IST/43
Information Technology for Learning, Education and Training

Proposal for a British Standard for Interoperability between Curricula, Syllabi and Competency Maps, in three parts:
Part 1 – Specification for mapping between normative standards and other metadata systems;
Part 2 – Code of Practice for development of localised metadata systems; and;
Part 3 – Code of Practice for the development of interoperability between systems

Draft v1.1
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for consideration at the meeting of
IST/-/1

27 February 2002

Version History

Version	Date	Description of changes
1.0	Dec 2001	Original version circulated for IST/43 committee meeting
1.1	Feb 2002	Changes to title, definition of parts 1-3, removal of part 4, clarification of scope and purpose, adjustments to lists of supporting organisations, minor changes to project plan

Executive Summary of a Proposal for a British Standard Framework for interoperability across curricula, syllabuses and competency maps

The transformation in the education and learning market over the last five years has been driven by four major technological and cultural changes:

- e-Learning – the Internet, intranets and extranets have revolutionised the way that multimedia training is delivered and have replaced the CD ROM as the primary means of delivering electronic learning content. The advent of distance learning across the Internet as apposed to educational institutions allows learners to choose from the full range of courses and providers rather than being limited to those in their geographical vicinity. The nature of the Internet also lends itself to modular learning, allowing courses to be personalised to individual needs.

- Increased diversity of courses and qualifications – formalisation of vocational courses and a rapidly expanding professional development market have led to an exponential increase in courses from an ever expanding number of providers.

- There have been fundamental changes to the job market - a rapid increase in short term and temporary contract work, and a far more migratory workforce (especially over international boundaries) have lead to difficulties in recruitment and development of staff. To cope with high staff turnover, and unfamiliar qualifications and accreditation schemes, employers must find new methods for determining whether people have the necessary skills for their jobs.

  Conversely, employees want to ensure that the skills they learn are transferable to other companies, sectors, professions and localities. They also want more modular training so that they learn just the things that they need, and expect 'just in time' or on-the-job-training from employers rather than long periods of training as part of initiation of employment.

- A variety of British Government initiatives aimed at repositioning the UK as a knowledge economy. These include the Modernising Government agenda as well as initiatives to promote lifelong learning and vocational training, expand the use of ICTs in schools, and a variety of regional economic regeneration schemes.

To succeed in this rapidly changing market, providers of education, training, lifelong learning, professional development and accreditation must reshape their business around these new user-expectations, methods for delivery and routes to market.

In this document we propose the development of a standard that will help the UK educational community to meet the challenges outlined above by enabling vendor neutral frameworks, facilitating the reusability of content, setting up interoperability, and mapping equivalences between an ever diversifying range of course materials, learning resources, accreditations and qualifications.

The benefits of the proposed standard are as follows:

Sector	Benefits
System / solution vendors	• Enable market for their products and services • Enable integration of multiple content producers • Easier integration of whole solutions • Higher quality end-user impact
Producers of learning materials	• Enable new markets and business models • Ensure reusability of content • Improve interoperability
Awarding and assessment bodies	• Enable new markets including export of services outside the UK • Accreditation of Prior Learning (APL) • Enable integrated systems drawing on multiple providers of learning content and assessments • Provide a more rounded service including remediation and retesting • Simplify accreditation processes by setting up equivalences and ensuring consistency across diverse range of courses and qualifications
Government	• Save money on content commissioning and creation by increased reusability and exploitation of new and existing content • Prevent vendor lock-in by facilitating vendor neutral frameworks • Consistency and simplified regulation of services offered within England, Northern Ireland, Wales and Scotland • Enable export of UK educational materials and services
Corporate e-learning users	• Easier procurement process • Integrate HR, training and recruitment systems • Qualification equivalences can be assessed through competency maps
Learners	• More choice when selecting training and assessment providers • Easier to transfer qualifications • Individualised targeted learning

IST/43 requests that IST/-/1 endorse their proposal to develop this standard.

The proposal is supported by the following:

1   A proposal for the scope of the project

2   A list of those organisations who have committed to work on the project

3   A draft project plan for the work (To be completed)

4   BSI form 11 (To be completed)

1. INTRODUCTION

This document is the scope for a proposed new British Standard for interoperability across curricula, syllabuses and competency maps

Working definitions:

Interoperability Framework – this defines the protocols, data and file standards and information structures that are used to enable data to be transferred between heterogeneous ICT systems.

Tier 1 metadata system – an international standard or specification such as IEEE LOM or IMS Metadata that does not contain local information specific to a particular implementation. Such systems do not usually include subject specific, pedagogical or attainment based vocabularies.

Tier 2 metadata system – a localised implementation of a standard or specification which includes variants to the normal element set, and specific controlled vocabularies.

Competency Map – a description of a qualification or competency framework, or part of a learner profile, which describes a set of key skills or competencies and associated attainment levels.

2. SCOPE

2.1 Who the standard is aimed at
The anticipated users of the standard are

- The Department for Education and Skills, The Department for Work and Pensions, and the Qualification and Curriculum Authority who set standards
- Local and Regional Grids for Learning who have regulatory responsibilities and disseminate best practice, and funding at a local level.
- Non-Departmental Public Bodies with education in their remit, for example, The British Library
- The Learning and Skills Councils and The Learning and Skills Development Agency that oversee vocational training in the country
- Universities, Further Education bodies and Lifelong Learning institutions who supply modular learning
- Professional Bodies running courses and issuing certifications and charters who need to understand parallels between courses from other issuing bodies
- Training users of online resources – governmental, corporate and private, for example the MoD, Department of Health and the aviation industry who use modular and just-in-time learning
- Vendors of training courses who want to maximise reusability of course materials and join up qualifications to optimise benefits to the user
- Solution Providers of learning management systems who write software that the training courses run on and want to provide integrated solutions and to interoperate with systems of other vendors
- National Training Organizations such as Metier (the NTO for the Arts) who provide careers and professional development guidance within specific sectors

Other interested stakeholders in the standard include:

- Learners who will benefit from transparency and gain flexibility in choice of course modules and portability of qualifications
- Teachers and trainers who need to make better use of resources and understand diverse curricula and how they interrelate
- Organisations that want to understand equivalencies between qualifications from different suppliers and for different employees, for example, national and overseas employers, education and training consultants, regulatory authorities (e.g. QCA, ACCAC, SQA and QAA), external auditors, funding organisations and government
- Educational publishers and content owners who want to maximise reusability of their content

2.2 UK-wide standard

The standard needs to be flexible enough to support curricula, syllabuses and competency maps across the whole of the UK despite regional variations.

2.2 Type of Standard and individual Parts

We propose a framework standard split into three parts:

Part 1 Specification for mapping between normative standards and other metadata systems

This will contain specific mappings between the element sets of existing and emerging Tier 2 systems used within the UK, such as the National Curriculum metadata system, and the system used by NGfL Scotland. Also specific mappings between Tier 1 systems for use within the UK.

Part 2 – Code of Practice for development of localised metadata systems

This will provide guidance to those developing Tier 2 metadata systems, and will include guidance on a minimum core element set that should be included in order to enable interoperability with existing systems within the UK.

Part 3 – Code of Practice for the development of interoperability between systems

This part will cover methods for interoperability, such as mapping into and out of overarching schemas, and methods for defining 'cross-walks' between specific systems. This part of the standard will also provide guidance on setting up mappings between controlled vocabularies (discussed further in Item 4, below). Guidance will be offered to enable users of the standard to determine the most appropriate method to use.

2.3 Purpose of the standard

What is this standard for?
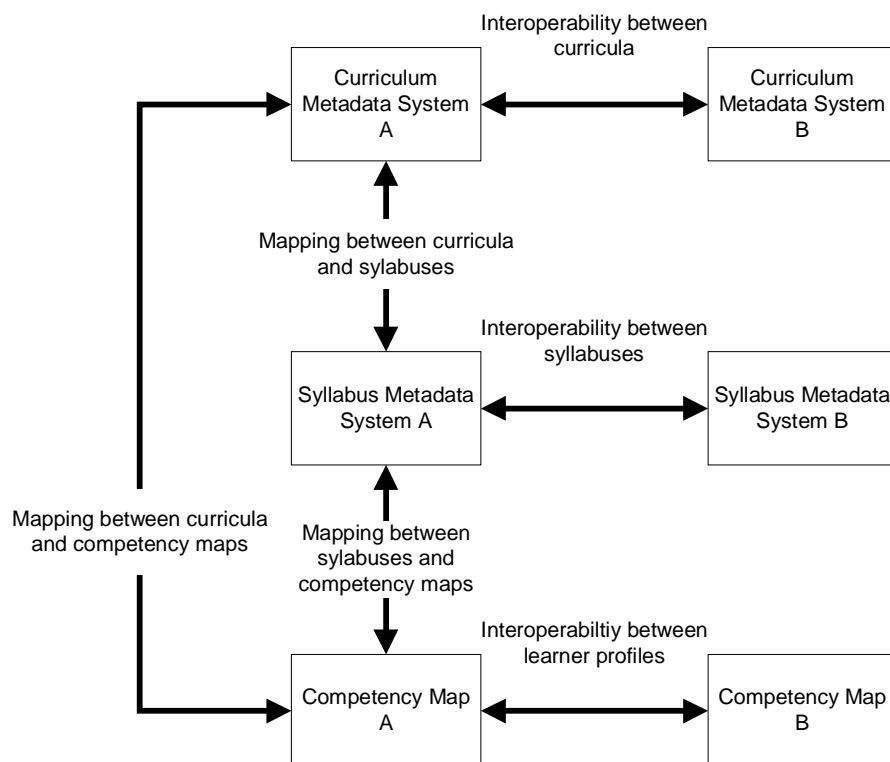
The standard is primarily intended to provide specifications and guidelines that will allow the transfer of data between localised Tier 2 metadata systems associated with curricula, syllabi and competency maps. The standard is intended to minimise, rather than completely remove, human interaction in the transfer of information between systems.

An example of use:

This standard will provide a mapping between the element sets of the National Curriculum metadata system (which is an extension of Dublin Core), and the metadata system used by NGfL Scotland (which is a localised version of European Schoolnet EUN). Guidance will also be provided within the standard to enable QCA and Learning & Teaching Scotland to define an approved mapping between their subject specific controlled vocabularies. The two together could then be used by vendors, publishers, and developers to transfer metadata records relating to learning resources between the two systems. Alternatively vendors, publishers and developers could define their own vocabulary mappings by following the guidance given within the standard, and in doing so achieve a similar result.

2.4   Limitation of scope

The standard is not intended to:
- Restrict organisations in their choice of core metadata system
- Place restrictions on generation of controlled vocabularies used within metadata systems
- Impose precise methods for implementing interoperability between systems
- Restrict protocols used for communication between IS/IT systems

The standard will not provide:
- Learning Objects Metadata for describing resources
- Criteria for assessing the educational value of content
- Learner Profiles, although profiles that contain competency maps could make use of the standard
- Pedagogical Vocabularies
- Mappings between controlled vocabularies, including subject specific and attainment vocabularies, which are maintained by the relevant regulatory authorities for specific curricula, syllabi or competency maps, although guidance to allow others to do so

3. Suitability for Internationalization

The standard is designed with the UK educational sector in mind but there is no theoretical or technical restriction on its use internationally.

The standard will enable an increase in the already strong market for UK training and education abroad.

4. Application of DTI CDS funding

There is provision for this work in the approved IST/43 Business Plan for 2002-3, which is subject to approval by IST/-/1. It is intended that IST/43 will apply for funding via the DTI Consultancy Drafting Scheme.

5. Normative and informative references

IMS Reusable Competency Definition Specification
http://www.imsproject.org/rcd/

IMS Learner Information Profile
http://www.imsproject.org/profiles/index.html

IEEE LTSC Standard for Information Technology --Learning Technology -- Competency Definitions
http://ltsc.ieee.org/wg20/index.html

IEEE LTSC Standard for Information Technology --Education and Training Systems -- Learning Objects and Metadata
http://ltsc.ieee.org/wg12/

Dublin Core Metadata Initiative
http://dublincore.org

National Curriculum Metadata Standard
http://www.nc.uk.net/metadata

Schools Interoperability Framework
http://www.sifinfo.org/

The following organisations have indicated that they are willing to be involved in the development of this standard The precise involvement will be confirmed during detailed planning at a future date.

- Education Online
- Simulacra Media
- NTO for the Arts - Metier
- UK Office of Library and Information Networking (UKOLN)
- Oracle
- Microsoft
- Nelson Thornes
- BECTA
- Chalkface
- City and Guilds

The following organisations have expressed an interest in the development of the standard; their involvement will be clarified at a future date.

- QCA
- University for Industry Limited (UfI)
- Oxford University Press
- Research Machines
- Centre for Interactive Assessment Development
- BIC
- EPC
- Sunderland University
- Edexcel Foundation
- The Learning and Skills Development Agency
- NCS Pearson
- Leighton Leigh Education
- Eloki Consulting
- RWCS
- RNCB
- UCLES
- NICCEA
- BSI

The following organisations are still to be contacted to determine their willingness to support the standard.

- Apple Computer
- Cisco
- The College of Law
- Department for Education and Skills
- Department for Work and Pensions
- IMS Global Learning Consortium
- Question Mark Computing Limited
- South African Qualifications Authority – NQF
- Sun Microsystems
- TÜV Product Services

Plan for preparation of a BS Framework for interoperability across curricula, syllabuses and competency maps
(assumes use of DTI Consultancy Drafting Scheme - CDS funding)

Item	Description	Deliverable	Notes	Start Date	Finish Date	Responsibility
1	Prepare Business Case and BSI form 11	Business Case and BSI Form 11		26 Jan. 2002	19 Feb. 2002	IST/43/-/3
2	Agreement in IST/43	Agreed proposal		25 Feb.2002	25 Feb. 2002	IST/43
3	Presentation to IST/-/1 and approval by IST/-/1	Approved Project		27 Feb 2002	27 Feb. 2002	IST/43 and IST/-/1
4	Announcement of 'New Work Started' in BSI Standards Update	Public awareness	Expected in April edition	Apr. 2002	Apr. 2002	IST/43 Secretary BSI Database
5	Members of IST/43 and IST/43/-/3 to inform contacts about the work	Public awareness		1 Mar. 2002	Ongoing	IST/43 and IST/43/-/3
6	Prepare a list of organisations to be consulted by the Drafting contractor in preparing the draft	List of Organisations to consult for incorporation in the drafting contract		26 January 2002	23 March 2002	IST/43/-/3
7	Preparation of Press Release to appropriate Education Publications that work is beginning	Press Release		26 Jan. 2002	1 Mar. 2002	IST/43/-/3 and BSI Press Office
8	Press Release to appropriate Education Publications that work is beginning	Public awareness		1 Mar. 2002	1 Mar. 2002	IST/43/-/3 and BSI Press Office
9	Establish WWW site for project	WWW site for project		1 Mar. 2002	31 Mar. 2002	Ian Huckvale David Keech
10	Prepare briefing for consultants to tender for preparing the draft	Consultant's brief		26 Jan. 2002	23 Mar. 2002	IST/43/-/3
11	Selection of consultants to tender for preparing the draft	Selected consultants	At least 3 prospective contractors	26 Jan. 2002	23 Mar. 2002	IST/43
12	Appointment of 'Steering committee' to monitor preparation of the draft	Steering Committee	Required by the terms of the DTI scheme	26 Jan. 2002	23 Mar. 2002	IST/43
13	Obtain letter of Government support for the standard	Letter of Support	Required by the terms of the DTI scheme	26 Jan. 2002	15 Mar. 2002	IST/43/-/3
14	Issue tender to selected consultants	Tenders issued		23 Mar. 2002	30 Mar. 2002	IST/43 Secretary
15	Preparation of quotations	Quotations for work	One month to prepare quotes	30 Mar. 2002	27 Apr. 2002	Selected prospective contractors
16	Close of period for tenders. Review and recommendation by the Steering Committee	Proposed contractor		27 Apr. 2002	4 May 2002	Drafting Steering Committee
17	Preparation and submission proposal of with recommended contractor to DTI for approval	Proposal to DTI	BSI external funding are already aware of project	7 May 2002	11 May 2002	IST/43 Secretary
18	Approval by DTI	Approval for DTI funding Agreement of contractor		11 May 2002	25 May 2002	DTI and BSI External Funding
19	Preparation and issuing of contract for the drafting work	Contact for Drafting		28 May 2002	1 June 2002	IST/43 Secretary BSI Purchasing Dept.
20	Drafting period	Draft Standard	Monitored by Steering group	1 June 2002	28 Sept. 2002	Selected Contractor BSI Text editing
21	Receive completed draft	Draft received		28 Sept. 2002	28 Sept. 2002	Selected contractor IST/43 Secretary IST/43/-/3

Plan for preparation of a BS Framework for interoperability across curricula, syllabuses and competency maps
(assumes use of DTI Consultancy Drafting Scheme - CDS funding)

Item	Description	Deliverable	Notes	Start Date	Finish Date	Responsibility
22	Review and acceptance of draft	Accepted draft	Payment to contractor can be authorised upon acceptance	28 Sept. 2002	5 Oct. 2002	Steering group
23	Review and acceptance of draft by IST/43/-/3	Accepted draft		28 Sept. 2002	5 Oct. 2002	IST/43/-/3
24	Review and authorisation to proceed to publish a BSI Draft for Public Comment (DPC)	Approval for DPC		5 Oct. 2002	12 Oct. 2002	IST/43
25	Prepare DPC	DPC	Includes announcement in 'Standards Update'	15 Oct. 2002	19 Oct. 2002	IST/43 Secretary
26	DPC issued and comments received	Comments from the public on the DPC		22 Oct. 2002	21 Dec. 2002	IST/43 Secretary
27	Prepare a press release for appropriate Educational Publications on availability of DPC	Press release to appropriate Educational Publications	Members of IST/43/-/3 encouraging public awareness and comments	22 Oct.2002	25 Oct. 2002	IST/43/-/3 and BSI Press Office
28	Press release to appropriate Educational Publications on availability of DPC	Press release to appropriate Educational Publications		25 Oct. 2002	25 Oct. 2002	IST/43/-/3 and BSI Press Office
29	Closure of period of public comment	Comments from the public on the DPC		21 Dec. 2002	21 Dec. 2002	-
30	Review and disposition of comments	Report on Disposition of comments. Decision on whether to revise draft and further DPC or proceed to publish	If document is significantly changed, may require a further iteration of the DPC process	2 Jan. 2003	31 Jan. 2003	IST/43/-/3
31	Text Editing of Final text	Final Text for agreement		31 Jan 2003	31 Jan. 2003	BSI Text Editing
32	Agreement to publish BS	Agreement to publish		1 Feb 2003	1 Feb. 2003	IST/43/-/3 and IST/43
33	Agreement of Final text	Agreed Final Text	Agreement recorded on BSI Form 8	28 Feb. 2003	7 March 2003	IST/43/-/3, IST/43, IST/- Secretary
34	Prepare a Press Release on Publication for appropriate Educational Publications on publication of Standard	Press release ready		28 Feb. 2003	7 March 2003	IST/43/-/3 and BSI Press Office
35	Press Release on Publication for appropriate Educational Publications on publication of Standard	Press Release		7 March 2003	7 March 2003	IST/43/-/3 and BSI Press Office
36	Publication	British Standard		14 March 2003	14 March 2003	BSI Production
37	Public Awareness of Publication	Usage of the publication		1 March 2002	2003 and onward	IST/43, IST/43/-/3 and other contacts
38	Post Publication review of plan	Project review report (may include recommendations on further work)		14 March 2003	28 March 2003	IST/43, IST/43/-/3