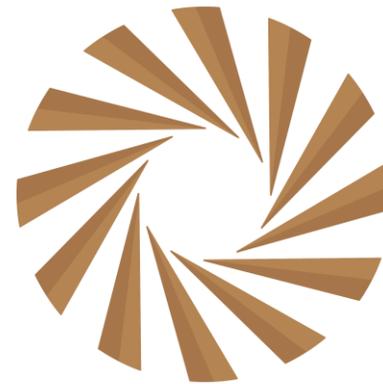
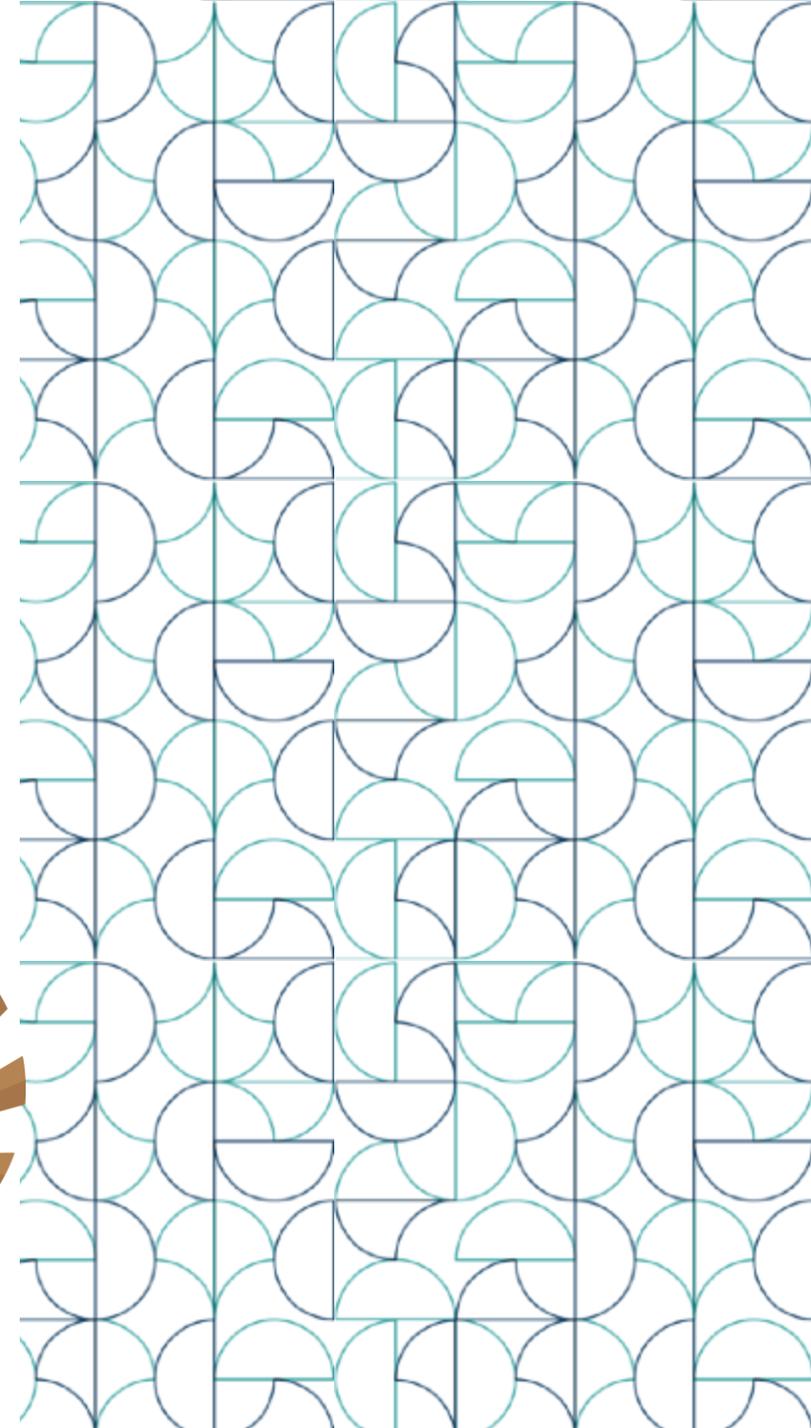


Connected Credentials and Competencies Linking Education and Careers

| Dr. Deborah Everhart
Chief Strategy Officer
Credential Engine



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attribution





Call to Action

Learn about credential transparency

Advocate for credential transparency as a public good

Participate in digital credentialing ecosystems

Build a culture of credential transparency





Overview

Why: (Today's presentation)

- The complex and opaque credentialing landscape
- The importance of credential and competency transparency

Who: (Today's presentation)

- Empowering learners, workers, credentialing organizations, quality assurance entities, and employers with valuable, transparent credential and competency data

What: (Tomorrow's presentation)

- Public Linked Open Data describing credentials and competencies
- Digital credentials issued to learners/workers

How: (Tomorrow's presentation)

- The Credential Transparency Description Language (CTDL)
- Linked Open Data CTDL in digital credentials





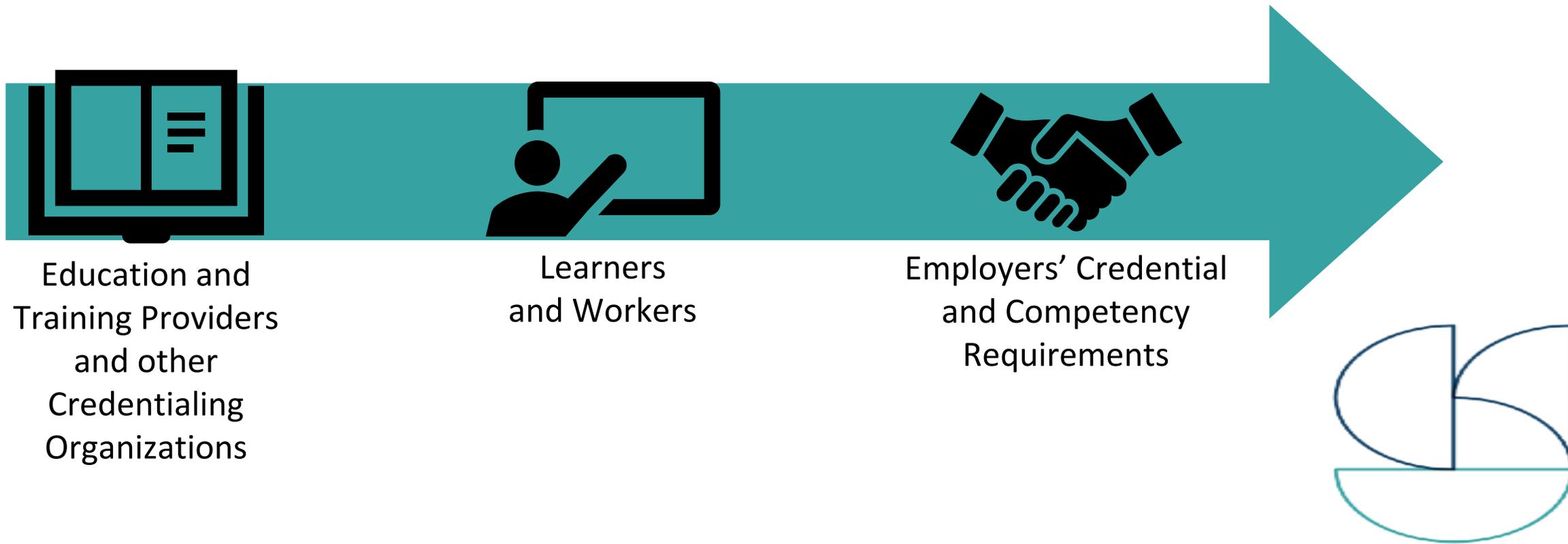
Why:
The Importance of Credential and
Competency Transparency





Information about credentials and employer requirements are disconnected

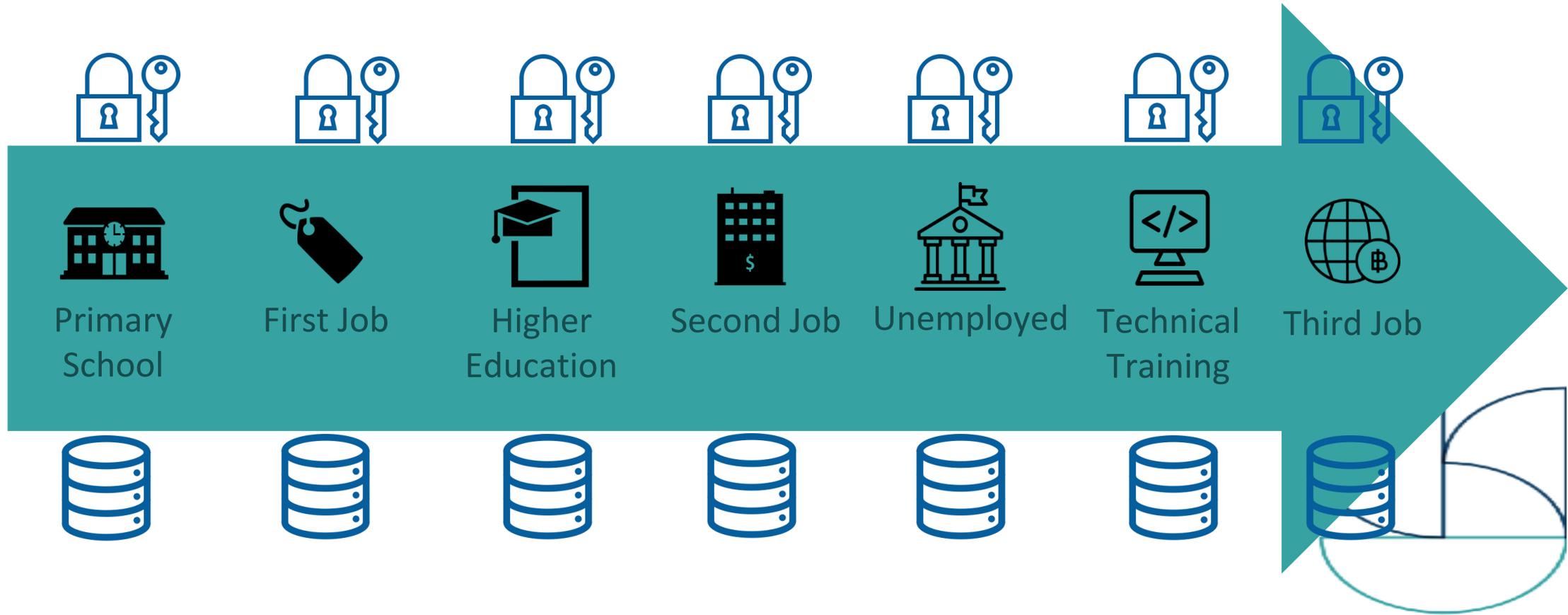
There is a lack of tools and systems to connect credential and employment information, causing mixed signals in the talent marketplace, including misalignment of education to competencies employers require or prefer.



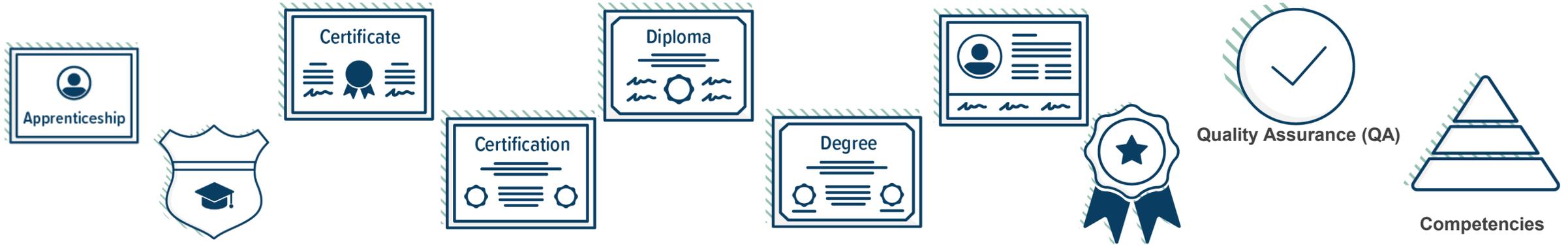


Learners can't make use of their own learning achievements

Learners don't have control over how the siloed, separate information about their competencies from education, training, and employment are documented, organized, or shared.



The education and career marketplace is complex and opaque



- Over 738,000 education and training credentials are offered in the U.S., millions globally: including qualifications, degrees, certificates, badges, micro-credentials, licenses, certifications, apprenticeships, diplomas, and more.
- Digital credentials issued to learners/workers generally do not currently use transparent, interoperable data to describe competencies, skills, and achievements.
- Educators, policymakers, employers, and learners/workers struggle to understand credentials' value.

Credentials can be more transparent and valuable if they use public, open, interoperable data to describe the many different characteristics of all types of credentials and qualifications, including competencies, learning outcomes, pathways, occupational alignments, transfer value, employment outcomes, quality assurance, and other information.

Characteristics of improved credentialing ecosystems

- Learning-based and learner-centered
- All learning matters wherever it's obtained
- All credentials are based on learning outcomes/competencies
- Credentials are portable, transferrable, and easily understood by learners, educators, and employers
- Learners can make informed choices about the value of different credentials and their investment in pursuing these credentials
- Technology and common data structures enable transparency and interoperability among all credentials, worldwide
- Dynamic credentialing ecosystems have the agility to build competitive, highly-skilled workforces in rapidly changing labor markets
- Credentialing pathways increase access and equity for all learners





Today, we can make credentials and competencies more transparent, relevant, and valuable

What if...

- Education and training organizations made their credentials and competencies transparent so everyone could see what they're really made of—and understand the value of what's inside?
- Employers had data to help them match candidates' credentials and competencies to job requirements?
- Government agencies could access credential and competency data in a common data structure that connects people and potential?
- Learners and workers could easily communicate what they know and can do, giving them clear and equitable pathways to career success?

We can achieve this together.





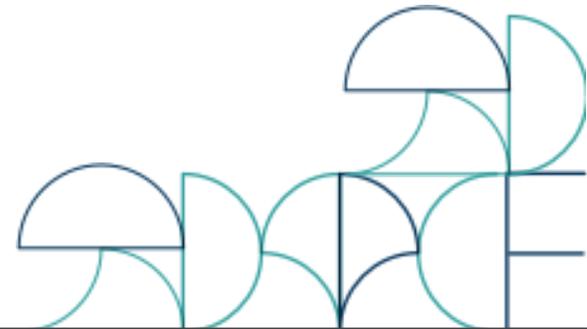
Who:

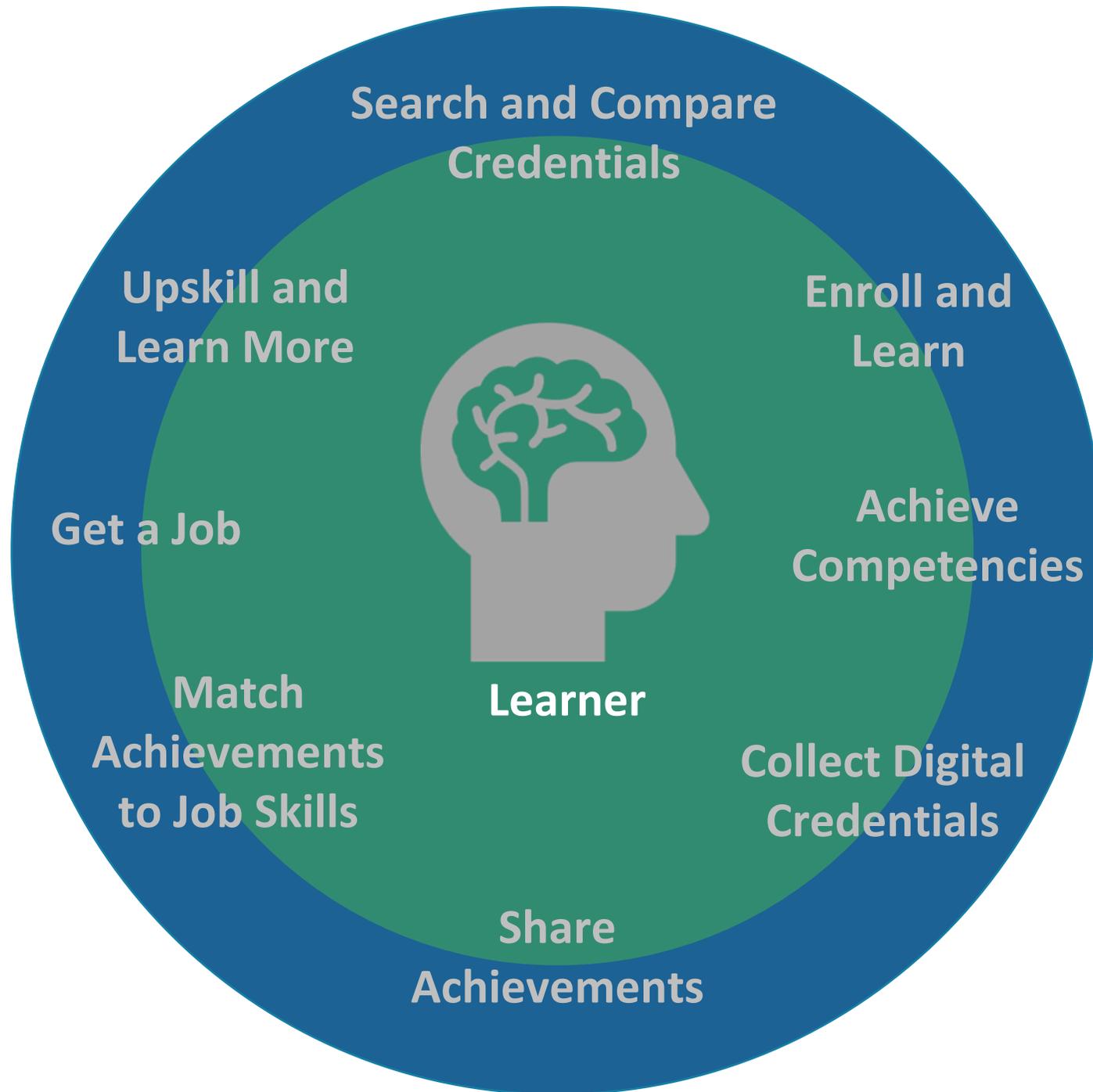
Building Ecosystems with Credential and
Competency Transparency





Empowering learners, workers, credentialing organizations, quality assurance entities, and employers and with valuable, transparent credential and competency data







How can credentialing organizations use credential and competency data?

- Search for and discover potential students
- Receive relevant enrollment application information
- Offer students transfer value for advanced standing based on their digital credentials
- Help students complete education and training programs more efficiently
- Communicate education and career pathways





How can quality assurance entities use credential and competency data?

- Define quality criteria requirements
- Receive relevant information from credentialing organizations in standard formats
- Organize quality evaluation data across different types of credentials and credentialing organizations
- Help learners understand the connections among different types of education and training programs
- Communicate the value of education and training programs
- Promote quality factors for equitable access and outcomes





How can employers use credential and competency data?

- Search for and discover potential employees
- Receive relevant job application information
- Analyze employees' current skills and skills gaps
- Offer employees advanced opportunities based on their digital credentials
- Help employees upskill and re-skill efficiently
- Communicate career pathways





Building Partnerships





About Credential Engine

- **Who We Are**

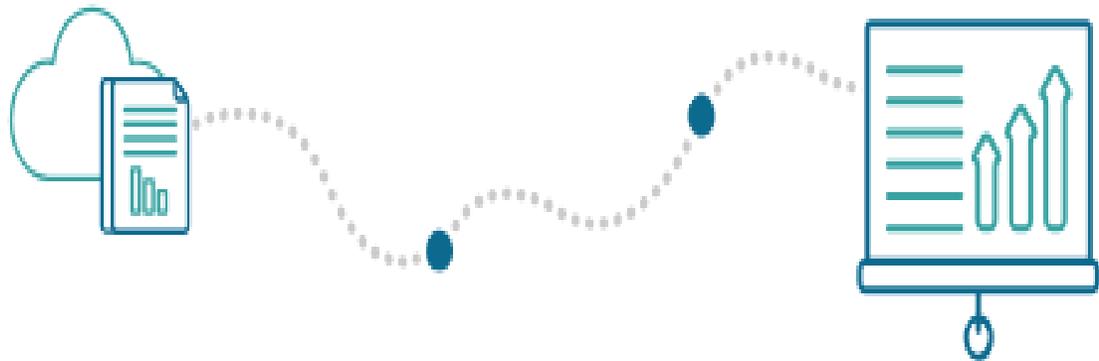
- Non-profit
- Community built
- Vendor agnostic
- Data Driven
- Mission oriented around credential, competency, and pathways transparency

- **What We Do**

- Advocate for credential transparency
- Develop and support linked open data schemas
- Provide open, interoperable infrastructure
- Build and mobilize partnerships

- **What We Do NOT Do**

- Collect or verify personally identifiable information
- Issue credentials
- Verify issued credentials





Credential Engine's Mission

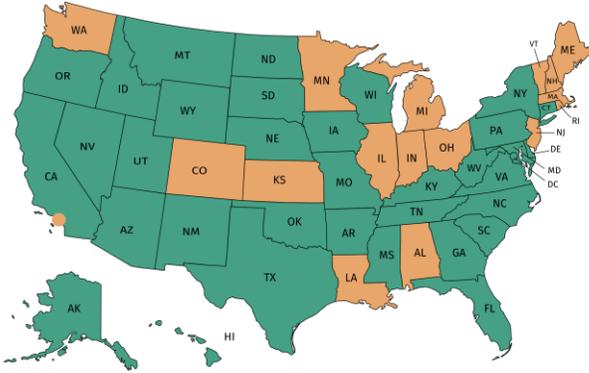
- To bring transparency to credentials—their content, competencies, pathways, and outcomes.
- To reveal the marketplace of credentials.
- To increase credential literacy.
- To help everyone make more informed decisions about credentials and their value.





Credential Engine's diverse partnerships

U.S. States



Quality Assurance Organizations



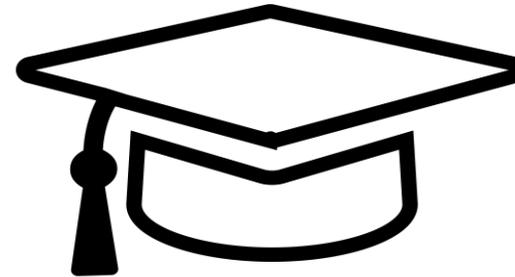
Employers



Government Organizations



Higher Education



Military

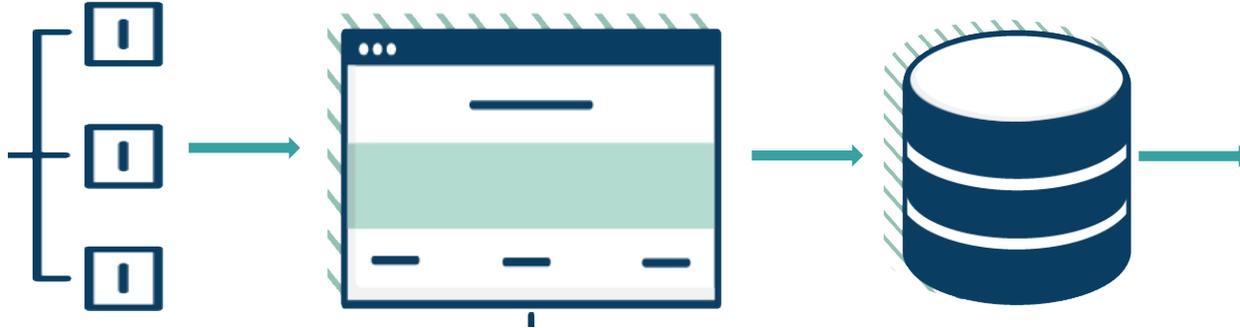


Industry Sectors





Transparency through technology



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Common descriptors allow for better apples-to-apples comparison between credentials.

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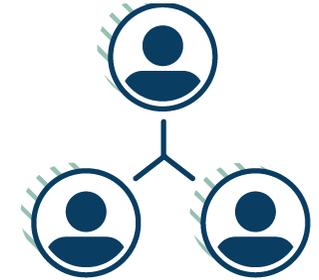
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The public can use the Finder to see all information published to the Credential Registry.



Community – A wide range of stakeholders provide and receive technical assistance and other services to both publish to the Registry and consume the data it houses

Credentialing bodies, developers, and other users have access to resources such as do-it-yourself guides, best practices, and technical support.



Certificate in Pharmacy Technician

Ivy Tech Community College of Indiana
Certificate

Basic Info

Connect to this Credential

About this Credential

A program that prepares individuals, under the supervision of pharmacists, to prepare medications, provide medications and related assistance to patients, and manage pharmacy clinical and business operations. Includes instruction in medical and pharmaceutical terminology, principles of pharmacology and pharmaceuticals, drug identification, pharmacy laboratory procedures, prescription interpretation, patient communication and education, safety procedures, record-keeping, measurement and testing techniques, pharmacy business operations, prescription preparation, logistics and dispensing operations, and applicable standards and regulations.



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Estimated: 8 months
Completed in two semesters (21 credit hours)

Credential Status Type

Active

Credential Type

Certificate

Learning Delivery Type

In-Person Online Only

Audience Levels

Secondary School or Equivalent

Subjects

Anatomy Anatomy and Physiology Health Care Medical Terminology Pharmacokinetics
Pharmacology for Health Care Support Pharmacy Pharmacy Technician Pharmacy Technician Experiential Seminar Physiology
Prescription Safety

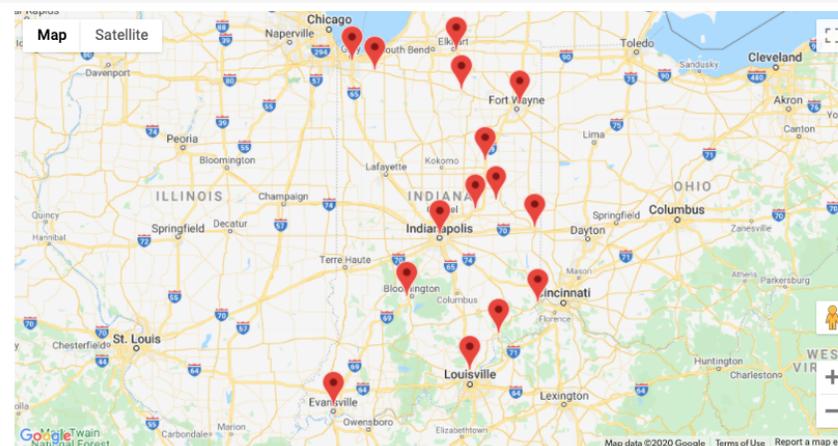
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Industries

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- 1440 E. 35th Av. , Gary, Indiana 46131, United States
- 50 West Fall Creek Parkway, North Drive, Indianapolis, Indiana 46208-5752, United States
- 50 Walnut Street, Lawrenceburg, Indiana 47025-1836, United States
- 590 Ivy Tech Drive, Madison, Indiana 47250, United States
- 261 S. Commerce Drive, Marion, Indiana 46953, United States
- 4301 South Cowan Road, Muncie, Indiana 47302, United States
- 2257 Chester Blvd, Richmond, Indiana 47374, United States

More Info

Competencies

90 Teaches 90 Competencies

Connections

1 Preparation For 1 Credential

1 Has 1 Common Condition

Quality Assurance

1 Quality Assurance

3 Owner's Quality Assurance

Requirements and Recommendations

1 Requires 1 Learning Opportunity

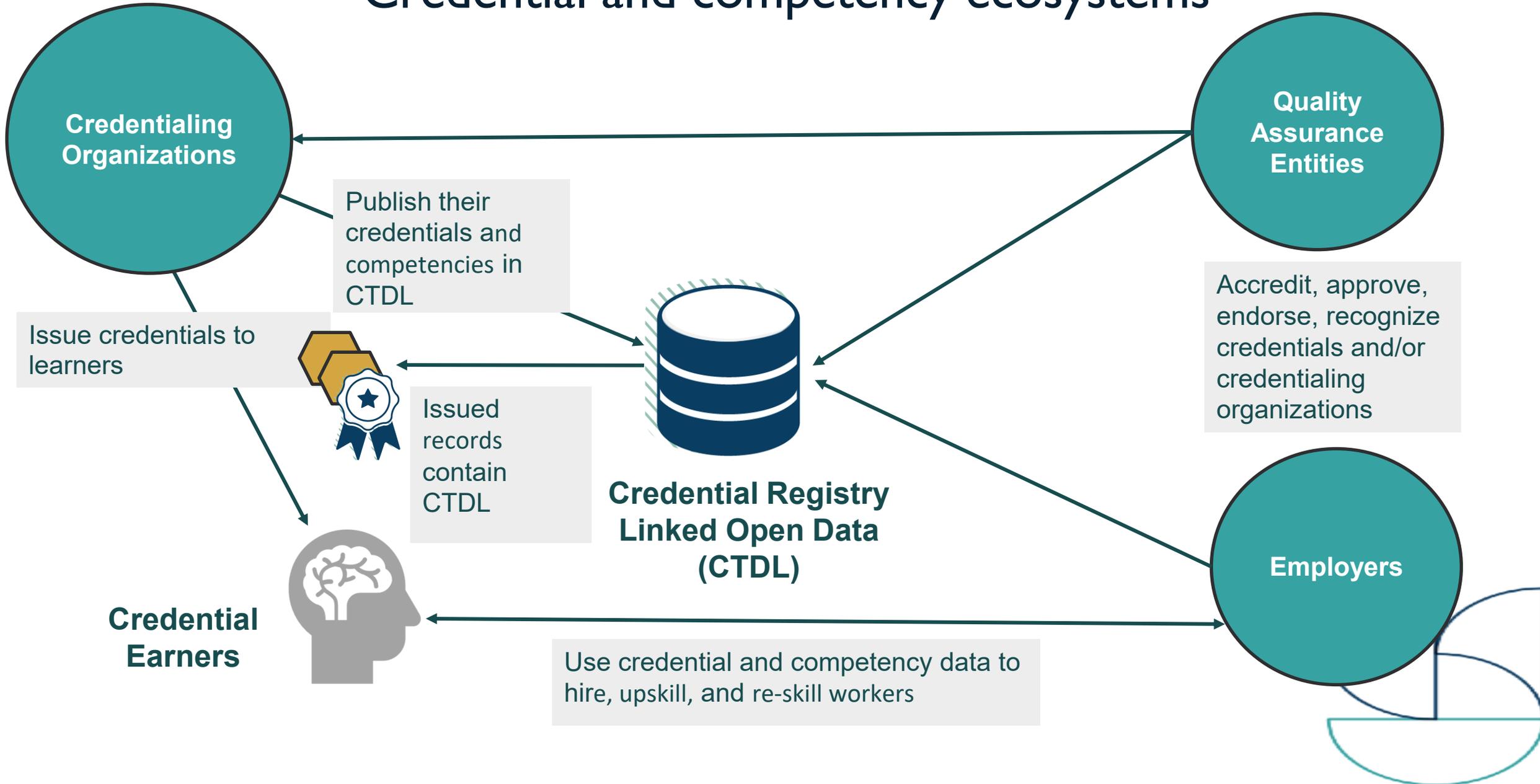
Estimated Costs

2 Costs

1 Learning Opportunity Cost



Credential and competency ecosystems





American Council on Education's Connecting Credentials and Competencies white papers

- 2 white papers:
 - ***Quality Dimensions for Connected Credentials***
 - ***Communicating the Value of Competencies***
- Analysis of evolving uses of credentials and competencies
- How employers value and assess competencies
- How credentialing organizations can improve their credentials and clearly articulate competencies
- Quality dimensions that support connected credentials

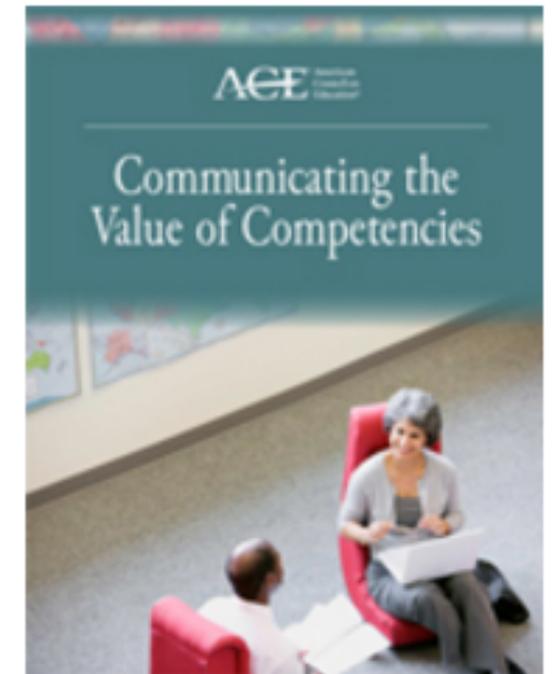


Communicating the Value of Competencies

Co-authored by Deborah Everhart (Georgetown University), Deb Bushway (Formerly U.S. Department of Education), and David Schejbal (University of Wisconsin- Extension).

This paper provides context for understanding the value of competencies among higher education institutions, students, and employers, as well as structure for improving communication of this value. It is intended to help higher education decision-makers consider how they currently articulate competencies throughout their programs, in the definition of credentials, curricular structures, and students' own evidence of learning. This paper includes definitions of key terms, problems stakeholders currently encounter, and challenge questions to stimulate discussion and visualize potential futures that address these problems.

<https://www.acenet.edu/Documents/Communicating-the-Value-of-Competencies.pdf>

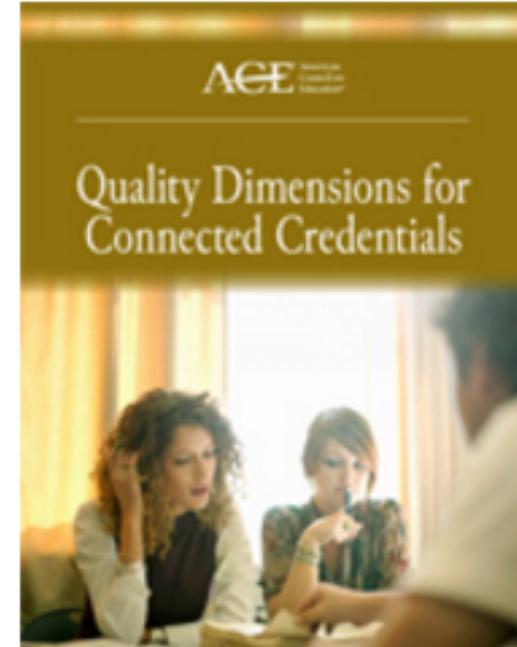


Communicating the Value of Competencies (PDF) 1 MB

Quality Dimensions for Connected Credentials

Co-authored by Deborah Everhart (Georgetown University), Evelyn Ganzglass (Corporation for a Skilled Workforce), Carla Casilli (OpenWorks Group), Daniel Hickey (Indiana University), and Brandon Muramatsu (Massachusetts Institute of Technology).

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Quality Dimensions for
Connected Credentials
(PDF) 1 MB





Quality dimensions for connected credentials and competencies

- Transparency
- Modularity
- Portability
- Relevance
- Validity
- Equity





Stakeholders and Key Initiatives for a Connected Learn-and-Work Ecosystem

1 Credential Transparency

- Credential Engine
- Credential Registry
- Open-platform schemas and languages

2 Alignment and Alliances

- State/regional projects
- Military (Dept of Defense, Navy)
- Public/private ROI
- Credentials of value
- Aligning bachelor's degrees and industry-recognized certifications
- T-Profile builder

3 Drive and Connect Systems

- Credential Engine: Credential Registry Learn and Build Summit Series (apps)
- T3 Innovation Network (10 pilot projects)
- Workcred: Data-sharing among organizations awarding non-degree credentials
- Non-Degree Credential Research Network
- Understanding the landscape of industry certifications

4 Understanding Credentials of Value

- State identification of credentials of value
- Public-private education/credentialing data infrastructure
- Credential Registry use in Eligible Training Provider List and other eligibility determinations
- Incremental higher education credentialing system framework
- SocialTech's unmucl.com

5 Employers/Workforce

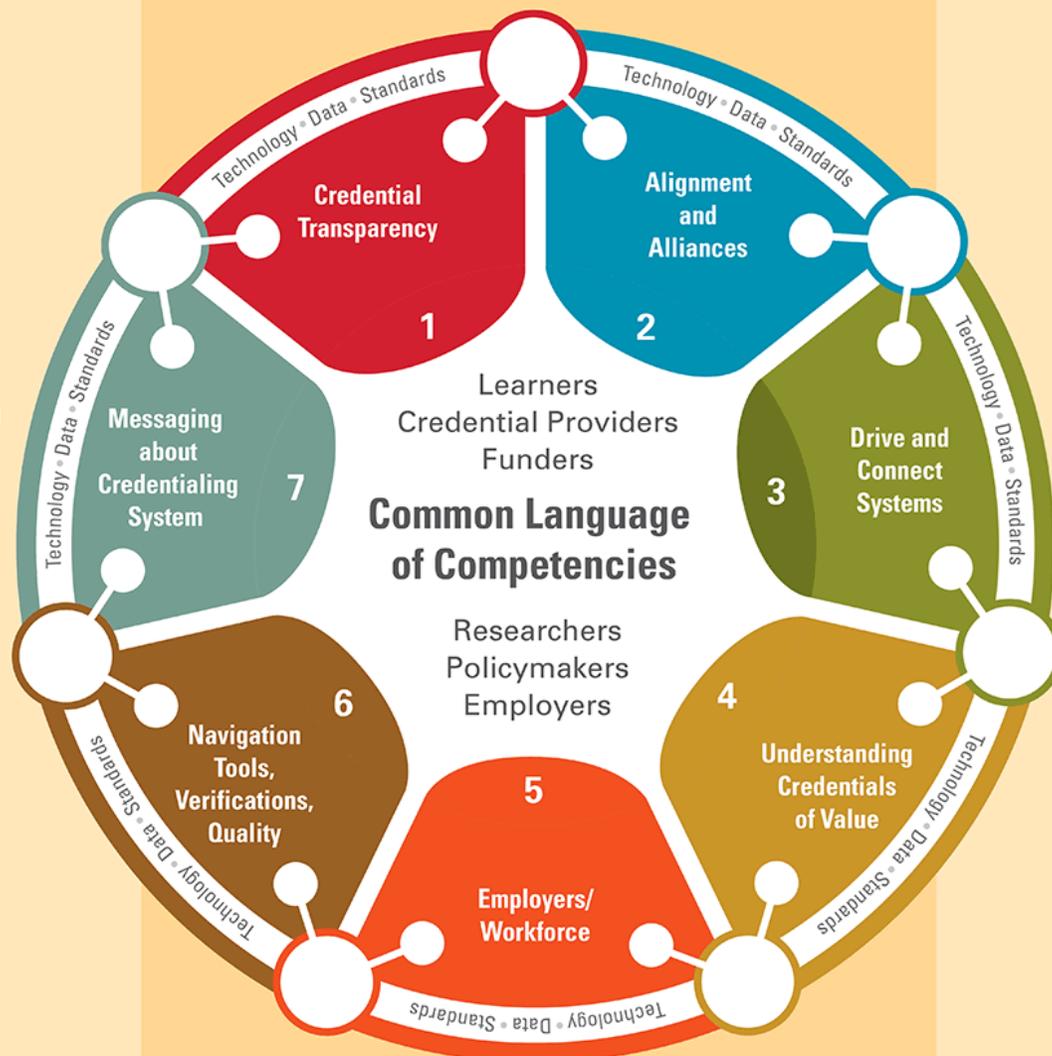
- Jobs Data Exchange
- Talent Pipeline Management Initiative
- Competency/skills/competency calibrator
- Hiring for competencies/skills
- Workforce Partnership Initiative

6 Navigation Tools, Verification Quality

- Digital learner records
- The Quality Assurance Commons
- Google Education and Pathways Search

7 Messaging about Credentialing System

- Gallup surveys
- Media messaging
- Research: number of credentials





We're all in.



<https://www.youtube.com/watch?v=zkgm8nrQxW8>





Credential Engine

TO LEARN MORE VISIT

www.CREDENTIALENGINE.org



Challenge Questions

- How does transparency about competencies help learners/workers understand and document their own career pathways?
- How do credentials and the competencies they include address market and economic trends?
- How can learners/workers communicate effectively with employers about their own competencies, how they represent valid, relevant achievements, and how they are useful?
- Do educational programs include authentic assessment of competencies?
- Can graduates actually demonstrate the competencies represented by the credentials?
- What are the relationships among credentials that enable credential earners to move vertically and horizontally within and across credentialing ecosystems for educational and career progression?
- What needs to be done to enable learners who stop and start in their education to use the modular units or competencies earned to continue along pathways to other credentials?
- Is information about credentials' underlying competencies, quality assurance processes, and market value machine-readable and publicly available on the web for all stakeholders to access?



For more information

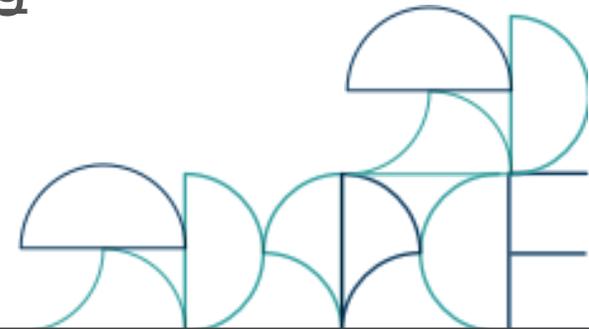
Dr. Deborah Everhart, Chief Strategy Officer deverhart@credentialengine.org

General Information: credentialengine.org

Technical Information: credreg.net

Digital Credential Guide: credregnet/quickstart/iwlrguide

Credential and Competency Finder: <http://credentialfinder.org>

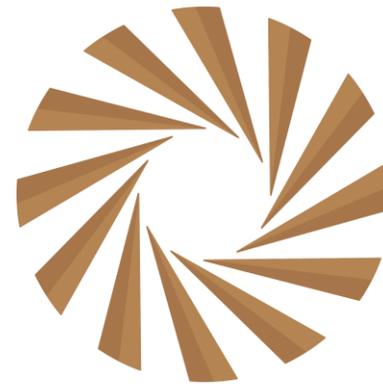


Follow @credengine on social media

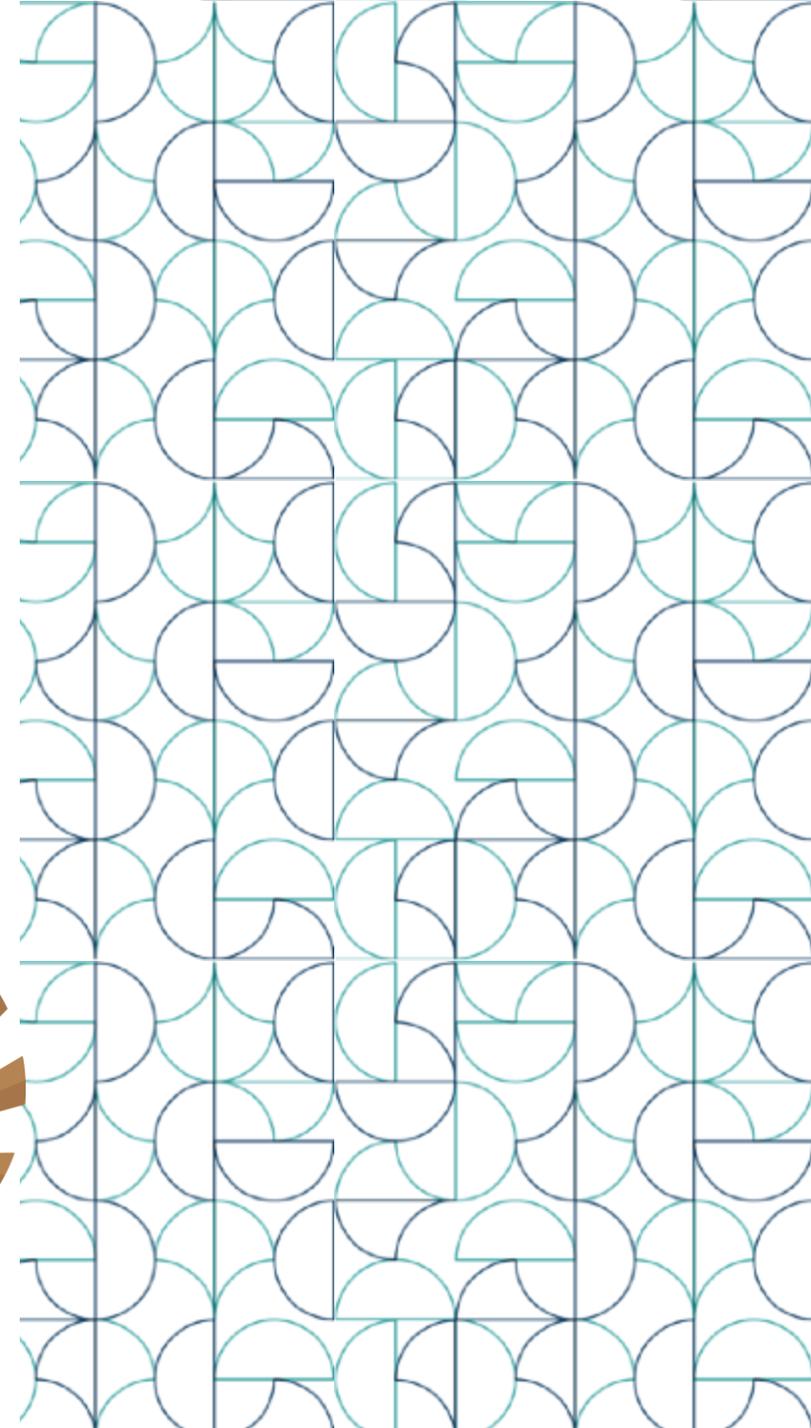


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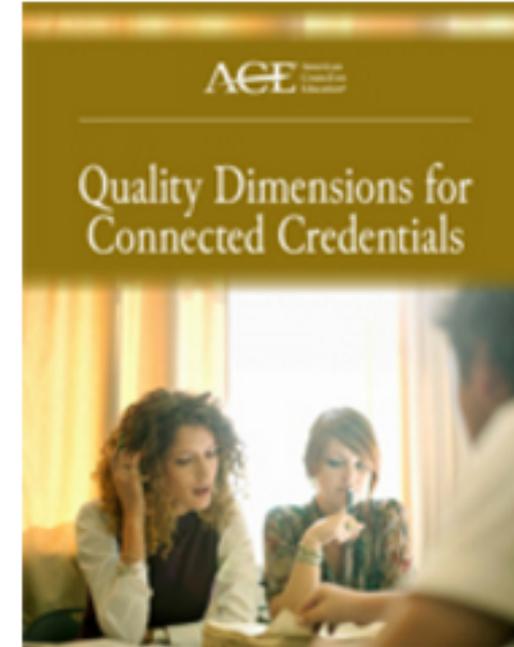
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Ecosystems Based on Credential and
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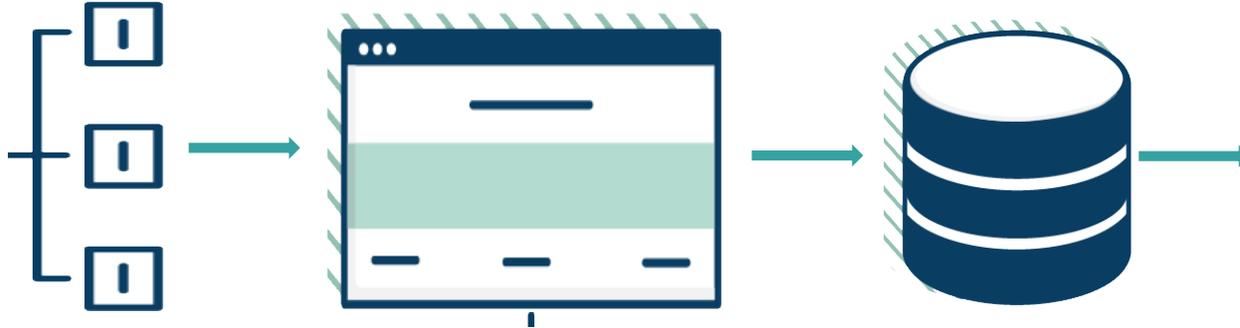
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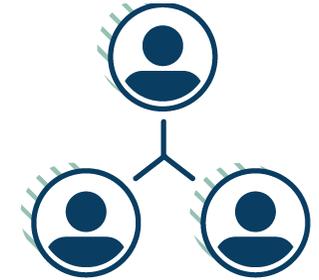
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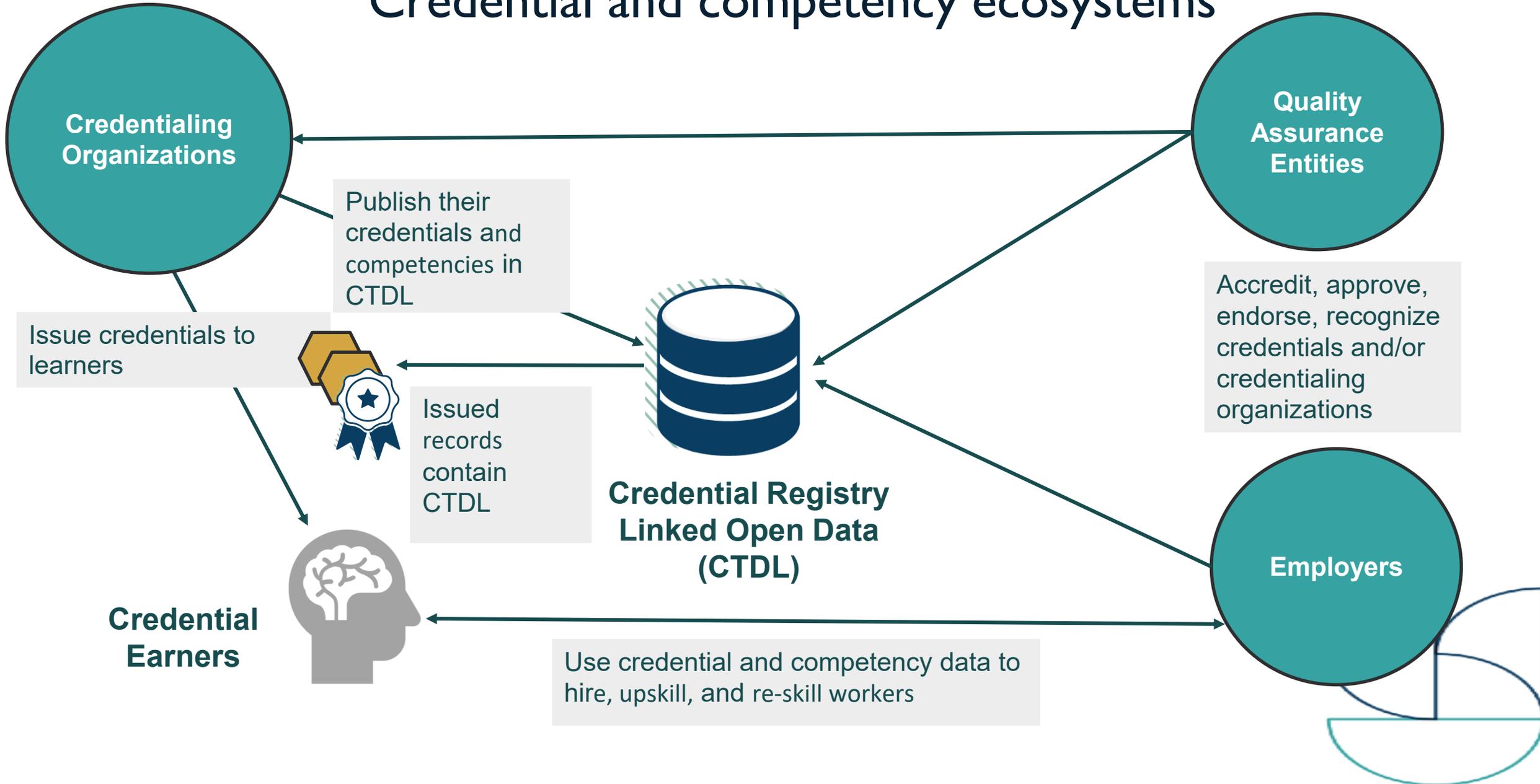
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Credential and competency ecosystems





Linked open data on the web

Searching for Jobs vs. Credentials

Google

Jobs
Near Washington, DC

Registered nurse Past 3 days Full-time Travel nurse Clinical nurse Nurse Emergency

REGISTERED NURSE / RN
General Healthcare Resources
Washington, DC
via CareerBuilder
6 days ago \$ 43-55 an hour

Med/Surg RN
General Healthcare Resources
Washington, DC
via ZipRecruiter
2 days ago

Specialty Registered Nurse
Quadrant, Inc.
Washington, DC
via ZipRecruiter
6 days ago Full-time

→ 100+ more jobs

Google

All Images Shopping Maps News More Settings Tools

About 201,000,000 results (0.70 seconds)

Purdue University Global | Online IT Degrees
[Ad go.purdueglobal.edu/InfoTech](https://go.purdueglobal.edu/InfoTech)
Own Your Education. Explore Purdue Global's IT Programs Today. Apply! Classes Start 6/6.

IT Programs | South College® Online
[Ad apply.south.edu/IT/Programs](https://apply.south.edu/IT/Programs)
Accredited Online Education. Fill Out a Form to Get Started. Military Friendly. Hands-On Career Training. Night & Flexible Classes. Get Started Today! Services: Career Advisors, Modern Technology, Career Fairs.
Current & Former Military · Military Grant · Financial Aid · First Responder Grant

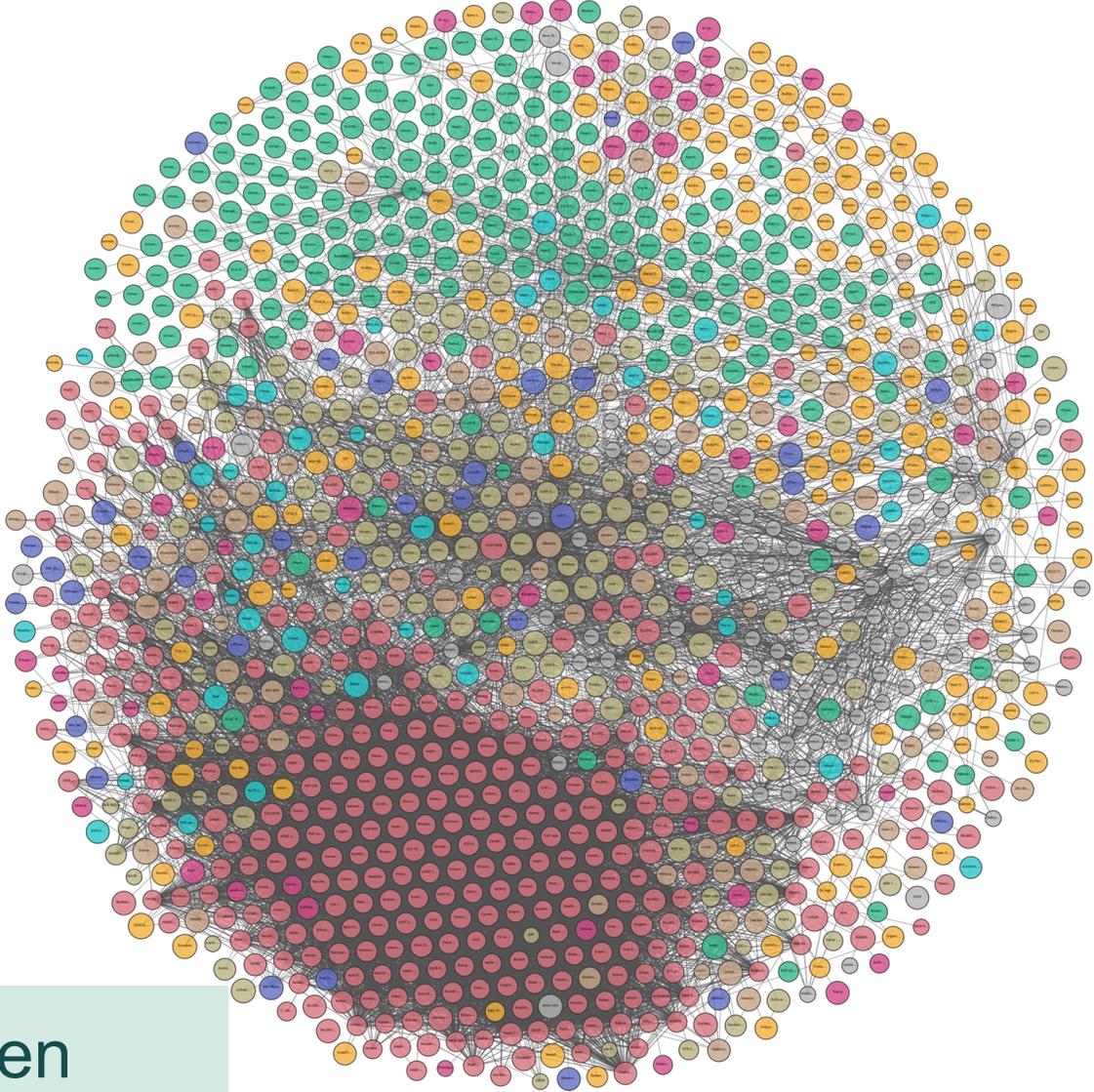
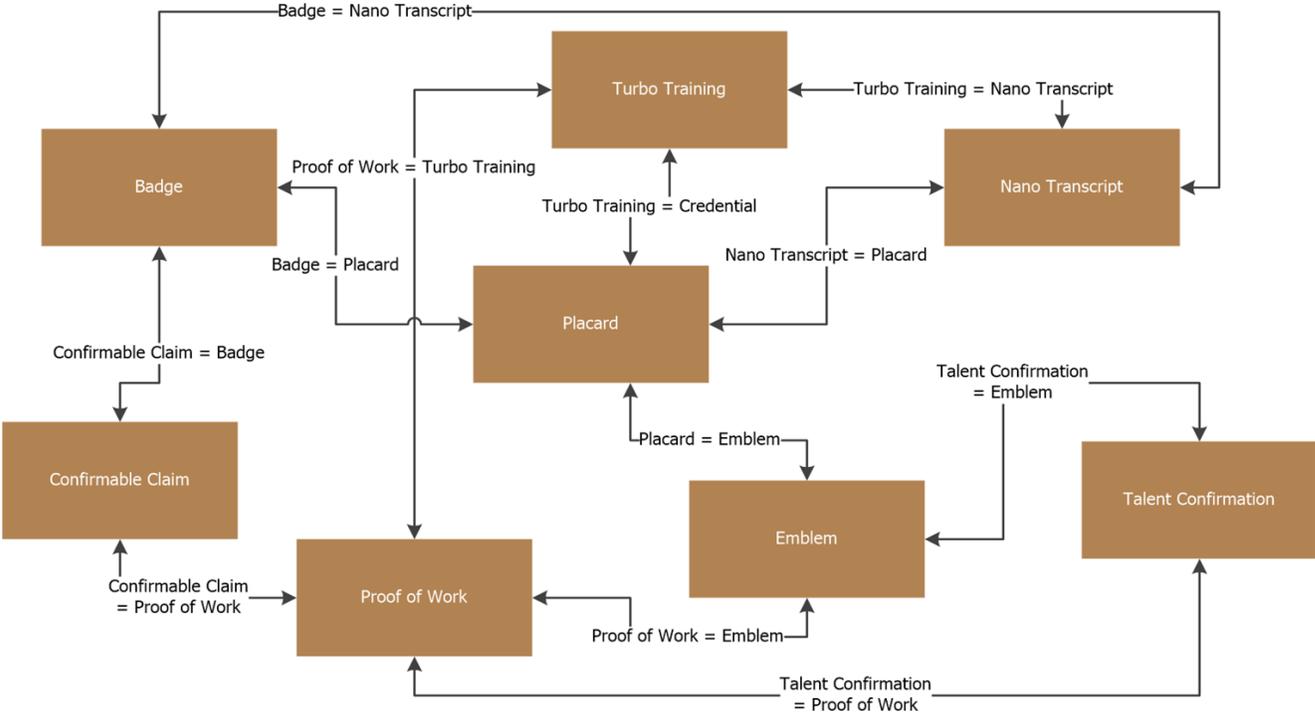
DC Adult Training Programs Provide Career Certification, Job ...
<https://osse.dc.gov/.../dc-adult-training-programs-provide-career-certification-job-plac...>
Sep 28, 2012 - WASHINGTON, DC – District of Columbia adult learners were awarded graduate certificates, trade certifications and immediate job placement ...

IT certification programs Washington DC, Microsoft Cisco CompTIA ...
<https://www.learn4good.com/.../washington-dc-computer-certification-programs.htm>
IT certification programs in Washington DC area: Computer training classes. ... Cisco CCNA & CompTIA A+ / Network+ certifications. ... Citiwide Computer Training Center in Washington DC is a nonprofit corporation dedicated to helping underprivileged people acquire the skills they need to ...

Computer Training & Certification Courses | Washington, D.C. ...
<https://www.dcnewhorizons.com/training-certifications>
New Horizons Washington, D.C. is a premier training provider. And, with award-winning instructors and a no-cancellation policy, we are able to utilize the best ...

Paid Training Jobs, Employment in Washington, DC | Indeed.com
<https://www.indeed.com/q-Paid-Training-l-Washington,-DC-jobs.html>
5957 Paid Training jobs available in Washington, DC on Indeed.com. ... Education - Graduate of an

Credentials can connect to a world of structured, Linked Open Data



System integrations

Linked Open Data on the Web



How:

Public Linked Open Data Supporting Credential
and Competency Transparency



Certificate in Pharmacy Technician

Ivy Tech Community College of Indiana
Certificate

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Connect to this Credential

About this Credential

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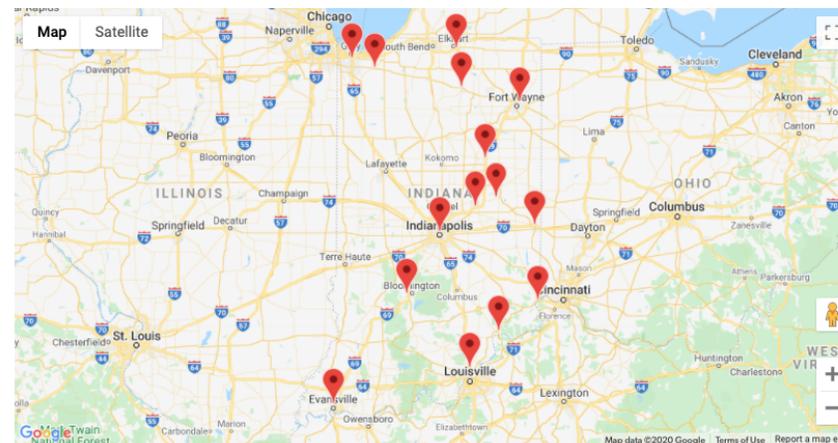
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More Info

Competencies

90 Teaches 90 Competencies

Connections

- 1 Preparation For 1 Credential
- 1 Has 1 Common Condition

Quality Assurance

- 1 Quality Assurance
- 3 Owner's Quality Assurance

Requirements and Recommendations

- 1 Requires 1 Learning Opportunity

Estimated Costs

- 2 Costs
- 1 Learning Opportunity Cost



Linked Open Data in the Credential Transparency Description Language (CTDL)

Registry Information

CTID: ce-99b0bd81-df21-4b2f-a746-af18c817a4b0

Envelope: [333c33af-beec-4da2-a4c0-ae2def9bfbe9](#)

Resource: [View in Registry](#)

Raw Metadata

```
{
  "@context": "https://credreg.net/ctdl/schema/context/json",
  "@id": "https://credentialengineregistry.org/graph/ce-99b0bd81-df21-4b2f-a746-af18c817a4b0",
  "@graph": [
    {
      "@id": "https://credentialengineregistry.org/resources/ce-99b0bd81-df21-4b2f-a746-af18c817a4b0",
      "@type": "ceterms:Certificate",
      "ceterms:ctid": "ce-99b0bd81-df21-4b2f-a746-af18c817a4b0",
      "ceterms:name": {
        "en-US": "Certificate in Pharmacy Technician"
      },
      "ceterms:image": "https://www.nextleveljobs.org/static/media/logo-horz.dd32d358.png",
      "ceterms:naics": [
        "62",
        "6213",
        "622"
      ],
      "ceterms:keyword": {
        "en-US": [
          "Next Level",
          "NextLevel"
        ]
      },
      "ceterms:ownedBy": [
        "https://credentialengineregistry.org/resources/ce-1abb6c52-0f8c-4b17-9f89-7e9807673106"
      ],
      "ceterms:subject": [

```





CTDL examples

<p><u>CREDENTIAL</u></p> <ul style="list-style-type: none">• Type• Description• Competencies• Owned/Offered By• External Quality Assurance• Renewal/Revocation• Connected Credentials• Jurisdiction	<p><u>ORGANIZATION</u></p> <ul style="list-style-type: none">• Name / Parent Organization• Type• Description• External Quality Assurance	<p><u>COST</u></p> <ul style="list-style-type: none">• Price• Cost Types• Payment Information• Residency
<p><u>ASSESSMENT</u></p> <ul style="list-style-type: none">• Name• Competencies• Assessment Type• Delivery Type• Requirements, Duration, and Location	<p><u>LEARNING OPPORTUNITY (PROGRAMS AND COURSES)</u></p> <ul style="list-style-type: none">• Types• Competencies• Delivery• Requirements, Duration, and Location	<p><u>AND MORE...</u></p> <ul style="list-style-type: none">• Employment and Earnings• Employer Requirements, Preferences, or Recognition• Career Pathways• Transfer Value• Credential Holder Profiles• Military-specific descriptors

Credential Transparency Description Language (CTDL) Terms

Over 500 Linked Open Data terms providing rich descriptions of credentials and

C ceterms:Certification	
URI:	https://purl.org/ctdl/terms/Certification
Shorthand URI:	ceterms:Certification
Label:	<i>en-US</i> : Certification
Definition:	<i>en-US</i> : Time-limited, revocable, renewable credential awarded by an authoritative body for demonstrating the knowledge, skills, and abilities to perform specific tasks or an occupation.
Comment:	<i>en-US</i> : Certifications can typically be revoked if not renewed, for a violation of a code of ethics (if applicable) or proven incompetence after due process. Description of revocation criteria for a specific Certification should be defined using Revocation Profile.
Type of Term:	rdfs:Class
Status:	vs:stable
Subclass Of:	ceterms:Credential ceterms:Credential
	ceterms:accreditedBy ceterms:isRequiredFor ceterms:accreditedBy ceterms:administrative ceterms:advancedSt ceterms:alternateNa ceterms:appealProc ceterms:approvedBy ceterms:approvedIn ceterms:assessment ceterms:audienceLe

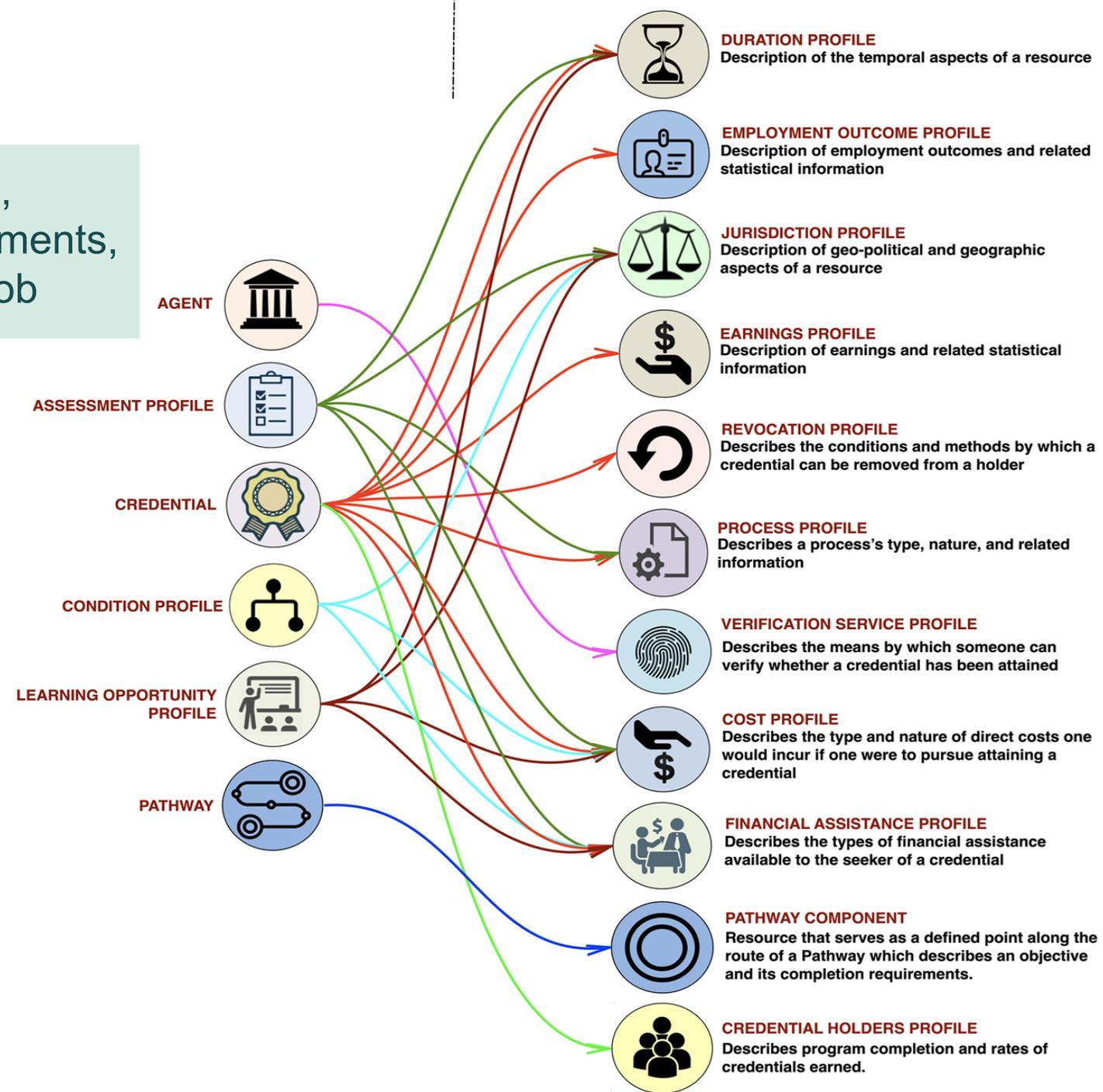
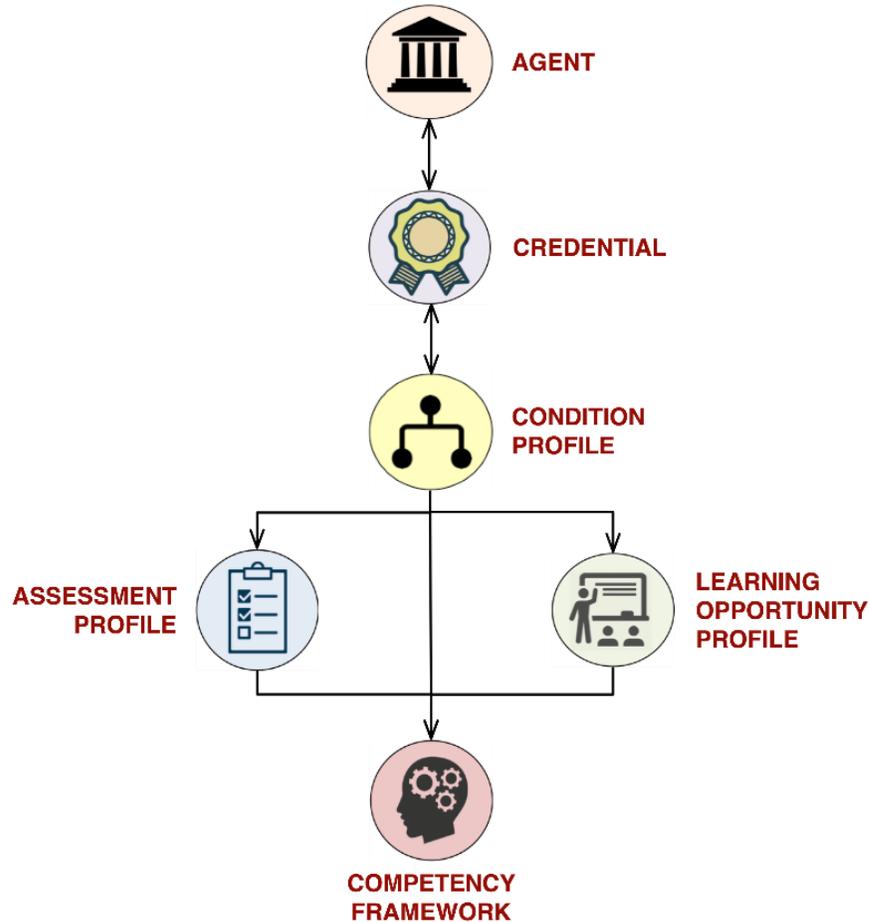
Certification:

Time-limited, revocable, renewable credential awarded by an authoritative body for demonstrating the knowledge, skills, and abilities to perform specific tasks or an occupation.

CTDL Linked Open Data

structure

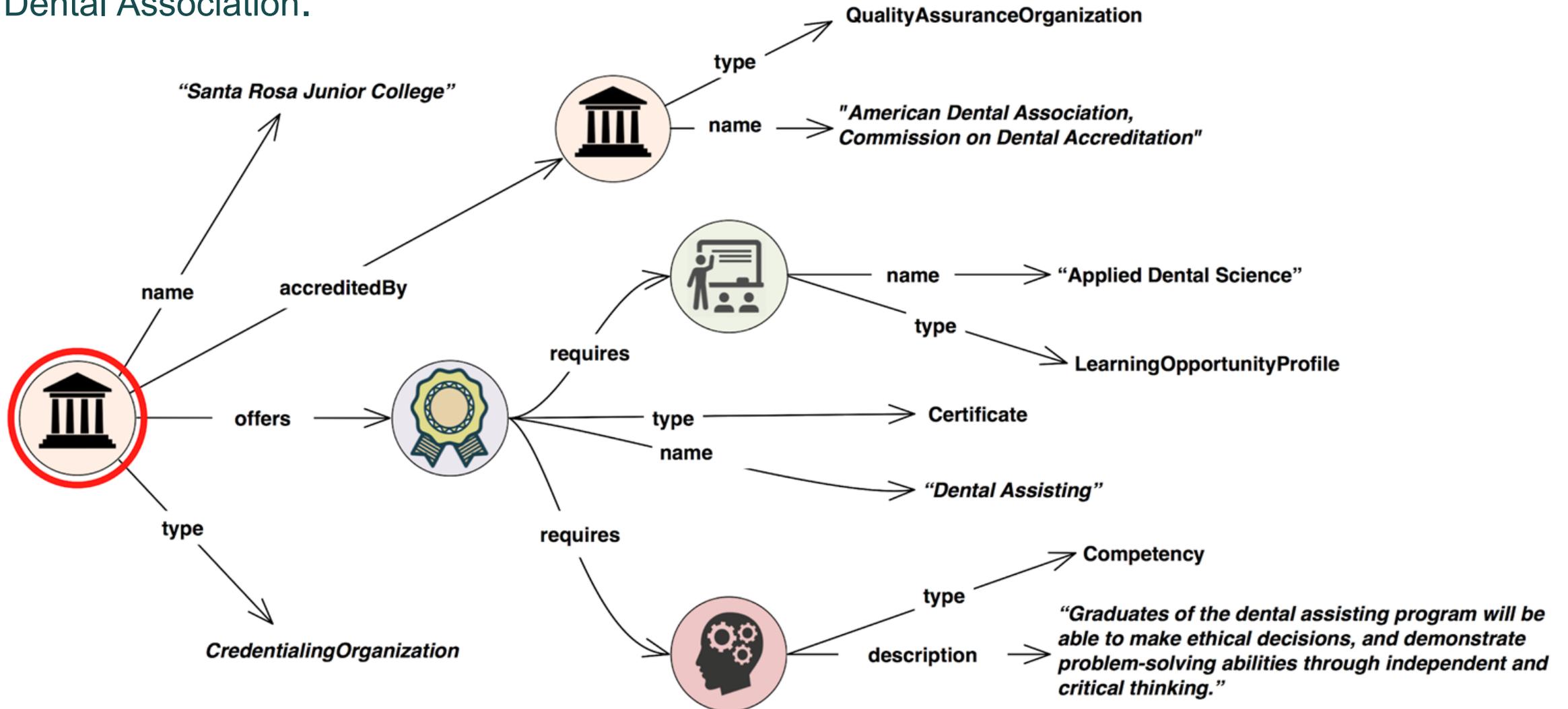
linking between credentialing organizations, credentials, competencies, courses, assessments, pathways, quality assurance, occupations, job skills....





CTDL Linked Open Data example

Santa Rosa college offers a Certificate in Dental Assisting that requires completion of their Applied Dental Science program and requires specific competencies and is accredited by the American Dental Association.

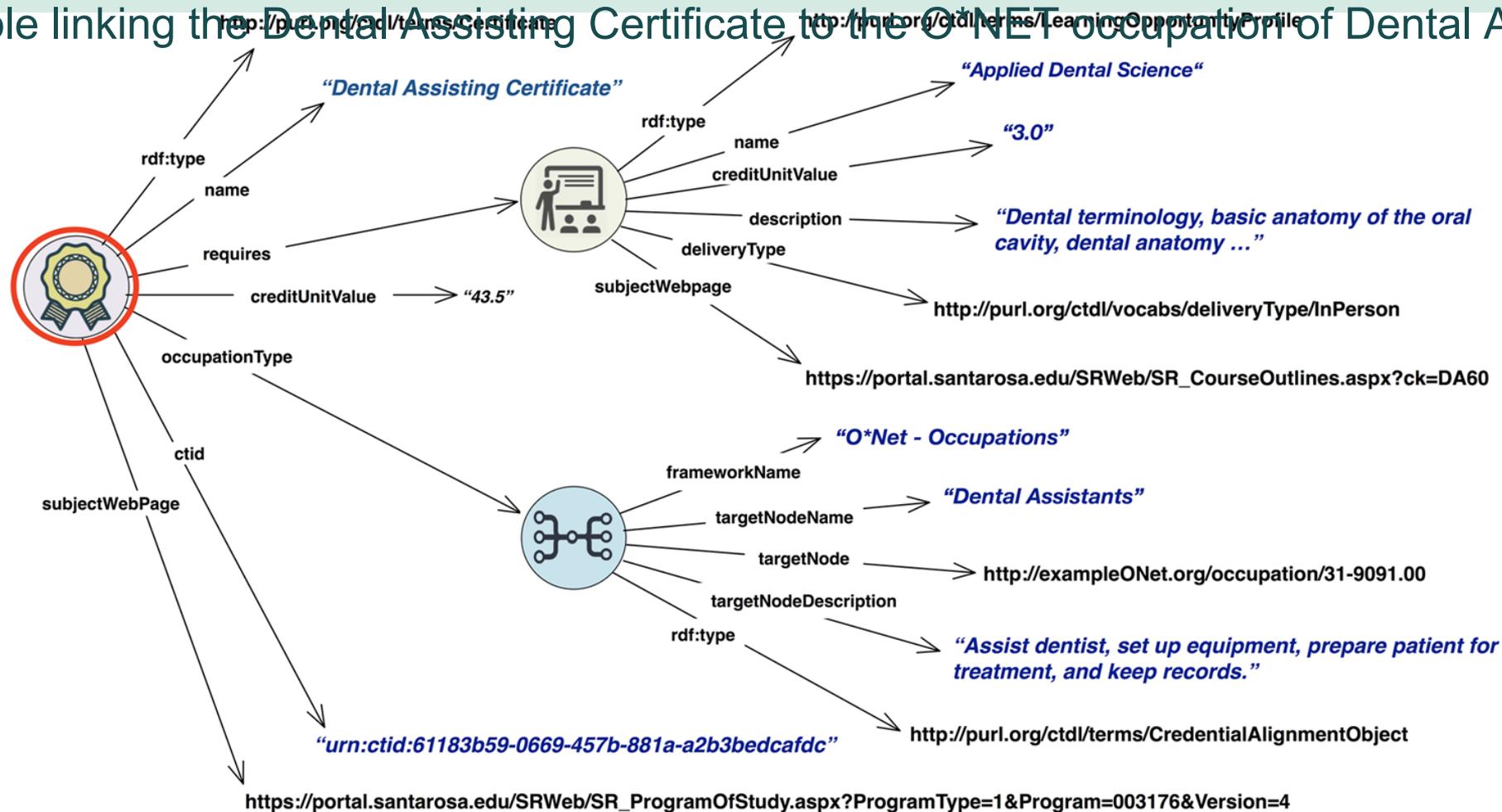




CTDL Linked Open Data globally unique identifiers

Each component has a unique identifier that can be linked to/from anywhere on the web, including across different data providers: identifiers for credentialing organizations, quality assurance organizations, credentials, competency frameworks, competencies, occupational frameworks, job skills....

For example linking the Dental Assisting Certificate to the O*NET occupation of Dental Assistants





What are digital credentials?

- Various names: Badges, Micro-credentials, Learning and Employment Records (LERs), Comprehensive Learner Records (CLRs)
 - Digital records of learning
 - Representing learning achievements from education and training, workplace, military, and community
 - Verifiable and secure
 - Interoperable: transferable and machine-actionable across education and employment systems and processes
 - Collected and curated by the learner/worker
 - Shareable by the learner/worker





What makes credentials valuable in ecosystems?

Credentials are only as valuable as the information they communicate

However, today....

- Traditional credentials often include little information
- Traditional credentials are generally siloed and can only be read/interpreted in a specific system
- Combining credentials from diverse sources is generally impossible, confusing, or cumbersome





Digital credentials can include valuable, structured data

Credentials become valuable when they communicate clear, actionable, relevant information

It's now possible for....

- Digital credentials to include rich Linked Open Data
- Data to be structured based on publicly accessible standards
- Digital credentials from diverse sources to be meaningfully compared, curated, and combined





CTDL Linked Open Data in digital credentials

Digital credentials become valuable when they communicate clear, actionable, relevant information

With CTDL in digital credentials.....

- The records link to rich Linked Open Data
- The data is humanly readable and machine-actionable across different types of systems and on the web
- Digital credentials from diverse sources can be meaningfully compared, curated, and combined
- And most importantly... learners, workers, educators, and employers are all empowered with the context they need to make informed decisions about education and career pathways



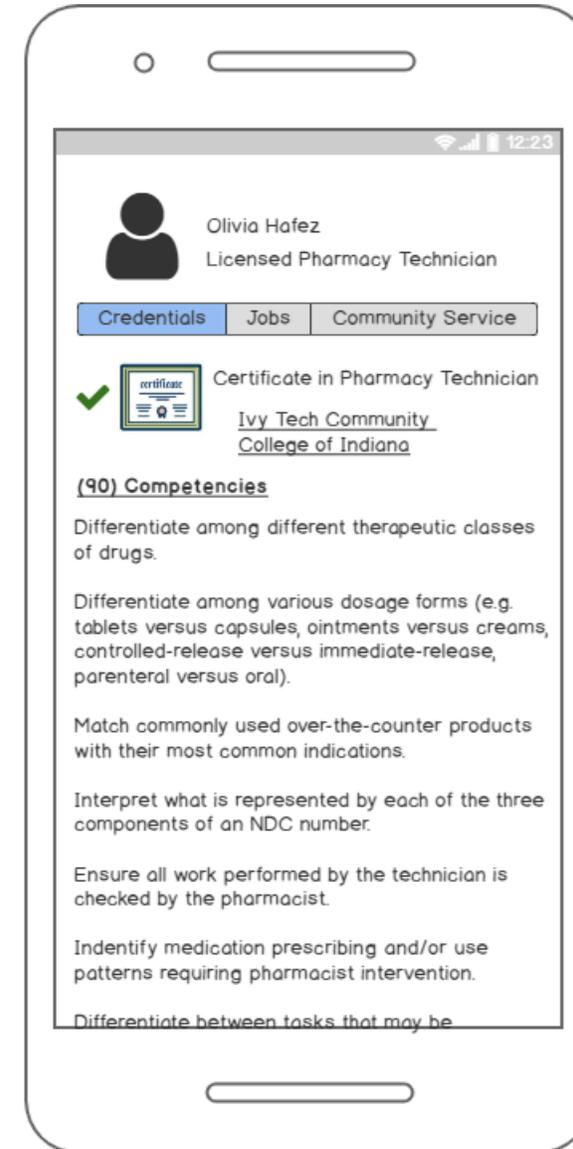
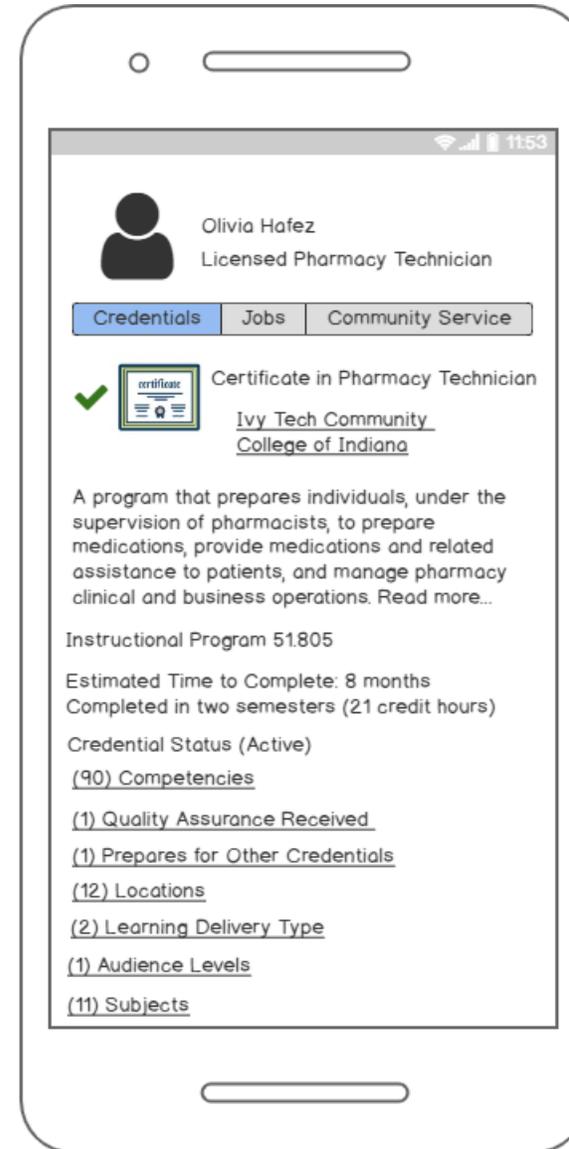
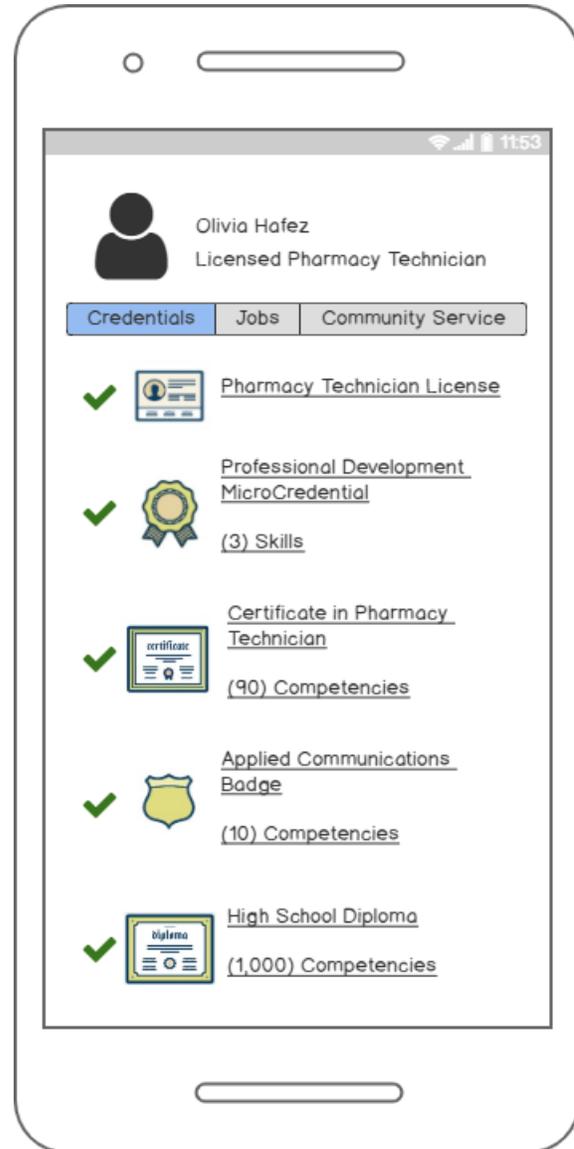


How do digital credentials work?

Education, training, employer, military, and community organizations issue digital records of learning achievements to individuals.

Individuals collect credentials in a “wallet,” “backpack,” “portfolio,” or “collection” that they control.

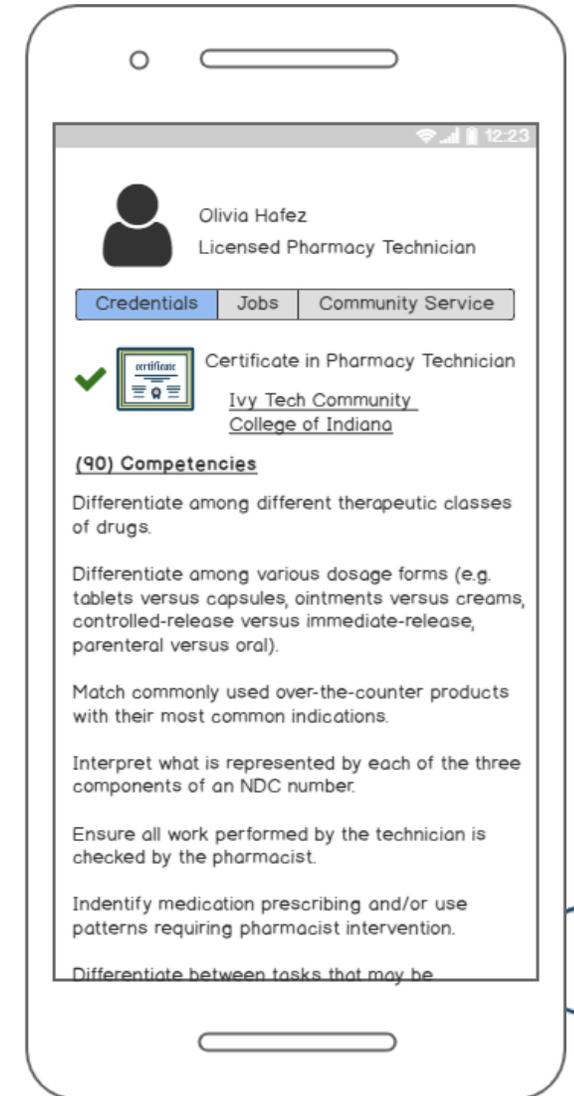
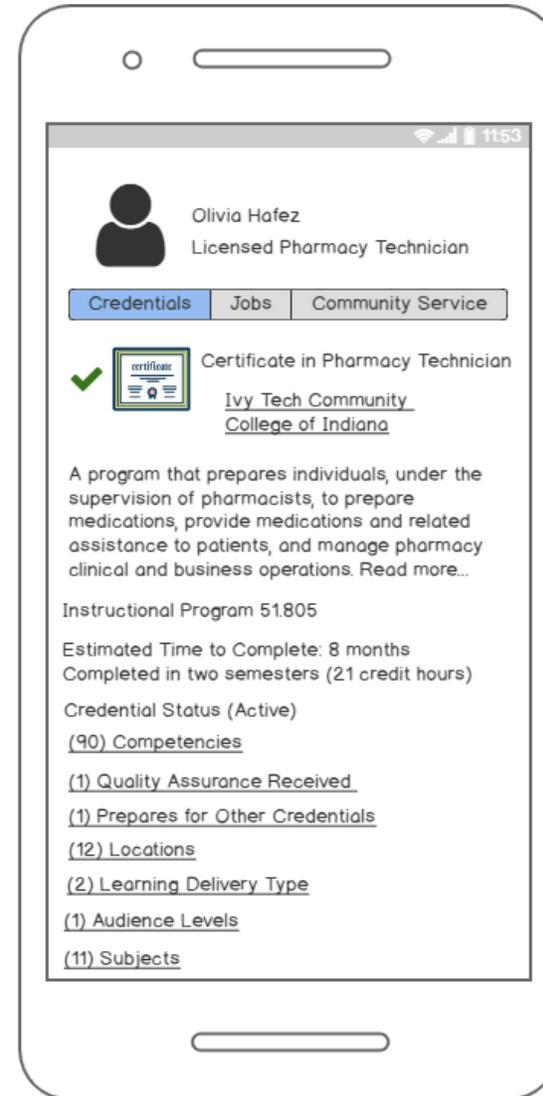
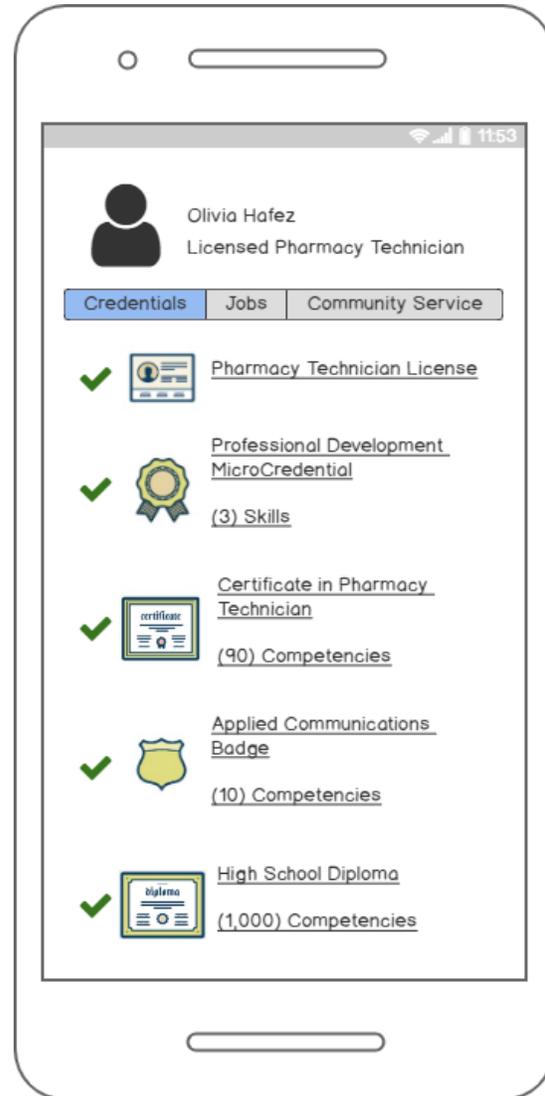
The individual curates sets of records to share on the web and in applications for education and employment.



How does CTDL add value to digital credentials?

Digital credentials can link to CTDL data that has been published to the Credential Registry. These links use globally unique identifiers on the open web to power the record with rich descriptions of the credentials and competencies earned by the individual.

This allows for records from multiple learners to reference the same credentials and competencies, which not only reduces data duplication and maintenance, but enables powerful search queries and data analytics.





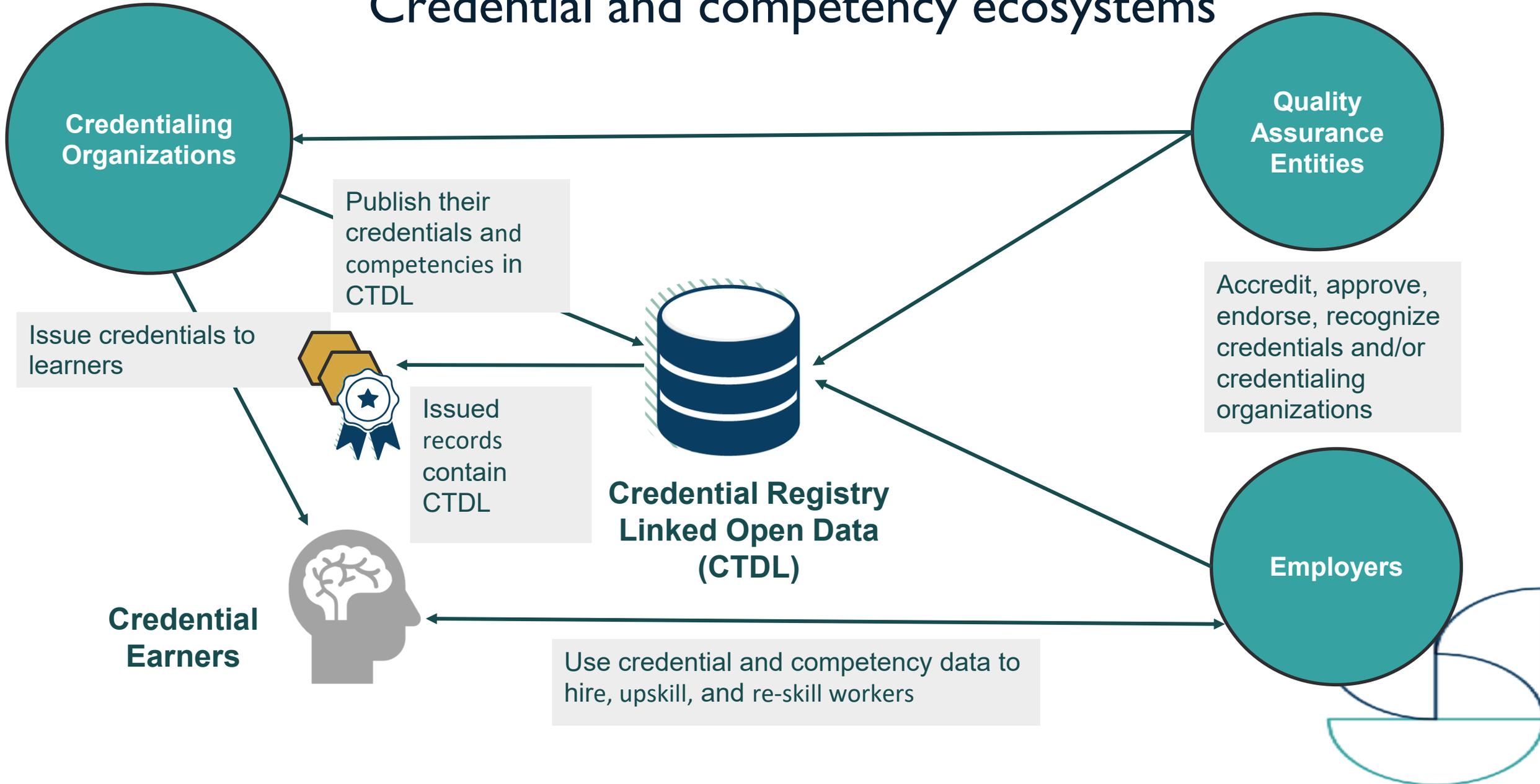
How to

1. Define requirements for the types of information that make your credentials valuable.
2. Organize data about credentials, competencies, occupational alignments, etc. from one or more sources.
3. Map existing credential and competency data to CTDL.
4. Publish credential and competency data as CTDL to the Registry and on the web.
5. Include CTDL in digital credentials issued to individuals.
6. Use CTIDs to link to rich credential and competency information from within digital credentials.





Credential and competency ecosystems





Call to Action

Learn about credential transparency

Advocate for credential transparency as a public good

Participate in digital credentialing ecosystems

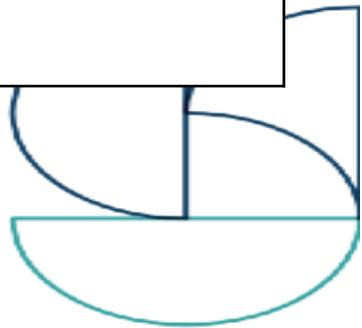
Build a culture of credential transparency





Call to Action

Learn	<ul style="list-style-type: none">• Read <u>Credential Engine resources</u>• Subscribe to <u>Credential Engine news and updates</u>
Advocate	Promote credential data transparency through <u>policy</u> , quality assurance processes, business practices, and within your ecosystems
Partner	Collaborate with Credential Engine and other partners to build solutions that innovate education and workforce ecosystems
Act	<ul style="list-style-type: none">• <u>Publish</u> credential and competency Linked Open Data• Power <u>digital credentials</u> with Linked Open Data





For more information

Dr. Deborah Everhart, Chief Strategy Officer deverhart@credentialengine.org

General Information: credentialengine.org

Technical Information: credreg.net

Digital Credential Guide: credregnet/quickstart/iwlrguide

Credential and Competency Finder: <http://credentialfinder.org>



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