Final Report:
Managing Digital Assets in Tertiary Education (MANDATE)

Contents

Acknowledgements

The project was funded by JISC under its 4/04 Supporting Digital Preservation and Asset Management in Institutions programme.

The project's operational partners were:
John Wheatley College
Centre for Digital Library Research (Strathclyde University)

The project was supported by:
Scottish Information and Library Research
Glasgow City Council

Executive Summary

Aims and objectives

The project's aimed to develop a toolkit to support the creation and implementation of digital asset management and preservation in the further education setting, and demonstrate its application in the setting of John Wheatley College (JWC).

The project was funded by JISC under the 4/04 programme (http://www.jisc.ac.uk/fundingopportunities/funding_calls/2004/07/funding_circular4_04.aspx) which funded projects in institutional digital preservation and asset management, with a specific focus on strategies and procedures for long-term digital preservation and asset management. The project undertook to examine issues associated with digital asset management, with consideration being given to preservation issues in a further education environment.

Overall approach

The project was led by John Wheatley College with expertise in digital asset management provided by the Centre for Digital Library Research.

The project examined digital asset management needs in John Wheatley College relating to documents supporting a pro-active approach to Freedom of Information legislation principle and flexible access to learning and teaching materials.

The project manager and the Centre for Digital Library Research project officer consulted with strategic managers, administrative managers and support staff and the College's ILT Champions teaching staff. The project officer researched issues and other projects working in the context of similar problems, and a database developer from the Centre for Digital Library research developed an initial database design and initial system development.

Findings

The project findings are contained in the toolkit available at http://mandate.cdlr.strath.ac.uk. The main findings were that:

- Any development of a digital asset management system has two key components: a strategy to manage the changes in the cultural and organisational "system" and a piece of technical development or implementation to support this.
- College requirements are that only a subset of College documents has long-term retention requirements (e.g. learning materials are required only for the period in which the learning outcomes supported are current).
- The process of gathering metadata from appropriate players requires simplification so that as much as possible is generated automatically and options are available through drop-down lists or other forms of controlled data entry.
- The level of granularity of metadata required to suit College purposes lies at document level rather than at document component (e.g. graphs) level.
- Metadata capture and automation is the key not only to information retrieval but also to the integration of information services (e.g. links between the UNIT-e MIS system and the web server through the SQL database, and integration of document publishing services with library management services).

Conclusions

The project has achieved the publication and dissemination of a toolkit supporting other colleges in approaching the development of a digital asset management strategy, and has supported the development of such a strategy in John Wheatley College.
The project demonstrates that Further Education colleges can develop a digital asset management strategy supporting flexible access to learning and teaching materials, and

publication of documents supporting a pro-active approach to Freedom of Information legislation principles.

Background

John Wheatley College sought to develop a management toolkit to support effective digital asset management and preservation meeting the FE environment. This was based on a research pilot in John Wheatley College, focussed primarily on curriculum-related materials, both administrative and e-learning.

The College built upon its previous work for JISC (09/02 Establishing Good Practice in Further Education Records Management: Using the model action plan for achieving compliance with the Lord Chancellor's code of practice on the management of records (http://www.jisc.ac.uk/whatwedo/programmes/programme_supporting_irm/project_goodferm) and built upon a partnership with the Centre for Digital Library Research (CDLR) developed through participation in the JISC-funded HaIRST (http://hairst.cdlr.strath.ac.uk/) project with the other Glasgow colleges.

John Wheatley College and the wider FE/HE communities benefited from the work undertaken by the College and partner, West Lothian College, under the auspices of the JISC Records Management Project.

Responsibility for the creation of learning/ teaching packs lies with Curricular Leaders who identify appropriate lecturing staff to develop individual packs. This nominated person is the 'subject leader' who develops lesson plans, learning and teaching approaches, resources, assessment materials and identifies relevant approaches to the use of learning technologies within the subject area. This work is supported by the College's Administration and technician staff.

The materials are, at present, available in a range of formats, including paper-based and electronic format.

There was no college-wide strategy for the development and storage of such materials and, as a result, storage, retrieval and preservation were at the discretion of individual curriculum managers.

There was a clear need for a strategy which ensures that all materials are created in digital format, are centrally stored and are preserved in a manner which maintains their accessibility to relevant users. The strategy also required to take account of retention requirements.

The MANDATE project was needed to support the development of digital asset management strategies in Further Education colleges by providing a toolkit to enable coherent approach to the management and preservation of digital assets. The toolkit also contains a case study, demonstrating its application in the setting of John Wheatley College.

Aims and Objectives

The aims and objectives of the project were to:

- create a toolkit to support digital asset management and preservation in FE colleges based on research practice to be piloted in John Wheatley College and supported by the Centre for Digital Library Research (CDLR) and the Scottish Library Information Council (SLIC);
- develop a system which would format, index, and store existing unstructured digital materials created in previously disparate processes and from the research practice create and test templates and workflow models for routine use in John Wheatley College and for application across the sector;

- develop appropriate structures for web-based storage of information that will contribute to the end goal of improved digital preservation; and
- examine the roles of various staff – teaching staff, librarians, administrators, technicians - in the creation of appropriate metadata

Methodology

Overall approach

The project was substantially supported by expertise supplied by Strathclyde University's Centre for Digital Library Research, and the Scottish Library and Information Council.

Detailed research was conducted by the Centre for Digital Library Research project officer, who also supported the development of an initial database design and initial system development.

Completion of the system development is being undertaken by the John Wheatley College Web Developer.

The project consulted strategic managers, administrative managers and support staff and ILT Champions teaching staff.

This overall approach was chosen in order to import the research, technical and library expertise which would not otherwise have been available to John Wheatley College, and to base the design on the feedback from staff facing the problem of asset management.

Methodology

The toolkit was supported by research conducted by the Centre for Digital Library Research project officer included findings from previous projects supported by Strathclyde University, findings from other projects supported by JISC, and web-based based research about applicable standards. This research provided links to further information as part of the toolkit.

The Centre for Digital Library Research project officer worked closely with the John Wheatley College project manager who facilitated several meetings with relevant College staff (administrative, teaching and technical) and who provided information about College processes and systems.

Extensive consultation was conducted at appropriate points with:

- College strategic managers (in particular the Assistant Principal who chaired the Steering Group and the Depute Principal, who manages retention policies;
- College ILT Champions (teaching staff who support flexible learning support for mainstream students and who lead in course teams on practice developments associated with the exploitation of information and learning technologies);
- College administrative staff who publish records of meetings.

This consultation took the form of interviews, ad-hoc meetings and demonstration of a prototype illustrating proposed upload and retrieval methods.

Based on the research and consultation process, the Centre for Digital Library Research project officer and database development supplied an initial database design and system development.

The system design was based on a database management system (MS SQL Server), and web server (MS Internet Information Server) and scripting (asp and asp.Net). The design principles apply regardless of platform, but the Microsoft platform was used to develop the system because of its deployment at John Wheatley College.

The system was developed to automate and simplify the process of metadata collection as far as possible, to enable staff without cataloguing training to contribute records.

There was insufficient project time for the development of the final system, and this work was taken on by John Wheatley College. The system development was interrupted for about 6 months as a result of staff turnover, exacerbated by delays caused by Disclosure Scotland processes required for staff recruitment.

The system now has its main components developed and will be trialled by administrative and teaching staff in December 2006 and January 2007.

Standards, interoperability and scalability

Serious consideration was given to the potential use of public domain software (specifically based on Linux) but the requirement to integrate with other software and staff skills issues led to the decision to base the technical design on the software already deployed at the College, which is mostly Microsoft-based. The requirement for the final system to integrate with Microsoft Active Directory was a particularly significant factor.

Standards decisions were based on the requirement for the system to contain data which can be exported for incorporation into a library management system, and to take account of potential future adoption of systems using IEEE LOM. It was decided to use Dublin Core as the base for metadata standards, with elements from IEEE LOM which could then be mapped into MARC.

The decision to use the College's existing SQL Server platform caters for scalability.

Implementation

The project work was planned in consultation with staff from the Centre for Digital Library Research and the project plan agreed by the Steering Group. The Centre for Digital Library Research provided support for the development of workpackages, which was outwith the experience of the John Wheatley College project manager.

Technical development was planned within the Centre for Digital Library Research team, based on the work of the Project Officer, who planned staff consultation in liaison with the College's network manager.

User contributions to the database and systems design were facilitated by a combination of single face to face sessions explaining concepts and interviewing key staff members (in particular, the College's Network Manager, Associate Principal (Quality) and Administration Manager and group sessions with College ILT Champions).

The College's network manager acted as liaison between the CDLR project officer and College staff as required.

The CDLR project officer worked on an ongoing basis to research best practice elsewhere and used the process to inform College staff and the toolkit development.

Outputs and Results

The end result of the project was the toolkit (available at mandate.cdlr.strath.ac.uk). The toolkit has a section supporting the development of a strategy for managing digital assets, with sections providing support for addressing issues associated with:

- Asset type decisions
- Metadata
- Workflows
- Interoperability
- Preservation
- Legislation
- Software and
- Training.

In addition, there is a case study of the approaches taken to these issues by John Wheatley College during the development of the toolkit and its initial system design, and information about the database design is also incorporated.

The toolkit is aimed at managers, administrative and technical staff considering the management of digital assets in colleges.

It discusses some of the main issues facing such developments, poses questions for consideration based on these issues and highlights the example of John Wheatley College and its plans to develop a digital asset management system to organise materials supporting learning and teaching and the publication of papers relating to the College's governance.

It is published primarily as a website to enable consideration of the issues by a variety of interested parties including managers, technical staff and librarians. The toolkit has also been produced as the Mandate toolkit print version, a single linear PDF document enabling distribution in paper format.

The John Wheatley College case study is given as a separate section.

The toolkit is being considered for use in the development of an InfoKit by JISC InfoNet to support Further Education colleges in developing and implementing a digital asset management strategy, with potential use by Regional Support Centres as the basis of training for college managers.

Outcomes

Project Deliverables:

Support for assessment of initial college position	Completed: supported database design
Database specifications	Outline database specification included as part of toolkit
Metadata collection templates	Developed as part of training for staff and included as part of toolkit
Cross-walks and mappings	Metadata mappings for MARC21 developed for project by CDLR and included as part of toolkit

Workflow process diagrams and explanations	Initial college-specific exemplars devised by CDLR and included as part of toolkit (to be revised once system in use by College staff)
Model strategy for adaptation and use by other colleges	Included as part of toolkit in form of case study of decisions and approaches taken by John Wheatley College
Training Programme specification	Included as part of toolkit and under consideration by JISC InfoNet
Case Study of application of toolkit in John Wheatley College	Included as part of toolkit: will be updated once system is completed and in use

Preparation of the toolkit designed to support other colleges in their approach to digital asset management supported significant enhanced capacity for the management of digital assets in John Wheatley College.

This capacity resides in the experience and understanding of the issues associated with digital asset management in diverse groups of staff, including managers (technical, administrative and curriculum), administrative, library and teaching staff.

The most obvious result of this enhanced capacity was the decision taken by the College to restructure and develop an information and learning services team to support flexible learning and information systems development. This restructure included the creation of a permanent management position (information and learning services manager), the addition of a half post supporting web development and a refocusing of the work of web development on database development and integration, and the creation of a new system development position to work towards the integration of database and web services. The new structure recognises the importance of making available learning materials through a web-based interface as an essential aspect of the College's flexible learning service plan, with the new team managed by the information and learning services manager.

The toolkit's dissemination has resulted in greater awareness of the issues associated with the development of a digital asset management system strategy. In particular, it has resulted in a realisation that metadata required for library system inclusion (MARC) may be gathered wholly through automated processes for documents associated with College governance, and may be significantly enhanced through the participation of teaching staff in supplying educational descriptions.

Internally, it has resulted in a greater strategic awareness of the positive implications for flexible learning opportunities of digital asset management and has assisted in the development of understanding of issues associated with metadata among teaching and administrative staff.

The project has also supported the further development of the Centre for Digital Library Research's support for cross-sector development of the Scottish Information Landscape, in particular through the cross-sector vehicle, the Confederation of Scottish Mini- Cooperatives.

Conclusions

The project work illustrates the critical importance of adopting library expertise and the consideration of systems integration in approaching digital asset management.

The project's main findings were that:

- Any development of a digital asset management system has two key components: a strategy to manage the changes in the cultural and organisational "system" and a piece of technical development or implementation to support this.
- The level of granularity of metadata required to suit College purposes lies at document level rather than at document component (e.g. graphs) level.
- College requirements are that only a subset of College documents has long-term retention requirements (e.g. learning materials are required only for the period in which the learning outcomes supported are current).
- Documents supporting meetings have retention periods set at a period designed to suit physical storage.
- Before preservation issues can be considered, organisations require first to coherently manage digital assets.
- The process of gathering metadata from appropriate players requires simplification so that as much as possible is generated automatically and options are available through drop-down lists or other forms of controlled data entry.
- The opportunity to use a single standard system across an organisation has led, in its anticipation, to standardisation of previously disparate practice (e.g. workflows and versioning issues associated with the production and publication of minutes of meetings).
- When administrative and teaching staff can quickly see the benefits of a system in its potential both groups are keen to support it and eager to learn about it use.
- The association of assets with individual Scottish Qualifications Authority units has provided the key access points to all learning materials and quality documents through appropriate places in the College website (being developed around the MANDATE project outputs).
- Strong senior management support is essential in providing access to key college staff for the development team
- Metadata capture and automation is the key not only to information retrieval but also to the integration of information services (e.g. links between the UNIT-e MIS system and the web server through the SQL database, and integration of document publishing services with library management services).

The main lessons learned by the project were that:

- System development is likely to take significantly longer than initially estimated;
- Recruitment and retention of key development staff is a significant risk which is difficult to foresee and offset;
- Strategic management vision and support is critical to project success;
- Change which supports wider access to flexible learning resources is supported by teaching staff; and
- Change which supports simple publication of college documents in line with the principles of Freedom of Information legislation is supported by administrative staff.

Implications

The project work demonstrated that relatively small (in UK terms) Further Education colleges are capable of developing and implementing a digital asset management strategy.

Useful further development work which could be undertaken would be:

- The development of community-specific controlled vocabularies;
- The development of specifications and automated harvesting methodologies to enable legal deposit of digital publications; and
- The development of a JISC InfoNet InfoKit to support other colleges in the development and implementation of a digital asset management strategy.

References

Managing Digital Assets in Tertiary Education Toolkit (http://mandate.strath.ac.uk and www.jwheatley.ac.uk/mandate/toolkit.)

Appendix 1: Toolkit Contents:

- Strategy
  - Purpose of an asset management strategy
  - Development of an asset management strategy
  - Managing the development of a strategy
- Asset Types
- Metadata
  - Metadata requirements
  - Metadata standards
  - Metadata quality
  - Model metadata schemas
- Workflow
  - Workflow for current practice
  - Workflow modelling and development
- Interoperability
  - Interoperability and metadata mapping
- Preservation
  - Preservation and the OAIS model
  - Preservation strategy
- Legislation
  - Legislation for freedom of information
  - Legislation for data protection
  - Legislation for copyright
  - Legislation for special needs
  - Software
- Training
- Case Study
- Glossary