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Arkansas Final Report

Executive Summary:
The Arkansas Teacher-Student Data Link project includes five major projects: the enterprise architecture planning oversight project, the educator data systems integration project, the roster verification project, the TrustED system for cross-agency sharing project and the Hive/local assessment data visualization project. Each one of these projects is a critical component of Arkansas' overall plan to strengthen its processes and systems related to the data link between teachers and students. The scope and nature of the projects reflect the enterprise-wide nature of Arkansas' approach and thus its overall success goes well beyond the five discrete projects represented.

Project narratives for each of the project(s)

I. The Enterprise Architecture Planning Oversight Project

This project addressed planning, data governance, and architecture across functions, projects, and organizational units and functioned as the coordinating project across key initiatives including Arkansas' five TSDL projects. Through this project an official data governance structure and process were created.

Major Accomplishments

Major accomplishments include approval of a teacher of record definition by the Arkansas Department of Education (ADE), implementation of a department wide data governance process that includes the selection of data stewards with responsibility over specific data sets and the formation of a data stewards committee. The data stewards received training on data governance, and meet regularly to address data governance and data quality issues. Significant work has been undertaken by the committee to reduce the number of required state reports and convert as many reports as possible from paper to electronic filing, thereby reducing the paper reporting burden on districts. ADE redesigned their enterprise architecture to further integrate data systems. All system(s) within ADE are well documented and supported through the data governance process that ensures documentation is updated whenever changes are made. This new architecture connects the student (SMS) and financial (FMS) data systems and enables ADE to pull real time (uncertified) data from districts nightly and on demand. Data from these systems populate the newly launched online accreditation system site http://adedata.arkansas.gov/saas/, which provides districts with up-to-date information about their status, including exceptions and potential violations, in the Arkansas Standards Annual Accreditation System.

At the policy level, ADE implemented its Teacher of Record (TOR) definition which is: A Teacher of Record is an individual (or individuals in co-teaching assignments) who has been assigned the lead responsibility for a student's instruction in a subject/course with aligned performance measures. Also defined is a Contributing Professional, which is is an individual who has been assigned the responsibility to provide additional services that support and increase a student's learning. Newly developed systems, such as the teacher licensure system, utilize the definitions, thus reinforcing and strengthening the teacher-student data link.

Lessons Learned

One important lesson was learned due to the SMS & FMS using specific data fields differently, which caused data quality issues in Triand, the single-sign on system for Arkansas educators. Once business rules were established around use of the fields and how the systems integrated the information, the issue was resolved.

The upgrade of the student information system eSchool+, which is used by almost all Arkansas school districts, continues to be challenging because eSchool+ is significantly different from the previous version, requiring increased training and technical support. As the source system for much of the teacher-student data link data, eSchool+'s successful implementation is critical to ADE's continued progress on enterprise

architecture, data quality, and TSDL. The upgrade is being rolled out to districts over a 3 year period, and is on schedule for completion in the 2014-2015 school year.

Increasing user awareness of the tools and resources available continues to be a priority. Although ADE currently provides annual training on specific new tools, data-driven decision making, etc. and sends regular communications to build awareness, data from periodic surveys of stakeholders indicate a continuing need to implement proactive strategies for increased user awareness.

Next Steps
Arkansas continues to move forward with its enterprise architecture system and the eSchool+ upgrade, with all districts scheduled to come online in the next three years. In addition, ADE has adopted the Common Education Data Standards (CEDS) data model and is working with Doubleline Partners to implement ED-FI which is compatible with CEDS and should enhance their statewide information system.

II. The Educator Data Integration System Project

This project was designed to improve the processes and information services to support licensure, certification, and professional development, as well as enhance the quality of educator data to support cross-functional use.

Major Accomplishments
Major accomplishments include the completion of a comprehensive evaluation of current processes and systems that enable ADE to make major strides toward the creation of a fully integrated educator data system. Fundamental in the multi-step process toward a completely integrated system was the establishment of a reliable unique educator ID through the Triand system, which began as an electronic transcript system and is now used as the educator ID sign-on system in most, but not all, systems. The statewide student information system, APSCN has been established as the source system for teacher demographic information, which now feeds that data to the certification system and into the HQT data systems, resulting in improved teacher demographic data quality.

Lessons Learned
ADE found that a significant amount of time must be spent defining the goals of the systems for the system to be successful. They now strongly recommend that, for any ADE development project, ample time be spent on defining how a system should work, and how it can potentially work with other systems, **before** development begins. It is also recommended that appropriate subject matter experts serve in a governing role from the beginning of the project as their knowledge is central to development. ADE is using their data governance processes to assist in creating the understanding that projects and systems should be owned by the subject matter experts rather than the IT department.

The next critical step taken to create an integrated educator data system involved replacing the antiquated professional licensure system with a new system called AELS (Arkansas Educator License System). AELS was designed and built in-house so that it could share data across other existing systems for maximum functionality. For example, AELS integrates with the Cognos reporting system to allow for more robust ad-hoc reporting. As new systems are developed, ADE must adopt the appropriate policies to ensure systems function effectively and yield the intended result.

Next Steps
In partnership with the Department of Information Services (DIS), ADE seeks to move toward a comprehensive single sign-on provider so that all systems in ADE may be accessed with one username and password. This requires new funding which is being sought. Other next steps include transforming the professional development system into a comprehensive professional growth plan system which incorporates teacher mentoring, professional development, the IDEAS resources portal, and eventually, evaluation. This system would also be an integral part of the overall enterprise architecture, exchanging data with other systems as appropriate.

III. The Roster Verification Project

This project was designed to create an event-based verification for teacher of record (TOR) data. The project included developing a process to pull student attendance and roster verification data from the common local student management system, which could be validated at the school level by teachers. Ultimately this process was designed to be accomplished on a daily basis and leverage the eSchool+ upgrade to allow for verification of multiple educators per class.

Major Accomplishments:
Major accomplishments include the development of the roster verification application and process, the successful completion of a pilot in 2 districts and subsequent application improvements. Training materials were also developed for the roster verification application and process and made available on the ADE website. The roster verification application is operational and teachers are strongly encouraged to verify their rosters before state testing labels are printed.

Lessons Learned
The creation of the application itself and the verification process development were not difficult. However, initial challenges centered on teachers' and administrators' ability to access and use the tool. Access to the application is granted through the Triand ID, which is assigned to each educator. Up to this point the Triand IDs had not been used regularly by teacher or administrators. Therefore, the pilot showed that many did not know their ID and/or password, and the process for retrieval of the ID was cumbersome and time-consuming. In addition, the pilot showed that training materials about the Triand ID and using the roster verification tool were needed to ensure fidelity of implementation and to minimize support issues. Once the training materials (including videos on the website) were developed and minor adjustments were made to the application to make it easier to use, the access and usage problems significantly declined.

Next Steps
Currently the roster verification system has not been mandated by ADE and it remains to be determined whether this will change. Many factors come into play, including the use of roster verification as it relates to the teacher evaluation system.

IV. The Trust ED project

This project was designed to pilot the "TrustEd" System for Cross-Agency Data Sharing. The Arkansas Education to Employment Tracking and Trends Initiative (AEETT) established cross-agency data sharing under an initial 2009 agreement with three state agencies—Arkansas Department of Education, Arkansas Department of Higher Education, and the Arkansas Department of Workforce Services. The project has been continued while connections with other agencies have been pursued. To address FERPA, HIPPA and general privacy concerns, TrustEd employs a "dual-database" architecture in which personally identifiable information is kept in a separate system from that which holds the de-identified research data. Through TrustEd, the Arkansas Research Center (ARC) serves as a service bureau to agencies by maintaining a knowledge base of identify information which allows for a high match rate for individuals, even when their name and/or ID may change over time and between agencies. De-identified agency data is stored in agency specific databases with unique agency IDs. Research data sets can be created using a temporary crosswalk between agencies, and this crosswalk is destroyed once the data set is created.

This project connected the goals of the TSDL project to TrustEd because it facilitated access to educator data that was not available within ADE's data systems. TrustED includes more detailed information concerning higher education preparation and salary and work information available through workforce data systems. TrustEd's ability to make de-identified cross-agency data sets available has distinct advantages for research. For example, ADE will be able to create more detailed High School Feedback reports, which will include details about a school's graduates as they go on to both higher education and the workforce.

Major Accomplishments
An important major accomplishment is that TrustEd is operational, documented and well researched. Significant research has been done in the area of identity resolution, which has generated great interest among other states. The project has created two separate open-source systems for this work, Oyster and

KIM. Oyster is an XML-based system which allows for great flexibility, by allowing for identity rules to be applied to non-ASCI character sets, for example. KIM is a database solution that is currently much faster than Oyster, and since it is primarily SQL driven, it allows for identity rules to be quickly modified. Development continues on both systems.

In addition, TrustEd has enabled the Arkansas Research Center (ARC) to better conduct cross-agency research. For example, one of the largest research projects is a higher education wage outcomes report, which details the work and wage histories for specific credentials going back ten years. This report is now being expanded to include outcomes for high school graduates, high school dropouts, GED students, and those with some college. Given the privacy protections built into TrustEd, ARC has also been able to conduct research in the medical field, such as matching the student outcomes of infants born with a variety of medical problems to assessment and other student data up to 12 years after their birth. ARC has also been able to automate a required Special Education Outcomes report that requires data from multiple agencies, and which to date has been conducted using only survey responses.

TrustEd continues to include new partners beyond the original three which were part of the AEETT consortia, such as the Arkansas Department of Human Services (primarily state PK data), some Arkansas Head Start programs, the Arkansas Department of Human Services, Arkansas Department of Corrections, Arkansas Career Education, and the University of Arkansas for Medical Sciences.

This work has facilitated Arkansas' involvement with the Common Education Data Standards (CEDS) work. Arkansas has been active in this work and maintains translation tables within its research database, which allows it to create CEDS-compliant reports.

Lessons Learned

While response to the project has been completely positive and participation has been extensive, there remain some agencies that do not participate. For example, there have been recent requests that require the inclusion of records from the Arkansas Department of Rehabilitation Services, but they insist that legally they cannot participate. While some Arkansas Head Start programs have provided data, a comprehensive picture of Early Learning in the state is not possible until all such centers are participating.

The work with CEDS is important, but it is somewhat difficult due to being ahead of the curve. TrustEd is completely operational and now in maintenance mode; however, CEDS continues to expand and evolve. This necessitates ARC's continued work to keep abreast of what is new within CEDS and modify the existing work.

Next Steps

The Oyster project has been posted to SourceForge and continues to be tested and developed. KIM was introduced to the community at large at the MIS Winter Conference in San Diego, and posted to SourceForge shortly after that. The documentation concerning Oyster is quite extensive, and documentation for KIM has begun as well. The next task will be to create an easy-to-use graphical interface for end users. Testing and development of both are parallel, with Oyster being used for the validation of KIM output and vice versa.

ARC has begun an "Awareness Campaign" concerning ARC and TrustEd's capacity, to generate more interest among researchers and policy makers, as well as to begin the process of securing permanent funding once ARRA funding ends. Plans are underway for a website redesign to better reflect the services provided by ARC as well as bringing all the online tools under the parent URL arc.arkansas.gov. They continue to arrange for presentations with several state agencies and boards and get requests for reports from the state Legislature.

ARC encourages other agencies to submit data to TrustEd. New regulations concerning FERPA allow for student-level feedback reports, so they began the development of such reports and hope this will encourage all Head Start programs in the state to participate. A specific request from the Legislature necessitates the inclusion of rehabilitation data, so that data will soon be included. ARC finalized the agreement for the inclusion of 10 years of Safe and Drug Free Schools' survey data and will soon be doing research linking student outcomes to school climate. Additionally, there is new emphasis on working with various training programs within the state such as WIA, TAA, Wagner-Payzer and others.

V. The Project to Expand Enterprise Data Warehouse with Local Assessment Data and Teacher-Student Link to Feed Data Visualization

This project was designed to build an expanded SLDS architecture to provide value to local districts, leveraging local assessment data and validated teacher-student data link, and providing useful access to that data through existing visualization tools.

Major Accomplishments/Deliverables

Data visualization tools were originally created using ActionScript. This means they were not compatible with many newer smartphone and tablet devices. A major goal of this project was to port existing work to HTML5 for compatibility with mobile devices and to provide a modern platform for continued development. This work has been completed for one such tool, QuickLooks, and will also be soon completed for the other tool, Hive. It is important to note that visualization of student scores and growth by teacher is in the updated QuickLooks system, with three years of these data for administrators to review.

A mobile application for local assessments has been developed and tested in one district. This application enables individual teachers to log in via the state's single sign-on solution, verify their roster, and record individual student DIBELS and DRA assessment scores. The scores are uploaded into the data visualization tools, QuickLooks and HIVE, as well as incorporated into the student growth calculation.

Lessons Learned

Porting the existing ActionScript code to JavaScript and HTML5 was very challenging and time consuming. There does not currently exist within JavaScript some of the user interactivity and richness of visualizations that were available with ActionScript. Modifications continue to be made to existing JavaScript libraries to emulate what was previously available. There is a significant tradeoff between the interactivity and possibilities afforded with ActionScript and the platform compatibility that JavaScript provides. Because of the complexity of Hive and the limitations of JavaScript/HTML5, the conversion process was not completed until summer 2012.

Another significant change was ARC's decision to use a hosted service, Amazon's EC2 cloud platform, rather than host its tools on local servers. While this move was challenging initially, ARC is now very comfortable with the hosted service and will continue to port other services to the cloud environment, which provides agility and cost-savings.

The evolving assessment work of the PARCC consortia, in which Arkansas participates, complicates ARC's future work on the inclusion of local servers. Questions remain concerning "Through Course Testing" and what this will mean for DIEBELS and DRA, as well as what platform schools will have to use for interim assessment. While interest in this project was originally very high, many schools are adopting a wait-and-see attitude regarding what resources the PARCC assessment will require.

Next Steps

Plans include extending current functionality to incorporate Special Education and Gifted and Talented data. Future developments, including the role of local assessments and the future of the state's assessment system will depend greatly on the assessment work being undertaken through the PARCC consortia.

Conclusion

ADE continues to pursue the wide range of initiatives that support the use of the teacher-student data link not only for K12 schools but also for cross-agency collaborations and research. Their commitment to creating and maintaining a strong teacher-student data link is evidenced by Arkansas' high ranking in the Data Quality Campaign state analysis. Promoting statewide implementation of the Teacher of Record and Contributing Professional definitions, and building out the enterprise architecture remain priorities.

Equally important are ongoing efforts to develop robust communications vehicles to enable all stakeholders, including educators, parents, researchers, and the public to be informed and able to use the systems for their intended purposes.