

Arkansas Workforce Data Quality Initiative

Overview

Data systems that support the three primary workforce development systems in the United States—K-12, post-secondary, and workforce systems (WIA and Wagner-Peyser)—evolved on separate tracks over many years with disjuncture between the education and workforce systems. As a result it has been difficult to match workforce data with education data that can be used to measure outcomes while complying with federal privacy regulations such as the Family Educational Rights and Privacy Act (FERPA). This problem has become more acute as the need for post-secondary education is now essential to the development of the skilled workforce that is required by industry. Arkansas has been fortunate to receive a U.S. Department of Education Institute of Education Sciences (IES) State Longitudinal Data Systems grant which has resulted in an education statewide longitudinal database system (SLDS) that links data between the Arkansas Departments of Education, Higher Education, Human Services, Career and Technical Education, Corrections, the University of Arkansas for Medical Sciences, and one workforce system database. What is not in place is a workforce SLDS that will link with the education SLDS. Also not in place is a transactional system that provides stakeholders user-friendly access to inputs and outputs of the SLDS. Funding requested in this proposal will support development and deployment of a workforce SLDS for Arkansas that will link with the education SLDS to improve training provider access to more detail on participant outcomes; incorporate existing multi-agency data from WIA, and Wagner-Peyser; improve capacity to track participants who find employment outside Arkansas; and increase the level of detail concerning employment while protecting individual privacy. This project also supports a pilot transactional system which will provide the platform for the inclusion of other programs in the future.

1. Statement of Current Capacity

The stage of the Arkansas education SLDS is best described as a comprehensive system that links data between the Arkansas Departments of Education, Higher Education, Human Services, Career and Technical Education, Corrections, and the University of Arkansas for Medical Sciences, and that is compliant with FERPA. The education SLDS currently only includes linkage to UI-Wage data but links to no other workforce data. Funding for this project will develop a workforce SLDS to expand the breadth of workforce data collected, including out-of-state data, and link with the existing education SLDS. Additionally, there is no existing transactional interface that provides a user-friendly transactional system for the SLDS—this project will implement a pilot transactional system that will support the tracking of outcome measures for the recently awarded statewide DOL Trade Adjustment Assistance Community College and Career Training Grant (TAACCCTG) titled “Path to Accelerated Completion and Employment (PACE) Initiative. The Arkansas SLDS is maintained by the Arkansas Research Center (ARC) which is a partnership between the University of Central Arkansas, the Arkansas Department of Education, and the University of Arkansas at Little Rock. ARC is a state agency which is under the governance of the Arkansas Commission for the Coordination of Educational Efforts.

The following list describes the current linked databases that comprise the education SLDS:

- Arkansas Department of Higher Education: Student enrollment, course registration, instructor, graduate, workforce, and athletic information are submitted to the Arkansas Department of Higher Education (ADHE) via the Arkansas Higher Education Information System (AHEIS). This data is submitted to ADHE by 44 reporting institutions, which includes eleven (11) public four-year colleges and

universities, twenty-two (22) public two-year colleges and eleven (11) independent colleges and universities. This data is submitted on a periodic basis and is stored in the Student Information System Database which is maintained by the Arkansas Department of Higher Education. Currently twelve years of student enrollment, remediation, graduate, and credit/course information for Arkansas students, and seven years of college enrollment and completion data from the National Student Clearinghouse are archived at ARC.

- Arkansas Department of Education (K-12): Prior to December 2005 Arkansas had a distributed set of operational and transaction databases that supported the state's school districts' fiscal, personnel, and program operations and statewide and federal reporting requirements. Each system had its own data model, data dictionary, business rules and quality assurance procedures. These district-level databases were housed at the Arkansas Department of Education. In December 2005 the Arkansas Department of Education was awarded grant from the U.S. Department of Education to construct an education longitudinal data system to fill gaps in the current systems and more effectively manage, analyze, disaggregate, and use individual student data to support decision making at the state, district, school, classroom and parent levels, in order to eliminate achievement gaps and improve learning of all students. Based on the success of this project, which ended in November, 2008, the Arkansas Department of Education was awarded a second education SLDS grant to further expand and improve the state education SLDS. Arkansas is now among four states whose education SLDS addresses all 10 of the SLDS elements as defined by the Data Quality Campaign. Based on the success of these projects the Arkansas

Department of Education submitted a proposal to the U.S. Department of Education for funding under the Statewide Longitudinal Data System initiative. This proposal (Arkansas Department of Education SLDS Improvement and Modernization Project) was funded in July 2010 in the amount of \$9,832,689. Currently eight years of student demographic, graduation, special education, and assessment data, as well as district financial data are archived at ARC.

- Arkansas Department of Career and Technical Education: This department has three different database requirements. The first utilizes the K-12 database which provides data on secondary students. There is an overlap with the Arkansas Department of Higher Education which collects data on high school students obtaining college credentials in concurrent credit high school programs. The second data resource is the National Office for Research on Measurement and Evaluation Systems which is located at the University of Arkansas. To date this has been limited to determining the number of students who continue their education at postsecondary institutions. A new database requirement has arisen with the recent implementation of the Arkansas Works Project which utilizes TANF funds to support Career Coaches that are deployed in 21 counties in Arkansas to mentor and recruit high school students into postsecondary education. There is a significant requirement to track these students from the secondary system into work or postsecondary education and, currently, a system to accomplish this does not exist. Currently twenty-five years of General Educational Development assessments as well as various data from specific programs are archived at ARC.

- Arkansas Department of Human Services: Data on TANF participants is maintained at the Arkansas Department of Human Services through the Arkansas Networked System for Welfare Eligibility and Reporting System. Currently, the Arkansas Department of Workforce Services accesses this data via the Arkansas Department of Information Systems, which maintains part of the workforce system data. The Arkansas Department of Education links to the SNAP data to determine direct certification for free and reduced meal status under the NSLA program. Currently seven years of data on the state’s Early Learning Program, including participation, attendance, developmental screening, and program quality information. Additionally, data from the Supplemental Nutrition Assistance Program are archived at ARC.

While the Arkansas education SLDS is well established, the Arkansas workforce SLDS is only partially linked to the education SLDS. The Arkansas Department of Workforce Services utilizes three primary systems to track participant outcomes—1) UI wage, which is linked, and benefit information, which is not linked, is stored at the Arkansas Department of Information Systems; 2) WIA Title 1, Wagner-Peyser, and Trade Adjustment Assistance information is housed in Kansas via a Letter of Agreement and Contract with America’s Job Link Alliance; and, 3) TANF data is maintained in a database located at the Arkansas Department of Human Services. Currently, ten years of Unemployment Insurance (UI) quarterly wage data, including UI claims data are archived at ARC.

i. Capacity for Maintaining Secure Data Storage: ARC developed a “trusted broker” system that is a secure data storage capacity which is FERPA compliant. ARC uses an open-source encryption product called TrueCrypt and a dual-database architecture where entity information is kept separate from the data that is shared with agencies. ARC has developed the TrustEd

Information Database (see **Description of Database Design, Data Quality Assurance and Proposed Uses**) which will be used to support this project. This methodology assures that even if data is stored unencrypted at an agency, a data breach would only effect a single agency, and the data would only include variables of research interest (test scores, salaries, etc.) and would not include identity information of any kind. All data systems at ARC are encrypted so that even if an agency's database is compromised, access would only be to this one agency's encrypted data with no way to join it with any other agency's data. This methodology will be used by the Arkansas Workforce Data Quality Initiative (AWDQI) project to insure security of data, see **Security Issues Section** for additional comments on security features.

ii. Planned or Established Partnerships between SWA and State Education Agencies: Prior to August 2009 Arkansas had limited data-sharing partnerships, especially between State agencies. Those that existed were project focused and thus limited in scope and impact. This included a 2005, Memorandum of Understanding between the Arkansas Employment Security Department and the Arkansas Department of Workforce Education (precursor to the current Arkansas Department of Career Education). This MOU provided the basis for the sharing of Unemployment Insurance Wage data to match selected student data. Subsequently, a 2006 State of Arkansas Department of Workforce Services Data-Sharing Agreement between the Arkansas Department of Education (ADE) and the Arkansas Department of Workforce Services (ADWS) provided guidelines for sharing student enrollment data from ADE with ADWS, and sharing of employer wage data from ADWS with ADE. Note, the 2005 and 2006 Agreements are not included in the attachments due to page limitations, but are on file. In August, 2009, at the direction of Governor Mike Beebe, a Project Charter was executed by five state agencies to establish the Arkansas Education to Employment Tracking and Trends (AEETT) initiative (see

Tab 8: AEETT Charter). The AEETT consortium, which operates under the direct oversight of the Governor’s Workforce Cabinet, was established to plan and execute a series of cross-agency matches and produce reports on the progress of students in the workforce, as well as other topics to unify Arkansas’ current education, employment and workforce development statistical results to support new and better services. The initial signatories to the agreement are the Arkansas Department of Workforce Services, the Arkansas Department of Higher Education, the Arkansas Department of Education and the Arkansas Department of Career and Technical Education. Phase 1 of the AEETT project included identifying data sources to produce selected reports, identifying missing data sources, documenting the methodology and approach for data storage and metadata, and documenting reports to be produced in this phase. The plan set forth in the AEETT Charter and Project Plan provided a basis for important major advances in cross-agency data sharing in the state. The education SLDS grant awards provided the resources to address a robust solution that is fully protective of privacy. These grants established the Arkansas Research Center (ARC). The ARC collaboratively examines a multitude of issues around the current availability and quality of data in the systems of the partnering agencies. The ARC develops new forward-looking data-sharing strategies that are flexible, efficient, and compliant with FERPA and other state and federal laws concerning individual privacy. Funding for the AWDQI project will provide the resources to develop a workforce SLDS that is linked with the education SLDS, and support a pilot project that will ultimately lead to a statewide transactional system.

In 2010, a data sharing agreement was established between the Arkansas Department of Workforce Services (ADWS) and the Arkansas Department of Higher Education (ADHE) with the goal of unifying Arkansas’ current education, employment, and workforce development statistical results to aid in providing new and better services (see **Tab 9: Data Sharing**

Agreements, Exhibit A). A product of this agreement was the creation of the Arkansas Education to Employment Report (AEER) which linked the ADHE student database with the ADWS UI-Wage database which is still the only workforce database that is linked with the education SLDS. Of note, this agreement did not explicitly address student privacy.

In 2011, a “Memorandum of Understanding Between the Arkansas Departments of Education, Higher Education, Health Services, Workforce Services, Human Services and Career Education” was implemented that explicitly addressed privacy issues (see **Tab 9: Data Sharing Agreements, Exhibit B**).

During the planning and development for this proposal all parties agreed to develop a blanket data-sharing agreement which will include all additional programs, i.e., UI-Beneficiaries, WIA, ES, TAA, and any other related databases, and implement policies and procedures in compliance with individual privacy laws.

iii. Existing or Planned Data Linkages: Currently, only UI Wage data is linked through the ARC to the education SLDS. This project will develop the workforce SLDS which will be completely linked to the education SLDS. The workforce SLDS will contain the following data: 1) WIA, Title 1; 2) Wagner-Peyser Act; 3) Trade Adjustment Assistance and Trade Readjustment Allowance; 4) UI Wage; 5) UI Benefit; and, 6) FEDES. This workforce data will be linked at the ARC to the education SLDS that contains early childhood, K-12, and postsecondary education demographic data, test scores, teachers, graduation rates, program completion, and transcripts.

Currently there are limited data linkages between the workforce databases (wage record data, employment and training services data, UI benefits data, TANF data, WIA, Wagner-Peyser and Trade Adjustment Assistance Program data) and education databases (K-12 and post-secondary

data). There are linkages, on the education side between the K-12 system and the higher education system that support student record transfers and reports. There also linkages on the workforce side such as the link between the Department of Human Services and the Department of Workforce Services via the Department of Information Systems that support the transfer of TANF data. This project will develop and improve linkages between existing database systems; leverage improvements funded by the U.S. Department of Education State Longitudinal Data System grant; and develop a comprehensive workforce SLDS that is fully linked to the education SLDS.

iv. Outcomes of Existing or Proposed Data-Sharing Partnerships: There are existing report formats and agreements between the Arkansas Department of Education and the Arkansas Department of Higher Education, such as the transfer of student transcripts, but only limited data sharing agreements between the workforce system and the education system, usually on a project basis. For example, in 2011 the Arkansas Department of Higher Education conducted a research study to determine if students completing selected postsecondary programs were employed in Arkansas. As a result the Arkansas Employment by Degree Level report was developed that reported on the number of graduates by the type of degree level (Arkansas Department of Higher Education database) who were employed in the State of Arkansas (UI Wage data at the Arkansas Department of Workforce Services). This is currently the only established linkage between the education SLDS and workforce data.

v. Partnerships with Agencies in Other States: Arkansas has several data sharing agreements with other states. A National Association of State Workforce Agencies Letter of Agreement and Contract with America's Job Link Alliance Products and Services between the Arkansas Workforce System and the Kansas Workforce System outlines the conditions for input and

access to WIA data by Arkansas workforce agencies. Additionally, higher education institutions do participate in the national student clearing house and every higher education institution is a participant of the SPEEDE transcript service at the University of Texas—Austin.

Arkansas participates in the Wage Record Interchange System (WRIS) and has access to the WRIS Clearinghouse, the technical operation to exchange wage data, which is built upon the Interstate Connection Network (ICON) used for the administration of interstate unemployment benefits and is currently operated through a cooperative agreement with the State of Maryland. WRIS facilitates the exchange of wage data among participating states for the purpose of assessing and reporting on state and local employment and training program performance, evaluating training provider performance, and for other purposes allowed under the WRIS Data Sharing Agreement. The exchange permits state workforce program performance agencies to secure wage data of individuals who have participated in workforce investment programs in one state, then subsequently secured employment in another. By participating in WRIS, Arkansas has a more robust picture of the effectiveness of their workforce investment programs, and is able to report more comprehensive outcomes against their performance measures. Implementation of WRIS2 expanded the WRIS program which support linkage of WRIS data to education data.

2. Plan Outline

i. Description of State Objectives: The Arkansas Workforce Data Quality Initiative will:

1. Create a workforce SLDS that is fully linked with the current, comprehensive education SLDS that will support cross-agency matching of participant records: As described earlier the current education SLDS is FERPA compliant and the limitation on individual disaggregated data is driven by federal restrictions such as the Wage Record Interchange System (WRIS) data sharing agreement which limits the aggregation to no fewer than 3 participants. Staffs at ARC,

the Arkansas Departments of Workforce Services, Education, Higher Education, and Career and Technical Education continue to collaborate on improvements to database linkages. Recently, this includes assignment of technical personal from the Arkansas Departments of Higher Education and Career and Technical Education to ARC. Funding for the AWDQI project will provide the resources to support and expand these relationships that will result in a permanent, unified deployment of a statewide SLDS that includes robust linkages between the education SLDS and the new workforce SLDS.

2. Implement a pilot SLDS transactional system that will support the recent statewide DOL TAACCCGT grant awarded to Arkansas. The outcomes of the pilot will provide the basis for statewide user-friendly access to the linked education SLDS and workforce SLDS: In 2011, Arkansas was awarded a U.S. Department of Labor TAACCCTG grant that includes all 22 community colleges in Arkansas. This is a complex grant which will require tracking of participants from education into employment. Creation of a workforce SLDS and transactional system will significantly benefit implementation of this grant.

If the AWDQI project is funded it will support both the development of a workforce SLDS that is linked to the current education SLDS, and development of a user-friendly access portal to the linked databases. The access portal will be Web- based and data entry fields will be aligned with the outcome measures approved by DOL which include the requirement to track parallel cohorts of students-those impacted by the grant and those not impacted. The following output reports will be developed: 1) formative reports to support the project management team in implementation and management of the AWDQI grant; 2) summative reports that will inform state strategic leadership; and, 3) reports that are formatted to support DOL reporting

requirements. The results of this pilot will become the basis for a statewide transactional system that will support education and workforce agencies in the future.

ii. Status of the State Longitudinal Education Data System: With significant help from its 2005 and 2009 IES SLDS grants, the Arkansas Department of Education (ADE) has established and continues to improve its SLDS, which by 2007 had already met all of the Data Quality Campaign's 10 essential elements. ADE is committed to achieving improvements in student outcomes and is pursuing a broad range of new initiatives to build a strong culture of Data Driven Decision Making (DDDM) that is enriched through cross-agency data sharing and engagement of the research community. In its December 2008 evaluation of the Arkansas education SLDS, the evaluator documented significant utilization and good end-user satisfaction with the SLDS. ADE is using the IES SLDS 2009 grant to advance new improvements and accelerate initiatives to address the new SLDS standard set by the seven required capabilities and 12 elements outlined in the U.S. Department of Education's RFA. Backed by the strong support of Arkansas Governor Mike Beebe ADE is meeting all current grant requirements to achieve the following outcomes under the 2010 IES SLDS grant:

1. Continued improvement of the Arkansas Research Center (ARC) with participation from ADE; Arkansas educational research, teacher preparation, and educational policy institutions; and higher education, workforce, human services, and health agencies.
2. Expansion and acceleration of current work on DDDM and researcher engagement, facilitation of relevant research within agencies and research that requires data from these agencies to be combined.
3. Expansion of data-sharing agreements to maximize the amount of data about the Pre-K population collected in the SLDS.

4. Continued improvement of the master data management/entity resolution, “TrustEd” and service oriented architecture (SOA) based on solutions—including incorporation of workforce elements—to ensure privacy protection, FERPA compliance, and a high degree of interoperability.
5. Expansion of the Common Education Data Standards (CEDDS) to include the new workforce SLDS that will be developed under this project.

Please see the **Statement of Current Capacity Section** for additional information on the education SLDS databases.

iii. Plans to Sustain the Workforce Longitudinal Database: In 2011, the Arkansas General Assembly passed legislation that required institutions of higher education to track and report on outcomes of their programs, including employment outcomes, as part of their justification for state formula funding. This legislation ensures that the requirement to track students into employment is institutionalized and that the need for this capacity will be permanent. Currently, higher education institutions have very limited capacity to track students into employment, thus the creation a workforce SLDS that is linked to the education SLDS is important, and the sustainment of this project will be supported in the future. Additionally, Arkansas recently was awarded a DOL TAACCCTG grant that requires tracking of participants into employment. This requirement is not atypical, thus there is a current and continuing need for a statewide linked education/workforce SLDS to support these types of federal investments. The Governor of Arkansas and his Workforce Cabinet, which consists of the directors of State agencies, are committed to sustaining the education and workforce longitudinal data systems and the processes, agreements and architectures that unite them (see **Letters of Commitment**). Funds to

sustain outcomes will come from user fees as appropriate, line item appropriations in state agency budgets as needed, and, if necessary, enabling legislation.

3. Description of Partnership Strategies

i. Partnerships within State Workforce Systems: In August 2009, at the direction of Governor Mike Beebe, a Project Charter (see **Tab 8: Attachment 3**) was executed by four state agencies to establish the Arkansas Education to Employment Tracking and Trends Initiative (AEETT) consortium under the lead of the Arkansas Department of Information Systems (DIS) and operating under the direct oversight of the Governor’s Workforce Cabinet. The AEETT was established to plan and execute a series of cross-agency matches and produce reports on the progress of students in the workforce, as well as other topics to “unify Arkansas current education, employment, and workforce development statistical results to aid in providing new and better services.” The initial signatories to the agreement are the Arkansas Department of Higher Education (ADHE), the Arkansas Department of Education (ADE), the Arkansas Department of Workforce Services (ADWS), the Arkansas Economic Development Commission (AEDC), and the Arkansas Department of Career and Technical Education (ADCTE). The signatories approved a detailed work plan and budget for DIS to carry out the initial phase of work, including the design, build, and implementation of a data mart data repository-note that this function is now done by ARC. Data are to be included only after official documented approval from agency data owners, and once complete, the data repository will be used only by authorized participating agencies for approved custom report views. Phase I included identifying data sources to produce select reports, identifying missing data sources, documenting the methodology and approach for data storage and metadata, and documenting reports to be produced in this phase. This effort also involved defining the scope of work for Phase II,

including the involvement of additional agencies. The Plan set forth in the AEETT Charter and project plan provided the basis for important major advances in **cross-agency data sharing** in the state. The initial work begun under this Charter has evolved to the establishment of ARC and an education SLDS that has the capacity to track students from Pre-K through postsecondary education. Funding for the AWDQI project will provide Arkansas the resources to leverage the education SLDS (see **Status of the State Longitudinal Education Data System**) and create a workforce SLDS that will support student tracking from Pre-K into employment while protecting individual privacy.

ii. Partnerships with State Education Agencies: The ADWQI project will build on existing partnerships between the Arkansas Department of Education, the Arkansas Department of Higher Education, the Arkansas Department of Career and Technical Education, and the Arkansas Department of Workforce Services, as evidenced by existing agreements. Through the trusted identity and security services provided by ARC, state education agencies and the Department of Workforce Services will link existing and new databases between the education and workforce systems on a disaggregated basis, while complying with federal privacy regulations.

iii. Partnerships with State Research Universities: The Arkansas Research Center (ARC) was founded in 2009 with the mission of fostering effective educational data use and to serve as a clearing house for state agency educational data needed to benefit education in Arkansas. ARC is a partnership of the University of Central Arkansas, the University of Arkansas at Little Rock, and the Arkansas Department of Education. **Dr. Neal Gibson (see Tab 10: Biographic Sketches), who is the Director of ARC, was involved in the planning process for preparation of**

this proposal and will provide key leadership for implantation of the AWDQI project. Dr. Gibson will be a **Co-Database and Co-Manager** for the AWDQI project.

iv. Partnerships with Additional State Agencies: The AWDQI project will partner with the Arkansas Department of Information Systems (ADIS), the Arkansas Department of Human Services (ADHS) and the Arkansas Department of Finance and Administration ADFA. The partnership with ADIS and its current maintenance of databases has been previously discussed. The partnership with ADHS will facilitate the inclusion of TANF participants in the longitudinal database. The partnership with ADFA will facilitate the implementation of SOC code identification on Arkansas income tax returns which can be used to track occupation-specific data.

4. Description of Database Design, Data Quality Assurance and Proposed Uses

During the planning process for the development of the Arkansas Workforce Data Quality Initiative proposal, meetings with strategic partners identified three challenges in addition to database management system integration issues. These were 1) entity resolution (data quality issues such as errors in data entry and common identifiers such as names—see **Data Quality Measures**); 2) regulations; and, 3) privacy issues (see **Privacy Regulations**). Resolution of these issues utilizes a dual-database architecture, TrustEd, to insure

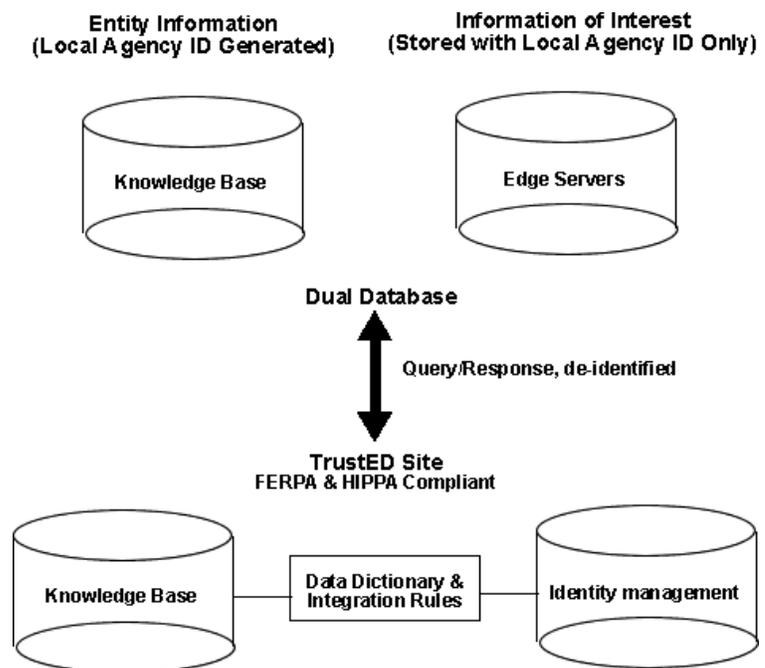


Figure 1: Trust Ed Architecture

compliance with federal privacy regulations and to resolve entity resolution issues as graphically shown in Figure 1. TrustEd is composed of three loosely-coupled modules: 1) TrustEd Identifier Manager (TIM); 2) Knowledgebase Identity Manager (KIM); and, 3) agency databases. The goal of the system is to protect individual privacy and prevent the joining of data between agencies except under specific, controlled circumstances.

i. Personal Identifier: State agencies will provide the “trusted site” (TrustEd) with entity information (social security number, student identification, name, date of birth, etc.) initially for

each entity. TrustEd will generate a unique de-identified **personal identifier** for each entity that will be returned to the agency, which will then use this unique personal identifier in future requests for data from other agencies. Each agency will store its own information of interest

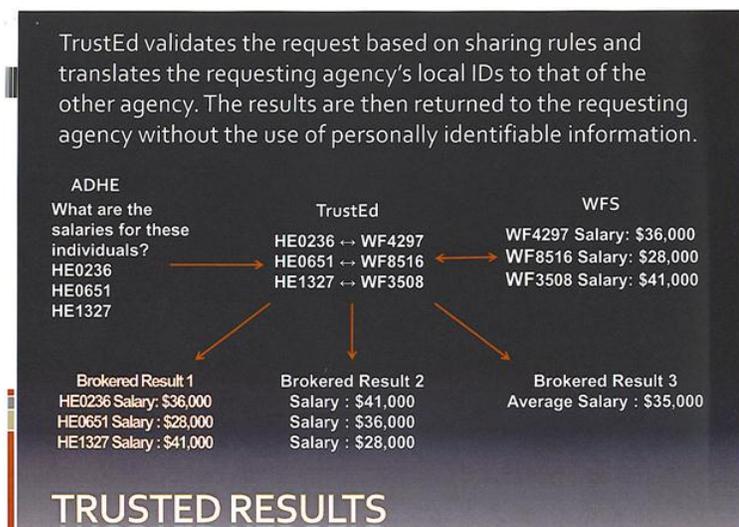


Figure 2: Example of Data Exchange

for each entity. State agencies maintain their databases through existing and future agreements. This de-identified architecture has been vetted by the U.S. Department of Education as FERPA compliant. Figure 2 illustrates an example of a data exchange between the Arkansas Department of Higher Education (ADHE) and the Arkansas Department of Workforce Services (ADWS).

ii. Data Quality Measures: The quality of the data input to a longitudinal data system is critical to the integrity of the system. As state earlier ARC maintains multi-agency data at TrustEd .which has three coupled modules—KIM, TIM, and agency databases. The matching of

individuals occurs in the KIM module, which is a knowledgebase approach to entity resolution. All known representations of an individual's first name, which includes middle name if present, last name, date of birth, and SSN are stored to facilitate matching. KIM uses a variety of methods for matching, including both deterministic and approximate matching algorithms. When a source file is submitted for inclusion at TrustEd, it is first loaded into TIM which splits the source data into PII data and research data and appends to both a source ID and a record ID. The PII data is first sent to KIM to determine if there is an exact match on all four elements. If there is not an exact match, KIM will assign an internal ID to the record and begin looking for possible matches among other representations it maintains, using both deterministic and probabilistic rules. If no matches are found KIM assigns a unique cluster ID to the record. The cluster ID links different representations on an individual together. If it does not find a match, say all other elements match but the last name is different, KIM will append a record to the cluster ID from the other representations and store this new representation for possible matching in the future. The cluster ID is then encrypted and sent to TIM as a KIM-ID, along with the source and record IDs. TIM can now take the KIM-ID and encrypt it using an agency-specific seed. Using the source and record ID, it can append to the research data the specific agency ID and this de-identified data can be loaded into the agency's database. It is important to note that because a different seed is used for encryption of IDs for each agency, there is no direct join between any agency databases. Joining between agency databases requires a specific research proposal which must be approved by the agencies that submitted the data. For example, if the Arkansas Department of Higher Education (ADHE) wants to have a report on wages of college graduates and the Arkansas Department of Workforce Services (ADWS) agrees that this is allowable, the first step is to generate a list of agency IDs which are then submitted to TIM to create a crosswalk between the

ADHE and ADWS IDs, creating a third encrypted ID to use for the research. The crosswalk is loaded as a temporary database and the join between ADHE and ADWS can be generated with the research ID. This approach may appear complex and burdensome but it provides some important capacities in terms of identity resolution and privacy protection. By using a knowledgebase approach we have a much higher match rate than just SSN alone. This is important since many sources of data we need to include in our P20W system, such as the Arkansas Department of Education (K-12) data, do not include a SSN.

The quality and breadth of the Arkansas SLDS has been recognized at the national level. The Data Quality Campaign recognized the state as being among the first to have all ten “Essential Elements” for an SLDA and currently Arkansas is the only state to have nine of the “State Actions” complete that the Data Quality Initiative Campaign states is necessary for a quality P20W System. Arkansas is also committed to the Common Education Data Standards (CEDS) and began mapping all of its data elements to CEDS in 2011. The workforce SLDS will benefit from this prior work that will support data quality and assurance measures.

The Arkansas Workforce Data Quality Initiative (AWDQI)-the proposed project- and the Arkansas Department of Education SLDS Improvement and Modernization Project are being linked under the Arkansas Employment Tracking and Trends Initiative (see **Tab 9: Partnership Data-Sharing Agreements, Exhibit A**) to create a statewide SLDS that will support disaggregated individual data reporting and tracking of participant outcomes. The AWDQI project will provide Arkansas, for the first time, the capacity to track individuals from education into employment, or advanced education.

iii. Scope of Longitudinal Data: The current Arkansas SLDS links existing State education agency data, and limited Human Services data-food stamp recipients. The AWDQI project,

through its strategic partnerships, will expand the current SLDS to improve linkages with WIA data, Wagner-Peyser data, UI data, TANF data, Trade Adjustment Assistance program data, and FEDES data. The AWDQI project will incorporate data on employment outcomes for those working outside Arkansas. The AWDQI project and the SLDS project will support the inclusion of postsecondary education data and career and technical education data, which will result in Arkansas having comprehensive matched longitudinal database systems which will for the first time provide the capacity to accurately measure education to employment outcomes. Arkansas currently participates in the Federal Employment Data Exchange System, or **FEDES**, initiative that provides information on federal employment to participating states to help them meet their reporting requirements. The AWDQI project will link appropriate portions of the project to the FEDES system. The AWDQI project will expand the current SLDS to include Unemployment Insurance's Classification of Instructional Programs codes by incorporating Standard Occupational Classification codes available from the Arkansas Department of Finance and Administration. While improving and expanding the current SLDS, a primary goal of the AWDQI project, the project also supports a pilot project to develop and deploy a user-friendly transactional system that will be the basis for future broad utilization by the public workforce system and education system.

iv. Security Measures: There are two primary statutory regulations, FERPA and HIPPA, which protect an individual's privacy that any longitudinal data system must be in compliance with. In the past these regulations have made it difficult to match education and workforce data systems. The following is a brief explanation of these regulations:

- FERPA prohibits agencies and institutions from disclosing personally identifiable education records without written parental (or eligible student) consent, unless such

disclosure meets certain specific criteria (research for or on behalf of organizations to improve instruction). However, it is clearly permissible to disclose de-identified data, not traceable to individual students, from state data systems.

- HIPPA (shown for completeness) requires that patients sign a supplemental authorization before their Protected Health Information (PHI) can be used for “extra” purposes such as research. However, under HIPPA’s “safe harbor” standard, information for research can be used without patient authorization if it is de-identified.

As stated earlier, compliance with FERPA privacy regulations is established with the TrustEd dual-database federated system that is housed at the Arkansas Research Center (ARC). The key strength of TrustEd is that data is maintained in a completely de-identified manner, and a breach of any one system would reveal very little. A breach of the Knowledgebase Identity Manager (KIM) which contains PII data, including SSN, but no research data such as student grades or wages for individuals, would be the most serious security issue. For this reason, access to KIM is limited to only local access with ARC and to only two individuals—Dr. Greg Holland who administers KIM, and Matt Jeffry who is TrustEd’s programmer and database manager. A breach of the TrustEd Identifier Manager (TIM) would result in limited security issues since it does not hold PII data or research data permanently. Data in TIM is only temporarily until KIM-IDs can be generated and encrypted to create agency IDs. The only data that TIM holds permanently are the source and record IDs it created when data is submitted along with KIM-IDs and the seeds needed for the encryption of agency IDs. Access to TIM is limited to the ARC local network and agency specific individuals that need to submit source data. While TrustEd has created a significant capacity to support participant tracking, expansion of this system to include a Web-based transactional system will require additional security components.

The Arkansas Cyber Security Office establishes security standards and policies for information technology in state government and serves as the focal point for cyber security issues. The State Cyber Security Office also coordinates resources to protect multiple governmental and educational organizations. Since state government and institutions of education house sensitive information about Arkansas's citizens and children, the State Cyber Security Office provides leadership across the state to coordinate resources to protect critical and sensitive state information about Arkansas's citizens.

State Cyber Security Office enabling legislation requires:

1. Implementing systems to ensure the security of state data and state data processing assets, to provide for disaster recovery and continuity of operations to the state agencies served, and to recover its costs from the customers benefited.
2. Providing a State Cyber Security Office to monitor information resource security issues, coordinating all security measures that could be use to protect resources by more than one governmental entity, and acting as an information technology resource to other state agencies.
3. Developing the information technology security policy for state agencies;
4. Participating in the development of information technology state contracts as requested by a state agency, including without limitation the identification of requirements, contract negotiation, and vendor evaluation;

The State Cyber Security Office is a DIS entity that provides protection to any information resources hosted there. The State Cyber Security Office has deployed essential security solutions which includes such items as: anti-virus solutions; backup and recovery; business continuity and response; employee training and awareness; help desk and IT support training; staff hiring and

termination controls; monitoring and logging; network auditing and logging; network security management; passwords and access control; physical security remote access security; sensitive data handling and protection; system level security; technical documentation; and testing and reviews. Additionally, ADIS hosts the Arkansas Continuity of Operations Program which provides training to state agencies on the operations and identification of critical services and data.

*v. **Planned Reports and Deliverables:*** This project will expand the capacity of the linked education SLDS and the proposed workforce SLDS to include WIA, Title; Wagner-Peysner; Trade Adjustment Assistance Program; and UI-Benefit data. Under the AWDQI project the State seeks to bring all data elements “under one roof” in a de-identified manner in order to support standard and specialized reports as follows:

Career Technical Education (CTE): 1) report on wage outcomes for K-12 students in career and technical education, including wage outcomes for participants in the Career Readiness Certificate (CRC) program 2) Wage outcomes differences between CTE and non-CTE students by career cluster; 3) employment rates between CTE and non-CTE students; 4) return on investment report on K-12 CTE costs and participant outcomes; and, 5) postsecondary outcomes by CIP code for CTE completers, CTE participants, and non-CTE participants, including time to credential, time to degree, and percentage of those continuing education after initial credential completion.

Adult Education (GED, WAGE, and Adult Basic Education): 1) impact of participation in ABE on TANF usage compared to those that did not participate in ABE; 2) wage outcomes report for participants in ABE comparison to those with an without a high school diploma; and, 3) wage outcomes report comparing GED with high school diploma only and high school dropouts.

Higher Education: 1) report on employment outcomes of Career Pathway Initiative which supports workforce training for TANF participants; 2) previously described Arkansas Education to Employment Report; and, 3) report for legislature that details completion rates for community colleges.

Workforce Services: 1) extend the existing Arkansas Education to Employment Report to include those employed outside the state by participating in WRIS2; 2) report by training provider on employment and wage outcomes of those participating in federally funded programs; 3) return on investment report on federally funded training program costs and participant outcomes; 4) interactive Web reporting on aggregate data for training providers on employment and wage outcomes of program participants, including those that found employment outside the state; and, 5) report on time unemployed based on credential or degree held.

Governor's Workforce Cabinet: creation of a geographical information system that will support a report on the number of workers within a geographical area that are qualified in a particular skill needed by current and new businesses and industries that will support real-time analysis of training needs in a geographical region.

This project will significantly increase the breath and quality of workforce data for the above reports. Additionally, the pilot transactional system will include development of a transactional system that includes customized reports in support of the Arkansas TAACCCTG grant reporting requirements.

5. Staffing Capacity

This Arkansas Workforce Data Quality Initiative (AWDQI) project will support development of a workforce SLDS that will link with the existing education SLDS to create a robust, sustainable system that will support tracking of workforce and education participants from

education/training into employment, and provide the capacity to generate data driven reports to support program and policy data-driven decisions. The staffing structure will include staff funded by both the AWDQI grant and the education SLDS grant. All grant staff will be Arkansas employees and are subject to *State and institutional laws, regulations, or procedures governing confidential data-sharing and/or transfer.*

i. Database and Co-Project Managers: Mr. Earnest L. Sweat III is the Information Systems Manager for the Arkansas Department of Workforce Services. In this capacity Sweat is responsible for the overall management of the Office of Automated Solutions, which includes the design, development, modification, and implementation of all of the agency's automated systems. Sweat has a vast knowledge of computer systems, which includes but not limited to, mainframe systems, client server systems and Database Administration. Sweat has more than 29 years experience in information technology and state government (see **Tab 10; Biographic Sketches** for additional information). As the Project Co-Manager, Sweat will be responsible for facilitating communication, meetings, timeline adherence, grant compliance, and coordination of the different entities that will implement the Arkansas Workforce Data Quality Initiative. Sweat will regularly inform the Chair of the Workforce Cabinet and appropriate Arkansas Department of Workforce Services (ADWS) staff on the progress of the project. Sweat will be responsible for creating performance and fiscal reports under the auspices of ADWS. Sweat in partnership with the other Project Co-Manager will coordinate the activities of the staff to ensure that strategies are implemented and outcomes completed in a timely manner.

Sweat is employed by ADWS and will be partially funded by the AWDQI grant.

Dr. Neal Gibson will function as a **Database and Project Co-Manager** for the AWDQI project. Dr. Gibson is currently the Director of the Arkansas Research Center (ARC) where he

oversees implementation of the Education SLDS and coordinates inter-agency data sharing between state agencies. Dr. Gibson is also the manager responsible for implementation of a data warehousing and data governance project for the state. Dr. Gibson was a member of the Council of Chief State School Officers State Education Data Center Technical Advisory Committee and currently serves on the CEDS Implementation Task Force and Early Learning Taskforce . Dr. Gibson holds a Ph.D. in Applied Science with Emphasis in Information Quality. His dissertation was titled “Improving Data Use of Longitudinal Data Systems”. Dr. Gibson will be the primary technical link between the Arkansas education SLDS and the AWDQI project (see **Tab 10 for Dr. Gibson’s Biographic Sketch**). Dr. Gibson is employed by University of Central Arkansas which is the fiduciary agent for the education SLDS grant.

ii. Duties and Responsibilities of Data Analyst(s): Mr. Val Pushkarev will provide data analyst support for this project. Pushkarev is currently a project manager at the Arkansas Research Center (ARC) where he is responsible for integrating data from multiple sources and platforms to support an information exchange network among disparate agencies with a focus on a MDM/entity resolution system, data protection, and data quality standards. Pushkarev will support the AWDQI project by: 1) working with designated agency/process owners to aggregate, transform and distribute data in accordance with data privacy laws, reporting guidelines, and data quality standards; 2) manage and develop national and global data standards and delivery of multi-year data roadmaps across many functions; 3) communicate and support efforts and milestones of the AWDQI project; 4) provide skill training, mentoring, and expertise to project personnel; 5) maintain documentation for existing and developing jobs and processes; and, 6) lead data quality efforts (see **Tab 10: Biographic Sketches** for additional information).

Pushkarev is employed by ARC and will be funded by both the education SLDS and AWDWQI grants.

Additional staff who will support the AWDQI project include:

- Rick Jenkins will represent the Arkansas Department of Higher Education. Mr. Jenkins is the Associate Director for Planning and Accountability for the Arkansas Department of Higher Education. He and his staff prepare reports on institutions of higher education in Arkansas on various topics, including enrollment, remediation, graduation rates, credentials awarded, college-going rate, program productivity and many others. He supervises the collection and reporting of data from forty-six institutions in the Student Information System Database. Mr. Jenkins has over fifteen years experience in higher education having also served with Southeast Arkansas College and the University of Arkansas at Pine Bluff. He holds a Master of Public Administration degree and a bachelor degree in Political Science. Mr. Jenkins is employed by the Department of Higher Education and is funded by the education SLDS grant.
- Dr. Jacob Walker represents the Arkansas Department of Career Education (ADCE). Dr. Walker has a Ph.D. in Instructional Systems and Workforce Development. Dr. Walker is currently a project manager at ARC and has the responsibility to coordinate activities between the Arkansas p-20W data system and ADCE and ADWS. Dr. Walker supports research projects that involve the P-20W data system and provides reports to the Arkansas General Assembly that support policy decisions in higher education funding models and K-12 funding models. Dr. Walker is employed by ADCE and funded by the Education SLDS grant.

- Subject-Matter Experts: The budget includes funding for subject-matter experts from state agencies who will be utilized to support agency-specific activities of the AWDQI project.
- Programmer: The AWDQI grant will fund a full-time programmer who will be employed by ADWS and funded by the AWDQI grant. The programmer will support development and deployment of reports (see **Section v, Description of Database Design, Data Quality Assurance, and Proposed Uses**). The programmer will also develop and deploy the SLDS transactional system for the TAACCCTG pilot project. The programmer will be a full-time employee of ADWS and funded by the AWDQI project.

iii. Identification and Qualifications of Proposed Staff: Included in above descriptions.

iv. Contributions of proposed staff positions: Included in above descriptions.

v. Employer of each Staff Member: Included in above descriptions.

6. Other Data Linkages

In addition to the complexity of funding sources for each of the three workforce development systems, education systems and federal agencies utilize different classification codes. In the case of the former, Classification of Instructional Programs (CIP) codes are used by higher education institutions to track graduates of certificate and degree programs. In the case of the latter, Standard Occupational Classification (SOC) codes are used by federal agencies. The 2010 Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of 840 detailed occupations according to their occupational definition. To facilitate classification, detailed occupations are combined to form 461 broad occupations, 97 minor groups, and 23 major groups. Detailed occupations in the

SOC with similar job duties, and in some cases skills, education, and/or training, are grouped together. Fortunately, there are “crosswalk” tables between CIP and SOC classification codes which support the matching of data. One of the shortfalls in current workforce and education data tracking systems is that they do not have the capacity to determine if an individual who has received training is actually employed in their occupational field. This project will support inclusion of input data fields for project-specific grants and initiatives so that participants can be tracked into specific jobs.

TANF data, which is maintained by the Arkansas Department of Human Services, is required for a number of ongoing projects which are managed by ADWS, ADHE, or ADCTE, or partnerships of same, depending on the project. Of special interest is the Career Pathway Initiative (CPI) where community colleges in Arkansas are provided grants with TANF funds to provide workforce training for this population. Tracking of these individuals requires linkage of workforce and education data. The AWDQI project will incorporate TANF data into its longitudinal data system, thus ensuring that this data is available to the education and workforce longitudinal data systems.

The Arkansas Department of Career and Technical Education is responsible for the Adult Education program in the state. As these participants gain skills and education credentials (GED, remediation, postsecondary, etc.) linkage between the workforce system and education system is essential in order to track these individuals into employment. This department also manages the Arkansas Works Project which funds Career Coaches to mentor and recruit high school students into occupational careers. Tracking outcomes of this investment requires linkage between the workforce system and education systems (K-12 and postsecondary). The AWDQI project will provide the capacity to track these employments from education/training into employment.

Arkansas has a Wage Record Interchange System (WRIS) data-sharing agreement that is basis for sharing data from other WRIS states with education entities and WIA One-Stop Centers. However, our WRIS agreement requires the removal of SSN, name of individual, and name of company leaving the wage amount and North American Industry Classification System (NAICS) code which can support aggregated tracking of education outcomes into employment in WRIS states. This capacity, as well as integration of WRIS2 that Arkansas will join, will be included in the workforce SLDS that links with the education SLDS.