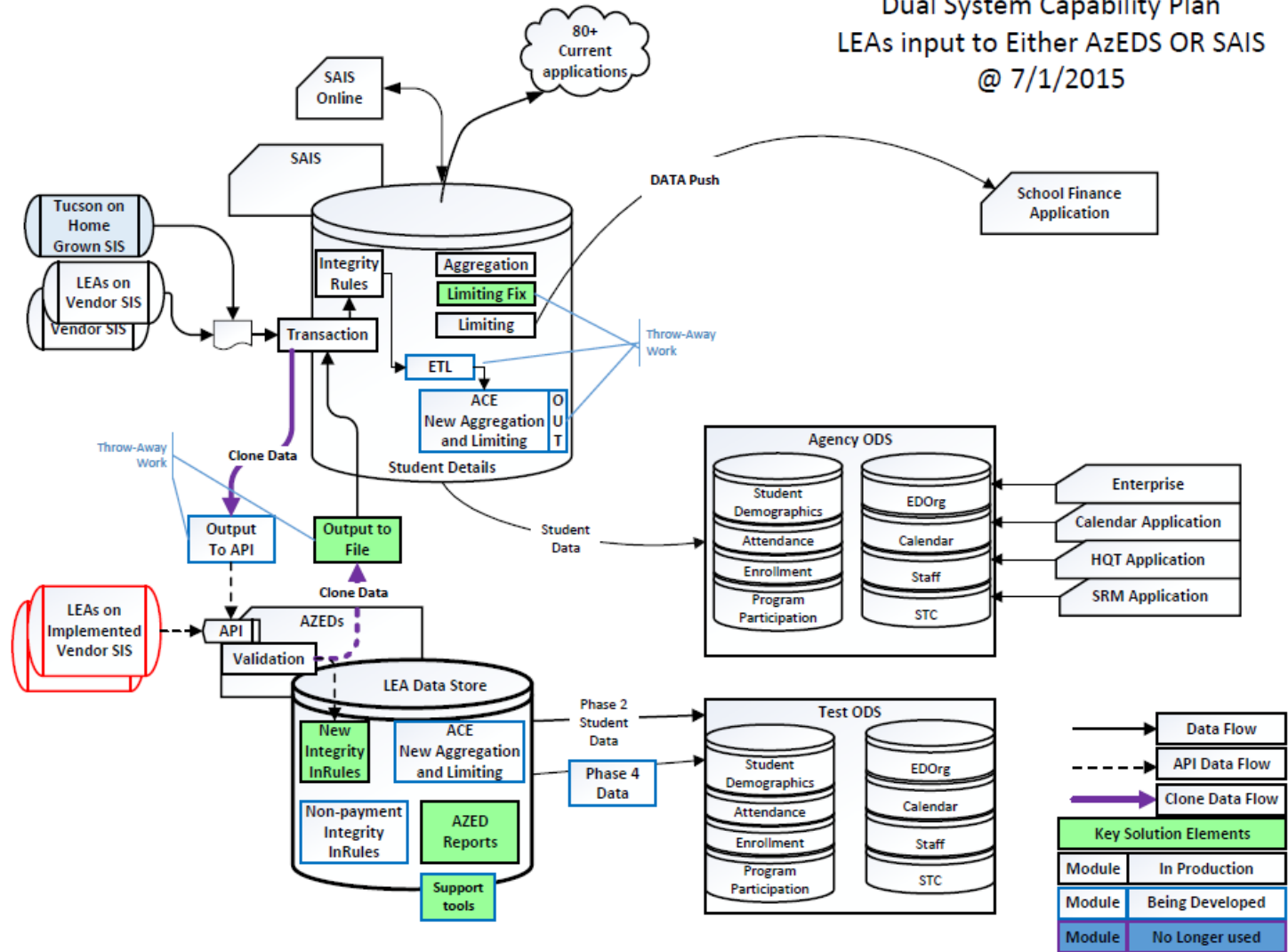
Figure 1: Dual System Approach 7/1/2015

Figure 2: Dual System Approach 9/1/2015
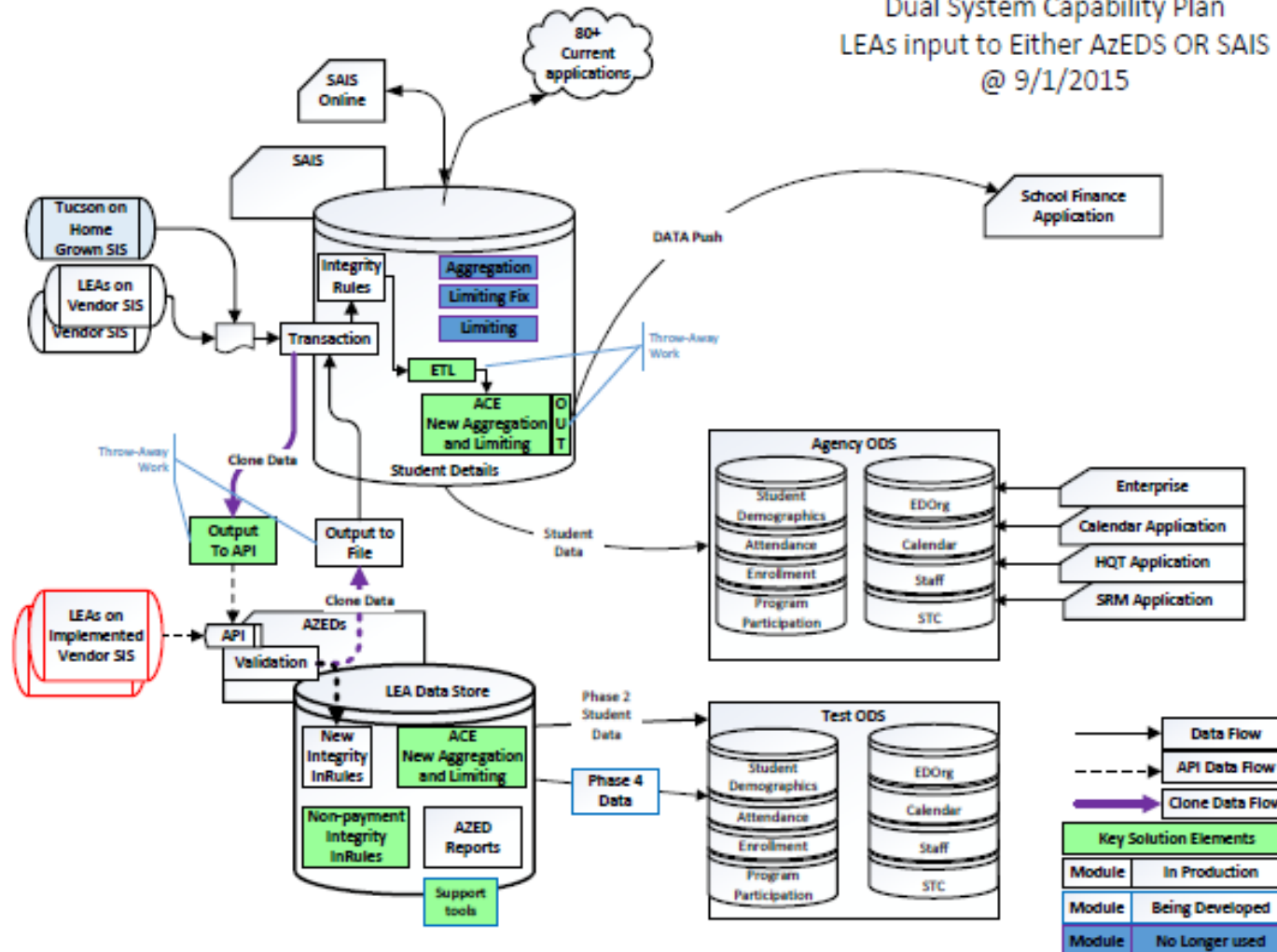
## Initial Review of the AzEDS Options

The West Ed/CELT team had specific concerns for the previous approach for the AzEDS implementation.  These included:

- 2016 data for 2017 district budgets and 2016 charter school budgets will only be allowed to come through SIS APIs to AzEDS, with the exception of Tucson Unified School District (TUSD).
- The business rules, aggregating and limiting routines, support tools and reports for the AzEDS data push to School Finance are behind and cannot all be completed by the 7/1/2015 go-live date for AzEDS.  (Note: over 1,500 SAIS business rules had to be reviewed for inclusion in the new AzEDS approach. Only 300 rules will be in the new system).
- The SIS vendor certifications and loads to all of the districts for the AzEDS APIs will likely not be complete by 7/1/2015.

The new approach with dual system capability had the following characteristics for addressing the concerns stated above:

- 2016 data for 2017 district budgets and 2016 charter school budgets will be allowed to come through SIS APIs to AzEDS or through the old SAIS approach.
- Data will be cloned and pushed to both systems (SAIS and AzEDS) regardless of the entry method.  This work for the data movement from AzEDS to SAIS and from SAIS to AzEDS will be used until the System of Record changes to AzEDS.
- Limiting routine fixes will be completed by 7/1/2015 for SAIS to establish ADM and prepare data for the push to School Finance.  This will be turned off when the new aggregation and limiting routines are completed on 9/1/2015, but it allows the 7/1/2015 deadline to be met for processing ADM calculations for districts and charters.
- New aggregation and limiting routines will be developed (as planned) for AzEDS by 9/1/2015 and be used to process data for both streams for data (SAIS and AzEDS).
- There will be a TEST ODS developed and maintained such that the districts and charter schools can see the different results for their ADM (and subsequent impact on budgets) from AzEDS and SAIS.  The TEST ODS will be turned off after all districts are cut over to AzEDS, and AzEDS is transitioned to the System of Record.

After an initial review of the diagrams, the West Ed/CELT stated to the ADE that the dual system approach seemed to mitigate many of the risks associated with the earlier approach.  To form a better opinion on the matter, an onsite review was scheduled for the week of May 4, 2015.  Additional documentation was requested on the new approach to be received and reviewed before the site visit.

# In-Depth Review - Site Visit Approach and Initial Questions

Prior to the site visit, the West Ed/CELT team received and reviewed the following documentation:

1. PIJ EDI 4004 AELAS SDS FY16 – this was a draft of a revised PIJ for AzEDS.
2. Project Investment Justification PIJ School Finance Payments - CR 2015 – this was a draft of a revised PIJ for school finance.
3. AzEDS Finance Plan 4 15 2015 – high-level diagrams that laid out the previous approach compared to the new dual system option for AzEDS.
4. AzEDS SF Architecture – more detailed architecture diagrams for the new dual system approach for AzEDS.
5. Portfolio Review_20150430_2 – Arizona's report on their project portfolio - monthly report for April.
6. School Finance High level Schedule 4 29 15 – high-level project plan for school finance.
7. Project AzEDS Build 20150429 – high level project plan for AzEDS.

The onsite visit explored a number of topics with the technical team.  These included, but were not limited to, the following:

1. The AzEDS component diagram (Figure 3 below) was thoroughly reviewed to discuss:
   - What is happening at each decision point and data flow
   - What stage of development each component is at
   - The estimated time to complete
   - Who has the lead for each component
   - What % of their time is allocated to the component
   - What is the estimated completion date
   - The type of testing and QA test plan developed
   - The volume of data projected to flow through the component daily
   - The load/performance testing
2. The data submittal schedule for SAIS and AzEDS from the district perspective – e.g., what data flows up by category, when, what reports come back, how is the data corrected.
3. The role of the district SIS currently versus with AzEDs and Ed-Fi.
4. District feedback from those sending data through the API now.
5. The status of the OEM work and the impact on AzEDS.
6. The communication and prep work to mitigate the impact (technical but more importantly the political impact) of the funding differences.
7. The issue of cascading updates as related to the funding calculations.
8. The impact of the ADE ODS schedule.
9. Lessons learned from the EduPoint implementations to date.
10. Ed-Fi ED-ORG data structure versus the customized AzEDS ED-ORG files.
11. The exceptions database (database to hold any business rule exceptions data so it can be retrieved by the SIS using a web service) and the exceptions web service (that exposes the business rule exceptions, so the SIS can consume it and have the LEA data steward correct the exceptions).

12. The impact of completing the current PIJ for AzEDS and issuing a new PIJ for the dual system approach.
13. The addition of the Ed-Fi domains for school calendar and student cohort to the phase 2 scope.
14. The 915 process (prior year budget changes) and AzEDS' ability to support this.
15. The essential steps required to be able to turn off SAIS data submittals for FY 16 (e.g., the 915 process).
16.  The assumptions for rule 915 in the PIJ.  Specifically:
    * The ADE will not create a secondary data collection tool to submit data (SAIS Online).  Previous years of AzEDS data and submittal process will be used to correct and resubmit data.
    * The LEAs will maintain the data through the SIS vendors solution.
    * Vendors are able to retain submission requirements for prior fiscal years and submit data for current and prior fiscal years according to the submission requirements for each year.
    * If ADE stores data for each fiscal year in a separate database the vendors/LEAs must be able to configure prior years to point to a specific ADE environment/ database to update the data for that specific year.
17. The Ed-Fi unique ID split/merge capability and the impact of not having this until 2016.
18. Charter estimated counts.
19. Support tools for helping ADOE assist districts with data submission issues.
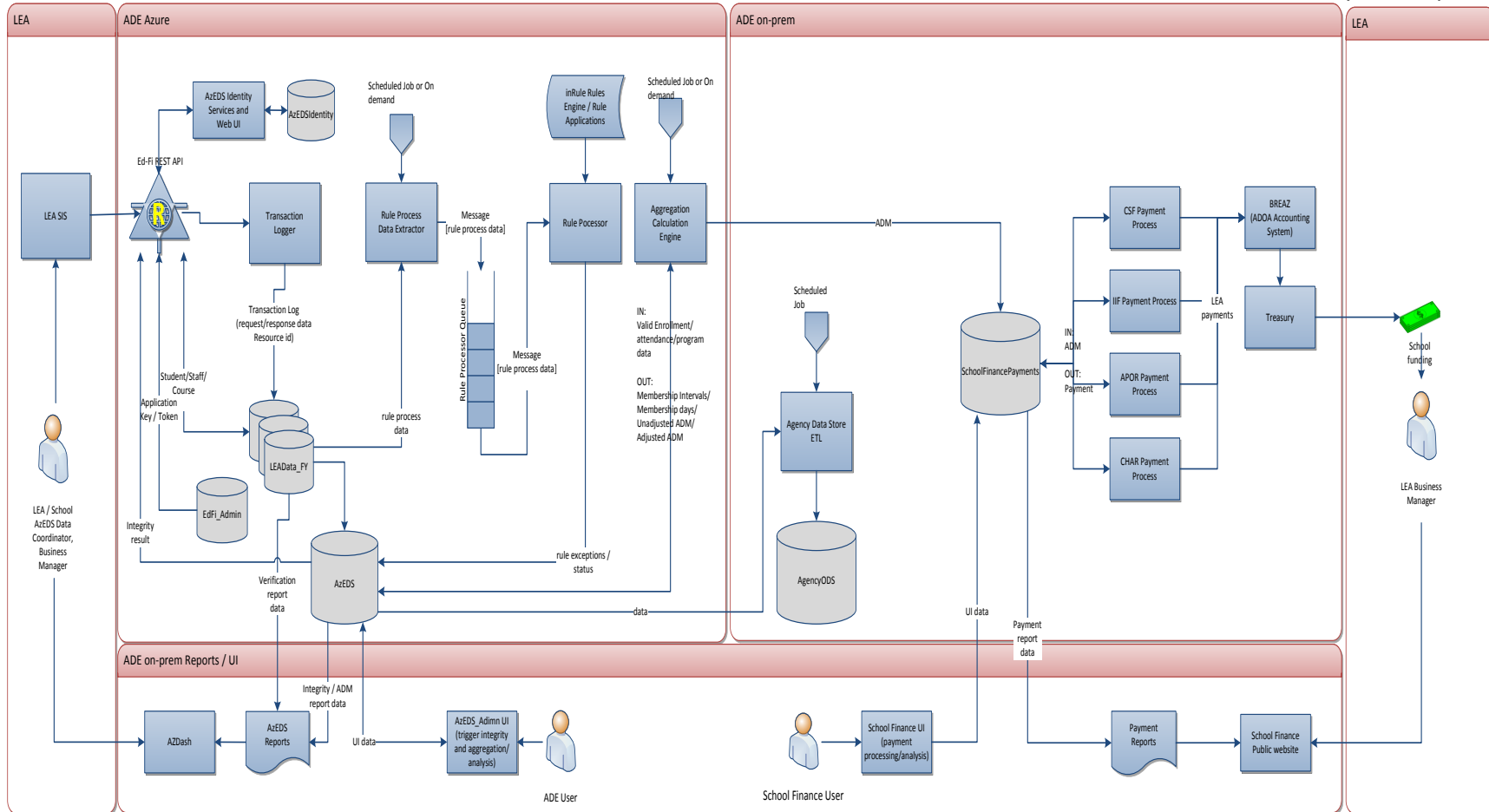
# AzEDS & School Finance Payments Components



Figure 3: AzEDS Component Diagram

# Findings and Recommendations

From the discussion around the above topics and others, the West Ed/CELT team developed the following findings and recommendations:

| Findings | Recommendations |
|---|---|
| 1. The go-live date for ACE is widely publicized as 9/1/2015; however the immediate critical path for this effort is squarely within the realm of the finance department and their availability to support the necessary facilitated discussions with the IT team to create the business rules. IT schedules are at risk due to factors beyond their control. | Revise and publicize the go-live date for ACE (and the comparison of SAIS and AzEDS data for calculating funding) as 12 weeks after the finance department has presented IT with a signed off version of the ACE requirements. |
| 2. The OEM work (also behind schedule) requires considerable time from the same finance team members as does the ACE effort. This detracts from the time they have to spend on the ACE requirements. However, with the dual system approach, OEM is not a critical path item. | Consider delaying the OEM work for enough time to allow the finance team members additional time to focus on the requirements for ACE. |
| 3. There is some uncertainty and lack of complete understanding regarding when SAIS will be shut down and what exactly this means for the department and for districts. Questions around the 915 process and ongoing use of the SAIS data structures are a couple of factors that make the timing and approach for shutting down SAIS (or its major components) uncertain. | After the dual system option is live, establish a project plan for shutting down SAIS. Explain in the plan what components are shut down and when and what the impact is for the Department and the districts. |
| 4. It appears that SAIS (or certain of its components) will remain in production past 2016 in order to continue to process 915 calculations for data that was originally submitted through SAIS. | As part of the above plan, communicate the fact that SAIS will remain in production past 2016 to do the 915 calculations. Establish and publish the project plans and schedules for supporting the 915 calculations for the long-term (e.g., beyond SAIS). |
| 5. The assumptions for rule 915 as documented in the PIJ for AzEDS place a lot of responsibility for this process on the SIS vendors and the districts for the future process beyond SAIS. The assumptions have also not been validated. These assumptions include:<br>• The ADE will not create a secondary data collection tool to submit data (SAIS Online). Previous years of | Part of the plan for turning off SAIS needs to include a well strategized and documented plan for the 915 process beyond SAIS. This plan should include time for developing and vetting the requirements with the finance department and with the districts. It also should give vendors a reasonable amount of time to develop the 915 options after they get the specs for the new development. Consider allowing at least 8 months for vendor |

| Findings | Recommendations |
|---|---|
| AzEDS data and submittal process will be used to correct and resubmit data.<br>• The LEAs will maintain the data through the SIS vendors solution.<br>• Vendors are able to retain submission requirements for prior fiscal years and submit data for current and prior fiscal years according to the submission requirements for each year.<br>• If ADE stores data for each fiscal year in a separate database the vendors/LEAs must be able to configure prior years to point to a specific ADE environment/database to update the data for that specific year. | development.  Consider also a test site for the vendors to use for a certification process for this function. |
| 6. There are a number of districts that use the SAIS online tool for the practice of correcting data.  It will become increasingly important as AzEDS goes into production that districts follow the best practice of correcting data at its source. | Seek out the districts that consistently use the SAIS online entry tool for correcting SAIS data and offer training and guidance on data management practices.  Proactively address the need for them to change this practice prior to shutting down SAIS online. |
| 7. Cascading of data by the SIS vendors and properly capturing this in AzEDS appears to be a potential source for data errors in the future.  While there is a certification process to ensure that vendors can properly submit data through the Ed-FI APIs, this certification does not currently address whether the vendor properly cascades all appropriate data elements.  While the ADE has developed a cascading option, this is turned off for any data that might affect funding calculations. | Establish test cases for ensuring that all vendors can appropriately cascade all AzEDS data, especially data that affects funding calculations. |
| 8. The use of the more public Azure platform for storing student data may raise concerns for data privacy among some of the Arizona constituency.  While there is no inherent concern for the Azure platform in this regard, the fact that student data is stored on a more public platform may be perceived by the general public as a potential data privacy issue. | Consider securing the FERPA related data at rest on the Azure platform through encryption. There is currently little such FERPA data on this platform, however as this type of data increases with the expansion of AzEDS, it may become an important consideration. |
| 9. While the dual system option appears to be the best solution for moving forward at this time, it will be a complicated and difficult set of software and data structures to maintain.  The potential exists to stretch limited ADE IT resources, create confusion | The West Ed/CELT team does not see any viable options for simplifying the dual system option approach.  However we do recommend that the data governance process and data stewards be educated and fully engaged to understand the dual option and the |

| Findings | Recommendations |
|---|---|
| about what data can and should be used, and as mentioned above create confusion about what SAIS options and systems are being turned off and when. | implications for data quality and confusion about what data store to use for various purposes.  The data stewards should be used to establish rules and guidelines to mitigate this confusion and to communicate with and train the districts.<br>Additionally, we suggest that ADE develop a communications strategy and plan for informing the local education agencies about what SAIS options and systems are being turned off and when. |
| 10. While the dual system approach addresses most of the problems of the prior approach, it will be more difficult to support and maintain until such time as SAIS is shut down. | Begin immediately to plan for the necessary support staff and procedures for when this system goes live.  Train the help desk staff to be prepared for tier 1 problem resolution.  Ensure staff has the training and/or the time required to handle tier 2 and 3 support requests.  Ensure contracts are in place as necessary for tier 3 support (e.g., for Double-Line Partners if they are needed for tier 3 support). |
| 11. Operational and internal support for nightly processes has not been completed. | Before the dual system can begin processing data in an automated fashion it will be necessary to fully schedule all of the required step needed to process the data. These steps will need to be identified, coded, sequenced and scheduled to run nightly.  Support for these jobs will need to be determined which includes assigning resources to monitor and address any issues that may occur during a nightly process. Communication to any downstream system will need to be created in order to inform them of any issues that may have occurred during the nightly processing. |
| 12. All of the data that flows through the API component currently is sourced through the SIS. Some of the data required for AzEDS (e.g., student-teacher course information) comes through a separate interface that districts enter data into (teachers, courses, course instances and students) called STC.  This system is hosted by the state and data is manually entered by the district at 2 intervals in the year.  When the AzEDS system is fully sourced through the API component this older STC system will be able to be turned off.  However, an issue that the West Ed/CELT is aware of as regards teacher- | For high-stakes use of the teacher-student data connection (e.g., teacher pay tied to student performance), a roster verification process will still be required to ensure that teachers and administrators have confidence in the data.  Any changes to the roster data resulting from this verification process will need to be propagated back to the district's source system of record. |

| Findings | Recommendations |
|---|---|
| student data connections is that the local SIS does not always keep an accurate teacher-student data connection at any particular point in time.  A roster verification process and tool is typically used by districts to validate the teacher-student data connections for any high-stakes use of the data. | |

## Risk Assessment Table for the AzEDS Options

Both the previous approach and the new dual system approach have a set of risks associated with them.  In many cases, the dual system approach helps to mitigate the impact, if not the probability, of the risk.  The table below outlines the risks that the West Ed/CELT team sees and what we believe to be the impact of the dual system option compared to the original option.

| Risk | Original Approach | | Dual System Option | |
|---|---|---|---|---|
| | Probability | Impact | Probability | Impact |
| 1.  The integrity rules (non-payment) and new limiting and aggregation routines will not be complete by 7/1/2015 in time for the system to go live.  There is a real risk that these will not be complete by the published date in the dual system plan of 9/1/2015. | High | High | High | Low See note 1 |
| 2.  SIS vendor certifications may not be all complete and disseminated to the districts for a July 1, 2015 go-live date. | High | High | High | Low See note 2 |
| 3.  For some districts, data quality of the SIS data as extracted for AzEDS may not be of a quality needed to support the school finance application. | High | High | High | Low See note 2 |
| 4.  The school finance results (e.g., budget dollars to LEAs and charter schools) will be different between the old SAIS and the new AzEDS processes.  These results may create backlash from the districts. | High | High | High | Medium See note 3 |
| 5.  The business rules for the SAIS replacement are different than those of the original SAIS.  This means that even if the data flowing through AzEDS completely matched the SAIS data, the calculations for school finance will return different results. | High | High | High | Medium See note 3 |
| 6.  The districts may not have sufficient procedures in place needed to correct the AzEDS data at the source (SIS) which may cause more work for these districts to put this in place. | Medium | High | Medium | Low See note 4 |
| 7.  Data in the SAIS tables, LEA Data Store, Agency ODS and Agency Test ODS will likely not be in synch due to different business rules and timing, and will produce different results for similar reports. | Low | Low | High | High See note 5 |
| 8.  Extending the life of the SAIS components will increase the risks that these obsolete SAIS systems may stop functioning. | Low | Low | High | High |
| 9.  Maintaining dual systems will increase support costs and pressure on support staff. | Low | Low | High | Medium |

| | Original Approach | | Dual System Option | |
|---|---|---|---|---|
| Risk | Probability | Impact | Probability | Impact |
| 10. Growing privacy concerns around student level data may create a political environment that is dangerous to AELAS regardless of system quality and functioning. | High | High | High | High |
| 11. The ADE is understaffed for the amount of district training and support to transition 650 districts to AzEDS in one year. | High | High | High | High |

Notes:

1. For option 2 the impact of this risk is mitigated by using the current SAIS rules, aggregation and limiting routines and a limiting routine fix until the new integrity rules and aggregation and limiting routines are in place.
2. For option 2 the impact of this risk is mitigated by allowing districts to continue entering data under the old SAIS approach until they are ready to switch to AzEDS.
3. For option 2 the impact of this risk is mitigated by allowing the district to see the ADM and budget impact as calculated by both the old SAIS and the new AzEDS approach. This will allow an opportunity for districts to explore the differences and correct any major problems on their end before switching to the new approach.
4. For option 2 the impact of this risk is mitigated by allowing districts extra time to put these data correction procedures in place before switching to the new approach.
5. This risk can be mitigated by clearly delineating the system of record for each of type of report and data query.

## Additional Risk Mitigation Strategies to Consider

1. Develop a proactive effort at the ADE to assist districts with the new data submission process and to help address questions that will arise from the impact of the new approach and business rules on their funding.
   a. Communication plan and materials to convey how the new business rules operate and the impact these will have on LEA and charter school budgets. Including webinars, websites, and regional meetings on AzEDS.
   b. Training and coaching on data quality and data correction procedures for the districts and charter schools.
   c. Monitoring of SIS versioning for each district to ensure AzEDS compliance software versions are loaded at each district. This could be tracked in the CRM.
   d. Escalation plan for districts that lack the skills, resources or political will to implement AzEDS.
   e. Identify districts that have successfully implemented AzEDS (including district data quality/governance activities) and create communications along the message "AELAS works" to establish clear responsibility between problems in loading data between districts and the ADE.
   f. Establish data quality "SWAT" teams to assist early adopters of AzEDS and use those experiences to develop data quality/AzEDS training and toolkits for other districts.
   g. Build political trust among state representatives that AELAS works and prepare them for complaints from districts that they cannot load data via AzEDS.
2. Help the districts to understand the new business rules and data standards by providing this information in a structure that is easily available to them such as a data dictionary. Publish the data dictionary to the districts along with the business rules. Include these in the communication and training plan for the districts.
3. Help the districts prepare for the transition to the new AzEDS and away from the old SAIS routines by providing a form of district readiness survey. Such a survey could help districts to better understand the potential impact of district specific problems when submitting data via AzEDS. This could include an option for voluntary on-site data quality audits.

## Summary:

The West Ed/CELT team feels that the ADE has selected the best approach for moving forward with its strategy of replacing the old data collection methods and SAIS components. The dual system approach appears to have been thoroughly thought out and designed. It addresses the schedule concerns and many of the risks of the old approach. The new approach does create some new risks and issues, as discussed above. Finalizing the integrity rules and the as yet unknown data issues from the API approach appear to be the biggest risks now. As the system

goes into production, the usage and load on the system and the impact on performance are an as yet unknown and should be monitored closely.