



SOCIAL POLICY RESEARCH
ASSOCIATES

Workforce Data Quality Initiative

Round One Final Report

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INTRODUCTION

The U.S. Department of Labor (DOL) launched the Workforce Data Quality Initiative (WDQI) in 2010 to support states in developing and improving longitudinal workforce databases. By promoting improvements in data quality and accessibility, the WDQI aims to assist states in developing data systems that provide full portraits of individuals' educational and workforce pathways. These combined data systems provide policymakers and practitioners with useful information about the workforce system, program operations, and the performance of specific education and training programs. The data and analyses generated by these systems also help states make programmatic adjustments to improve workforce services and provide consumers with information that allows them to select the education and training programs that best suit their needs.

In July 2011, DOL awarded a thirty-six-month contract to Social Policy Research Associates (SPR) to provide technical assistance to the thirteen Round 1 WDQI grantees.¹ SPR's technical assistance focused on helping grantees achieve the goals of their grants by providing process facilitation, action planning, access to subject matter expertise, and connection to other members of the grantee community. In this Round 1 Final Report we provide an overview of the project, an account of the technical assistance that we provided to the Round 1 grantees, and recommendations for future technical assistance.

PROJECT OVERVIEW

While sharing a focus on creating, maintaining, and using longitudinal data systems, each WDQI grantee had different grant goals. The case studies of each grantee, included in the appendices of this report, detail the goals of each grantee. In the task-by-task description of our technical assistance (TA) activities below, we give examples demonstrating how our TA supported grantees in achieving their goals.

In its TA support of WDQI, SPR was informed by prior federal data systems initiatives. Prior to the creation of the WDQI, DOL invested in a pilot project to explore the value of longitudinal data systems for managing and improving workforce programs. The Administrative Data Research and Evaluation (ADARE) was created in 1998, first in partnership with five states and ultimately with nine, each of which developed the capacity to respond to welfare-to-work policy questions posed by the Office of Policy Development, Evaluation, and Research in the Employment and Training Administration (ETA) at DOL. Each state partner negotiated data-

¹ The technical assistance contract, also for a three-year period, is thus offset from the grantee awards by seven months. Round 1 grants ended November 30, 2013. The technical assistance contract ends June 30, 2014.

sharing agreements with state agency owners of pertinent administrative data. Alliance partners and their state agency colleagues comprised a reliable and rapid response network, able to conduct research of immediate policy relevance.² In demonstrating the value of longitudinal data to answer policy questions, ADARE states laid the foundation for WDQI.

Another effort with direct and current relevance for WDQI is the State Longitudinal Data System (SLDS) grants funded by the U.S. Department of Education (DOE). DOE began awarding SLDS grants in 2005, authorized by Title II of the Educational Technical Assistance Act of 2002. These grants of up to twenty million dollars per grantee extend for three to five years. In November of 2005, the first year of the grant program, the Institute of Education Sciences—the creation of which had also been authorized by the legislation—awarded SLDS grants to fourteen states. Over the next seven years (the most recent grants were awarded in May 2012), DOE awarded almost one hundred grants to states, territories, and the District of Columbia; numerous awardees received more than one grant. The main goal of the SLDS grants, similar to the WDQI grants, has been to support the design, development, implementation, and expansion of K12 and P-20W (early learning through the workforce) longitudinal data systems.

In July 2011, DOL awarded SPR the first TA contract to support the thirteen Round 1 WDQI grantees for a period of three years, July 2011 through June 2014. In the subsequent two years, we began providing TA to Round 2 and Round 3 grantees; we now provide TA to twenty-nine state grantees.³ Thus, the TA activities described in this report are integrated with activities for the broader community.

For the remainder of the report we review our activities for each task in the Statement of Work. For each task we describe accomplishments and recommendations for the future. In closing, we provide more global recommendations.

PROJECT STATUS BY TASK

SPR's approach to providing TA to grantees included both individualized and cross-grantee support. Individualized support refers to one-on-one assistance that each grantee received from an assigned TA coach. Using this coaching model, each grantee worked with an SPR staff member who supported it throughout the course of the grant to:

- Facilitate planning
- Share tools and other resources
- Broker assistance from subject matter experts or other grantees
- Provide accountability to grantees for achieving their goals

² <http://www.ubalt.edu/jfi/adare/index.cfm>

³ Appendix 1 is a map showing the three rounds of grantees.

- Collect information about challenges and help grantees navigate solutions
- Serve as a liaison with other members of the grantee community and with the TA team

Cross-grantee support refers to activities and resources that were made available to the whole grantee community. A major element of our cross-grantee support involved creating and facilitating opportunities for grantees to share expertise and resources among themselves. In addition, we brought in subject-matter experts from a variety of organizations, including SPR, DOL projects, the TA team supporting DOE SLDS grantees, and others.

SPR facilitated peer-to-peer and subject-matter expert support for both cross-grantee and individualized TA on the following topics, among others:

- Developing research agendas and enumerating research questions
- Facilitating partnership development and coordination
- Engaging policymakers and practitioners
- Developing data-sharing agreements and linkages with partner systems, especially SLDS
- Establishing data governance structures
- Addressing concerns about data privacy and confidentiality
- Implementing database design, programming, hosting, updating, maintenance, and security measures
- Developing and disseminating the products of research (including reports, online tools, scorecards, etc.) to a variety of audiences
- Planning for sustainability in longitudinal data systems maintenance and enhancement

In addition to these two primary categories of assistance, we also supported DOL by responding to a number of ad hoc requests. For example, to support the White House Data Access Working Group, we compiled and provided to our FPO a matrix of grantee data system characteristics and participation in data sharing partnerships; we supported a Government Accountability Office (GAO) study by collecting information from grantees to share with GAO staff; and, for the annual SLDS Best Practices conference, we helped the conference planners incorporate the interests and concerns of the workforce community into the conference agenda, as well as helped to facilitate the conference sessions, to the benefit of the WDQI grantees.

The Statement of Work contained eight discreet tasks. The following section describes these tasks and the activities SPR conducted with Round 1 grantees in order to accomplish each.

TASK 1: ANNUAL MEETINGS AND CONFERENCE CALLS AND/OR WEBINARS

Bringing the grantee community together is a foundational aspect of TA support to the individual WDQI grantees, and is at the core of our assistance to the grantees as a community.

ANNUAL MEETINGS

The meeting associated with this task has been the annual grantee convening, held in conjunction with the DOE's annual SLDS Best Practices conference. Since the funding of the first round of WDQI grantees, the WDQI grantee community has been invited every year to participate in these conferences, in recognition of the need for collaboration between education and workforce longitudinal data systems, both within and across states.

In addition, the SPR TA team has hosted day-long meetings for all WDQI grantees on a day adjacent to the general conference. The goal of these meetings has been to provide grantees with in-person contact with representatives from DOL's Employment and Training Administration (ETA) National Office, to feature speakers with relevant information or perspectives, and, most important, to build relationships between grantees and the TA team as well as peer-to-peer relationships between the existing cohorts of grantees and each new round of grantees. We have found this time critical to troubleshooting issues and facilitating the exchange of best practices. SPR has been responsible for developing an agenda for the WDQI grantee portion of the conference with guidance from ETA Federal Project Officers (FPOs), and for developing training content and activities.⁴

During the Round 1 TA period of performance, we attended three of the SLDS annual Best Practices conferences.

- November 14-16, 2011, Arlington, Virginia
- October 29-31, 2012, Washington D.C.
- March 18-21, 2014⁵, Crystal City, Virginia

The DOE did not hold a 2013 Best Practices conference.

⁴ In addition to our participation in the conference, we have made remarkable strides in gaining WDQI grantees access to the SLDS community, negotiating memberships to the SLDS program's online Community of Practice, GRADS360, which contains a wealth of tools and resources created by the education community, which has been doing longitudinal data systems longer than many state workforce systems.

⁵ Round 1 grants were scheduled to end on November 30, 2013. However, many of the Round 1 grantees received no-cost extensions through June 30, 2014, and most of the Round 1 grantees attended the 2014 conference.

We organized the agendas for the WDQI-specific day-long meetings adjacent to the larger conference. Examples of sessions have included:

- Remarks from WDQI FPOs providing details about the grant and grant management
- Presentations by subject-matter experts from DOL on topics such as WRIS and WRIS 2
- Presentations by subject-matter experts from relevant organizations and academic institutions, such as the Workforce Data Quality Campaign
- Presentations by grantees themselves on topics such as web portals, identity matching strategies, cultivating legislature and gubernatorial support, and research based on longitudinal data analysis
- Paired, small-group, and large group activities such as meet-and-greets, world café style rotating discussions, and consultation clinics

The DOE has noted the increasing value of the participation of the WDQI grantee community and the SPR TA team in these conferences. This became especially clear during the second year of our community's attendance. The conference was officially cancelled due to Superstorm Sandy; yet so many conference participants had already departed from their home states before the cancellation was announced that approximately half of the participants arrived at the hotel. To help grantees make the most of the situation, the SPR team worked with DOE organizers to prepare for and facilitate impromptu sessions for the full two days that had been allotted for the original conference. We received numerous comments, from attendees and SLDS staff alike, that attendees benefited from networking, trouble-shooting with, and learning from other grantees in the spontaneous environment of what came to be known as the "Un-Conference."

For the third conference to which the WDQI community was invited, the SPR TA team became even more involved in the planning of the conference, participating in planning-team calls; shaping the structure of the conference, in which cohorts of state teams (education and workforce representatives both) travelled together from session to session, building relationships for continued collaboration at home; and sharing responsibility for conference sessions with SLDS team members. Such involvement helped build a collaborative environment among key stakeholders of the two initiatives, enhanced peer-to-peer learning across workforce and education agencies, and ensured that WDQI grantee interests were represented at the conference.

WEBINARS AND CONFERENCE CALLS

SPR conducted bimonthly webinars during the Round 1 performance period. The goals of the webinars were to identify and troubleshoot common issues, engage grantees and subject-matter experts in presenting on topics of interest, highlight innovations, and provide a forum

for WDQI grantees to share concerns and best practices with one another. The webinars were a popular cross-grantee activity. We were never at a loss for volunteer presenters—the most important kind, given the community’s consistent expression of interest in hearing from its peers.

During the Round 1 period of performance, we hosted and archived the following webinars:

- Grantee Welcome and Introduction to the TA Team
- Data Sharing and FERPA. Guest presenter: DOE’s Privacy and Technical Assistance Center staff
- Sustainability (series). Peer presenters: Florida, Washington, Virginia, and Maine
- Messaging What Matters. Guest presenter: Holly Minch, Lightbox Consultants
- Un-Webinar: Post-Conference Peer-to-Peer Roundtable
- P-20W Data Governance. Guest presenter: DOE’s SLDS State Support Team
- Managing Identifiers and Groups. Peer presenter: Washington State
- Research Agendas. Peer presenters: Pennsylvania and Ohio
- Products Showcases (series). Peer presenters: Virginia, Texas, New Jersey, Washington, and Missouri
- The Art of Collaboration. Peer presenters: Arkansas and Virginia
- Data Stories. Peer presenter: Rhode Island
- Round 1 Grantee Exit Interview

For every webinar, our team identified topics; reached out to experts, federal staff, or individual grantees to identify presenters; and prepared an invitation. Our support staff worked with a registration system to generate the email invitation and track attendees, and to send out reminders during the countdown to the webinar. Our support staff also worked with each presenter prior to the webinar, sharing a PowerPoint slide template and instructions on organizing and preparing for their talk. On the morning of each webinar, support staff set up an early test of the sound and the slide deck to ensure a smooth live session. SPR team members facilitated the webinars by introducing each presenter or activity, and as appropriate, presenting framing content, transitioning from one speaker or activity to another, and facilitating a question-and-answer period or discussion at the end. In addition, during the webinar, multiple members of the SPR team were acting in support roles, communicating via “presenter only” chat windows with the presenters, monitoring questions that arrived through the public chat window and generating new questions if questions from attendees were slow to arrive, organizing questions for the question-and-answer session, managing phone lines for best sound quality, and pushing downloadable material, including the slides, to the desktop for attendees to download. Finally, after each webinar, the SPR team sent out a recording of the webinar to any member of the community who had been unable to attend.

In addition to our regular webinars, our team also created a number of ad hoc working groups composed of WDQI grantees and specially matched SPR TA team members. We established a working group when we saw the need for a more specialized conversation than the webinars could provide but more participant diversity than one-on-one conversations between coaches and individual grantee teams would likely offer. Our approach to the working groups has been to provide logistical support for setting them up, including providing invitations, conference lines, webinar room, facilitation, and note-taking. Such logistical support was especially important where we saw that the working group should include team members other than the project manager and other regular webinar attendees. For example, our Technical Working Group is designed for IT staff, programmers, system developers, and quantitative analysts who may not be regular webinar or even coaching call attendees. Other ad hoc working groups initiated during the Round 1 period of performance have focused on legislation and on sustainability.

Finally, in addition to webinars and technical working groups, as part of our individualized assistance, our coaches conducted at least bimonthly (every other month) calls with grantees. Sometimes these calls were designed with a specific protocol or activity in mind. For example, early on in the relationship, all coaches conducted an exercise with their grantees called Context Mapping. Using a graphic template displayed virtually, the coach led the grantee through a series of questions designed to help the grantee understand the political and economic context in which the WDQI grant is operating and to identify opportunities for engaging its SLDS counterparts. Coaches adapted their approach to the relevant contextual issues in the state. For example, in Massachusetts, the coach used the content mapping exercise as an opportunity to discuss with the grantee ways that they could bring partners, especially education K-12, community college and higher education, into their workforce LDS discussion. Several grantees reported back to their coaches that they were using the context map as a planning tool or in their team meetings.

At other times, coach-grantee conference calls were more free-form, with the coach asking the grantee how things were going and the conversation unfolding from there. For example, the North Dakota WDQI project manager noted that his calls with his coach were a “safe space” for him to think through issues that were too sensitive to process with a team that included partner agencies. Even in teams with relationships that allowed for open processing of issues, the value of the coaching calls was apparent. For example, the Ohio WDQI project manager noted that the coaching calls brought him and the academic researcher partner at Ohio State University—with whom he has a strong and open relationship—together when they had not been in touch recently.

WHAT WORKED WELL

- Using the SLDS Best Practices annual conference to provide grantees with on-site time with each other
- Demonstrating, via the conference, the need for and impact of bringing together the education and workforce entities that are working to build and use longitudinal data systems
- The webinars have consistently high attendance and volunteer presenters. They are an efficient and effective way to support peer-to-peer sharing.
- One-on-one coaching calls allow for the development of a more intimate relationship between the grantee and the TA provider. Especially in the matter of dealing with challenges, these calls (and ad hoc emails that precede or follow them) are a critical TA tool.

RECOMMENDATIONS FOR THE FUTURE

- Support increased collaboration between the WDQI TA team and the SLDS TA team in planning and facilitating the conference. For the 2014 conference, the WDQI TA team was invited by the SLDS TA team to participate in planning and facilitation to an unprecedented degree. The results were powerfully positive; building on that success we recommend in future rounds to dedicate TA resources to allow for an involvement at the level established by the 2014 conference.
- At the beginning of the project year, the TA contractor should consider laying out a plan for the bimonthly webinars, including identifying potential subject matter experts, peer presenters, and topics for stand-alone webinars as well as series.

TASK 2: REMOTE MONITORING

At the heart of individualized TA to grantees has been the use of a coaching model. To provide the best possible assistance to grantees, it has been critical for coaches to establish a protocol of regular contact (including the conference calls described above), both to build rapport and to provide grantees with resources that will help in building and sustaining the longitudinal data systems underway.

As noted, under Round 1, each grantee was assigned a TA coach. SPR coaches communicated with grantees by conducting bimonthly conference calls, responding to ad hoc TA requests, and conducting on-site visits as needed within the TA budget for travel. Participants in conference calls and email communication included state WDQI project managers and other members of state teams as needed. Throughout the project, coaches tailored communication as much as possible in response to the individual needs of grantees. In addition, we have connected

grantees with their regional (and occasionally national) FPOs. For example, Massachusetts asked its coach about applying for a no-cost extension. Since the grantee was experiencing delays in the implementation of the UI Online system, the coach discussed with the state the need to request a no-cost extension. The coach worked with the state to outline its rationale for the extension and briefed the ETA FPO that the state was considering applying for one. In another instance, a coach discussed with her grantee the importance of being able to share aggregate wage record information with other partners as part of the SLDS and highlighted the states that have already signed agreements to become WRIS 2 states. The coach highly encouraged that the state team work through its FPO and the National Office WRIS contact to address any data sharing concerns.

In addition to coaches meeting with grantees to conduct “remote monitoring”, SPR WDQI project managers and coaches met monthly and communicated via ad hoc email to share information across sites and explore needs and opportunities for cross-site TA communication, support, and assistance.

WHAT WORKED WELL

- The individual coach-grantee model of providing TA (in combination with the cross-community TA described elsewhere in this report) is an effective way to ensure that grantees receive targeted assistance specific to their needs throughout the course of the grant.
- Our FPO hosted a conference call with the SPR team and all WDQI FPOs to help clearly delineate the distinct roles for contracted TA providers and regional FPOs. The call helped clarify roles and paved the way for good practices. In addition, SPR coaches always refer items that may require a grant modification to the respective FPO.

RECOMMENDATIONS FOR THE FUTURE

- Host an introductory meeting with the National Office WDQI technical assistance FPO, the Regional Office FPOs, and the TA contractor team at the beginning of each new round of funding. The meeting should review support roles, and allow regional FPOs and the SPR team to discuss their preferred methods of communication, thus tailoring the communication loop between coaches and FPOs.
- Increase communication between coaches and FPOs. Possible options include setting up quarterly calls between all grantees in a particular region and that region’s FPOs and coaches, or to hold occasional calls joining individual FPOs, grantees, and TA coaches. Another option is for FPOs and TA coaches to share their respective site-visit memos when either goes on site.

TASK 3: ON-SITE VISITS

SPR planned for site visits to three Round 1 grantees. These visits were designed to provide targeted TA in areas that grantees were finding particularly challenging. In practice, we only conducted one site visit, to Louisiana. The visit was framed as a promising practice visit because the site was doing well and engaging in practices that, with guidance from our project officer, we deemed worthy of further investigation. The two sites that were selected to receive targeted on-site assistance because they were struggling to accomplish the goals of their grant plans were Massachusetts and Iowa. In both cases, the sites cancelled the visits at the last minute and were very reluctant to reschedule.

WHAT WORKED WELL

- Conducting a visit to a grantee desiring to host its coach and share information about its good practices
- Working with the grantee ahead of time to plan the agenda, including to set up meetings with appropriate parties
- Providing the grantee with a site-visit follow-up memo reviewing insights and action steps agreed upon during the visit

RECOMMENDATIONS FOR THE FUTURE

- In the case of grantees that could benefit from a TA site visit but are reluctant to receive one, have coaches involve Regional and National Office FPOs early, to negotiate a solution with the grantee
- Site visits are an excellent way to build the relationship between the TA provider and the grantee. Site visits provide coaches with access to a much finer-grain level of detail and a view of departmental functioning or partner relationships in practice that can never be captured via a conference call. Although we only conducted one official site visit to a Round 1 grantee (the South Carolina coach also visited that grantee, but the visit was informal because the coach was at the State Workforce Agency under the auspices of another project), we draw on our experience of Round 2 site visits to recommend that DOL dedicate TA resources for site visits to as many of the grantees as possible.

TASK 4: TRAINING SEMINARS

As described above in Task 1, we conducted bimonthly webinars with Round 1 grantees. In response to requirements that this task include at least two training seminars, ideally with the second building on the first, we also developed a sustainability series of seminars. These

seminars were offered virtually, using the same technology used for our bimonthly webinars. However, these virtual offerings were unique in three ways: (1) they were created as a series, the content of the second building on the first, and the content of the third building on the first two (whereas the majority of our webinars, even those that fall under a common theme over time, such as our “Building Blocks” webinars, are stand-alone offerings); (2) they involved bringing in an outside consultant to provide some of the content; and (3) they required grantees to prepare work ahead of sessions. In the interim between trainings, we offered feedback on the “homework” to grantees that requested it.

WHAT WORKED WELL

- The linked series of trainings allowed the TA team and grantees to delve more deeply into topics of special importance.
- Sustainability was an excellent topic for the training seminar series, as a fundamental tenet of the WDQI TA is that attention to sustainability must begin early and continue throughout the life of the grant.

RECOMMENDATIONS FOR THE FUTURE

- Other topics could benefit from linked trainings conducted using a webinar platform. Themes to consider include a series on linking, matching, and analysis; a series on establishing and launching a data governance body and subcommittees; and a series exploring how to support state-level leadership goals with data products.

TASK 5: REVIEW AND ASSESSMENT OF GRANT PLANS AND ORGANIZATIONAL MATERIALS

Each grantee has a different set of circumstances, both contextual ones such as the political landscape, and technical ones such as how much progress the grantee has already made toward establishing a workforce longitudinal data system or connecting to an existing P-20 system.

Thus, our coaches’ first step in providing focused and tailored TA to each site was to review closely the grant plans of their assigned grantee. In addition, coaches familiarized themselves with the website of their grantee's state department (typically the state workforce agency), and any documentation there or elsewhere on the web about the state’s P-20 or P-20W system, research, and partnerships, especially those with third-party entities such as universities or independent research centers.

Initial calls were also a time for coaches to request copies of supplemental materials associated with the WDQI or associated longitudinal data collection plans or systems. Coaches reviewed all materials and subsequently held follow-up calls to further clarify areas for TA, as well as promising practices. For example, the Missouri grantee expressed an interest in finding out examples of successful collaboration in data governance in other states. In response, the coach put out a request for information to the other coaches. From the Maryland coach's familiarity with Maryland's grant plan and supporting documents, she suggested to the Missouri coach that Maryland's experience may be useful. The coach then sent Missouri an extract from Maryland's WDQI proposal that described use-restricted data access agreements with three school districts, all community colleges, and the state university system. In addition, the coach sent the grantee an extract of a 2006 report authored by SPR titled "Strategies for Integrating the Workforce System: Best Practices in Six States" that described an array of strategies including consolidation, creation of common data systems, and coordination.

WHAT WORKED WELL

- The introductory conference call between coach and grantee team during which the goals of the grant and other relevant information are reviewed is an excellent way to launch the coaching relationship.
- Coach familiarity with the grant plan allows the coach to quickly identify resources of use to her or his grantee that the coach encounters when interacting with other coaches during team meetings, with other grantees during webinars or at conferences, and even in other projects the coach is involved with.

RECOMMENDATIONS FOR THE FUTURE

- Develop a protocol for an initial grant plan review and assessment that all coaches fill out during their review and use during a follow-up phone call. Because the language of grant goals often can be broad and general, this protocol should include questions designed to elicit more specific articulations of grantee goals.
- Create opportunities for grantees to share their grant goals with their peers in other states – such as via webinar, conference, or on the Community of Practice.

TASK 6: ASSISTANCE WITH RESEARCH AND ANALYSIS DESIGN

One of the most important aspects of the TA work thus far has been in helping grantees focus on three project aspects crucial to the WDQI: a big-picture focus on the purpose of the project, in order to inform decision-making; a project management focus on getting objectives accomplished; and a research focus on what to do with the data being collected and linked. This

third objective, the research and analysis that workforce- and education-linked longitudinal data systems will enable, is a critical aspect of all of the grantees' grant plans. SPR coaches helped grantees in this area in a number of ways. In addition to being TA providers, all of the coaches come from research backgrounds. It has been helpful that coaches understand how to formulate research questions and use data to advance public policy because that is often what their grantees are focused on achieving. In addition, over the course of Round 1 TA, we served progressively more grantees; as a result, at present, we have three years' worth of sample documents from the twenty-nine grantees we have served thus far. These include numerous research agendas and lists of key policy questions, from such grantees as Maryland, Virginia, Ohio, Oklahoma, Pennsylvania, and Texas. In fact, nearly every grantee has shared something of interest to someone else in the grantee community. Access to such a broad array of information about "what other states are doing"—the most common request from grantees—provides our project team with both a store of knowledge to bring to conversations with grantees as well as a reference library to turn to when grantees ask questions.

The Round 1 grantees were all at different stages of implementation when their grants began. For example, grantees participating in ADARE—Florida, Maryland, Missouri, Ohio, and Texas—were typically farther along than the other states. Thus, our TA to the grantees in the area of research design and analysis differed. For example, Maryland already had a fully functional workforce longitudinal data system; its grant was focused largely on research, along with connecting to the nascent P-20 system. The highly experienced researchers at the Jacob France Institute (JFI), research partner of Maryland's Department of Labor, Licensing and Regulation, did not need assistance with research design. However, we served the grantee community at large by sharing research products that JFI produced over the course of its grant.

In another example, the Maine coach helped the grantee re-focus on research and analysis after a period of intense focus on the technical aspects of the grant. At one point, the Missouri grantee expressed a need to identify and review examples web-based data visualization tools for presenting its research and analysis. After asking the other coaches, Missouri's coach sent them a list of links to a wide array of online tools. The grantee used these tools to develop its own online reporting tool, which was finalized by the end of the grant. The Florida grantee made a request for assistance regarding the issue of converting a crosswalk between Classification of Instructional Programs (CIP) codes to Standard Occupational Classification (SOC) codes, commonly referred to as CIP/SOC crosswalks. The grantee was struggling with the fact that a single CIP code may map to several SOC codes. The coach researched this issue and sent the grantee links to several such crosswalks. However, in looking at the examples, the coach and grantee realized that the issue was not the particular crosswalk being used, but rather intrinsic to the nature of the relationship between the two sets of codes. Armed with information and assistance from its coach in interpreting it, the Florida team was able to

provide clearer instructions to users of its Occupational Supply and Demand Model, rendering the model's outputs more useful to the community.

WHAT WORKED WELL

- Coaches have been able to act as conduits of information about research, analysis, and tools that has led to a solid learning community.
- Sharing grantee research, analysis, and tools with the community via the Community of Practice was another way to make items available to interested grantees.
- Hosting webinars focused on creating research agendas, using data analysis to create data stories, and managing identifiers across multiple sources of data helped many grantees think through their own issues around research and analysis.

RECOMMENDATIONS FOR THE FUTURE

- Provide targeted TA on other aspects along the spectrum of data collection, analysis, and use, such as assistance with scorecards and dashboards. These products are of great interest at DOL currently, and those that have been produced by members of the grantee community have been very well received by the constituencies they were designed for: administrators, policymakers, workforce program staff, and the general public.
- Initiate a Research Working Group that would provide a forum for data analysts, statisticians, and other grantee team members focused explicitly on conducting research and analysis.

TASK 7: REFERENCE MATERIALS

Fostering peer-to-peer learning and sharing of best practices was a key aspect of our TA to Round 1 grantees. The outcome of Task 7 was originally envisioned as three separate reference materials; however, at the request of our FPO, we consolidated those separate items into a single, more comprehensive “how-to” manual. The manual is designed to serve as a guide for current and future WDQI grantees (typically, state workforce agencies) aiming to design and build longitudinal data systems.

Topics covered in the guide include:

- Strategies for developing data-sharing partnerships and data governance structures
- Steps for acquiring or building systems for secure data storage
- Issues surrounding linking data from various systems including the challenges of using social security numbers (SSNs) to connect workforce and education data

- Ways to ensure data security and privacy
- Best practices in using longitudinal data effectively for a variety of audiences, including conducting analysis, creating tools and reports, and disseminating and marketing data products
- Strategies for sustaining the longitudinal data system after the grant ends

WHAT WORKED WELL

- Consolidating the several reference materials into a comprehensive guide gave us more time to gather the experiences of current rounds of grantees, including Round 1 grantees.

RECOMMENDATIONS

- In order to ensure full reception of the manual by former, current, and potential future WDQI grantees, we suggest conducting one or more webinars focusing on specific chapters or subsections of the guide.

TASK 8: DEVELOPMENT OF TECHNICAL ASSISTANCE WEB SITE

One of the first things we created under the Round 1 contract was a Community of Practice (CoP) website. It includes discussion threads about WDQI-relevant issues; blog posts; and a document repository including sample reports, data-sharing agreements and other resources from grantees, links to the archived webinars, and other TA products, such as notes from the conferences. SPR hosts the CoP website and manages all content and membership.

During our kick-off webinar with the Round 1 grantees, we introduced the site and allowed grantees to ask questions about its functionality. We also created accounts for the designated contact from each grantee, and sent grantees invitations as well as some basic instruction about how to access the site. We also assisted grantees with posting questions to the community at large using the discussion feature.

WHAT WORKED WELL

- The CoP on Central Desktop has been an effective repository for documents that can be useful for the community.

RECOMMENDATIONS

- As the Round 1 TA contract nears completion, we have reviewed a wireframe version of the new CoP website, which is slated to go live by June 30. After collecting input from

grantees and our FPO—which included a request for more intuitive and customizable ways for grantees, FPOs, and coaches to interact with each other—we subcontracted with a web developer to design a customized website for the WDQI grantee community. We recommend continuing to gather feedback from current and former rounds of grantees about the usefulness of the new CoP.

FINAL RECOMMENDATIONS

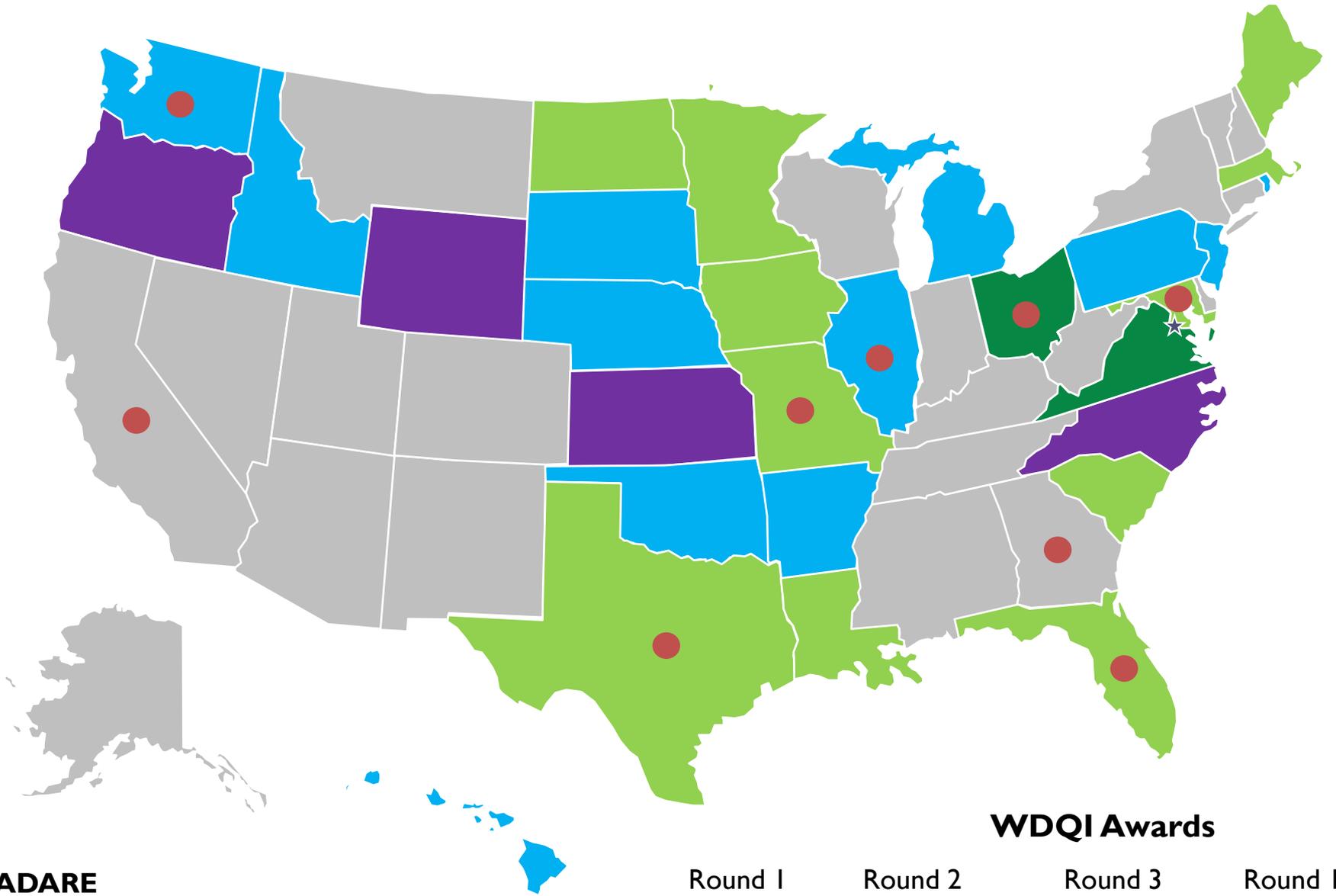
In closing, we offer the following project-wide recommendations.

OVERARCHING RECOMMENDATIONS FOR THE FUTURE

- **Increase coordination on WDQI across DOL departments.** WDQI is meant to improve the collection and analysis of education and workforce-related data in states. In order to help states improve their coordination on their projects, it may be helpful to have various departments or units within DOL meet to discuss overarching data collection efforts and how they can be used towards state LDS efforts. For example, we recommend that DOL's labor market information (LMI), unemployment compensation (UC), WRIS and performance accountability units meet to discuss WDQI and how their units can support state-level efforts to collect longitudinal data. In addition, it would be helpful for UC to identify which states have compensation plans for reporting aggregate wage record data. We recommend that LMI share ongoing efforts in states to make their data collection efforts more user-friendly and accessible.
- **Increase coordination with national organizations.** We recommend that the National Office and/or the TA provider work with national organizations such as the Workforce Data Quality Campaign and the Data Quality Campaign to elicit responses to policy-level issues that need to be addressed on a national scale for LDS project success across the nation. In addition we recommend that DOL and/or the TA provider work with these organizations to develop survey tools, coordinate responses to the LDS-interested community, and develop reports and briefings on issues relevant to the community.
- **Continue to support the creation of operational P-20W systems.** Longitudinal data systems are receiving greater recognition as important tools for supporting state government policy, program administration, and consumer decision-making. But there is still a long way to go for states to reach full capacity to use them. We recommend that DOL consider the following actions:
 - Increase coordination with the Department of Education in messaging the need for state systems that can connect data on early childhood program, elementary school, high school, and post-secondary program participation to workforce program and labor market participation.

- Increase coordination with the Department of Education in bringing SLDS and WDQI grantees together virtually and physically.
- In recognition that building and maintaining operational longitudinal data systems is a long-term effort, consider establishing two types of WDQI grants, with different expectations for each: one type to help states that have not even begun to create a workforce LDS and one type for states that have already made a baseline level of progress.
- Also in the recognition of the importance of providing long-term support for the long-term effort to create and use longitudinal data systems, we recommend establishing a grant funding structure that includes the possibility of multiple option years beyond the initial three-year period.

APPENDICES



ADARE



Round 1

Round 2

Round 3

Round 1 & 3



A-3



GRANTEE CASE STUDIES



FLORIDA

\$1,000,000

GRANTEE AGENCY

Florida Department of Economic Opportunity, Labor Market Statistics Center

STATE CONTEXT

The state of Florida has a long history of interagency data sharing, especially between education and workforce partners. The story of this collaboration began in early 1980s, when then-governor Bob Graham played an important role in promoting legislation requiring state agencies to publish outcome data. This in turn made it easier to centralize administrative data from a number of departments and agencies. The Florida K-20 Education Code, passed in 1998, required schools to establish a comprehensive plan for student progression. It also mandated the creation of a continuing program of information management, the Florida Education and Training Placement Information Program (FETPIP), the purpose of which was to compile, maintain, and disseminate information concerning the educational histories, job placements and employment, enlistments in the U.S. armed services, and other measures of success of former participants in state educational and workforce development programs. The result was an automated system that matched the SSNs of former participants in state educational and training programs with information in the files of state and federal agencies that maintain educational, employment, and U.S. armed service records, and implemented procedures to identify the occupations of those former participants whose SSNs are found in employment records (Provision 1008.39(2)). Because of this legislation, data sharing between Florida education and workforce agencies is ongoing and commonplace. Therefore, the WDQI project encountered a very favorable institutional landscape, dominated by a long history of data sharing and longitudinal database building.

WDQI GRANT GOALS

To expand and extend its systems and to improve linkages with education, Florida proposed creating an occupational supply and demand model that would include workforce data, education and training supply data, and new demand data from the Conference Board's Help Wanted OnLine (HWOL) data series. Supply data were to reflect Workforce Investment Act (WIA) training enrollees and recent completers, unemployment insurance (UI) claimants, Wagner Peyser job seekers, and education program graduates (that is, graduates of all public and private postsecondary education and workforce training programs from the Florida Department of Education [FLDOE], including school district technical programs, the Florida College System, the State University System, and schools licensed by the Commission for Independent Education). Education supply data for the institutions belonging to the Independent Colleges and Universities of Florida (ICUF) were obtained from the Integrated Postsecondary Education Data System (IPEDS). Demand data for short-term outlooks were obtained from real-time job ads from the Conference Board's HWOL data series; data for long-term outlooks were generated using the Florida Department of Economic Opportunities' projected average annual openings, produced by Occupational Projections staff in the Bureau of Labor Market Statistics. A third source of selectable demand was found in the custom report, using demand identified from job openings in Employ Florida Marketplace (EFM).

This new supply and demand model was envisioned to be of use to: consumers (especially the unemployed and other job seekers), regional workforce boards, workforce development professionals, local and state public and private education administrators, chambers of commerce, economic development personnel, firms desiring to relocate or expand and looking for a supply of skilled workers, and others. These data would provide for enhanced program planning and analysis at the local, regional, and state level.



Workforce Data Quality Initiative

The second intended goal of the project was to develop a comprehensive Green Training Opportunities portal in Florida in conjunction with FLDOE, listing green training providers and courses offered throughout the state. Consolidating Green Training Opportunities in Florida in one portal, to complement the in-development Green Jobs Portal, was intended to assist individuals wishing to enter green jobs training and/or green employment.

The third stated goal was to conduct and publicize extensive longitudinal analysis and research (including the development of prototype models of analysis that could be useful to other, less advanced states) to extend and improve the performance outcome data shown to consumers of education and workforce training about those on eligible training provider lists (ETPL). Collating the ETPL research data with education data available from 1995– to 2012 and workforce data available from 2004 to 2012 made it possible to conduct and publish extensive longitudinal analysis and research on Florida's WIA and Wagner Peyser program, using longitudinal workforce data linked with FETPIP and FLDOE SLDS data. The data resulting from this match of comprehensive workforce and education individual-level information would provide a highly enriched set of data for mining, analyzing, and further research. These data sets would be available for a three-year period via the Center for Analysis of Postsecondary Education and Employment (CAPSEE) project at Columbia University.

PARTNER RELATIONSHIPS

As pointed out above, Florida has a decades-long history of data sharing between the Department of Economic Opportunity (DEO) and multiple education partners, facilitated by state legislation. As a result, the WDQI project did not require any targeted efforts toward data sharing, such as creating and sustaining relationships, obtaining buy-in, negotiating data-sharing memoranda of understanding, or devising data security procedures. Therefore, although the WDQI team communicated often with a range of partners, there was little active involvement of partners in designing the supply-and-demand model or developing the research agenda.

For the research component, the WDQI contracted with Dr. Lou Jacobson, president of New Horizons Economic Research. The education and workforce research data produced was made available to the CAPSEE project at Columbia University.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

The data used for both the supply-and-demand model and for research purposes came from DEO, FETPIP, and FLDOE. The common identifier used to match the research data was the SSN, which was removed from the data prior to releasing to the researcher. There is a standing contract between DEO and FLDOE whereby DEO reimburses FLDOE for workforce data follow-up, for special projects, and for acquiring wage data used in federal quarterly reports for outcome data on all workforce programs. However, this is a mutually beneficial arrangement: FLDOE also needs workforce data because it is required to publish outcomes for its students. Therefore, this is a situation in which each party needs and fully cooperates with the other, which ensures cooperation on both sides.

DATA USE

The supply-and-demand model began to be tested in early 2012 and became web enabled in August 2012. Various types of users were invited to try out the system and their level of satisfaction with the tool was assessed. This demonstration phase was also a means of popularizing the system among state-level agencies and planners as well as local-level users, the main intended users of this tool. After some reflection, the team allowed users to define what constitutes an oversupply or undersupply of occupations by selecting a value for a “tolerance level” field, thereby allowing users to define a tolerance level other than the default 10 percent level. This caused concern among some education partners, who worried that some of their programs would appear oversupplied, which in turn could cause problems with funding.



Workforce Data Quality Initiative

As of May 2014, the supply-and-demand model was still not available on a public website. However, an assiduous soft launch campaign was being planned to teach local Workforce Investment Boards how to use the tool. A training manual has been created, and a statewide series of trainings, most of them in person, is planned .

The supply-and-demand application creates two kinds of reports. The standard report provides supply and demand data based on the most recently available supply sources and for the most recent month of demand data. The user can choose to see the data aggregated in a statewide report or broken down by workforce investment region or into aggregation of selected regions. On the Customized Report, users can choose to include specific sources of occupational supply (e.g., WIA participants) and specific time periods for each selected source. For each educational source, users can also choose to include enrollees, completers, or both. For Florida public universities, users can choose to include all universities, or to select individual universities.

In summer 2012, DEO asked US DOL to allow Florida to use funds originally intended for the Green Training Opportunities to be expended instead on further enhancements to the supply-and-demand model, as half of the state's construction jobs had been lost in the Great Recession, and therefore there was not much interest or need for the Green Training Opportunities web-based application. As a result, US DOL allowed DEO to place more emphasis on the supply-and-demand model. Given that the labor market, especially the occupations most affected by the recession such as construction, had not yet recovered, there was a need to understand how various occupations were trending to inform job training policy and education policy, especially in regards to better alignment of education and workforce training to the needs of employers.

All the research reports written as part of the grant have been submitted and approved. Dr. Jacobson, the lead researcher, via the CAPSEE program at Columbia University, is allowed by the contract to continue working on the project even after WDQI expires.

MAJOR CHALLENGES

A change in the Standard Occupational Classification (SOC) version used by the Conference Board—from SOC 2000 to SOC 2010—forced the team to recode and revamp much of the system programming. Further compounding the difficulty, DEO only had projections and wage data on occupations using SOC 2000, due to Occupational Employment Statistics (OES) data collection cycles. Another issue that is intrinsic to all traditional supply-and-demand reports is that they rely on a crosswalk between Classification of Instructional Programs (CIPs) to Standard Occupational Classification (SOCs), commonly referred to as CIP/SOC crosswalks, as a single CIP code may map to one SOC code, several SOC codes, or many. So if, for instance, there are one hundred graduates, on a supply-and-demand report this could appear as five hundred potential supply units, in five separate occupations. To handle this issue, the team created a special software feature that allows the end user to click on any education or workforce occupational supply number and see precisely which programs (and how many individuals) provided supply to the occupation. Users have no clear way to know which primary occupation former students gain employment in, rather, they can see there are X-number of qualified individuals for the various occupations. Therefore, users are instructed not to total all supply units but rather to look individually at each occupation when dealing with the problem of multiple related occupations, and to take into account that not all individuals with the requisite training will find employment in the occupation.

UNIQUE STRATEGIES

One of the strengths of the Florida project has been its ability to popularize and market its occupational supply-and-demand model. The team presented on its work numerous times during webinars and other events organized by the TA team for WDQI grantees. Presentations of the application were also given to the Florida Association of Career and Technical Education, Florida Division of Career and Adult Education, adult educators, college and workforce summits,



Workforce Data Quality Initiative

several committees from the Florida Senate and House, and many others. Generally, the plan was to share details of the application with a large number of highly visible stakeholders, and already quite a few know about it. For example, Florida Tax Watch, a private, nonprofit, nonpartisan research institute, wants to spread the word about the supply-and-demand model to stimulate better-targeted spending of public money.

Another promising practice that can be learned from Florida's experience is that although it may not be possible to replicate the legislation that formed the basis of cooperation between FDOE and DEO to other states, it makes sense for workforce agencies to bargain with education partners, and to seek out the mutual benefits that can be obtained through data sharing. Education agencies need to know the outcomes (such as wages) of their students, and labor is interested in accounting for the educational background of its customers. This self-interest on the part of both partners should be conducive to collaboration.

Another useful (if somewhat indirect) outcome of WDQI has been the addition of Florida to the CollegeMeasures.org website, which is now hosting Florida data. Although the data used on the site come from FETPIP and not from WDQI, the connection with College Measures was made by WDQI team members, who learned about the site during a WDQI conference held in Washington, DC in fall 2012.

Finally, a potentially useful aspect of the research process was that the contract allowed Dr. Jacobson (via CAPSEE) to continue to work on the data provided by the WDQI grant, even after the WDQI grant funding is over. This arrangement is potentially conducive to sustainability because it ensures that professional researchers will keep paying attention to the project.

SUSTAINABILITY PROSPECTS

In April 2012, House Bill 7135 was passed by both the Florida House and Senate and went into effect. The bill requires DEO to prepare annually an economic security report showing employment and earnings outcomes for degrees or certificates earned at all public postsecondary educational institutions. DEO entered into a contract with CollegeMeasures.org to satisfy the requirements of HB 7135. In addition, the bill requires all private postsecondary institutions that receive state funds to submit student-level data to appropriate state level entities. The WDQI team is very pleased with this development because it will provide for timelier reporting from the Commission of Independent Education (CIE) and may improve state access to ICUF data in place of the dated IPEDS data for ICUF institutions.

The state legislature approved the request to continue funding the development of the supply-and-demand tool after the expiration of the grant. The state will fund the project with \$453,812 per year recurring from general revenue, for an unspecified period for continued maintenance and enhancements. This will fund two full-time equivalent jobs dedicated to the WDQI-created Florida Occupational Supply-and-Demand System. This will allow the team to continue working on this project, potentially for quite some time, as there is no sunset clause.



IOWA

\$1,000,000

GRANTEE AGENCY

Iowa Workforce Development (IWD)

STATE CONTEXT

Iowa launched its Round 1 WDQI grant with more than 30 years of experience generating reports for federal and state workforce programs and a brief history of linking higher education and wage data. The Iowa Workforce Development (IWD), the state workforce agency, received the WDQI grant. As the state workforce agency, IWD focuses on linking job placement and skill development into a “system of lifelong learning and opportunity” to promote the economic future and security of its residents. In 2007, with state support, IWD and the community college division of the Iowa Department of Education (IDE) began collaborating to match wage and educational records to support analyses of earnings at the state-level and for individual institutions. On the education side, beginning in 2009, the Iowa Department of Education (IDE) engaged in parallel—but separate—effort to build a state longitudinal education system, EdInsight, supported by an \$8.7 million SLDS grant from the US Department of Education, followed by a \$3.7 million SLDS grant in 2012. For the 2009 SLDS grant, IWD collaborated with IDE to conduct a longitudinal analysis of wages for high school graduates. For the 2012 SLDS grant, IWD is in the process of assisting with a high school feedback report that includes employment outcomes in addition to post-secondary enrollment in developmental classes, awards, and transfers. While the two agencies met on a regular basis to discuss goals and action plans, they have pursued different approaches to building their data warehouses. Finally, prior to the WDQI grant, the Department of Criminal & Juvenile Justice Planning (CJJP) in Iowa had developed its own longitudinal, linked data warehouse, the Justice Data Warehouse (JDW), a central repository of key criminal and juvenile justice information. Partnering with CJPP was considered during the planning phases and in the grant proposal but did not occur within the scope of the WDQI project.

At the time of the grant award, the Iowa Workforce Development (IWD), Iowa Department of Education (IDE), and Iowa College Student Aid Commission (ICSAC) had a legislative mandate to link their data systems in order to track trainees into the workforce and to demonstrate the effectiveness of student financial assistance. While the legislation was in place, it did not specify funding levels to support a linked longitudinal data warehouse across education and workforce. Although the WDQI grant was awarded to the Labor Market & Workforce Information Division within IWD, the bulk of the work transferred into the Information Technology (IT) department during the project. Key to the success of the project in the IT department was an incremental approach to developing the warehouse and the use of pilots to demonstrate the value of the data warehouse in reducing time and resources needed to meet reporting requirements.

WDQI GRANT GOALS

The first stated priority of the WDQI project in Iowa was to address the agency's multiple databases that did not have a common linkage and to link with other data systems outside the IWD, including the IDE and ICSAC. At the time of grant award, the second priority was to assist the Iowa Department of Education in generating meaningful and timely data to support Area Education Agencies (AEA's) and local K-12 systems' decision-making about educational programs.



Workforce Data Quality Initiative

Once the Iowa Workforce Data Warehouse (IWDW) was in development, these priorities broadened into the general goal of the warehouse becoming a one-stop on-demand data reporting initiative with the ability to: 1) eliminate the reliance on production environments for federal, state, and other reporting requirements; and 2) provide user groups with workforce data that could be matched to their data warehouses to answer questions about program effectiveness.

PARTNER RELATIONSHIPS

During the WDQI grant period, Iowa focused on deepening existing partnerships rather than developing new ones. IWD had ties with the Department of Transportation (DOT) prior to the WDQI grant and had been receiving DOT files for identity theft and fraud protection for over 10 years. During the WDQI grant, IWD and the IWDW continued to receive DOT information to do profile verification and began exploring the possibility of expanding the partnership with DOT to integrate IWD's workforce data in the DOT's TeraData Data Warehouse (see *Data System Structure/Housing Arrangement* section below for more details).

Beyond the DOT partnership, the IWD staff maintained connections with IDE and the SLDS project through regular project meetings.¹ In the final year of the grant, the WDQI project began making data available to internal IWD divisions (e.g., Labor Market Information) and other user groups, including the SLDS team members from IWD and IDE. Partnerships with other agencies (e.g., criminal justice, human services) were not developed during the WDQI grant period.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

The Iowa Workforce Data Warehouse (IWDW) is housed in and managed by the Information Technology (IT) Department of IWD. Data for key workforce programs are organized in schemas around categories and reside in staging tables as a temporary subset of a data warehouse.² Staging tables are built through the standard ETL process of extracting data from the production environments, transforming the data, and loading into tables. Schema categories include: claims data, customer data, wage data, and a number of specific applications including WIA and TAA, all of which can be linked along any common data elements or probabilistically if no data elements are shared. Specific workforce programs in the initial warehouse staging tables include: IWorks (integrated workforce delivery system), My Iowa UI (unemployment insurance), Trade Adjustment Assistance (TAA), and Unemployment Insurance Benefits.

Looking forward, the IT department is exploring the possibility of integrating with the DOT's existing TeraData Data Warehouse. Because the IWD wage records contain SSNs but not name or birth date, integrating into an existing warehouse with the capacity to match on SSN, name, and birth date could greatly enhance the efficiency and accuracy of data matching as well as the ability to link to other data sources with limited identifiers.

DATA USE

Internally at IWD, the IWDW is used to meet reporting requirements in three prioritized categories: federally-mandated, state-mandated, and other reporting requirements. The primary objective of building the data warehouse was to cut costs by replacing thousands of reporting functions in the old production environments with batch reporting in the new data warehouse environment. Transitioning from the production environment to the data warehouse reduces the CPU

¹ Project team staff from SLDS meet on a weekly basis, including one representative from IWD. Every other week, technical staff meet with IWD divisions and other agency representatives to provide updates on what is available in the data warehouse.

² A staging table is an intermediary step in between the data sources and the data warehouse. While staging areas are often intended as temporary steps between source data and a data warehouse, they can hold data for extended periods of time.



Workforce Data Quality Initiative

cycles and job processing requirements and takes load off the production systems. Once the business unit compares and approves reports generated from both the old production environment and from the new staging tables, the IT department shuts off reporting in the production systems and allow users to do ad-hoc and on-demand self-service reporting out of the new staging tables. In addition to reporting functions, the data warehouse has also allowed IWD to begin evaluating its own internal programs, including employment outcomes for training programs. For example, IWD began using the IWDW to generate quarterly and annual reports on wages for participants who exited Iowa's Promise Jobs program (Promoting Independence and Self Sufficiency through Employment), a welfare program designed to assist Family Investment Program recipients in becoming self sufficient.

To date, the IWDW has not yet had significant impacts on use of workforce data outside of IWD because wage records are the most commonly requested data match and fulfilling wage record requests does not require a linked data warehouse. As described in the introduction, both the 2009 and 2012 SLDS grants in Iowa have drawn on workforce data to examine post-secondary and labor outcomes for high school students, including exploring outcomes by demographic characteristics, educational attainment, and industry sector.

MAJOR CHALLENGES

The WDQI project in Iowa faced a number of challenges early on in the grant period. During the first year of the grant, there were hiring freezes throughout IWD as well as widespread layoffs and departmental restructuring. Due to agency-wide hiring freezes, the project was unable to fill two positions during the first year of the grant, causing considerable delays and setbacks. In addition to staffing challenges, the project also faced structural and administrative challenges. While the grant was awarded to the Labor Market & Workforce Information Division, the success of the project depended on the support and expertise of the IT department. By Fall 2012, it was clear that the majority of operations needed to shift to the IT department, but the IT department did not have available manpower to devote to the project. After bringing in a consultant to serve as project manager, the WDQI project began making headway in 2013, the final year of the three-year grant.

Within the IT department, another challenge was resistance to change. For some staff in the organization, data warehousing was a new concept and a marked deviation from the past 30 years of reporting processes. Not all staff understood the reason for change until a pilot quarterly Trade Act Participant Report (TAPR) was developed and demonstrated that what once took senior staff hours of labor over a month-long period to produce each quarter could be automatically generated and updated in 15 minutes.

With respect to the technical aspects of the project, data mapping presented the greatest challenge. Running extracts and building the staging tables was not a major challenge, but standardizing and developing a data rationalization to ensure elements were identified correctly (e.g., a person is identified as a person) required more time and effort and is an on-going process.

UNIQUE STRATEGIES

One of the most unique strategies in Iowa is the long history of collaboration and strong partnership with the DOT. Because DOT data includes SSN, name, date of birth, and other identifying fields, they play an important role in matching data without shared identifiers (e.g., wages data with SSN but no names or birth days and K-12 data with no SSN).

Another unique strategy was the approach the IT department took to developing the data warehouse. Rather than taking an all-or-nothing approach to architecting the warehouse, the IT department relied on small, incremental steps. By



Workforce Data Quality Initiative

building a pilot with minimal success criteria for TAPR, the project that demonstrated its value as soon as possible and created a foundation for adding features and functions at a later point in time.

SUSTAINABILITY PROSPECTS

At the end of the grant period, the WDQI project in Iowa did not have a set sustainability plan. Although linking workforce, education, and student aid data is legislatively mandated in Iowa, no funding stream has been set to support linked longitudinal data warehouses. One approach Iowa intends to explore is cost-sharing agreements with participating agencies with the IT department billing IWD and other agencies on a monthly basis. Whether or not the staging tables for the IWDW are integrated into the existing DOT data warehouse also has unknown ramifications for sustainability and cost sharing over time.



LOUISIANA

\$1,000,000

GRANTEE AGENCY

Louisiana Workforce Commission

STATE CONTEXT

Before the WDQI grant, there was a growing appreciation in Louisiana for linking data and using data to measure outcomes. In one previous attempt at creating common databases, during the 1990s, the agencies involved were more or less the same as in the present effort: Labor and Higher Education, with some more limited involvement from Secondary Education, Corrections, and Social Services. State legislation enacted in 1997 required the Department of Labor to develop a common system. The effort was not as comprehensive as WDQI, but an interagency workgroup was created. Team representatives visited Texas and Florida because these states were seen as frontrunners in developing interagency databases, and some features were modeled after them. In some sense, WDQI is the expansion of this early system, using a better platform and operating on a much bigger scale. The WDQI team even used some of the old data-sharing MOUs to draft the new ones. However, the earlier effort was much more limited in that no longitudinal data linking actually took place—the resulting database contained just one year of data across programs.

WDQI has also benefited from political support. Louisiana governor Bobby Jindal has been trying to get workforce, education, and economic development agencies to increase their collaboration. One result of this policy has been the creation in 2008 of the Louisiana Workforce Commission (LWC), which gathers all workforce agencies and programs under the same roof.

WDQI GRANT GOALS

In its grant proposal, the WDQI team established three main goals:

- To develop a new statewide workforce longitudinal data system that combined data from the following sources administered by the LWC: UI Wage Records and Benefits, Workforce Investment Act (WIA), Wagner-Peyser (WP), Trade Adjustment Act (TAA), Veteran Assistance (VA), Strategies to Empower People (STEP), Workforce Opportunity Tax Credit (WOTC), Louisiana Vocational Rehabilitative Services (LRS), Louisiana Job Employment Training (LaJET); as well as the Office of Juvenile Justice (OJJ), Federal Employment Data Exchange System (FEDES), Registered Apprenticeship Partners Info Data System (RAPIDS), Department of Children and Family Services (LDCFS), Department of Education (LOOE), and Board of Regents (BOR)
- To create an automated reporting tool using the longitudinal database
- To produce nineteen short reports based on the data

PARTNER RELATIONSHIPS

The WDQI grantee's main partner has been Louisiana State University Division of Economic Development. This relationship has been built over the last fifteen years. The Division is an applied research unit affiliated with LSU's Department of Economics. For a long time, the collaboration consisted of about one project a year. Beginning in 1996-97, the Division's leadership began focusing more of its efforts toward collaborative efforts with the state government. An ongoing project has been the annual job vacancy survey, together with employment projections. A few years before WDQI, LWC and LSU decided to jointly pursue a green jobs grant, which they won. Over the years, their steady, moderate



Workforce Data Quality Initiative

level of interaction became a close relationship. Now LSU is routinely included on many funding proposals prepared by LWC.

The WDQI team has established an interagency working group consisting of the Louisiana Workforce Commission (which administers WIA, TAA, UI, WP, VETS, and Vocational Rehabilitation), Department of Children and Family Services (which administers TANF), Office of Juvenile Justice (OJJ), Louisiana Department of Education (LOOE), Louisiana Community and Technical College System, Board of Regents (BOR), and LSU. This group met regularly and discussed data-sharing procedures, serving as an important communication tool between LWC/LSU and their partners.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

LWC has a strong and dedicated legal team consisting of two or three people who read and drafted MOUs and data-sharing agreements. Members of this legal team know their counterparts working for other state agencies, which sped the process of vetting the MOUs. The project manager oversaw the legal team. LSU was instrumental in deciding which data items needed to be collected and shared. That was an important step because those items had to be specified in the MOUs. Because these MOUs were not conceived of as one-time affairs, but rather as instituting a recurring process in which data will continue to be shared in the future, they also needed to specify the rules around that recurring data transfer. Likewise data security—who has access to what, how access is controlled, and how to maintain data confidentiality—had to be addressed in the MOUs.

There is a shared storage drive that LWC and LSU can access. It started as a Google drive, but in order to make it available to partners, a shared drive was deemed as a better solution. Keeping all the project information (including MOUs) logged helped to maintain institutional memory when important people left the team.

Another important task was to estimate hardware needs based on the expectation that the size of the databases will continue to expand into the future. LSU was helpful in coming up with that estimation.

The WDQI team evaluated two database-building strategies—the federated model and the warehouse model—and chose the warehouse model. The federated model received limited support from the beginning. One of the limitations of the federated model identified by the team is that it is not “real-time”: users have to first request information, receiving it only the data is called and retrieved. By contrast, the warehouse model gives users the ability to get information in real time and at multiple levels, which was something that the WDQI team wanted. The team determined that the federated model would be most appropriate in a state in which the partners are not yet ready to collaborate. But since the team felt there was a good level of collaboration with partners in Louisiana, the warehouse model seemed the better choice. The disadvantage of the warehouse model is that a server has to be purchased to house the database, and it is difficult to estimate the server size needed to store data for multiple years and to continue to receive data in the future. The warehouse model also requires that the project team consider software updates, security issues, and speed, and that it commit to increased documentation.

DATA USE

The longitudinal data system developed through WDQI has two main intended uses: to feed an automated online reporting tool; and to facilitate the production of nineteen reports to serve to showcase of what the system can do. During the site visit conducted in August 2013, the reporting tool (hosted on an internal server) appeared functional and close to being launched. However, as of May 2014, a search conducted on LWC’s Labor Market Information website found that the link to the tool was not yet active.

In its proposal, LWC identified nineteen reports to be produced as part of the grant, as follows:



Workforce Data Quality Initiative

- Report 1: age distribution of Louisiana workers by occupation at the local level
- Report 2: impact of workforce supply challenges on business survival
- Report 3: impact of workforce supply challenges on business retention
- Report 4: impact of workforce supply challenges on business expansions
- Report 5: cost-effectiveness of training programs relative to increased earnings of individuals and tax revenues
- Report 6: cost-effectiveness of employment services programs relative to reduction of UI benefits
- Report 7: tracking of participants in FastStart
- Report 8: cost-effectiveness of employment services programs relative to reduction of TANF benefits
- Report 9: employment and education outcomes of participants in LWC's collaborative program with OJJ to link paroled youth with WIA youth programs or other services at Business and Career Solutions Centers
- Report 10: movements of the labor force through the state and across state borders
- Report 11: enhanced tracking of existing workforce programs aimed at high school graduates without employable skills and dropouts, analyzing wage improvements, unemployment rates, job retention rates, career advancement, and re-entry into post-secondary educational programs
- Report 12: comparison of data on program completers with vacancy and occupational forecast data
- Report 13: employment outcomes of different education and training programs
- Report 14: identification of education exit points within a training program that maximize employment and earnings
- Report 15: dropout and remediation efforts of both LDOE and LWC from a workforce point of view
- Report 16: enhanced report based on the Scorecard system, tracking objective performance measures of postsecondary programs over time and including analysis of education exit points
- Report 17: identification of industries that are hiring the majority of individuals at each education level
- Report 18: performance of vocational and technical programs, measured by comparing wages, employment rates, re-entry into other training programs or postsecondary education of participants relative to similar individuals who did not participate in the program
- Report 19: performance of teacher-training programs based on individual student performance (postsecondary, career markers, state mandated educational testing)

As of August 2013, preparation of the reports appeared to be on track.

MAJOR CHALLENGES

Creating data dictionaries was a long and difficult process. The team spent almost the entire first year finalizing MOUs. But the MOUs needed to specify the contracted data, which required defining data dictionaries and data structure. Much of this work was done by LSU and a technical consultant hired for this purpose. The team's challenge was to determine what data are located at various entities, including internally within LWC (for example, Unemployment Insurance, Office of Workforce Development, etc.). There were many dissimilar datasets that needed to be recouped and combined. Some of the datasets had more than one hundred tables.

Finding skilled people to work on projects like WDQI is very difficult. Not only it is challenging to locate talented programmers, database specialists, and research analysts, but it is even more difficult to have them only on a temporary basis. The Baton Rouge area is currently experiencing an IT boom, with firms like IBM expanding in the area, and talented people are drawn to these higher-paying jobs in the private sector. Having LSU as a partner was beneficial because it gave WDQI access to a large pool of graduate students and faculty who are both well trained and available on a temporary basis. Nonetheless, finding good IT specialists was a challenge.



Workforce Data Quality Initiative

It was also challenging to find a balance between regular job duties and the extra duties carried by the WDQI project. That involved some extra work during weekends and holidays.

Although initially the team targeted OJJ as an entity from which they intended to collect data, eventually this aspect of the project was dropped because of lack of communication from OJJ. The WDQI team had a very difficult time trying to get OJJ representatives to respond to their requests. In the second year of the grant, LSU found that OJJ had stopped collecting some of the data the team had requested. The team initiated an escalation procedure consisting of follow-ups, but even the highest escalation levels were getting no results. The criterion we used to stop pursuing these data was a cost/benefit calculation. The idea behind getting OJJ data was to be able to look at the labor market outcomes of ex-offenders coming from the juvenile justice system, and though the team still thinks there is much value in collecting these data, it did not warrant an inordinate investment in resources and time.

Similarly, the Registered Apprenticeship Partners Info Data System (RAPIDS) database was included in the grant proposal as a source for the longitudinal data system. However, because of technical difficulties, the linkage with RAPIDS could not be made and the team dropped this source from its list.

Lastly, there were some problems in accessing K-12 education data. Late in 2012, it appeared that all the partners were on board and all the data-sharing MOUs had been signed and executed. Subsequently, however, DOE became reluctant about sharing K-12 data. The WDQI team tried to persuade DOE to follow through, but difficulties persisted for a time. As of August 2013, these data access issues appeared to have been solved.

UNIQUE STRATEGIES

One promising practice was to identify data needs of prospective partners and to use that need to generate support for WDQI data needs (i.e., the “two-way street” approach). In Louisiana, the technical and community college system has a research project called “Accelerated Opportunities,” with Urban Institute as their research entity and additional involvement from Kellogg and the Gates Foundation. This project needed data from LWC, which made it easier for LWC to ask for community college data.

Another promising practice was to identify state-level bodies that can be successfully harnessed to promote WDQI data needs. In Louisiana there is a state body called the Louisiana Council of Systems Directors (CISD). The CISD works to “promote coordination among the State information services organizations and serve as a primary advisory group for decision makers on IT matters” (excerpt from mission statement)¹. CISD meets once a month, and members across many agencies get to know each other, and they get along very well. The WDQI used connections formed through CSID to make data requests and make the case for WDQI, though only after the MOUs were signed and there was already a legal basis for collaboration.

SUSTAINABILITY PROSPECTS

One promising practice initiated by LWC was to set up the interagency data-sharing MOUs as ongoing. This arrangement ensures that there is no “expiration date” for the agreement, which translates into good sustainability prospects for the products developed under the grant, especially the online tool. Even if no additional funds are picked up, the effort of downloading and updating the WDQI database is minimal, which means that even if no major developments or upgrades can be done, the longitudinal database will still be there.

¹ <http://www.lacisd.org/pages/about-the-cisd>



MASSACHUSETTS

\$1,000,000

GRANTEE AGENCY

Massachusetts Department of Workforce Development, Division of Career Services

STATE CONTEXT

In 1998, the Massachusetts Department of Elementary and Secondary Education (DESE) began the process of developing a state student-level education data system called the Student Information Management System (SIMS). SIMS was a first step in the state’s implementation of a student data collection system for its K-12 programs. Prior to SIMS, each school and district collected data and reported to the state on an aggregate level. The introduction of SIMS—a standardized set of student-level data variables—proved challenging for school districts and their schools, which had legacy systems and third-party vendor systems, each with vastly different functionality and automation.

SIMS required local school districts to map their existing data collection systems to a set of common, standardized data collection elements (i.e., a state data dictionary) and to transmit data three times per year to DESE. Many of Massachusetts’ school districts, however, had little information technology (IT) infrastructure and struggled to meet SIMS specifications and data collection requirements. According to DESE, it took almost three years from initial launch for the agency to have confidence in the completeness and accuracy of data submitted by school districts to SIMS.

DESE has received two rounds of SLDS funding from the U.S. DOE. Under its first SLDS grant, totaling \$5,993,464 and awarded in May 2009, DESE proposed to create a comprehensive data collection system that allowed for dynamic harvesting of student-level data from school districts to improve student achievement. The first SLDS grant also included the assignment of a unique state-assigned student identifier (SASID) that could be used across state data collection systems to track student progress, achievement, and employment outcomes. The second SLDS grant, totaling \$12,972,730 and awarded in July 2010, created the Massachusetts Information Providing Accelerated Student Success from Preschool to Occupations in Real-Time (i-PASSPORT). This second infusion of funds allows the state to focus on developing an LDS to track student progress from early childhood through adult education. The i-PASSPORT system allows for up to one hundred thousand users to have role-specific access to FERPA-compliant data reports as well as provides school districts and schools with reports on the earliest feasible indications of risk (school, dropouts, student assessment results, etc.).

Even though Massachusetts has its own state statute governing the collection, maintenance, and disclosure of personal data contained in manual or computerized personal data systems, the Fair Information Practices Act (940 CMR 11.00), there appears to be widespread support across political leaders, state agency secretaries, agency staff, and the public for integrating data and providing opportunities for data to be used to improve student achievement and success and to link said information with employment and labor market information.

In August 2010, the Massachusetts Department of Workforce Development (DWD), now the Executive Office of Labor and Workforce Development (EOLWD), submitted a grant application to the U.S. DOL requesting one million dollars in funds to expand Massachusetts’s workforce LDS for unemployment insurance and labor market information to include workforce information from its Division of Career Services and Division of Apprenticeship Training and Commonwealth Corporation. According to DWD agency staff, the state’s WDQI grant provided the Department with valuable funding to



improve their current workforce technology infrastructure and ensure its compatibility with other state data collection and reporting systems.

WDQI GRANT GOALS

EOLWD identified the following goals for its WDQI grant:

- 1) Complete the reporting requirements for Unemployment Insurance revenue and benefits, with full implementation of the QUEST revenue and benefits applications system. Once operational, UI Online, as it is now called, will replace the UI legacy systems in the state and allow for more web-based functionality and administration of UI claims and benefit payments.
- 2) Create a longitudinal data system that serves as a single repository for workforce system data records including information from unemployment insurance, labor market information, apprenticeship and American Job Centers (AJCs)
- 3) Link data records and track participants across unemployment insurance, employer-reported wage records, Workforce Investment Act (WIA) and Wagner-Peyser employment and training programs, Trade, apprenticeship, National Emergency Grants (NEGs), and state youth programs
- 4) Integrate programmatic and performance data with Labor Market Information (LMI) data to analyze how program results tie back to labor trends in the state
- 5) Link the design of the workforce longitudinal data system efforts with DESE's education-based longitudinal data warehouse (P-20)
- 6) Use data analytics to evaluate education and workforce programs and answer key policy questions and funding questions for state legislators, policymakers, and members of the Massachusetts Workforce Investment Board

PARTNER RELATIONSHIPS

The scope of the EOLWD WDQI longitudinal workforce data system includes unemployment and workforce programs operating under the administration of EOLWD. DWD within EOLWD comprises three divisions: the Division of Unemployment Assistance (DUA), which is responsible for UI revenue and benefits programs and economic research and analysis; the Division of Career Services, which is responsible for the major federal workforce programs (i.e., Wagner-Peyser, WIA, and Trade Adjustment Assistance Act) as well as services delivered through the AJCs; and the Division of Apprentice Training (DAT), which is responsible for promoting, developing, and administering registered apprenticeship programs in the state. Additionally, Commonwealth Corporation (CommCorp), a quasi-public authority within EOLWD, administers state-funded youth jobs programs and sector training programs, as well as selected workforce demonstration projects.

The Massachusetts Workforce Investment Board's (MWIB) Performance Committee has also been a strong advocate for a state LDS that would link education and workforce data to create an integrated performance management system. The MWIB envisions that the LDS data warehouse will help to inform policymakers and practitioners regarding the performance of workforce and education programs not only at the state level, but at the local level as well.

Other key partners on the WDQI project are DESE and the Department of Higher Education (DHE). Both state agencies have been instrumental in creating a data governance structure with EOLWD to oversee the sharing of data across state agencies. In addition, EOLWD worked with DHE to create a Memorandum of Understanding (MOU) for data sharing between the two state agencies. While the MOU was limited in scope, it will serve as a template for future data-sharing efforts across state agencies.



DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

The DWD LDS is a major new project for the agency and is still in its early implementation stages. DWD hired a third-party contractor, Currier McCabe & Associates CMA Consulting Services, to develop the LDS and remains hopeful that agency IT staff will be able to manage the system once it is operational. Massachusetts uses Oracle’s Business Intelligence Suite Enterprise Edition (OBIEE) as the foundational application for the data warehouse. The contractor installed OBIEE and developed a multi-year plan for building the workforce LDS. Individual-level data across seventeen separate categories of data will be maintained in the workforce LDS (see the table below for a listing of the data categories).

Data Category	Source System	Owner
UI employment and wage record data	QUEST	DWD DUA
UI claimant and UI benefits data	QUEST	DWD DUA
Wagner-Peyser	MOSES	DWD DCS
WIA Title I Adult, Dislocated Worker and Youth	MOSES	DWD DCS
Trade Adjustment Assistance (TAA)	MOSES	DWD DCS
Trade Readjustment Allowance	QUEST	DWD DUA
Registered Apprenticeship	SQL database	DWD DAT
YouthWorks (state-funded youth jobs program)	SQL database	CommCorp
Sector training programs/demonstration projects	SQL database	CommCorp
Quarterly Census of Employment and Wages	Research	DWD DUA
Local-area unemployment statistics	Research	DWD DUA
Mass layoff statistics	Research	DWD DUA
Business employment dynamics	Research	DWD DUA
LED quarterly indicators	Research	DWD DUA
Federal Employment Data Exchange System	FEDES	Federal Government

The Date Warehouse (DW) is being developed by the Massachusetts Department of Unemployment Assistance (DUA). DUA implemented a new UI Online system on July 1, 2013. The first goal for the DW as stated above, which is to complete the reporting requirements for Unemployment Insurance revenue and benefits with full implementation of the



Workforce Data Quality Initiative

UI Online revenue and benefits application system, has yet to be completed. Thus far, only UI benefits data have been set up in the DW. Additional work to add revenue and LMI data into the DW will be undertaken beginning June 2014. Department of Career Services (DCS), which is responsible for the workforce programs data inputs to the DW, and is the WDQI grant recipient, also will begin to move data into the DW in July 2014, starting with WIA, Wagner-Peyser, and Trade federal reports data. DCS was granted an extension by DOL for their WDQI project, to November 30, 2014.

DATA USE

To date, linkages across all of the program data in the table above have not been realized, but Massachusetts continues to advance in creating a state workforce data warehouse. Data from the workforce LDS will be comprehensively linked and integrated into a re-architected data warehouse for up to one thousand users, scalable for public facing and external stakeholders with increased usage. The system will feature role-specific data marts that provide rapid, relevant, timely, and legally compliant data for users. WIASRD-level data for workforce programs will be included in the data system. OBI EE software will provide web-based access to dashboards, reports, and ad hoc query functions to be designed and developed with input from workforce partners and other potential users (e.g., education, legislature, researchers).

Thus far, UI benefits data have been available to DUA through dashboards and reports. Federal reports on programs for UI claimants and Trade participants that include information on services provided at career centers are produced through the DW, relying on interfaces between UI Online and MOSES (the workforce MIS system). The DW pulls from UI Online to create the reports.

MAJOR CHALLENGES

The implementation of a new UI Online application has been the primary focus for EOLWD and has drawn resources from all departments to ensure a successful transition. Even with the high level of support across the divisions within EOLWD, Massachusetts encountered delays in implementing the new UI Online application due to data conversion and equipment problems. These delays have impeded EOLWD's ability to transition its workforce data into a single data warehouse with state wage records, UI benefits data, LMI and workforce services, and outcomes data.

EOWLD departments conduct all of their workforce data matches off an individual's Social Security Number (SSN). Education partners and programs, however, do not use SSN for their data matches. So there is some concern that the data matching and resolution process may be impeded if alternative characteristics cannot be used to conduct data matching across the various education and workforce data sets. Another related challenge for Massachusetts is that they do not currently access FEDES for federal employment wages. Massachusetts is considering refining its Wage Record Interchange System agreement to allow the state to access FEDES information.

UNIQUE STRATEGIES

In order to develop stronger ties with the SLDS effort underway in the state, EOWLD entered into a contractual relationship with the same third-party contractor, Collaborative Systems, that is also working on the state's SLDS design and implementation. EOWLD and DWD staff have confidence that once UI data migration is complete and the new UI Online system is fully functional, the contractor will be able to recommend ways to automate the linkages between wage record, workforce, K-12, and postsecondary data. Having one contractor who is knowledgeable about the types of data stored in each of the systems and any data limitations will help the process of data integration proceed quickly.



SUSTAINABILITY PROSPECTS

EOLWD will continue to expand its data warehouse, but at a slower pace than anticipated when the WDQI project began. EOLWD hopes to sustain the project through close working relationships with DESE and by seeking the support of the state legislature for additional funding.



MARYLAND \$1,000,000

GRANTEE AGENCY

Department of Labor, Licensing and Regulation

STATE CONTEXT

Maryland’s State Workforce Agency has a long history of investment in longitudinal data systems for evaluation. As a member of the Administrative Data Research and Evaluation (ADARE) alliance, Maryland’s Department of Labor, Licensing and Regulation (DLLR) signed data-sharing agreements with eight other states to share data for research and evaluation purposes.

Perhaps the most significant contextual factor affecting the WDQI grant in Maryland is the fact that its governor, Martin O’Malley, maintains a commitment to data-informed governance. In 2010, Governor O’Malley created legislation that appropriated state funds to build the Maryland Longitudinal Data System (MLDS) and its home, the Maryland Longitudinal Data Center (the Center). In addition, Maryland won a U.S. Department of Education Race to the Top (RTTT) grant, also in 2010. Combining funds from RTTT with funding from the state Department of Education (MSDE), the Governor’s Office, and the Maryland Department of Higher Education (MHEC), the state built the Maryland Longitudinal Data System. While the system is education-focused as a result of the predominance of education partners and funding, Governor O’Malley has a keen interest in examining the skills gap in the state and is seeking a better understanding of the state’s supply and demand trends. Thus, an operational P-20W system with a research agenda more balanced across education, labor force, and economic development is likely in the coming years.

WDQI GRANT GOALS

The primary aim of DLLR’s Division of Workforce Development and Adult Learning WDQI grant was research focusing on:

Table with 3 columns: Year 1 (2011), Year 2 (2012), Year 3 (2013). It details the start and completion of two WDQI studies across three years.



Workforce Data Quality Initiative

	data sources	analyses of the time alignment of documented employment affiliations and earnings amounts with enrollment profiles.
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Additionally, DLLR was involved in expanding and extending current systems to improve existing linkages with the educational system, complete and distribute longitudinal data analysis, and develop user-friendly platforms as a means of generating performance data on both educational and workforce programs.

Of particular interest is what might be called a metagoal: that of contributing original, policy-relevant research based on longitudinal data analysis that will help make a business case for sustained investment in longitudinal workforce data systems in Maryland and across the nation.

DLLR submitted a set of research documents based on the research in the period 2010-13. These included:

1. *Integrated Data System Person Identification: Accuracy Requirements and Methods* (2012)

This report responds to a WDQI challenge—the unreported quality of person identification (PI) features in many integrated data systems (IDS) that link confidential workforce, education, and social services administrative records. www.jacob-france-institute.org/documents/MD-WDQI-Person-Identification-Report.pdf

2. *Neglecting the “L” in a Longitudinal Integrated Data System Can Be a Costly Mistake* (2013)

This report is intended to send a clear message to the funders, designers, and managers of P-20W SLDS initiatives that immediate short-term coverage capabilities only permit access to tip-of-the-iceberg return on investment rewards. Hidden from view in the early years of these initiatives is the long-term value that can be achieved if attention is paid to the importance of sustained “L” coverage. www.jacob-france-institute.org/documents/DLLR-WDQ-1-4-13.pdf

3. *Toward a Business Case for Sustained Investment in State Longitudinal Integrated Data Systems* (2014)

This report sets a business case for continued federal funding and successful promotion of state funding. It identifies the essential components that can be drawn from existing administrative data sources to make a strong business case for future investment. It also provides evidence of state education and workforce integrated data system value, evidence that can help to inform and improve the effectiveness of future high-impact education and workforce expenditure decisions. www.jacob-france-institute.org/wp-content/uploads/JFI-WDQI-Year-Three-Research-Report1.pdf

The state’s WDQI goals cannot be summarized without reference to the DLLR’s participation as a founding member of the MLDS team. That team developed eleven policy questions that the MLDS would attempt to answer and in doing so assist the state in making policy decisions associated with the questions. The system itself and governing structures will be described in more detail below. The policy questions that are pertinent to the workforce system are:

- What happens to students who start at community colleges and do not go on to four-year institutions?
- What are the educational and labor market outcomes for individuals who use federal and state resources to obtain training at community colleges or other postsecondary institutions?
- What economic value do noncredit community college credentials have in the workplace?
- Are exiters of Maryland colleges successful in the workforce?



- How do answers to the policy questions developed by the MLDS governing body, including those cited above, vary by demographic categories such as race/ethnicity, gender, age, income level, ESL status, and geographic origin?

PARTNER RELATIONSHIPS

The cornerstone research partnership of the WDQI effort was that between the DLLR and the Jacob France Institute (JFI) at the University of Baltimore. The partnership predates the WDQI grant, and is in its twenty-first year. (Other state and local government entities have used the partnership's data storage, linkage, and analytical capabilities at different times over these years.) Due to JFI's institutional infrastructure, the longitudinal data system supported by the WDQI grant will almost certainly continue past the end of the grant.

As noted, the DLLR is also an active member of the MLDS, if also a minority compared with the majority of educational system members. The MLDS Center is an independent unit of state government established by statute in 2010 (Senate Bill 275; MD Education Articles §§ 24-701 through 24-705). The legislature authorized two million dollars in funding to build the system, which is currently housed at the newly created Maryland State Data Center and staffed by the Maryland School of Social Work at the University of Baltimore; the Center opened in July 2013.

The Maryland State Department of Education (MSDE), the Maryland Higher Education Commission (MHEC), and the DLLR are key stakeholders in the MLDS.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

Maryland uses a federated model for its longitudinal data system; each partner maintains a warehouse where its data are stored. The data systems themselves typically are legacy systems; the historical data housed in these systems varies in quality, rendering transfers and alignment of data from multiple sources difficult. Much of the current work of the MLDS Center and its membership agencies is on alignment and programming so that the systems can better communicate with one another to yield strong data and rich analysis. All databases associated with the Maryland SLDS have their metadata stored in Erwin data modeling tool. Data from the state Unemployment Insurance system, apprenticeship programs, Wagner-Peyser, and Adult Basic Education will all eventually feed into the LDS.

The MLDS Center is overseen by a twelve-member Governing Board, which includes the secretary of the Higher Education Commission; the chancellor of the University System of Maryland; the president of Morgan State University; the state superintendent of schools; the secretary of Labor, Licensing and Regulation; a representative of local superintendents of schools; the executive director of the Maryland Association of Community Colleges; the president of the Maryland Independent College and University Association; and four members of the public. At the inception of MLDS planning, the founding agencies established governance policy, technology, and privacy working groups. The MLDS data security plan was approved by the Governing Board in the fall of 2012.

The Center has executive and associate directors, and three divisions: IT and Data Management, Reporting and Portal Services, and Research and Policy Services.

DATA USE

One of the primary objectives of Maryland's WDQI grant specifically was to generate research from existing longitudinal data systems. In January 2013, researchers at JFI published *Neglecting the 'L' in a Longitudinal Integrated Data System Can Be A Costly Mistake*, a longitudinal analysis of the education, employment, and social safety net participation and outcomes of Maryland public community college enrollees of fall 1984. A second report, based on the same 1984 cohort,



Workforce Data Quality Initiative

Toward a Business Case for Sustained Investment in State Longitudinal Integrated Data Systems, was issued in January 2014. The reports shared two primary objectives:

- Make a case for the value of integrated longitudinal data systems by demonstrating outcomes analysis possible with access to select administrative records over the course of almost thirty years
- Share actionable insights for individual, agency administrative, and state policy decisions related to education, training, workforce participation, and related public services programming

Other data analysis is in the works, including a baseline report on the estimation of the impacts of the December 2007–June 2009 national recession on student enrollment in, persistence through, and completion of selected Maryland public postsecondary education programs. Other research will include an analysis of the time alignment of documented employment affiliations and earnings amounts with the enrollment profiles. Further planned studies include a replicable research design and report of findings from a multi-occupation analysis of job retention durations, inter-industry transition paths and rates, and geographic mobility profiles.

Incorporating the DLLR’s participation in the Maryland State Data System project, other major accomplishments include the creation of the data center’s public-facing portal, [Maryland State Data System Center](#). The portal includes access to longitudinal data resources for policymakers, researchers, parents and students, and employers. The home page features a variety of dashboards to demonstrate what the site can do and provide visual analysis of data related to some of the state’s key policy questions for education and the workforce. For example, one of the featured dashboards is accompanied by the policy question, “Are we producing the right degrees for Maryland jobs?” The dashboard provides access to three data tables with data relevant to the overarching question, all using data from 2009–10:

- Employment Demand for Top Twelve Occupations in Maryland by Degree Requirement
- Comparison of Job Listings for Associate Degrees Awarded and Occupations with the Largest Anticipated Demand
- Employment of CTE Graduates by Community Colleges

In addition, the dashboard offers suggestions for use, limitations, and an explanation of the data sources.

Other dashboards featured on the site respond to the following policy questions:

- Are Maryland’s high school graduates college-ready?
- What percentage of Maryland high school students enroll in college?
- How quickly and effectively do Marylanders graduate from college?
- What percentage of high school students are engaged in STEM education?
- How many two-year and four-year college degrees awarded in Maryland are STEM-related?

The MLDS team has presented its public-facing portal and dashboards to the state House Appropriations Subcommittee and to the Senate.

The MLDS’s web portal has been publically accessible since 2013. Prior to the creation of the MLDS, the state built a workforce-focused public web portal. The two systems have not yet been operationally connected.

MAJOR CHALLENGES



Workforce Data Quality Initiative

A challenge specific to the WDQI project is that the DLLR has questions that would require extracting data from DLLR's legacy system. The DLLR IT Department will have the capacity to do this eventually, but needs additional time and money, one of the primary reasons that Maryland applied for a WDQI Round 3 grant. (Maryland was not one of the Round 3 awardees.)

In terms of the workforce LDS joining the state P-20 system, the MLDS, the primary challenge is that the MLDS is, in origin and currently, very focused on education. The data center was created with US DOE RTTT (\$250 million) and state general fund seed funding; by state statute, state appropriation of twenty million dollars for ongoing support is expected in 2015. By contrast, the WDQI grant provided one million dollars, "a drop in the ocean" in terms of the funding needed to build and maintain a P-20W system. The MLDS platform requires Oracle programming expertise, which is expensive and difficult to find.

UNIQUE STRATEGIES

The existence of a relationship between the state labor agency and a state university with strong research capabilities was critical to the DLLR's success at producing groundbreaking research that demonstrates the possibilities inherent in an operational longitudinal data system.

In terms of the larger effort of the DLLR as a member of the MLDS team, the WDQI project manager (and MLDS representative for DLLR) noted that executive-level leadership was critical to the MLDS effort—that of bringing together multiple education agencies and the labor agency to create a longitudinal data system. "We were running thirty different ships and things only jelled when the governor's office got on board and said, 'Well, we're going to do this, and what should be done in four years, we will do in two.' We did four years' worth of work in one and a half years! ... If [a] person in power [i]s not interested in your program, it w[ill] not get off of the ground." She further specified that Governor O'Malley's support was critical, not only for the larger success of the MLDS effort, but in encouraging DLLR leadership to become more serious in its commitment to membership in that project. The project manager suggested that connecting the federal interest in longitudinal data systems with state leadership could result in faster roll-out.

She further notes that intensive commitment on the part of staff from each of the partner agencies was critical. Accomplishing the governor's charge in two years instead of four required numerous meetings per week for those two years—almost always supported by staff members whose primary duties were not the MLDS project.

SUSTAINABILITY PROSPECTS

The DLLR has applied for a Round 4 WDQI grant in order to continue its research and support the connection of the numerous sources of labor data to the state's MLDS.

The MLDS team intends for the MLDS Center to become economically self-sufficient. Sustainability of the system seems promising, as many agencies have approached the team with requests to query and access the system. While the MLDS does not yet have the processes or capacity to respond to these inquires, the capacity to do so is part of the operations and sustainability plan. Governor O'Malley's second term ends in 2014; thus, the sustainability of an operational longitudinal data system that supports state policymaking with data and analysis will depend in part on the new governor's agenda and commitment to data-driven governance.



MAINE

\$1,000,000

GRANTEE AGENCY

Maine Department of Labor

STATE CONTEXT

Maine's WDQI project benefited from preexisting relationships with the community college system and the state Office of Information Technology (OIT). Beginning in 2009, some community college campuses had shared data with the Maine Department of Labor (MDOL) to produce one-off reports on regional employment outcomes to meet their reporting requirements. The success of these reports was the impetus for greater collaboration between MDOL and the public higher education systems, including the University of Maine system (UMS) and the statewide community college system. Because there was already support for increased data sharing (in fact, increased data sharing was already in the plans when Maine received the WDQI grant), MDOL was one step ahead in building both a working relationship and buy-in with the community college system.

Similarly, MDOL had a close working relationship with OIT and used some of their in-house products for other projects, such as the quarterly census of employment and wages. This established relationship facilitated their ability to keep the project in-house, which was beneficial because OIT is already familiar with MDOL's data system and needs. Initially, the WDQI team struggled to find IT staff that had knowledge of SQL and databases *and* could understand the bigger picture about longitudinal data systems in order to best collaborate as partners with the team. However, the team took the time to find staff that fit their needs and, while it took more time than finding a third-party contractor, they feel the time investment was worthwhile. Using in-house staff means that they understand the dynamics of the department, understand the workforce "lingo," are more invested in the project, and are more accessible to the team.

Although Maine has had two SLDS grants (2007–11 and 2009–14), these grants have not contributed significantly to the WDQI project. Under the grants, DOL was contracted to provide data to calculate some college outputs. However, due to an inability to match K-12 student data on SSNs, there has been little crossover between the SLDS grant and the WDQI grant.

Looking forward, the WDQI project should benefit from the state legislature's heightened focus on data. Toward the end of the grant (in January 2014), the state legislature formed the State Education and Employment Outcomes Commission, established to "develop procedures to maintain and disseminate information and data from [MDOL's] educational outcome database,"¹ which is the database maintained by WDQI. The legislation tasks the commission with developing procedures to maintain and disseminate information regarding anticipated career lifetime earnings of graduates of the state's postsecondary institutions, creating procedures for the use of information provided by other state agencies, making recommendations regarding the design of the website that will house the data dashboards developed under WDQI, identifying long-term funding to maintain the database, and reporting to the legislature regarding funding for the database and the use of the database by the public and state agencies. While it remains unclear exactly how this commission will affect the WDQI project in the future (the legislation does not mention WDQI by name), the attention that the legislature is paying to the database bodes well for future sustainability.

¹ www.mainelegislature.org/legis/bills/getPDF.asp?paper=HP1253&item=1&num=126



WDQI GRANT GOALS

Maine's original grant plan was very ambitious. The Maine WDQI team planned to create linkages to data from multiple agencies, including the Bureau of Employment Services (BES), Bureau of Rehabilitation Services (BRS), UMS, the community college system, Department of Health and Human Services (DHHS), and Department of Education (DOE), and to produce reports with multiple metrics for each partner. They quickly realized that they had underestimated the amount of time it would take to develop the data warehouse, link data, and come to an agreement with partners on the most appropriate metrics. As a result, the WDQI team refined their goals to focus on a few partners at a time and reduced the number of metrics that would be used for each partner. Using that strategy, they were able to demonstrate success by calculating graduate employment and earnings in the first year after graduation for community college and four-year university students, a result that helped build momentum to move the project forward. They focused first on developing data dashboards for the community college system and UMS and later focused on BES and BRS. In the next round of funding, the WDQI team hopes to expand their partnerships with DHHS and DOE and to focus on deeper research questions with the community colleges and UMS. For example, they want to investigate employment outcomes by degree and field of study in the third and fifth year after graduation, the proportion of graduates who are employed in the third and fifth year after graduation, and which industries tend to have higher employment rates and wage levels. After these have been established, they will move on to deeper questions.

The WDQI team is currently working on establishing a data-sharing agreement with DHHS that makes both agencies feel comfortable. Once the data are linked, they want to look at employment and wage outcomes for recipients of TANF and SNAP. After they finalize the data-sharing agreement, they will identify more specific research questions.

PARTNER RELATIONSHIPS

Key partners with WDQI include the community colleges, UMS, BRS, and BES. The relationships with each of these agencies have strengthened over time, particularly in the last year as the project has made tangible progress on the data products. The WDQI project does not currently have a formal data governance system. WDQI staff is developing a loose data governance manual that describes their processes. When it is finished, they will share the manual with their partners for feedback. They have an oversight committee that includes representatives from each agency they have data-sharing agreements with. They met more frequently in the beginning and plan to meet again as the grant wraps up for a debriefing meeting. Generally, most of the communication occurs on a more individual basis rather than through the oversight committee. Key partnerships are described below.

Community College System / University of Maine System: As described above, MDOL had been providing data to community colleges on an individual basis since 2009. Under WDQI, it began working with the community college system as a group, as well as the University of Maine system, to develop data dashboards that would serve as both a planning tool for the schools and a public-facing product for consumers. MDOL worked in tandem with representatives from both systems on the design of the data dashboard, engaging in an iterative process to create a product valued by the colleges. A tumultuous budget climate complicated the process; schools began to feel vulnerable and wary of what the data might reveal. WDQI staff spent a lot of time reworking different versions of the data dashboard and hashing out how granular the reports would be. In the end, the colleges agreed to a more complete and granular version of the dashboard featuring useful information for consumers, faculty, and college leaders. While investing time and resources in this iterative process was burdensome for the WDQI project, it resulted in strong support of the product. MDOL hopes that the community college and University of Maine systems will be able to pay for the product in the future in order to sustain the work. MDOL is currently working with the schools to develop a marketing and training plan that will help school staff talk to policymakers and other stakeholders about the information presented in the reports.



Workforce Data Quality Initiative

Bureau of Rehabilitation Services: Although BRS is excited about the ability of the WDQI project to match data, because they have not had access to this type of information in the past, they appear to receive less value from the products than the schools do. Because BRS serves a very different population than does the schools, its needs in terms of metrics and data products have been very different and the team had to create different metrics for its dashboard.

Bureau of Employment Services: The WDQI collaboration with BES was stymied by the latter's planned transition to a new data system. Though WDQI staff spent the better part of the grant waiting for the transition to occur in order to start linking the data, in the belief that linking beforehand would be a waste of resources, the agency decided to stick with their old system at the last minute. As a result, the WDQI team is still in the process of developing the technical logistics around sharing the data and has not yet developed a product.

Office of Information Technology: As described above, OIT houses the data for WDQI. In order to facilitate WDQI's access to the department, the grant partially funds some OIT staff, allowing WDQI team members to access OIT staff without requesting a ticket.

Department of Education: Although the WDQI partnership with DoE is not well established because WDQI and DoE have not found an effective way to link wage records with K-12 education records, which do not have SSNs, they do produce quarterly reports for Adult Basic Education (ABE) and one-off reports for Special Education to help them meet their reporting requirements. Because ABE and Special Education records usually have SSNs, data matching has not been an issue for these reports.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

The WDQI warehouse was developed in-house by OIT. The community colleges and UMS send school records to OIT quarterly using secure file transfer protocol. (At a later date, they will probably transition to one annual data dump.) BRS and BES contribute data annually. The WDQI team uses Oracle Business Intelligence Enterprise Edition (OBIEE) to interact with the database and they produce data visuals for the dashboards with Tableau. They are currently working on a data dictionary and the development of business rules. Because data linkages to BES were delayed, they have not yet completely mapped out all the elements, which has slowed the development of the data dictionary. They will focus more on system documentation after they finish modeling the BES data in the existing warehouse.

It is worth noting that OIT developed a converter that allows data contributors to check their data and convert their files to xml before submitting them over secure file transfer protocol to OIT. The converter does not require advanced computer skills and can be shared easily over DropBox. The converter rejects characters that are not legal (e.g., numbers are in fields that should have letters), encouraging data contributors to be more accountable about sharing clean data. It also allows the data contributors to have a greater sense of what data they are sending and understand the file format better. WDQI staff believe it has saved OIT time in cleaning data and strengthens partner involvement in the data process.

DATA USE

Because the WDQI team is still linking data with BES, developing data dashboards with BRS, and finalizing data dashboards with the school partners, the data have not yet been used extensively by partners. The colleges are currently sharing the data dashboards with their staff and thinking about how they can train staff on strategically using and sharing the information to improve programming and communicate with stakeholders.

MAJOR CHALLENGES



Workforce Data Quality Initiative

The most significant challenge, and the reason the Maine WDQI team was granted an extension, was the delay BES faced in transitioning to a new data system. Because project staff were waiting for BES to adopt its new system before beginning to match the data and BES only recently decided to stick with their old system, the WDQI team is only now working with OIT to model BES data into the warehouse.

The inability to use SSNs to link K-12 data and labor outcomes posed a second major challenge. Because this seemed like a monumental challenge to overcome, the team decided to focus first on developing linkages with their other partners and think about alternative methods for linking the K-12 data at another time. They hope to focus on that in the near future.

UNIQUE STRATEGIES

The team developed a sophisticated metric to calculate average first-year earnings of graduates, one that provides a better picture than more traditional calculations. They use earnings for graduates working full time in the third through sixth quarters after graduation; in order to meet this definition of full-time work, graduates must have earned a total of at least thirty times the hourly state minimum wage in all thirteen weeks during these quarters (i.e., at least as much as someone who worked at minimum wage for thirty hours per week).

SUSTAINABILITY PROSPECTS

The Maine WDQI team is hoping to receive another round of funding to continue the project. They also hope to transition to a fee-for-service model, which they believe their partners may accept because they value the product. In addition, MDOL has some funding set aside to keep the servers going and to continue to add data if other funding is not found, although in that case they would not be able to produce any reports. Due to new interest in data at the state level, as demonstrated by the legislation that created the State Education and Employment Outcomes Commission, they may be able to secure general fund allocations in the future. As mentioned previously, the legislation tasks the commission with identifying viable long-term funding methods to maintain the database. It is yet to be seen what this new commission will mean for the WDQI project.



MINNESOTA

\$1,000,000

GRANTEE AGENCY

Minnesota Department of Employment and Economic Development (MN DEED)

STATE CONTEXT

MN DEED has a long history of data sharing with other agencies, including sharing with the Minnesota Department of Education (MN DOE), the Minnesota Office of Higher Education (MN OHE), and the Minnesota Department of Human Services (MN DHS). In the case of MN DHS, because MN DEED serves some of the MN DHS clients funded by Temporary Assistance to Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP), the two agencies have been sharing data for over twenty years, so that MN DHS can access the employment outcomes of its participants.

MN DEED was awarded a WDQI grant in 2010 with the aim of creating a workforce-education longitudinal data system (MN-WELDS) to link workforce and education datasets. Prior to that time, in 2006, MN DOE was awarded a State Longitudinal Data System (SLDS) grant for \$3.3 million from the U.S. Department of Education and also obtained an additional \$12.4 million in 2009 under an American Recovery and Reinvestment Act (ARRA) grant. MN DOE had thus begun to create their SLDS with education data when, in 2010, MN DEED was added to the SLDS governance structure. Even though the two agencies collaborate and share data with one another, MN DOE and MN DEED are developing parallel data systems. The administration of the SLDS system will eventually be moved to MN OHE and MN DEED will continue working with them on the SLDS.

WDQI GRANT GOALS

MN DEED had four main goals in the implementation of WDQI:

- (1) Develop longitudinal database capacity so that employment and education data are combined in a central repository
- (2) Use MN-WELDS for research and analysis that can influence policy decisions
- (3) Disseminate and publish findings of research
- (4) Sustain MN-WELDS after WDQI grant expires

PARTNER RELATIONSHIPS

MN DEED has a number of key partners with whom they share data. MN DOE, MN OHE, Minnesota State Colleges and Universities (MN SCU), and the University of Minnesota all contribute data to MN-WELDS. The data shared in MN-WELDS from MN DOE includes Adult Basic Education only; to merge K-12 and employment data, MN DEED contributes their data to the MN DOE SLDS. MN DHS gets data from MN DEED to assess the employment outcomes of their participants.



Workforce Data Quality Initiative

As the SLDS project advanced, MN DEED and MN DOE forged a closer relationship, moving beyond simply data sharing, and MN DEED became more active in the data governance structure. Staff members from MN DEED met frequently with other agencies working on SLDS as part of that structure, which included staff from MN DOE, MN OHE, and postsecondary institutions. MN DEED staff sat on numerous SLDS committees, which included a committee for agency commissioners from MN OHE, MN DOE, and MN DEED, a research and data committee, a coordinators’ committee, and a subcommittee for developing data access policy. In one example of coordination, MN DEED staff on the data access policy subcommittee helped draft a thirty-page document outlining data access policies and procedures for use of SLDS data. The coordination between MN DEED and MN DOE included all levels of the agencies, from the commissioners to legal teams to management to program staff.

In addition, MN DEED worked closely with MN DOE to assist them in understanding and using workforce data. MN DEED advised the SLDS team on the most accurate method of linking education data and workforce data to ensure the quality of the matches. MN DEED and MN DOE have often communicated about the meaning of the data in their respective systems.

MN DEED noted that this level of interagency collaboration under MN-WELDS and SLDS was unprecedented.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

To accomplish the WDQI grant goal of creating a database that houses workforce and education data, MN DEED contributed its program data (Wagner-Peyser, WIA, TAA) and UI data to the SLDS. All datasets included in MN-WELDS are also included in the SLDS warehouse and the systems share the same data elements and dictionary. As a result, SLDS is a fully developed P-20W warehouse including K-12 enrollment, post-secondary enrollment, UI wage data, ACT scores, college entrance scores, GED status, Adult Basic Education data, K-12 assessment, Kindergarten Readiness data, National Student Clearinghouse data, DEED eligibility-based program data, and Wagner-Peyser Employment Services client data. However, the matching algorithm still needs to be improved so that there is a better probabilistic match rate between workforce and education data. Due to a high security threshold, MN DEED only gets deidentified matched data from SLDS, so it is difficult to validate the SLDS data and compare it to MN DEED data. MN DEED is hopeful to get identified data in the future, enabling it to do validation on SLDS data and improve the matching process.

Thus, at the same time the SLDS was being constructed, MN DEED built its own database, MN-WELDS, that merges workforce, adult education, and postsecondary data, as shown in the table below.

Program	Agency	Confidentiality Requirements	Unique Identifier
WIA IB (Adult / Dislocated Worker / Youth)	MN DEED	State Statute	SSN
Wagner-Peyser Employment Services (ES) / Veterans	MN DEED	State Statute	SSN
Trade Act Assistance	MN DEED	State Statute	SSN
State E&T programs (Diversionary Work ES, MN Family Investment ES, MN Youth, Supplemental Nutrition Assistance ET)	MN DEED & MN DHS	State Statute	SSN
UI wage records	MN DEED	State Statute, 20 CFR Part 603	SSN



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Quarterly Census of Employment and Wages (QCEW) by industry, size, and geographic information	MN DEED	None	Ten-digit Minnesota UI account number
Adult Basic Education (ABE)	MN DOE	State Statute, FERPA	SSN
Public postsecondary education	MN State Colleges and Universities (MN SCU), University of MN	State Statute, FERPA	SSN
Public and private postsecondary education	MN OHE	State Statute, FERPA	SSN

The database has historical data from MN DEED and MN DHS, and two years of data from postsecondary institutions; MN DEED hopes to get more years of postsecondary data in the future. MN DEED is also able to link to UI claims data, but these datasets are too large to be merged permanently; instead, they can pull an extract of data from MN-WELDS and merge it with a subset of UI claims data. At this time, MN DEED is not able to add K-12 data to MN-WELDS because these datasets do not have the Social Security numbers (SSNs) needed to do the match. MN DEED had explored using Department of Transportation (DOT) records as an intermediary to match workforce and K-12 data, but this avenue was not fruitful.

Initially, MN DEED planned to construct an LDS warehouse using a third-party vendor, but realized that at this point in their system development it was more pragmatic to build a relational database model that could meet the project needs for the time being, tabling a larger investment in a warehouse model. Because many workforce development research questions are complex (e.g., understanding how people flow in and out of workforce programs and the labor market), MN DEED found that they needed to explore the functionality they desired from a warehouse before committing resources to building a system that could have required significant changes postconstruction. MN DEED was thus able to use in-house IT expertise to create their relational database, using their own Structured Query Language (SQL) server.

As part of their development process, MN DEED developed a database schema, data dictionary, metrics for workforce and other program outcomes (e.g., definitions for part- and full-time employment, full-time wages, hourly wages, etc.), and a methodology for generating matching documentation. MN DEED found that documenting and standardizing data was an important, though time-consuming process. They convened meetings with data-sharing partners to discuss the definitions of data fields and how data from different sources should be aligned.

As for the reporting capabilities of the database, although MN-WELDS does not yet have a data mart, MN DEED was able to ask state IT staff to use SQL scripts to turn data into secure views that can be displayed online in a searchable tool that incorporates charts.

DATA USE

MN DEED has used its in-house capabilities to conduct research. MN DEED has staff analysts that conduct research for the agency and for other state department and postsecondary institutions. MN DEED has found that staff analysts are best situated to produce research tools and reports because they have the most detailed understanding of the specifics of labor market and program data.

MN DEED initially developed a very ambitious research agenda, however, with limits on the years of data available from the postsecondary institutions, they reassessed and created a more feasible set of research questions. The process of developing a functional research agenda took quite a bit of intense coordination between the MN DEED labor market



Workforce Data Quality Initiative

information team and the performance management team to create a final (although still “living”) research agenda document. MN DEED is hoping that more historical data from postsecondary institutions will become available to use for longitudinal analysis in the future.

Using WDQI funding, Labor Market Information Office of MN DEED has produced a number of articles published in MN DEED’s research publications, *Minnesota Economic Trends* (quarterly) and *Minnesota Employment Review* (monthly), listed below:

- An analysis of wage increases associated with increased training of healthcare and construction workers: “Back to the Classroom,” *Minnesota Economic Trends*, December 2012
<http://mn.gov/deed/newscenter/publications/trends/december-2012/back-to-classroom.jsp>
- An exploration of how to predict postsecondary enrollment levels: “Using Unemployment Rates to Predict Post-Secondary Enrollment,” *Minnesota Employment Review*, February 2012
<http://mn.gov/deed/newscenter/publications/review/february-2013/unemployment-college-enrollment.jsp>
- An analysis of work outcomes for Twin Cities Ford Plant employees affected by mass layoffs: “Life after Ford,” *Minnesota Economic Trends*, June 2013
<http://cdm16105.contentdm.oclc.org/cdm/compoundobject/collection/p16105coll3/id/1580/rec/4>
- An analysis of industry and geographic mobility of the nursing workforce: “Geographic and Industry Mobility of New Nursing Grads,” *Minnesota Employment Review*, January 2014
<http://mn.gov/deed/newscenter/publications/review/january-2014/nursing-grads.jsp>
- An overview of the metrics developed in 2014 to evaluate labor market outcomes of recent Minnesota graduates: “Measuring Employment Outcomes for Graduates,” *Minnesota Economic Trends*, March 2014
<http://mn.gov/deed/newscenter/publications/trends/March-2014/employment-outcomes.jsp>

MN DEED also constructed a public-facing online consumer reporting tool.¹ This tool allows the public to view how many recent Minnesota graduates found jobs during the first year after graduation, the wages they earned, and other labor market indicators. All results can be filtered by region, award level, institution type, and Classification of Instructional Programs (CIP) codes.

The tool’s intended audiences are:

- Prospective students, to set realistic expectations for employment and wages following graduation in any given program
- Parents and career counselors, to help prospective students make informed decisions that weigh prospects for employment and earnings following graduation
- Education program planners interested in more closely aligning program offerings to labor market demand

¹ The tool can be found at <https://apps.deed.state.mn.us/lmi/etd/default.aspx>, with a description of the tool, a discussion of notable findings, a glossary, and documentation on the methodology and limitations found at <http://mn.gov/deed/data/data-tools/graduate-employment-outcomes.jsp>.



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- Policymakers interested in identifying potential under-supply or over-supply of skilled labor in strategic sectors of the economy and evaluating the state's return on investment in institutions of higher education

MN DEED was able to use existing programming code in SQL to automatically roll up data, apply an automatic suppression scheme, and create an updated online view every time that a new batch of data is uploaded. For the tool, MN DEED currently uses graphics developed in .NET, but DEED has started exploring the use of Tableau to build dashboards and data stories drawing from the WDQI data views.² So even though MN DEED did not invest in business intelligence data marts or data cubes, they used in-house capabilities to construct similar products.

MAJOR CHALLENGES

MN DEED faced two major challenges over the course of their WDQI grant. The first was in understanding the technical options available to construct the system. The second was in accessing data from postsecondary institutions. At the end of the grant, MN DEED had navigated these challenges in a way that allowed their database and data products to be successfully developed.

As mentioned above, MN DEED originally planned to use a third-party vendor to build a data warehouse. They found that understanding the technical options available to them was quite difficult and they lost quite a bit of time exploring the potential use of business intelligence tools, a route that they later abandoned. Eventually, MN DEED realized that the functionality provided by a relational database was sufficient to meet project needs. Another factor that complicated their progress in this area was a miscommunication with the IT department about the qualities MN DEED desired in a data system. Following that, MN DEED worked to better communicate their vision to the IT department and the IT department was able to better explain the technical options available. Together they were able to successfully launch the tool interface that MN DEED needed. The LMI staff developed the relational database and the IT department assisted with the ETL process that allows data to be moved from development to staging and finally to a production environment for publication.

MN DEED faced a few hurdles in obtaining postsecondary data. The first is that obtaining data on postsecondary completers from MN OHE took longer than anticipated and included only two years of data. Due to these delays, MN DEED had to condense much of the complex metric development and analysis needed for its reports and online consumer reporting tool and this delayed the publication of the tool. In addition, MN DEED had to navigate complicated data suppression rules for the data used in the online tool, which further delayed publication of the tool. MN OHE has separate agreements with each postsecondary system and individual institution and these agreements specify that no individual institution can be identified in public reporting of outcomes. So the online tool was not able to distinguish the outcomes for individual schools, and MN DEED needed to suppress data that would indicate outcomes were from a particular school even when the school was not directly identified.³ This meant that if only one institution in the state offered a particular education or training program that program had to be omitted from the tool because users could deduce that those outcomes were for a specific institution. MN DEED is hopeful that data will be forthcoming more

² Tableau is visual analytics software (<http://www.tableausoftware.com>).

³ Despite the fact that the tool does not identify the names of individual schools and presents information by institution type only, MN DEED suppressed program data that came from a single institution and could potentially reveal the identity of the institution itself.



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quickly in the future and that confidentiality waivers might be obtained to allow them to publish outcomes by institution, even when they potentially would enable the disclosure of data from a single institution.⁴

UNIQUE STRATEGIES

MN DEED's strategy of employing in-house expertise was very beneficial to project outcomes. MN DEED staff was very familiar with the peculiarities of workforce data, so they could easily flag issues and quickly move to build metrics and conduct analyses. In addition, the MN DEED researchers plan to conduct outreach to educate stakeholders (including regional Labor Market Information analysts, workforce center case managers and staff, and postsecondary and high school counselors) about the online consumer reporting tool and how they can use it in their work. MN DEED is well positioned to do this outreach because staff members have in-house knowledge of the data and have access to the network of American Job Center users and case managers. MN DEED hopes that by using this dissemination and training strategy, these stakeholders can better educate potential trainees or students about the real-world employment outcomes of education or training options and help them make data-driven decisions about their career paths.

Using state LMI staff database development and state IT staff for online tool development allowed MN DEED to work closely with state staff to design the features that were most desirable and will allow them to make changes as they are needed in the future; if MN DEED had used a third-party contractor, they would have to re-engage them to make any modification or enhancements to the system.

SUSTAINABILITY PROSPECTS

The Minnesota SLDS obtained funding from the state legislature for fiscal years 2014 and 2015 (\$882,000 per year) to sustain and expand its efforts. The majority of that funding will go to the state IT department to maintain the infrastructure of the SLDS data warehouse and acquire additional data through purchase in development. The remaining funds will be allocated by all the SLDS partners collectively (MN DOE, MN OHE, MN DEED) to support the SLDS system.

In addition, MN DEED was allocated \$500,000 per year for two years by the legislature for pilot projects that use MN-WELDS data to guide job seekers (especially WIA participants) in obtaining training that better aligns with employer requirements and for projects that will assist training providers in developing better-aligned educational programs.

MN DEED will continue to build on their collaboration with the SLDS team to improve the data that are contained in that system and MN DEED will continue to contribute data to the SLDS. Both SLDS and MN DEED partners see value in working together to make the data warehouse a successful collaboration. Meanwhile, MN DEED is likely to retain its own database for internal purposes, at least until all data can successfully be matched and workforce data can be queried from SLDS.

⁴ The tool was never intended to display names of individual schools, but sometimes within the same institution type there is only one school that offers a specific program.



MISSOURI

\$1,000,000

GRANTEE AGENCY

Missouri Department of Economic Development, Division of Workforce Development (DWD)

STATE CONTEXT

The Missouri state workforce agency, the Missouri Department of Economic Development (DED), Division of Workforce Development (DWD), was actively involved in the years before WDQI in the development of a pilot workforce longitudinal data system for Missouri under a National Governor's Association (NGA) / Kaufmann Foundation Honor State's Grant for Longitudinal Data Analysis. Under the NGA grant, the DWD in collaboration with other Missouri agencies such as the Missouri Department of Elementary and Secondary Education (DESE) and the Missouri Department of Higher Education (MDHE) jointly developed a pilot longitudinal data system which was housed at the University of Missouri Columbia (UMC) and provided the basis for data linkage between the existing SLDS and workforce information, culminating in the release of three LDS Stakeholder Feedback Reports in early 2010.

Although the NGA grant demonstrated many of the difficulties of matching K-12 education data with employment outcomes, one important benefit of the project came from a P-20 data sharing governance document that was approved by the Missouri DED, DESE, and MDHE in December 2008. The document detailed the oversight responsibility of the interdisciplinary state agencies for reviewing and approving research requests and uses of data linkages across data systems. Additional benefits from the NGA grant came from the experience gained by the Missouri agencies in working through the process of linking and analyzing unit records from the various agency databases. Key to the process was an understanding of the limitations of linking unit records from education to labor force data via valid Social Security Numbers (SSNs), as the SLDS and the DESE K-12 database, the Missouri Student Information System, do not require the SSN as a data field and instead use a Missouri Student Information System identification (MOSIS ID) as the unit record identifier. The linking process, limitations of data linkage, and analysis conducted under the NGA grant were documented in a white paper in early 2010 for SLDS planning and implementation. The WDQI proposal built on this expertise in longitudinal data analysis, and attempted to make use of the existing data structures.

WDQI GRANT GOALS

Missouri DWD proposed to construct a system that would emphasize links between the existing educational enrollment data, labor force outcome measures (UI wage record data), adult training programs (WIA, TAA, AEL, GED, Vocational Rehabilitation), social support services (TANF and food stamps), and job search support (Wagner-Peyser and UI). The primary link between the education data and labor market measures was envisioned to be through individual records providing postsecondary enrollment and graduation. The proposed workforce LDS was to provide links to wage record data from employers not covered by state UI wage records, using the FEDES and WRIS systems.

Five written reports were to be produced:

- *WIA and TAA adult training program outcomes.* Participants in program years 2007–2010 (July 2007-June 2010) for the WIA Adult and Dislocated Worker programs, and TAA would be examined, separating analyses by the level of service in order to compare participants receiving training with those receiving less intensive services.
- *Wagner-Peyser and UI recipient outcomes.* Parallel analyses would be undertaken for participants in Wagner-Peyser activities and Unemployment Insurance benefit recipients, who generally receive low-intensity services.



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- *Matching analyses.* Matching analyses would compare outcomes for participants receiving training (Adult and Dislocated Worker programs, TAA) with individuals receiving only Wagner-Peyser service or UI benefits. These analyses permit a comparison of individuals who have similar demographic characteristics and prior employment and earnings histories, allowing inferences about the value of training.
- *Field of study and labor force outcomes.* This study would focus on the articulation between college studies and labor market outcomes, examining graduates from public postsecondary institutions in the state for the period July 2006–June 2011.
- *College choice and teaching careers factors.* For this report, college graduates would be matched both with the UI wage record data and with the DESE dataset providing information on public school (K-12) teachers. The analysis would examine the determinants of the decision to enter teaching, including college major, individual characteristics, and, for those who attended secondary school in Missouri, high school grades and test scores.

PARTNER RELATIONSHIPS

Three working groups were created to oversee the work on the WDQI project. There was a kickoff meeting in late February 2012 where all these three groups participated. This meeting was designed to build momentum for the project and secure the commitment of all the major participants. The meeting was also used to clarify some of the responsibilities of the parties involved.

- The first group was the “legal” group, staffed mostly with attorneys and specialists who oversaw all the MOUs for data sharing.
- The second group managed the entire IT component. There were two subgroups in this group: the core IT team, which was charged with developing all the IT solutions, and the larger IT group, which also had participants from education agencies.
- The third group was called the “WDQI Implementation” team, but it was in fact a governance/policy group. They gathered high-level representatives from several relevant agencies.

In many ways, the most important group was the third because it comprised important officials from various agencies, including DED, DESE, MDHE, Department of Labor and Industrial Relations, and Department of Social Services.

University of Missouri Columbia was contracted to provide all the research products.

The relationships between DED and all the partners were excellent, however there were difficulties building lasting connections with data from DESE. DESE provided an extract of necessary data to develop the research products but the larger, on-going connection of information within the longitudinal data system has not been completed due to concerns DESE has over security and usage.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

SSNs and other identifying elements were used to merge data from different transactional systems or other longitudinal data platforms in the workforce LDS. A linking reference table was established in the workforce LDS that stores unique identifiers for other data platforms where records have been matched. The ClientId (LDS unique identifier) and MOSIS ID (SLDS unique identifier) are fields included in this table and represent workforce data and education data respectively.

The team opted for a data warehouse as the main strategy to build the LDS architecture. The data were first loaded into a staging area. At that point, personally identifiable data were deleted, and the data were loaded into the warehouse, after which the data from the staging area were deleted.



Workforce Data Quality Initiative

Data transfers from partners are going to continue after the end of the grant, and they will continue feeding the online tool with fresh data. New data is expected to be loaded at least once each year (usually in summer). There will be a rolling period of seven years in reporting the data—in other words, once a new year of data comes in, the oldest year will be dropped.

DATA USE

The WDQI team created a web-based data visualization and reporting tool using the data developed through WDQI. Called the Wage Explorer¹, the tool allows online users to explore links between various training choices and employment outcomes. For each field of training, the tool presents the average wages for graduates at four different levels: certificate, associate's, bachelor's, and master's. The results are available for the whole state and also for individual Workforce Investment Areas.

As of late May 2014, of the five reports initially planned, three—outcome analyses for WIA and TAA adult training programs, outcome analyses for Wagner-Peyser and UI recipients, and field of study and labor force outcomes—were completed. Two other reports—matching analyses, and college choice and teaching careers—were in the final stages of completion; they were available to the grantee in draft form but still being vetted editorially.

MAJOR CHALLENGES

The education partners (especially DESE) have been nervous about data sharing. In the interpretation of the WDQI team members, this was partially the result of uncertainty regarding how the data will be used. In particular, the education partners appeared concerned about the possibility that the linked data could be used to criticize education agencies. The team dealt with this by assuring the education partners that the role of education data is to answer questions that are mutually important to education and workforce partners. In addition, the WDQI team learned that it is often important not to pose questions that would require too much deliberation and opposition.

UNIQUE STRATEGIES

One of the greatest successes of the grant has been the team's ability to create a web-based data visualization tool using the data developed through WDQI. Called the Wage Explorer, the tool allows online users to explore the links between various training choices and employment outcomes. This tool is remarkable because it is an additional product that was not mentioned in the original funding proposal. The WDQI team, however, felt that having an online tool would go a long way toward demonstrating the value of the grant to partners and potential future funders, resulting in increased chances of sustainability. As of May 2014, an external vendor was hired to perform a number of enhancements, including a new search function and additional features such as the ability to compare the graduates from one type of training with all graduates. The enhancements were to be finalized by the end of May 2014.

SUSTAINABILITY PROSPECTS

In 2012, WDQI has been approached by St. Louis Regional Chamber and Growth Association (RCGA) with a proposal for collaboration. RCGA has an initiative called "76,000 Degrees" that aims to improve the educational attainment of the St. Louis metropolitan area by adding 76,000 people with advanced degrees to the labor pool. Although the discussions have not yet led to a contract, RCGA expressed an interest in using the WDQI database for this project. The WDQI team will continue to explore this exciting option with a view to extending the life of the project after the WDQI grant ends.

¹ www.missourieconomy.org/wdqi/reportcard/SelectionPage.aspx



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Data transfers from partners are going to continue after the end of the grant, and they will continue feeding the online tool with fresh data annually, maintaining data for the seven most recent years. The cost of loading the data and maintaining the system will be low—just a few hours of staff time. Therefore, even in the eventuality that no more funds are attracted to the project, the LDS will continue to grow. The WDQI members are aware, however, that additional funding is highly desirable in order to be able to expand the functionality and the uses of the online tool and of the longitudinal database. To this end, the team has submitted a proposal to be awarded funding under the fourth wave of WDQI.

Another avenue for sustainability has been created by the DOL-funded TAACCCT grants. Because DOL requires all the projects it funds through TAACCCT to be evaluated, the resulting need to gather data for evaluation makes databases created by the WDQI grant very attractive because they typically have data on the receipt of educational training, receipt of labor market services, and labor market outcomes, all from the same source. DWD has been approached, and is working with, one of the consortia that received funding under TAACCCT Round 4, to supply data for the evaluation. The availability of educational and workforce development data from the same source makes the WDQI database an attractive source of data for many similar projects in the future, potentially contributing to long-term sustainability.



NORTH DAKOTA

\$1,000,000

GRANTEE AGENCY

Job Service North Dakota (JSND)

STATE CONTEXT

North Dakota began their WDQI project drawing on more than fifteen years of experience matching education, training, and workforce data for state and federally managed reporting requirements. Prior to WDQI, data from different agencies were matched in an ad-hoc and as-needed basis in FINDET (Follow-up Information on North Dakota Training and Education), the state’s system for longitudinal reporting. For fifteen years, FINDET was sufficient for exchanging data across agencies and producing accountability measures required by state legislature, including statistics on employments of graduates, responsiveness to workforce training needs, and follow-up on WIA, DHS, and TANF participants.

In 2007, the state legislature created the multi-agency Statewide Longitudinal Data System (SLDS) committee to develop a plan for incorporating educational and workforce data into a more robust longitudinal system, with an infrastructure for storing matched data and the capacity to meet the growing demands for longitudinal research, reports, and data access in the state. The legislatively mandated SLDS committee includes representatives from key stakeholder agencies, from workforce and K-12 to human services and commerce. Represented agencies include: (1) North Dakota Workforce Development, (2) Department of Public Instruction, (3) Information Technology Department, (4) Job Service North Dakota, (5) North Dakota University System, (6) Commerce Department, (7) Education Technology Council, (8) Career and Technical Education, (9) Department of Human Services, (10) North Dakota Council of Educational Leaders, and (11) the Governor’s office. The mission of the committee is to “propose, develop, and govern a system for sharing longitudinal data that will maximize the usefulness of management information to stakeholders and partners of North Dakota education, training, employment and service systems while protecting the privacy and security of personal information.”

Based on recommendations from the SLDS committee, North Dakota pursued federal funding and put aside state funding to build a more robust longitudinal data system that would integrate education and workforce data. The development of a longitudinal K-12 data warehouse (the North Dakota Educational Longitudinal Data System or ndSLEDS) was supported with a \$6.7 million grant from the Department of Education, received in 2009 under the American Recovery and Reinvestment Act (ARRA). For higher education data, the North Dakota University System (NDUS) implemented a common student information system with unique student identifiers and SSNs to link secondary and postsecondary data with workforce data. In addition to the \$1 million WDQI grant, the state set aside an additional \$2.2 million to extend the education longitudinal system with workforce data.

WDQI GRANT GOALS

The WDQI grant in North Dakota was granted to Job Service North Dakota (JSND), the state workforce agency that delivers services to targeted workforce sectors, administers the state and federal unemployment insurance program, and provides labor market information. The grant focused on three main objectives:

- 1) Expanding the capacity to deliver longitudinal data by creating a data warehouse and upgrading reporting technology at JSND



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- 2) Improving the quality of workforce data and expanding the capacity to link workforce and education data, in order to analyze fully supply/demand linkages
- 3) Demonstrating the value of longitudinal data by generating important research

North Dakota organized its grant work into three major phases with milestones and deliverables:

- Phase I: Data Sharing Agreement Data Sets: Build a data warehouse within JSND, linking formerly disparate datasets and systems including wage records, employer records, WIA data, and other data sets.
- Phase II: Grant Data Sets: Expand the JSND data warehouse to include job search data, Unemployment Insurance (UI) claims and payments, and other workforce data.
- Phase III: Research, Reporting, and Expansion: Expand on previously implemented data sets and/or add additional data sets for JSND reporting needs, depending on time, resources, and budgets. Within the grant scope for Phase III, North Dakota aimed to:
 - Evaluate outcomes of JSND workforce training programs and show changes in salary, employment status, and program cost per participant
 - Analyze high school dropouts and graduates who do not attend college and their ability to find employment in North Dakota
 - Analyze programs used by UI claimants and the effectiveness of educational and training programs to facilitate rapid re-employment
 - Conduct a supply-demand analysis of job seekers and their ability to find employment in North Dakota

PARTNER RELATIONSHIPS

Because the WDQI project fits into the state mandate and under the umbrella of the state's multi-agency SLDS committee, the project began with many key partnerships already in place. The legislated SLDS committee includes representatives from all of the major state agencies, ranging from K-12, postsecondary, and career and technology education to workforce, commerce, and human services. Prior to the beginning of the WDQI project, seven¹ agencies had already signed an interagency data-sharing agreement for a statewide longitudinal data system among education, workforce, and training entities, to be housed in the state's Information Technology Department (ITD).

Throughout the WDQI grant, members from multiple project teams coordinated to ensure that the K-12 and workforce data warehouses were aligned and could be linked. On a data governance level, members of the WDQI team attended quarterly SLDS committee meetings along with members of the Department of Public Instruction (K-12), NDUS (postsecondary), and other state agencies. On a technical level, members from the WDQI and the K-12 technical teams coordinated on technical strategy to ensure compatibility and successful matching with the Master Person Index (MPI), an index that includes key demographic information for matching across systems.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

The WDQI warehouse is one of three centralized data warehouses within the larger SLDS project in North Dakota, along with K-12 and higher education. Similar to a federated system, the three data warehouses hold their respective data sets separately and match using MPIs for each warehouse. The educational and workforce systems are housed in the state's

¹ The seven agencies that signed the interagency agreement prior to WDQI were: JSND, Information Technology Department, North Dakota Workforce Development Council, North Dakota Department of Human Services, Career and Technical Education, Department of Public Instruction, and NDUS.



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ITD and are designed to have the same infrastructure, in order to support linkages and building aggregate tables. Both the educational and the workforce data projects also contracted with OtisED, a data management solutions and software research and development firm. Looking forward, the SLDS committee hopes to overcome legal and licensing issues in order to house the workforce data in the educational warehouses, allowing the projects to avoid duplication and reduce costs.

JSND serves as the owner and point of access for the WDQI warehouse, which draws on workforce data from in-house programs. Over the course of the grant, the following datasets were incorporated and linked in the WDQI warehouse: WIA (youth, adult, and dislocated workers), TAA, Wagner-Peyser, UI claims and payments, employer and wage data, Workforce 20/20 (a state-funded program for retraining and training upgrades to support introduction of new technologies in the workplace), New Jobs Training (support for businesses to create new employment opportunities through expansion and relocation to North Dakota), and Job Opportunities and Basic Skills (a companion program to TANF that focuses on work-readiness, training, and job placement). For all workforce data sets, the project completed models, configuration with the MPI, and validation reports.

DATA USE

North Dakota invested the majority of its grant resources in building the WDQI data warehouse, with a limited focus on data use. During Phase 3 of the project, six distinct reporting functions were developed to meet federal and state reporting requirements and provide on-going analysis in areas of interest to the state. These reports were: (1) Wage Change Report, (2) Employment Status Report, (3) High School Drop Out and High School Graduate Report, (4) UI Claimant Program Participation Effectiveness Report, (5) Analysis of Job Seekers and Employment Report, and (6) Job Seeker Supply/Demand and Employment Ability Report. At the conclusion of the grant, all six reports had been developed and deployed with one report still undergoing additional testing. During the grant period, requests for access were limited because the WDQI project team was not prepared to share data from the warehouse.

At the conclusion of the grant, the goal for the North Dakota WDQI database is to maintain its existing data elements, data cubes, and reporting functions but not to add any additional data sets or linkages with the MPI. As part of the close-out for the grant, several labor market information (LMI) staff received training on how to use the newly developed reports and have the capability to enhance the existing reports or create new ones. With the emergence of a new interstate project called WyCAN, a collaboration to build a common UI program across Wyoming, Colorado, Arizona, and North Dakota, the future uses of WDQI in North Dakota for UI data are uncertain. As the WyCAN project develops in the region, it is unclear whether WDQI will continue to play a reporting role for UI claims data or whether that responsibility will shift to WyCAN as the new interstate system develops.

MAJOR CHALLENGES

Most of the challenges faced by North Dakota fell into the category of logistics, timeline, and workflow management. For example, working with an outside vendor (OtisED) presented both opportunities and setbacks. While the project benefited from outside expertise, developing and approving the scope of work for the vendor delayed the timeline for the project. Similarly, housing the data warehouse within the ITD provided access to technical staff and helped ensure alignment with the K-12 data warehouse. However, ITD staff often had competing priorities and were unable to prioritize the WDQI work over other in-house deadlines.

Another challenge reported was that the planning of the different project phases did not leave sufficient time for the third and final phase, which focused on demonstrating the value of the longitudinal data warehouse. As a result, although



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the project met grant objectives around building the workforce data warehouse and developing the grant-specific reporting functions, there was insufficient time to produce outward-facing reports for the public.

Looking beyond the grant period, North Dakota also faces the challenge of different data retention rules and regulations. Depending on the workforce data set, individual-level data can be retained for anywhere between six and twenty years. Although the project team continues to explore legal issues and the possibility of retaining data for longer periods, they have also built summary aggregate layers for all data files and developed purge schedules to meet data requirements.

UNIQUE STRATEGIES

To enable linking of workforce and education data, North Dakota developed an MPI, drawing on individual data from JSDN programs (SSN, name, date of birth) and linking with K-12, post-secondary, and identifiers from programs offered by other agencies (DHS, CTE, Commerce). The MPI enables matching across data sets that do not share a common identifier (such as K-12 data, which lacks SSNs).

A second unique strategy used in North Dakota was coordination between the workforce and educational data warehouse projects on vendors and technical support. Because both the workforce and education warehouses used the same vendor and had closely collaborating technical staff from ITD, the resulting data warehouses were built to have the same infrastructure and to match on their respective MPIs.

Finally, the WDQI project in North Dakota made extensive use of project management tools and systems, including the Project Management Institute's Project Management Body of Knowledge (PMBOK) and the North Dakota Project Management Guidebook. These systems helped keep the WDQI project on its timeline and within budget by tracking progress towards concrete and highly specified deliverables and milestones. North Dakota was one of only a few Round 1 WDQI grantees to successfully meet all of their objectives within the grant period and not request a no-cost extension or continue their work with another WDQI grant.

SUSTAINABILITY PROSPECTS

At the conclusion of the WDQI grant, North Dakota has a basic framework for sustaining the workforce database in place. As the data warehouse owner, JSND will continue to cover monthly user fees for business intelligence tools like SharePoint while ITD will continue to cover storage costs and the K-12 SLDS project will cover service-level agreements related to future data requests. Prior to the grant ending, several in-house LMI staff received training on the architecture of the data warehouse in order to support continued use of the reporting functions after the grant period. Another prospect for sustainability is the possibility of the WDQI warehouse replacing the aging benefits mainframe and taking on the role of the internal repository for all reports within JSND.



OHIO

\$1,000,000

GRANTEE AGENCY

Ohio Department of Job and Family Services (ODJFS)

STATE CONTEXT

Before joining the Workforce Data Quality Initiative (WDQI) as a Round 1 grantee, Ohio had more than ten years of experience developing and managing longitudinal databases for educational agencies and workforce agencies. As one of nine member states in the Administrative Data Research and Evaluation (ADARE) alliance, the Ohio Department of Job and Family Services (ODJFS) brought first-hand experience collaborating with other state agencies around matching education and workforce data to their WDQI project. ODJFS is the state agency responsible for developing and supervising the state's public assistance, workforce development, unemployment compensation, child and adult protective services, adoption, child care, and child support programs, and for administering Ohio's Medicaid program. Prior to the WDQI grant, ODJFS worked in partnership with Ohio State University (OSU) and the Ohio Board of Regents (BOR) to develop a longitudinal data repository, maintained by the Center for Human Resource Research (CHRR), a multidisciplinary research organization affiliated with the College of Social and Behavioral Sciences at OSU. Moreover, since the 1960s Ohio State's Center for Human Resource Research has managed the National Longitudinal Surveys for the Bureau of Labor Statistics.

Ohio brought to the WDQI project not only a rich history of collaborating across agencies and matching data but also strong policy and research focus, including previous work exploring labor market outcomes for adult workforce-education students and educational outcomes for adults in community colleges. Because of past work under ADARE, Ohio launched the WDQI project with significant infrastructure in place, including data warehouse architecture, staff with expertise, and relationships with agencies. As in most states, the WDQI grant in Ohio was seen as parallel to the development of the educational state longitudinal data system (SLDS), funded by the 2009 America Recovery and Reinvestment Act through the Department of Education and managed by the Ohio Department of Education (ODE).

WDQI GRANT GOALS

The overall objective for the WDQI Round 1 grant in Ohio was to establish a longitudinal data repository for employment and education data at the Ohio State University that could serve as a resource for analysis and research. The project aimed to achieve four key goals:

- 1) Developing an archive of data from ODJFS and the BOR at OSU
- 2) Establishing the middleware schema for documenting the data
- 3) Setting up a research agenda for use of the Ohio data
- 4) Producing operational, evaluation, and research reports

Within each goal, the project was guided by benchmarks and milestones, which included signed legal agreements, data transfer timelines and protocols, and the establishment of a research advisory committee. Under the fourth goal, a broad research agenda was developed through conversations with partner agencies. This research agenda was guided by areas of interest for key stakeholders, the need for linked data across systems, the size and scope of programs, and the



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availability of data. The agenda also reflects the input of Federal agencies in areas of Dashboard development in particular, and making information available to consumers. Within the first year of the grant, a standing research advisory committee was formed and the following broad policy areas were identified, each with subquestions:

- 1) *Understanding the labor market:* What are trends in employment, characteristics of jobs, and educational profiles of workers?
- 2) *Understanding program participants and students:* What kinds of people participate in education and workforce programs? What are the features of existing training programs and degree programs?
- 3) *Understanding effective strategies:* What programs promote positive outcomes for youth, adults, and dislocated workers? What specific educational programs benefit individuals?
- 4) *Quality of schooling and training:* What courses do students take? How do they do on assessments and standardized tests?
- 5) *Outcomes of education and training:* What are the intermediate outcomes of education and training?

The research advisory committee included representatives from the three primary organizations (ODJFS, OSU, and BOR) as well as ODE, the Ohio Department of Mental Health and Addiction, and the Governor's office. In March 2012, CHRR at OSU was awarded designation as the Ohio Education Research Center (OERC) under Race to the Top, allowing CHRR to receive all of the K-12 education data specified in the WDQI grant.

PARTNER RELATIONSHIPS

During the Round 1 WDQI grant, ODJFS built on existing relationships with CHRR at OSU and BOR and expanded the partnership to include other agencies. Over the course of the three-year grant, WDQI received K-12 data from ODE and developed relationships with several school districts, including Columbus, Dayton, and North Union. Although no additional MOUs or formal data-sharing agreements were established during the Round 1 grant, Ohio continued to develop connections and explore putting in place partnerships with the state departments of health and mental health.

The Ohio project is guided by the research advisory committee, composed of high-level members from participating agencies, and a data stewards advisory committee. The research advisory committee meets several times a year and advises on setting the research agenda, formulating data governance policy, and developing sustainability plans. Established at the midpoint of the grant, the data stewards advisory committee began with representatives from the three primary organizations (ODJFS, OSU, and BOR) and expanded to include Ohio Department of Mental Health (ODMH). The data stewards advisory committee meets on a biweekly basis and focuses on developing data access procedures, facilitating long-term understanding of data systems in Ohio, and creating a communication strategy for soliciting broad-scale use of the longitudinal data system. Members from the WDQI team also participated in ongoing meetings with the SLDS project team throughout the Round 1 WDQI grant period.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

All data for the Ohio WDQI project are housed in CHRR at OSU. The core data elements from ODE (K-12), ODJFS (workforce), and BOR (higher education/adult education) are linked in a centralized data warehouse called the Ohio Longitudinal Data Archive (OLDA). Data are owned by their respective state agencies which provide them to Ohio State University for the purposes of research, policy/planning, and analysis.

Once agency data arrive at CHRR, they are read in using a basic ETL process, archived as original data, and transformed into value-added data that is linked to the existing warehouse. Raw data is transformed by reshaping with a name-data point vector and deidentified by replacing individual identifiers like SSNs with a key ID. Metadata are added through the



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Designer system. After incorporating data into the OLDA, OSU develops legal agreements for researchers to sign that give them access to deidentified data over a web-based system called Investigator, an end-user browser and data extraction tool.

Data sets built into the OLDA during the Round 1 WDQI grant include: WIA, TAA, Wagner-Peyser, UI Wage records, and UI Benefit data from ODJFS; student, staff, and district/building data from ODE's Education Management Information System; and higher education information (for faculty, students, and institutions) and adult workforce education information from BOR.

DATA USE

Access to the OLDA is controlled through a multi-step research application process. The process includes completing the OLDA Request for Data, signing relevant data-sharing agreements, receiving agency approval for all requested data access (including IRB approval as needed), and completing OSU's online Collaborative Institutional Training Initiative (CITI) human subjects training. Research requests and other supporting documents submitted to CHRR are forwarded to the relevant data-providing agency representatives and must be approved by each agency whose data is requested. Depending on the data requested, data access may be restricted to within the CHRR building on OSU's main campus in Columbus, unless permission for data access from another location is granted from all data-providing agencies. All research findings must be presented to the data-providing agencies and approved before release to external audience.

During the Round 1 grant, data from the OLDA were used by project staff and external researchers to demonstrate the value of the project and to tackle questions in the research agenda. In late 2011, findings from three demonstration projects were shared, including: (1) a mid-market report, (2) a study of the effects of developmental education on the performance of nontraditional adults in community colleges, and (3) an evaluation of apprenticeship programs. Throughout the grant, project team members drew on the OLDA to answer questions under the five policy domains identified by the research advisory committee, including the employment outcomes of graduates from Ohio's higher education institutions and teacher supply and demand in Ohio. By the end of the Round 1 grant, more than twenty-five groups had expressed interest and begun the application process to access OLDA data, ranging from universities (e.g., Case Western and Columbia University) and school districts (e.g., North Union) to research firms (NORC and IMPAQ) and specific programs (e.g., Post Secondary Enrollment Options [PSEO]). Approved and active projects covered range of topics, including the education outcomes of at-risk early childhood students, course trajectories of STEM community college students, and economic outcomes of the shale industry.

Finally, during the WDQI Round 1 grant, Ohio laid the groundwork for external-facing products, including developing a branded website and exploring different dashboard and reporting options. In the last year of the grant, Ohio migrated from the initial WDQI website to "Ohio Analytics," which will house documentation on data holdings, information on how to access data, and reports and research products. Ohio also looked into several data reporting tools and services, such as Ed-fi and Tableau, and will continue to investigate dashboard reporting tools with Round 3 funding.

MAJOR CHALLENGES

While Ohio successfully took receipt of K-12 and higher education data during the grant period, legal questions and concerns caused delays in collaboration with other agencies and external data vendors. Significant effort was invested in modifying legal agreements to include TANF and SNAP data in the OLDA, but ultimately these data sets were not incorporated during Round 1 due to concerns about the release of HHS data outside of the OLDA system.



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Other challenges noted by Ohio included managing the time and effort required to develop procedures and keeping a big-picture perspective. Formulating documents and processes while ensuring that all participating agencies understood and were comfortable with them was critical to the success of the WDQI project in Ohio. However, getting different agencies on board required not only understanding how they collect and store their data but also holding meetings and discussions to address questions and concerns and minimizing the burden and effort required for agencies to participate in WDQI. Because the WDQI project required so many small steps along the way, the project team stressed the importance of having a vision or sense of what the project was working toward, to provide motivation and inspiration during periods of tedious revisions and legal reviews.

While not an impediment to progress during the grant, concerns about protecting confidentiality as the growing OLDA incorporates multiple data sources over time were raised by the Ohio team. A recurring question during the Round 1 grant was how to protect confidentiality in research results and mitigate risk of data disclosure through suppression. As the OLDA expands to include more data and is accessed by more researchers, ensuring confidentiality for individuals, businesses, and other entities remains a top priority for the Ohio team.

UNIQUE STRATEGIES

Partnering with and being housed in a university with an active research center afforded the project several advantages. First, there was a strong culture of engaging professors, graduate students, and staff from different departments and actively seeking funding support for research projects. Second, the designation of the Ohio Education Research Center (OERC) accelerated the process of obtaining K-12 data. Third, the university affiliation contributed to networking and relationship-building among researchers in the academic community and participating agencies. Finally, CHRR offers a neutral, objective, and independent context for data analysis.

Another unique strategy was the structure of the data stewards committee and the frequency of its meetings. Members of the group were selected because they crossed the boundary between technical and research groups and had both a practical and a policy perspective, enabling them to see beyond running pre-defined reports to meet performance standards. Regular, biweekly meetings were also critical and enabled the group to make progress toward developing data access procedures and plans for expanded use of the OLDA.

SUSTAINABILITY PROSPECTS

Ohio has taken a multi-pronged approach to sustaining the WDQI project, including federal, state, and other funding sources. To qualify for Round 3 funding, Ohio joined WRIS2 and was one of the two Round 1 grantees awarded a Round 3 grant in 2013, receiving over one million dollars. Under the renewed WDQI funding, Ohio aims to build a website that will generate information on workforce data in action, to develop a dashboard tool for program managers to access data for decision-making, to create interactive tools and communication for policymakers as well as performance measures for cross-program perspective, and to incorporate a geospatial analysis of program outcomes, including patterns across state lines.

In addition to renewed federal funding through WDQI, Ohio also applied for other federal and foundation grant support. In fall 2013, the project received a nearly five hundred thousand dollar grant from the National Science Foundation (NSF) to expand the community of users and to focus on training, collaboration, and capacity building opportunities. In late 2013, Ohio also submitted a proposal to the Institute of Education Sciences (U.S. Department of Education) to track high school students through college and the workforce, focusing on the levels of remediation required to be successful.



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Starting in July 2014, Ohio anticipates having an appropriation from ODE in place to partially defray the costs of documenting and incorporating educational data in the OLDA.

At the conclusion of the Round 1 grant, the OLDA and OERC/CHRR teams were identified as a resource to help the Governor's Office of Workforce Transformation align performance measures across education and workforce agencies. The work involves compiling and reporting on state agency workforce and education data and tracking a consistent set of measures for WIA, Adult Basic Literacy Education (ABLE), Cal Perkins, and state financial aid and scholarships. Under the Round 3 grant, Ohio will incorporate new data, including GED and National Student Clearinghouse data, and build new dashboards and reporting functions for the cross-cutting performance measures. This project brings in another two hundred and fifty thousand dollars in funding over a three-year period, from 2014 to 2017, drawing on support from the Health Innovation Fund.

As another sustainability approach, Ohio has begun case-by-case fee-for-service models for access to the OLDA, with fees that are adjusted depending on which groups and individuals request access. Finally, as the OLDA continues to grow and take on a more central role in policy research in Ohio, the WDQI team has begun preparing language to deliver to legislative staff in different agencies as part of a parallel—but slower—effort to create permanent funding for WDQI through legal changes to the Ohio administrative code.



SOUTH CAROLINA

\$289,417

GRANTEE AGENCY

South Carolina Department of Employment and Workforce (SCDEW)

STATE CONTEXT

In South Carolina, SCDEW’s WDQI efforts were aided by the fact that they used the existing data warehouse managed by the State of South Carolina’s Budget and Control Board’s Office of Research and Statistics (ORS) to store and manage their data. The creation of the ORS data warehouse was mandated by state legislation. At the time of the WDQI grant, ORS had already built the data warehouse infrastructure and had needed data management and security procedures in place.

Using the ORS data warehouse benefited SCDEW in a number of ways. SCDEW had already been sharing Unemployment Insurance (UI) data with ORS when the agency obtained the WDQI grant and wanted to add other program data to the warehouse. In addition, by contributing data to ORS, DEW was able to facilitate easier links between their data and the data of over thirty other agencies also participating in ORS. The same year (2010) that DEW received WDQI funding, the South Carolina Department of Education (SCDOE) was awarded approximately \$14.9 million dollars under the U.S. Department of Education’s State Longitudinal Data System (SLDS) grant program, and while SCDOE created an internal SLDS, they also contributed data to ORS.

WDQI GRANT GOALS

SCDEW had four main goals for the WDQI grant:

- (1) Distribute workforce data to ORS. In addition to the Unemployment Insurance (UI) wage and benefits data that were already being contributed to ORS, SCDEW was to add Wagner-Peyser, Workforce Investment Act (WIA), and Trade Adjustment Assistance (TAA) program data to ORS.
- (2) Link workforce data to education, social services, and vocational rehabilitation data. Prior to the WDQI grant, SCDEW was able to link their data to education and social services, but not to vocational rehabilitation.
- (3) Merge LMI data with the South Carolina Works Online Services (SCWOS) system to provide customers with more information. SCDEW later found that this goal did not align well with the larger WDQI goals of building a system.
- (4) Use data to advise policymakers on the effectiveness of workforce and partner programs, by using longitudinal data to populate the Eligible Training Provider List (ETPL) outcomes. Due to a few high-profile data breaches in South Carolina and increased concern about data sharing, this goal was put on hold. Therefore, SCDEW focused on getting WIA data into the ETPL. Once the state data-sharing environment improves, DEW will focus on incorporating the longitudinal data.

PARTNER RELATIONSHIPS

SCDEW had three main partners in the WDQI grant: ORS, SCDOE, and the South Carolina Department of Social Services (SCDSS). ORS was a key partner because they provided SCDEW with the warehouse in which to store data and also



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provided data management services. Prior to South Carolina getting the SLDS and WDQI grants, not much data sharing occurred between SCDEW and SCDOE, but under the WDQI grants SCDOE became a key partner. SCDEW and SCDOE were able to share K-12 and workforce data via ORS (post-secondary entities do not contribute data to ORS). SCDSS and SCDEW were also able to share data through ORS.

Coordination between SCDEW and SCDOE increased under the grants; however, there was less collaboration than expected at the outset. While there were more frequent meetings between the two agencies, the program did not establish a coordinated data governance system. However, a system was established for partner agencies requesting data access through ORS, requiring the requestor to sign a data-sharing agreement with all agencies that contributed data to the request. Each agency developed its own data-sharing agreement, vetted by their respective legal team.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

The ORS data warehouse stores and links data across multiple service agencies while allowing each agency to retain control of their own data at all times. ORS has developed a series of algorithms to create its own unique data identifier, enabling statistical staff to link individuals across multiple providers and settings while protecting the confidentiality of clients. Requests to link data must be approved by all participating agencies and organizations. Given these established systems, it was a natural fit for SCDEW to leverage the existing resources provided, by contributing data to ORS.

The ORS data warehouse houses data from numerous other agencies including the SCDOE, Legal/Safety Service (including criminal justice data), SC Department of Social Services, Behavioral Health Department, SC Department of Health and Environmental Control, SC Department of Disabilities and Special Needs, SC Department of Vocational Rehabilitation, SC Commission on the Blind, Governor's Office, Division of Continuum of Care, the SC Division of Children's Foster Care Review unit, Lieutenant Governor's Office on Aging, Welvista, homeless shelters, medical claims systems, all-payer health care databases, disease registries, and SC health professional boards.

ORS manages the resulting data by allowing each contributing agency to retain ownership of its data; data are only linked between the warehouses when someone submits a research request. This framework helps protect the security of the data. In addition, ORS does the actual data linking, scrubbing identifiers and assigning a pseudo-identifier to the file. Because the SCDOE collects SSNs, education and workforce data can be linked relatively easy.

SCDEW maintains a data dictionary for all of its workforce programs.

DATA USE

ORS created a data cube¹ for SCDEW using the workforce data that SCDEW contributes to the warehouse, and including SCDEW business rules. The cube was intended mainly for use by SCDEW staff members, so that they could easily access reports on workforce programs (e.g., Wagner-Peyser, WIA, and TAA) and its implementation received praise for agency leadership.

Although postsecondary institutions did not contribute data to ORS, SCDEW is using data obtained directly from postsecondary institutions to update its ETPL.

¹ "A cube is a set of data that is usually constructed from a subset of a data warehouse and is organized and summarized into a multidimensional structure defined by a set of dimensions and measures. A cube provides an easy-to-use mechanism for querying data with quick and uniform response times." From Microsoft, <http://technet.microsoft.com/en-us/library/aa216365%28v=sql.80%29.aspx>.



Workforce Data Quality Initiative

At the end of the WDQI grant, the main user of the workforce data in ORS was SCSS, which used the data to assess the outcomes of participants in their programs. While SCDEW and other agencies have not made much use of the data for research, SCSS serves as an example of what is possible using SCDEW data in ORS. For example, in 2012, SCDEW and SCSS used the state's data warehouse at ORS to link information regarding Supplemental Nutrition Assistance Program (SNAP) and Temporary Assistance to Needy Families (TANF) with workforce databases, showing whether clients of these program they received SCDEW services. This information gave SCSS an idea of how many of their clients utilized staff-assisted services and training services available via Wagner-Peyser, WIA, and TAA. The data also indicated where the services were being administered as well as demographic data on who was being served. The ultimate goal of this data sharing was to better understand how and if job search and training services were being utilized by DSS Economic Service Families, and how those services could be improved to better serve this population. Considering the breadth of data available in ORS, even more extensive research is possible.

MAJOR CHALLENGES

One of the major challenges that SCDEW faced during the implementation of their WDQI grant was that South Carolina experienced a number of high-profile data breaches. The data breaches put all state data sharing under scrutiny, hindering data sharing across agencies, due to the increased time it took to get any legal agreements executed. This delayed the process of SCDEW getting access to longitudinal postsecondary data to include in their ETPL.

Another challenge was staffing changes in the middle of the WDQI grant. The original project manager who wrote and administered the grant initially left SCDEW in April 2012.

While ORS staff had expertise in housing and managing data, its staff were not as familiar with the peculiarities of workforce data, so it took some time to explain the sometimes complicated specifics of all the fields in workforce datasets. The involvement of someone able to marry technical capacity and skills with a deep understanding of workforce programs would have been helpful.

At the end of the WDQI grant, SCDEW had not formalized a research agenda. Having developed a research agenda early on would have aided SCDEW in making more use of the data during the grant period. During the grant, SCDEW instead focused on getting data into ORS and getting the data cube constructed.

UNIQUE STRATEGIES

Partnering with a state agency such as ORS was very beneficial because it offered SCDEW a ready-made warehouse in which to store data. ORS also had security procedures in place that offered SCDEW protection in a climate in which data security was at the forefront of concern.

Realizing that they needed to publicize the system in order to get agency staff and researchers interested in using the data, SCDEW began to promote the system to users and potential users. Using the data cube developed by ORS, SCDEW was able to show agency staff how data could be used to inform program decisionmaking at the local levels. At internal SCDEW staff trainings, the WDQI grant manager emphasized that using program data can help local areas to better understand performance. Having a better understanding of the uses of the data helped staff become more invested in conducting good data entry, so that the results would accurately reflect their efforts at the local level.



SUSTAINABILITY PROSPECTS

Because ORS does not charge much to house and manage SCDEW data, the process of contributing data to ORS was supported by the agency and has been absorbed into the regular duties of the Performance and Reporting Unit. Increased awareness of ORS and their capabilities has been a positive for SCDEW since the agency does not have the capacity or the resources to maintain a data warehouse to the scale that is currently at ORS.



TEXAS

\$997,014

GRANTEE AGENCY

Texas Workforce Commission (TWC), in partnership with the Ray Marshall Center (RMC)¹ at the University of Texas at Austin

STATE CONTEXT

Since 1992, Texas has gathered performance data and provided aggregated reports to participating partner agencies involved in education and workforce training programs. The purpose of linking records was to assist community and technical colleges in documenting post-exit outcomes and using the data to meet accreditation standards. The pilot led to the creation of the Texas Automated Student and Adult Learner Follow-Up System. In later years, follow-up was conducted on graduates of 4-year institutions, high school exiters, degree-granting proprietary schools and a wide range of workforce training programs at the Texas Workforce Commission.

In 2003, Senate Bill 281 required TWC, in cooperation with other state agencies, to “maintain and operate an automated follow-up and evaluation system” for reporting on the employment and wage statuses of higher education and workforce training cohorts. The statute requires annual reports to be submitted to the Texas Workforce Investment Council (TWIC) for strategic planning and evaluation of education and workforce training programs. To maintain compliance with FERPA interpretations regarding agency use of student data, TWC sends workforce program data cohorts to the Texas Higher Education Coordinating Board (THECB) to be linked with the postsecondary master enrollment database and returned as aggregated reports.

Around the same time, the US Department of Education (US DOE) issued a memo from Deputy Secretary of Education William J. Hansen with guidance on the Family Educational Rights and Privacy Act (FERPA), which led to a constricted interpretation of FERPA in the State of Texas, limiting the exchange of data between state agencies. While TWC contributed data to THECB, restrictive interpretation of the law prevented participant-level data from being shared with TWC by the education agencies. This interpretation of FERPA persisted until recently; the recent guidance on FERPA from the DOE has facilitated a more favorable interpretation allowing increased data sharing among the state agencies.

In 2007, the Texas legislature authorized the creation of three Education Research Centers (ERCs) to house Texas education and workforce longitudinal data, including data from the Texas Education Agency (TEA), THECB, and TWC, with the intention that that they would facilitate research by academics, policymakers, and state agencies using education and workforce data. The ERCs currently house linked P-20 data, Unemployment Insurance Wage Records, and workforce participant records. Recent legislation extended the mandate of the ERCs and they now include TWC as part of their joint advisory board.

In 2009 and 2011, TEA received two Statewide Longitudinal Data System (SLDS) grants from US DOE to expand its student data system for enhanced reporting to parents, policymakers, and other stakeholders. The grants assisted in improving data collection methods and system architecture, while also expanding the datasets to include student assessments and

¹ "The Ray Marshall Center is a university-based research center dedicated to strengthening education, workforce, and social policies and programs that affect current and future generations of American workers. The Center partners with a range of stakeholders to conduct timely, relevant research and to translate that research into effective policies and programs." From <http://www.utexas.edu/research/cshr/rmc1/>.



Workforce Data Quality Initiative

teacher characteristic elements. The Texas SLDS project has strengthened connections for the Texas P-16 Public Education Information Resource (TPEIR) data warehouse, and in 2011, a data sharing agreement was signed that would share TWC UI Wage Record data in TPEIR in exchange for record linkages to GED, High School, and Adult Basic Education (ABE) program data.

In 2010, TWC obtained WDQI funding to support its efforts to expand research, enhance data collected under SB281, and improve coordination among state agencies on the existing longitudinal data systems. TWC partnered with RMC to conduct new academic research studies and expand existing ones with a focus on student transitions from education to the workforce.

WDQI GRANT GOALS

TWC had a number of goals under WDQI:

- (1) Enhance the data collected under Senate Bill 281 in order better to track participants across programs
- (2) Increase links across education and workforce agencies, so as to open up data for analysis by a broader set of researchers
- (3) Expand ERC data with UI Wage Records and workforce program participant records
- (4) Conduct new academic research projects at the RMC
- (5) Develop an online consumer reporting tool (Texas Consumer Resource Education and Workforce Statistics or CREWS) in partnership with THECB
- (6) Pilot an employer follow-up survey to determine if higher education graduates and workforce program completers are obtaining employment in the occupations for which they were trained

PARTNER RELATIONSHIPS

The long-term relationship between TWC and RMC was key to the success of the project. RMC helped write the initial WDQI grant proposal and works closely with TWC to discuss ongoing projects using TWC data.

Despite differences in the interpretation of FERPA, TWC, THECB, and TEA have found ways to share data without violating the provision of FERPA while being able to address federal and state reporting requirements. Recent guidance on FERPA from the US DOE and critical assistance from the Privacy Technical Assistance Center has resulted in increased data sharing among the three agencies.

The inclusion of TWC staff in the state's P-16 Council and the Education Research Center Advisory Board has facilitated a closer relationship among agency staff. TWC's willingness to support the SLDS project at TEA with the sharing of the UI Wage Records has expanded the repertoire of reports available in the Texas Public Education Information Resource to include district-level outcomes reports for the first time in 15 years. These reports provide a glimpse of education and labor market outcomes for each of the more than 1,100 Texas schools districts.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT



Workforce Data Quality Initiative

The Texas ERCs can be considered the de facto State Longitudinal Data System. The state legislature recently renewed the mandate of the ERCs. There are currently two ERCs, one at the University of Texas-Austin², and the other at the University of Texas-Dallas. An advisory committee made up of the heads of the ERCs and staff from TEA, THECB, TWC, independent school districts, and a university partner provides guidance and reviews and approves research proposals. Once a proposal has been approved, the researcher has access to de-identified data on a terminal at the ERCs. Data in the ERCs are immune from outside access by the absence of connectivity to the Internet. Researchers must complete all work at the ERC and all reports are reviewed prior to release to ensure that no individuals are identified in the reports. Some supplemental data are allowed into the ERC data warehouse; however, only on an exception basis. Additional datasets are being reviewed for future addition to the warehouse.

TEA Data	THECB Data
<ul style="list-style-type: none"> District and Campus Data 	<ul style="list-style-type: none"> CBM Report 1: Student Enrollment (1992–2012)
<ul style="list-style-type: none"> Organizational data (1991–2011) 	<ul style="list-style-type: none"> CBM Report 2: Texas Academic Skills Program (TASP) / Texas Success Initiative (TSI) (1990–2011)
<ul style="list-style-type: none"> Financial data, budgeted and actual (1991–2011) 	<ul style="list-style-type: none"> CBM Report 4: Class Report (2000–2012)
<ul style="list-style-type: none"> Staff employment data (1995–2011) 	<ul style="list-style-type: none"> CBM Report 8: Faculty Report (2000–2012)
<ul style="list-style-type: none"> Student Data 	<ul style="list-style-type: none"> CBM Report 9: Graduates Report (1990–2011)
<ul style="list-style-type: none"> Enrollment (1994–2011) 	<ul style="list-style-type: none"> CBM Report 11: Facilities Room Inventory Report (2006–2011)
<ul style="list-style-type: none"> Attendance (1993–2009) 	<ul style="list-style-type: none"> CBM Report 14: Facilities Building Inventory Report (2006–2011)
<ul style="list-style-type: none"> Course completion (1993–2010) 	<ul style="list-style-type: none"> CBM Report A: Students in Continuing Education Courses Report (2000–2012)
<ul style="list-style-type: none"> Graduation, leaver, and dropout (1992–2010) 	<ul style="list-style-type: none"> CBM Report B: Admissions Report (2000–2012)
<ul style="list-style-type: none"> Special education data (1992–2011) 	<ul style="list-style-type: none"> CBM Report C: Continuing Education Class Report (2000–2012)
<ul style="list-style-type: none"> Disciplinary data (1999–2010) 	<ul style="list-style-type: none"> CBM Report M: Marketable Skills Achievement Report (2002–2011)
<ul style="list-style-type: none"> Accountability Data 	<ul style="list-style-type: none"> CBM Report R: Residents/Fellows Report (2008–2012)
<ul style="list-style-type: none"> Federal accountability reports (2003–2008) 	Financial Aid Data System (FADS) Data (2001–2011)
<ul style="list-style-type: none"> State accountability reports (2004–2009) 	State Board of Educator Certification (SBEC) Data (2006–2010)
<ul style="list-style-type: none"> Assessment Data 	TWC Data
<ul style="list-style-type: none"> Texas English Language Proficiency Assessment System (TELPAS) (2004–2009) 	<ul style="list-style-type: none"> UI wage records (1990–2012)
<ul style="list-style-type: none"> All grades, all subjects, all versions, Spanish and English (TAAS 1994–2007, TAKS 2003–2010) 	

DATA USE

Data on education and workforce exit cohorts required under SB281 for follow-up are submitted to TWC and analyzed and reported in the Workforce and Education Dashboards. The Dashboards provide a one-stop location for statewide data on the post-exit achievements of high school graduates and leavers, higher education graduates and leavers, GED test-takers, Adult Education and Literacy participants, and workforce program participants such as those in SNAP E&T, WIA, TAA, Apprenticeship, TANF, Employer Customized Training, and, in the future, Career Schools and Colleges.

TWC, in cooperation with THECB also created an online consumer reporting tool, Texas CREWS (described above).³ This interactive dashboard provides comparative information about graduate outcomes at Texas public postsecondary institutions, including earnings, loan amounts, and loan ratio, and can be organized by institution and by program. Texas

² <http://www.utaustinerc.org/>

³ The tool can be found at www.thecb.state.tx.us/apps/txcrows/.



CREWS has ten years of data accessible to help parents and students make informed decisions about college and programs of study.

Finally, TWC piloted an online Employer Follow-Up Survey with RMC as the survey entity. The survey captured the occupational title, a full-time/part-time flag and zip code location of the job of the former student/workforce training participant. The survey was conducted to assess whether the former students/workforce training participants are employed in an occupation related to their major or area of training. The results of the study will be used to improve the program mix being offered at Texas institutions and as a means to align with the needs of employers.

MAJOR CHALLENGES

Although FERPA was an impediment in sharing data among education and workforce agencies in Texas, the agencies found ways to share data while maintaining data privacy of students specified by the law. The recent guidance on FERPA from the US DOE was timely in jarring loose some of the obstacles previously encountered by TWC. The result has been improved cooperation among agencies and the goals of Texas's WDQI team were achieved.

Additionally, there was some concern about the future of the Texas ERCs that were alleviated by the passage of a bill by the Texas legislature that assured their continued existence. The legislative confirmation opened the door to expanding the datasets available in the ERCs with workforce participant data from TWC. With the addition of TWC data, the ERCs now have a research database to conduct studies from pre-kindergarten and elementary school, middle school, high school, GED, Adult Education, higher education, workforce training, and the labor market.

UNIQUE STRATEGIES

In 2013, TWC and RMC organized a day-long statewide FERPA conference so that state and local agency leadership, staff, and legal departments could access a common interpretation of regulations and clarify issues around data sharing more generally.⁴ TWC and RMC engaged US DOE's Privacy and Technical Assistance Center (PTAC), a leading expert in FERPA and privacy to participate, in the hopes that education partners would ease restrictions on data sharing as allowed under recent revisions to FERPA. The conference also featured a number of presentations from US DOE, state agency staff members, and researchers. As a result of the FERPA conference and guidance from US DOE, Texas institutions of higher education began sharing student data with TWC, allowing TWC to conduct additional research and link to WRIS2 data for first time.

SUSTAINABILITY PROSPECTS

The ERCs now have a ten-year contract and are funded through a fee-for-service model where researchers pay to access data. At TWC, the legislative mandate from Senate Bill 281 supports the work done internally. TWC's Automated Student and Adult Learner Follow-up System, however, continues to look for additional opportunities to expand its research and serve the needs of partner agencies.

⁴ A summary of the FERPA conference is available at www.utexas.edu/research/cshr/rmc1/index.php/component/content/article/1-about/962-ferpa.html.



VIRGINIA

\$1,000,000

GRANTEE AGENCY

Virginia Community College System (VCCS)

STATE CONTEXT

In 2010, the Virginia Department of Education (VDOE) received a State Longitudinal Data System (SLDS) grant from the U.S. Department of Education (US DOE) for \$17.5 million. Six months later, VCCS was awarded a WDQI grant for \$1 million. In addition, the Virginia SLDS received some funding from the State Council for Higher Education in Virginia (SCHEV). The coordination between VA DOE and VCCS, which is the state agency responsible for workforce development services, began even prior the grants being awarded, as VCCS was part of the SLDS grant writing team. This level of commitment resulted in the creation of a joint SLDS in Virginia, called the Virginia Longitudinal Data System (VLDS). Prior to the SLDS and WDQI grants, there was some ad hoc data sharing through individual agreements, but the joint creation of the VLDS through the two grants solidified coordination between the participating agencies, including VDOE, SCHEV, Virginia Employment Commission (VEC), and VCCS.

This coordination was also assisted by the then-governor of Virginia. The governor's office had just moved oversight of Workforce Investment Act (WIA) programs to VCCS and part of his campaign platform emphasized the importance of the workforce system. Given this, his office advocated for VCCS to be an active participant in the creation of the SLDS. After that governor's term in office ended, commitments between VDOE and VCCS were already cemented in the grant proposals, which ensured that the collaboration would be sustained across administrations.

Because state law mandates that personally identifiable information of program participants and students stay in the source agency and not be shared with other state agencies, Virginia had to design a federated data system in which all agencies retained control of their data and data are only linked (and deidentified) to satisfy specific research requests. Due to publicity around data security issues, the VLDS team took steps to ensure rigorous system security and identification protections.

WDQI GRANT GOALS

VCCS had five main objectives for the WDQI grant:

- (1) Develop a workforce longitudinal data system
- (2) Develop the capacity to link education and workforce data
- (3) Improve the quality of workforce data
- (4) Use data to understand workforce programs and drive improved performance
- (5) Promote the system through the development of user-friendly web-based portals to display data, administer training to users, and provide ongoing communication to stakeholders



PARTNER RELATIONSHIPS

Though VDOE held the majority of funds for the system in their SLDS grant, all partners (VDOE, SCHEV, VEC, and VCCS) were active in the creation of the VLDS and its supporting framework. Through the joint creation of the VLDS, the participating agencies developed a high level of coordination. The legal context and the complicated design of the federated model required that agencies work together closely to build consensus over how the system would be built and governed. Whereas prior to VLDS development, agencies had separate data-sharing agreements with one another to exchange data, now all VLDS partners use the same agreement.

Virginia’s governance model was developed early in the project and was an active consideration in all major project and design decisions. The group is governed by a “Book of Data Governance” or charter that allowed it quickly to provide guidance and decisions throughout the design, development and operation phases. The group meets monthly and votes on decisions related to system design, enhancements, and fixes and works collaboratively on research projects, legislative initiatives, communications, and sustainability.¹ VLDS partners put a great deal of effort to formalizing this data governance structure, the development of which required frequent meetings and communication. This intensive coordination fostered an atmosphere of trust between agencies.

The scope of the VLDS originally included only workforce and education data. However, the system as it is constructed is scalable in order easily to accommodate additional partners, as data are not housed together, but linked only upon request. The VLDS’s federated model requires minimal work on the part of participating agencies, as they are not required to make massive data transformations in order to house everything in a data warehouse. Given this, it is possible that all research using state-level data could run through the VLDS. VCCS hopes that there will be more interest from additional potential partners.

DATA SYSTEM STRUCTURE/HOUSING ARRANGEMENT

In August 2013, the VLDS went “live.” VLDS uses a federated model for longitudinal data, meaning that the participating agencies—VDOE, SCHEV, VEC, and VCCS—retain full control of their data. It was developed to allow the merging of data in a highly controlled environment, making it possible to analyze education and workforce data with greater ease and more flexibility than possible previously.

The VLDS federated system merges data across participating agencies in a complex double-deidentifying hashing process that leaves private (i.e., personally identifiable) data behind the existing firewalls of the participating agencies. The system prepares the data using a one-time, one-way hashing algorithm to create a random, unique identification code for each individual. VLDS then applies the unique identification code to each instance of the individual in all data tables provided from that data request. Each time a researcher requests data, the system will generate a completely new set of unique identifiers for each individual in the data. This feature, developed to comply with state law, ensures that the new data set cannot be linked to the previously requested data set based on unique identifiers.² This technology was developed, in partnership with VLDS participating agencies, almost entirely with in-state resources including Virginia Tech, Virginia Information Technologies Agency (VITA), and Center for Innovative Technology (CIT).³ In addition, the

¹ The VLDS Book of Data Governance can be found at www.doe.virginia.gov/school_finance/arra/stabilization/reported_data/assurance_b/2011-2012/attachment_v.pdf

² From <http://vlvs.virginia.gov/privacy.html>

³ From <http://vlvs.virginia.gov/about.html>



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system is versatile because its data adapter is able to connect data from different types of systems (e.g., Oracle, SQL, etc.), making it easy to include additional partners.

Data merges are initiated by vetted researchers who first have completed an application process and whose research questions have been reviewed to match the VLDS Burning Questions (below) and validated. They are then assigned a committee of agency “sponsors” who guide and oversee the process to ensure accuracy and security. Each step along the way, from access request to publication of results, must be approved by the sponsoring agency.⁴ In addition, the VLDS includes a web-based access portal for requesting data, that allows the researcher to request access, identify data elements, develop data sharing agreements, execute queries, and download data. Thus researchers do not need access to any specific hardware or software in order to use VLDS data. VLDS also provides researchers with data dictionaries for all data supplied by the participating agencies.

The workforce data that are accessible via VLDS include WIA program data, Trade Act (TAA) program data, Wagner-Peyser program data, UI wages, and UI benefits. The Department of Aging and Rehabilitative Services is also working to begin sharing data in early 2014. In addition, VLDS partner agencies and the Virginia Early Childhood Foundation are working together to include Virginia Department of Social Services (VDSS) and Virginia Department of Health (VDH) as new partners in 2014.

Near the end of the first round of WDQI funding, the VLDS team was still working on ironing out logistical issues and bugs in the system, which they hope will be resolved by the first anniversary of the system going live.

DATA USE

One highlight of the VLDS system is that it requires there to be a partnership between researchers and their sponsoring agencies. This requirement helps establish a significant level of coordination between the two groups to achieve common research goals. Thus instead of developing a comprehensive research agenda, the VLDS team came up with “Burning Questions” around which all research must align to be approved. These questions are:

- What are the participant outcomes of student and workforce opportunities and programs?
- How do education and workforce programs align to known and projected employer needs?
- What is the return on investment (ROI) from specific types of education and workforce opportunities and programs?
- What factors or conditions lead to high-quality education and workforce outcomes?

As more workforce agencies join the VLDS, these core questions will be expanded to allow for other lines of research with new datasets.

At the end of the first round of WDQI, researchers have completed ten major studies using data accessed via VLDS. One example is Virginia’s Post-Completion Wages of Graduates report. This public report provides wage and enrollment outcomes on a subset of graduates at all levels of award, by institution. Another example is a study aimed at helping to improve the performance of Virginia’s public workforce system by examining the ROI for three programs: WIA, Wagner-

⁴ From <http://vlvs.virginia.gov/privacy.html>



Workforce Data Quality Initiative

Peyser, and TAA.⁵ Other research projects include a study evaluating the teacher licensure programs; Career and Technical Education (CTE), Adult Education, School Peer Groups and student achievement data.

In addition, VLDS contributes data to the Economic Success Metrics Program on CollegeMeasures.org⁶, which supports several scorecards developed through the Virginia Workforce Council (the state workforce board) focusing on overall workforce measures and WIA outcomes.⁷

In an interesting strategy for marketing the system, VLDS is paying university researchers to conduct research studies as a way to get researchers “hooked” on using VLDS data. In return these researcher produce helpful reports and also identify quirks in the data that can be documented or resolved. The VLDS team hopes that word of mouth will spread the benefits of the system to a wider audience. There is some evidence of that happening: the VLDS team was contacted by organizations writing proposals for the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grants funded by the U.S. Department of Labor to see if VLDS would be useful in their grant performance reporting and evaluation.

MAJOR CHALLENGES

As with any new project, the VLDS team sometimes faced resistance to collaboration from various state agencies due to a variety of factors, such as legal, financial, or cultural barriers. The response of the VLDS team was to be persistent in finding ways to overcome these barriers by working closely with the entities in question to build positive relationships, find work-arounds for obstacles, and to convince reluctant agencies that they had something tangible to gain by joining the VLDS efforts.

UNIQUE STRATEGIES

The fact that all of the VLDS partners were involved in the project from the beginning was key to the success of the project. This close communication and coordination between the founding members allowed trusting working relationships to grow, which aided in developing a shared vision for the VLDS. At present members of the VLDS team work together well to accomplish common goals.

VLDS developed a coordinated marketing and outreach plan shared across agencies in order to ensure that the system develops a brand. The VLDS team hired a marketing company to promote the system and create marketing materials for various audiences. A logo was developed, as well as a website and general descriptive information on the system. VLDS created two user-friendly videos for the public in order to promote the system—one that explains what the VLDS is and

⁵ From the VLDS E-Newsletter, May 2014. Sponsored by the Virginia Department of Education, State Council of Higher Education for Virginia, Virginia Community College System, Virginia Employment Commission, and Center for Innovative Technology.

⁶ The Economic Success Metrics Program on CollegeMeasures.org provides states with a website on which to display an interactive tool that the public can use to access data on the outcomes associated with various college programs and/or colleges in a state. Virginia’s Economic Success Metrics Program page is located at <http://esm.collegemeasures.org/esm/virginia/>.

⁷ The Virginia Performs Scorecard can be found at <http://vaperforms.virginia.gov/extras/WorkforceReportCard.php> and the WIA Scorecard can be found at https://bi.vita.virginia.gov/VCCS_WIA/rdPage.aspx.



Workforce Data Quality Initiative

another that describes the privacy protections built into the system.⁸ Interested parties can also subscribe to a monthly VLDS e-newsletter that provides updates on activities of the system and its partners. The VLDS team also marketed VLDS by paying university partners to conduct research using the system, to demonstrate the value of the system through research products and in hopes that that these researchers would continue to use it for future projects.

In 2013, the VLDS also held a daylong conference, the VLDS Insights Conference, to promote the system and demonstrate how it could be useful to researchers, policymakers, and the public. Participants in the conference included representatives from universities, state agencies, federal agencies, local school districts, start-up companies interesting in working with educational data, General Assembly members, members of the Governor's office, and interested parties from other states. The VLDS team also conducted demonstrations of the system at the conference. The second annual VLDS Insights Conference is scheduled for June 2014.

SUSTAINABILITY PROSPECTS

In 2013, VCCS was awarded additional funding from US DOL in under the third round of WDQI grants. Using this additional funding, VCCS plans to onboard more partners in the VLDS, expand the use of the data to the public and policymakers by developing more data products, such as additional research reports, scorecards, and interactive online tools. In growing the system and the use of the data, VLDS hopes to make it indispensable to researchers and the community at large, thus ensuring that the system will be more likely to be maintained over time. The VLDS team has also been working to promote the system with the new governor and General Assembly members, in an effort to build sustainability across administrations.

⁸ The VLDS website can be found at www.vlds.virginia.gov, where the informational video is embedded. The privacy video can be found at <http://vlds.virginia.gov/privacy.html>.