



JISC

PDP4XL2:
Personal Development Planning
for Cross Institutional
Lifelong Learning

Objective 4.1

Investigating the data structure of learner records for PDP in Blackboard and comparing it with the specification in ioPortal

Phosphorix Ltd

Daniel Cox, David Hunter, Selwyn Lloyd

1. OVERVIEW	3
2. DELIVERABLES.....	3
3. DATA STRUCTURES	3
4. AGGREGATION AND MIGRATION OF E-PORTFOLIO DATA	3
4.1 <i>BLACKBOARD CONTENT INTEROPERABILITY SPECIFICATION.....</i>	3
4.2 <i>TRANSFORMATIONS</i>	4
5 FURTHER RESEARCH.....	5
5.1 <i>COMPARISON OF IMS AND BLACKBOARD CONTENT PACKAGE STRUCTURE.....</i>	5
5.2 <i>VISUAL COMPARISON OF EPORTFOLIOS.....</i>	7
5.2.1 <i>Sample Blackboard EPortfolio.....</i>	7
5.2.2 <i>Sample IoPortal EPortfolio</i>	7
6 REFERENCES.....	8

1. OVERVIEW

Investigate the data structure of learner records for PDP in Blackboard and compare with spec in ioPortal.

2. DELIVERABLES

- PD4XL2_4.1.1 - Common Data Structure and content stored within Blackboard e-Portfolio Application identified.
- PD4XL2_4.1.2 - IoPortal Structure compared with results from 4.1.1.
- PD4XL2_4.1.3 - Identify and document map between these applications.
- PD4XL2_4.1.4 - Use of RSS feeds or similar technology to facilitate aggregation and migration of e-Portfolio data between applications investigated.
- PD4XL2_4.1.5 - Required transforms identified.

3. DATA STRUCTURES

The underlying data structures used in the Blackboard system were unavailable so comparisons of the data structure with the ioPortal data structure could not be carried out. However potential interoperability between the systems would most likely be done via XML (such as RSS feeds or export/import using data standards) so the lack of access to the database should not greatly impact any interoperability work.

We found api documentation about Blackboard, but nothing in terms of the underlying data structures was publicly available to us or easy to find.

In terms we have been restricted by the limited access we had to Blackboard either as a user of it and certainly restricted (No developer access)

4. AGGREGATION AND MIGRATION OF E-PORTFOLIO DATA

Investigation into migrating data from external applications has been discussed in "PDP4XL²: Work Package 4.2". It was proposed that a simple transformation could take place from an ePortfolio RSS feed into a ioPortal ePortfolio. The same concept applies to any RSS feeds provided by the Blackboard system.

In other words if there are XML feeds for blackboard e-portfolios (the example we were provided did not have one) we could import data from them.

4.1 BLACKBOARD CONTENT INTEROPERABILITY SPECIFICATION

Since we were unable to detect obvious interoperability potential via the demo links sent, we elected to research Blackboard documentation.

Blackboard uses an XML standard for interoperability called "Blackboard Learning System CIS 3.0". This is based on the IMS Content Packaging¹ XML standard (see 6 Further Research for more details on the Blackboard Learning System CIS 3.0).

The "Blackboard Learning System CIS 3.0 implements the core elements of the following specifications:

¹ <http://www.imsglobal.org/content/packaging/index.html>

- IMS Content Packaging (CP) specification version 1.1.3
- IMS Learning Resource Meta-data specification version 1.2.3
- IMS Question and Test Interoperability (QTI) specification version 1.2”²

The above elements cover all the data stored in an ioPortal ePortfolio and thus ioPortal could be extended with an interface to import Blackboard Learning System CIS 3.0.

This standard is primarily designed for transport and interoperability between different Blackboard installations. However any open standards implementation can be used to provide interoperability between any system that supports the standard.

4.2 TRANSFORMATIONS

IoPortal could be extended to support both the IMS Content Packaging standard and the Blackboard extensions using new ioMorph³ XSL transformations.

Two new transformations would need to be written.

1. import data held in IMS CP into the ioPortal ePortfolio XML structure
2. export an ioPortal ePortfolio into IMS CP

Two additional transforms would need to be written to handle any Blackboard specific extensions to the IMS standard. In addition the ioPortal system will need to be extended to import any additional files (documents, images etc) that are held within the IMS CP zip file into its file repository.

² Blackboard Learning System - Vista 4.2/CE 6.2 Enterprise Content Interoperability Specification

³ <http://iomorph.ionetwork.ac.uk/website/>

5 FURTHER RESEARCH

5.1 COMPARISON OF IMS AND BLACKBOARD CONTENT PACKAGE STRUCTURE

The “Blackboard Learning System CIS also defines a unique schema and namespace to represent the system’s base extensions to the IMS CP schema. These extensions are used when describing all learning objects. In addition, the Blackboard Learning System CIS defines a unique schema and namespace for each WebCT learning object it supports. The elements and attributes defined in the namespace for each of these schema represent content-rich features that are not defined by the IMS CP schema.

An IMS CP manifest contains three main sections: Metadata, Organizations, and Resources. A CIS manifest contains four main sections: Metadata, Organizations, Resources, and ContentObject. This is shown in the following diagram.

The ContentObject section contains additional learning object features that are not covered by the IMS CP and Meta-data specifications.”⁴

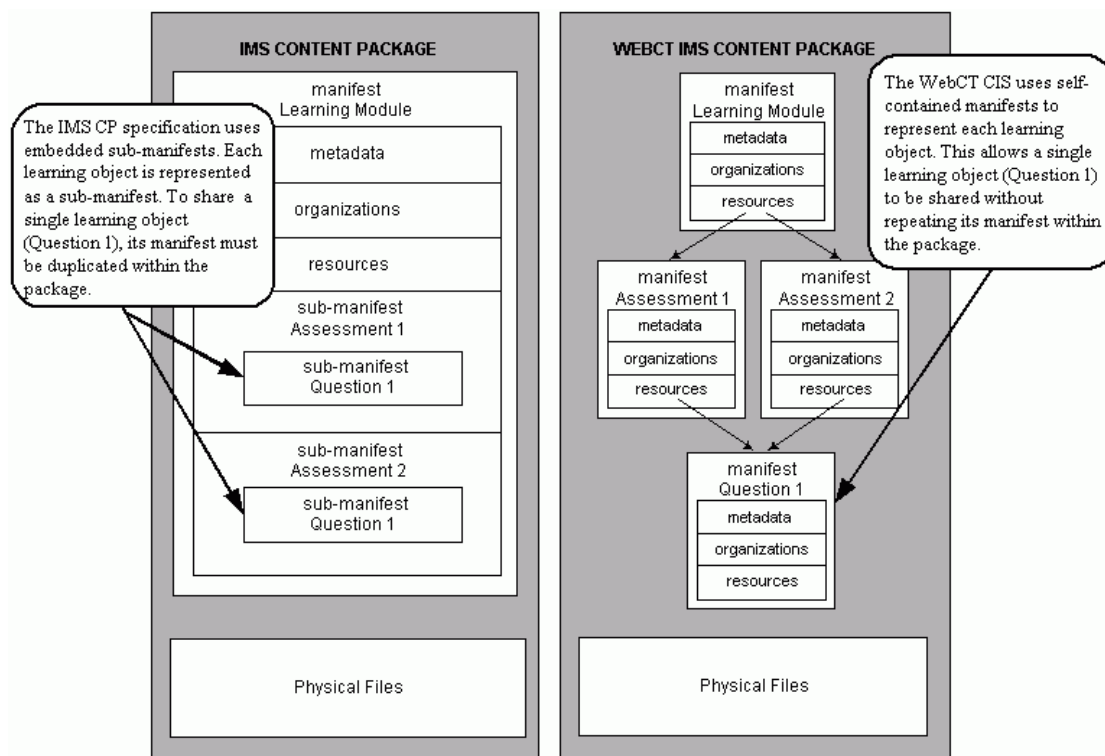


Illustration 1: Source - Blackboard Learning System - Vista 4.2/CE 6.2 Enterprise Content Interoperability Specification

4 Blackboard Learning System - Vista 4.2/CE 6.2 Enterprise Content Interoperability Specification

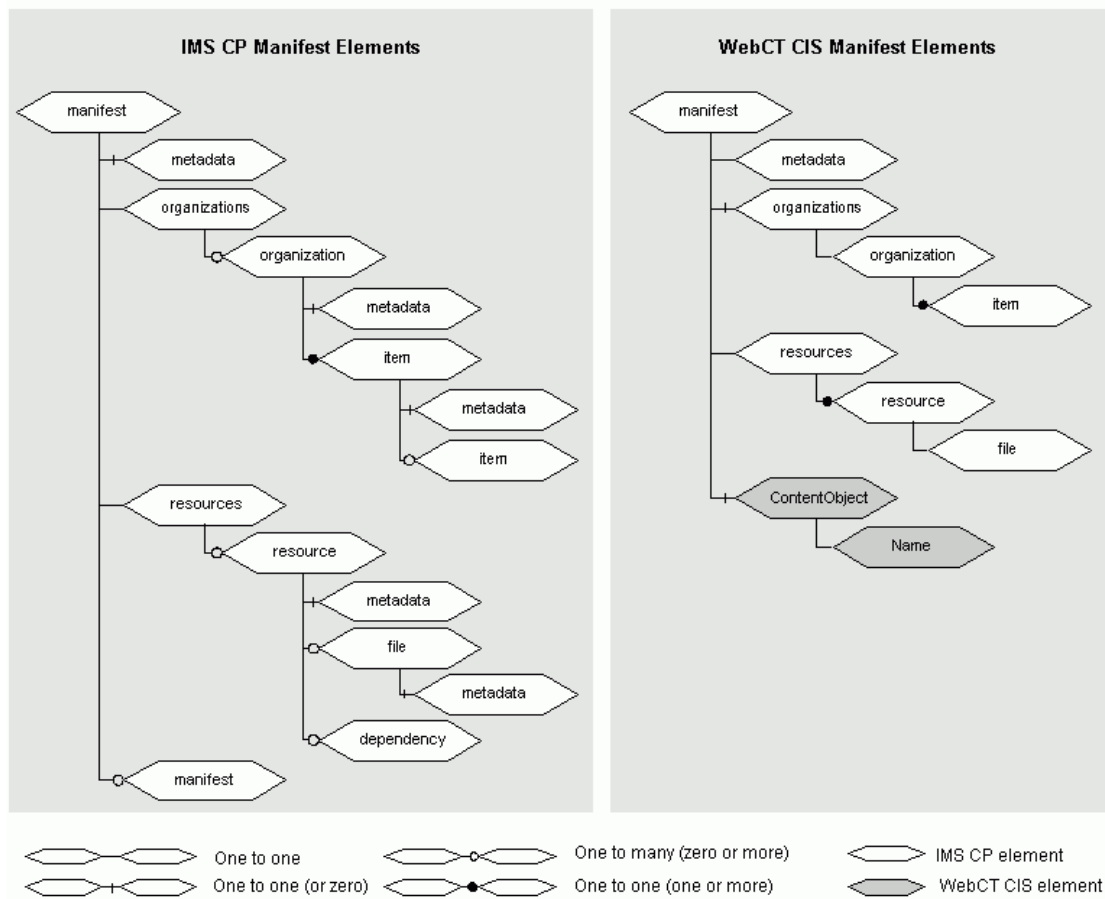


Illustration 2: Source - Blackboard Learning System - Vista 4.2/CE 6.2 Enterprise Content Interoperability Specification

5.2 VISUAL COMPARISON OF EPORTFOLIOS

Below is a visual comparison of ePortfolios created via Blackboard and ioPortal. It should be clear from the left hand menus that the data contained within each is comparable.

5.2.1 Sample Blackboard EPortfolio

The screenshot shows a Blackboard EPortfolio profile page. On the left is a dark red vertical navigation menu with the following items: Career Portfolio, Profile, Resume, Skills, Artefacts, and Comments. The main content area is white and titled "Profile" in a large, bold, dark red font. Below the title, there are three sections: "Education:", "Goals:", and "Qualifications:". Each section contains a bulleted list of information.

Profile

Education:

- ♦ Junior at Florida State University.
- ♦ Major: Communications Minor: Business
- ♦ Active Board member of Student Government.

Goals:

- ♦ Work for a marketing or public relations firm.
- ♦ Expand my technical and business-related abilities.

Qualifications:

- ♦ Creative, hardworking and highly-motivated.
- ♦ Computer skills - Microsoft Office and Adobe Photoshop.
- ♦ Bilingual in Spanish and English.

5.2.2 Sample IoPortal EPortfolio

The screenshot shows an IoPortal EPortfolio "About Me" page. At the top is a blue gradient banner with the text "About Me" in white. Below the banner is a navigation menu on the left with the following items: Personal Details, Skills, Supporting My Skills, Occupation, Formal Qualifications, Other Qualifications, Experience, References, and GuestBook. The main content area is white and titled "Personal Details" in a bold blue font. Below the title, there is a paragraph of text and a bulleted list of personal details.

About Me

Personal Details

Here you should see a small list of your personal details, those details you wish to share with the person[s]
Who will get to view your Web EPortfolio such as the example below:

Mr Archie Underpass
12 Blackway Road
Exeter
Devon
EX43HE
Telephone: 01 392811 333
Mobile: 07979240333
DOB: 08/09/1967

My Photo

6 REFERENCES

- Blackboard Learning System - Vista 4.2/CE 6.2 Enterprise Content Interoperability Specification
- Blackboard Academic Suite Advanced Data Integration and Management Manual
- Blackboard Building Blocks Developer Guide
- PDP4XL²: Work Package 4.2
- ioMorph – <http://iomorph.ionetwork.ac.uk>