




**Strategic Roundtable RT 2:
What's In a Standard? Tales of Mapping and
Exchanging Electronic Transcripts**

Monday, June 16, 2014
4:30 – 5:30 pm
Discussion led by:
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ARUCC Rep to AACRAO SPEEDE Committee,
ARUCC Rep to Canadian PESC User Group



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eTranscript Roundtable Synopsis

The American computer scientist Andrew S. Tanenbaum once said,
“The nice thing about standards is that there are so many to
choose from.”

Members of the *Canadian PESC User Group* have spent the last
two years working towards the goal of a *Canadian electronic
transcript exchange network*.

In a data exchange world that includes the widespread use of *ANSI
X12 EDI* and many longstanding *proprietary* values, but is
moving rapidly towards *PESC XML*, what sorts of issues have
presented themselves during *data mapping* and *exchange*
exercises?


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eTranscript Roundtable “Agenda”

- Desire is to make presentation as interactive as possible
- Prepared slides
 - eTranscript exchange
 - Available standards
 - Gotchas
- Attendee input
 - Discuss your experiences, issues, questions

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Electronic Data Exchange (EDX)

- EDX = umbrella term covering EDI, XML and PDF
- Computer-to-computer exchange of standardized documents
- An electronic replacement for
 - Mail
 - Fax
 - Courier
- Eliminates or reduces
 - Fraud
 - Delays
 - Re-keying of Data
 - Errors (both in keying and interpretation)


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eTranscripts: you may feel like this ...




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Lessons Learned

1. We now have it within our power to completely eradicate fraudulent transcripts.
2. EDX transcripts are no harder to implement than printing transcripts was originally. It is just a different **Format**.
3. The facility to send and receive EDX transcripts (EDI, XML or PDF) already exists within many student systems.


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EDI Format

- Delimited – like a CSV file
- Named “Segments” (i.e., rows)
 - Can repeat and be nested
 - e.g., *CRS*
- Numbered “Fields” (i.e., columns)
 - e.g., *CRS01*
- Mixture of Optional, Required and Conditional

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EDI Sample (snippet)

```

SES|199906|1||SM99;
SUM|Q;
CRS|R|Q|4|0|511|S||L||81|230401|0||COMM|121|COMMUNICATIONS I;
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;
    
```

Delimiter
Empty – i.e. Optional Fields
Segment Terminator

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EDI Format – Implementation Guides (I.G.)

Detail (Table 2):

Pos	ID	Segment Name	Req	Max Use	Repeat	Notes	Usage
LOOP ID - SES							
180	SES	Academic Session Header	O	1	1000		Used
183	SSE	Entry and Exit Information	O	1			Used
190	NTE	Note-Special Instruction	O	50			Used
200	NI	Name (Override Institution)	O	1		N2/200	Used
210	N3	Address Information	O	1			Used
220	N4	Geographic Location	O	1			Used
LOOP ID - SUM							
240	SUM	Academic Summary	O	1	5		Used
240	NTE	Note-Special Instruction	O	5		N2/210	Used
LOOP ID - CRS							
250	CRS	Course Record	O	1	50		Used
260	REF	Reference Identification	O	5			Used
270	CSU	Supplemental Course Data	O	1			Used
271	L1U	Language Use (Language of Instruction)	O	10			Used
272	RAP	Requirement, Attribute, and Proficiency	O	5			Used
280	NTE	Note-Special Instruction	O	50			Used
290	NI	Name (Override Institution or Agency)	O	1		N2/290	Used
300	N4	Geographic Location	O	1			Used
LOOP ID - MKS							
305	MKS	Marks Awarded	O	1			Used
306	L1U	Language Use (Language of Examination)	O	1			Used

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EDI Format – I.G.(cont'd)

CRS Course Record Page: 256 Detail: Opened Max: 1
Loop: CRS Email: ID

To provide the receiving institution or organization with information about courses taken and the status of those courses

Element Summary:

Ref.	Id.	Element Name	Res	Size	Min/Max	Usage...
CR01	11P	Rate for Academic Credit Code Description: Code indicating how academic credit was granted by an institution or earned by a student Code NAME A The College Board's Advance Placement (AP) Program B Credit by Exam C College Level Examination Program (CLEP) D Credit Awarded for US Department of Defense DANIELS Program E Departmental or Institutional Credit based on experience (Life Experiences) F Study Abroad G The College Board's (CBEES) Credit H Completion or Removal of an Incomplete Grade I International Equivalencies M Military Code N Correspondence P International Council on Education Program on Non-Resident Sponsored Instruction (ACE PONS) Credit Recognition R Special Exception T Academic Credit Transferred in From Another Institution U Credit in Various States (No Code Assigned) W Work Experience X Not Applicable (No Prog. - Grade 12 non) Z Other Types Not Included in Above List	M	ID	1:1	Must use
CR02	11B	Academic Credit Type Code Description: Code indicating the type of credit used (provided by the sending institution) Code NAME A Adult Credit C Continuing Education Unit G College Unit D No Credit Q Quarter Hour Credit R Quarter Hour Credit	G	ID	1:1	Used



EDI Format (cont'd)

Common Formatting Questions:


- Transmission Segments & Fields (i.e., sender & receiver)
- Institution ID's
- Transcript Legend

... Do you have any questions?




What is XML ?


- XML stands for eXtensible Markup Language
- XML is a markup language much like HTML
- XML was designed to *carry* data, not to *display* data (though it can)
- XML is designed to be self-descriptive



What is PESCC XML ?

- PESCC = P20W Education Standards Council
www.pesc.org 
- North American higher education standards-setting body
- XML "schemas" (standardized definitions):
 - Documents (e.g., Transcript)
 - Data elements (e.g., Course, Name)

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PESCC XML Sample (snippet)

```

<AcademicRecord>
  ...
  <AcademicSession>
    <AcademicSessionDetails>
      <SessionDesignator>1999-06</SessionDesignator>
      <SessionName>SM99</SessionName>
      <SessionType>Quarter</SessionType>
    </AcademicSessionDetails>
    <Course>
      <CourseCreditBasis>Regular</CourseCreditBasis>
      <CourseCreditUnits>Quarter</CourseCreditUnits>
      <CourseCreditLevel>Undergraduate</CourseCreditLevel>
      <CourseCreditValue>4</CourseCreditValue>
      <CourseCreditEarned>0</CourseCreditEarned>
      <CourseAcademicGradeScaleCode>S11</CourseAcademicGradeScaleCode>
      <CourseAcademicGrade>S</CourseAcademicGrade>
      <CourseCIPCode>230401</CourseCIPCode>
      <CourseQualityPointsEarned>0</CourseQualityPointsEarned>
      <CourseLevel>Lower Division</CourseLevel>
      <CourseSubjectAbbreviation>COMM</CourseSubjectAbbreviation>
      <CourseNumber>121</CourseNumber>
      <CourseTitle>COMMUNICATIONS I</CourseTitle>
    </Course>
  </AcademicSession>
  ...
</AcademicRecord>
  
```

Annotations: Tags (pointing to opening and closing tags), Data (pointing to attribute values), End Tags (pointing to closing tags).

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PESCC XML Format – Implementation Guide (I.G.)


PESCC XML College Transcript Implementation Guide
Version 1.4.0 August 16, 2012

Table of Contents	
Page	
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v	Development History and Acknowledgments
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x	About Versions
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5	Header
6	Organization
10	LocalOrganizationID
11	Contact
13	Address
18	Phone
18	Fax/Hours
20	Email
21	URL
22	Accreditation
24	Distribution
25	Organization
29	LocalOrganizationID
30	Contact
32	Address
35	Phone
37	Fax/Hours
39	Email
40	URL
41	Student
43	Person
47	Agency/Identifier
49	Birth
51	Name

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PESC XML Format – I.G. (cont'd)

StudentAcademicRecord.AcademicSession.Course




Course element is too large to view easily here ...
Let's look at another example to get the idea ☺

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PESC XML Format – I.G. (cont'd)

Student.Person.Name



Tag Name	Schema Element	Description	Recommended Use	Format
NameCode	Optional	The type of name being included in the transcript for the student	Recommended	maxLen 2 Enumerated: 1 Enumerated: 2 Enumerated: 3 Enumerated: 4 Enumerated: 5 Enumerated: 6 Enumerated: 7 Enumerated: 8 Enumerated: 9 Enumerated: 10 Enumerated: 11 Enumerated: 12 Enumerated: 13
NameAlpha	Optional	An alphabetic, title or form of address that precedes the name	Not Recommended	maxLen 50 maxLen 1 maxLen 3 maxLen 5 maxLen 10
FirstName	Optional	The first name of the person, usually given at birth, baptism, or during another ceremony, or through legal adoption	Recommended	maxLen 50 maxLen 1 maxLen 3 maxLen 5 maxLen 10


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Translating Between EDI and PESC XML

EDI "course":
CRS|E|Q|4|0|511|S|L|81|230401|0|COMM|121|COMMUNICATIONS I ;

Same "course" in PESC XML:

```
<Course>  
<CourseCreditBasis>Regular</CourseCreditBasis>  
<CourseCreditUnits>Quarter</CourseCreditUnits>  
<CourseCreditLevel>Undergraduate</CourseCreditLevel>  
<CourseCreditValue>4</CourseCreditValue>  
<CourseCreditEarned>0</CourseCreditEarned>  
<CourseAcademicGradeScaleCode>511</CourseAcademicGradeScaleCode>  
<CourseAcademicGrade></CourseAcademicGrade>  
<CourseIPICode>230401</CourseIPICode>  
<CourseQualityPointsEarned>0</CourseQualityPointsEarned>  
<CourseLevel>LowerDivision</CourseLevel>  
<CourseSubjectAbbreviation>COMM</CourseSubjectAbbreviation>  
<CourseNumber>121</CourseNumber>  
<CourseTitle>COMMUNICATIONS I</CourseTitle>  
</Course>
```




Translating Between EDI and PESC XML (cont'd)

- SPEEDE Committee developed crosswalks
 - not yet complete for *all* versions of *all* PESC standards
- OUAC, OCAS and some U.S. schools have developed proprietary translation processes based on SPEEDE's crosswalks
- SPEEDE Committee developing open source software
- Multiple translations are *equivalent*, but not *identical* to the original:

XML₁ → EDI → XML₂ EDI₁ → XML → EDI₂


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EDX Challenges – Mapping & Sharing

- Multiple representations of the same data
 - e.g., Courses (within semester or not), Grades (actual or “special”)
- Parts of standards are open to interpretation
 - e.g., DEG/FOS vs. SES13 → program of study?
 - e.g., <TransmissionType> → “Resubmission” vs. “Reissue”
- Some data exists in either EDI or PESC XML *but not both*
 - e.g., <CourseCreditLevel> was not in EDI
- Some data exists in both EDI & XML *but not the same format*
 - e.g. # 1, character codes vs. word codes
 - “L” versus “LowerDivision” from previous example

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EDX Challenges – Mapping & Sharing (cont'd)

- Some data exists in both EDI & XML *but not the same format (cont'd)*
 - e.g. # 2, addresses

2 fields, each max 55 char

EDI:
N3|Adm Office, Bldg A|33-72nd Ave-
N4|Toronto|ON|MSK 3A1|CA-


Country only specified in XML if not U.S., Canada

up to 3 occurrences, each max 40 char

XML:
<Address>
<AddressLine>Adm Office</AddressLine>
<AddressLine>Bldg A</AddressLine>
<AddressLine>33 - 72nd Ave</AddressLine>
<City>Toronto</City>
<StateProvinceCode>ON</StateProvinceCode>
<PostalCode>MSK 3A1</PostalCode>
</Address>

- Standards evolve over time
 - PESC XML attempts to maintain backward compatibility

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EDX Challenges – Mapping & Sharing (cont'd)

- EDI “NTE” and PESC XML “NoteMessage” & UDE’s
 - For data that doesn’t “fit”, isn’t specific enough or may only be applicable in a certain jurisdiction
- Mutually defined codes
 - e.g., BGN02 / <RequestTrackingID>
- “Non-standard” usage of codes
 - e.g., DEG01 “level of academic award”
 - Ontario universities defined several additional codes to fulfill business requirements
- Automated document matching & exceptions
 - Which fields? Effectiveness? Always included?
