U.S. Chamber of Commerce Foundation

New Data Paradigm Planning Phase Technical Report:

Exploring the Key Design Features of a Public-Private Data and Technology Infrastructure

Talent
Technology
Transformation

Executive Summary

The U.S. Chamber of Commerce Foundation's T3 Innovation Network launched the New Data Paradigm (NDP) initiative in August 2025 to explore a public-private approach for collecting and using more standardized education and work-related data to empower learners and workers and better connect them with employers and education, training and credentialing providers in talent markets. The NDP initiative proposes to achieve these goals through a data and technology infrastructure capable of supporting an open marketplace of AI-powered tools and secure credential applications. Between September 2025 and April 2026, the NDP initiative conducted a planning phase to analyze key design features of this proposed infrastructure. This planning phase report summarizes this analysis, presents an initial high-level functional design of the proposed infrastructure, and provides a roadmap and recommendations for moving forward.

This report proposes to further design and pilot-test a public-private data infrastructure to improve, coordinate, and standardize how employers and providers:

1. Publish job and learning opportunities,
2. Report data to government, and
3. Issue Learning and Employment Records (LERs) as verifiable credentials.

This includes how employers and providers share more standardized and comparable skills data. It also proposes to explore a distributed data infrastructure that can support existing data uses as well as AI-powered distributed data analytics tools and Learning and Employment Record (LER) issuing services that expand public and private sector data access and use while protecting privacy. In addition, this report proposes a set of shared infrastructure services to coordinate and align the collection and use of education and work-related data. These shared services include data standards, job and learning opportunity taxonomies, skills ontologies, privacy and security standards and guidelines, and public-private governance. This report proposes a three-phase work plan moving from design to pilot-testing to scaled implementation from 2026 to 2029. During the design phase, the report recommends that the NDP initiative:

- Collaborate with government agencies and leading standards organizations and initiatives to develop and utilize a unified data model/ontology to align and enhance work-related and education data standards and LER standards;
- Promote the development and use of public and private sector skills ontologies and mapping and translation services that provide the basis for a common or comparable language for skills data;
- Advance privacy and security standards and practices including the use of AI-readable privacy obligation frameworks;
- Further develop strategies and pilot-test plans for: (1) improving, coordinating and standardizing the publishing of job and learning opportunities, administrative data reporting to government, and issuing LERs; (2) strengthening the LER ecosystem; and (3) exploring distributed data analytics applications; and
- Explore the design and pilot-testing of public-private state and multi-state data utilities for developing and managing the proposed distributed infrastructure.

Introduction

The U.S. Chamber of Commerce Foundation's T3 Innovation Network launched the New Data Paradigm initiative in August 2025 to explore a public-private approach[1] for collecting and using education and work-related data to empower learners and workers to successfully pursue learning and career opportunities in data-driven, skills-based talent markets.[2] This initiative was launched with a NDP brief that presented the need for a new paradigm and the priorities and major stakeholder use case applications compared to the existing government-centered paradigm. This brief also proposed key design features for a new public-private data and technology infrastructure. Finally, the brief proposed a planning phase for the NDP initiative to further explore the NDP vision and key design features of this infrastructure.

In this planning phase, the NDP initiative further explored the vision of the new approach and the design of a data and technology infrastructure from September 2025 to July 2026. This phase focused first on aligning and coordinating promising initiatives to improve the collection and use of education and work-related administrative data and the issuing and use of Learning and Employment Records (LERs). This was discussed at two national NDP virtual meetings held on December 2, 2025, and January 28, 2026. The NDP initiative then focused on the development and use of skills data in talent markets. This was discussed at a third national NDP virtual meeting held on March 25, 2026.

This NDP initiative report summarizes the results from this planning phase and recommendations for next steps. This report first provides an overview of the NDP vision. It then describes how the NDP initiative proposes to build on the Jobs and Employment Data Exchange (JEDx)[3] approach to improve the collection and use of work-related administrative data and apply it to education data. It also describes how the JEDx approach could build on similar initiatives to improve education data reporting. The report then describes how an NDP infrastructure could be used to improve how employers and providers report administrative data to government, publish data about job and learning opportunities, and issue LERs at scale. It also describes how the infrastructure could be used to improve the development and use of skills data. It then provides an overview of the design of the NDP data and technology infrastructure based on a high-level functional diagram. In addition, the report concludes with a roadmap and recommendations to implement the NDP vision and key design features of the infrastructure. Finally, the report proposes to explore the development and pilot-testing of state and multi-state data utilities to develop and manage this infrastructure.

[1] The NDP public-private approach is different from the existing government-centered approach because it proposes a more balanced public-private governance and management of a data and technology infrastructure designed to support data use by both government and private sector stakeholders utilizing both government and private sector applications and tools to improve talent markets.

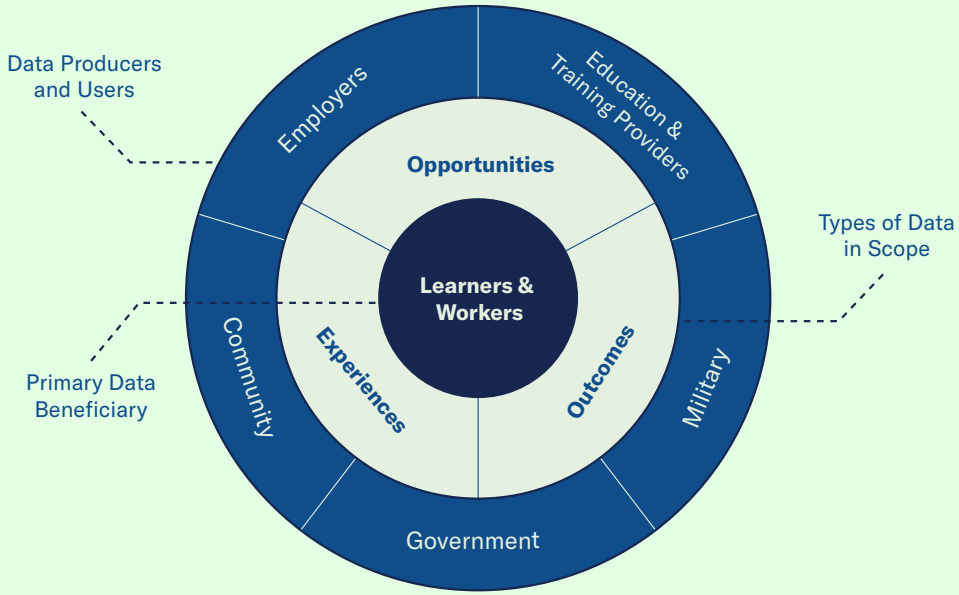
[2] U.S. Chamber of Commerce Foundation, "The New Data Paradigm: Empowering Learners and Workers in Skills-Based, Data-Driven Talent Markets," August 2025.

[3] Jobs and Employment Data Exchange (JEDx) | U.S. Chamber of Commerce Foundation.

New Data Paradigm Vision and Priorities

As shown in Figure 1, the New Data Paradigm initiative is a public-private effort to empower learners and workers with the data they need to succeed in rapidly changing, skills-based talent markets and to efficiently access government programs. It also seeks to improve connections between learners and workers, employers, and education and training and credentialing providers in talent markets and provide the data necessary for government-focused applications including government program administration and federal statistics.

Figure 1: New Data Paradigm: Empowering Learners and Workers



This initiative is exploring a major shift from the current government-focused paradigm in which federal and state governments take the lead to address government priorities to a more public-private approach. This new approach focuses first on empowering learners and workers and improving their connections between learners and workers, employers, and education and training and credentialing providers in skills-based talent markets. It provides better data for existing government-centered use case applications–government statistics, program administration and research–but goes further by enabling new types of distributed data analytics and the issuing of LERs for empowering learners and workers, improving talent markets, and supporting both public and private sector initiatives.

The NDP proposes to achieve these priorities through a new public-private data and technology infrastructure that can support an open marketplace of AI-powered tools and applications. These tools and applications can guide the actions of learners and workers, employers and providers in talent markets and improve the efficiency and effectiveness of government programs using near real-time data that is more granular in describing the current skills-based economy and offering better predictions about future trends. This new infrastructure is based on key design features including public-private governance, public-private data standards and privacy preserving practices and alignment and coordination of government work-related and education administrative data reporting, publishing job and learning opportunities, and issuing LERs at scale. It also is committed to a decentralized or distributed data infrastructure managed through a public-private governance approach.

Building on JEDx to Improve the Collection and Use of Work-Related and Education Administrative Data

The NDP planning phase explored the key design features of this public-private data and technology infrastructure by exploring how to build on the U.S. Chamber Foundation's JEDx initiative[4] to improve the collection and use of work-related data (e.g., jobs, employment). It also explored how to apply the JEDx approach and strategies to education data reporting in ways that build on existing efforts to improve education data reporting referenced later in this report.

JEDx is a public-private, standards-based initiative to support and improve:

Government Reporting

Reduce federal and state reporting costs for employers and government agencies while improving data quality and timeliness,

Workforce Analytics

Provide better and more timely data for public and private workforce analytics and government program administration applications, and

Consistent and Coordinated Data Sharing

Ensure that employers and their HR service providers take a consistent and coordinated approach in reporting data to federal and state government agencies, sharing job description and posting data, and issuing LERs to workers and learners.



The JEDx initiative conducted a landscape analysis of federal and state government data collection systems that ask employers to provide data by either submitting administrative data through web portals and file uploads or completing surveys.[5] This analysis determined that employers are now asked to provide job and employment data for over 150 federal and state administrative data and survey reporting systems with different data definitions, types of reporting systems, and reporting cycles.[6]

[4] U.S. Chamber of Commerce Foundation, "Jobs and Employment Data Exchange (JEDx)."

[5] Administrative data refers to data submitted by employers or education, training and credentialing providers from internal operating systems used to manage data for their own use. For employers, these systems include HRIS, payroll, time and attendance, and recruiting and applicant tracking systems. For providers, these systems include student information systems, learning management systems, and academic course/curriculum management systems. In contrast, survey data refers to data gathered through online surveys that may require employers and providers to query operating systems to answer survey questions but does not require data sharing directly from operating systems.

[6] U.S. Chamber of Commerce Foundation, "The Potential of JEDx to Reduce Employer Burden by Consolidation Reporting to Government: Initial Observations."

To address these issues, the JEDx initiative developed and pilot-tested a new approach for improving government reporting based on three major strategies:

1 **Data Standardization.** Developed a comprehensive data model and dictionary in cooperation with the HR Open Standards Consortium for use in benchmarking and standardizing data requirements for federal and state collection systems;

2 **Modernization of Reporting Systems.** Developed API standards in cooperation with the HR Open Standards Consortium and Access For Learning (A4L) and used these API standards to develop and pilot-test a JEDx Reporting Service and a JEDx Collection Service for reporting and receiving a standardized data package as well as an improved and integrated occupational coding system; and

3 **Consolidation of Reporting Systems.** Explored and pilot tested how to consolidate government reporting starting with enhanced state Unemployment Insurance reporting and three related Bureau of Labor Statistics (BLS) programs.[7]

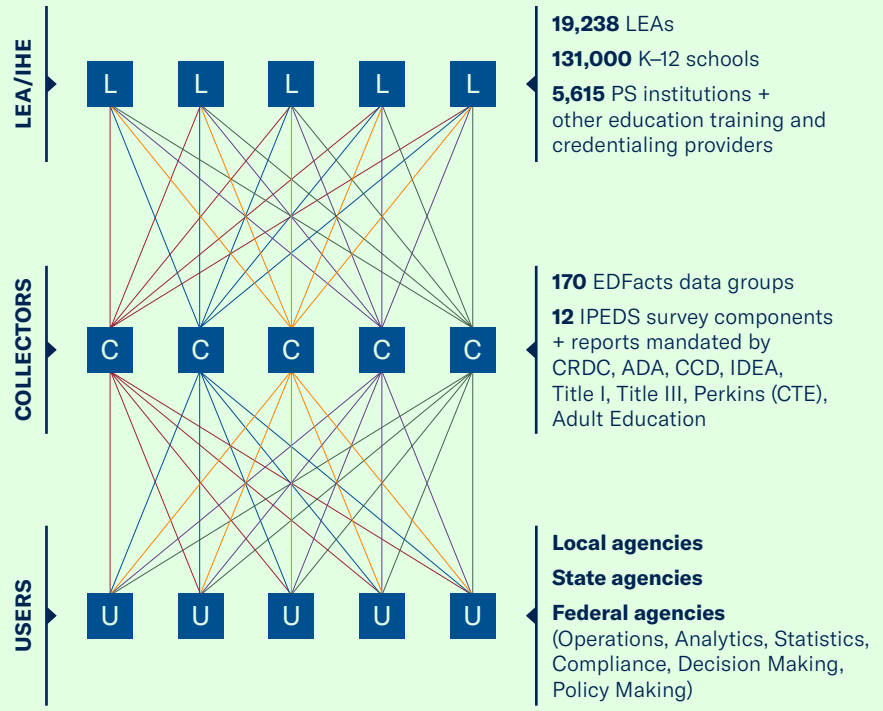
JEDx recently launched a new phase of work to explore how to use administrative data reporting to address the work verification data requirements for Medicaid, Supplemental Nutrition Assistance Program (SNAP), and other government programs. This phase also will provide data standardization and modernization tools to federal and state partners for enhancing state UI data collection and consolidated reporting. Finally, JEDx will explore how to coordinate government reporting and the issuing of LERs with employment data that could be used to address work verification requirements for government programs and job application.

[7] U.S. Bureau of Labor Statistics, "Annual Refiling Survey"; U.S. Bureau of Labor Statistics, "The Multiple Worksite Report"; U.S. Bureau of Labor Statistics, "Occupational Employment Statistics (OES) Respondents Home Page."

Applying the JEDx Approach and Strategies to Education Data

The NDP initiative conducted an initial landscape analysis of federal and state government education data collection systems resulting in similar findings to the JEDx landscape analysis of work-related data systems. The initiative discovered that there are many federal and state data collections that have similar problems. As shown in Figure 2, local education agencies (LEAs), schools, colleges and universities now provide data through a myriad of collection systems differing in data definitions and reporting systems and cycles. These include reporting systems for specific mandates and requirements such as Common Core of Data (CCD) and Civil Rights Data Collection (CRDC) including the Americans with Disabilities Act (ADA) requirements. They also include collection systems for specific programs such as federal funding streams for K–12 education and separate programs for individuals with disabilities, career and technical education and adult education programs.[8] In addition, these collection systems include major initiatives to consolidate government reporting for secondary and postsecondary education. For example, EDFacts is a U.S. Department of Education (ED) initiative that centralizes and standardizes educational data collection from state education agencies (SEAs) and local educational agencies (LEAs) across pre-kindergarten through grade 12.[9] And, IPEDS (Integrated Postsecondary Education Data System) consolidates government reporting for postsecondary education institutions that participate in federal student aid programs.[10] This myriad of collection systems is even more complex when considering other related federal and state systems such as veterans and apprenticeship programs and state licensing agency reporting systems.

Figure 2: Education-Related Data Fragmentation



[8] Elementary and Secondary Education Act (ESEA), Title I, "Improving the Academic Achievement of the Disadvantaged," and Title III, "Language Instruction for English Learners and Immigrant Students"; Individuals with Disabilities Education Act (IDEA) ; Carl D. Perkins Career and Technical Education Act (Perkins V), formally the "Strengthening Career and Technical Education for the 21st Century Act"; Adult Education and Family Literacy Act (AEFLA), Title II of the Workforce Innovation and Opportunity Act (WIOA).

[9] U.S. Department of Education, "The EDFacts Initiative."

[10] National Center for Education Statistics, "About IPEDS."

The NDP initiative then explored how to apply the JEDx strategies to improve education reporting and determined this approach could build on many existing efforts. Here are some leading examples.

Data Standardization

Federal and state education data reporting systems already have a strong foundation with standards like the Common Education Data Standards (CEDS) and A4L and the utilization of the JSON-LD data format. For example, 11 states are already using the SIF Infrastructure in Pre-K to 12th grade education (which the JEDx infrastructure is based on), and a number of states are using EdFi for interoperability and reporting. There is a strong readiness for solutions that leverage public-private partnerships.

1

Modernization of Reporting Systems

Education and training providers have utilized APIs to integrate source data systems used in government reporting. Examples include the DXtera CampusAPI and the 1EdTech Edu-API. Also, many education reporting systems now utilize API standards and API-based reporting systems which provide a strong foundation for using this strategy across all reporting systems.

2

Consolidation of Reporting Systems

There have been many federal and state efforts to align and consolidate education data reporting systems that could be built on. For example, Generate is a free, open-source software application designed specifically to automate, standardize, and streamline EDFacts federal reporting for State Education Agencies (SEAs).[11] Originally built by the Center for the Integration of IDEA Data (CIID) and powered by CEDS, Generate acts as a technical translator. It converts a state's raw, student-level data into the exact aggregate file formats required by the U.S. Department of Education. By utilizing Generate, states potentially can experience a dramatic reduction in reporting burden.

3

[11] Center for the Integration of IDEA Data, "Generate," a free, open-source software application built on the Common Education Data Standards (CEDS) to help state education agencies improve data quality and automate federal reporting requirements.

Coordinating Administrative Data Reporting and Job and Learning Opportunity Data Sharing

As discussed earlier, the JEDx approach was designed to encourage employers and their HR service providers to take a coordinated approach to government reporting and the sharing of job description and job posting data. This was done to ensure consistency and standardization in how employers describe their job and employment opportunities in government reporting and job postings and how they describe these opportunities in job description data shared with partners, including education, training and credentialing providers. This consistency and standardization are critical for data such as job title or occupation, job duties and responsibilities, skill requirements, and work location.

Building on the approach of JEDx with work-related data and the success of Generate for K–12 federal reporting, the NDP initiative proposes to extend Generate beyond just federal K–12 reporting to empower learners and workers with their own data; extend the Generate collection approach to postsecondary education including non-credit programs; extend the JEDx and Generate architectures to support the modernization of IPEDS; and, align standards that cross boundaries of K–12 education, higher education, and non-credit workforce and lifelong learning contexts.

In applying the JEDx approach to education data, the NDP initiative also would encourage education, training and credentialing providers to ensure that the data submitted in government reporting about education, training and credentialing opportunities is consistent with data that is shared with employers and other partners. This is especially important for data such as program and credential names, classifications, and learning outcomes.

The NDP initiative proposes to further explore the modernization of job and learning opportunity publishing on provider websites to expose job and learning opportunity data to search engines and AI tools and continuously distribute this data to public and private platforms (e.g., job boards) and registries (e.g., credential registries). This approach could build on existing efforts including Credential Engine tools to publish credential data to the Credential Registry.

The NDP data and technology infrastructure could support the standards-based sharing and use of job and learning opportunity data and the support of public and private job and credential platforms and registries. This could include the development and use of skill profiles based on skill ontologies. It also could support a public-private marketplace of AI-powered tools such as JobSIDE[12] that employers and providers could use to develop, map, and align job requirements and learning opportunities. In addition, it could support an open marketplace for AI-powered tools that provide guidance on the connections between learning opportunities to maximize learning mobility[13] including the potential for credit transfer and advanced standing. Finally, it could provide improved access to and linkages with contextual and outcomes data from government administrative data for AI-powered applications for learners and workers.

[12] U.S. Chamber of Commerce Foundation, “JobSIDE.”

[13] The proposed focus on learning mobility applications draws from the work of the National Learning Mobility Collaborative.



Coordinating Administrative Data Reporting and Learning and Employment Record (LER) Initiatives

As discussed earlier, JEDx was designed to ensure that employers coordinate and provide consistent data for government reporting and for issuing LERs. The New Data Paradigm initiative explored how to apply this approach to education data and the coordination of work-related and education administrative data reporting and LER initiatives. This coordination is necessary for:

Transparency

Providing workers the ability to easily view and confirm their own work-related and education data held by employers, providers and government;

Expanded Access to LERs

Using government administrative data to issue LERs not provided directly by employers and providers;

Personalized Analytics and Guidance

Integrating personal LER data with large-scale de-identified administrative data to support AI-powered analytics to provide more personalized guidance for exploring career and learning opportunities; and

Consistency and Standardization

Ensuring consistent and standardized data is used to report to the government and issue LERs.

Transparency: Using Employer, Provider, and Government Self-Service Portals

Leading employers and education, training, and credentialing providers are taking steps to provide learners and workers with access to their own data through self-service portals. Employers and their HR system partners have pioneered the use of self-service online portals for employees containing HR data for each employee including employee personal information such as name, address, and other contact information as well as payroll, benefits, and taxes paid for payroll periods.[14] They make it easier for employees to view and correct or update their information and make requests such as work schedules resulting in improved HR system accuracy and higher levels of employee engagement. However, they do not fully replace the need for HR staff assistance.[15]

Education, training and credentialing providers and their education technology partners have pioneered similar self-service portals and mobile apps for students as well as for employees similar to the employer self-service portals described above. These portals and mobile apps for students are moving toward more centralized and integrated hubs to view and update personal information, view academic records (e.g., course enrollment, course grades, transcripts), manage course registration, pay fees, and track financial aid and degree progress. These systems have the potential to provide benefits to colleges and universities and students leading to more accurate data systems and more engaged and informed students. They also have the potential to provide more personalized services to students.[16]

The NDP initiative is further exploring how these self-service portals could be used by learners and workers to request LERs based on the administrative data in their portals. For example, they could request LERs to document course enrollments and work hours and earnings to meet Medicaid and SNAP verification requirements. In addition, the NDP initiative is further exploring how state governments could provide similar self-service portals as centralized hubs for all administrative data reported by employers and providers that learners and workers could use to view and request corrections to their own data. They also could use self-service portals to request LERs to be issued by the government based on data provided by employers and providers when employers and providers do not directly issue LERs.

Expanded Access to LERs

The NDP initiative is exploring how to expand access to LERs by providing the necessary infrastructure and marketplace of public and private tools and applications for: (1) employers and providers to issue LERs directly to learners and workers upon request and (2) more government entities to issue LERs upon request when not provided directly by employers and providers.

In recent years, education, training and credentialing providers and their education technology partners have made significant progress in using their operational systems and credential issuing services to issue verifiable LERs to their students. These include the Western Governors University Achievement Wallet and the Arizona State Trusted Learner Network (TLN). Leading national initiatives such as the AACRAO Project Infuse are pioneering efforts for more higher education institutions to issue LERs at lower costs.[17] Employers and their HR technology partners have not made similar progress but national efforts such as the Velocity Network Foundation project with healthcare providers have shown the potential value of employer-issued LERs for background checks and other applications.[18] The NDP is exploring how to build on these efforts to promote and support how employers and providers issue LERs through the use of self-service portals and modernized government reporting systems.

Many states also have explored how to use their education and work-related administrative data to issue LERs. For example, North Dakota has explored how to use its state longitudinal data system (SLDS) to support a North Dakota LER awarding service and credential publisher that can issue LERs into a wallet system. North Dakota has developed an issuing platform for their postsecondary institutions that could provide a model for other states. The NDP initiative is exploring how to build on and coordinate and align these state initiatives as well as explore the use of government self-service portals that provide a more centralized hub for viewing administrative data across states and requesting LERs based on these administrative records. This could potentially provide nearly universal access to basic LERs for the most critical applications including application for employment and verification for government programs such as Unemployment Insurance, Medicaid, and SNAP.

[14] American Payroll Association, "Self Service Technology Provides Instant Access to Pay for Remote Workers," reporting that more than 80 percent of employers provide employee self-service portals with at least payroll data.

[15] SHRM Foundation "Self-Service Technology Brings Benefits and Concerns."

[16] EdTech Magazine, "Students Find University Apps Helpful, but Want More Personalization."

[17] AACRAO, "Project Infuse: A Collaborative Leap Toward Learner Mobility and Digital Credentialing."

[18] Velocity Network Foundation, "Velocity: The Next-Gen Public Infrastructure for Workforce Credential Verification."

Personalized Analytics and Guidance

The NDP initiative proposes to empower learners and workers in talent markets by providing them access to public and private AI-powered tools and applications that can effectively integrate their own LER data with large-scale de-identified administrative data to provide more personalized guidance for exploring and choosing career and learning opportunities. For example, these AI-powered tools could develop career and learning pathways based on the pathways taken by others with similar learning and employment backgrounds in the same regional talent market. They also could compare the potential returns from choices between different learning and job opportunities. This would require the alignment and coordination of the government reporting and the LER ecosystem so that these tools and applications have access to both an individual's LERs within a wallet and the large-scale de-identified data collected and managed in a decentralized government data infrastructure.





Data Consistency and Standardization

Increasing transparency, expanding LER access and providing more personalized analytics and guidance requires data consistency and standardization between job and learning opportunity publishing, government reporting systems and the LER ecosystem. For example, employers need to use the same data standards to share data about a job opportunity, describe the same job held by a worker in government reporting, and that same job held by the individual in an LER for an individual to use in providing verified data about work history. Providers also need to use the same data standards to describe a published learning opportunity in a credential registry, describe the same the learning opportunity that a learner enrolled in and submitted to a government reporting system and describe the same learning opportunity in an LER for an individual to provide verification for Medicaid and SNAP program participation. In addition, employers and providers need to use a common language or comparable languages when describing skills. The need for the alignment and enhancement of data and technology standards across learning and career opportunity publishing, government reporting and the LER ecosystem is discussed later in the report.

Strengthening the LER Ecosystem

One major priority of the New Data Paradigm initiative is to empower learners and workers with access and use of their own LERs to pursue learning and career opportunities. In recent years, there have been many promising public and private initiatives to build an LER ecosystem that can support LER access and use. As described above, leading providers and national initiatives have launched efforts to issue LERs starting with academic records such as transcripts. Others have focused on improving access to wallets to manage and use LERs and explore improved identity management. Progress has also been made in the development of issuer registries to disclose information about the credential issuer. In addition, standards organizations have developed and supported standards for LERs and the next generation of resumes (e.g., Trusted Career Profile)[19] that utilize and reference LERs.

The NDP initiative is exploring how to build on these initiatives to support the further development of the LER ecosystem. The NDP initiative conducted an analysis of the readiness of the LER ecosystem based on a core LER architectural blueprint. As shown in Figure 3, this analysis found that the foundational protocols and standards are now in place as well as core LER services including issuer services and credential wallets. There also are promising efforts to design and pilot-test issuer/verifier registries for improving trust in the ecosystem.

This analysis identified wallet-attached storage solutions as having the potential to provide greater assurances that individuals will have continued access to their own LERs regardless of the wallet product they choose to use, and user choice of platforms on which to host an individual's credentials. In addition, this analysis identified areas needing further attention such as implementations profiles to assist those implementing LER services and promote LER consumption by enterprise services, such as HRIS systems, to demonstrate the value of tamper evident data ingested by third-party applications. Finally, this analysis pointed to a major gap in identity verification for individuals, and the emerging AI agents acting as proxies for people that need immediate attention. Based on this analysis, the NDP initiative proposes to build on current initiatives by working with partners to improve trust through issuer registries and identity verification and promote innovations in the application marketplace by working with partners to develop and pilot-test open-source solutions such as wallet-attached storage and LER and HRIS integrations. The NDP initiative also proposes to work with partners to build an LER test bed for developers and implementers to confirm conformance with LER ecosystem standards. These priorities are discussed further in presenting recommendations for next steps.

[19] HR Open Standards Consortium, Inc., "HR Open Standards Announces Official Release of the Trusted Career Profile (TCP)."

Figure 3: Core LER Architectural Blueprint: A Readiness Snapshot



Unlocking Skills Data

The NDP vision for empowering and improving connections in dynamic skills-based, data-driven talent markets requires more precise, trusted, standards-based, and machine-actionable skills data using common or comparable language based on widely adopted public-private standards.[20] There have been major federal and state initiatives to improve and standardize skills data over the last few decades.[21] There also have been major public-private efforts to promote access and use of skill frameworks and related resources.[22] There has been progress in developing and using standards for machine-actionable skills data including the Credential Engine CTDL-ASN standard and the 1EdTech Competencies and Academic Standards Exchange (CASE) standard. Finally, there has been major progress in recent years among employers, providers and intermediaries in talent markets.[23]

The NDP initiative reviewed current efforts and concluded that there has been major progress in developing and communicating skills data in more standardized language with machine-actionable data formats with many active and diverse communities of practice continuing to grow. There are great potential scaling opportunities with advances in data standards and AI agents and tools. The key challenge and opportunity now is improving the transparency, interoperability and trust of skills data developed and communicated across communities of practice. This includes addressing problems such as the interoperability of skills frameworks (e.g., taxonomies, ontologies) and standards and recommended practices developing measurable skill statements as well as building trust and evidence in skills claims.

This would also require addressing incentives for employers, providers, and learners and workers to use more open and interoperable skills frameworks based on standards. Finally, this would require the NDP infrastructure to address the key data requirements for AI-powered tools and applications, including:

- Access to talent market data;
- Open and fully developed and validated skills ontologies;
- Data standards and guidance and recommended practices;
- Human input and validation from domain experts;
- Provenance data (e.g., reference and use of frameworks); and
- Performance and feedback data.

[20] "Skills" is a shorthand reference to what someone should know or be able to do, including knowledge, tasks, skills, abilities and competencies.

[21] Examples include federal and state skill standards initiatives (e.g., National Skill Standards Board) and efforts to define core competencies in major sectors such public health and manufacturing, and the development of the ongoing O*NET program and state K-12 education standards.

[22] Examples include the T3 Innovation Network's Competency Explorer project to develop and pilot-test approaches for finding and accessing skills frameworks.

[23] Examples are "Skills Ontology Software Helps Close Competency Gaps"; Competency-Based Education Network (C-BEN); Lightcast, "Lightcast Skills Taxonomy."

NDP conducted a preliminary analysis of the development and use of skills frameworks including skills ontologies for developing skills data and determined the need for the further development and use of open comprehensive and standards-based skills ontologies supported by the NDP infrastructure. Based on this analysis, the NDP initiative proposes to focus on three major priorities in improving skills data:

Skills Ontology Standards and Practices

Promote wide-scale adoption of standards and recommended practices for definition and use of interoperable, comparable, and machine-actionable skills ontologies.

Skills Ontology Ecosystems

Support public-private ecosystems of open standards-based skills ontologies that function as dynamic and fluid skills data graphs that make connections between skills, jobs, and learning and credentialing opportunities in talent markets. Also, support the development and use of mapping and translation services between these ontologies.

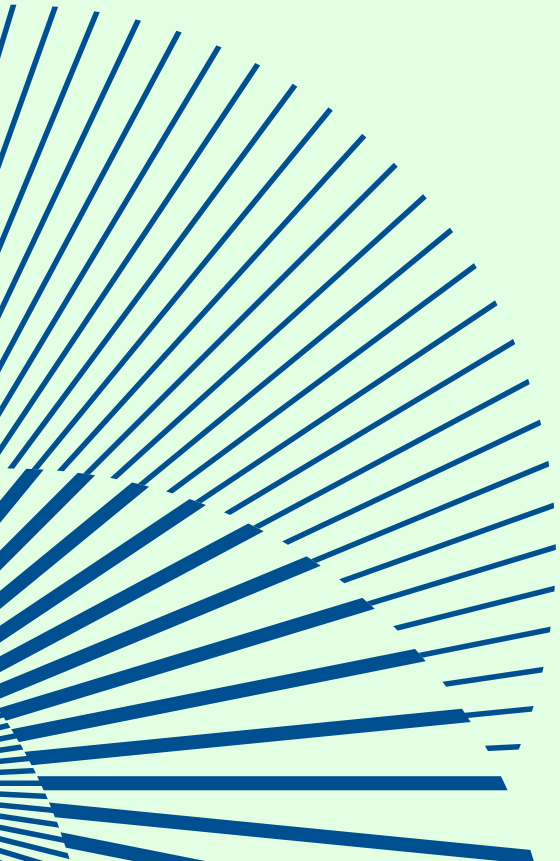
AI Agents, Tools and Incentives to Support Skills Ontology Development and Use

Support an open marketplace of AI agents and tools using standards-based open skills ontologies. Provide incentives for standards-based open skill ontologies and AI agents and the tools using them. Promote the development of applications such as JobSIDE that provide usage and feedback data for continuously updating skills ontologies (e.g., provenance data) and applications that can validate skills ontology-based matches (e.g., employer skill requirements and job applicant skills) in talent markets.

These proposed priorities should build on the work of Credential Engine, 1EdTech Consortium, HR Open Standards Consortium and the IEEE Standards Association that have made progress in making skills data open, structured, and machine actionable.

Designing the NDP Data and Technology Infrastructure

The NDP initiative developed a functional diagram of a data and technology infrastructure as a first step in further exploring a governance framework and further designing and pilot-testing key features of the infrastructure.



Coordinating and Aligned Employer and Provider Data Sharing

As shown in Figure 4, the NDP initiative will further explore an infrastructure that can be designed to improve and coordinate how employers and education, training and credentialing providers use source data systems to share higher quality and more standardized and timely data at lower cost for:

Job and Learning Opportunity Publishing

Publishing data on employer and provider websites to expose job and learning opportunity data to search engines and AI-powered tools and continuously distribute this data to public and private platforms (e.g., job boards, national and state credit transfer networks) and registries (e.g., credential registries) that support other AI-powered tools for comparing and aligning these opportunities.

Government Administrative Data Reporting

Providing work-related and education data to federal and state governments using modernized reporting and collection systems and a distributed federal and state data infrastructure. This administrative data would be linked with more detailed job and learning opportunity data. This would also support the issuing of LERs as verifiable credentials by employers and providers directly to learners and worker wallets. It also would support the issuing of LERs as verifiable credentials by government agencies to learner and worker wallets based on the administrative data reported by employers and providers if not issued by employers and providers directly.

LER Issuing

Employers and providers issuing LERs as verifiable credentials to learner and worker wallets that can be integrated with published job and learning opportunity data and administrative data for a wide variety of AI-powered applications (e.g., career pathway guidance) while protecting privacy.

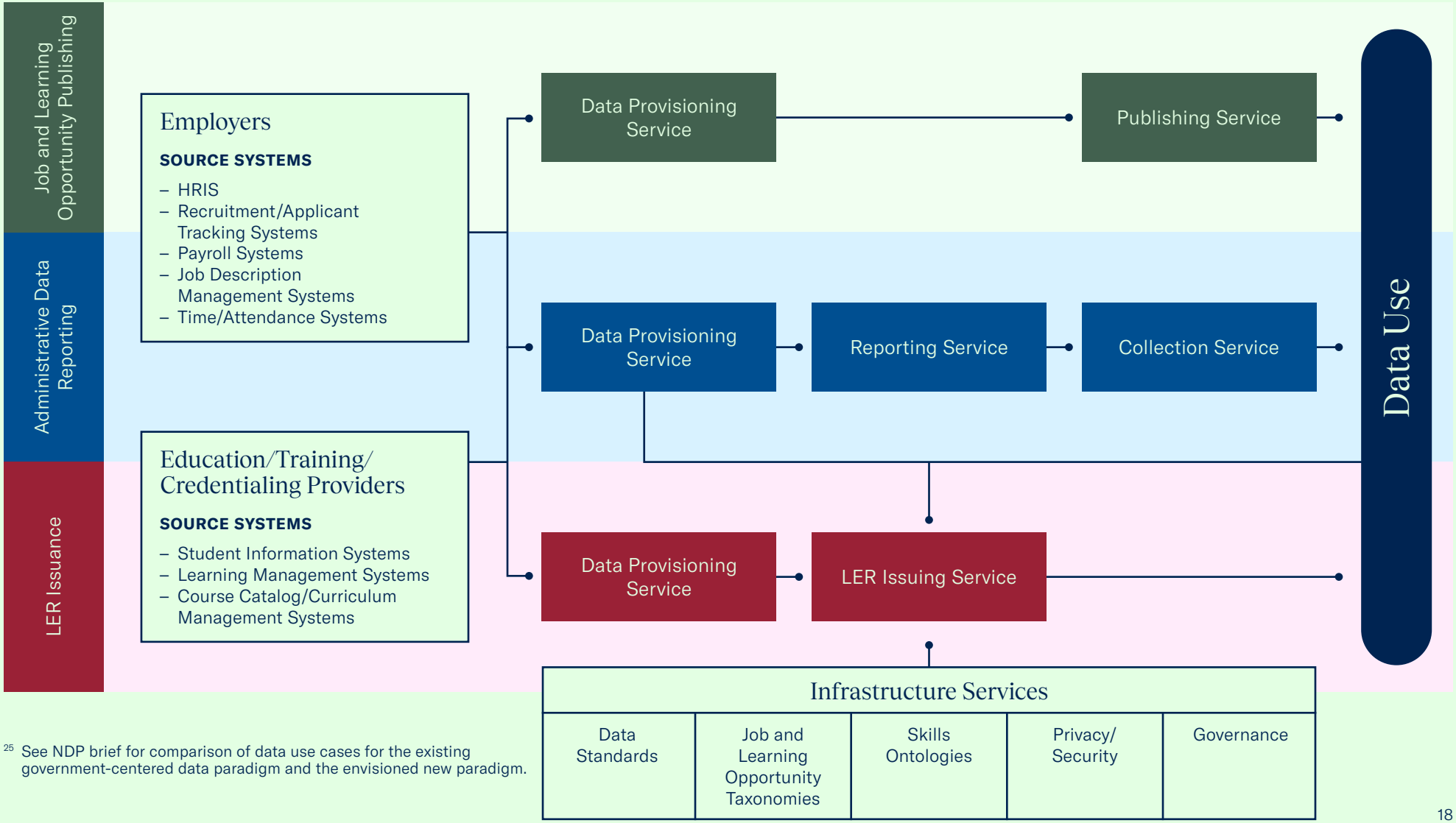
NDP will explore how opportunity publishing, government reporting and LER issuing can be improved by modernizing data provisioning services[24] provided through source data systems or other partners to provide data to destinations including registries, distributed government data systems, and wallets. Some key source data systems for employers include human resource information, payroll, time and attendance, and recruiting and applicant tracking systems. Some key source data systems for education, training and credentialing providers include student information systems, learning management systems and course catalogue and curriculum management systems.

[24] The role of data provisioning services is based on Dxtera Institute and Strada Education Foundation, Considerations for Digital Credentialing—FINAL.

Expanding Data Access and Use

The NDP initiative also will explore how this more standardized and timely data provided by employers and providers could be managed in ways that improve existing government-centered data uses including federal statistics, government program administration, and academic research relevant to public policy. In addition, it will explore how this data could be used to expand both public and private sector data access and use while protecting privacy through an open marketplace of AI-powered applications and tools that empower learners and workers and improve connections in talent markets.[25] These new NDP applications would require access to and integration of data from a wide variety of distributed data sources including job and learning opportunity platforms and registries as well as federal and state administrative data systems. As a result, the NDP will explore advances in distributed data analytics that allow the use of distributed micro-level data while protecting privacy. In addition, the NDP will explore how learners and workers can use AI-powered applications that analyze their own data in LER wallets as well as data on job and opportunity data and government administrative data to provide more personalized analytics in pursuing job and learning opportunities such as guidance applications that develop more personalized career pathway opportunities.

Figure 4: Functional Diagram of the NDP Data and Technology Infrastructure



[25] See NDP brief for comparison of data use cases for the existing government-centered data paradigm and the envisioned new paradigm.

Infrastructure Services

The NDP initiative also will explore how job and learning opportunity publishing, government reporting and LER issuing as well as public and private sector data use can be supported by a set of shared infrastructure services that are necessary to ensure more consistent and standardized data sharing and use. These shared infrastructure services would include:

Data Standards	Aligned and enhanced data standards and standards utilization tools and resources provided by standards organizations for use by employers and education, training and credentialing providers and their technology partners; other public and private data service providers in the data and technology infrastructure; and data users. This infrastructure service would require the development of a more unified data model and ontology and vocabulary with a common data format to align and enhance work-related and education data standards. It also would require standards organizations to work together to provide tools and resources for consistent use of standards across the entire public-private infrastructure.
Job and Learning Opportunity Taxonomies	Public and private sector taxonomies for the classification of job and learning opportunities. These include widely used public sector taxonomies for jobs (e.g., Standard Occupational Codes [SOC]) and education programs (e.g., Classification of Instructional Programs [CIP]).
Skills Ontologies	Skills ontology services that provide improved access and use to an open marketplace of public and private standards-based skills ontologies for use by employers and education, training and credentialing providers and their technology partners; other public and private data service providers; and data users. These services require standards and guidelines on the development and use of skills ontologies and mapping services for translating between standards-based skills ontologies. They also should support applications that provide feedback on skills ontology usages and validation of skills-ontology-based matches in talent markets.
Privacy and Security	Privacy and security guidelines and leading practices for sharing, management and use of data that expand access while protecting privacy and confidentiality and ensure data security. These guidelines would address how to support advanced distributed data analytics.
Governance	Governance services based on a public-private governance framework for public-private entities (e.g., data utilities) to manage the development and use of the data and technology infrastructure.

Road Map and Recommendations for Moving Forward

As shown in Table 1 the NDP initiative proposes to build on work completed in the planning phase and the initial design of the NDP data and technology infrastructure based on a three-phase roadmap for the next three years and beyond.

Table: New Data Paradigm Initiative Roadmap: Phases and Timelines

NDP PHASE	TIMELINES
Design Phase: Focus on aligning and enhancing data standards, privacy and security standards and practices and the governance framework and organizational models for managing the NDP infrastructure as well as further design and develop pilot-test plans for key features of the infrastructure.	2026–2027
Pilot Phase: Continue design work as needed and focus on conducting pilot-tests of key design features of the infrastructure including publishing and aligning learning and job opportunities, improving government reporting, and strengthening the LER ecosystem. Continue to develop and pilot-test the governance framework and organizational models for managing the NDP infrastructure.	2027–2029
Scaled Implementation: Continue design and pilot-testing work as needed and continue the implementation of standards and privacy practices and the governance framework and organizational models and scaled implementation of the key features of the infrastructure that have been successfully pilot-tested and supported by partners.	2029 and beyond

Design Phase Recommendations

Based on this roadmap, the NDP initiative recommends the following:

1. **Shared Infrastructure Services.** Further explore the development and pilot-testing of the major shared NDP infrastructure services:

1.1 **Public-Private Collaboration in the Development, Adoption and Use of Unified Data Standards and Schema.** Collaborate with Data Standards United's EDUcore project to develop a unified data model and ontology and vocabularies to align and enhance work-related and education data standards and provide the necessary semantic backbone for the proposed NDP infrastructure and the AI applications it supports. This should be done in cooperation with relevant data standards organizations and initiatives including JEDx, CEDS, Credential Engine, IEEE Standards Association, HR Open Standards Consortium, Access 4 Learning (A4L), 1EdTech Consortium, and Schema.org. Also, collaborate with Data Standards United and other standards organizations[26] to engage public and private sector leaders in establishing a public-private partnership for the continual updating of the unified data standards and schema and the development of resources and services to support their effective utilization for NDP use cases. This should be done based on leading public-private collaboration approaches for data and technology standards including the approach used for electronic medical records.

1.2 **Develop and Support Open Skills Ontology Ecosystems.** Promote the development and use of open standards-based skills ontologies and mapping and translation services that provide the basis for a common or comparable language for skills data.

- **Skills Ontology Standards and Recommended Practices and Guidance.** Collaborate with the Data Standards United's EDUcore project and relevant data standards organizations to further develop and promote wide-scale adoption of standards and recommended practices and guidance for the development and use of interoperable and machine-actionable skills ontologies. This should include the architecture and essential components of fully developed ontologies and the development of well-defined skill definitions.
- **Skills Ontology Mapping and Translation Services.** Explore the development and use of AI tools to map and translate between standards-based skills ontologies and the use of open reference ontologies or metaontologies that could be supported by the NDP infrastructure. This should explore the development of both public and private sector reference ontologies that could leverage existing public (e.g., O*NET) and private sector efforts.
- **Applications Providing Feedback and Validation Services.** Explore the development and support of applications such as JobSIDE that can provide usage and feedback data (e.g., provenance data) for continuously updating skills ontologies and keeping them connected to changes in skills in talent markets. Explore applications that validate skills ontology-based matches (e.g., employer skill requirements and job applicant skills) in the talent markets including applications that use government administrative data.

1.3 **Explore Privacy and Security Standards and Practices.** Engage leading experts in identifying leading public-private standards and privacy-preserving practices including AI-readable privacy obligation documents and their implementation in the NDP infrastructure.

1.4 **Develop Governance Framework.** Convene governance experts to develop a public-private governance framework for public-private state and multi-state data utilities that are designed to develop and manage the NDP data and technology infrastructure.

[26] Data Standards United, "Standards."

2. **Improving and Coordinating Employer and Provider Data Sharing.** Further develop and pilot-test strategies to improve and coordinate the three major types of employer and provider data sharing supported by the infrastructure—job and learning opportunity publishing, government reporting and issuing LERs.

2.1 **Coordinate and Align Initiatives to Improve Government Reporting of Work-Related and Education Data Focusing on Data Standardization, Modernization and Consolidated Reporting.** Coordinate and align leading initiatives to improve government reporting of work-related and education data focusing on the three major JEDx strategies of data standardization, modernization and consolidation of reporting systems. This should include:

- **Align JEDx Data Standards with Unified Data Model and Ontology/Vocabulary.** Collaborate with Data Standards United's EDUcore project to align and integrate the JEDx data model and dictionary with the unified data model and ontology and vocabularies.
- **Further Develop and Pilot-Test JEDx Modernization and Consolidated Reporting Tools.** Further develop and document the JEDx modernization tools including the JEDx Reporting Service, JEDx Collection Service and auto coding tools and conduct pilot-testing with states interested in enhancing UI reporting and/or consolidated reporting including new work verification data requirements for Medicaid and SNAP.
- **Expand Landscape Analysis of Education Data Reporting Systems.** Expand the landscape analysis of current education data collection systems, new collection requirements (e.g., Workforce Pell) and related education data reporting systems (e.g., apprenticeship, veterans).
- **Develop and Pilot-Test Strategies to Standardize, Modernize and Consolidate Education Data Reporting Systems.** Collaborate with education data standards organizations and existing efforts (e.g., DXtera CampusAPI and 1EdTech APIs) to modernize and consolidate reporting systems and develop pilot-test strategies consistent with JEDx initiatives in improving work-related data reporting systems.

2.2 **Coordinate Government Reporting and Job and Learning Opportunity Data Sharing and Alignment.** Improve how employers and education, training and credentialing providers share job and learning opportunity data including skill profiles through platforms and registries in coordination with government reporting.

- **Align and Promote Standards for Job and Learning Opportunity Data.** Collaborate with Data Standards United's EDUcore project to align standards for publishing job and learning opportunity data based on the unified data model and ontologies and vocabularies and develop guidance and technical assistance materials to promote the use of these standards by employers and providers as well as platforms and registries.
- **Develop an Open Marketplace of AI-Powered Tools for Using Skill Profiles to Align Job and Learning Opportunities and Improve Learning Mobility.** Develop open standards-based prototypes such as JobSIDE to stimulate the open applications marketplace of employer and provider tools to develop skills profiles based on skills ontologies and use them to align job and learning opportunities and improve learning mobility in talent markets. These prototypes should also demonstrate how future applications could provide critical usage and feedback data (e.g., provenance data) for constant updating and addressing major skill changes in talent markets.

2.3 **Coordinate Government Reporting and Issuing LERs.** Use improved government reporting systems to encourage employers and providers to directly issue Learning and Employment Records (LERs) consistent with the data reported to government; and support government agencies in issuing LERs based on the data reported by employers and providers if not issued directly by employers and providers.

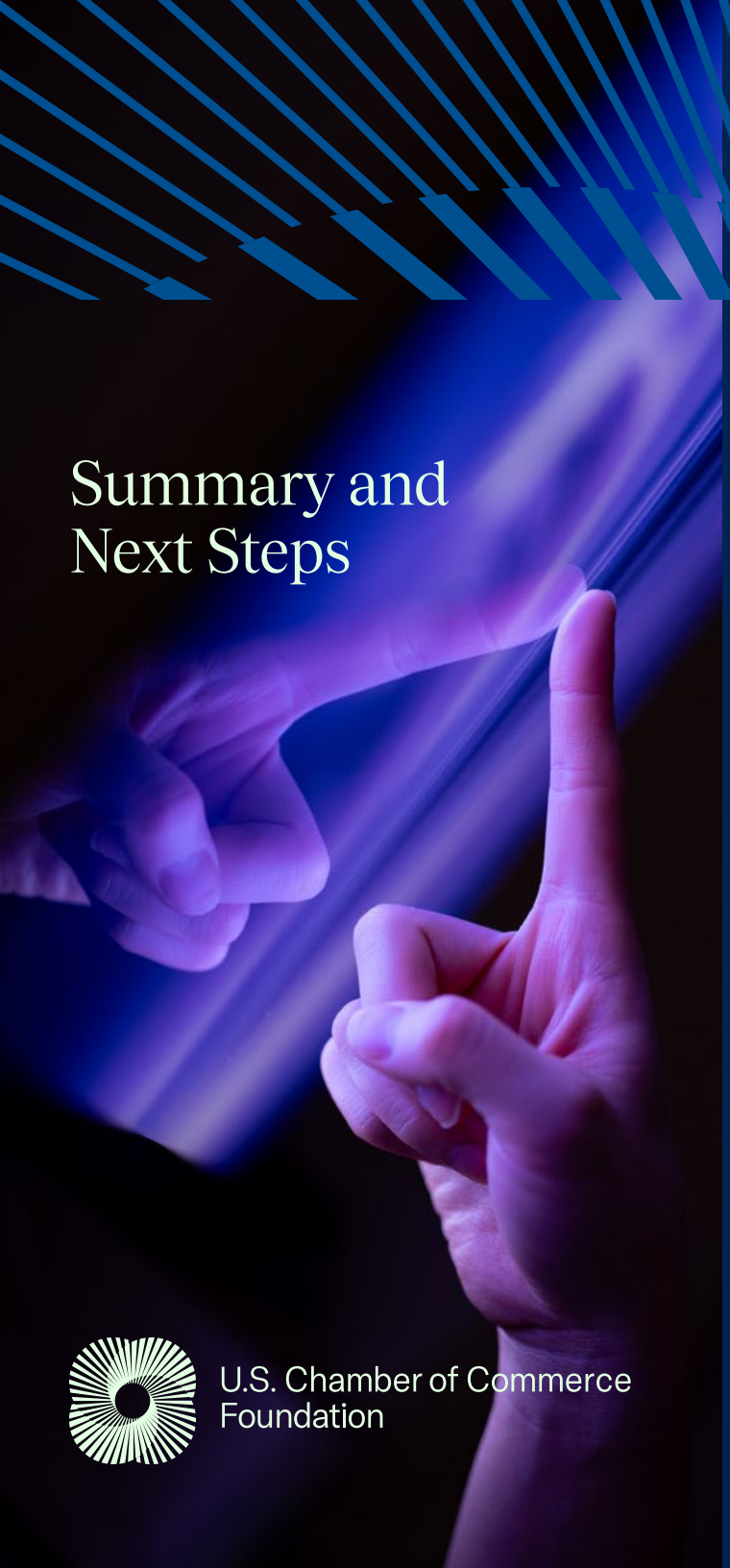
- **Promote the Expansion and Use of Employer, Provider, and Government Self-Service Portals.** Explore strategies to expand the use of employer and provider self-service portals and develop government self-service portals. Also, explore how these portals can be better utilized by learners and workers to request the issuing of LERs as verifiable credentials based on operational data held by employers and providers and on administrative data held by government based on data reported by employers and providers.
- **Develop Strategies and Pilot Plans State Government Self-Service Portals Used to Issue LERs.** Develop strategies and pilot plans for states to establish and use self-service portals for learners and workers to view their own data and issue LERs as verifiable credentials in response to requests by learners and workers.

2.4 **Strengthen the LER Ecosystem.** Build on existing LER ecosystem initiatives to improve connections and fill gaps necessary to empower workers and improve transparency and trust in the issuance and use of LERs in talent markets.

- **Landscape Analysis.** Continue to conduct a landscape analysis of the LER ecosystem to improve connections, address gaps and reflect more recent developments.
- **Applications Market Stimulation and Support.** Develop application prototypes and demonstrations to stimulate and support the applications marketplace including implementation profiles, APIs for wallet services the development of verifiable employment credentials coupled with endorsements.
- **Employer Engagement and Pilot-Test Planning for the Issuing and Use of LERs.** Engage employers and their HR technology partners in pilot-testing the issuing of employment records as verifiable credentials and utilizing LERs in the job application and advancement process.
- **Building Trust in Issuing LERs: Verifiable Issuers and Verifiers Registry.** Build on current work by the World Wide Web Foundation, 1EdTech Foundation, OpenID Foundation, Trust Over IP Foundation, Credential Engine and others to develop and support issuer and verifier registries based on leading models and standards including W3C standards.
- **Building Trust in Personal Identity: Digital Identity Management.** Improve digital identity management for individuals by building on current efforts including third-party verification of self-sovereign identity, DID insurance by education institutions and the use of multiple identifiers.
- **Building Trust in Employer and Provider Identities.** Improve identity management for organizations including both employers and education and training providers building on leading approaches based on Recognized Entity Credentials (REC).
- **LER Test Bed.** Provide an LER test bed for developers and implementers to confirm conformance with LER ecosystem standards.

2.5 **Explore the Design and Pilot-testing of Public-Private State and Multi-State Data Utilities and the NDP Distributed Data Infrastructure and Supporting Public and Private Sector Data Uses.** The NDP planning phase did not explore the governance framework and organizational models for public-private state and multi-state data utilities for developing and managing the NDP infrastructure. In the next phase, the NDP should design these utilities based on: (1) leading public-private governance frameworks and utility models (e.g., health data utility models); and (2) the requirements of the data infrastructure and the public and private use case applications described in this report.

- **Develop Governance Framework and Organizational Model for State and Multi-State Utilities.** Develop a public-private governance framework and organization model for data utilities based on the design of the infrastructure and the needs of public and private sector data providers, infrastructure service providers, and data users.
- **Develop Pilot-test Plans to Demonstrate Immediate Value.** Develop pilot test plans with public and private partners for data utilities to demonstrate immediate value starting with the learner and worker empowerment and the issuing and use of LERs and the implementation and use of near real-time AI-powered distributed data analytics for public and private sector use cases.



Summary and Next Steps

U.S. Chamber of Commerce Foundation

This NDP report has summarized the results from the NDP planning phase conducted between September 2025 and July 2026 to further explore the NDP approach and key design features of the proposed public-private data and technology infrastructure. This report has presented a three-phase work plan moving from design to pilot-testing to scaled implementation from 2026 to 2029. During the design phase, the report has recommended that the NDP initiative:

- Collaborate with government agencies and leading standards organizations and initiatives to develop a unified data model/ontology to align and enhance work-related and education data standards and LER standards;
- Promote the development and use of public and private sector skills ontologies and mapping and translation services that provide the basis for a common or comparable language for skills data;
- Advance privacy and security standards and practices including the use of AI-readable privacy obligation frameworks;
- Further develop strategies and pilot-test plans for: (1) improving, coordinating and standardizing the publishing of job and learning opportunities, administrative data reporting to government, and issuing LERs; (2) strengthening the LER ecosystem; and (3) exploring distributed data analytics applications; and
- Explore the design and pilot-testing of public-private state and multi-state data utilities for developing and managing the proposed data infrastructure.

The NDP initiative will utilize this planning phase report to further engage public and private stakeholders and partners in exploring the NDP vision and priorities and the proposed three-phase roadmap and design phase recommendations.

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