IEEE 1484.2 Learning and Employment Record (LER) standards

SESSION PRESENTER

Greg Nadeau

Public Consulting Group /
Ed 3.0

Access 4 Learning Community & PESC

IEEE (1)

- **The Institute of Electrical and Electronics Engineers (IEEE)** traces its founding to 1884 and the American Institute of Electrical Engineers. It was formed in 1963 from the amalgamation of the American Institute of Electrical Engineers and the Institute of Radio Engineers. As of 2018, it is the world's largest association of technical professionals with more than **423,000 members** in over **160 countries** around the world. Its objectives are the educational and technical advancement of electrical and electronic engineering, telecommunications, computer engineering and similar disciplines.

IEEE (2)

- **The IEEE Standards Association (IEEE SA)** is an operating unit within IEEE that develops global standards in a broad range of industries, including: power and energy, artificial intelligence systems, internet of things, consumer technology and consumer electronics, biomedical and health care, learning technology, information technology and robotics, telecommunication and home automation, automotive, transportation, home automation, nanotechnology, information assurance, and emerging technologies.

IEEE (3)

- **The IEEE SA Learning Technology Standards Council (LTSC) is** an open collaborative to document and publish guides, recommended prved working group with authorization from IEEE SA to work with the LTSC to gather, curate, set in context, and share standard recommended practices for Learner and Employment Records (LER). The following groups are presently active within the LTSC.

IEEE P1484.2 - HISTORY (1)

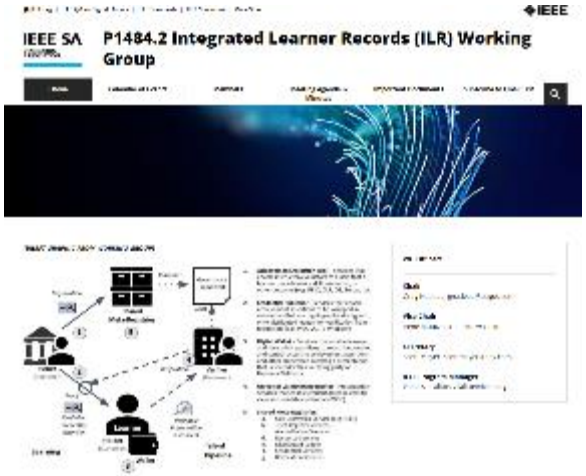
- ILR was created on **May 14, 2020**, when IEEE approved a project approval request (PAR) for P1484.2
- On **Feb 11, 2021**, a motion passed unanimously to approve a draft framework that organizes the ecosystem into five components
- **Mar 2, 2023** the WG approved the draft. The core team worked to get the approved draft into IEEE template with macros and worked with IEEE SA Open to move the annexes into an editable repository.
- **Aug 23, 2023** balloting opened. Sep 22, balloting closed. The draft met the threshold for returns ballots 77% (threshold of 75%) and approval rate of 80% (threshold of 75%) with 171 comments

IEEE P1484.2 - HISTORY (2)

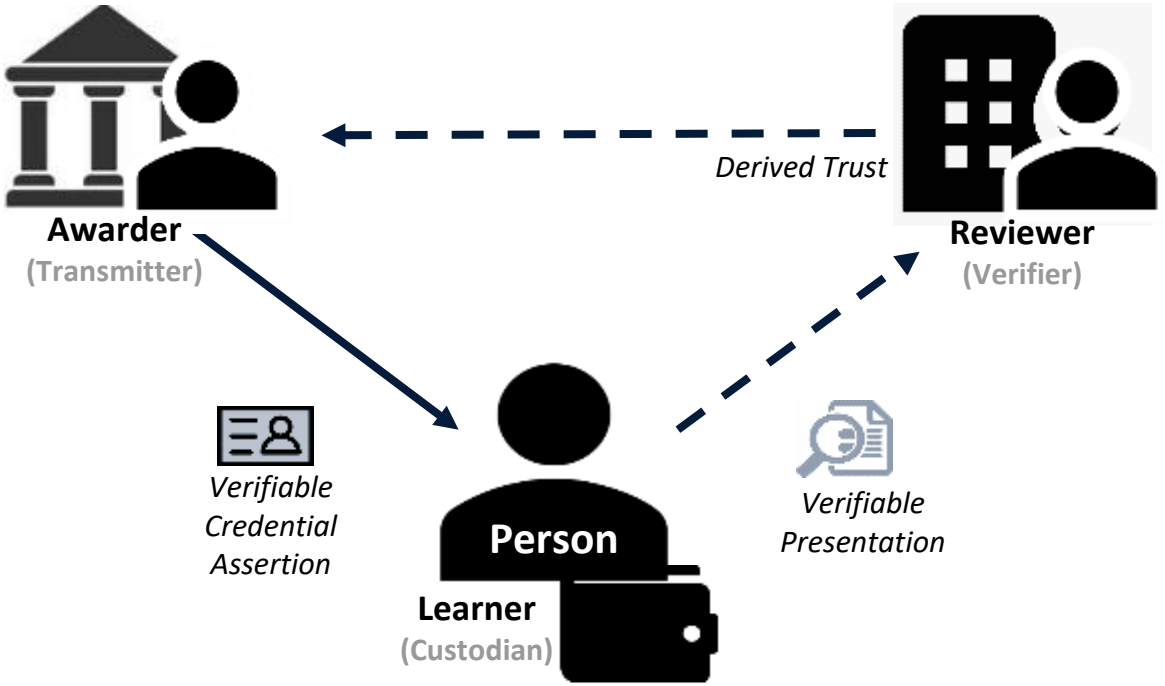
- **Oct 5, 2023** chair appointed a Ballot Resolution Committee (BRC)
  - Phil Long
  - Brenda Braitling
  - Marty Reed
  - Alan Davies
- BNRC downloaded spreadsheet and address each comment
- Made edits with track changes and record actions in the spreadsheet [discussion of comments and edits]

IEEE P1484.2 - NEXT STEPS

- Will now re-circulate draft with cover letter
- Balloters review new draft and can change their votes
- Often 2-3 re-circulations to get the final
- RevCon is looking for responses
- Submit to RevCom by Dec for Jan to make a recommendation to approve
- SASB final approval
- Final publishing editing from IEEE staff
- Published



The LER vision



LER. A Learning and Employment Record is a collection of digital badges and micro-credentials that a L/Earner can collect from multiple awarders and control.

Digital Wallet. A mobile app to curate and control access to the L/Earner's LERs.

Skills-Based Hiring and Advancement? A transformation of human capital management towards merit

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A vision of the near future

- in which people's skills become machine-readable data
- that can be held and controlled from a digital wallet app
- and exchanged like currency
- for learning and employment opportunities
- on the open Internet
- the way goods and services are exchanged today

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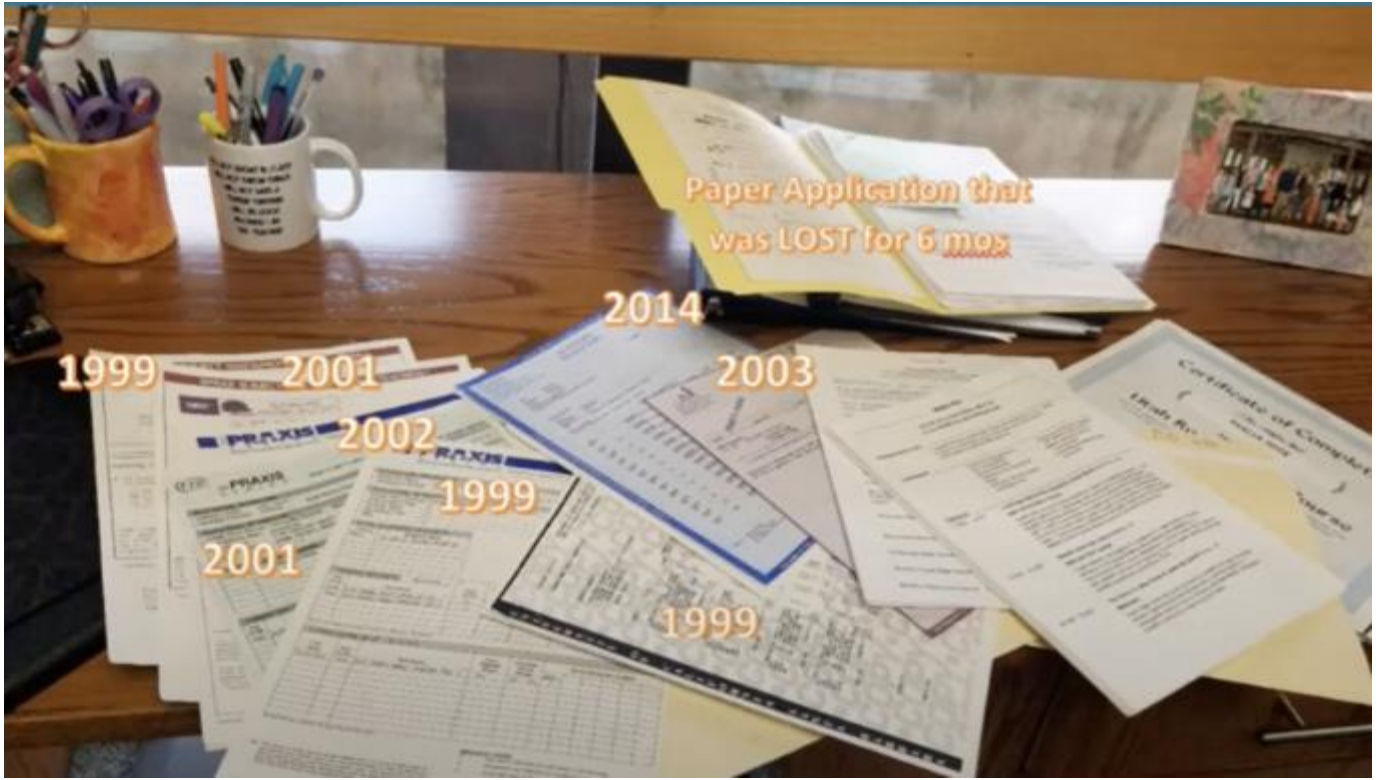
Example Job Type: TEACHER

Current State



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Putting lifelong learning records in a digital wallet

Pre-Service

- Grow Your Own program resources
- ParaPro test prep

Certification

- ParaPro tests
  - Current offering
  - Redesigned ParaPro
  - ParaPro/Core hybrid
- Competency-Based Assessments (e.g., classroom management)

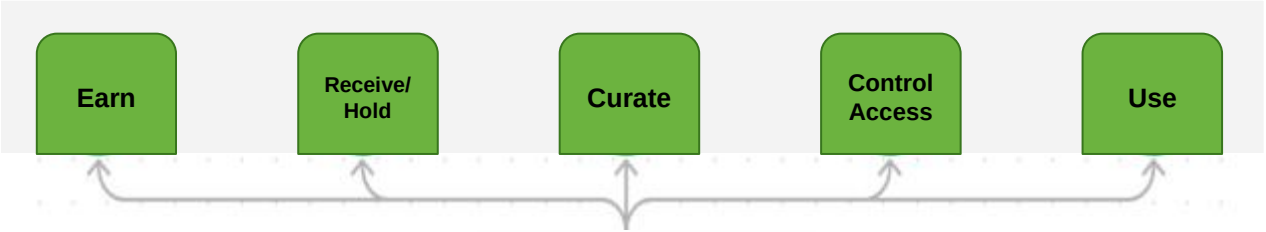
In-Service

- Job placement
- Paraprofessional success
  - Statewide PD
  - Custom district PD
- Apprenticeships

Advancement

- Paraprofessionals-to-teachers personalized career navigation

Enabling exchange of value



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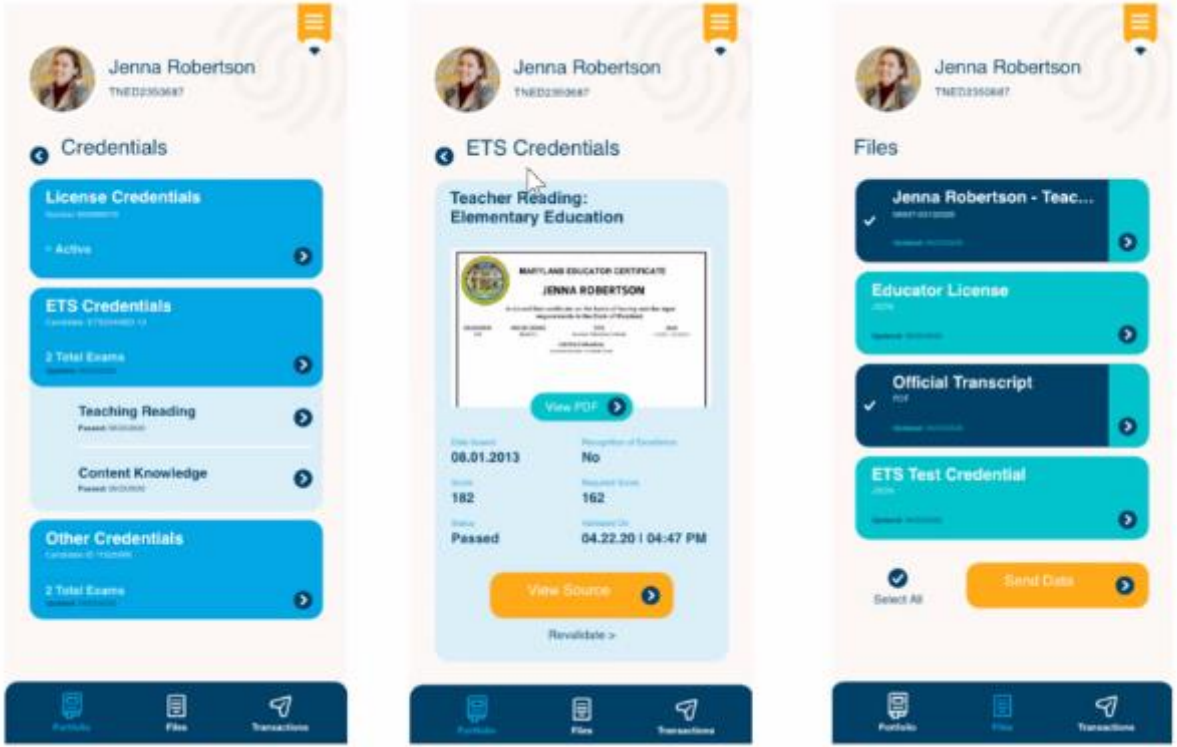
Putting lifelong learning records in a digital wallet



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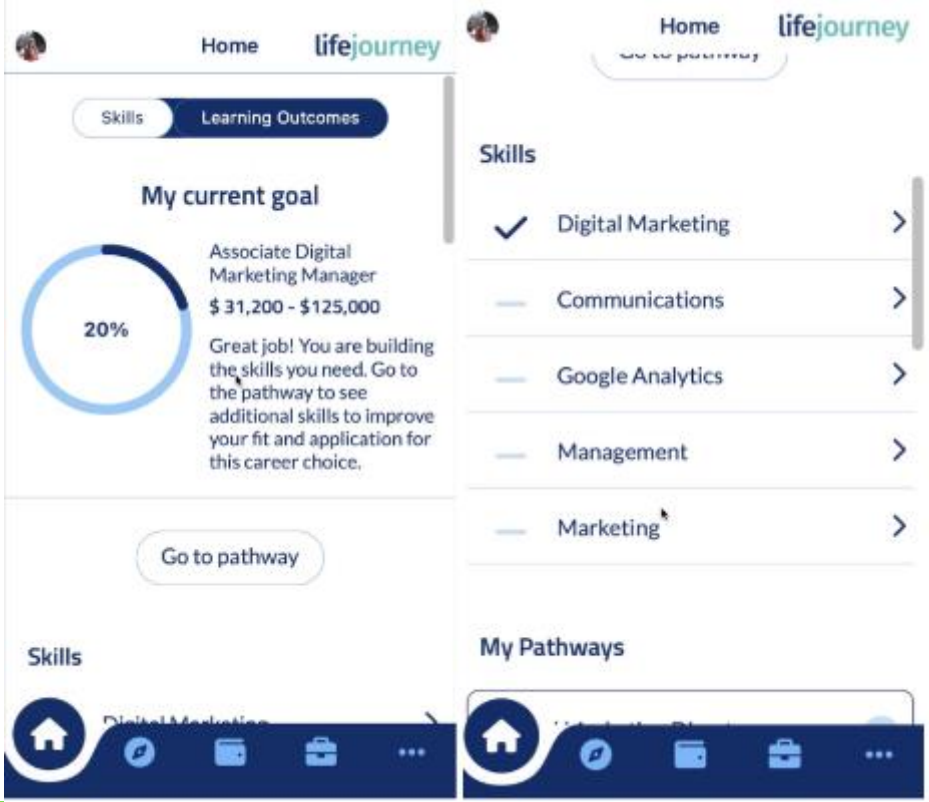
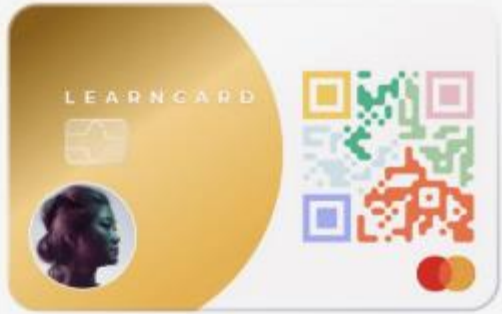
Navigating Career Pathways



Enabling exchange of value

The **LearnCard** allows any education or employment system to issue Verifiable credentials and IDs, using Wordpress style plugins for any layer of the infrastructure, and acts as a public good privacy preserving digital wallet, like MetaMask, for learners and employees that is portable and standards based, allowing it to carry on with them through their lifeline skilling journey.



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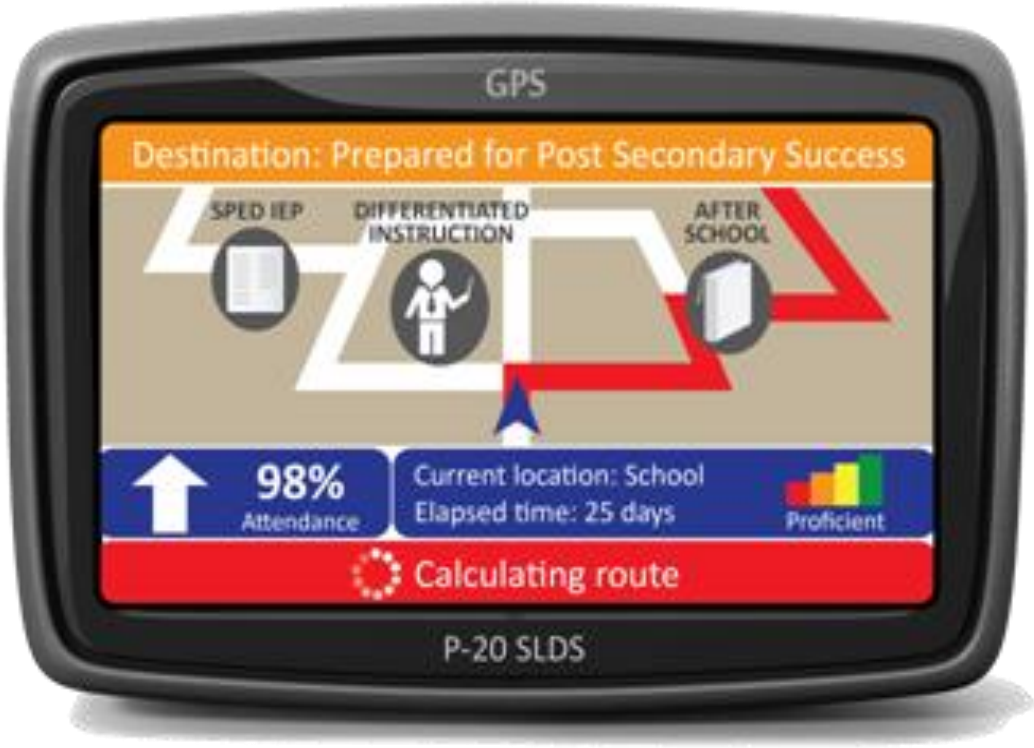
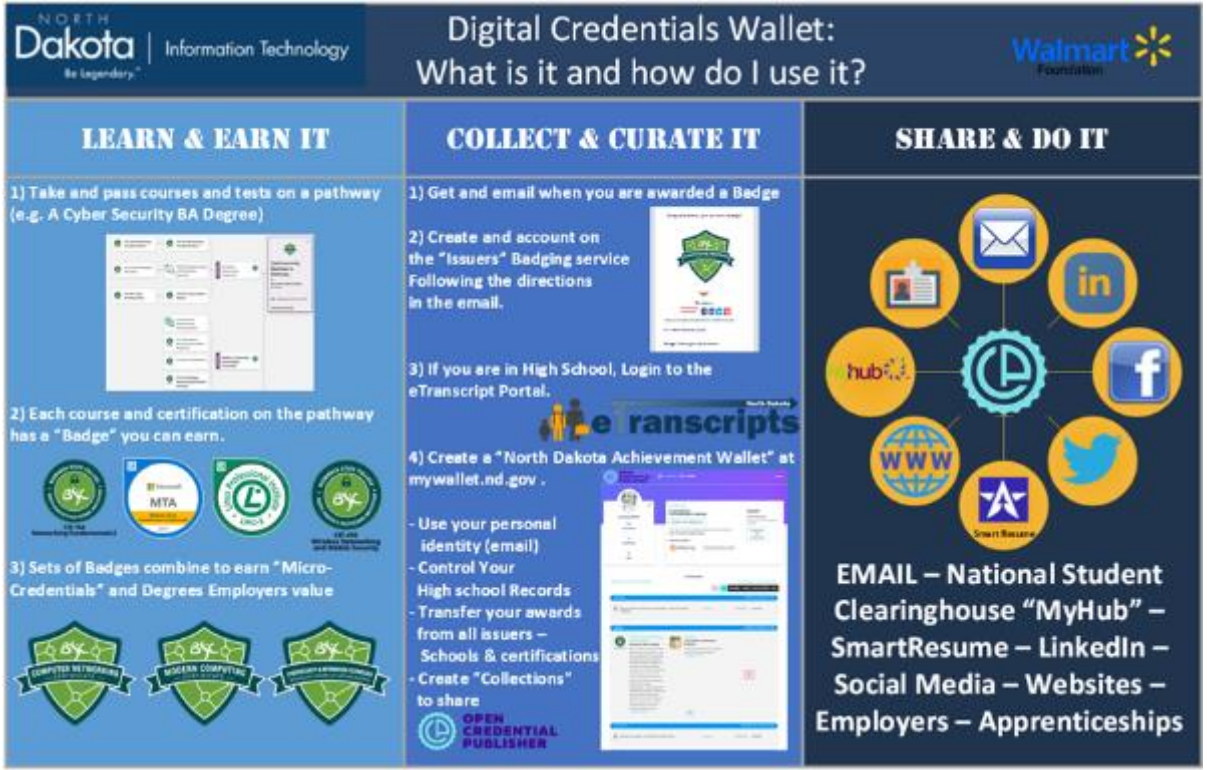


Best Practice: The Co-Lab Process

PCG process for stakeholder engagement



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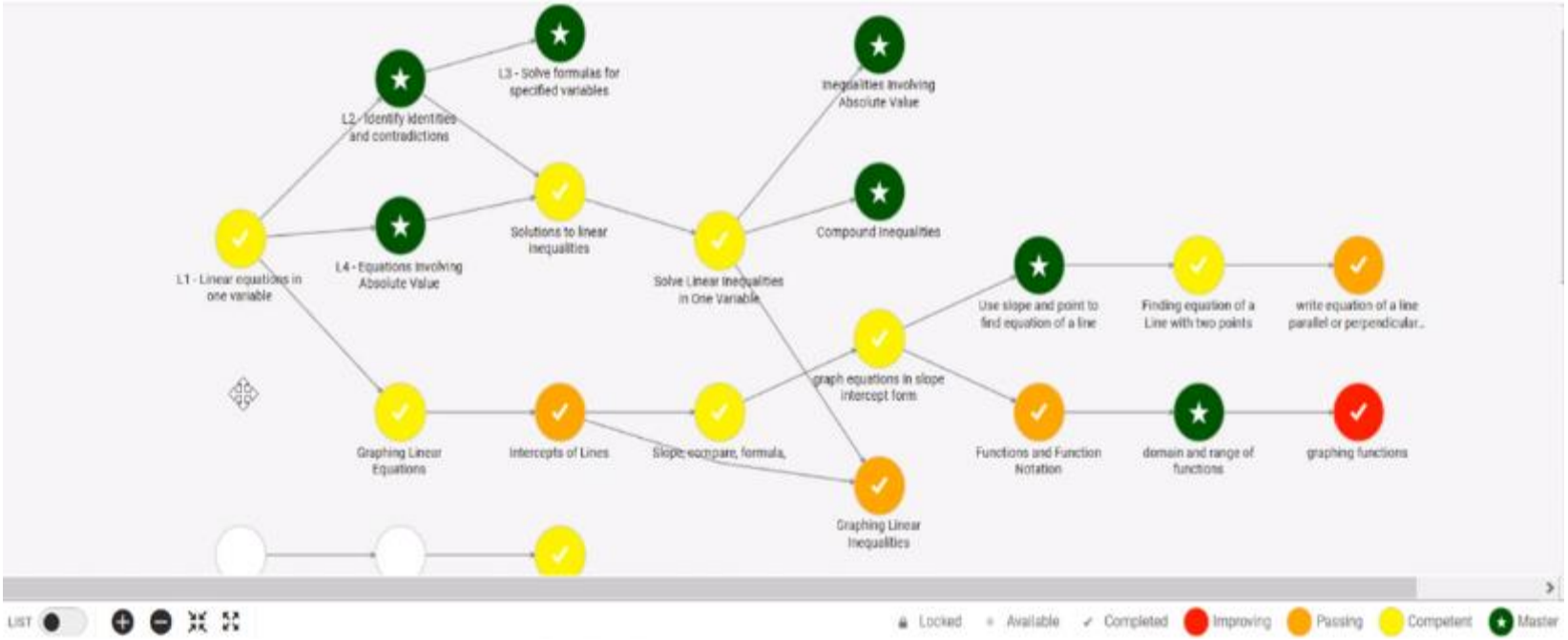
Collaborative Laboratories (Co-Lab)

The Co-Lab process is one of open, broad and active engagement of stakeholders in a public project management forum. Meeting on a regular and persistent tempo (weekly or bi-weekly), the core team invites and engages different stakeholders in a solution design and implementation process with clear deliverables and goals that are defined in terms of the interests and priorities of all stakeholders.

Every co-lab is different based on the goals, stakeholders and standards involved. PCG has the experience and talent to partner with all stakeholders and realize truly innovative solutions using the Collaborative Laboratory Methodology.

Best Practice: JCCP Documentation

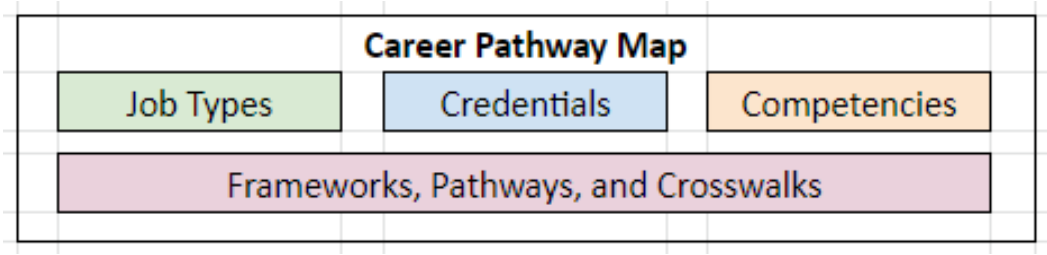
PCG Jobs, Credentials, & Competency Pathways (JCCP) process and tools



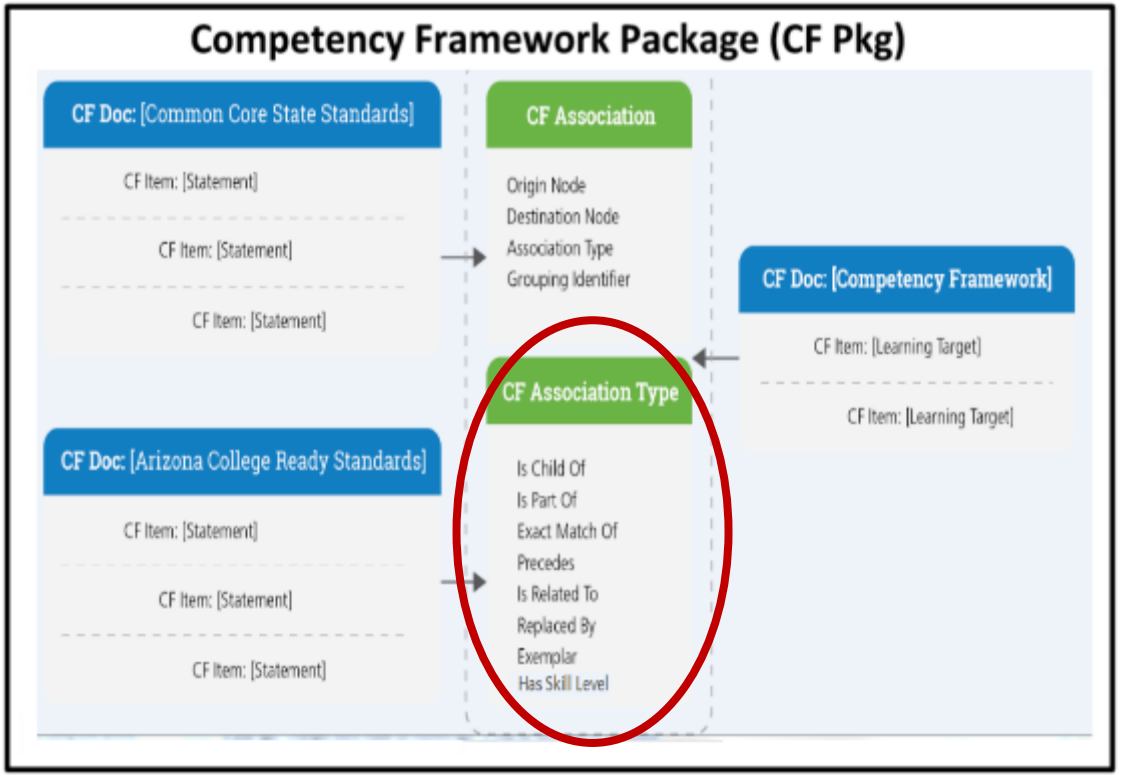
The JCCP Mapping Process

The Jobs, Credentials, and Competency Pathway (JCCP) mapping process uses a uses a JCCP Workbook Template to discover normalized lists of job types, learning opportunities and credentials (CTDL), and their underlying skills, knowledge, and abilities (CASE competencies).

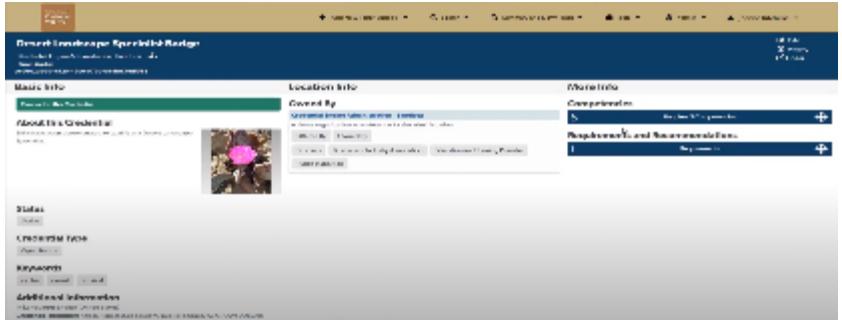
1. ND Interim Report
   a. ND Career Ready Practices Certificate JCCP Specifications
   b. EMS JCCP Specification
   c. ND Cyber Security JCCP Specification
   d. TrainND Nurse Assistant JCCP
2. Goodwill Career Pathway JCCP



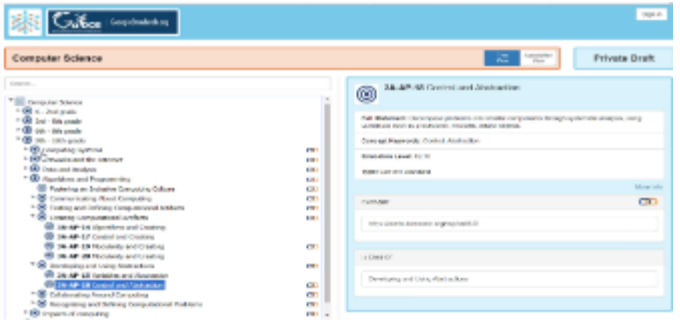
CASE Conceptual Model



The JCCP Mapping Process



Credential Engine

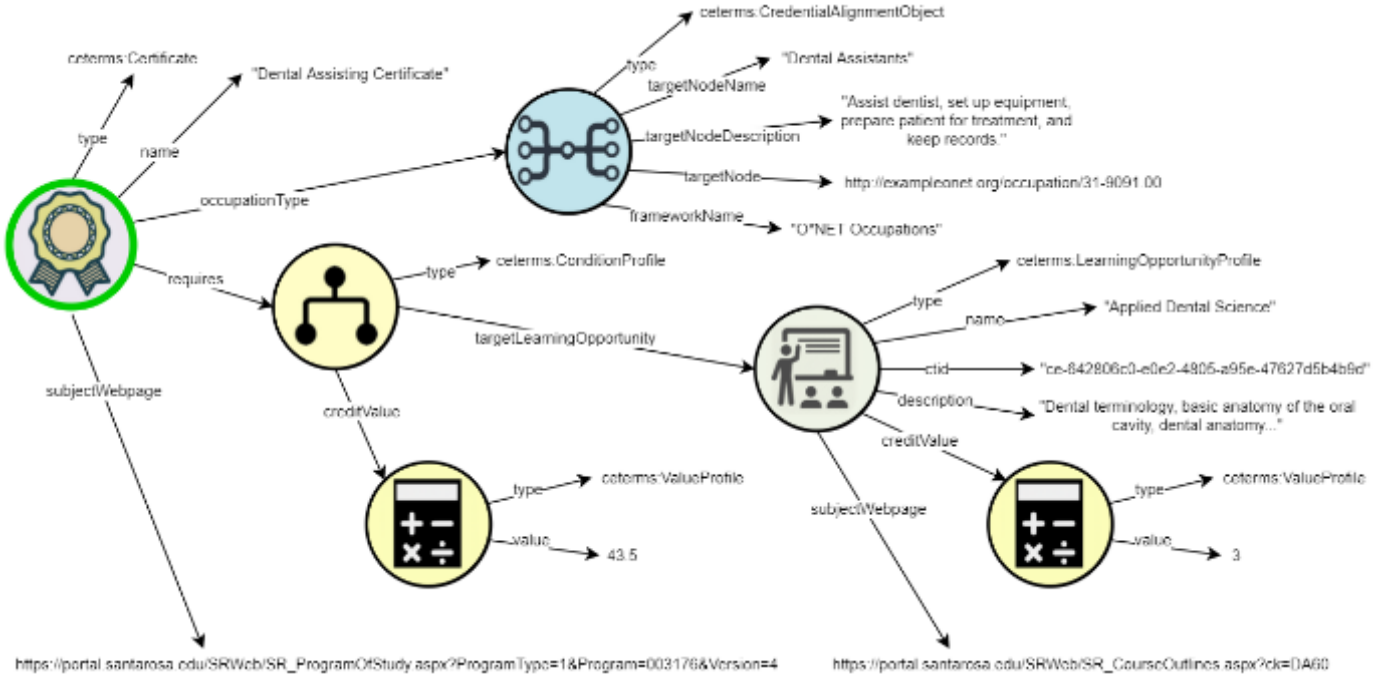


OpenSALT

Through individual discovery interviews and co-labs, participants document and analyze insights and artifacts to produces lists of structured data that can be validated with SMEs and then loaded into Credential Engine and OpenSALT CASE management tool for precise alignment and exported for UAT.

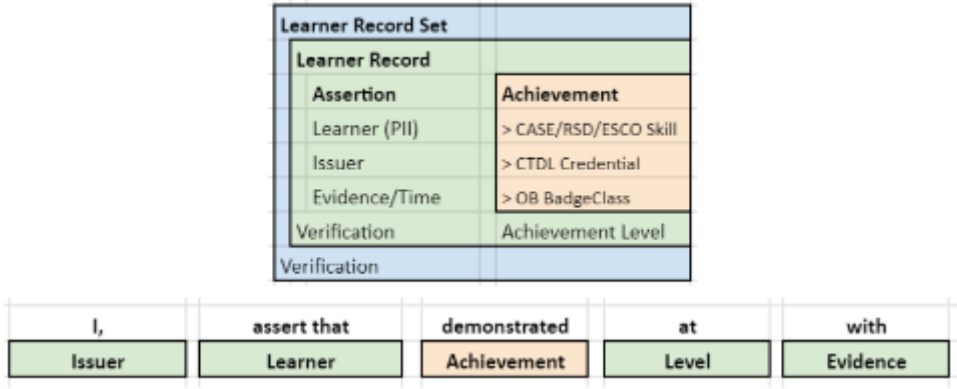
CTDL: Credential View

Credentials have **type**, **name**, **occupation type**, **requirements**, and **subjects**



http://credreg.net/ctdl/terms/Credential#Credential

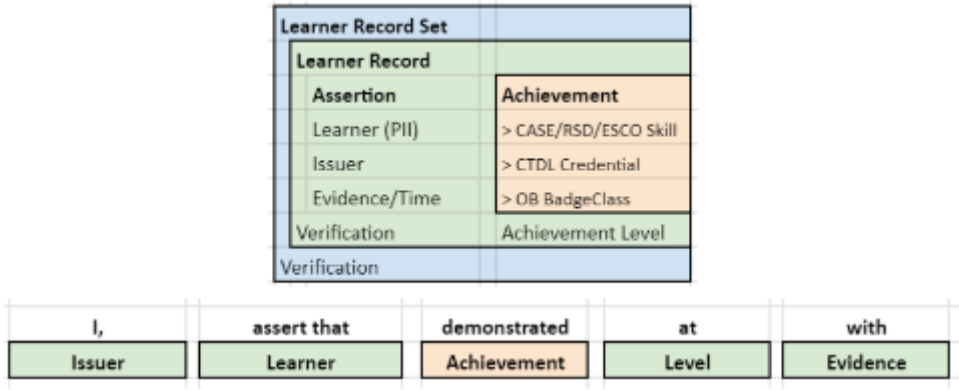
Achievement Assertions (1)



1. **Learner Record.** In a learner record, the core record is a distinct **assertion/claim** that could have **evidence** and/or an **achievement** to a **level** described in a **rubric**.

2. **Achievement (Description)**. An achievement can be described as a shared record that can be set as a goal and/or accomplished by more than one learner and, therefore, be compared and exchanged. **Rubrics** can be used to define levels associated with the achievement definition (e.g. “approaches,” “meets,” “exceeds).

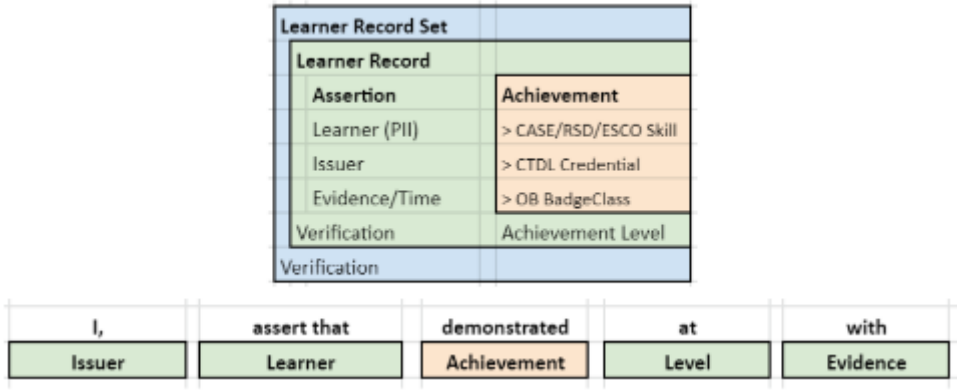
Achievement Assertions (2)



3. **Assertion/claim.** The attestation made by an Issuer about a Learner regarding an Achievement. The Assertion may also include associated evidence, results, or other metadata regarding a specific Achievement.

4. **Evidence**. Information supporting the issuance of an assertion such as URL to an artifact produced by the Learner. Evidence can be curated into **portfolios** and used to generate **assertions**.

Achievement Assertions (3)



5. **Learner Record Sets.** Sets of achievement assertions can be grouped into immutable **transcripts** and/or can be curated into learner record sets.

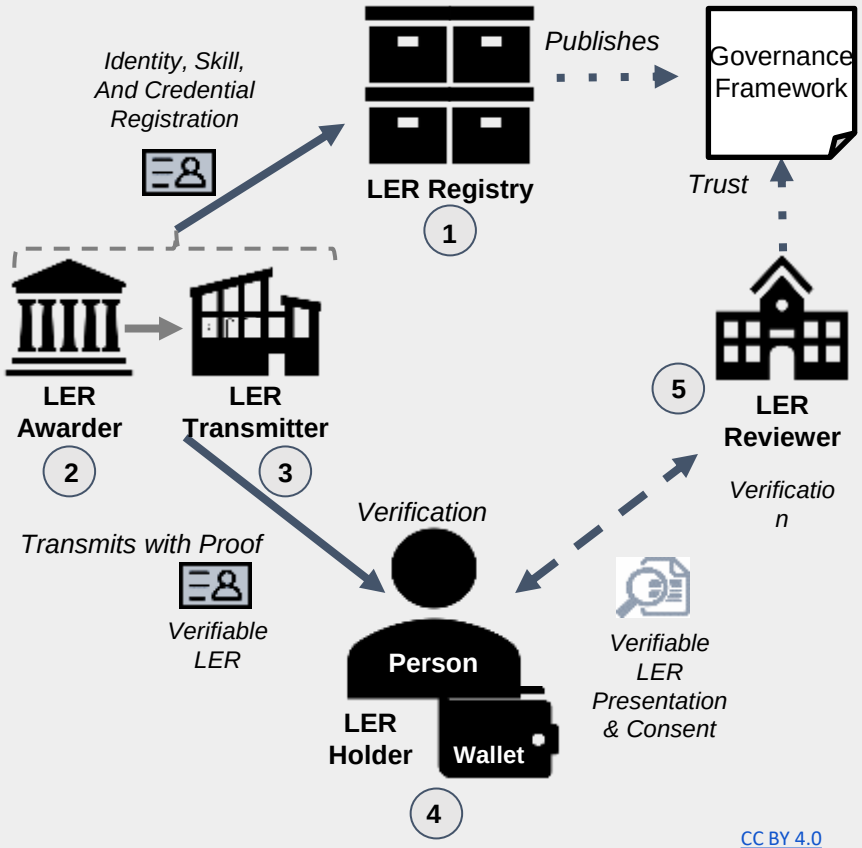
6. **Context.** Learner records exist as linked data related to other learner records and sets and aligned with other relevant objects like CASE and CTDL.

IEEE: Learning and Employment Record (LER)

When it is published later this year, IEEE 1484.2 will set a global standard for LER ecosystem components and link to open source resources.

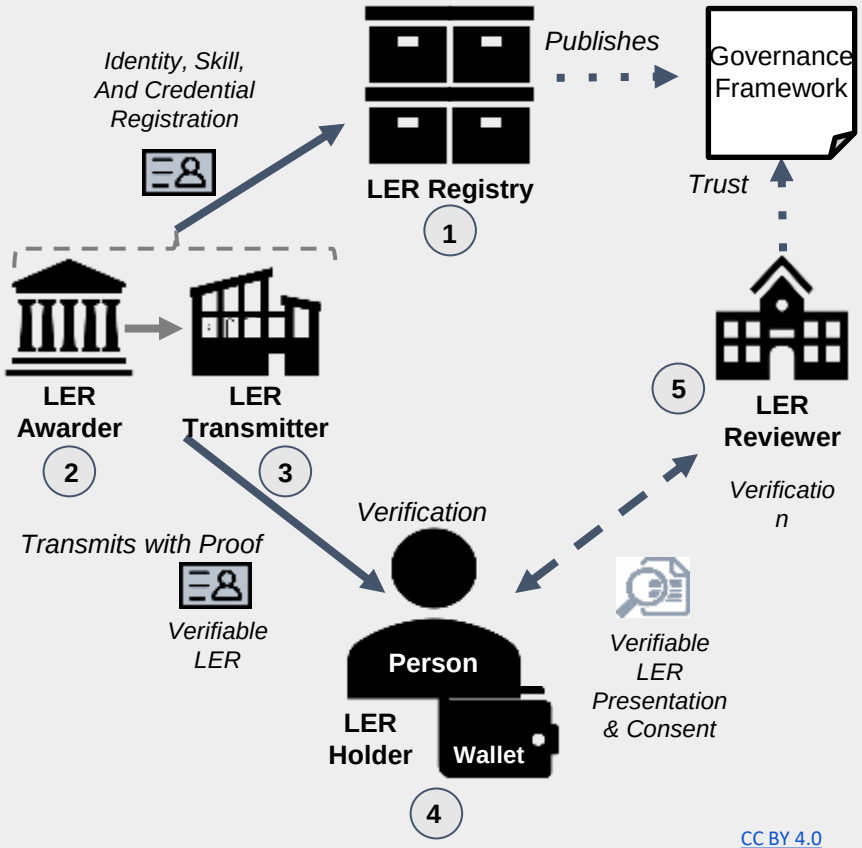
Recommended Practices:

1. **LER Registry.** In order for a credential to be machine-actionable by an LER reviewer outside of the enterprise in which it was awarded, credentials definitions **should** be securely cataloged and registered with one or more shared registries that address identity, quality, job types, credential descriptions, competency statements, frameworks, crosswalks, and pathways.



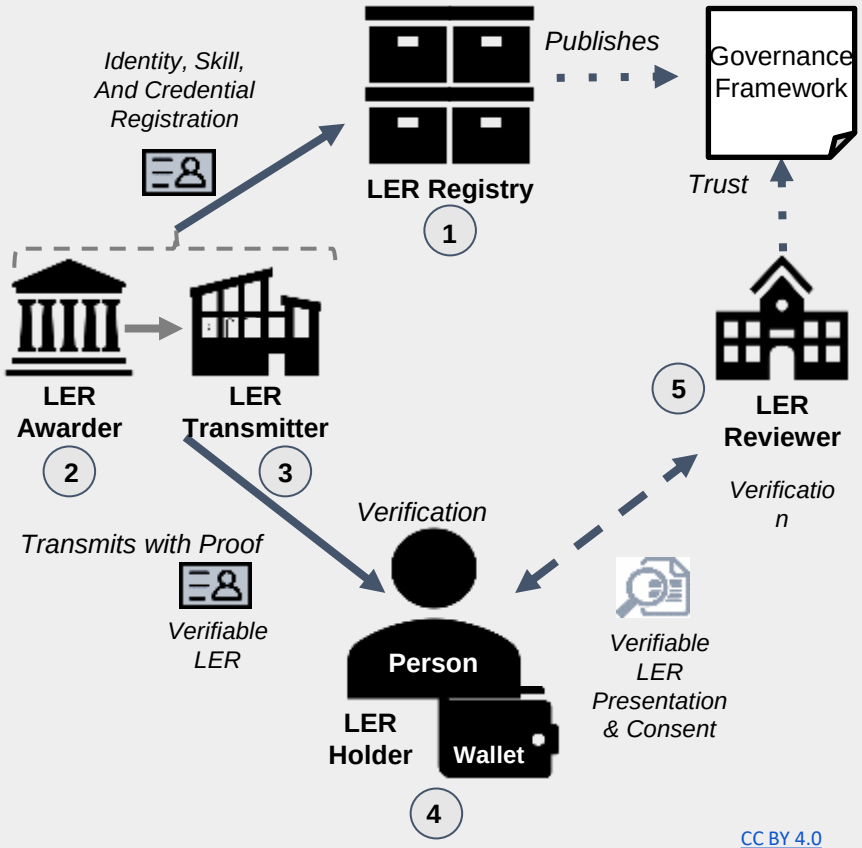
Recommended Practices:

2. **LER Award.** Education and work-based learning providers, evaluators, and systems (LER Awarder) **should** log, as structured data,each instance of a claim or revocation by instructor/evaluators that a learner has achieved a skill, experience, or credential, that can be machine-interpretable by unknown future systems.



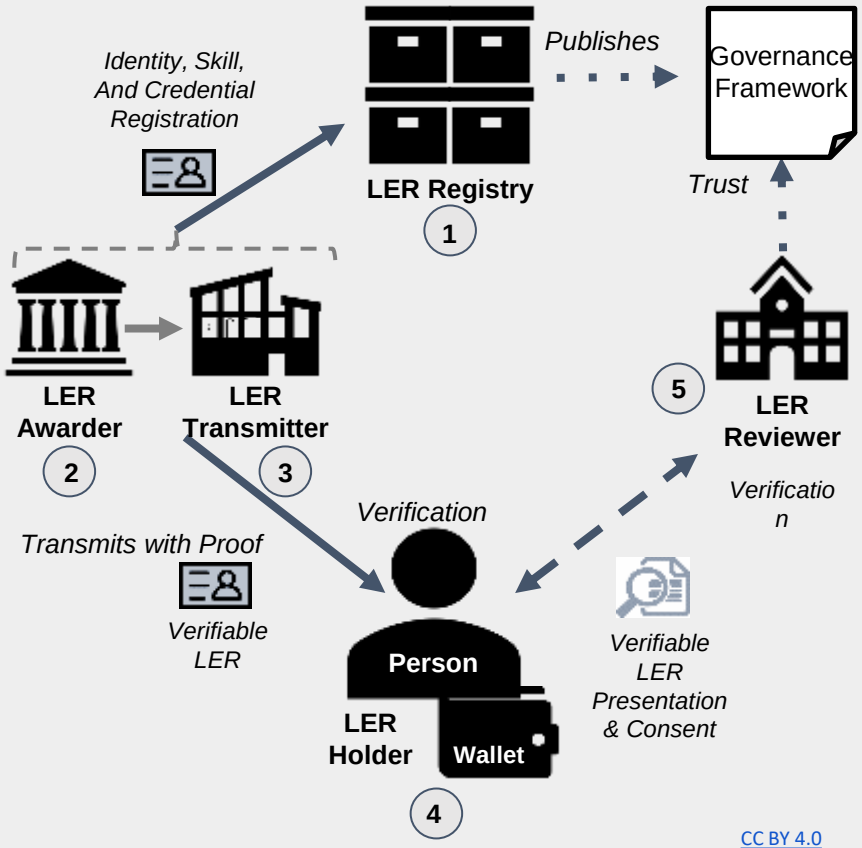
Recommended Practices:

3. **LER Credential Transmitter.** Credentials transmitted outside the enterprise **should** be wrapped in verifiable credentials (see normative W3C VC and DID).



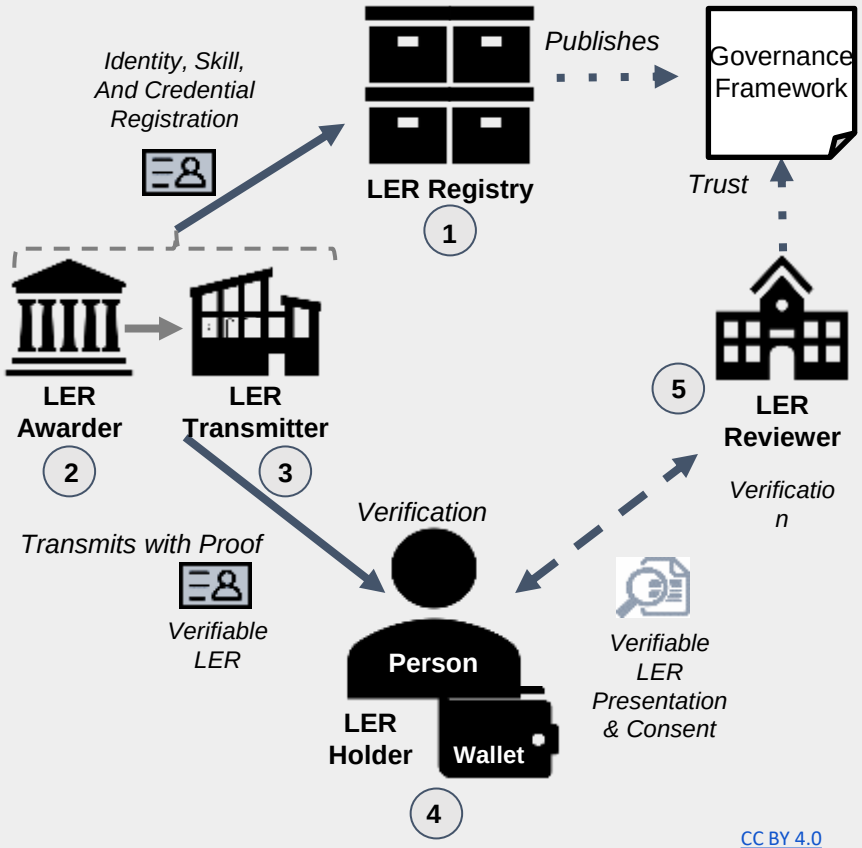
Recommended Practices:

4. **LER Digital Wallets.** The subject of the LER (or their adult custodial guardian) **should** be able to subscribe, curate, and control access to achievement assertions and other credentials and creating a presentation that is shared with verifying parties including an ability to request, hold, curate, and control.



Recommended Practices:

5. **LER Talent Marketplaces.** Education and employment entities **should** be able to request from a holder controlled access to verifiable credentials to automate actions, validate, and view credentials and other assertions. Education and employment providers can post, invite, review, and verify, and trust.



Definitions

3.1.1 Learning and Employment Record (LER): An open standards-based, computationally-actionable, digital record of an individual's formal and informal learning and employment that is constructed as a W3C Verifiable Credential (or equivalent) that can be combined with other digital records useful in supporting an individual's education, employment, and supportive services.

3.1.2 LER Awarder: A formal education, informal education or work-based learning provider, or an evaluator or credentialing organization, that makes a claim about a person achieving a competency at a performance level.

3.1.8 LER Transmitter: A service provider that serves as a proxy for/or is the LER Awarder that signs the LER as a Verifiable Credential and provides the LER to the LER Holder.

Definitions

3.1.3 LER Digital Wallet: A software application or other technology used by the LER Holder to subscribe, curate, and control access to achievement assertions and other credentials by creating a presentation that is shared with verifying parties.

3.1.4 LER Holder: The person who is the subject of the awarded LER (or their legal guardian or authorized agent) and has rights to curate and control access to the records use outside of the legitimate educational and employment purposes of the issuing entity, the LER Awarder.

3.1.5 LER Presentation and Consent: The process an LER Holder uses to control access to LERs.

Definitions

3.1.6 LER Registry: Shared services that provide trusted governance of, and access to, catalogs of LER Awarders and LER specifications (e.g., credential type, credential descriptions, and competencies) to verify the LER Awarder and the details of the LER being awarded.

3.1.7 LER Reviewer: An employer or education provider that uses LER presentations to make employment, admissions, or third-party provider..

3.1.10 LER Verification: The evaluation of whether a verifiable credential or verifiable presentation is an authentic and timely statement of the LER Awarder and LER Holder, respectively. This includes checking that: (1) the credential (or presentation) conforms to the specification; (2) the proof method is satisfied; and, if present, (3) the status check succeeds (W3C VC).

Definitions

3.1.9 LER Trust: The ability of the LER Reviewer to “trust” meaning: (1) the LER has not been altered; (2) the LER was awarded by the entity indicated; (3) the LER meaning maps to semantics the LER Reviewer understands; and (4) a specific LER verifiable credential has not been revoked or expired.

Core Usage Scenario

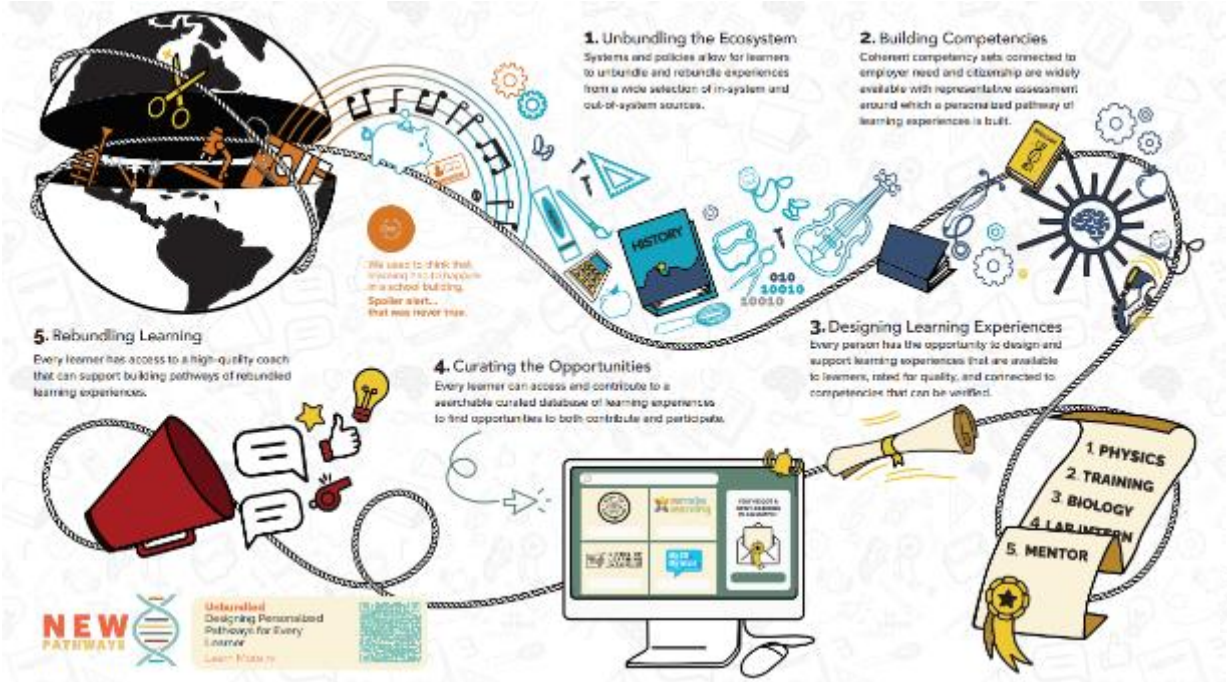
- When an LER Awarder records evidence of a person's mastery of one or more competencies or credential descriptions, an LER Transmitter can publish a verifiable credential to the LER Holder.
- The LER Holder can then curate and control verifiable presentation to the LER Reviewer.
- The LER Reviewer can trust and automate action based on the Learning and Employment Record without the need for a direct relationship with the LER Awarder or the LER Transmitter.
- To meet this scenario in a way acceptable globally, the solution should incorporate principles of privacy-by-design and self-sovereign identity management.

The Internet of Education

Any time, any where, any place, any pace, personalized, competency-based learning.

Building the Unbundled Ecosystem

New pathways to personalized learning for every learner



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PCG is consulting firm with a mission to provide solutions that matter for public sector clients

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- Improve impact in Education, Health, Human Services, Developmental Disabilities
- Project work and clients in all 50 states, 6 Canadian provinces, and most recently all 6 Australian states
- Core services include: consulting, information technology, and ongoing operations support