The Academic High School and College Transcript

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Matt Bemis, Associate Registrar, USC
Monterey Sims, Director Admissions & Evaluation, University of Phoenix
Thomas Black, Chief Innovation Officer, Paradigm
Ken Sauer, Senior Associate Commissioner & CAO, Indiana Commission for Higher Education

Tuesday, December 8, 2020  12:15 pm – 1:30 pm EST
• Intro/Kick off – Rick

• Discussion of transcript exchange (sending and receiving) – Matt/Monterey/Ken

• Digital ecosystem – (Tom/Ken)

• Current vs. Future state – All
The EDI experience at USC

• History of EDI Data exchange at USC
  • Implemented in 2010 as part of an unfunded mandate for state community colleges to exchange electronic transcript data
  • Inbound implementation was quick and easy
  • Outbound EDI proved to be a humbling experience
  • Since going live, USC exceeds 15,000 transactions annually
• Integrated EDI exchange with vendors to automate key time sensitive and high volume transaction
  • International Education Research Foundation (IERF) – All international credential evaluation results sent from vendor over the NSC servers using PESC standards (e.g. use of GEOcode and EDI TS130)
  • CollegeSource – Student ‘self service’ platform allows transfer applicants to self report prior learning, packaging the data in EDI/XML formats sent over the NSC server.
The EDI experience at UOPX

There and back again, a transcript tale...

Data exchange requires partners, it can be a long yet rewarding journey!

Lonely EDX Mountain
**eTAP Improvement Timeline**

- **2007**
  - Centralize Transcript Acquisition
  - Acceptance of PDFs
  - EDI Transcripts (TS130) - Vendor Based

- **2008**
  - Switched to homegrown EDI (TS130)
  - EDI Request (TS146)

- **2009**
  - EDI Outbound (TS130)
  - EDI Response to Request (TS147) - homegrown

- **2010**
  - Transcript Tracker SharePoint dashboard for advisors

- **2011**
  - Institution Profiles tracking
  - Integration of TS130 - EDI Transcript Data with SIS, eliminate manual data entry

- **2012**
  - Trading Partner Relationships:

- **2013**
  - **2014**
  - **2015-19**

- 2011
  - eSignature
  - Advocate for 3rd party ordering & data transmission
  - EdExchange pilot
  - Update matching criteria

- **2014**
  - Research eSignature
  - Service Provider Advisory Committees

- **2015-19**
  - EdExchange pilot
  - Update matching criteria
The journey is far from done!

- Receipt:
  - PAPER: 17%
  - Electronic: 83%

- Request:
  - PAPER: 8%
  - Electronic: 92%
INDIANA E-TRANSCRIPT PROGRAM: STATUS REPORT

PESC Data Summit & Symposium
December 8, 2020

Ken Sauer, Ph.D.
Senior Associate Commissioner and Chief Academic Officer
Indiana Commission for Higher Education (ICHE)
OVERVIEW

- Started in 2005 by ICHE and made statutory in 2013

- Includes both:
  - High School to College (HS2C)
  - College to College (C2C)

- Funded by state: full support for HS2C, partial for C2C

- Built on PESC e-Transcript standards, powered by Parchment

- Aims at exchanging transcripts as XML data files
HS2C

- 2 million sent since 2005 via Parchment platform
- 200,000 transcripts sent annually
- Free to all HS students, recent alums
- Common statewide HS XML schema built on PESC standards
- 100% sent as PDFs (virtually no paper transcripts), with
  - 75% also sent as XML data through Parchment
- Naviance and Common App not helpful in supporting XML
### Indiana HS by SIS Vendor

<table>
<thead>
<tr>
<th>SIS Vendor</th>
<th>Number of All High Schools</th>
<th>Percent of All High Schools</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerSchool</td>
<td>165</td>
<td>41.0%</td>
<td></td>
</tr>
<tr>
<td>Skyward</td>
<td>88</td>
<td>21.9%</td>
<td></td>
</tr>
<tr>
<td>Harmony</td>
<td>80</td>
<td>19.9%</td>
<td>82.8%</td>
</tr>
<tr>
<td>RDS</td>
<td>20</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Synergy</td>
<td>19</td>
<td>4.7%</td>
<td></td>
</tr>
<tr>
<td>Infinite Campus</td>
<td>13</td>
<td>3.2%</td>
<td>95.8%</td>
</tr>
<tr>
<td>Others</td>
<td>17</td>
<td>4.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>402</strong></td>
<td><strong>100.0%</strong></td>
<td></td>
</tr>
</tbody>
</table>
C2C

- Common statewide college XML schema built on PESC standards
- Desire for C2C exchange driven by both:
  - Multi-directional transfer of college students
  - Indiana’s large dual credit initiative
- Breakthrough last year: Ivy Tech licenses Parchment
- Community college send/receive, then university send/receive
CONCLUSIONS & STATE PERSPECTIVE

- Benefits of exchanging transcripts as XML data files:
  - Processing applications more efficiently & quickly
  - Incorporating data into SIS to facilitate research
- Embracing PESC standards facilitates inter-state exchange of transcripts
- E-Transcript infrastructure a step toward CLRs and digital credentials:
  - Indiana’s participation in the AACRAO-NASPA-NILOA Phase II CLR project
  - Parchment Award product
CONTACT INFO

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Past Will Not Be Prologue to Our Future

The Transcript:

[[Image of transcript]]

- Foundationally is an administrative tool
- Originated as an internal means for tracking...
- Repurposed as a reporting device
- Codified for interinstitutional understanding
- Digital expression for exportability
- Shibboleth Society or “Inside baseball” phenomenon!
What Was The Worldview of the Academy (that is changing or about to change)?

• Administrators needed to see evidence of completion
  • Degree auditing
  • Official notes, statuses and coded remarks
  • Intra/Inter-institutional Interoperability

• Academics needed to draw inferences
  • Time with the material
  • Order and sequence of preparation
  • Grades as signals of engagement, mastery & capacity
  • Broadly evidentiary
Why It Doesn’t Work Any More.

Expense of Education; Multiple Stakeholders; Lifelong Phenomenon; Technology & Emphasis on Specific Skill Development

The Record is arguably:

• Incomplete—not comprehensive
• Difficult to understand—not comprehensible
• Not necessarily market relevant
• Not evidentiary
• Not Accessible
What Is Being Asked For Now?

- Pedagogically Inclusive
- Learner-centric claims
  narrative self-sovereign
- Instrumentality credentials
- Portable standards
- Fungible and Interconvertible machine-readable
- Digitally Verifiable
Why Is This Hard To Do? Moving Value Targets.

**2016**
1) Complex problem solving
2) Coordinating with others
3) People management
4) Critical thinking and analysis
5) Negotiation
6) Quality control
7) Service orientation
8) Judgment and decision making
9) Active listening
10) Creativity, originality and initiative

**2020**
1) Complex problem solving
2) Critical thinking and analysis +2
3) Creativity, originality and initiative +7
4) People management -1
5) Coordinating with others -3
6) Emotional intelligence new
7) Judgment and decision making +1
8) Service orientation -1
9) Negotiation -4
10) Cognitive flexibility new

Future?

2025
1) Analytical thinking and innovation new
2) Active learning & learning strategies new
3) Complex problem solving -2
4) Critical thinking and analysis -2
5) Creativity, originality and initiative -2
6) Leadership and social influence new
7) Technology use, monitoring and control new
8) Technology design and programming new
9) Resilience, stress tolerance and flexibility new
10) Reasoning, problem solving and ideation new

What Keeps You Up All Night?

Is it...
What & how is being taught, learned?
What is recorded & why?
Data or meta data?
Credentials?
Standards?
Platforms?
Algorithms?
Digital ledgers?
Stakeholders?

Stay tuned to the rest of the Summit & Symposium!

More resources

AACRAO Web Site

AACRAO Research and Publications

Electronic Records & Data Exchange
- PDF Best Practices
- Technical Resources
- CLR Resources
- Paper vs. Electronic cost calculator

speede-g@vt.edu SPEEDE larger community Listserv Subscribe

SPEEDE@AACRAO.ORG for questions and testing

Postsecondary Electronic Standards Council
- Approved Standards
- Implementation Guides for EDI and XML
Thank You!
EDI vs. JSON vs. PDF vs. XML

Jason Weaver, Vice President of Product, Parchment

Matt Bemis, Associate Registrar, USC

Ben Harper, Manager, Software Development and Architect, OCAS

Monterey Sims, Director Admissions and Evaluation
University of Phoenix

Tuesday, December 8, 2020  3 pm – 4 pm EST
Agenda

• Review formats (The What)
• Contrast and Compare (The How)
  • Best fit
  • Using multiple formats
  • Structured data
• Industry trends (The Why)
  • What is happening now
  • Looking in the crystal ball
  • Importance of increasing adoption
JavaScript Object Notation (JSON)

- JSON is short for JavaScript Object Notation
- Text format that employs key/value pairs
- Hierarchical in nature

How do you pronounce JSON?
Douglas Crockford of Yahoo, JSON creator, sets the record straight.
Listen to his pronunciation here:
https://www.youtube.com/watch?v=zhVdWQWKpM
JSON-XML comparison

**JSON**

```
{"employees":[
    { "firstName":"John", "lastName":"Doe" },
    { "firstName":"Anna", "lastName":"Smith" },
    { "firstName":"Peter", "lastName":"Jones" }
]}
```

**XML**

```
<employees>
  <employee>
    <firstName>John</firstName>
    <lastName>Doe</lastName>
  </employee>
  <employee>
    <firstName>Anna</firstName>
    <lastName>Smith</lastName>
  </employee>
  <employee>
    <firstName>Peter</firstName>
    <lastName>Jones</lastName>
  </employee>
</employees>
```

Source: https://www.w3schools.com/js/js_json_xml.asp
JSON-LD

Linked Data
Linked Data empowers people that publish and use information on the Web. It is a way to create a network of standards-based, machine-readable data across Web sites. It allows an application to start at one piece of Linked Data, and follow embedded links to other pieces of Linked Data that are hosted on different sites across the Web.

JSON-LD is a lightweight Linked Data format. It is easy for humans to read and write. It is based on the already successful JSON format and provides a way to help JSON data interoperate at Web-scale. JSON-LD is an ideal data format for programming environments, REST Web services, and unstructured databases.

Source: https://json-ld.org/
JSON-LD

{
   "@context": "https://creddreg.net/ctd1/schema/context/json",
   "@id": "https://credentialengineregistry.org/resources/ce-1abb6c52-6f8c-4b17-9f89-7e9807673106",
   "@type": "certerns:CredentialOrganization",
   "certerns:ctid": "ce-1abb6c52-6f8c-4b17-9f89-7e9807673106",
   "certerns:duns": "007424644",
   "certerns:fein": "351150631",
   "certerns:name": {
      "en": "Ivy Tech Community College of Indiana"
   },
   "certerns:image": "https://www.ivytech.edu/images/ivy-tech-2615-logo_header.png",
   "certerns:opeID": "009917",
   "certerns:offers": [
      "https://credentialengineregistry.org/resources/ce-7533f794-87d4-4268-8f1d-a8e4d7b402ac0",
      "https://credentialengineregistry.org/resources/ce-26028070-1851-44dc-b3bd-4e36c8b80f60",
      "https://credentialengineregistry.org/resources/ce-e73d3b3-bbb3-4b74-9d20-66025972c70",
      "https://credentialengineregistry.org/resources/ce-9e3ef525-1ec4-4cc8-bf65-62fa101585f5",
      "https://credentialengineregistry.org/resources/ce-ch3d1cf-482e-4e9a-8e11-12e9e10c86e2",
      "https://credentialengineregistry.org/resources/ce-9d98090e-07cb-4520-8d00-aab6f261f2d0",
      "https://credentialengineregistry.org/resources/ce-2bd1028e-6c20-4758-a87b-5787c3cb31ba",
      "https://credentialengineregistry.org/resources/ce-924c1d80-5b42-4d20-ab5f-e6e76b26324b",
      "https://credentialengineregistry.org/resources/ce-c88b762-028c-4a5c-9c9c-5222a1f9425b",
      "https://credentialengineregistry.org/resources/ce-ed6a602c-7ab0-46d2-a208-313e74ac5592",
      "https://credentialengineregistry.org/resources/ce-50b91a0-eccd-49af-aa1b-7e32e93f3ae9",
      "https://credentialengineregistry.org/resources/ce-84af8ea0-2219-4827-9d64-56eadc976a6b",
      "https://credentialengineregistry.org/resources/ce-9dd8b3db-432b-3d2d-97e3-b91098174ee5",
      "https://credentialengineregistry.org/resources/ce-50a4d48-ff79-4ff3-8cb2-9ac723b9f478",
      "https://credentialengineregistry.org/resources/ce-63df506-58ef-4ab9-8aa9-d03bc0f8b6e7",
      "https://credentialengineregistry.org/resources/ce-4acc9f42-4419-4873-8d1d-55ac4c230ea9"
   ]
}
Portable Document Format (PDF)

History & Overview
• Released by Adobe Systems 1993
• Cooperated w/ISO for standardized subsets
• Open standard in 2008
• Image vs. data
• Sending: extract a data from SIS spool to PDF
• Receiving: determine how to get data to SIS
• Authentication
• Encryption
• Attachments at document or page-level

Challenges
• Email directed to spam filters
• Bad email addresses
• Security features can cause issues for uploading, expirations, etc.

Benefits
• Familiar - mirror official paper transcript
• Quick implementation
  • Supported by a variety of vendors
  • Requires little technical knowledge
• Affordably deliver transcripts
PDF best practices

• Utilize security within the PDF according to the audience receiving it
• Use secure transmission methods
• Keep it digital
• Consider batching
• Explore OCR
• Coordinate with primary trading partners
Electronic Data Interchange (EDI)

• The AACRAO Standardization of Postsecondary Education Electronic Data Exchange Committee (SPEEDE) began developing national standard in 1989 (initial format for the College Transcript)

• US Department of Education’s National Center for Education Statistics (NCES) began developing a national standard during same timeframe (K-12)

• Both groups worked with the American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 to develop standard formats (ANSI ASC X12 Transaction Set 130 for the Student Educational Record (Transcript) approved in early 1990’s)

• Adopted as approved PESC (P20W Education Standards Council) standards around 2008 (maintained by Education Record User Group (ERUG), Current version is TS130 Version 4.0, May 2009)
EDI format

- Delimited – like a CSV file
- Named “Segments”
- Mixture of Optional and Required fields and segments
- Multiple Occurring and Nested Segments
EDI format example

```
SES|200507|1|||Fall 2005;
SUM|U|4|N||1|||3.33;
CRS|R|U||1|01|B+|||82|0014.000|3.33||CECN|801|Principles of Eng Economics;
SES|200601|1|||Winter 2006;
SUM|U|U|N||1|||3.67;
CRS|R|U||1|01|A-|||3.67||CVL|425|Hydrology and Hydraulic Eng;
SES|200609|1|||Fall 2006;
SUM|U|U|N||1|||3.67;
CRS|R|U||1|01|A-|||3.67||CVL|324|Geotech Properties of Soil I;
```

Named Segment  Empty – i.e. Optional Fields  Segment Terminator
EDI considerations

• Capabilities of the organization
  • IT resources available
  • Interest level of senior management
  • Compatibility with SIS

• Cost/benefit analysis
  • In house vs. vendor sponsored solution
  • Efficiency gains
  • Process reengineering

• Strategic goals
  • Preferred trading partner methodologies

• Technical complexity limits some institutions

• Need for translation software or SIS compatibility to recognize full benefits

• Data mapping can be cumbersome

• Perception of complexity or lack of IT resources

• Many small important setup details, but it’s only done once
EDI Process Benefits

- Standards are consistent
- Resources are available
- Processes can be batched and automated
- Large network of institutions using standard
- Efficient transmission of data

- State/Province and district initiatives
- Sender and receiver are identified
- Automated acknowledgements
- Secure transmission
- Costs decrease
- Speeded delivery 😊
Best fit?

• Identify the problem to be solved
• Determine guiding principles
• Identify potential solutions
• Validate solution
EDI to XML crosswalk

• Support interoperability among users of different PESC Standards

https://www.pesc.org/pesc-approved-standards-1.html
Multiple formats and structured data

• EDI and JSON and PDF and XML, Oh My!
• Each has their own benefits – the key is structure using a standard
• Adoption of one format or another may be influenced by:
  • Capabilities of your technical team
  • Capabilities of your existing Student Information System
  • Capabilities of your partners with whom you will exchange
• You do you.
Variability among implementations

• PESC Implementation Guides are not law/gospel
  • Control of content and format lies with the Institution
• When exchanging with many partners, you may need to learn their ways
• Transcripts not just grades – reflect the uniqueness of the institution
• Varied use of NoteMessages and UserDefinedExtensions
• It is challenging to manage
  • This is a core value proposition of exchanges, hubs and related vendors/partners
What’s happening now?

• OCAS Initiatives
• USC Experience
• UOPX Case Study
About OCAS - Our Products and Services

**Domestic Application Service**
- Apply
- Mobile App
- College-Branded Application
- Electronic Transcript Exchange
- Partner Portal

**International Application Service**
- Applicant Portal
- College Portal
- Agent Portal
- SIS Integration

**Data and Insight Services**
- Applied Research
- Business Intelligence
- Data Warehouse

**Learner Experience Services**
- Ontariocolleges.ca Experience
- Tier 1 Support
- Outbound Calling/Marketing

**Technology Services**
- Website Design and Development
- Managed Cloud Hosting
- IT and Project Management Consulting

**Finance Services**
- Bookkeeping and General Ledger
- Payroll
- Accounting

**Service Innovation**
- Apprenticeship Modernization
- Credential Modernization
- Continuous Learning Platform
Transcript Exchange in Ontario

20 Public Universities (502,000 enrolled)
24 Public Colleges (273,000 enrolled)
876 High Schools (630,000 students)

Retiring the EDI Format
Colleges: 2021
Universities: 2022
The EDI experience at USC

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$avings

• 25-35% savings for senders
• 65-75% savings for receivers
• Savings contingent on volume, partners and level of automation

• **Cost Savings Calculator**
University of Phoenix Case Study
Costs and volume by method

Requests
Volume 1 yr = ~60,000

Cost by request method
(not including Vendor service fee(s))

• Electronic PDF Request
  • Average Institution Fee $4
• EDI
  • Average Institution Fee $0
• PAPER
  • Average institution Fee $7.69

Electronic Partnerships = 4821
(requesting & receiving)

• Requests
  • Electronic 92% vs. Physical 8%
    • SPEEDE Server (EDI TS146) 2%
    • Institution/Vendor Portal 90%
    • USPS/paper 8%
• Receipt
  • Electronic 83% vs. Physical 17%
    • XML <1%
    • EDI 10%
    • PDF 73%
    • PAPER 17%
The WHY!

**Time to Fulfill Request**
- Electronic (PDF, EDI): 1.5 days
- PAPER: 17 days

**Time to Process Transcript Received**
- PAPER: 3 days
- PDF: 1-2 days
- EDI/XML: SAME DAY!!!

**Rework/Student Experience**
- PDF/PAPER errors: 5%
- EDI exceptions: 1%
Results of adoption

**EDX benefits to the student…**
- Timeliness
- Accuracy
- Security

**EDX benefits to institutions…**
- Decreases risk of exposing PII
- Decreases acceptance of fraudulent credentials
- Decreased operating cost
- Reduces errors
- Improves partnerships
- Improve efficiency
Evolution of PESC standards

• PESC Standards continue to evolve in formats and content
  • Robust but responsive process via Standards Development Forum
• Extremely diverse network of institutions with different areas of study, geographies, student bodies
• Rapidly growing number of consumers of transcripts outside Post-Secondary Education (employers especially)
• Evolution of Credential and Learner record ownership (Consent)
• Interoperability with other standards beyond PESC facilitates student mobility
Future

• [www.aruccnationalnetwork.ca](http://www.aruccnationalnetwork.ca)  
  Student Mobility across Canada

• CanPESC Common Digital Layout Working Group
EDI vs. JSON vs. PDF vs. XML

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THANK YOU!