Lumina™
FOUNDATION

Build Transparent Credential Infrastructure

Credential Engine

A 501(c)3 based in Washington, D.C. whose mission is to bring transparency to all credentials in the marketplace (www.credentialengine.org and https://credreg.net), reveal the marketplace as it exists, improve credential literacy, and help individuals and institutions make more informed decisions about credentials. The rationale for Credential Engine is founded in the recognition that the marketplace of credentials in the United States is large, growing, complex, and inefficient. There are at least 738,000 confirmed unique credentials in the U.S., including diplomas, badges, certificates, certifications, licenses, apprenticeships, and degrees of all types and levels. In such an expansive and chaotic marketplace, credentials remain the most important and common signal of an individual's knowledge, skills, and abilities. Credentials are the often the best signal employees have of the competencies required for particular occupations. Open, transparent data on credentials, competencies, and outcomes is fundamental to improving access to opportunity, increasing accountability, and aligning education and training offerings with employer needs. Credential Engine provides an open family of specifications for describing credentials, competencies, and outcomes as well as technologies that support trusted search, discovery, and comparison.

Credential Registry

Credential Engine technology includes the Credential Registry, which uses Credential Transparency Description Language (CTDL) to search and compare information about all types of credentials (including data from diplomas, badges, certificates, licenses, certifications, and degrees of all types and levels). It is a central location to collect, maintain, and connect credential and competency information to support an open applications marketplace. Using data from the Registry gives learners, workers, credentialing organizations, employers, and others more access to critical and comparable information to make decisions about both education and career. The Registry maintains minimum data and currency policies. All credentials in the Registry have been voluntarily submitted by the organization that offers those credentials or submitted by an approved third-party publisher. The Credential Engine's technical site provides more information and guidance on the Credential Registry https://credreg.net.

Open Languages/Schemas

Credential Engine's family of specifications are available for use under open licenses. These specs include the Credential Transparency Description Language (CTDL) to describe credentials and information about them — including the organizations offering credentials, the learning opportunities and assessments for earning them, pathways, and outcomes. The CTDL- Achievement Standards Network (CTDL-ASN) is used to describe competencies, learning standards, and performance and learning objectives.

These languages are developed through open processes and are modeled on World Wide Web Consortium standards for the Semantic Web for use on websites, in the Credential Registry, and for web or mobile applications. These practices ensure that information published to the Web or to the Credential Registry is structured as linked open data that is human readable and machine actionable. Structured data is machine-readable and used by search engines to understand the content of web pages. Linked data is a type of structured data that links between systems via the Web. When data is both structured and linked, it becomes a powerful tool that search engines and other systems can leverage. Linked Data is at the foundation of the Semantic Web, which is all about: (a) making meaningful links between data points understandable to humans and machines alike; and (b) providing the means for inferring new data from existing data. Creation and use of these specifications ensure a common language that supports transparency and comparability of information. These specifications can be used by all organizations that offer credentials on their websites and in the Credential Registry. Further, they make it easier for students, businesses, researchers, search engines, and automated systems to discover, understand, and compare information about credentials from a variety of sources.

The CTDL was used to launch a World Wide Web Consortium Community to include credential information with Schema.org. The CTDL is mapped to Schema.org to support search engine crawling. CTDL is openly available through a Creative Commons Attribution 4.0 International License. It is also consistent with certain federal policies and programs on open data and the use of standards, including the Open Data Policy, Office of Management and Budget (OMB) Circulars A-119 and A-130, and the Federal and Defense Standardization Programs. Credential Engine harmonizes with widely used international standards for the web such as Open Badges. Credential Engine also works in partnership with international standards bodies such as PESC and IMS Global to improve standards and data interoperability.

Visit the Credential Engine Technical Site to use the family of specs and guidance https://credreg.net

Key Initiative Descriptions

Accelerate Ecosystem Developments through Alignment/Alliances

Credential Engine: State and Regional Partnerships

Credential Engine has a state and regional strategy to advance its mission and promote use of CTDL / CTDL-ASN and the Credential Registry. Credential Engine partners with key agencies and organizations to identify and operationalize the use of transparent credential information that allow states, regions and stakeholders to improve services, practices, programs, and policies. These improvements benefit students, workers, veterans, employers, educators, policymakers, and others — allowing them to make more informed decisions in the marketplace of credentials and to significantly advance the publishing of credentials in those states and regions to the Registry.

- **Indiana** – Through the Commission for Higher Education, Indiana was the first state scale-up initiative, focusing first on publishing information about healthcare credentials, including connections to military training and credentials. This was part of Governor Holcomb's Next Level Indiana initiative to demonstrate which credentials are related to high-priority industries. In 2019, CHE successfully published data about all credentials offered by the state's public two- and four-year institutions to the Credential Registry, totaling over 3,000 credentials. Commission leaders are currently collaborating with the Indiana Department of Workforce Development to map and publish data from the state's Eligible Training Provider List to the Registry. Work is also expanding with the state's licensing bodies and a growing number of private employers who both issue and use credentials. They were the first state to feature Credential Registry data on their website for residents to access directly. Indiana is the first state working to connect data from the Registry to other state initiatives and priorities.

- **New Jersey** – Led by the Department of Labor and Workforce Development, New Jersey's state scale-up project is focused on utilizing the CTDL and Registry as the backbone of its Eligible Training Provider list. As New Jersey revamps its application and renewal process, data from training providers will be published directly to the Registry. The New Jersey team is also working with other New Jersey agencies and systems to develop use cases and strategies for further scale-up, such as integrating Credential Registry data into their revamped Career Connections platform.

- **Kansas** – Led by the Board of Regents, Kansas has published all active degrees, certificates, and short-term technical programs offered by the public postsecondary schools in the state with the goal of increasing visibility and comparison across state lines. Its goal is to use the Registry to articulate credit for military experience and to indicate high-demand, high-wage credentials. Kansas was the first state to use the API across the system, and continue to look for ways to add additional details about its credentials to the Registry.

- **Michigan** – Michigan's Department of Labor and Economic Opportunity — the state's primary workforce development office— is working collaboratively with other state agencies to publish information about degrees, diplomas, certificates, licenses, apprenticeships, and other credentials offered in the state to the Registry. By completing this project, they will be able to better identify and map career pathways and expand Registered Apprenticeships in high demand sectors of Michigan. Additionally, they will integrate credential data from the Registry into their free Career Pathfinder tool (https://pathfinder.mitalent.org) enabling students and jobseekers to access more complete information about career pathways and training options. They are currently gathering information and building the working group to begin the publishing of credentials to the Registry.

- **Ohio** – Ohio's scale-up project is led by its Department of Higher Education with help from stakeholder partners. Their work began with identifying and publishing data about credentials in the information technology and cybersecurity sectors, but now they have expanded their goal to include all credentials offered by their public postsecondary institutions on the Registry. Their aim is to reveal the labor market value of credential options, strengthen pathways from secondary career technical education to postsecondary credentials, inform policy used for career and education advising in all Ohio secondary schools, and help ensure veterans are receiving proper credit for military training. Additionally, they plan to upgrade the platform that shows which credentials are approved for state and federal funding. The new upgrade includes Ohio's Tech Cred initiative, which offers funding for students and job-seekers to access education and training in two of the state's highest-demand sectors— IT and cybersecurity.

- **High Value Credentials for New England** – The New England Board of Higher Education (NEBHE) launched a project to work with Credential Engine to provide individuals, institutions, state policy leaders, and employers the tools to use a common language to describe credentials, evaluate the value of credentials, identify critical education and employment pipelines, and understand the skills and competencies obtained by earning a credential. The project focuses on four states where credentials issued by public and private higher education institutions, as well as third-party providers, will be published to the Registry in the sectors of healthcare, life/biosciences, information

Accelerate Ecosystem Developments through Alignment/Alliances

technology, and business and finance, with the goal of illuminating pathways within and across state lines.

- **Maine** – Maine Community colleges and four-year systems have agreed to participate in the initiative. In Fall 2019, almost all of the institutions in the state had published information to the Registry.

- **New Hampshire** – Both the Community College System of New Hampshire and the University System of New Hampshire have formed a partner ship with DXtera as a technical assistance provider to map program information to the CTDL and publish credentials to the Registry. The Community College System of New Hampshire completed their publishing in Fall 2019. New Hampshire is focused on its 65 by 25 attainment plan and sees this work as a vehicle for strengthening relation ships with employers.

- **Massachusetts** – NEBHE and labor market analytics company EMSI are working with institutions across the state to publish data to the Registry.

- **Rhode Island** – NEBHE is working with the community colleges and four-year systems in Rhode Island to include information to the Registry. Identifying high-value credentials is a key aspect of the state's attainment strategy. This will prepare Rhode Islanders for well-paying, future-oriented jobs. NEBHE is also partnering with the Association of Independent Colleges and Universities of Rhode Island to support the participation of private institutions.

- **Colorado** – Working as part of a larger statewide, multi-agency effort to establish an interoperable data collaborative, credential data will be published with support from Credential Engine and other partners.

- **Washington** – Washington's partnership with Credential Engine is led by the state's Workforce Training and Education Coordinating Board (WTCEB). This agency works to maintain Washington's economic health by raising the skill level of Washington's workforce through education and preparation. WTCEB will map and publish information about the programs listed in its Career Bridge platform to improve transparency and mobility.

- **Los Angeles** – Los Angeles Area Chamber of Commerce and Credential Engine received funding from the ECMC Foundation to develop a strategy to publish and put to use data about all credentials in the Los Angeles region.

- **Minnesota** – Minnesota's work is a collaboration among three agencies—Minnesota State, Office of Higher Education, and the Department of Employment and Economic Development. The goal of this work is to use the Registry as a publicly searchable database for the credentials offered in the state. This goal creates a one-stop experience for Minnesotans looking for education and training options, thus transforming how the state shares information about its public programs to students.

- **Louisiana** – Louisiana's work is led by the Louisiana Community and Technical College System. This work aims to better serve a growing portion of higher education students who often struggle to complete credentialing programs (starting with veterans and other students with prior learning experience).

The state will focus its initial efforts on high-wage, high-demand industry sectors including welding, construction, and manufacturing. Their publishing efforts will begin with credentials offered within the system.

- **Alabama** – Alabama's work, led by the Governor's Office in collaboration with agencies across the state - plans to use linked credential data to better connect employers, education providers, and students, beginning with high-demand sectors. Ultimately, they plan to utilize the CTDL and other Credential Engine technologies to develop a one-stop platform to house longitudinal data, serve as a student backpack, and provide an employer signaling platform. Relevant credential data will be published to the Registry to contribute to the ultimate goal of enhancing learners' access to career pathways.

Additional funding will support Credential Engine's ability to engage other states and regions to tee up new initiatives. A growing number of states and regions are interested, including, Connecticut, Vermont, Arkansas, California, Illinois, Florida, Tennessee, Kentucky, Maryland, Pennsylvania, Virginia, North Carolina, and Texas; and New York City, Chicago, Indianapolis, Detroit, Denver, San Diego, San Francisco, Dallas, and the Greater Washington D.C. area.

Schmidt Futures: Data for the American Dream

Choices about education and job opportunities are among the most consequential decisions that individuals will make for their financial well-being. Yet, most people – especially low-income Americans from disadvantaged backgrounds – make these decisions with less data-driven insight than is the case when choosing a movie to watch at

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night. An estimated 13 million Americans are unemployed or underemployed, in many cases because they don't know where to go to get the information they need to navigate the labor market. Opportunities are out there, but workers are simply not able to find them or to get the training needed to obtain them. This not only hurts the neediest in our society—low-income Americans from disadvantaged backgrounds—but also hurts overall economic growth as productive jobs and skill needs go unfilled.

The Data for the American Dream (D4AD) initiative aims to support innovative efforts to expand access to education and career data through partnerships that might include both public and private agencies and organizations. The initiative's goal is to help students and jobseekers make better career decisions in a changing economy through data-driven information, and especially to help low-income, lower-skilled, underemployed, and unemployed Americans access better jobs and education opportunities.

A collaborative effort by funders is helping to achieve the breakthroughs the ecosystem needs by encouraging state and local governments to unlock their existing education and workforce datasets. The vision is that by 2025, every education and training program, credential, or upskilling opportunity in all 50 states will be publicly available, searchable on the web, linked to their respective return on investment, and accessed by the populations that need them most. Schmidt Futures, partnering with Lumina Foundation, Walmart Foundation, and Walton Family Foundation, has awarded grants to 3 states (New Jersey, Michigan, Colorado) to link their education and workforce datasets.

Credential Engine: Sector Initiatives (Retail and Hospitality; Information Technology/ Cybersecurity; Healthcare; Manufacturing)

Credential Engine has launched a National Retail and Hospitality Credentials Initiative, supported by the Walmart Foundation, and in collaboration with the National Retail Federation, National Restaurant Association, and the American Hotel and Lodging Association. This initiative, and other sector initiatives to follow, start with the employers in the sector identifying credentials that they most value, the data about those credentials they most care about, and how the use of the data will be of greatest benefit. Collectively, the members of the sector initiative work with the providers of these credentials to publish them to the Credential Registry. Then, Credential Engine is able to support the development of apps and tools to put the information into the hands of students, workers, employers, educators, and others. In phase one of this project, almost 200 credentials related to the sector were published to the Registry and several important use cases were identified. In phase two, the project team will continue work to add credentials to the Registry, and will also develop and test a user application to demonstrate the value of the data in the Registry. Additionally, Credential Engine is seeking to launch new sector initiatives in IT/cybersecurity, healthcare, manufacturing, and other identified sectors of importance.

Credential Engine: Military: Navy Research and Development and Training Transformation

In 2013, the Navy launched a major initiative (Sailor 2025). Its goal is to improve and modernize IT systems with several personal initiatives which include: ensuring training, education, and maintenance systems are well linked and managed, and are an appropriate match to Navy Occupations to civilian occupations and their

corresponding credentials. The latter requires that KSAOs (Knowledge, Skills, Abilities, and Other Characteristics) and credentials acquired in the military are transparent and have the ability to be continuously updated and refined. The Navy trains sailors to prepare for work (on ships, submarines, bases, and supply sites) using many tools it has developed: KSAOs, curriculum, assessments, and credentials that qualify sailors for specific tasks. These tools in turn are linked to an array of technical and nontechnical manuals, work process schedules, job task analysis, engineering drawings, parts lists, and maintenance plans designed to help sailors carry out their tasks. The systems and processes for these are currently cumbersome, difficult to manage, and dated. The Navy partnered with Credential Engine based on the recognition that the Navy may be able to use the Credential Transparency Description Language as a typology to update its internal systems and publish its Navy Task Classification and credentials to the Credential Registry. The partnership is 1) completing a gap analysis between the CTDL and Navy Task Classification Taxonomy; 2) mapping the CTDL to Navy specs that support data linked to various components of its training artifacts; 3) linking the CTDL with all Navy KSAOs in its linked data classification and curriculum (e.g., "courses"); and 4) connecting the CTDL to KSAOs in the Navy's Maintenance Task Analysis. This R&D work is guided by a Cooperative Research and Development Agreement (CRADA) signed by the Navy's Research and Development Unit. If this demonstration project is implemented, Credential Engine can incorporate Navy-linked credentials to the Credential Registry. This would allow the Navy to update its internal systems using a common credentialing language so civilian organizations can better understand Navy-linked credentials and it would also allow veterans leaving the service to transition easily into civilian jobs.

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Accelerate Ecosystem Developments through Alignment/Alliances

Credential Engine: Military: Department of Defense

The Armed Services strive to make their education and training offerings and outcomes transparent and receive the most credit possible by external academic and credentialing entities. This effort by DoD is enabling new collaborations to incorporate a common language of credentialing (or translation among languages). Because active-duty military and veterans are seeking educational pathways to civilian jobs, community colleges are an important partner in military competency mapping and pathways work. Credential Engine is continuously collaborating with the Department of Defense on ways to publish all credentials that the military issues, purchases, or funds for its uniformed and civilian personnel to carry out their duties, or funds in support of recruitment, readiness, professional development, and transition to the civilian workforce.

Credential Engine: International Pilots

Credential Engine's technologies—the schema (CTDL and CTDL-ASN), Credential Registry, publishing tools, and app development resources — are designed and intended to be applicable worldwide. This allows common frameworks for the search, discovery, comparison, and analysis of credentials anywhere and from any provider. Credential Engine is in discussions with OECD, UNESCO and a number of individual countries to pilot use of its technologies. Some of these technologies have more mature sets of frameworks for their education and training systems, and some have immature or non-existant frameworks and/or systems. Additional support for these international pilots and expansions will help these potential projects develop more quickly.

Workcred: Aligning Bachelor's Degreesand Industry-Recognized Certifications

Students at four-year universities have very few opportunities to earn certifications with labor-market value during their pursuit of a baccalaureate degree. Workcred, the Association of Public and Land-grant Universities (APLU), Coalition of Urban Serving Universities (USU), and UPCEA are exploring how students can earn both degrees and certifications as part of their four-year degree program. Workcred, APLU/USU, and UPCEA is hosting 5 convenings between certification bodies and universities with the goal of creating new opportunities and identifying practical examples to connect four-year degrees and certifications that result in credential pathways. These credential pathways will thereby create more opportunities for students to earn credentials with labor-market value. Each convening addresses the following industry sector or topic: health care, cybersecurity, liberal arts, manufacturing, retail and hospitality. The project seeks to: gain a better understanding of the knowledge that universities and certification bodies have of each other; gather information about the level of interaction that currently exists between universities and certification bodies; uncover barriers and challenges that prevent universities and certification bodies from developing partnerships; and identify opportunities to strengthen relationships between universities and certification bodies. Based on the convenings, the partners will synthesize the emerging themes into a framework laying the groundwork for potential pilot programs to test innovative strategies and promising practices. Ultimately, the project will help identify examples and opportunities to connect degrees and certifications that result in new credential pathways and thereby create more opportunities for students to earn credentials with labor-market value.

Credential Engine: Creating Stronger Connections between Education and Workforce in Indiana

Credential Engine was awarded a grant in September 2019 from the National Science Foundation (NSF) to support a partnership with the Indiana Commission for Higher Education and Lumina Foundation to identify and build critical data exchanges between education and workforce systems in Indiana. This is a Phase I effort — which will result in a Phase II proposal to the NSF to support state-level guidance — on how to break down data silos between education and workforce. This effort will empower policymakers with the information they need to make strategic and programmatic investments as well as provide students and workers with the data to make informed decisions about their learning and career pathways. This work is part of NSF's Convergence Accelerator, a new capability within NSF to accelerate use-inspired, convergence research in areas of national importance via partnerships between academic and non-academic stakeholders.

Education Design Lab: T-Profile Builder

Based upon the concept of the T-shaped learner, the Lab has been using a paper prototype of this tool for 3 years as a mechanism to identify the most essential combination of 21st century (human/durable/power) skills in addition to specialized technical skills for specific job roles. The Education Design Lab launched a digital version of this tool in late 2019. It will continue to collect data on the most essential skills by job role across industries of growth across the country. In 2020, this data will be made public in a visual library for learners and workers to gain more knowledge about skills hiring managers are seeking.

Create and Implement Technology/Data/Standards to Drive and Connect Systems

Credential Engine: Credential Registry Learn and Build Summit Series

Fostering and supporting an open application marketplace for the development and deployment of tools, services, and resources that use data from the Credential Registry—either on their own or in combination with data from other sources — is an essential goal for Credential Engine and the entire marketplace. To this end, Credential Engine hosted an initial series of "Learn and Build Summits" (hackathons of a type) to advance such a marketplace. The first event was held in the D.C. area in December 2018, and the second was held in Indianapolis in May 2019. A first version of a software development kit (SDK) has been released, but a wide range of other tools and services need to be developed for this marketplace to take hold and mature. Credential Engine also seeks to develop a range of apps for distribution to and use by community-based organizations, other nonprofits, and public agencies that may lack either the resources or development capabilities to develop their own apps. Several participants of the Learn and Build series have incorporated or plan to incorporate Registry data into their tools, including Parchment and NOCTI.

T3 Innovation Network

The T3 Innovation Network launched March, 2018 to bring businesses, postsecondary institutions, technical standards organizations, human resource professionals and their technology vendors together to explore emerging Web 3.0 technologies in an increasingly open, decentralized public-private data ecosystem. Phase 1 consisted of a background paper, four work group reports, and a final Phase 1 Report that identified 10 pilot projects to build a public-private data and technology infrastructure. Now in Phase 2, the T3

Network has grown to more than 250 organizations and 600 participants to make all learning count, make competencies the new currency, and empower workers and learners with their data.

The 10 pilot projects are grouped into four topic areas that will be implemented and build off one another throughout Phase 2 (January 2019 – December 2020):

Promoting Open Data Standards

- Pilot Project 1: Mapping and harmonizing data standards

- Pilot Project 4: Promoting data standard adoption in the public and private sectors

Supporting Comprehensive Learner/ Worker/Military Records

- Pilot Project 2: Improving the quality of employment outcomes data

- Pilot Project 3: Documenting all learning as data

Building an Open, Shared Competency Infrastructure

- Pilot Project 5: Making competencies discoverable and sharable

- Pilot Project 6: Translating competencies across stakeholders

- Pilot Project 7: Generating learning outcome statements

- Pilot Project 8: Promoting the adoption and use of competency data

Enabling Linked, Individual Level Data

- Pilot Project 9: Support new and existing data collaboratives for individual-level data

- Pilot Project 10: Improve learner self-sovereignty

Workcred: Promote Data-Sharing Among Organizations Awarding Non-Degree Credentials

With the emergence of many different types of credentials, including badges, industry certifications, and other microcredentials, there is a growing need to understand the value or return on investment of non-degree credentials. Workcred is creating a network of 25-30 non-degree credentialing bodies that offer certifications and/or assessment-based certificates to help inform credentialing bodies about the value of sharing data. The project also hopes to gain the participation of these credentialing bodies in data-gathering efforts (e.g., National Student Clearinghouse, Credential Engine) so that information about the value of the credential can be better understood. Credentialing bodies are selected to participate in this network based on multiple criteria, which include their potential to be early adopters and influencers in sharing data. Another criterion includes credentialing bodies' level of interest in learning more about the academic and employment outcomes of individuals who hold their credentials.

Create and Implement Technology/Data/Standards to Drive and Connect Systems

The Non-Degree Credential Research Network (NCRN)

Managed by researchers at the George Washington Institute of Public Policy (GWIPP), the Non-Degree Credential Research Network (NCRN) is a selective but growing group of leading researchers and key stakeholders (employers; policymakers; providers of employment, training and certification). The network's purpose is to clarify what is currently known about such credentials (certificates, certifications, apprenticeships, licenses, microcredentials, etc.) and their place in the broader credentialing ecosystem. The network will determine what new research is needed, identify lessons learned in the course of the project, their implications for policy and practice, and share the project's findings with practitioners, policymakers and other stakeholders. In 2019, the NCRN completed a literature scan describing the current landscape of non-degree credentials research (Non-Degree Credentials Literature Scan). NCRN members comment on the many upcoming opportunities for researchers to shape federal data collection policy concerning non-degree credentials. The Network maintains a list of such credentials: Federal Data Collections Relevant to Non-degree Credential Research. The NCRN will host additional meetings for researchers in 2020, publish an agenda for future research on non-degree credentials, and host a meeting for stakeholders in late 2020. This project is funded by a grant from Lumina Foundation.

CSW: Understanding the Landscape of Industry Certifications

Corporation for a Skilled Workforce, in partnership with Workcred and the George Washington Institute of Public Policy, is conducting a 2-year comprehensive study to unpack the complex heterogeneity of certifications. The goal of the study is to provide policymakers, practitioners, employers, and funders with a clearer picture of the dimensions, patterns, and trends among certifications, as well as how they currently or could interrelate with other parts of the credentialing ecosystem. The project will examine certifications in 7 industries through a combination of original research and synthesis of prior research. The study will focus on answering 8 primary topics about certifications within industries: 1) issuer and purpose, 2) quality assurance processes, 3) quality indicators, 4) relationship with education, 5) market penetration, 6) relationship to employment, 7) evidence of value for users, and 8) transparency.

Advance Understanding of Credentials of Value (COVs)

Developing Public-Private Education and Credentialing Data Infrastructure for Attainment and Outcomes

Due to the increasing diversity of credential-issuing mechanisms and providers and their scope exceeding federal and state governmental regulatory and collection mechanisms, a public-private education and credentialing data infrastructure is vital to enabling growth while understanding successful and less successful approaches. In 2016, the National Student Clearinghouse, in partnership with the National Association of Manufacturers and the United States Census Bureau, began a project to collect, report, match, aggregate, and analyze records on credit and non-credit education, industry certifications, and employment and earnings. This work expands the national education data infrastructure built by the Clearinghouse over its 25-year history and begins the path to a public-private national education data infrastructure that will enable the identification, analysis, and reporting of education to workforce pathways. This project is now focused on extending this infrastructure to include non-credit education at two-year and four-year institutions and certifications but is designed to expand to apprenticeship programs and all types of credentials.

Work under this project has focused on four distinct but complementary tasks: 1) formatting/reporting of attainment records from industry certification providers; 2) formatting/reporting of non-credit course data from state community college systems; 3) matching of credit and non-credit education and certification data and analysis of those matched records to determine combinations of credentials and common education pathways; and 4) matching/analysis of combined education/certification records with employment and earnings data (and the aggregation of that data to meet disclosure requirements): United States Census Bureau to match with a set of employment, earnings, and demographic datasets available at that agency and create a series of aggregate-level reports on the impact of education and credential attainment on labor market outcomes. Datasets expected to be available from the Census Bureau include UI Wage Records from the Longitudinal Employer–Household Dynamics (LEHD) program, W-2 and 1099 tax records from the Internal Revenue Service, population demographics from the decennial census, and employer demographics from the economic census.

National Skills Coalition:
State Identification of Credentials of Value

National Skills Coalition (NSC) is assisting states in collecting data on non-degree credentials and identifying non-degree credentials of value. The non-degree credentials include certificates from public and private institutions, apprenticeship certificates, industry certifications, and licensures. State data collection and maintenance includes individual-level administrative records of credential attainment, demographic data, and incorporating data into state longitudinal data systems. NSC surveyed all 50 states and D.C. on their status of data collection and how they identify credentials of value. NSC provides a 9-step guide for states on how to measure non-degree credentials and provides technical assistance to select states on implementing the guide, including best practices from other states.

NSC has also led a conversation with national higher education and business groups about high quality credentials that improve long-term educational, employment and earnings outcomes across racial/ethnic groups. There is general consensus that this must be a state-driven process. However, there is unclear and sometimes conflicting guidance for states on how to create an operational high-quality definition and establish the policies and practices to evaluate credentials based on that definition. In the absence of a state definition or guidance, there is not a way for these providers to understand what credential programs lead to further education and employment. In the absence of this guidance, these organizations are inadvertently offering credential programs that are dead-end pathways. During 2019-2020, NSC will conduct work in:

1. Drafting consensus definition through a "Leading State" working group that will help identify policies and processes necessary to support and expand attainment of these credentials.

2. Vetting definition by a wider group of state partners and quality assurance national advisory panel; i.e., stakeholders interested in measuring and evaluating non-degree credentials but have not yet taken significant steps towards establishing a state quality assurance model. This process will allow states to identify potential obstacles to implementation, helping refine the definition to make it universally accessible and identify alternate policy levers that states may use to fully support adoption of the definition moving forward. A significant outcome will be a shared statement or principles document that both endorses the proposed state-level definition.

3. Publication and promotional event/activities: publication that outlines the new state-level definition of quality non-degree credentials, as well as case studies from Leading States on policy and practices that can serve to best operationalize the definition.

Advance Understanding of Credentials of Value (COVs)

Education Strategy Group:
State Identification of Credentials of Value

Credential Engine recently published a report estimating over 738,000 types of postsecondary credentials in the U.S. Roughly 28% of these are nondegree credentials (i.e., less than an associate degree or higher). Numerous reports and studies have shown that people with higher levels of postsecondary attainment are often, on average, associated with more positive work outcomes: higher earnings, lower unemployment, etc. These reports often compare high school graduates (or less) with associate degree, bachelor's degree and graduate and professional degree holders. We need to learn more about individuals whose highest educational attainment is a nondegree credential (e.g., postsecondary certificate, certification and/or license). Less is known about the labor market (and quality of life) outcomes of individuals with only nondegree credentials. This work will increase knowledge of how states, employers, and policymakers can more systematically identify and capture data on nondegree credentials of value (CoV's) through (ideally) integrated data systems within states (K-12, higher education and workforce). Work includes four phases:

- Developing tools and resources states and other stakeholders can use to assess and strengthen their systems to capture data on CoVs: self-assessment framework to help states identify strengths and gaps in their current processes of collecting data on CoVs; model processes for identifying CoVs that can be adopted or adapted by states, building on work underway in several states; employer signaling tools to share lessons from several states leading in CoV work with other states; sample data quality standards and data-sharing agreements to help states and others

efficiently collect reliable information on student credentialing rates to include nondegree credentials.

- Work with 6-8 states in a Credentials of Value Institute to help them assess and improve their systems. CoV Institute included lead-off convening in spring 2019 to focus states on the intended cross-sector outcomes of the work, establish timelines and routines for that work, and provide assistance on how each team will use the suite of tools and resources; state-led credential transparency work using the tools, with virtual support from ESG, to preliminarily create formal state list of priority industry-recognized credentials for K-12, postsecondary, and workforce development, and identify those that will count for postsecondary course credit; deployment of expert team that includes ESG team as well as other leading state and national experts to examine each participating state's work to date, identify strengths and gaps, and form recommendations for additional work through the remaining grant period.

- State-led pathways analysis that includes each state examining the extent to which credentialing opportunities are embedded within their high school to college pathways in high-skill, high-demand fields – with coaching support from ESG; states at this time undertake the additional work on priority industry certification lists identified by the expert team.

- Creation of State Aggregation Stories that capture each state's work, including formal priority list of industry-recognized credentials, delineation of those that count postsecondary course credit, and identification of industry credentialing opportunities embedded in pathways that begin in high school and continue into higher education – so that we can disseminate lessons learned and highlight leading state action that can be replicated in other states.

Credential Engine: Use of Credential Registry as Part of Eligible Training Provider List (ETPLs) and Other Eligibility Determinations

Agencies and organizations tasked with determining a set of credentials, or programs that lead to credentials, that are eligible to be offered and paid for as part of public programs have historically struggled. They have had difficulties with the process of setting appropriate standards, being able to measure credentials against those standards, and ensure that they are actively able to include the complete set of all credentials that appropriately meet the standards set by the governing body. The use of common schema across all credentials and an open, shared Registry could dramatically improve the development, management, and value of such eligibility lists, including those for WIOA, Perkins CTE, state-approving agencies for GI Bill funds, and other programs and services. Several states are planning to utilize these technologies to support their approval processes, including New Jersey and Ohio.

SocialTech's Unmudl Project

SocialTech.AI, is a public benefit corporation located in Austin, Texas. It is launching the unmudl.com work and learn marketplace founded on a cooperative business model for working learners. unmudl's goal is to become a one-stop marketplace for the 64.5 million working learners in the U.S. and the even greater number of working learners across the globe. The work and learn marketplace will focus on non-degree, skill-driven learning options and tools for working learners to develop skills as well as build real-world experiences to practice and prove those skills. The marketplace is co-founded by Innovate+Educate, a skills-based hiring non-profit out of New Mexico. Innovate+Educate has been developing

Advance Understanding of Credentials of Value (COVs)

a skills-based taxonomy and tools to fuel a skills-driven ecosystem for the past decade. Founding partners include the National Institute for Student and Organizational Development (NISOD.org) and an initial five founding community colleges which will be offering community college skill-development offerings: Bellevue College (WA); Central New Mexico Community College (NM); GateWay Community College (AZ); Pima Community College (AZ); and San Juan College (NM).

SUNY/Empire State College: Developing a Nationally Recognized Incremental Higher Education Credentialing System

Higher Education still functions on the traditional model, in which younger students enter college directly out of secondary education. These students then complete a 2- and/or 4-year degree, sequentially within a designated period. Yet, students of all ages step in and out of their education and many do not complete credentials, even if they have progressed part-way. Currently, the system does not recognize additional learning beyond the associate or bachelor's degree, unless it fits neatly within master's and/or doctorate degrees. This leaves the nation with a system that only recognizes those who successfully complete a limited number of options, ignoring those who do not complete the convention. This project is developing a nationally recognized, incremental higher education credentialing system that expands upon the established certificates, associate degree, and bachelor's degree structures at the undergraduate level to increase the number of individuals who hold high-quality postsecondary degrees. Phase I is interviewing key leadership to examine policies and practices at the federal; regional, national, and specialized accreditation; state; system; and institutional levels to determine equity

implications, potential barriers, and changes needed for a recognized incremental credentialing system. This phase is exploring models of 3-year degree programs, innovative transfer of lower-division general education, and arrange of international credentialing systems. A national advisory council will vet findings. The project will also initiate a pilot within the State of New York to explore how a recognized incremental credentialing system can increase enrollments, persistence, and completion of high-quality stackable credentials at 3 institutions: SUNY Empire State College, Suffolk County Community College, and SUNY Rockland Community College. Pathways to explore include 1- and 3-year degrees that validate stackable knowledge gained within shorter timeframes and credentials that incorporate opportunities such as apprenticeships, workplace and experiential learning. The project is also exploring options with New York State Education Department, State University of New York, and City University of New York regarding types of policy, practice changes and internal supports needed within one state to develop clearly articulated credentialed pathways that incorporate stepwise credentialing and transfer options.

Advance Employer/Workforce Signaling for Credential Transparency

Job Data Exchange (JDX)

The Job Data Exchange (JDX) is an open data infrastructure that will improve how quickly and clearly employers are able to communicate their hiring requirements to education and training providers. The JDX, and the job data standard it employs (JDX JobSchema+), help employers and their HR partners break down a job description into specific skill and hiring requirements. The JDX collects open-source, non-proprietary, and free to use hiring data and makes that data available to education and workforce partners that are helping students and job seekers prepare for the workforce. The JDX will help: students and workers have access to better data on what it takes to be career ready; education and workforce partners to receive more granular, actionable data on employer workforce needs to align curriculum, credentials, and career services; and employers and their HR partners to improve their job description and postings. The US Chamber of Commerce Foundation is leveraging participants in the Talent Pipeline Management project and bringing together employers, employer collaboratives, education providers, and HR technology service providers. In February 2019, the initiative announced 7 pilot partner teams across 7 states that would co-design and pilot test the JDX prototype throughout 2019. Pilot partner teams are comprised of education and training providers, employers, HR professionals, and HR technology vendors representing the industries of healthcare, defense, utilities, energy, and manufacturing. An advisory committee was also formed to provide recommendations and feedback on the design, data integration, pilot, evaluation, adoption, and future use of the JDX. The JDX final outcome report was shared publicly November, 2019. The report also included recommendations for the phase 2 of this work which will occur in 2020.

Talent Pipeline Management (TPM)

The U.S. Chamber of Commerce Foundation's Talent Pipeline Management™ Initiative is a demand-driven, employer-led approach to close the skills gap that builds pipelines of talent aligned to dynamic business needs. The following funders have supported this work to date: Strada, J.P. Morgan Chase & Co, Kellogg, and Walmart. The TPM Academy trains state and local leaders, business associations, employers, and economic development agencies to drive partnerships with their education and training providers based on need. Work is happening in 29 states across 9 TPM Academies involving over 250 partner organizations and an estimated 3,000 employers. The Chamber Foundation works with a board of advisors to develop a training curriculum designed to walk business-led organizations through the process of implementing a TPM orientation and six strategies that build on one another. Growth of the TPM initiative has led to The National Learning Network, a national network of TPM leaders and champions who act as Peer Advisors to businesses and states new to the process. Each year in October, the initiative hosts a national workforce conference that brings these audiences together to discuss best practices, challenges, and successes.

Common Employability Skills Framework

The Common Employability Skills Framework was created by the National Network of Business and Industry Associations as a first step toward laying out the foundational skills that all individuals need for current and future jobs, no matter where they work. This work provided a foundation for the National Network to identify industry-recognized competencies and credentials that have real value for students, workers and employers. The work was based on the understanding that there are a number of industry-recognized credentials that represent the technical or job-specific skills needed for certain industries or occupations. These credentials help students and workers validate their knowledge, skills, and abilities while helping employers find candidates who are poised for success. The National Network, led by the Business Roundtable from 2013-2018, brought together a cross-section of 21 business and industry groups. These groups represented economic sectors that will be the source of nearly 75% of projected job growth by 2020. They are helping to communicate to learning institutions the skills employers are looking for, and help industries and employers adjust their hiring and business practices to focus on the competencies and skills workers have and are developing in the rapidly-evolving economy.

Connecting Credentials: beta Credential Framework

The beta Credential Framework (renaming is under discussion) was created and tested between 2015-2018 by the Connecting Credentials national initiative led by the Corporation for a Skilled Workforce (CSW). The tool is being used to calibrate what level and mix of competencies are associated with a given credential, job description, and/or educational program of study. An important outcome of this work is to make the competencies associated with a given credential, program, or job description explicit rather than implicit – including colleges aligning more precisely their program requirements with the mix and levels of competencies needed by relevant employers. In particular, the Framework has been beneficial in assisting colleges in functions such as: 1) planning new programs; 2) reviewing existing programs, especially 5-year reviews following approval by state coordinating boards required by many colleges; 3) determining how to connect pathways that contain different types of credentials; 4) reviewing competencies

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within current programs; 5) aligning credential programs to employer needs; and 6) creating pathways to stackable university programs. An app is under development for the Framework, which will have a URL and live website. This is expected to go live in 2020.

Markle Foundation: Skillful

Skillful, a non-profit initiative of the Markle Foundation, is dedicated to enabling all Americans – particularly those without a four-year college degree – to secure good jobs in a changing economy. In partnership with Microsoft and others, Skillful is developing skills-based training and employment practices in collaboration with state governments, local employers, educators, and workforce development organizations. Skillful and its partners are working to create a labor market in which skills are valued, and people can more easily access the information and education they need to keep pace with technology's impact on work. This skills-based approach to hiring reduces bias and creates a more equitable job market that screens in for skills and clarifies credential requirements.

The Skillful model focuses on driving change in five key areas through the use of technology, data, partnerships, and new practices:

- Encouraging widespread understanding of the multiple pathways to success that are available in the digital economy.

- Facilitating widespread adoption of high-quality skills-based employment practices.

- Aligning educational programs to employment needs by driving collaboration through industry-specific approaches.

- Driving increased transparency and data around educational outcomes to make it easier for job seekers to understand the value of training options.

- Creating a system of effective, evidence-based career coaching to help job seekers navigate opportunities for good-paying jobs in high-growth industries and successfully achieve career growth.

To drive this change, Skillful brings together employers, state government, nonprofits, and educators to develop tools and practices that are tested and deployed in key states, and shared through its national network of partners and state leaders. Key initiatives include:

- Making data on training content, and outcomes available in an accessible format to give educators a clearer picture of which skills are in demand in their area, and provide employers a better sense of which skills are available in their applicant pool. In Indiana, Skillful is working on a data transparency initiative, Credential Engine, to provide Hoosiers with better access to reliable information around training options. In Colorado, Skillful is partnering on a pilot project with SkillsEngine's Calibrate initiative to connect educational institutions curriculum to employer need.

- Creation and deployment of employer resources which include the Skillful Talent Series, a 4-part SHRM-certified program of workshops to help employers embed skills-based practices at each stage of the talent management lifecycle. This enables employers to better define the skills they need, expanding opportunities for more workers, while building a stronger workforce for themselves.

- Elevation of the services provided by career coaches, and the network of support already embedded in the workforce system, to support workers and jobseekers. This includes the Skillful Governor's Coaching Corps, developed to equip career coaches with the skills, tools and support they need to help people recognize the skills they have, the training they may need, and the employment opportunities within their reach. This is supplemented by the Skillful Coaching Community of Practice, an online forum to connect career coaches and provide access to tools and a platform for asking questions or sharing insights with other coaches.

Deployment and impact begin at the state level with Skillful's on-the-ground operations in Colorado and Indiana which develop and deploy tools and practices to accelerate a skills-based labor market and create better pathways to good jobs for those in the state. In 2015, in partnership with former Governor John Hickenlooper, Skillful launched its first state-level initiative in Colorado. In October 2018, this was followed by launch of Skillful Indiana with the support of Governor Eric J. Holcomb, the Markle Foundation, Microsoft Philanthropies, LinkedIn, Walmart, Lumina Foundation, Purdue University and Purdue Extension, together with the Governor's Workforce Cabinet and local workforce development boards. To share learnings from on-the-ground operations and work being developed by other states, Skillful created the Skillful State Network, a non-partisan collaboration among 27 governors to accelerate the transformation of the U.S. labor market at a scale and pace not possible through individual state actions.

Network members share assets, foster partnerships, and refine methods of engagement within their labor markets. Skillful State Network members, (which represent more than half the states in the nation), are:

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Arkansas, California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kansas, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Utah, Vermont, Virginia, Washington, and Wisconsin.

Skillful works closely with Markle's other influential networks, including the Rework America Task Force, a network of 60 leaders from business, education, government, and non-profit organizations. Skillful also works with the Rework America Business Network, a collaboration of 11 leading businesses in the U.S. that are changing business practices to support a skill-based labor markets and sharing learnings to accelerate adoption at other organizations across the nation. Markle also works with innovative educators dedicated to helping adult, working learners obtain the skills and support they need to succeed and advance in a rapidly changing labor market. This collaborative approach is creating solutions grounded in experience and shared broadly through influential networks and technology-based solutions. This approach will open up opportunities to all Americans and build a labor market for today's digital economy.

Business Roundtable: Workforce Partnership Initiative

The Workforce Partnership Initiative (WPI) is a CEO-led initiative created by the Business Roundtable (BRT) to increase the skills and diversity of America's workforce by building strategic partnerships between business, nonprofits, and educational institutions. More than 30 CEOs from leading U.S. companies are partnering with local colleges and universities in several U.S. regions to fill high-demand jobs in STEM-related fields and in skilled trade positions. These partnerships are helping to better align career and educational pathways— ensuring that

companies have a strong supply of talent and that employees are afforded increased opportunities for development and growth. The initiative is focusing on four significant workforce skills challenges:

- Boosting fundamental workforce readiness skills including basic math, reading, and problem-solving skills.

- Increasing STEM skills within America's workforce and growing the number of job candidates who are qualified for the jobs of today and tomorrow. This includes high-demand fields of cybersecurity, data science, engineering, and computer science.

- Growing the number of workers with specialized skills to fill trade positions such as machinists, welders, electricians, and sheet metal workers.

- Engaging, training, and employing women, minorities,veterans, and other populations who are underrepresented in STEM occupations and digital jobs of the new economy.

WPI regions were launched in 2018 with lead BRT companies, supporting partners, and the skills/education focus of each regional initiative:

- **Chicago, IL** – Midwest Region: Lead Companies: AON,Accenture. Supporting Partners: McDonald's, Risk Management Solutions of America, Inc, Walgreens, Zurich. Education/Skills Focus: Build upon the successful apprenticeship model used by Aon and Accenture to expand the number of participants and increase skills for people to enter careers in white-collar occupations such as HR, IT, software engineering, and health care.

- **Cleveland, OH** – Midwest Region: Lead Company: Eaton Corporation. Supporting Partner: Altec Industries, Inc. Education/Skills Focus: Companies are partnering with Cuyahoga Community College to develop a Department of Labor-certified apprenticeship program in advanced manufacturing. The program will be replicated/scaled for use at additional company facilities, with work summarized in an apprenticeship playbook and disseminated to WPI companies for future replication.

- **Columbus, OH** – Midwest Region: Lead Company: American Electric Power. Supporting Partners: Accenture, Ernst & Young, JP Morgan Chase & Co. Education/Skills Focus: Companies will collaborate with higher education institutions to replicate or scale existing partnership models. Programs will target undergraduate students, incumbent employees and students matriculating through K-12, with goal to advance digital skill sets of students through work-based learning.

- **District of Columbia/Maryland/Virginia** – Lead Companies: Northrop Grumman Corporation, Capital One. Supporting Partners: AWS, EY, FIS, IBM, Jacobs Engineering, JP Morgan Chase & Co., Lockheed Martin, MedImmune, MedStar Health, McKinsey & Company, Walgreens, Washington Gas. Education/Skills Focus: Work alongside local employers, colleges and universities, and the Greater Washington Partnership to develop unique industry-recognized education credentials and increase the number of workers graduating with core digital skills competencies such as data analysis, cybersecurity, artificial intelligence/machine learning, and cloud computing needed in high-demand engineering and computer science occupations, and data analysis and visualization in non-technical occupations.

- **Milwaukee, WI** – Midwest Region: Lead Company: Rockwell Automation, Inc. Supporting partners: DOW Chemical, FIS, ManpowerGroup, Northwestern Mutual (additional outreach to other partners). Education/Skills

Key Initiative Descriptions

Focus: Develop steady pipeline of talent that meets the region's workforce needs in the areas of industrial automation and the industrial internet of things (IIoT). This will include a large expansion of work-based learning programs that align high school programs into certificates, and then lead to apprenticeships-style opportunities at the associates-level, and on to research internships and co-op-like opportunities at the bachelor's level.

- **New York City, NY** – Northeast Region: Lead Company: IBM Corporation. Supporting partners: Aon, Guardian Life, Johnson & Johnson, JPMorgan Chase, MasterCard. Pitney Bowes, SAS, S&P Global, UPS. Education/Skills Focus: Increase early college and two- and four-year pathways to develop the region's workforce in technological fields including data science, cybersecurity, and cloud technology. The group will identify key workforce competencies needed for the Greater NYC region, and will engage with education partners to map those needs against existing educational offerings to determine how companies can support solutions for stronger curricular alignment and expanded student learning opportunities.

- **Palo Alto, CA** – West Region: Lead Company: SAP SE. Supporting Partners: AT&T, Ernst & Young, IBM Corporation. Education/Skills Focus: Work with higher education institutions to develop work-based learning pathways, focused on increasing the number and diversity of undergraduate students with digital technology skills. A key goal is to create a talent pipeline that can be replicated to address company workforce needs in other regions.

- **Raleigh-Durham, NC –** Mid-Atlantic Region: Lead Company: Ernst & Young. Supporting Partners: Bank of America, IBM, SAS, Wells Fargo & Company. Education/Skills Focus: Work with employers, their

existing higher education partners, and/or technology platform companies to create new or non-traditional undergraduate pathways and upskill the existing workforce in digital fields such as artificial intelligence, data science, and design thinking. Companies are adapting the Generalist digital technology competency map developed by the D.C./Maryland/Virginia region to create a competency map relevant to every digital professional. Companies would like North Carolina higher education institutions to integrate these competencies into a credential which could be offered to students. As part of the partnership model, companies would offer students who gain this credential unique opportunities for internships, job interviews, or hiring.

- **Salt Lake City, UT** – West Region: Lead Companies: The Boeing Company, Northrup Grumman. Education/Skills Focus: Expand apprenticeships leading to certification to meet the region's aviation manufacturing needs and increase the number of workers graduating with aerospace, mechanical, and electrical engineering degrees. This will involve increasing from 40 apprenticeships for aerospace manufacturing jobs and increasing baccalaureate-level engineering jobs to support plans of regional employers to hire additional engineers.

- **South Carolina** – Southeast Region: Lead Company: Siemens Energy. Supporting Partners: Altec Industries, Inc., Day and Zimmermann, Owens Corning, Tyson Foods, Inc. Education/Skills Focus: Replicate/expand Siemens' apprenticeship program in advanced manu facturing to create a new apprenticeship model in the Southeast that increases participation among BRT member companies with similar workforce needs for quality talent in the manufacturing industry.

BadgedToHire

Building on the success and learning from TeeUpTheSkills, 2018-2019, Education Design Lab is conducting a 2-year study in three U.S. regions (Central New Mexico Community College, San Jose State University, the University of Maine). This study will evaluate the value of 21st century skill microcredentials as a hiring signal for career readiness, particularly for underserved learners. These three primary educational partners are developing and scaling their micro-credentialing programs to reach approximately 5,000 students over a two-year period. To match students who earn the Lab's in-demand microcredentials with jobs in growing sectors, the Lab is building a coalition of partners. The list includes economic development offices, industry associations, and workforce boards to target growing sectors and sophisticated employment data to identify local and national employers willing to participate in the study. By working in tandem with college and industry partners, the Lab will identify the specific mobility skills needed for entry-level positions and help create a process to equip college students with the right combination of skills to meet the regions' economic needs. Through direct work with hiring managers from over 25 companies, the Lab will demonstrate the degree to which 21st century skills digital microcredentials can be valuable in the hiring process. The Lab is using a key tool from Tee Up the Skills, the T-profile, to identify combinations of 21st century skills and technical skills that employers want for entry-level roles. A library of T-profiles will be built out in these three hiring markets, as well as through a national "What's Your T?" social media campaign.

Key Initiative Descriptions

Advance Navigation Tools, Verifications, Quality Assurance

Google Education and Pathways Search

In 2019, Google launched Pathways, a new product initiative in Search that connects job seekers to education and trainings that lead to local in-demand jobs. When people search for things like "job training in Richmond" on Google, they'll be able to more easily find jobs that are in demand, discover local training programs to prepare them for those jobs, and compare program costs and outcomes. Pathways includes a subset of qualifying in-person training programs that are up to two years in length if taken fulltime, or longer if they include paid training, like an apprenticeship.

Pathways is currently live in Richmond and Hampton Roads, Virginia, through partnership with the Virginia Governor's Office and the Virginia Community College System. It will launch next in Washington and Indiana, through partnership with the Washington Workforce Training and Education Coordinating Board, and the Indiana Commission for Higher Education, and Credential Engine.

Pathways will continue to scale to additional locations in 2020. State governments that maintain lists of eligible programs online and institutions that provide programs can integrate by implementing the job training schema. Visit jobs.google.com/pathways to learn more.

Learner Records

The American Association of Collegiate Registrars and Admissions Offices and NASPA: Association of Student Affairs Professionals partnered on a national pilot project between 2015-2017 to develop models for a more comprehensive student record. After the success of the pilot, the associations moved to the second stage of this work on the development and adoption of Comprehensive Learner Records in American higher education. The National Institute for Learning Outcomes and Assessment (NILOA) joined the work as a partner. This work has focused on the development and implementation of a single learner record across a broad number of American colleges and universities. The Comprehensive Learner records seek to capture, record, and communicate learning when and where it happens in a student's college experience. This includes learning outcomes from courses, programs, and degrees, as well as experience outside the classroom. There are several emerging technologies that have demonstrated their ability to show the institution's learning framework and some of these also provide a deeper exploration of the information and evidence of what that learning means or how it was attained and validated.

As Phase II of the project progresses, it is focused on scaling up the adoption of CLRs among colleges and universities, the content of competency-based transcripts/records, the integration and use of data to create CLRs, and track student progress toward competencies and learning outcomes. The scaling is being done by working with higher education systems and networks, as well as workshops for single institutions interested in creating and implementing a CLR. Working with C-BEN and IMS Global, the content of CBE transcripts/records is being standardized and socialized among those institutions who offer CBE courses and programs. A report of recommended standards for CBE transcripts was produced in September 2019. Data integration work has already produced a white paper that delineates the challenges and potential solutions. Degree audit system processes are being documented to provide resources for institutions seeking to track student progress toward learning outcomes/competencies.

The Quality Assurance Commons

The Quality Assurance Commons for Higher and Postsecondary Education (QAC) is a nonprofit organization established in 2016 to create a new voluntary approach to assure that higher and postsecondary programs of all types and across all disciplines graduate students who are well prepared for employability in the 21st century. Based on a successful co-design pilot project in partnership with 27 academic programs from 14 institutions across the country, the Essential Employability Qualities Certification (EEQ CERT) certifies bachelors, associates, and certificate programs that prepare graduates with eight essential employability qualities and that meet other criteria including verifiable student records that display EEQ competencies, effective career services, employer engagement in program design and quality, student and alumni feedback and engagement, and publicly available program information and student outcomes.

Currently, the QA Commons is working with the Kentucky Council on Postsecondary Education (CPE) to implement the EEQ CERT; 19 programs from three community colleges and three four-year institutions are submitting portfolios for certification review in the first phase. Three of these programs submitted portfolios early and were successful in receiving certification, serving as models for subsequent submissions. Based on the success of this project, there will be an expansion of programs working with the QAC going forward. To build faculty advocates for an institutional culture supporting employability for all graduates, a Faculty Employability Fellows' program has been launched in Kentucky as well with an initial cohort of fourteen Fellows from seven institutions. They are undertaking campus environmental scans, interviewing employers, meeting with regional and state leaders, and completing an impact project.

Advance Navigation Tools, Verifications, Quality Assurance

In Fall 2020, the QA Commons will also be initiating an Employability Academy in Kentucky with a pilot group of community colleges.

The QA Commons is also developing a new process—a Readiness Review—to assist programs that wish to self-assess their status and to enter into a developmental process with QAC assistance. In early 2020, QAC will work with the Connecticut State College and University System (CSCU) to bring the Readiness Review to 24 programs at five community colleges and three universities. The EEQs include people skills such as collaboration, teamwork, and cultural competence; problem-solving abilities such as inquiry, critical thinking, and creativity; and professional strengths such as communication, work ethic, and technological agility. The EEQs represent the knowledge, skills, abilities, and experiences that help graduates be ready not only for their first job, but also a lifetime of engaging employment and participation in the rapidly changing workforce of the 21st century. The EEQs represent current and future employer expectations as reflected in numerous studies, such as those completed by LinkedIn, ACT, the Foresight Alliance, Jobs for the Future, Career Tech, the Business Roundtable, O*NET, third way, National Network of Business and Industry Associations, and the Institute for the Future. As the QA Commons works with state systems like the Kentucky CPE and CSCU, it will continue to revise and update its processes and support services to meet institutional objectives as well as employer needs.

Expand Messaging around Credential Transparency

Credential Engine: Inventory and Mapping of All Credentials in U.S.

Prior to the research commissioned by Credential Engine no comprehensive count of U.S. secondary and postsecondary credentials existed. In 2019, a comprehensive report was prepared for Credential Engine by the Center for Regional Economic Competitiveness (CREC), "Counting U.S. Postsecondary and Secondary Credentials", issued in September 2019 which identifies 738,428 credentials across 14 subcategories grouped into four primary provider types: (1) postsecondary education institutions (370,020 credentials); (2) MOOC providers (7,132); (3) non-academic organizations (315,067, including occupational licenses, industry-recognized certifications, military certifications, apprenticeships, coding bootcamps, online course completion certificates, and digital badges); and (4) public and private secondary schools (46,209). Credential Engine plans to continue to research the credential landscape to track developments and provide more analysis of this rapidly growing marketplace.

Gallup Surveys

Over the last few years, Gallup began conversations with leading organizations looking for a better measure of the US jobs landscape. Remarkably, there is no widely recognized, comprehensive measure of job quality in the U.S. The few indicators developed in recent years are either based solely on income or on a small set of factors such as access to healthcare and retirement plans, in combination with income. Lack of data on preferences for a broader range of job characteristics has meant that scholars have had to assume what workers value most. The Great Jobs Study aims to address this deficit. This research, funded by asking more than 6,600 U.S. workers about the factors that matter most for overall

job quality, and how their jobs stack up on those characteristics. The resulting measure includes not just common considerations such as income and employment benefits, but also career advancement opportunities, autonomy and control over their working lives, job security, and other attributes important to workers. The primary measure of job quality combines worker ratings of satisfaction and importance across 10 dimensions of job quality. Gallup classifies job quality index into "good," "mediocre," or "bad" based on the average response to these 10 items, giving higher weight to the items deemed more important to workers. The result is a more comprehensive indicator of job quality, one that incorporates American workers' views on the job characteristics most likely to help them lead better lives amid changing labor market conditions. The analysis pays specific attention to income groups, reflecting the recognition in previous studies that income is central to any discussion of job quality in America. There is also a focus on educational backgrounds and race/ethnicity as they factor into job quality. Finally, the survey asks workers about how their job quality has changed over time to get a sense of how their jobs have been evolving. The first report was released in October 2019 at an event at Gallup's Washington D.C. headquarters. Gallup and the underwriting sponsors also coordinated a public relations and media outreach campaign to maximize coverage of the findings, providing ample time for embargoed reports and pre-release pitches to journalists and media outlets. Gallup intends to further its efforts to establish a large-scale, on-going center for labor statistics that would provide this information on a consistent basis going forward – including down to a zip-code level of analysis.

Messaging through Media

A number of media-focused efforts have been recently completed or are under way to inform the public and niche audiences of the need to be clear about the learning various credentials represent as the integration of work and learning grows and evolves. Examples include:

- American Public Media – The radio documentary unit, APM Reports, produces 3-4 back-to-school documentaries annually, a podcast season in the fall/spring, and shorter prices for national radio newsmagazines such as All Things Considered, Marketplace, and Morning Edition.

- The Atlantic, CityLab, and AtlanticLIVE – digital reporting series that explore how to prepare people for future of work and how often-overlooked cities are investing in talent development as well as events to explore The Future of Work.

- The Conversation – Works with faculty members to convert their research and expertise on Education and Economy + Business into articles for lay audiences that are picked up by major media outlets.

- EdSource – Covers California education and workforce issues, including a focus on communications.

- The Hechinger Report – This nonprofit news organization has its own branded platforms and partners with outlets such as The New York Times, The Washington Post, and PBS NewsHour to extend its expertise and through leadership around workforce training and higher education.

Expand Messaging around Credential Transparency

- PBS NewsHour – education segments in the spring and fall that include coverage of adults who are pursuing first credentials, as well as periodic coverage tied to the role of education and training in promoting economic opportunity and social mobility.

- The Poynter Institute and Education Writers Association – provide journalism training on issues such as disparities in outcomes by race, ethnicity, and incomes as well as initial credentials and the future of work and learning.

- PRX (formerly Public Radio International) – Global Nation covers topics related to immigrants using education and training to keep their knowledge and skills relevant in today's economy.

- Roadtrip Nation – produced a documentary called "Rerouting" for public television on three adults exploring their next steps in a changing economy.

- Washington Monthly – supports independent, policy-oriented journalism about issues vital to creating a better-educated country.

- WGBH (Boston) – The On Campus desk produces compelling radio pieces for the Northeast and national broadcasts on All Things Considered, Marketplace, and Morning Edition, as well as a monthly public affairs show.

- WorkingNation – produces blogs, live programming, and video assets on education and training after high school that prepares people for jobs and further learning, and also partners with major broadcast news organizations and groups such as ASU/GSV and SXSWedu to provide live or video content.