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Cross-Standards LER Wrapper and Wallet

to provide guidance to implement an Interoperable Learner Records using a VC structure and learner wallet functionality, created in an **open architecture for any given domain** to use and extend depending on their use case

December 9, 2020

Adapted from May 1, 2020 presentation with U.S. Chamber of Commerce Foundation. All slides are CC BY 4.0

T3 Network Overview and Projects



Building the data and technology infrastructure of the future for the talent marketplace, where: 1) all learning counts; 2) competencies and skills are the new currency; and 3) learners are empowered with their data.



Image: Second Standards igoodell Image: Second Standards Im
https://ceds.ed.gov Create an Account Forgot User Name or Password Home About Elements Data Model Tools Resources Conta Domain Entity Schema
Home About Elements Data Model Tools Resources Conta Domain Entity Schema
Domain Entity Schema
Domain Entity Schema
Domain Entity Schema (DES) provides a hierarchy of domains, entities, categories, and elements. It is intended for use primarily by people
an index to search, map, and organize elements in a logical way.
Domain: All
Search: Eilter
📩 🗁 Forly Learning
Career and Technical
Adult Education
🔄 🛅 Workforce
💿 🗋 Assessments
🖻 🔄 Credentials
E Credential Definition
Credential Offered
Credential Award
Credential Definition Agent
- Extend Your Search

Goals:

- Draft a public domain specification for an LER wrapper and learner wallet—or minimum viable data elements to transport learner record data from system to system and/or to and from a learner wallet.
- 2. Post the draft specification on the LER Resource Hub as a protocol for LER pilots to test and use as they see fit and for data standards organizations to use and possibly adopt as they choose to.

Connection to T3 Network

- Map and Harmonize Data Standards Project
- Comprehensive Learner/Worker/Military Record Standards Project
- Management and Use of Individual-Level Data Records Project

Important Note: The draft domain specification embraces all standards (no preference) and does not require any changes to standards.







Interoperability Considerations: Transport



e.g. Credential Issuer System, Employer System, etc.

e.g. Employment Record, Transcript, Credential Assertion, Competency Assertion, etc. e.g. Job Application System, College Application System, etc.







Interoperability Considerations: Transport











General

- Keep it simple
- Save problems for later- do not raise controversies
- Support all standards in payload
- Use existing standards
- We are starting with a JSON-LD wrapper designed to be simple and as close to the W3C Verifiable Credential (VC) design pattern as is possible and practical

Learner Wallet

- Limit to functional specifications (the "what")
- Do not prescribe specific technologies, architectures, protocols (the "how")

LER Wrapper

- Informed by W3C VC
- Support all standards payloads





Interoperability Considerations

*e.g.

A4L

Different record types using different data and packaging standards* can share a secure container

PESC (Transcript, Certificate...)



... other standards and data not yet in serialization standard.







Interoperability Considerations

Wallet
Identifier (Wallet ID)
Wallet Metadata
LER
LER
LER
LER

Minimum Functionality

 \square

The Learner Wallet must be able to:

- 1. Receive LERs
- 2. Persist Learning/Employment Records
- 3. **Select** Learning/Employment Records by querying the wallet data store (filter persisted Learner Records)
- 4. Send LERs



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Goal	Description
Control	Give entities, both human and non-human, the power to directly control their digital identifiers without the need to rely on external authorities.
Privacy	Enable entities to control the privacy of their information, including minimal, selective, and progressive disclosure of attributes or other data.
Security	Enable sufficient security for relying parties to depend on the LER verification and security model for their required level of assurance.
Proof-based	Enable LER subjects (learners) to provide cryptographic proof when interacting with other entities.
Discoverability	Make it possible for entities to discover LERs for other entities to learn more about or interact with those entities.
Interoperability	Use interoperable standards so LER infrastructure can make use of existing tools and software libraries designed for interoperability.
Portability	Be system and network-independent and enable entities to use their LER Metadata with any system that supports LERs and Learner Wallets.
Simplicity	Favor a reduced set of simple features to make the technology easier to understand, implement, and deploy.
Extensibility	Where possible, enable extensibility provided it does not greatly hinder interoperability, portability, or simplicity.

LER Design Principles



Adapted from: https://w3c.github.io/did-core/





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Interoperability Considerations: Record Info

Different record types using different data and packaging standards can share a secure transport of portable data, if provided basic information such as:

1. **The Payload**: The content of the LER.

Payloads can use different existing standards or models.

- 2. The Wrapper Metadata: Minimum info needed about "the Payload."
 - a. Identifier
 - b. Issuer Identifier
 - c. Type
 - d. Date
 - e. Name
 - f. Description
 - g. Image

- h. Proof of Control Identifier
- i. Payload Type
- j. Payload Format
- k. Payload Encoding
- I. Payload Compression
- m. Payload Encryption





LER Wrapper	
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Description		Image		
	Description	Description	Description Image	Description Image

T Network

LER Wrapper			Ident	ifier	Issuer ID	Туре
		Name	De	escription	Image	e
Proof (eleme	nts may vary	with Proof	type)			
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LER Wrapper	Identi	fier Iss	uer ID	Туре
	Name De	scription	Image	
Proof (elements may vary type created	/ with Proof type) proofPurpose	verificationM	ethod	JWS
Record				
Proof of C	ontrol ID			



		Identifier	Issuer ID	Туре
	Name	Description	Image	
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Record				
	Proof of Control ID			
Payload				
Payload	Pavload Record	Р	ayload Type	
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Рауюай	Payload Record Payload Record includ pertinent Data about to event related to the learner/employee in a	es all the format	ayload Type ayload Format vload Encoding ad Compression	



#T3Network



The LER Specification: tinyurl.com/LERWrapper

https://drive.google.com/file/d/1RfdXAUNhp0kluD9htpb8c_Tg2dLm2QcJ/view

T3 Network webpage: uschamberfoundation.org/T3-Innovation **LER Resource Hub:** lerhub.org

Presented by: Jim Goodell: QIP/CEDS, jimgoodell@qi-partners.com Alex Jackl, Bardic Systems, alex@bardicsystems.com Jim Kelly, PESC Board Chair, Jim Kelly Technologies LLC, jim@jimkellytech.com

Groningen Declaration Network

UPDATES FROM THE PANDEMIC Kathleen Massey, President, GDN Associate Vice-President (Students) University of Lethbridge, Canada

Melanie Gottlieb, Treasurer, GDN Deputy Director American Association of Collegiate Registrars and Admissions Officers, USA





Agenda

- Lessons Learned from the Pandemic
- New Developments
- Discussion: Expanding Access

Even well-resourced countries and institutions were not ready

"Alternative online service developed in response to Covid-19- July 15, 2020

A new service will be launched shortly to enable electronic transcripts to be issued securely to third parties via Portico on request by students. This service has been developed to replace the printed transcript service that was suspended when offices closed in response to the Coronavirus (Covid-19) outbreak."

"COVID-19 Update

Due to the current Covid-19 pandemic, paper documentation cannot currently be produced. We have implemented a digital option for official transcripts, but these delays have caused significant backlog that we are working on.

Printed official transcripts will not be available until further notice."



Even well-resourced countries and institutions were not ready

Official Transcript Printing & Delivery in the early days of the pandemic: 64% were printing transcripts on campus even though the campus is closed for normal business 13% are being printed at home by a staff member 43% are experiencing a delay in outbound printed transcripts

56% say the delay is less than one business week <code>Official Transcript Delivery</code> and <code>Receipt</code> \cdot

In direct response to COVID-19:

34% of those who receive high school transcripts for any purpose were making changes

- 21% making changes to how official college transcripts are received
- 24% are considering changes to how they delivery official college transcripts









Deep Disparities in Digital Access Persist

"Half of the total number of learners – some 826 million students – kept out of the classroom by the COVID-19 pandemic, do not have access to a household computer and 43% (706 million) have no internet at home, at a time when digitally-based distance learning is used to ensure educational continuity in the vast majority of countries."

"...in sub-Saharan Africa, 89 per cent of learners do not have access to household computers and 82% lack internet access."

Startling digital divides in distance learning emerge. UNESCO. https://en.unesco.org/news/startling-digital-divides-distance-learning-emerge

Higher Education must (continue to? Accelerate?) Embrace Innovation



Inspired by the 2014 GDN meeting in DC "Introducing the Digital Student Data Ecosystem"



"Digitisation is understood as...digitisation of student data and as digitisation of parts of the credential evaluation process."

European Qualifications Passport for Refugees



Groningen Declaration



WE MUST INCREASE THE PERCENTAGE OF LEARNERS WHO HAVE ACCESS TO DIGITAL MOBILITY TOOLS WE HAVE EVIDENCE OF A NUMBER OF SUCCESSFUL GLOBAL PROJECTS. WE NEED MORE.

THE TIME TO COMMIT RESOURCES IS NOW, BEFORE THE INEVITABLE

NEXT CRISIS



Groningen Declaration

Impact of the Pandemic

- Cancellation of the in-person annual meeting
 - Passing of the By-laws
 - Webinar series
- Building for the future





Groningendeclaration.org

- Updated look and feel
- Signatory benefits
 ✓ Login
 - ✓ Directory
- Digital Signatory application process



Harnessing Resources: New Opportunities to Engage



Patronage

- Minimum 3-year commitment
- Substantive financial commitment
- Support the sustainability of the GDN's access mission

Advisory Board

- Recognition of thought leadership in the digital mobility space
- Gain a stronger advisory voice in strategic direction of GDN initiatives





Looking forward to 2021

GDN Annual Meeting moved to13-15 October 2021





Groningen Declaration

Questions / Discussion

Groningen Declaration Network

MORE RELEVANT THAN EVER

- CONNECTING THE -NEW DIGITAL ECOSYSTEM



Introduction to PESC: IEEE LTSC & W3C

Jim Goodell Kim Hamilton Duffy Simone Ravaioli (moderator)

DATA STANDARDS UNITED FOR LIFELONG LEARNING AND EMPLOYMENT

Vision

Collaborate and align standards to support the global education and workforce digital ecosystem.

Charter

Establish a "common ground" mechanism to coordinate and align disparate global data standards while respecting each organization's independence across systems, platforms, networks, sectors, and industries, produced, or supported by the respective standards bodies.

Mission

Establish a sustainable collaborative of Data Standards Development Organizations (SDO) and their stakeholders across education, employment, and training sectors.

CORE VALUES

Organizations within Data Standards United, will abide by the following core values:

1) Free access to data standards.

2) Transparent, voluntary, consensus-based standards development, approval, and maintenance processes.

 Public support of the Data Standards United collaborative and lifelong learning and employment standards.

IEEE LTSC

Learning Technology Standards Committee (LTSC)

The LTSC follows an open and transparent formal standards development process and fully supports the IEEE's sponsorship of the OpenStand Initiative. We coordinate with other organizations, both formally and informally, that produce specifications and standards for learning technologies. We welcome new members who can volunteer their time and expertise to help understand and solve product interoperability issues caused by the rapid advance of new learning technologies. Please contact the LTSC Secretary or a relevant Work Group Chair if you are interested in participating.

LTSC Officers

- Chair Richard Tong
- Vice Chair Jim Goodell
- Secretary Brandt Redd
- Treasurer Shelly Blake-Plock

To contact the officers, please email ltsc@ieee-ltsc.org

LTSC Work Group Chairs

- Child and Student Data Governance Working Group (P7004) Marsali Hancock marsalih@gmail.com

Public email reflector

A public email reflector has been established to provide public announcements about the LTSC.

Subscribe to the Email List Here

Upcoming Events



ILR vs LER vs WTF





INTEGRATED LEARNER RECORD

FOCUS: ILR FRAMEWORK

Logical Component Framework

Universal Architecture. Any ecosystem requires common components to fulfill the universal scenario.



- 1. Collaboration Tools - Services such as WeLibrary and Brighthive that support collaboration between stakeholders, generate governance frameworks, and data trust
 - **Trust Registry Service**
 - **Trusted Accreditation Organization**
 - **Skill Crosswalk Service**
 - **Resource Services**
 - **Credential Services**
 - **Revocation Services**
- Achievement Assertion Tool Services that enable learners or instructor/evaluators to initiate claims of achievement (skill, credential, etc) with evidence that result in assertions.
- Credential Publisher Services that enable achievement assertions to be wrapped in credentials that are cryptographically signed onto distributed ledgers for verification from requestors
- Universal Wallet Services that enable learners and their adult guardians to subscribe, curate, and control access to achievement assertions and other credentials.
- Universal Validator/Requestor Services that enable credential requestors to view and validate credentials.
- Skills Lab credential currency exchange deployment services not covered above to complete the ecosystem

The ILR Recommended Practices [1484.2] provides best practice guidance for learner records related to:

- Identity and Trust
- Open Ontology References
- Verifiable Assertions
- Integrated learner record payloads supporting the spectrum of formal or informal education and workplace learning, and military learning records.



At Global scale



DNA of the work

- Informed by the W3C VC specification as suggested in the ILR Wrapper spec -The Envelope
- Drilling down inside the wrapper by investigating and modeling different types of Educational Verifiable Credentials' payloads *The Letter*
- Liaising with other standardization bodies like PESC, HR Open, A4L, CEDS, ADL, Medbiquitous, W3C, ISO, IMS Global, CEN...
- Seeking out inclusive international contribution from outside North America, namely Europe and Asia.





A primer: The ILR wrapper spec







IEEE SA ARRANPutting lifelong learning records in a digital wallet



W3C Credentials Community Group

- Standards Incubation
- Broader charter, draft standards, but not SDO
 - We create draft standards and work with SDOs that can help bring the specs to maturity
 - We solidify with reference implementations, use cases
- VC-EDU Task Force
- Closely aligned with IEEE LTSC
- Modeling Educational Verifiable Credentials

What do we mean by "credential"?



Verifiable Credentials Ecosystem



LER Wrapper

- How to verify the credential
- Whether the issuer is authentic
- How to verify the learner
- Credential status information
- Vocabulary/taxonomies used in the credential



Question:

EdExchange but with SSI?

IEEE LTSC Active Work Groups

The following workgroups are presently active within the LTSC:

- Adaptive Instructional Systems (AIS) (P2247)
- Augmented Reality Learning Experience Model (AR-LEM) (P1589)
- Child and Student Data Governance(CSDG) (P7004)
- Collaborative Edge Computing (CED)
- Conceptual Model for Learning Technology Systems (CM4LTS) (P1484.1)
- Computer-Managed Instruction (CMI) (P1484.11.2 P1484.11.2)
- Digital Literacy, Skills and Readiness (DLSR) (P3527.1)
- Experience API Base Standard (xAPI) (P9274)
- Explainable Artificial Intelligence (XAI) (P2894)
- Federated Machine Learning (FML) (P3652.1)
- Interoperable Learner Records (ILR) (P1484.2)
- Learning Object Metadata (LOM) (P1484.12)
- Mobile Learning Platforms (Mobile) (P7919.1)
- Recommended Practices for Defining Competencies (P1484.20)
- Resource Aggregation Models for Learning, Education, and Training (RMLTWG) (P1484.13)
- Renewing SCORM Standards (SCORM) (P1484.11.1 P1484.11.2 P1484.12.1, P1484.12.3)
- Standard for Learning Metadata (LMeta) (P2881)

- CONNECTING THE -NEW DIGITAL ECOSYSTEM



Introduction to PESC: IEEE LTSC & W3C

Jim Goodell Kim Hamilton Duffy Simone Ravaioli (moderator)

Thank You!



Data Standards United for Lifelong Learning and Employment

PESC 2020

Who Are These People and Why Are They Talking to Me?

Kim Bartkus - Executive Director, HR Open Standards Consortium Interesting Kim Fact: Learned how to kayak last year

Larry Fruth, Ph.D. - Executive Director, Access 4 Learning (A4L) Community/Student Data Privacy Consortium (SDPC) Interesting Larry Fact: Been in Vomit Comet AND Alvin Submersible

Johmarx Patton - Director, Educational Technology and Standards/MedBiquitous, Association of American Medical Colleges (AAMC) Interesting Johmarx Fact: Recently restarted practicing Japanese calligraphy

Agenda – Or Questions to Answer:



- What is the Current State Of Technical Standards in the Marketplace?
- What is Data Standards United?
- What Does It or Could It Do?
- What is the Value-Add for MY Organization?
- How Do I Get Involved If It Might Be a Fit for Us?

What is the Current State Of Technical Standards in the Marketplace?



It's Messy!

Matrix

And this is JUST K12.....



What is Data Standards United (DSU)?

Mission: Establish a sustainable collaborative of Data Standards Development Organizations (SDO) and their stakeholders across education, employment, and training sectors.

CORE VALUES: Organizations within DSU, will abide by the following core values:

- Free access to data standards.
- Transparent, voluntary, consensus-based standards development, approval, and maintenance processes.
- Public support of the Data Standards United collaborative and lifelong learning and employment standards.

Data Standards Organizations will adopt the charter organizationally

What is Data Standards United (DSU)?

DSU is <u>NOT</u> a new organization but a <u>collaborative</u> to:

- Promote transparency, harmonization, data linkages and communications on the usage of openly developed and freely accessible interoperability standards.
- Determine levels of compatibility between data standards; identify opportunities for further alignment, convergence and partnerships; and develop better understanding of each stakeholder's role across education, employment and training sectors.
- Inventory, share, and map/crosswalk data standards, models, taxonomies, vocabularies & schemas.
- Support various projects brought to the community and produce agreed upon communications, documentation, outputs, tools and artifacts for use and adoption

What Does It or Could It Do? Real World Examples

Collaboration with HR Open and T3 Network

- The Employment and Earnings Records Standard
 - Addresses reporting of employee's employment and earnings records to the government
 - Explains how records can be better used by employers, government, and publicprivate data collaboratives in support of workforce analytics
- The Job Data Exchange (JDX)
 - Refine job posting standard in coordination with HR Open Standards, USCCF, Schema.org, and Credential Engine
 - Converted to JSON-Schema and XML and hosted by HR Open Standards to promote adoption and allow continued maintenance



Background: HR Open Scope





What Does It or Could It Do? Real World Examples

PESC and SIF High School Transcript

- Collaboration with co-habitation of each group to align deliverables
- PESC "we are HE and here is what we want"
- A4L/SIF "we are K12 and here is what we have to give"
- 95% congruence between the two work products!

JSON Task Force

- A4L Community and PESC partnered to further the development of JSON usage in their approved open standards and specifications.
- This collaborative identified rules for creating a programmer friendly JSON from XML defined data.

Background: A4L Community



SIF DATA MODEL (New Zealand)

SIF DATA MODEL (North America)

SIF DATA MODEL (United Kingdom)

Student Data Privacy Consortium (SDPC) goals

SIF INFRASTRUCTURE (global)

━ X **S** Tools and Leverage Identify projects Develop a clearinghouse of Resources Partnerships that have onthe-ground and student data real-world privacy operational impact

The A4L and SDPC Communities help schools and marketplace providers establish <u>"connected, secure and</u> <u>effective learning</u> <u>ecosystems"™</u>



What Does It or Could It Do? Real World Examples

Creating a new standard alone or in collaboration

- No data exchange standard currently exists for sharing immunizations and CPR training, key pieces of a digital credential for healthcare professionals and leaners
- Is there something that already exists?
- Can we collaborate on a new standard?
- Two simple questions but a powerful set of responses
 - Community of Practice



Background: MedBiquitous

Health Professions Education is undergoing a dramatic shift:

- Digital transformation of teaching and learning
- Digital transformation of education administration
- Digital transformation of licensure, credentialing and certification
- Digital transformation of healthcare

AT THE SAME TIME!

Three key aspects to the MedBiquitous Program:



- A community of health professions educators and technology innovators.
- A process to develop, approve, and disseminate health professions education data standards.





What is the Value-Add for MY Organization?

VALUE PROPOSITION

- Add your organization's expertise and public support for a seamless, lifelong learning infrastructure via sustainable standards.
- Be a part of an open forum for emerging and innovative technologies and business applications wishing to work within a standards environment.
- Promote existing standards-based solutions while not disrupting current investments in technology and systems.
- Foster an understanding in each stakeholder's role across education, employment and training sectors and to leverage each other's work.





Organizational:

• Establish additional "rules of the road" for the gatherings

Projects:

PESC JSON Transcript Workgroup

- Launch Wednesday January 27, 2021 Noon EST
- Free & Open (Voting Restricted to PESC Members)

Standards Registry & Repository

- Upgrade on the Horizon
- Partnerships & Collaboration



How Do I Get Involved If It Might Be a "Fit" for Us?

STANDARDS BODIES

- Review and sign charter acknowledging your organization agrees with the collaboration's mission and values
- Participate in meetings to work with colleagues on projects and share ideas

OTHER SUPPORTERS

- Participate in meetings to work with colleagues on projects and share ideas
- Engage others about questions/strategies on your data needs



Questions and To Find Out More

Top of Mind Opportunities?

Start of a Web P<u>r</u>escence for Collaboration https://datastandardsunited.org/contact-us

Come Help Form the Community and Get the Latest!

Next Call: Wednesday, January 13 at 12ET Send contact info to <u>lfruth@a4l.org</u>

