

JOBS AND EMPLOYMENT DATA EXCHANGE

DESIGN PHASE REPORT

SEPTEMBER 30, 2022

STANDARDS IMPLEMENTATION CONC

INTRODUCTION AND OVERVIEW 3

FEDERAL AND STATE REPORTING: WHERE WE ARE NOW AND FUTURE VISION 4

JEDx WORKGROUPS 5

DATA AND APPLICATIONS PRIORITIES WORKGROUP 6

SYSTEM ARCHITECTURE WORKGROUP 10

JEDx RESEARCH ENRICHMENT PROJECT (JEDx-REP) 14

NEXT STEPS: BRIDGING FROM DESIGN PHASE TO PILOT PHASE 15

INTRODUCTION AND OVERVIEW

The U.S. Chamber of Commerce Foundation (Chamber Foundation) and the T3 Innovation Network (T3 Network) launched the Jobs and Employment Data Exchange (JEDx) initiative in 2021 to develop a public-private approach for collecting and using standards-based jobs and employment data. JEDx builds on the Chamber Foundation's Job Data Exchange (JDX) initiative to promote public-private standards for job descriptions and postings, and the T3 Network's Employment and Earnings Records Standards Project to develop and use public-private standards for comprehensive employment and earnings records. Both the JDX and the T3 Network efforts were done in cooperation with the HR Open Standards Consortium and other public and private partners.

The JEDx initiative started with a two-month planning phase with input from a public-private advisory committee. This planning phase identified four project priorities:

Project 1: Improving federal and state reporting

Project 2: Improving job description data for sharing and use in career pathway partnerships

Project 3: Improving job posting data for search

Project 4: Empowering workers/learners to use employment records for job and government program and benefit applications

In launching the JEDx design phase, the Chamber Foundation focused first on Project 1, Improving Federal and State Reporting starting with Unemployment Insurance (UI) reporting. This project has the following objectives:

Primary Objectives

- Reduce federal and state reporting costs for employers and government agencies
- Improve data quality and timeliness in federal and state government reporting
- Provide better data for improved public and private workforce analytics and program administration applications

Secondary Objectives (connections to future projects):

Ensure that employers and HR technology service providers take a consistent approach in:

- Sharing and using job description data in career pathways (Project 2)
- Improving job posting data for search (Project 3)
- Providing workers/learners with their own LERs for job applications and government programs and benefits (Project 4)

To guide the Project 1 design phase, the Chamber Foundation established a national, public-private JEDx Steering Committee composed of representatives from national, state, and regional organizations as well as public and private partners from seven states that agreed to participate on the steering committee and technical workgroups and explore future options for pilot-testing. The seven participating states were: Arkansas, California, Colorado, Florida, Kentucky, New Jersey, and Texas.

The Chamber Foundation also established two technical workgroups addressing: (1) data and applications priorities, and (2) system architecture. In addition, the Chamber Foundation received funding from the Sloan Foundation for the JEDx Research Enrichment Project (JEDx-REP) to engage the research community in identifying data needs and exploring how to improve access while protecting privacy.

The first three steering committee meetings focused on clarifying Project 1 objectives and exploring the current state and future vision of federal and state reporting. These meetings also provided updates from the two technical workgroups which circulated draft reports for review and comment prior to the development of this project report.

The final steering committee meeting discussed the draft design phase report. This final design phase report first highlights the project objectives and current state and future vision of federal and state reporting. It then summarizes the reports issued by each workgroup and interim findings from the Sloan-funded JEDxREP. The report concludes with recommendations for Project 1 next steps from November 2022 to March 2023 that provide a bridge into the pilot phase in 2023.

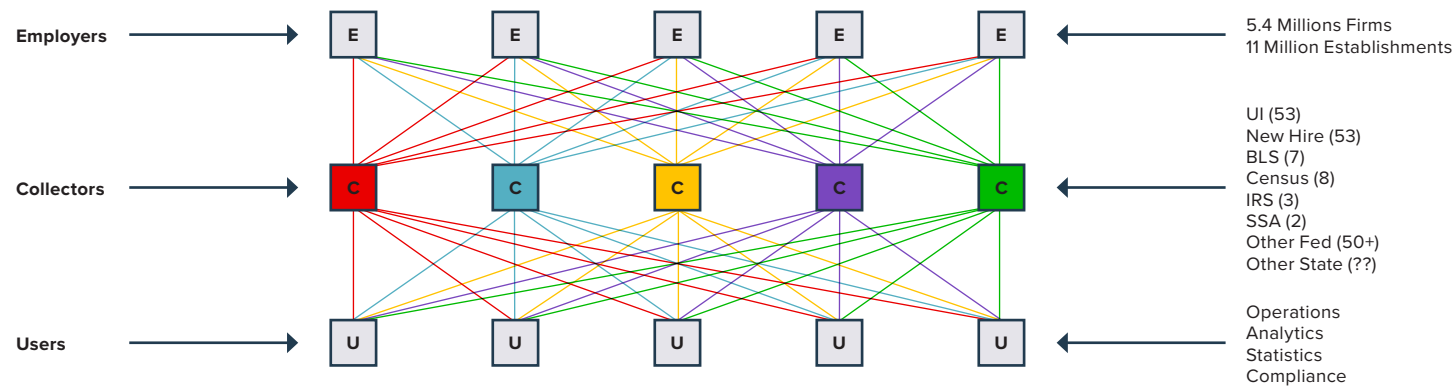


FEDERAL AND STATE REPORTING: WHERE WE ARE NOW AND FUTURE VISION

JEDx WORKGROUPS

The Project 1 design phase began with an analysis of current federal and state reporting systems including UI. As shown in Figure 1, nearly 200 different systems collect employment and jobs data from employers in the United States. Many of these systems have weaknesses that stymie important potential uses of the data, including inconsistent definitions, lack of timeliness, barriers to access, and inadequate geographic specificity, as well as some critical data simply not being available. Many of these systems are based on employer surveys, while a few are based on administrative record systems collecting data from virtually all employers including UI reporting. Among these systems, redundancies in collection processes and out-of-date technologies impose higher costs than are necessary on the employers that report the data and on governments that collect, clean, and compile them. The 53 jurisdictions that administer UI programs represent about one quarter of the employment data collection systems in the country. Each one is unique and reflects many of the system shortcomings noted above. However, as they are administrative data systems, they offer advantages as starting points for exploring new approaches to data collection serving broad needs.

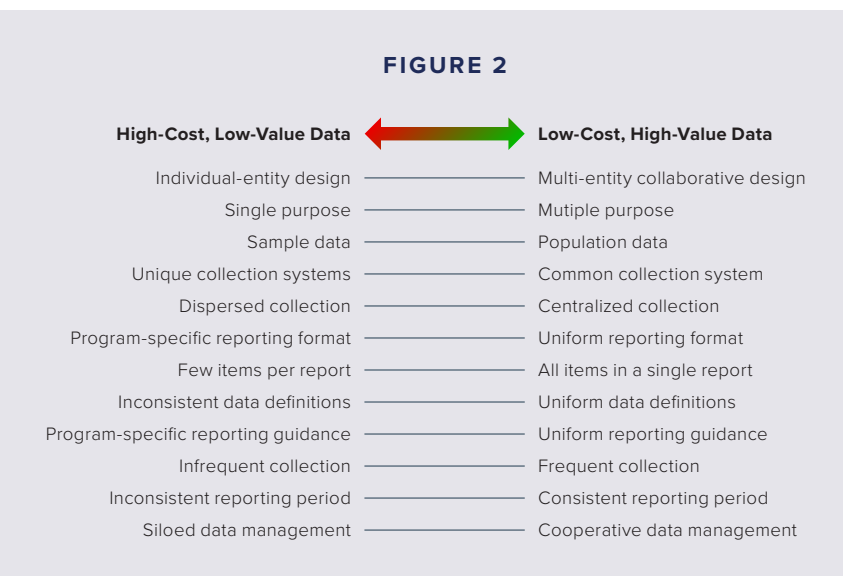
FIGURE 1



As discussed in the first three steering committee meetings, JEDx seeks to move forward with a vision of providing higher value and lower costs (See Figure 2). This future vision is moving toward a:

- Comprehensive, standard set of employer data meeting requirements for reporting and high-value public and private uses
- Submitted as one report using a standard system architecture (e.g., APIs)
- Governed by a public-private data trust to expand public and private use and protect employer and worker privacy

FIGURE 2

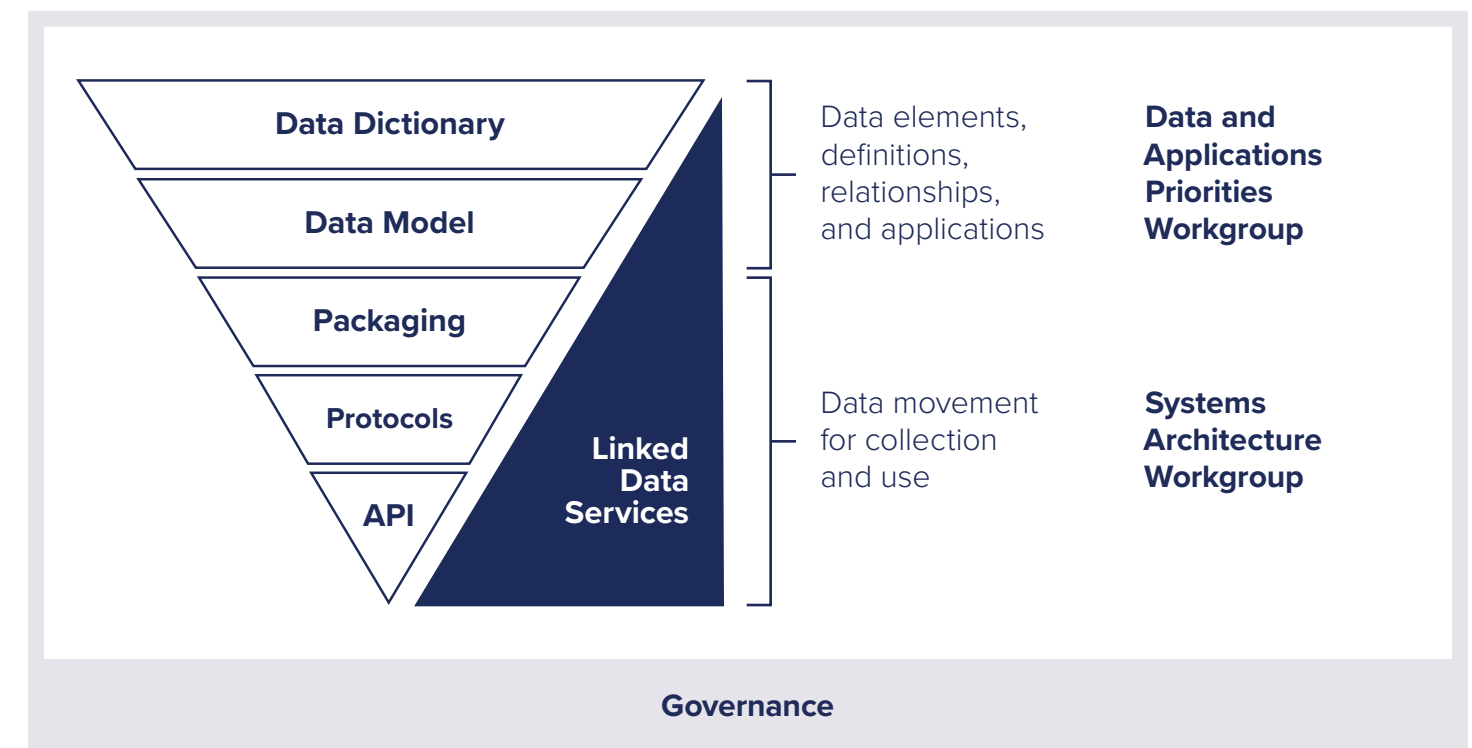


Data standards are key to the JEDx strategy. Standards form the fundamental building blocks for modern systems for compatibility, consistency, and interoperability across data systems and data exchanged between systems. Figure 3 below illustrates the different layers of data standards.

The two JEDx technical workgroups addressed different aspects of data standards. The Data and Applications Priorities Workgroup focused on priority applications/uses of employment and jobs data, the data elements needed to address those applications, and how the data should be defined. The workgroup's recommendations were consistent with the data model and dictionary maintained by the HR Open Standards Consortium.¹

The Systems Architecture Workgroup focused on layers of the standards stack supporting data movement and use.

FIGURE 3



¹ U.S. Chamber of Commerce Foundation, Developing and Using Public-Private Data Standards for Employment and Earnings Records, February 2021, pp. 10-12, <https://tinyurl.com/yck23k32>

DATA AND APPLICATIONS PRIORITIES WORKGROUP

The Data and Applications Priorities Workgroup involved stakeholders in decisions about which data uses were of highest priority, the data elements needed to address those uses, how those data should be defined, and how those data could be used for stakeholders' maximum benefit, while improving the quality of the data and minimizing costs of producing them. The workgroup included members of the state coalitions, federal agencies, state and local workforce associations, national economic research and education organizations, and employer service providers.

The workgroup was given the following objectives:

1. Establish initial priorities for jobs and employment data collection based on stakeholder needs for priority program applications, potential workforce analytics, and cost savings
2. Identify necessary refinements to the data model and dictionary based on those priorities
3. Explore consolidated data reporting options in addition to UI reporting
4. Recommend high-priority applications that demonstrate value

To align the initial data recommendations with stakeholders' priorities, the JEDx team solicited input from various stakeholder organizations. The JEDx team also reviewed previous reports on data uses, collected input through discussions and interviews with stakeholder groups, and in conversations with state coalition members. In-depth interviews were conducted with members of the research community as part of the Sloan Foundation-funded JEDx Research Enrichment Project (REP).

From the input received, the JEDx team distilled a set of what they believed were the highest priority uses and grouped them into the six user categories seen below. These use cases were then reviewed by the workgroup, members of the state coalitions, and selected stakeholder organizations. Ongoing outreach to stakeholders to refine and validate these use cases is planned.

Unemployment Insurance Administration

- Improving the accuracy, effectiveness, efficiency, and integrity of initial and continuing UI benefit payments, including the prevention and detection of overpayment and fraud
- Improving the reemployment of UI benefit recipients: reduced time to reemployment, increased earnings, reduced program costs, and potential for reduced unemployment insurance taxes
- Improving equity in UI benefit administration from application and benefit
- Improving worker access to their learning and employment records (LERs) to improve UI claim processing and accelerate reemployment (related to Project 4)

Employers, Employer Partnerships/Collaboratives, Employer/Industry Organizations, and HR and Payroll Service Providers

- Improving state and regional benchmarking information for HR analytics and talent recruitment and management
- Improving access to data for workforce demand and labor supply analyses that support investment/location decisions, recruiting, and hiring
- Improving employer jobs data on skills requirements to expand the number of qualified job applicants

Students, Workers, and Career Guidance and Employment Services Providers

- Improving descriptive state and regional jobs data for benchmarking current compensation and providing career guidance and job search services
- Improving state and regional data on education and training program outcomes for career guidance services in evaluating education/training opportunities
- Improving the use of worker LERs in identifying job opportunities to pursue and accelerating reemployment (related to JEDx projects 2, 3 and 4)

Education and Training Providers

- Improving employment outcomes data for managing and improving programs and providing information for recruiting students
- Improving jobs data to better align curriculum with available and emerging jobs and skill trends

Public Sector: Education, Economic and Workforce Development, Workforce Information

- Improving supply-demand analysis to align education and workforce investment to meet employer needs
- Providing more timely and thorough analyses of trends in sub-state labor markets

Research Community

- Improving the comprehensiveness and timeliness of government statistical reports and analysis for the nation, regions, states, and substate areas
- Improving the comprehensiveness and timeliness of social, economic, and policy research for the nation, regions, states and substate areas
- Improving the cost-effectiveness of employment, training, and education-related programs, for both ongoing programs and demonstrations

While stakeholders' priority use cases were the primary factor in identifying initial priorities for data collection, other factors were considered that could potentially contribute to improving data quality and reducing the cost of data collection, including:

- Standardization of data elements and data definitions to increase accuracy, consistency, and comparability. The workgroup suggests collecting a standard set of more granular data for some data types to meet varied needs among users.
- Consolidation of reporting systems to reduce redundancy in reporting and collection. The workgroup reviewed the following ten federal and state data systems collecting data consistent with those needed to address the use cases, as possible candidates for consolidation with UI reporting:
 - New Hire Registry conducted by each state and the federal Department of Health and Human Services
 - Bureau of Labor Statistics' Annual Refile Survey, Multiple Worksite Report, and Occupational Employment Survey
 - Census Bureau's Census of Public Employment and Payroll
 - Equal Employment Opportunity Commission's EEO-1, EEO-3, EEO-4, and EEO-5 reports
 - Department of Health and Human Services Hospital Wage Index Occupation Mix Survey
- Alignment of reporting frequency with employer pay periods to eliminate added effort to calculate and compile data for government-specified time periods.
- Improvement of technology to move data more efficiently (addressed by the Systems Architecture Technical Workgroup)

Based on addressing the priority use cases above, but also keeping in mind the opportunities for potential report consolidation and the JEDx goal of standardization, the workgroup identified initial recommendations for data to be collected in pilot tests.



DATA AND APPLICATIONS PRIORITIES WORKGROUP

The recommended data are grouped below into seven categories. Different data collection approaches may be warranted for each of the categories. For example, data that change frequently may require a scheduled report, while more stable data may be updated on an as-needed basis.

01

Employer Organizational Descriptors

Federal Employer Identification Number	Operating Status	Contact Name
Previous Federal Employer Identification Number	Operating Status Date	Contact Phone
State Unemployment Tax Account Number	Trade Names	Contact Email
Legal Name	Mailing Address	Parent Company Tax ID
Business Structure Type	Physical address	Parent Company Name
	Industry Code	
	Principal Products & Services	

02

Employer Establishment Descriptors

Federal Employer Identification Number	Functions	Contact Phone
Establishment ID Number	Establishment Industry Code	Contact Email
Establishment Name	Establishment Principal Products & Services	
Establishment Status	Establishment Physical Address	
Establishment Status Date	Contact Name	
Establishment Business		

03

Employer Job Descriptors

Federal Employer Identification Number	Employer Job-Required Education and Experience
Employer Job Code	
Employer Job Title	
Business Support Role	
Employer Job Duties	
Employer Job-Required Skills	

04

Worker Personal Descriptors

Social Security Number	Residence Address
Previous Social Security Number	Birth Date
First Name	Military Status
Middle Name	Gender
Last Name	Ethnicity
Previous Last Name	Race
	Disability

05

Work Relationship Descriptors

Period Covered by Report	Stock Owner Indicator	Seasonal Work Beginning Date
Social Security Number	Worker Type	Seasonal Work Ending Date
Last Name	Work Status	
Assigned Establishment ID	Work Status Reason	
Assigned Employer Job Code	Date of Hire	
Primary Work Location	Date of Termination	
Officer Indicator		

06

Worker Paid Time

Period Covered by Report	Total Premium Hours Worked
Social Security Number	Total Hours of Paid Leave Taken (Paid Time Off)
Last Name	
Weeks Worked	
Worked in Payroll Period Including 12th of the Month	
Regular Hours Worked	

07

Worker Compensation

Part 1: Employee Earnings, Compensation Earned

Period Covered by Report	Total Leave Pay Earned
Social Security Number	Total Premium Hourly Wages Earned
Last Name	
Period Covered by Report	Total Other Cash Compensation Earned
Salary Earned	
Regular Hourly Wages Earned	

Part 2: UI Tax Calculation Factors, Compensation Paid

Period Covered by Report	State Personal Income Tax Withheld	Compensation Paid in Categories (to be determined) that are Used to Calculate Taxable UI Wages
Social Security Number	Compensation Paid Subject to State Personal Income Tax	
Last Name		
Total Wages Paid Out of State		
Total Compensation Paid		



SYSTEM ARCHITECTURE WORKGROUP

The System Architecture Workgroup focused on standardizing system architecture and optimizing the way in which data move from the source to collection to storage to data users. The main challenge of this system design task was accommodating for the complex relationships among multiple data collectors, employers, and data users.

The JEDx architecture is modular to support different implementation needs across states and stakeholders, while standardized to support reuse and efficiency in collection and use. Standard components will provide great efficiencies for employers and third-party agents, especially those that operate in more than one state, while expanding application and use of data collected.

Collection Architecture

A key component of the proposed architecture is a standard Application Programming Interface (API). The specification addresses data transport, security, and access management for the transport and exchange of data. This transport layer of the architecture is separated from the data layer so that the data packages carried by the API are flexible to accommodate current and future needs.

The data package(s) exchanged via the API initially will be defined based on guidance of stakeholders and the JEDx Data and Applications Workgroup and state pilots. Later the API will be able to support other collection and exchange use cases. The following figure shows a modern cloud-based architecture that includes the API Gateway, API Implementation, Identity Provider/Broker, and Data Lake (or part of a data mesh) for storage of both structured and unstructured data.

The data collection package is designed using the standard protocol for Javascript Object Notation (JSON). The data packages are encrypted for transport. Specifications and examples are provided in the JEDx API Specification. These specifications and examples include the data package to support collection to be further developed for the JEDx pilots and with more robust representations of the data elements based on the work of the JEDx Data and Applications Workgroup.

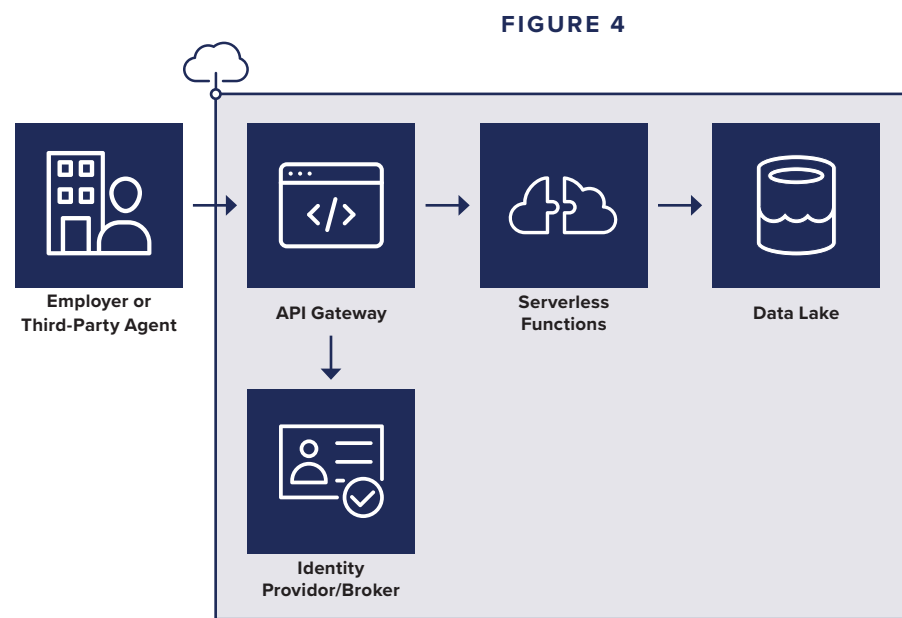


FIGURE 4

Architectural Elements

- API Gateway:** Endpoint for API. Provides security and Access Management to the API.
- Serverless Functions:** The code to implement the API logic. Microservices based on cloud serverless frameworks.
- Data Lake:** A repository of structured and unstructured data sources that can easily be found, accessed, managed, and protected.
- Identity Provider/Broker:** Component to provide identity and access credentials for the API.

Use Architecture

Different end uses of public-private data may necessitate different data architectures and local governance models. These data use architectures may vary as states and other stakeholders progress from siloed collection and use systems using legacy technology to modern infrastructures that may support public-private collaboration.

As JEDx participants progress toward the vision for enhanced data collection and use, optimizing public-private collaboration might increasingly leverage architectures such as a “data mesh.” These architectures support federated computational governance and data as a service to control appropriate uses of the data and reduce risks associated with centralized data stores.

Data Governance and Privacy

The JEDx architecture workgroup at this point is not recommending a particular governance model for JEDx but plans to continue requirements gathering among stakeholder and pilot participants to make a final recommendation.

Data governance will play a critical role in enabling the responsible sharing required to support JEDx use cases. Data Governance is ultimately about who has the power to make decisions over data and how those decisions are made. This will include decisions about the rules and process for how JEDx data is collected, shared, accessed, controlled, and used. Because JEDx relies on a unique public-private partnership, it will rely on governance models that are multi-stakeholder, collaborative, and legally compliant and that protect stakeholders against risks and liabilities.

JEDx deals with some of the most sensitive data about individuals. In addition to ensuring compliance with federal and state data privacy laws, JEDx’s multiple stakeholders have surfaced industry and stakeholder-specific requirements around the data, the systems transacting and storing it, and its downstream uses. The rules and requirements will need to be expressed and enforced as data policies.

FIGURE 5

Program Reporting	Pooled Analytics for Policy	Third-Party Reuse (Analytics & Apps)
<ul style="list-style-type: none"> One-to-many data flows and microservices architecture Data harmonization capabilities and robust metadata management 	<ul style="list-style-type: none"> Modern cloud data warehouse architecture Robust governance processes for prioritizing analytics needs 	<ul style="list-style-type: none"> Robust anonymization routines and privacy guarantees Research data lake architecture and secure analytics environment for outside parties to access External publishing APIs

JEDx data policies fall into 6 general buckets:

- Privacy
- Security
- Quality
- Transparency
- Access
- Use

The JEDx system architecture includes features of privacy and security by design. The design principles for JEDx privacy and security build on best practices for any system with sensitive data, including Encryption in Transit (SSL/TLS), Encryption at Rest, NIST Cybersecurity Standards, FIPS, PII Compliance.

In addition, the JEDx System Architecture Workgroup is exploring newer technologies that would embed a governance metadata framework into the fabric of the data structures to inform access control. With this framework, privacy objects are attached to data objects early in the collection pipeline and travel with the data from collection systems to use systems. These attached privacy objects contain both provenance information (where the data came from) and links to the sets of rules and regulations for restricting or granting access including links to data-sharing agreements and encoded logic for the conditions by which the data may be used. Lastly, the governance group will explore newer cloud-based architectures that allow for analyzing data without copying, moving, or providing unencrypted access to third parties.

SYSTEM ARCHITECTURE WORKGROUP

Pilot Roadmap: Implementation of the Architecture Privacy Obligation Documents

During the Pilots the JEDx System Architecture will explore embedding governance metadata into the fabric of the data structures to inform access control. The functional components of this technology are described in Figure 6.

FIGURE 6

Privacy Obligation Document (POD) Components	
POD – Privacy Obligation Document	<ul style="list-style-type: none"> Act which contains details of the parties involved, the data which can be transferred from one party to another, details of the technical benchmarks which must be adhered to (e.g., encryption levels) and details of any additional parties which may handle the data.
POD Lookup Service	<ul style="list-style-type: none"> Provides a means by which external applications request and obtain the current POD that applies to them.
POD Enforcer	<ul style="list-style-type: none"> Officially the “Data Protection Enforcer Service” this service: <ul style="list-style-type: none"> Checks that any incoming requests from external applications are referencing their correct POD. Uses the rules from the applicable POD to clean the raw data being returned in a request, ensuring that a ‘cleansed’ data set is returned to the requesting external application. Is placed and configured to honor all payload encryption requirements.

Stage 1

Milestones

- JEDx sandbox environment, privacy obligation components, and security infrastructure developed and tested with participating submitter(s).
- Collectors and submitters plan and prepare for JEDx deployment provisioning.

Stage 2

Milestones

- State deployed JEDx sandboxes tested with simulated data pushed via API from third-party agents.
- Web form added to select state pilots based on scope.
- States ready to pilot on a defined scale alongside JEDx enhanced collection alongside existing processes and infrastructure.
- States explore multiple options for enhancing their data collection, use, and sharing opportunities, with collaborative agreements on privacy, data management, and security.
- States explore data governance and data privacy structures to support chosen data use cases.

Stage 3

Milestones

- Third-party agents (on behalf of opt-in employers) have successfully pushed real data to the state JEDx collection deployment.
- States begin to integrate JEDx data subsets into existing processes.
- Select states pilot collaborative use options.
- States pilot data governance and data privacy structures to support chosen data use cases.

Stage 4

Milestones

- States have begun to pilot the use of richer data sets made possible by the JEDx architecture.
- High-priority use cases (see High-Priority Use Cases and Preliminary Data Requirements) take advantage of the richer data sets to enhance a variety of programs. Examples include:
 - improved UI administration (for example, through enhanced fraud and error detection);
 - improved HR analytics and management;
 - better job and compensation benchmarking;
 - improved analysis of employment outcomes to design more efficient training programs;
 - better analysis of the supply-demand data to enable more accurate alignment of the workforce investment with employer needs; and
 - reduced reporting burden for employers and their third-party agents.
- Plan for scale.

Throughout the pilot, stakeholders will continue developing and implementing a public-private data governance model. Parallel to this roadmap, each state and key stakeholder will require their own projects to address existing systems integrations, process improvement planning, and stakeholder engagement to address local variations.

JEDx RESEARCH ENRICHMENT PROJECT (JEDx-REP)

The aim of the JEDx-REP is to engage the economic research, statistical, and evaluation communities to:

- Identify the **data elements** (e.g., occupation, work hours, demographics) on individual workers, to be included in more comprehensive employer administrative records to support the most critical economics research, statistical, and evaluation **use-case applications**; and
- Determine how best to enable **improved user access** to data from more comprehensive employer administrative records, including options such as an Administrative Data Research Facility (ADRF), while **protecting privacy**.

To date, JEDx-REP researchers have obtained input through two online forums (June 16, July 7) and 26 completed individual interviews; they expect to conduct interviews with an additional 12 individuals.

Thematic findings to date:

Use Cases—Users Seek:

- More detailed occupational demand and labor supply analysis
- More rapid priority policy analysis (e.g., COVID proposals, labor shortages)
- Improved benchmarking of regional/state/local supply & demand for planning
- Capacity to analyze determinants of national and local labor market and social outcomes (e.g., labor shortages, unemployment, inequality, mobility)
- Lower cost program evaluations (e.g., long-term impacts of skills training)
- Capacity to conduct more complex evaluations (e.g., labor market outcomes of formerly incarcerated with high geographic mobility)
- To enable above use cases, ensure that business-valued use cases are identified and facilitated

Data Elements—User Priorities Include:

- Standardized and accurate worker earnings, hours
- Occupation, job title and work schedule for workers
- Employer-employee relationship (traditional, contractor/1099, third party)
- More timely and frequent (weekly or at least monthly) information
- Worker demographics (gender, race, ethnicity, age) and start/stop dates
- Worker’s work location and residence location
- Employer and worker Identifiers to allow linkages with other data sources

Access

- Solution likely to be mixed—multiple, complementary public- and private-hosted access points, serving different purposes and/or user groups
- Access attributes to be addressed include:
 - Purpose of access
 - Persons given access
 - Terms of access
 - Access system capabilities
 - Legal provisions (privacy, antitrust)
 - Governance
- Attribute design should be informed by experience of existing data systems serving analogous purposes (14 identified to date)

After completing the interviews and a comprehensive literature review, the JEDx-REP team will prepare its final report with recommendations by the end of November 2022.

NEXT STEPS: BRIDGING FROM DESIGN PHASE TO PILOT PHASE

The Chamber Foundation will take the following actions to build on the Project 1 design phase from October 2022 to March 2023 as a bridge to the pilot phase starting in 2023. This bridge phase will:

01

Further explore the JEDx employer value proposition.

Engage employers and employer organizations and their HR service partners in further developing and communicating the major JEDx employer value proposition—lower collection costs and higher value applications— in cooperation with national and state partners. This will include a national employer survey in partnership with the Society for Human Resource Management (SHRM) as well as meetings with other employers and employer organizations. The Chamber Foundation also will work with states that wish to engage their employers and employer associations in the discussions.

02

Explore how to improve employer capacity in developing, managing, and using data.

Explore how to work with industry and professional associations, HR system providers, and government to help employers develop, manage, and use high-quality jobs and employment data for addressing the highest priority employer use cases including benchmarking and using HR technologies consistent with proposed JEDx standards in sharing and reporting data.

03

Further explore the JEDx value proposition for state workforce/UI agencies and federal statistical agencies.

Engage federal and state agencies to assess opportunities for improving data for operations and potential reporting consolidation.

04

Incorporate findings and recommendations from the JEDx REP.

Incorporate the final findings and recommendations from the JEDx Research Enrichment Project (JEDx-REP) including high-priority use cases and data requirements and insights for improving user access.

05

Develop Pilot-Testing Plans.

Engage federal, state, and TPA partners in pilot-test planning and design based on the JEDx pilot-testing road map and identification of resource requirements (e.g., money, technical assistance, time) necessary to complete and evaluate the pilot-testing.

06

Explore Future Public-Private JEDx Governance.

Engage public and private partners in exploring 1) options for future JEDx governance, including public-private models of governance made possible with JEDx architectures and 2) how to continue public-private collaboration by establishing an ongoing mechanism or forum to develop and maintain public-private data and technology standards.

This JEDx bridge phase will culminate in a national meeting in March 2023 that will present the final pilot test phase plan.



JEDx



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