Notes from the Rome European Workshop, 9 November 2007

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Publisher's Note: The Workshop was organized by four e(Euro)-generation entrepreneurs independent of any formal standards-setting organization and with informal support from EUNIS (European University Information Systems) organization. U.S. readers should be aware the participation of the three U.S. representatives was based on a transmittal email from EUNIS President Martin Price to Jim Farmer. The PESC (Postsecondary Electronics Standards Council) Board—an organization developing data exchange specifications for U.S and Canadian higher education—asked Board member Dave Moldoff to attend representing the organization. Randy Timmons was asked to attend because of his experience and expertise in data exchange in the U.S.

The announcement of the Rome European Workshop began:

> Defining electronic standards and procedures for the exchange of student curriculum data between Institutions of Higher Education within international mobility.
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> **Background:** As a result of the growing internationalisation of higher education in Europe which is also supported by the new Lifelong Learning Programme, an increasing amount of students are spending time at numerous institutions during their course of studies. It is therefore necessary that all institutions visited by the student can access and manage the student's complete curriculum data in their student management systems. This data should include all the courses attended and grades attained by the student at all previously visited institutions and is the basis for ECTS /diploma supplement. The standard format for the data exchange should be based on the existent standards for the description of study programmes and course units (CDM, XCRI, etc) completed with information regarding the participation of students in course units. An online collaborative platform is to be defined for the request and exchange of data among partner institutions.

Thirty eight attended the conference organized by unisolution Gmbh (DE), Digitary (IE), and Kion (IT).

There were three candidate specifications: CDM used in Norway and France (as CDM-FR), XCRI in the United Kingdom, and PESC used in the U.S. CDM 1.0 version 2 was issued 20 October 2004. XCRI 1 Nov 2001, and PESC transcript 30 April 2004 with a course inventory—similar to XCRI-CAP—expected in 2008.

The Swedish EMIL standard developers was aware of CDM (like XCRI) but wasn't an implementation of it. For instance, EMIL has the notion of presentations of a course, which CDM lacks. Having researched both and found neither a perfect fit for the UK, the XCRI developers took the best features of each.

In June 2004 Norway and Sweden jointly submitted EMIL (Education Information Markup Language)—the Swedish version of CDM—to CEN (Comité Européen de Normalisation) for standardization. The CDM / EMIL harmonization proposal that went to CEN in 2004 was rejected. It was only when the German PAS1068 was successfully presented earlier this year that developers of the XCRI, CDM, EMIL and CDM-FR got involved. Because all of the developers had been communicating and the German proposal arrived from outside this group, it was certainly a surprise and hence a source of most concern about the CEN process.

> CEN, the European Committee for Standardization, was founded in 1961 by the national standards bodies in the European Economic Community and EFTA [European Free Trade Association] countries.
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> Now CEN is contributing to the objectives of the European Union and European Economic Area with voluntary technical standards which promote free trade, the safety of workers and consumers, interoperability of networks, environmental protection, exploitation of research and development programmes, and public procurement.

Welcome to the European Workshop

In the opening welcome Simone Ravaioli and Stéphane Velay summarized the need for curriculum data exchange "Student mobility at national level (e. g. Bachelor ! Master) and international level (e. g. exchange mobility) creates the need for student curriculum data to be exchanged electronically between institutions." And they concluded: "The necessary technology is available. A widely recognised standard is missing, only some country specific standards are in place." The motivation for the meeting they organized was clear. The two organizations were trying to meet the needs of their users; they would like to do this is a way consistent with "standards," yet there was no "standard" available.

They summarized their goals—the goals of the meeting: "Get an overview of current initiatives and projects regarding standard data format and exchange of data at a national/ international level

- Summarise lessons learned
- Define a common vision for introducing and implementing an international standard for student curriculum data (eventually based on existing ones like Europass, CDM, etc.)
- Assess interest of universities and all other stakeholders
- Initiate common actions (work group, prototype, etc.)

They shared written comments from Tore Hoel, Vice Chair, CEN/ ISSS Workshop on Learning Technologies, Oslo University College: "I would like to inform you that the CEN/ ISSS Workshop on Learning Technologies is just about to start work on developing a harmonised European standard for exchange of Course Related Information. …This work is supposed in due time to be handed over to the CEN Technical Committee

353 for formal standardisation as an European Norm. We have also just accepted a new work item on a Curriculum Exchange Format, to be developed in the same manner in co-operation between the Workshop and the TC." Hoel invited participation of those attending the Rome European Workshop.

"Best Practices" Presentations

The morning session focused on "best practices"—how some of the universities were implementing data exchange. Italy maintains a student master file. Marco Lanzarini, CINECA, described this experience. CINECA provides networking and administrative services to 88 universities. Via Kion, CINECA provide student administration to 60 universities. CINCEA makes university data available to the public via the Web with specialized selection and display applications.

Alerto Leone, Consorzio Interuniversitario Alma Laurea described the collection of data from university graduates to improve internal and external effectiveness. The survey data is available to students and graduates, companies, and the universities directly using a Web application. Alma Laurea serves 50 of the 80 universities. The consortium is providing a longitudinal record for those students and companies who contribute. Though Leone did not comment on the use of the data for policy analysis, the volume is large enough that valid statistical analysis is possible even though not all former students participate.

It is interesting to note, from Leone's data, the high percentage of engineering and science, economics and foreign language graduates compared to the total. A quick view of the numbers suggests a bright future for Italian graduates and Italy.

unicon's Manual Dietz described the company's interest "unisolution offers software solutions and services for Institutions of Higher Education with a special focus on the Internationalisation of Higher Education." He described the "Data exchange processes in international mobility" as they have been implemented by moveonnet. He summarized the challenges:

- all countries have their own specific rules and organisational structure
- standard formats or procedures at a European level are missing
- student management systems are not typically conceived to manage international mobility

AND

- even good solutions take time and effort to be diffused!!"

He observes; this effort is "resulting in the improvement of quality of service for students" as well as improving administration in the universities.

Professor Hermann Strack, Hochschule Harz, concludes there are: "Synergies with "Big eGovernment." Documents should be exchanged using the OSCI (Online Services Computer Interface) protocol and electronic signatures currently implemented by German

government agencies. OSCI itself is based on Internet standards. He suggests that "Transcripts of Record" necessary to support mobile students should be communicated similarly.

There are two major benefits of this design: Sharply enhanced security since encryption could be used (in addition to e-signatures) during transmission omitting the availability of the original text at each intermediate nodes. e-Signatures provide assures validity of the document. To provide complete interoperability he listed four needed XML schemas—Xuniversity, XStudy/programme, XStudent and Xcertificate.

The approach suggested by Dr. Strack is similar to the Meteor project in the U.S.—real-time messaging based on XML, SOAP, encrypted messages, and Shibboleth authentication. The network supports financial aid data—business processes unique to ubiquitous student loans to the U.S. The network has been operational since 2001 without either a security breach or complaints of performance even though a response to a student may require exchanges of messages among three to eleven data sources. This experience validates Dr. Strack's recommendation to use OCSI technology.

Andy Dowling, Digitary, discussed how digital signatures had been used to provide legal validity to XML-based digital versions of Europass. The institution issues the digitally signed digital document to the student. The student provides the digitally signed digital document to an employer. The employer then verifies the validity of the document. This process has already been implemented in two universities and the rollout to all of the Irish Technical Institutes. Dowling also reported Digitary is participating in the development of an XML schema specification for the European Diploma Supplement and developing SOA (service-oriented architecture) interfaces to e-Portfolios.

This process is sharply different from the U.S. process where the institution issues all transcripts for a fee; these fees provide significant discretionary income for registrars. Registrars have been reluctant to consider any alternate business process that would threaten their income.

unisoltuion's Stéphane Velay defined the Europass Mobility Instrument as "A standard template for the detailed recording of trans-national learning or working experiences in another country within the European Union and European Economic Area." "Europass [is] sort of (e) Portfolio collection of documents which describe the skills and competencies of an individual [and was] developped by the European Centre for the Development of Vocational Training (Cedefop)." Europass may include language skills. diploma supplement (higher education qualifications), certificate supplement (vocational qualifications), and mobility (periods of learning within a Mobility programme)." The XML-based Europass has software that renders it in HTML for Web pages, Adobe (or ISO) PDF (portable document format, or the Microsoft and OpenOffice file formats.

With a similar purpose of the U.S. college or university transcript, the Europass Diploma Supplement is issued to graduates of higher education institutions along with their degree

or diploma. The Europass Diploma Supplement was developed jointly with UNESCO and the Council of Europe.

The U.K.'s Joint Information Systems Committee (JISC) sponsored the development of XCRI in 2005; the effort continues and is funded through March 2009. This work began using the CDM and EMIL specifications.

Mark Stubbs, who led the XCRI (eXchanging Course- Related Information) project, described the XCRI Course Advertising Profile as "an open specification for producing and aggregating collections of courses offered by [education] providers." XCRI was developed in 2005. The first version was field tested at two further education colleges, three institutions of higher education, and two organizations that aggregated course information for a region. The choice of the "Advertising Profile" was to obtain a larger number of implementations by meeting the needs of a high-demand application and an application that had no or minimal legacy implementations. He recommend focusing on the "core data elements" and later extend the specification for, as examples, curriculum management, e-Admissions, e-application, transcripts, student records, pathways advice (career planning in the U.S.), portfolio, and personal development planning. He also had encouraged harmonization of overlapping and competing standards—the primary motivation of those organizing the workshop.

Stéphane Velay provided information about CDM in Norway and France. He said one of the primary advantages of CDM was its extensiveness. "[CDM] can be used to describe all level of granularity of the university educational offer (curriculum, diploma, course, course unit..) as well as related pedagogical objectives, registration procedure, organisation and contact details." He commented "The French Ministry of Education developed a French application profile of CDM being progressively deployed by French universities." After the conference it was confirmed the ESUP Portail Project—now a consortium of 105 universities, research centers, school districts, and government agencies—began implementation in 2005. (The consortium began as 17 universities adopting uPortal as the basis of their institutional architecture. ESUP Portail leader Alain Mayeur is a JA-SIG Board member).

David K. Moldoff, PESC Director & Founder and CEO of AcademyOne, listed several uses of course data and how College Transfer.net provides access to the data. He demonstrated how course equivalencies were displayed. This permits students and faculty to see how a course at one college or universities compares with courses at other colleges and universities. This is a function that was not identified in other presentations. Equivalencies are important in the U.S. where many students take courses in a community college for one or two years and get "credit" for equivalent courses at a college or university where they 'transfer" to complete their degree. He identified the PESC standards used in the College Transfer.net example and described the organization, activities, and processes of the Postsecondary Electronic Standards Council.

PESC has both the earlier electronic data interchange (EDI) standard and the XML specification for transcript data, admissions and test score specifications, and student

financial aid transactions. (In September 45,000 transcripts were exchanged electronically with 38,000 acknowledgements, and 36,000 admissions applications. 156,000 documents were exchanged that month. The average month exceeds 200,000 documents increasing about 20% per year.)

Jonas Brorssson, Ladokkonsortiet, described the Ladok Consortium and LadokPing. The Consortium is 35 universities using the same software "tools" using their own student databases. With mobile students and joint degrees, there is a need for immediate access to student data. Mikael Berglund, Umeå University, described Ladok Ping as on-line real-time access to the national data base (98% of all students) by "Student aid officers, Degree officers, Students, and Potential employers."

This may be the first online, real-time access to national or regional higher education data, designed to meet the needs of many different people, including students, who have different roles. A similar system—limited to student course—using SOAP messaging, Shibboleth authentication with SAML attributes, and message encryption was developed as a prototype for the California Community Colleges. The project director said the Java technology was too complex to be supported. Berglund may reflect a similar view saying the technology "Is expensive to implement." But, of course, Ladok was successful.

Lígia Maria Ribeiro, Universidade do Porto representing EUNIS, described the organization and its activites. She said EUNIS was interested in the implementation of the Bologna process and was participating in JISCinfoNet. She commented students expressed the need for the Bologna process. She also mentioned one of the motivations of the European Commission for supporting the Bologna process was to achieve competition among universities [through student choice].

Open Discussion Periods

Several points were made in the two brief open discussion periods.

Mark Stubbs suggested the companies should concentrate first on the core elements of course descriptions and then broaden the applications later—the strategy used in the U.K. He responded the differences between CDM and XCRI core was small suggesting harmonization was possible.

Lucas Heymans, Oracle Corporation, suggested that every exchange of data with industry should be based on existing HR-XML specifications since interfaces already exist in company ERP (enterprise resource planning) systems. [Although invited, higher education did not participate in the development of these HR-XML specifications].

Both Lucas Heymans and Dave Moldoff suggested they—the Euro-generation entrepreneurs—should consult with someone who has had experience working with standards-setting bodies. They also suggested cooperation among the firms *before* the EU committee begins its deliberations of the CDM specification.

Dr. Strack suggested they consider an OCSI-based data exchange technology since he had been implemented and was successful.

Randy Timmons suggested they follow industry practices where relevant. This is particularly important when you begin real-time exchange of data among institutions or integrate with current ERP systems.

Appendix Workshop Presenting Participants' Partnerships

Firm	Partner	Product or Service
Datenlotsen Informationssysteme GmbH (DE)		
	IMC AG	Learing management system, authoring tool
	Intel DE	Wireless technology for campus management system
	Magic Software Enterprises	System integration, SAP VAR, Oracle and IBM partner
	Microsoft Corporation	Integration Microsoft Office into CampusNet
Digitary (Framework Computer Consultants Ltd) (IE)		
	Campus IT	Student management systems
	PCI Post Trust	Cerified EU digital certificates
	Sungard Higher Education	Student management systems
	Tribal Technology (Tribal Group plc) (UK)	Student management system SITS
evento (Balzano Informatik AG) (CH)		
	educo gmbh	consulting and integration
KION SpA (IT)		
	Apex-Net srl (IT)	System integration
	EUNIS association	Member and exhibitor
	Oracle Corporation	Adopter for the universities
	IBM Corporation	Services collaboration
	Sybase Inc.	PowerBuilder supplier
	Technosoft srl (IT)	Software for optical scanning and data entry
	unisolution gmbh (DE)	University international software and services
unisoltuion GmbH (DE)		
	Technische Universität Darmstadt	pilot user and product design and development
	KION spa (IT)	products integration, technology exchange
	Feigenbaumpunkt	graphic design
	moveonnet work group	collaborative business process design
	Université de la Réunion	development internship
	Università di Trento	marketing internship

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